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СОВРЕМЕННЫЕ УГОРЗЫ ЗДРАВООХРАНЕНИЮ И РОЛЬ США: МЕЖДУНАРОДНАЯ СИСТЕМА И НАЦИОНАЛЬНАЯ БЕЗОПАСНОСТЬ

THE PROACTIVE AND REACTIVE ROLES OF THE UNITED STATES FOR MODERN INTERNATIONAL HEALTH THREATS

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ABSTRACT

Infectious diseases have plagued the world for centuries and are reemerging into today's society. The argument that emerging infectious diseases are global, not just state, problems demand international solutions and preventative measures for public health, scientific, and political perspectives. The Centers for Disease Control and Prevention serve as the main governmental agency in charge of domestic and international research and incidents involving infectious diseases and health crises. This dissertation identifies the main proactive and reactive methods of the United State, which the CDC uses to prevent and combat modern infectious disease outbreaks and how it can contribute internationally. The research examines as to why different outbreaks, mainly the Ebola and Zika viruses, were handled differently at the time as compared to how the World Health Organization and its regional offices responded to the outbreaks. This study argues that organizational structure, higher lethality, securitizing factors, and behavioral motivations affect the rate of response time and resource allocation to these outbreaks. This concludes with the explanations of those aspects express the importance of a centralized organization and securitizing the outbreak as the main contributors to an effective and quick response, while the epidemiological and behavioral factors had less effect and were inconclusive.

Keywords: Infectious diseases; Centers for Disease Control and Prevention; World Health Organization; Zika; Ebola; public health response; organizational structure; securitization; globalization; behavioral motivation; epidemiology

АННОТАЦИЯ

Инфекционные болезни, захватывающие мир на протяжении веков, вновь появляются в современном обществе. Новые инфекционные болезни являются не только проблемой на государственном, но и на глобальном уровне, и требует международных решений и превентивных мер для общественного здравоохранения, научных и политических перспектив. Центры по контролю и профилактике заболеваний служат главным правительственным агентством, отвечающим за внутренние и международные исследования и случаи, связанные с инфекционными заболеваниями и кризисом в области здравоохранения. В данной диссертации выявлены активные и реактивные методы Соединенных Штатов Америки, которые используются центрами по контролю и профилактике заболеваний для предотвращения вспышек инфекционных заболеваний и борьбы с ними, а также, как центра могут способствовать международному развитию. В исследовании анализируется, как разные вспышки вирусов, главным образом Эбола и Зика, обрабатывались по-разному по сравнению с реагирование Всемирной организацией здравоохранение и ее региональными отделениями. Это исследование утверждает, что организационная структура, более высокая летальность, секьюритизирующие факторы и поведенческие мотивации влияют на скорость реакции и распределение ресурсов на вирусные вспышки. Наконец, было выявлено понимание аспектов, выражающих важность централизованной организации и секьюритизация данных вспышек в качестве основных факторов эффективного и быстрого реагирования, в то время как эпидемиологические и поведенческие факторы оказывали меньшее влияние и являлись неубедительными.

Ключевые слова: Инфекционные болезни, Центры по контролю и профилактике заболеваний, Всемирной организацией здравоохранение, Зика, Эбола, ответ общественного здравоохранения, организационная структура, секьюритизация, глобализация, поведенческие мотивации, эпидемиология

LIST OF ABBREVIATIONS

AFRO African Regional Office

CDC Centers for Disease Control and Prevention

CEF Contingency Emergency Fund

DOD Department of Defense

EOC Emergency Operations Center

ETU Ebola Treatment Unit

GBS Guillain-Barre Syndrome

GOARN Global Outbreak Alert and Response Network

HHS Department of Health and Human Services

IHR International Health Regulations

IMC Incident Management Center

MSF Médecins Sans Frontiéres

NCBI National Center for Biotechnology Information

OCHA Office for the Coordination of Humanitarian Affairs

OID Office of Infectious Diseases

PAHO Pan American Health Organization

PHEIC Public Health Emergency of International Concern

SARS Severe Acute Respiratory Syndrome

UNICEF United Nations Children's Fund

UNMEER United Nations Mission for Emergency Ebola Response

USAID U.S. Agency for International Development

WHO World Health Organization

INTRODUCTION

A. Importance

Throughout history, few events have demonstrated such catastrophic effects as those connected with infectious disease outbreaks. At least 75 million people are thought to have perished from the devastating bubonic plague called the "Black Death" with some estimates as high as 200 million worldwide.[1] Almost half of Europe during the span of only four years in the mid-14th century may have died from the pandemic. In 1918, a dangerous form of influenza named the Spanish Flu spread around the world to an estimated one-third of the world population, taking as many as 50 million lives with one million deaths every week for the first half-year of the outbreak.[2] With the world vastly more populated, traversable, and interconnected, it has become more vulnerable and susceptible to pandemics and epidemics that could spread and affect people at a frightening rate.

After decades of neglect, infectious diseases have re-emerged as an area of focus in the areas of science, public health, and politics. With renewed concern, themes of global recognition and international cooperation have been expressed in both scientific discourse and popular culture. The argument that emerging infectious diseases are global, not just state, problems demand international solutions and preventative measures for public health, scientific, and political perspectives. Over the past 40 years, how health emergencies and crises are addressed and managed has been shifted. Humanitarian response and relief actions were more emphasized with less attention given to policies, strategies, and actions enacted prior to health risks that can lessen the disastrous effects of these event on societies and preserve assets and save lives. While humanitarian efforts remain important, there is also a need emergency preparedness programs vital for reducing the effects of health risks that are needed to protect sustainable development.

States continually invest in organizations and professionals whose aim is the prevention of public health catastrophes. It has been called the field of Public Health Emergency

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[1] "The Five Deadliest Outbreaks and Pandemics in History" // Robert Wood Johnson Foundation, 2013. URL: https://www.rwjf.org/en/culture-of-health/2013/12/the_five_deadliesto.html (accessed 18.01.2018).
[2] "Outbreak: 10 of the Worst Pandemics in History" // MPH Online. URL: https://www.mphonline.org/worst-pandemics-in-history/ (accessed 20.01.2018).

Preparedness and Response.[3] According to Nelson et al., Public health emergency preparedness "is the capability of the public health and healthcare systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities."[4] Emergency preparedness has traditionally focused on building up and allocating relief goods and providing services in the time of crisis to meet the public's basic needs. While elevating capacities remains a priority for all countries, it can be said that more is needed to reduce the economic, social, and political consequences of infectious diseases and other health threats.

States carry the main responsibility for the protection of their citizens and assertion of safety. National and international communities need close association with authorities, public, private, and governmental organizations to strengthen their capabilities to prepare for and control the consequences of various hazards and casualties. Organizations like the Center for Disease Control and Prevention (CDC) and the World Health Organization (WHO) are at the head of the movement to improve preventative and response measures locally and globally, but the responsibility should not just lay with them. There is a critical need for international cooperation between multiple entities that enact domestic and foreign public health policies and contribute aid to those in need of assistance.

Scholars and political leaders are starting to recognize the emergence and reemergence of infectious diseases represent the processes of globalization. Public health, a topic distant from the hectic environment of global commerce and finance, is being analyzed differently as an effect from globalization. With the distinction between the national and international public health no longer relevant, there has been the need to redesign previous preparedness plans and responses to adapt to the changes brought on by globalization.

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[3] Hunter, M.D. Approaches to Plans in Public Health Emergency Preparedness and Response // UC Berkeley, 2017. URL: https://escholarship.org/uc/item/0mj764qc#article_main (accessed 20.01.2018).

[4] Nelson, C., Lurie, N., Wasserman, J., Zakowski, S. Conceptualizing and Defining Public Health Emergency Preparedness // American Journal of Public Health, Vol. 97, No. 1, 2007. P. 1-3.

B. Aims and Objectives

The Centers for Disease Control and Prevention of the United States compared to the World Health Organization are considered as the **objects** of the current dissertation, while their proactive and reactive responses to infectious diseases are the **subject** of research.

This dissertation explores explanations for why the Centers for Disease Control (CDC) responded differently domestically and with international organizations, such as the WHO, to each recent major infectious disease outbreak: Swine Flu (H1N1); Severe Acute Respiratory Syndrome (SARS); anthrax attacks in the United States in 2001; the Ebola virus; and the Zika virus. The organizational, epidemiology, securitization, and protection-motivation theory literature suggest six primary answers to these questions. This research uses these sources to formulate four explanations through which to examine each case. The case studies are assessed along two dependent variables: time from the start of the outbreak until the American and international organizations' response, and the amount of financial and human resources allocated to the response.

In the organizational structure explanation, the author examines the CDC's and the WHO's structures and their budgetary mechanisms to determine whether or not a centralized or decentralized structure and contribution mechanisms in resource availability contribute to a slower or faster response. Second, the epidemiological explanation focuses on the transmissibility and lethality of each infectious disease. In this explanation, the author examines whether a more easily transmissible and lethal virus results in a faster response allocating greater amounts of human and financial resources. Third, the securitization explanation examines whether the assessment of each health threat results in the allocation of more financial and human resources. Finally, the protection-motivation explanation examines the social response and whether it influences the response time and the amount of resources used regardless of procedure.

Several research questions were taken into consideration when examining these cases and exploring explanations:

- What do American governmental and non-governmental organizations do to prevent and combat infectious disease outbreaks?

- How do these organizations contribute to the actions against these health threats that affect their national and international relationships?
- How do American domestic and foreign health policies attempt to assist in identifying, containing, and preventing infectious diseases?
- Why are there differences in response time and resource allocation between the different cases presented?
- Were they treated differently due to differences in lethality?

Hypotheses

The literature used produce the following hypotheses, which guide the analysis of the main two organizations, the CDC and the WHO, responses to each infectious disease case. Hypotheses one and two (H1 and H2) relate to the organizational structure, hypotheses three and four (H3 and H4) relate to the epidemiological explanations, hypothesis five (H5) relates to the securitization explanation, and hypothesis six (H6) relates to the protection-motivation explanation.

H1: The more centralized the bureaucratic structures, the quicker the organization's response to the outbreak.

H2: The more decentralized the bureaucratic structures, the slower the organization's response to the outbreak.

H3: The more lethal the disease, the more quickly the organization will respond and the more resources the organization will allocate to the response.

H4: The more easily transmissible the disease, the more quickly the organization will respond and the more resources the organization will allocate to the response.

H5: When an outbreak is framed in a convincing way the outbreak is securitized, and as a result, the organization will allocate more physical and financial resources to the emergency.

H6: When the perception of the severity of and vulnerability to an infectious disease outbreak and recommended behaviors are determined quickly, the more quickly the

organization will respond and the more resources the organization will allocate to the response.

C. Theoretical Framework

Organizational theory

Organization theory stems from Max Weber's research developed during at the beginning of the Industrial Revolution at the end of the 19th century. The ideal organizational structure is that responsibilities for staff are clearly defined and their behavior is controlled tightly by procedures, policies, and rules. It suggests that resource allocation and response time is linked to the type of organizational structure, whether centralized or decentralized, and the more the budgeting mechanisms allow for flexible usage of funds, and the varying amount of contributions, the slower the response and the fewer resources allocated to help the cause.[5] The main disruption in the coordination and speed taken to act to an emergency is the organization's lack of clear lines of accountability and communication. Furthermore, the integration of Abraham Maslow's "hierarchy of human needs" into organization theory introduced two important connotations: people have different needs and incentives; and that their needs change over time.[6] The hierarchical level differences between decentralized decision-making structures and centralized ones can also influence the rate of response and overall management philosophy of the organization. The formalized system of rules and policies sets the agenda for efficiency and behavior while categorizing the organization as informal or formal. The organizations mentioned in this study are examples of both centralized and decentralized organizations with varying formalities and structures used in analysis of their efficiency of formulating and carrying out response plans during times of health emergencies.

[5] Organization Theory // Inc. URL: https://www.inc.com/encyclopedia/organization-theory.html (accessed 22.01.2018).
[6] Maslow, A.H. Motivation and Personality // Harper & Row: New York, 1954.

Epidemiological transition theory

Epidemiological transition theory was devised in a research study published by Omran in 1971, which provided a description and explanation of the mortality aspect of the "demographic transition", the start of a sharp decline in death rates and then in birth rates.[7] Principally, the theory focuses on the complex change in patterns of disease and health and on the interactions between these observed common patterns and their sociologic, economic, and demographic causes and effects. Omran states five main propositions: 1) mortality as a factor in population dynamics; 2) pandemics are gradually displaced by regressive and man-made diseases attributed as the primary cause of death; 3) the most serious changes in disease and health patterns occur among young women and children; 4) the shifts in disease and health patterns in epidemiologic transition are closely related with the socioeconomic and demographic transitions that comprise the modernization complex; and 5) three fundamental models of the epidemiologic transition are an action of "peculiar variations in the pattern, pace, the determinants and the consequences of population change."[8]

The theory can be applied in different social contexts to exemplify the causes and consequences of change in health and disease with the use of comparative analyses and case studies.[9] The epidemiological approach suggests that the more easily transmissible and lethal the virus, the quicker a health organization responds and the greater allocation of resources. With socioeconomic improvements and modern public health programs, an increase in labor effectiveness leading to economic productivity tends to be because of the decrease in mortality and of infectious disease. Since the Sanitary Movement of the 18th and 19th centuries, the modern public health movement has led to the improvement of living conditions and identifying infectious diseases as major contributors to mortality and morbidity.[10] This practice has helped shape public health programs and organizations develop response plans, prevention, and control. The problem of categorizing epidemiological transition still remains, however, with a need to incorporate a more inclusive view

[7] Mackenbach, J. P. The epidemiologic transition theory // J Epidemiol Community Health, Vol. 48. P. 329-331.
[8] Omran, A.R. The Epidemiologic Transition: A Theory of the Epidemiology of Population Change // The Milbank Quarterly, Vol. 83, No. 4, 2005. P. 739.
[9] Omran, A.R. The Epidemiologic Transition: A Theory of the Epidemiology of Population Change // The Milbank Quarterly, Vol. 83, No. 4, 2005. P. 740.
[10] McKeown, R.E. The Epideimiologic Transition: Changing Patterns of Mortality and Population Dynamics // American Journal of Lifestyle Medicine, Vol. 3, No. 1, 2009. P. 19-26

with more complex systems and models rather than the basic identification of isolated risk factors and awareness.

The World Health Organization provides the following definition: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[11] The biomedical model supports policies and practices of national health services and defines health care services, replacing older, more traditional approaches with a scientific one. The patient's main concern is for the recovery of their health through the best possible treatment they can receive acts as specific advantages.[12] The model provides a basis for preventative or therapeutic intervention in infectious human diseases based on biological knowledge and scientific research.

Cultural and professional models of medical threats and illnesses influence decisions individually to patients and their access to health care. The biomedical models of illness tend to integrate many closely associated set of beliefs: all illnesses and symptoms originate from a concealed abnormality residing within the body, referred to as a disease; the absence of disease being health; disturbances of bodily function are separate from mental phenomenon; the patient is a victim by chance and is expected to cooperation as a recipient of treatment. Some disadvantages to this model include treating patients as their diagnosis and not as an individual.

Securitization theory

Barry Buzan analyzed five different sectors essential to understanding security: societal, economic, military, environmental, and political. He states that the "five sectors do not operate in isolation from each other. Each defines a focal point within the security problemata, and a way of ordering priorities, but all are woven together in a strong web of linkage."[13] With the question of "What is a security issue?" broadening over the past two decades, security is no longer limited to

[11] Constitution of WHO: principles // World Health Organization, 1946. URL: http://www.who.int/about/mission/en/ (accessed 27.01.2018).
[12] Wade, D.T., Halligan, P.W. Do biomedical models of illness make for good healthcare systems? // BMJ: British Medical Journal, Vol. 329, No. 7479, 2004. P. 1398-1401.
[13] Buzan, B. New Patterns of Global Security in the Twentieth-First Century // International Affairs, Vol. 67, No. 3, 1991. P. 433.

the five narrow sectors defined by Buzan. Health issues are significant for the security agenda ever-broadening because they fall well outside traditional assumptions of what constitute security issues. Securitization is not a binary condition, or an issue is either securitized or not, but rather, it is a continuum with partial securitization along that continuum.[14] Balzacq argues that the mere application of the speech act attempting to raise an issue in the process of securitization is not enough, and that to gain traction in the security debate, the statements must usually be related to an external reality.[15]

Related to the health sphere, securitization theory suggests that when a pandemic outbreak is framed as a security issue, its position in normal politics is elevated to an existential threat that calls for an equally proportionate response. The result should consist of greater resources allocated to an emergency response with more efficiency and care. The differences in decentralized and centralized structures of a health organization produce varying interpretations on how quickly a rising health issue is classified as a security threat. The focus is on the speech and its power to construct security while emphasizing that successful securitization processes are due to the acceptance of the audience.[16] Legitimate security claims can alter an existing emergency preparedness plan or call for the creation of a new approach. There has been greater attention given to the securitization of health issues, such as reemerging and newly emerging infectious diseases with existing response plans being put to the test to see how effective they are dealing with modern health threats.

Protection-motivation theory

Developed in 1975 by R.W. Rogers, protection-motivation theory was devised to better understand fear appeals and the ways people cope with them. The need to protect oneself from danger depends upon four factors: the perceived severity of a threat; the perceived probability of a threat endangering them, or vulnerability; how effective is the recommended behavior; and how

[14] McInnes, C. HIV/AIDS and securitization theory // European Journal of International Relations, Vol. 19, No. 1, 2012. P. 115-138.
[15] Balzacq, T. Understanding securitisation theory: the design and evolution of security problems // Routledge: London, 2009. P. 49
[16] Sulovic, V. Meaning of Security and Theory of Securitization // Belgrade Centre for Security Policy, 2010.

well they perceive they will act in a dangerous situation.[17] These factors are used to develop and perform adaptive responses. While securitizing and examining the epidemiological aspect of infectious diseases, the protection-motivation theory gives a clear understanding of fear appeals, persuasive communication, and cognitive behavior changes.[18] The point of the fear-drive model is that fear acts as a motivator for trial and error behavior, which is exemplified in preparedness response plans. Using a plan that reassures those in danger of a threat expresses the urgency of the emergency and encourages cooperation to combat the threat.

With the ever-rising complications of identifying, treating, and preventing infectious diseases, there is a need to encourage people to consider their health when taking actions with an intent to avoid negative health consequences. While a thoroughly laid-out preparedness response plan can be effective, it ultimately lies with the practical usage which depends upon not only the speed of the response and amount of resources allocated to the emergency, but also on an individual's behavior and actions to help the cause. The heath belief model serves as a framework that attempts to predict and explain health behaviors by observing the beliefs and attitudes each individual holds. It is built on the notion that a person will act in consideration of their health if that person: thinks that a negative condition (i.e., HIV) can be avoided; expect that they can prevent or avoid a negative health consequence by following an a recommended action; and that they believe that it is within their abilities to successfully take a recommended health action.[19] It has similar aspects to the protection-motivation theory of how a threat is perceived (i.e. susceptibility, severity, benefits, and barriers) and adds signals to action for strategies to activate self-efficacy and readiness when ones takes action.

This model cannot be applied to simple motivations, such as exercising to look good and feel better, because there is not an intent on avoiding or preventing a negative health outcome. The health belief model is better for how the public perceives a health threat and to develop health education strategies, prevention programs, and preparedness response plans.[20] The research

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[17] Conner, M., Norman, P. Predicting Health Behavior // Open University Press, 2005. P. 95.
[18] Conner, M., Norman, P. Predicting Health Behavior // Open University Press, 2005. P. 98.
[19] Health Belief Model // Health Communication University of Twente. URL: https://www.utwente.nl/en/bms/communication-theories/sorted-by-cluster/Health%20Communication/Health_Belief_Model/ (accessed 18.01.2018).
[20] Health Belief Model (HBM) // ReCAPP Resource Center for Adolescent Pregnancy Prevention. URL: http://recapp.etr.org/recapp/index.cfm?fuseaction=pages.theoriesdetail&PageID=13 (accessed 20.01.2018).

intends to use this model as to why some response plans can be less effective than others during a health emergency due to the fact of the perception of danger and motivation to cooperate with preventative measures and treatment plans and the complications that arise when the variable of individual and state behavior comes into play. Essentially, a plan is only as effective as the willingness to cooperate and follow through with the plan in a time of crisis. Combined with the biomedical model, this study will cover both the social and scientific levels dedicated to the formulation of response plans and the efficiency when implemented in the presented case studies.

Theoretical Approach

The specific aim directing the study is to inspect the mechanisms of response plans and how they interact by confronting a variety of accounts, through the comparison of difference cases' approaches and methods to formulate and enact their respective response plans to medical emergencies. Using and observing how the previously outlined theories play a role in shaping the creation of an involved organization's response, it would be the intention to provide a framework for isolating objects from their context, grouping them within a similar frame, and establishing relationships between them. The cases are analyzed based on their nature to incorporate those methods into their preparedness response plans and how that affects the speed of the response and the allocation of resources during an emergency of an infectious disease outbreak. These comparative analyses will attempt to provide a clear relationship between a centralized organization, such as the CDC, and a decentralized organization, the WHO, and their effectiveness against infectious diseases that occurred specifically within the United States and their efforts abroad through international cooperation.

D. **Methodology**

In the analysis, this dissertation uses the method of structured, focused, and chronological comparison analysis to evaluate the CDC's and the WHO's responses to the 2001 anthrax outbreak, SARS, H1N1 Swine Flu, Ebola, and Zika viruses, while setting the emphasis on Ebola and Zika cases for further examination. The author applies the same set of questions to each of the case studies to evaluate each organization's performance in the same way. The author

focuses on these cases to demonstrate the changes in the response plans of organizations as international health regulations and new medical standards have been introduced and adjusted to specific international medical emergencies. The response from the wider international community of related health organizations was also important to consider, though the author chooses to focus on these two organizations' responses to the outbreaks to provide a more in-depth analysis. The author relates each independent and dependent variable by identifying the steps along the way to trace the process used in each case.

Questions guiding my comparative analyses

The methodology requires a set of questions that are asked of each case study to assess cases in the same way. Questions are developed based on four theoretical explanations the author developed above and using two models to further develop the explanation. This research starts off by defining the dependent variable: What was the nature of the organization's response to the infectious disease outbreak? What kind of resources were allocated, and by whom?

The organizational structure explanation produces the following questions:

1. What bureaucracies were involved in the response to each case?
2. Were these bureaucracies centralized or decentralized and to what extent?
3. Had these bureaucracies experienced similar outbreaks in the past?
4. Did the bureaucracies involved have existing emergency preparedness response plans suited for the infectious disease outbreak?
5. What mechanisms existed for allocating resources to disease outbreaks?

The epidemiological response asks the following questions:

6. How transmissible is the virus?
7. How lethal is the virus?
8. What kind of long-term effects can the virus have for affected regions, societies, or countries?

The following questions arise from the securitization explanation:

9. Who were the security actors who were active in framing each infectious disease case?
10. Was the case determined as a public health issue requiring sustained engagement, or as a rapidly evolving emergency?
11. How did the media portray the frames put forth by the actors? Did the media attempt to alter them in any way?
12. To what extent did human and financial resources flow to the affected regions following the securitization of the outbreak?

The last questions are formed from the protection-motivation explanation:

13. What is the perceived severity of the infectious disease outbreak?
14. What is the perceived vulnerability of the occurrence?
15. What is the perceived self-efficacy in its response to the disease outbreak?

Strengths and weaknesses of comparative analysis

Comparative analysis allows for systemic comparison between case studies as each case study is evaluated using the same list of questions used in a structured, focused manner to allow for an in-depth evaluation. Case studies should use variables that allow for explanation across cases and provide scholars with information that can influence other outcomes beyond the case(s) used for analysis. Evaluating two (or more) cases using the comparative analysis method avoids the complications of a single case study contributing to a larger theory that the case is an instance of.[21]

While this analysis may not result in a theory that weaves together organizational, epidemiological, securitization, and protective-motivation approaches to understand the CDC's and WHO's response to pandemic outbreaks, selected methods prevent relying on a single theory or approach for explaining each case. As a result of this, this analysis explains more than a single

[21] George, A.L., Bennett, A. Case Studies and Theory Development in the Social Sciences // MIT Press: Cambridge, Massachusetts, 2005. P.67-72.

theory could by itself, leading to a better understanding of the factors that contribute to the organizations' response.

Additional literature analyzes and critiques each organization's response, as the CDC serves as the United States' coordinating health agency and research facility, and the WHO serving as the world's coordinating health agency. By situating this research within the existing literature, the author hopes to illustrate how this thesis contributes to the theory that helps predict the organizations' responses to future outbreaks.

This research uses the 2001 anthrax attacks, the SARS epidemic, and the H1N1 influenza outbreak to illustrate the acknowledgement of public health as a national and international security risk during times of emergency. The anthrax attacks put the United States into an unprepared and cautious state with respect to infectious disease outbreaks. The influence the attacks had on the responsiveness of public health organizations led to the adoption of a crisis-response mentality. When the SARS outbreak first emerged in China, these new response plans were put to the test to determine their effectiveness and costs. These developments in public health safety introduced the International Health Regulations by the WHO in 2005, and from there shaped how preparedness response plans approached infectious disease outbreaks.

After the severe acute respiratory syndrome (SARS) epidemic, there were major efforts to construct response and surveillance systems to identify outbreaks early, respond on a global scale, and contain the spread at the source of infection.[22] Delays in global disease outbreak responses are evident in the instance of the H1N1 influenza outbreak. These delays were also present in the cases of Ebola, and Zika viruses and became the main focus of this thesis to comparatively analyze the characteristics of each case to hypothesize about what influences the length of delays. Deferred global mobilization seems to be a greater source of delay than the worldwide surveillance capacities of public health organizations. Despite the efforts that have been developed after the International Health Regulations, prolonged time delays can still be seen in severe infectious disease outbreaks between global collective action and their emergence. If an outbreak, such as the cases studied in this section of the thesis, involve international spread

[22] Hoffman, S.J., Silverberg, S.L. Delays in Global Disease Outbreak Responses: Lessons from H1N1, Ebola, and Zika // American Journal of Public Health, Vol. 108, No. 3, 2018. P. 329-333.

and require a coordinated international response, recognition is primarily declared from the World Health Organization (WHO) that it constitutes a public health emergency of international concern (PHEIC) based on the 2005 regulations.[23] The responses to these cases were affected by the organizational structure of the CDC and the WHO, which the differences in response is attributable to their decentralized and centralized natures.

[23] International Health Regulations and Emergency Committees // World Health Organization, 2016. URL: http://www.who.int/features/qa/emergency-committees/en/ (accessed 25.01.2018).

I. LITERATURE REVIEW

The literature that this dissertation uses informs the four explanations through which the author assesses the case studies. There are four major international relations literature that relate to the research question and objectives. The first is the organizational theory literature on bureaucratic structures. Second, the epidemiological literature on diseases is related to international relations topics such as security and health. It provides a rational-actor explanation for the CDC and the WHO's responses to the cases. The third approach is the Copenhagen School's securitization theory. It is useful to understanding how framing an infectious disease outbreak as a security issue helps gather resources during a time of medical emergencies. The fourth approach is the protection-motivation literature, which helps to explain the perception of a threat and the motivations behind a response and its capabilities. This theory can be related to the securitization theory to further explain the methods to prioritizing an outbreak as a severe security threat.

To help gather data and formulate my results, the author also uses the biomedical and health-belief models. The biomedical model organizes the data into the policies and practices of a public health organization to clearly show the progression of the development of a response. The health-belief model takes into consideration the framework to explain and predict health behaviors and the motivations individuals and organizations have to take action and understand the practical usage of a response.

The research dedicated to the roles of public health organizations in the context of international relations has been sparse until the World Health Organization enacted the International Health Regulations (IHR) in 2005. Since then, studies on the importance of health treatment in times of crises have slowly appearing with the main focus generally on the humanitarian aspect. Analyses on infectious diseases and states' and organizations' response plans to these threats have been limited with little development, besides the epidemiological and biological point of views. Security and international cooperation to combat and prevent infectious diseases have been a rising topic in the past decade due to the stubborn and evolving characteristics of emerging and reemerging diseases. Past efforts have had some success, but some have lagged behind or even failed. With the ever-growing issue of biological security in the modern world and newer medical technological advances, the question is how to determine the most cost-effective and quick response plan needed in a specific health emergency. Efforts from

the WHO and the CDC have proven difficult in their efficiencies due to their organizational structure and limitations in health emergency protocol.

Not much literature exists, however, that analyzes emerging and reemerging infectious diseases from the perspective of international politics. The global problem-international cooperation theme in this field of literature does not directly confront the problems international health cooperation has had in the 20th and the beginning of the 21st century. The data for the epidemiological explanation primarily comes from the Centers for Disease Control and Prevention and the World Health Organizations websites and publications. The theoretical explanations require large amounts of data from a variety of sources: theorists such as Buzan and Balzacq on the securitization theory, scientific journal articles, and official reports from organizations to identify the actors. This study will use the public health and epidemiological perspectives – disciplines not typically associated with the general study of international relations – as a basis. This research will incorporate that knowledge along with the mentioned theories and models to provide a comparative analysis case study to express the critical need for international cooperation to deal with the global problem of emerging and reemerging infectious diseases and the advantages and disadvantages of the centralized and decentralized organizations and their role in those health emergencies.

A. Organizational Theory Literature

For the first section of the literature review the author examines the literature concerning the relationship between organizational structure, policy response, and budget. This literature can help us understand how the CDC and the WHO's organizational structure and budgetary mechanisms explain the differing responses to the H1N1 influenza, Ebola, and Zika viruses. The author uses the theory to show the relationships between bureaucracies within an organization. It focuses on communication between the different levels of hierarchy in the organization, as well as explaining how miscommunication can occur between larger organizations.

The majority of studies from the centralized organization type will be from the U.S. governmental agencies of the Centers for Disease Control and Prevention (CDC) and the U.S. National Library of Medicine and its National Center for Biotechnology Information (NCBI).

Their studies lay out their advances in science in health and past experiences in dealing with infectious diseases and health emergencies. Their research into health threats extending into detection, response, prevention, examination, and promotion of healthy and safe behaviors. Past records of their efforts to respond to infectious diseases is used to present case studies for comparative analysis of their efficiency and speed in planning and responding to such threats.

The CDC is a centralized organization and one of the Department of Health and Human Service's major operating components within the United States government. With its headquarters based in Atlanta, Georgia, the CDC houses 16 offices (Figure 1) to allow the agency to be more effective and responsive when handling public health concerns.[24] The main offices of focus for this thesis are the Office of Infectious Diseases (OID), the Center for Global Health, the Office of Public Health Scientific Services, and the Office of Public Health Preparedness and Response. These CDC offices' mission is to promote, guide, and facilitate programs and uphold policies to reduce the strain of infectious diseases, health concerns, develop and initiate preparedness and response plans, and provide surveillance strategies and capabilities at large in the United States and globally.[25] The budget of the CDC is provided by the United States government supplied yearly with varying increases and deductions. In addition, the CDC provides funding through assistance and acquisition. Assistance refers primarily to cooperative agreements and grants and acquisition refers the services and supplies purchased by the CDC.[26]

[24] CDC Organization // Centers for Disease Control and Prevention, 2018. URL: https://www.cdc.gov/about/organization/cio.htm (accessed 24.01.2018).
[25] CDC Organization // Centers for Disease Control and Prevention, 2018. URL: https://www.cdc.gov/about/organization/cio.htm (accessed 24.01.2018).
[26] About CDC Funding // Centers for Disease Control and Prevention, 2014. URL: https://www.cdc.gov/funding/AboutCDCFunding.html (accessed 22.01.2018).

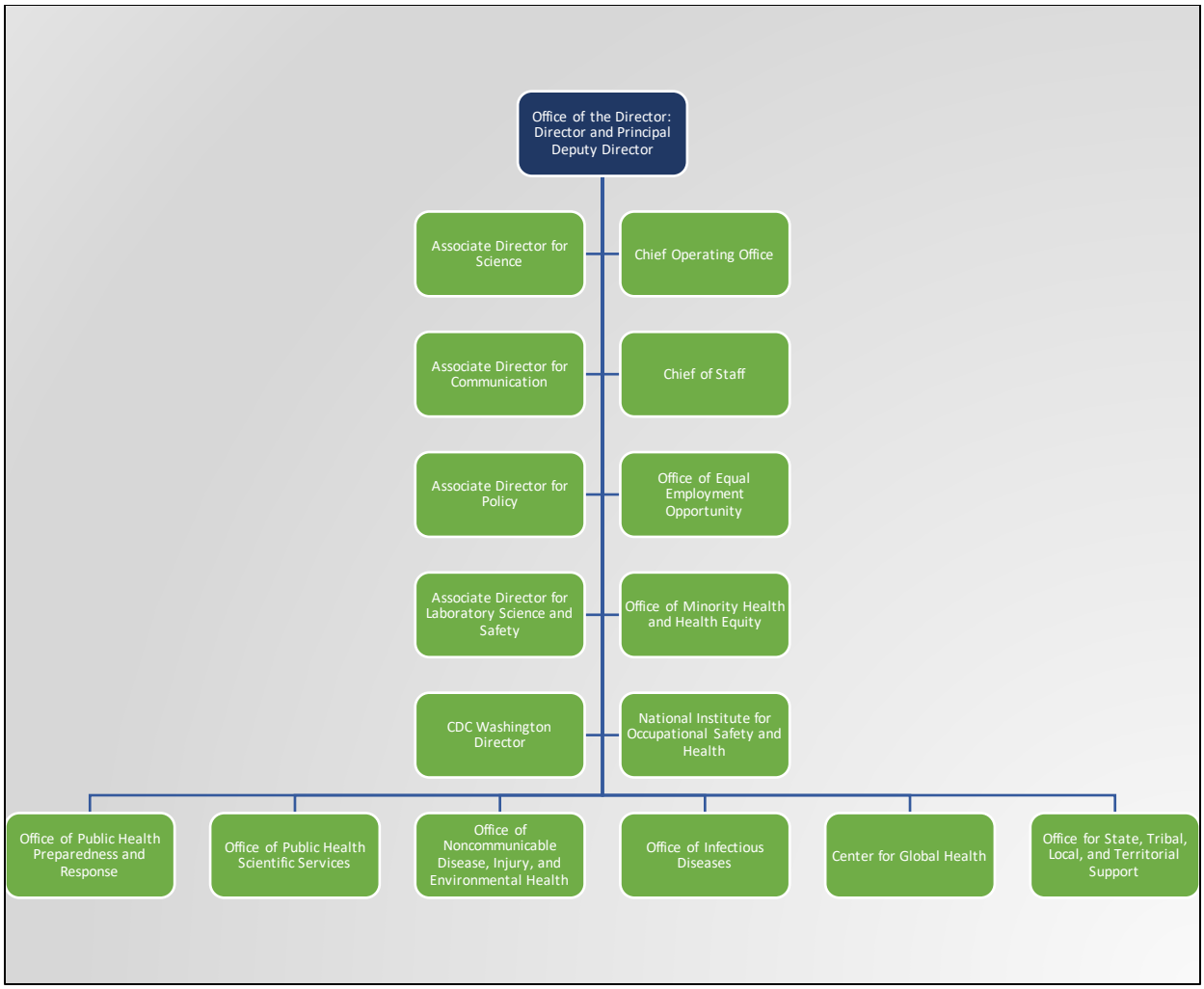

Figure 1. The Centers for Disease Control and Prevention organizational structure.[27]

The WHO is a decentralized international organization consisting of six regional offices and 150 country offices out of the 193-member countries (Figure 2). Its structure is that of regional offices, which have developed to become highly autonomous from its headquarters in Geneva, Switzerland as its regional offices have been modeled from the Pan American Health Organization's (PAHO) structure that was formed and operated prior to the WHO's formation in 1948. With country offices also developed into autonomous entities, during crisis situations, they are often unable to or choose not to communicate with regional offices to coordinate emergency responses. One expects for the WHO and Member States' response be slower, with fewer

[27] CDC Organization // Centers for Disease Control and Prevention, 2018. URL: https://www.cdc.gov/about/organization/cio.htm (accessed 24.01.2018).

resources allocated due to delegation relationships. The WHO's budget is split into two main categories: assessed contributions and voluntary-specified contributed, with voluntary-specified contributions comprising approximately three-quarters of the overall budget each year.[28] Those contributions are largely focused on special programs that address issues plaguing a region. The growth of voluntary funds flowing to special programs and diminished assessed contributions result in fewer available resources when an emergency arises, such as an infectious disease outbreak.

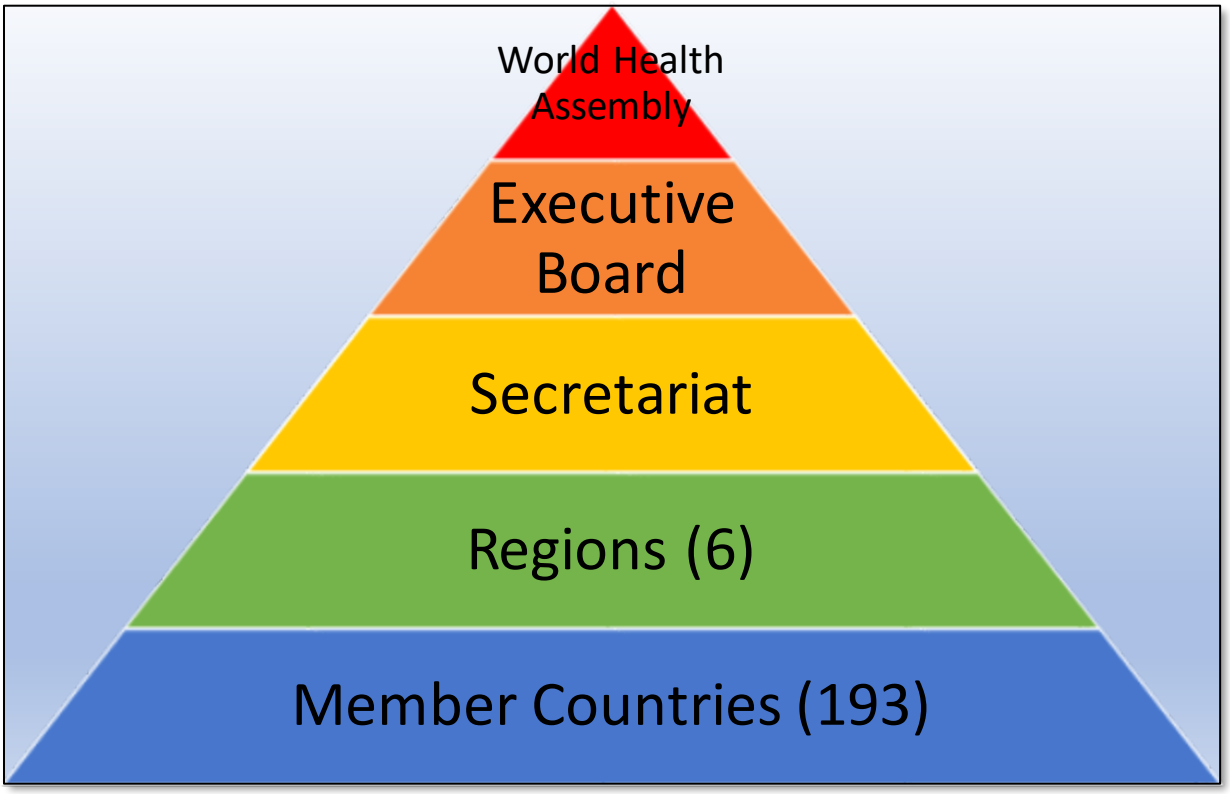

Figure 2. World Health Organization headquarters organizational structure.[29]

International organizations are actors that behave strategically and independently that also interact with states and their wider environment.[30] The theory of principal agents can

[28] Budget // World Health Organization, 2018. URL: http://www.who.int/about/finances-accountability/budget/en/ (accessed 26.01.2018).
[29] Interim organizational structure – WHO Headquarters // World Health Organization. URL: http://www.who.int/about/structure/organigram/en/ (accessed 12.02.2018).
[30] Hawkins, D., Jacoby, W. "How agents matter" Delegation and agency in international organizations // Cambridge University Press: Cambridge, UK, 2006. P. 200.

coincide with organizational theory to explain how principals are actors who cede some of their authority to an agent in order for that agent to take over a role that the principal outlines in the delegation contract.[31] An agent who is responsible for fulfilling the tasked outlined in the delegation contract can be small groups, individuals, or organizations. This can be used to lock in credible commitments, reduce transaction costs, and resolve problems in a mutually beneficial way. The specialization of the agent, the information available to the principal, the composition of the principal (single or multiple), and the willingness to cede some sovereignty to the agent by the principal all amount to varying degrees of delegation.

Agency slack is a common by-product of delegation in organizations to an agent with specialized knowledge (e.g. the CDC or WHO's specialized medical and scientific staff) and heightens problems of hidden action and hidden information.[32] Concealment or mishandling information from the principal makes it harder for the principal to control its agent clearly and efficiently. Specialization is important to consider in the case of the WHO and the CDC with their divisional and regional offices, as they are highly trained at dealing with global health issues. Movement of information is costly in time, effort and money, and agents can hide information due to their highly specialized knowledge that the principal does not have, leading to complications in the order of due process and actions.

Once a state grants a significant amount of discretion to an international organization, there is a greater chance for slack to occur. This is highly probably when an international organization is staffed by international personnel, as opposed to government officials who are seconded to serve in such organization. More specifically related to the case of the WHO, Cortell and Peterson show how the WHO staff engaged in agency slack during the 2002-2003 SARS outbreak due to the high degree of autonomy from its principal (the Member States of the World Health Assembly), due to the two-thirds majority voting rule, and as a result of their international staff.[33] One case of slack occurred when the WHO used non-governmental sources to learn more

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[31] Buchanan, A. Principal/agent theory and decision making in health care // Bioethics, Vol. 2, No. 4, 1988. P. 317-333.

[32] Hawkins, D., Lake, D., Nielson, D., Tierney, M. Delegation and agency in international organizations // Cambridge University Press: Cambridge, UK, 2006. P.24

[33] Cortell, A. Peterson, S. "Dutiful agents, rogue actors, or both? Staffing, voting rules and slack in the WHO and WTO" Delegation and agency in international organizations // Cambridge University Press: Cambridge UK, 2006. P. 263.

about the pandemic happening in China, which then allowed the WHO to blame the Chinese government and criticize their lack of cooperation. In addition, the emergency health alert issued by the WHO for various parts of the world where SARS had been reported, was acted beyond its delegation contract, and also outside of the International Health Regulations that required reporting from national governments rather than non-state sources.[34]

Scholars studying international organizations and bureaucratic structures argue that organizational bureaucracies appear neutral, but are actually highly political, which is one method in which they obtain their power and autonomy, as referred to as the "pathologies" of IOs.[35] International organizations take on a life of their own as a result not only of their professional and specialized staff, but also their internal structure and organizational formalities. Peabody notes that according to organizational theory, the structure of an organization plays an important role as is it influences its agenda, and, thus influences outcomes.[36] The centralized structure calls for a stricter claim of autonomy for the CDC, whereas the decentralized structure of the WHO and its highly specialized staff allow for greater autonomy from its Member States in the World Health Assembly and for its regional offices. Centralization speeds up decision making and leaders to quicker response to situations that demand a more immediate response, as this research will show with the CDC through the case studies. However, decentralization slows down the decision-making process and leads to slower responses with greater chances of miscommunications between headquarters, regional, and country offices.

This research uses organizational theory as a means to identify key strong suits and weak points in bureaucratic structures of the CDC, the WHO, and its Member States. A distinction between previous literature and this study uses the comparison of, not only a centralized organizational structure, the CDC, and a decentralized one, the WHO, but also between regional branches of the WHO taken into consideration as a whole. The goal is to identify whether there are key differences between regional branches and headquarters, and the characteristic of

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[34] Cortell, A. Peterson, S. "Dutiful agents, rogue actors, or both? Staffing, voting rules and slack in the WHO and WTO" Delegation and agency in international organizations // Cambridge University Press: Cambridge UK, 2006. P. 270.

[35] Barnett, M.N., Finnemore, M. The Politics, Power, and Pathologies of International Organizations // International Organizations, Vol. 53, No. 4, 1999. P. 702.

[36] Peabody, J.W. An organizational analysis of the world health organization: Narrowing the gap between promise and performance // Social Science & Medicine, Vol. 40, No. 6, 1995. P. 731-742.

proximity to an emergency for a centralized organization presented as a challenge to set preventive methods and reactive measures to emergencies as they arise.

B. Epidemiological Theory Literature

The epidemiological theory serves as the baseline expectation for the behavior of actors involved in an infectious disease outbreak. The lethality and transmission characteristics are most important for understanding why each organization's response to one outbreak differed in reactivity and proactivity of allocating resources. Lethality of a virus is measured by the case fatality rate, which can only be measured once a pandemic or epidemic is ongoing, as case fatality rates for the same virus often vary across different outbreaks. It is used as a measure of disease severity and acts as a decent predictor of the possible number of those infected in the future. The result is calculated by dividing the number of deaths over a given time period by the number of people diagnosed with the same disease during the same time frame and then multiplied by one hundred to yield a percentage.

The Centers for Disease Control and Prevention (CDC) defines transmissibility as the estimation of the basic reproductive number, R0.[37] R0 is an epidemiological measurement that describes the reproductive rate of a virus and is used to measure the number of secondary infections that are produced by a typical case of a specific infection.[38] For example, if the R0 for smallpox is 18, then it can be expected to spread rapidly because each new case of smallpox would produce 18 new secondary cases. In the 2009 H1N1 influenza outbreak, the reproductive rate ranged from 1.2 to 1.6 worldwide.[39] In the Ebola outbreak the specific range for the reproductive number across Guinea, Liberia, and Sierra Leone was between 1.51 and 2.53.[40]For

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[37] Glossary of Terms // Centers for Disease Control and Prevention, 2012. URL: https://www.cdc.gov/hantavirus/resources/glossary.html (accessed 19.01.2018).
[38] Breban, R., Vardavas, R., Blower, S. Theory versus Data: How to Calculate R0? // PLoS One, Vol. 2, No. 3, 2007.
[39] Van Kerkhove, M.D., et al. Epidemiologic and virologic assessment of the 2009 influenza A (H1N1) pandemic on selected temperate countries in the Southern Hemisphere: Argentina, Australia, Chile, New Zealand and South Africa // World Health Organization, 2009. URL: http://www.who.int/influenza/surveillance_monitoring/Epidemiologic_virologic_assessment.pdf (accessed 23.02.2018).
[40] Althaus, C.L. Estimating the reproduction number of Ebola virus (EBOV) during the 2014 outbreak in West Africa // PLOS Current Outbreaks, 2014.

the current Zika outbreak, the R0 is estimated to range from 3.0 to 6.6, meaning that one case of Zika produces between 3 and 7 new Zika virus cases.[41] The differences shown between these three cases can be attributed to the transmissibility by its carriers. The low transmission rates of the H1N1 and Ebola viruses are a result of it being transmissible only through bodily fluids, contact with an infected person and contaminated surfaces. The higher transmission rate of the Zika virus can be attributed to its transmissibility by mosquitoes, as they can easily cross boundaries and are indifferent to who they infect.

When examining the lethality of the three cases, one can expect the response to the H1N1 influenza virus to be the quickest and consist of a large amount of financial and human resources, with Ebola not as fast or as resourceful, and Zika to be slower and resource-poor. Contrarily, one would expect for the response to the Zika virus to be quick and resource-rich due to its higher transmissibility, while the response to Ebola and H1N1 being slower and with poor resources. It seems the lethality of the virus matters more in the amount of resources dedicated to an infectious disease outbreak emergency response, while the transmissibility matters more for the speed of response. Evidence suggests that the H1N1 response was underprepared and with complications, but once the issue was securitized, the resources allocation speed up coordination to the response became more focused. The response to Ebola was initially slow, but became more under control after securitization. The WHO has responded more quickly, but fewer resources were allocated at the beginning stages of the outbreak even after the WHO declares Zika a public health emergency of international concern (PHEIC). The epidemiological explanation partially explains some of the responses to the three cases, but it cannot explain why the large financial and military response to Ebola was slow, why the resource-poor response to Zika was so quick, or even why the response to H1N1 was so poor overall. Political explanations are necessary to explain the speed of response and amount of resources allocated to the response in my three case studies due to the differences in organizational structure and bureaucracies.

There are three assumptions previously from professional and cultural models of illness: there is a single underlying cause for all illness; that single cause being disease; and attenuation

[41] Nishimura, et al. Preliminary estimation of the basic reproduction number of Zika virus infection during Colombia epidemic, 2015-2016 // Travel Medicine and Infectious Disease, Vol. 14, 2016. P. 274-276.

or removal of the disease will lead to better health.[42] Evidence suggests that the three assumptions presented above are wrong. A new model, based off of the biomedical model, derived from the WHO's international classification of functioning framework, gives a more comprehensive record of illness less biologically dependent.[43] The new model features two main factors that suggest illness is a defect of the person physically and socially: international classification of disability and handicap and the recognition of the power of a systems analytical approach.[44] This expanded model of illness emphasizes that disease acts as only one factor adding to illness behavior. Other factors could include social, financial, and political factors as well. Healthcare systems are social organizations, and their functioning power relies on society using a compatible model of illness with a system of values to decide the rights and responsibilities connected with health threats, and how these are to be policed and prepared for with their measures.

An issue between the biomedical approach and other societal approaches arose in Guinea at the start of the Ebola outbreak. In December 2013, epidemiologists started to investigate the links of transmission, while local people were trying to understand the reason for these deaths. The epidemic control measures taken by regional, national, and international public health organizations were faced with strong reluctance and sometimes aggressive attitudes of the affected communities.[45] Epidemiologists involved in outbreak response identified the first Ebola deaths to the transmission of a virus by contract with fluids of patients, but the locals believed the deaths were caused by the breach of taboo. The outbreak response must be flexible and must systematically document information related to the outbreak to form and adapt its control interventions. Cultural, societal, and even personal situations interfere with more scientific approaches, but should be taken into consideration just the same.

This study expands upon epidemiology by using the newer biomedical model as a means to incorporate individual behavior and more social characteristics instead of relying solely on the

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[42] Wade, D.T., Halligan, P.W. New wine in old bottles: the WHO ICF as an explanatory model of human behaviour // Clin Rehabil, Vol. 18, 2003. P.349-354.
[43] International classification of functioning disability and health // World Health Organization, 2001. URL: http://www.who.int/classifications/icf/icf_more/en/ (accessed 23.01.2018).
[44] Wade, D.T., Halligan, P.W. Do biomedical models of illness make for good healthcare systems? // BMJ: British Medical Journal, Vol. 329, No. 7479, 2004. P. 1398-1401.
[45] Thys, S., Boelaert, M. The origin of Ebola: Biomedical approach versus popular interpretations in Macenta, Guinea // Sante Publique, Vol. 29, No. 4, 2017. P. 497-507.

medical aspects of this theory. The background chapters and the case studies use this method to illustrate relations between distinct infectious disease outbreaks, both pandemics and epidemics. Each case provides a different circumstance: region, transmission method, fatality rate, and even specifics of the pathogen itself, being a virus, disease, or a bioweapon. The focus is not to rely on one case to come to the conclusion to whether or not this theory has a great influence on the emergency responses that an organization takes, but rather to base a conclusion on multiple cases for examination.

C. **Securitization Theory Literature**

The Copenhagen School of International Relations describes "securitization" as the phenomena through which "speech acts" frame a previously non-security issue as an emerging security threat.[46] Barry Buzan and the Copenhagen School defines securitization as a "successful speech act through which an intersubjective understanding is constructed within a political community to treat something as an existential threat to a valued referent object, and to enable a call for urgent and exceptional measures to deal with the threat".[47] The process of securitization is dependent upon the capabilities and capacities of involved actors to make credible claims about threats, how these claims are portrayed, whether the target audience accepts them, and a multitude of case-specific factors.[48]

Barry Buzan's "New Patterns of Global Security in the Twenty-First Century" is a comprehensive and systematic introduction into the more modern security issues that have arisen in the 21st century. His study that began at the end of the 20th century continues today. His three levels of security, individuals, states, and international systems, analyzes the importance of the nature of a state and how it affects individual security. His understanding considers security a factor of health, status, life, wealth, and freedom. However, his concept cannot be used in the same way on both the individual and the national level of security. He identifies five main levels

[46] Waever, O. Securitization and Desecuritization // Columbia University Press: New York, West Sussex, 1995. P. 18
[47] Buzan, B., Waever, O. Regions and Power // Cambridge University Press, 2003.
[48] Williams, M.C. Words, images, enemies: securitization and international politics // International Studies Quarterly, Vol. 47, No. 4, 2003. P. 511-531.

of security: political, military, economic, societal, and environmental in an attempt to further define what classifies a threat and in what direction should be taken to address the threat.

Constructivists emphasize that the agency of the particular securitizing agent is of more concern than the existing context in which speech acts are conveyed to the audience. Over time, the actions of the agents may influence the H1N1, Ebola, and Zika responses more than the context of the speech acts do. The response of an organization may be path-dependent, or how the response to previous outbreaks influences the response to later outbreaks. This is evident after the implementation of the International Health Regulations (IHR) and the adjustments the organizations had from one outbreak to the next. The context refers to the immediate climate in which the infectious disease health event is unfolding, whether it is a pandemic or an epidemic. Public health organizations may internalize past criticism of their response actions, which may influence their future response to infectious disease threats. In 2009, the WHO was criticized for their excessive response to the H1N1 influenza pandemic.[49] This criticism could have influenced the WHO's caution in issuing a PHEIC for Ebola, being reminded of the faults in their previous response. The WHO was criticized for their actions for not recognizing the seriousness of the 2014 Ebola pandemic sooner.[50] It could be argued that this criticism could have influenced the much faster response to the Zika virus in 2016, despite the non-serious or benign effects it had on the majority of the infected.

Copenhagen theorists stress the importance of actors, who have reshaped the understandings of security where the state was the main reference point to where individuals and sub-state communities are now referent objects.[51] Both structures and agents are necessary for the other to exist, meaning that both structure and agent are forever changing through interactions through mutual-reinforcement, and respond to change in the other. The Copenhagen School asserts that an actor-centric approach more accurately describes real-world change, with an individual (usually a political leader) acting as the securitizing actor, conveying speech acts

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[49]Gostin, L.O., Hodge, J.G. "Zika prevention is a matter of national security" // Time, 2016. URL: http://time.com/4449287/zika-prevention-national-security/ (accessed 05.04.2018).
[50] Harmon, K. "Measuring the Zika virus' international security implications // Security Magazine, 2016. URL: http://www.securitymagazine.com/articles/87004-measuring-the-zika-viruss-internationalsecurity-implications (accessed 03.04.2018).
[51] Paris, R. Human security: Paradigm Shift or Hot Air? // International Security, Vol. 26, No. 2, 2001. P. 87-102.

that lead to institutional and definitional changes.[52] The position of power is also stressed to successfully securitize an issue. Elbe (2011) and Kamradt-Scott and McInnes (2012) not that journalists, politicians, medical practitioners, and senior policy-makers act as influential actors who have securitized pandemic influenza and continue to do so. Buzan and Balzacq can be criticized that their views on securitization have a lack of practical usefulness and the irrationality of a successfully securitized issue, especially within a medical context. Expanding security beyond past meanings of "security," such as Buzan outlined, begins to define larger areas of social life.

As a result of redefining communicable and non-communicable diseases as a global health threat, the scope of security has broadened and has been attributed to processes, such as globalization. In "The Globalization of Public Health: Emerging Infectious Diseases and International Relations", David Fidler explains how the processes of globalization and recent securitization updates have changed the original distinctions between international and national public health. His article examines the reasons for the emergence and reemergence of infectious diseases and provides insights into the challenges that the globalization of public health has in the understanding of modern international relations. Pandemic influenza, as an example, illustrates how actors can reframe an outbreak as a health pandemic that also is a threat to social, political, and economic stability. Because of this, governments continue to revise and strengthen their emergency preparedness response protocols to infectious diseases. The World Health Organization also created an influenza surveillance network to monitor and report such outbreaks.[53]

Also by David Fidler, "Microbialpolitik: Infectious Diseases and International Relations" addresses the renewed concern about infectious diseases in the fields of public health, science and politics. He states that not only has this concern been expressed in scientific discourse, but also in popular culture.[54] He signifies the need to examine emerging infectious diseases not only as a scientific and public health problem, but also as an international political problem. He makes

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[52] Williams, M.C. Words, images, enemies: securitization and international politics // International Studies Quarterly, Vol. 47, No. 4, 2003. P. 511-531.
[53] Fidler, D. Globalization, International Law, and Emerging Infectious Diseases // Emerging Infectious Diseases, Vol. 2, No. 2, 1996. P. 32.
[54] Fidler, D. Microbialpolitik: Infectious Diseases and International Relations // American University International Law Review, Vol. 14, No. 1, 1998. P. 12

an initial attempt to give an analytical framework in which to examine emerging infectious diseases as a challenge for international relations. International cooperation is not what is new to global health security; what is new is an increasingly interconnected, easily accessible world.

In the context of the H1N1, Ebola, and Zika cases, securitization theory suggests that when securitizing actors emerge and successfully frame and convey to a public health organization, such as the CDC or the WHO, that an infectious disease outbreak constitutes a security issue, the organization should allocate larger amounts of financial and human resources to combat the threat. Conversely, if there are no credible securitizing actors available to convince the organization that an outbreak is a security issue, then they will not allocate the same amount of resources to the response effort. It can be said, however, that an issue does not need to be framed as a traditional security issue to be securitized, but rather an actor can convince the target audience that an issue conveys the urgency with which it must be addressed as a security threat.

The author criticized that earlier securitization theorists relied more on the political and social aspects of security and did not take into consideration public health and health threats as a major security issue. This study takes various infectious diseases and incorporates securitization theory to further explain how the theory can be applied in the public health sphere. The problem on why this theory previous was difficult to be used in this context depends on the catalyst of an issue that requires securitization. In most cases, the security threat is associated with humans or actions directed by humans. However, in the case of infectious diseases, the catalyst is not something you can see or hear, but instead something that cannot be controlled beyond immunological resistance. The author argues that infectious diseases should be taken more seriously as a security threat and less of a minor concern, which involves less resources and speed of its response.

D. Protection-Motivation Literature

The spread of infectious diseases around the world is an important health issue in the society. Preparedness strategies for disease outbreaks are being promoted with greater understanding of the factors associated with preventive behavior and methods. To better understand fear appeals and how people protect themselves from health threats, scholars examined the determinant

factors of preventive behaviors with used protection-motivation theory.[55] It has two examination stages of threat appraisal (perceived sensitivity, severity, and rewards) and coping appraisal (perceived self-efficacy, response, and costs) and fear, that the outcome of these two stages is the intent to protect and behavior response.[56] Several previous studies have researched protective health behavior of influenza with protection-motivation theory. Scholars conducted a study about preventive behaviors to fight against SARS disease using the theory, and showed that perceived threat and perceived response efficacy was the most important predictor regarding preventive behavior and response.[57]

A study on the theory used with the H1N1 pandemic positively related perceived sensitivity and perceived severity.[58] It illustrated a strong and significant relationship between perceived severity and response efficacy in that people who had a higher perceived severity about the risks of influenza reported higher response efficacy. If the person's intention to do a behavior is greater, the chances that he does the behavior are higher. Public health organizations had preventive measures against previous strains of influenza in place, but the perceived severity of the 2009 outbreak at the beginning was too small and resulted in unpredicted behaviors of self-efficacy.

For the case of the Ebola virus, psychological factors prevented the eradication of the disease. News of the outbreak, gruesome images, and xenophobia created a social division caused behaviors that were disproportionate to the actual risk.[59] The cost of the disease was not directly to the disease itself, but rather emerged from its negative psychological and behavioral effects incited by fear. The perceived vulnerability of Ebola was greater due to the high fear

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[55] Rogers, R.W. A protection motivation theory of fear appeals and attitude change // J Psychol, Vol. 91, 1975. P. 93-114.

[56] Sharifirad, G., Yarmohammadi, P., Ali, M., Sharifabad, M., Rahaei, Z. Determination of preventive behaviors for pandemic influenza A/H1N1 based on protection motivation theory among female high school students in Isfahan, Iran // Journal of Education and Health Promotions, Vol. 3, No. 7, 2014.

[57] Jiang, X., Elam, G., Yuen, C., Voeten, H., de Zwart, O., Veldhuijzen, I., Brug, J. The perceived threat of SARS and its impact on precautionary actions and adverse consequences: A qualitative study among Chinese communities in the United Kingdom and the Netherlands // International Journal of Behavioral Medicine, Vol. 16, 2009. P. 58-67

[58] Sharifirad, G., Yarmohammadi, P., Ali, M., Sharifabad, M., Rahaei, Z. Determination of preventive behaviors for pandemic influenza A/H1N1 based on protection motivation theory among female high school students in Isfahan, Iran // Journal of Education and Health Promotions, Vol. 3, No. 7, 2014.

[59] Kim, H.S., Sherman, D.K., Updegraff, J.A. Fear of Ebola: The Influence of Collectivism on Xenophobic Threat Responses // Psychological Science, Vol. 27, No. 7, 2016. P. 935-944.

appeal and not to the epidemiological severity of the disease. Individualist societies and organizations were more susceptible to fear and delayed response after the outbreak of Ebola. Collectivism became a response mechanism for coping with disease vulnerability and affected the regional organizations' response time and resource allocation. Specialists and medical staff from regional, national, and international public health organizations were motivated to protect themselves in relation to their behavior to assist the emergency aid for Ebola.[60] Complications arose from the disparities between fear and protection by the misuse of equipment, protocol, and the controversial use of quarantine.

The effectiveness of the Zika virus health outbreak response could be attributed to the relation that more people that accept false or inaccurate information, the greater the misunderstanding between healthcare experts and civil society.[61] The CDC, the WHO, and other reliable sources of public health information took a significant time to release statements on the Zika virus. These delays encouraged rumors of a threat response that facilitated citizens' behavior. The virus garnered more attention through indirect means and the speed of the response hastened while amounting to more-than-typical resource allocation.

An additional model can be applied to protection-motivation theory the further explain my strategy. The Health Belief Model acts as a psychological model that tries to predict and explain health behaviors by focusing on the beliefs and attitudes of individuals. The focus of the model is on increasing the use of available preventive services, such as disease screening and vaccines.[62] By educating people about the benefits of proactive health behaviors, the increased recommended behavior towards a preferable and safe action during the time of a health emergency. Through an assessment during the H1N1 influenza vaccine development, it showed that through information and recommendations from healthcare professionals about the benefits

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[60] Leigh, L.N.F. Behavioral and environmental attributes of Ebola epidemic in West Africa and United States emergency nurses' motivation to protect themselves against Ebola infection // The University of Toledo Digital Repository, 2017. No. 2131.

[61] Valecha, R., Vemprala, N., Volety, T., Kwon, K.H., Rao, H.R. An Investigation of Cyber-Rumor Sharing: The Case of Zika Virus // The Bright Interest Global Summit, 2017. URL: http://www.bigs2017.org/Program/Papers/B4.%20An%20Investigation%20of%20Cyber-rumor%20Sharing%20-%20The%20Case%20of%20Zika%20Virus.pdf (accessed 05.04.2018).

[62] Health Belief Model (Detailed) // Dheimann. The Ebola Network. URL: http://www.comminit.com/ci-ebola/content/health-belief-model-detailed (accessed 19.01.2018).

of preventing the flu through receiving the vaccine, there was an increase in vaccination rates.[63] Possibly the most important aspect to address at the time of the H1N1 influenza outbreak was that its emergence occurred simultaneously with one of the two new seasonal flu viruses found in humans, which cause high virulence and unique and lethal viral genetic changes.[64]

For Ebola, the confidence in the competence of the media and government to accurately report on or prevent an epidemic in the United States was low. A study by Kelly, et al showed that despite a low perceived susceptibility, half of the adults surveyed during the outbreak in 2014 intended to employ behaviors to prevent transmission and a high number preferred policy not currently recommended by health officials.[65] The Ebola virus's extreme nature possibly motivated people to act in ways that were not necessarily advised given the low risk of transmission in the U.S. Another study reported that the model predicted the public's perception adequately regarding their belief about the threat of infectious disease and susceptibility towards Ebola. It stated that informing the public about the real risks of Ebola in the United States through media sources and health professionals can elicit appropriate behavior in any possible future cases of an outbreak within the United States.[66]

As the spread of the Zika virus intensified in the United States, the uncertainty surrounding it has became increasingly evident. The perceived threat was being crafted by epidemiological estimated that the virus would be asymptomatic for 80% of those infected, but could still propagate the spread of the Zika virus; therefore, needing more effective health education messages.[67] Any Zika-infected person, regardless of resistance to the virus, is a host for the virus. When the mosquito season has passed, it is quite plausible that the virus could have become endemic in the United States, particularly because of sexual transmission. The Health Belief Model is instructive in this context as it posits that an individual's perception of

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[63] Coe, A.B., Gatewood, S.B., Moczygemba, L.R., Goode, J.V., Beckner, J.O. The use of the health belief model to assess predictors of intent to receive the novel (2009) H1N1 influenza vaccine // Innoy Pharm, Vol. 3, No. 2, 2012. P. 1-11.

[64] Najimi, A., Golshiri, P. Knowledge, beliefs and preventive behaviors regarding Influenza A in students: a test of the health belief model // Journal of Education and Health Promotion, Vol. 2, No. 23, 2013.

[65] Kelly, B., Squiers, L., Bann, C., Stine, A., Hansen, H. Lynch, M. Perceptions and plans for prevention of Ebola: results from a national survey // BMC Public Health, Vol. 15, 2015. P. 1136.

[66] Vadhariya, A. Sansgiry, S.S. Use of health belief model to understand knowledge, attitudes and behaviors of people towards the Ebola outbreak // Value in Health, Vol. 18, No. 3, 2015.

[67] "Zika: Health Education as Prevention – An epidemiologist details the Health Belief Model" // Hassad, R.A. Medpage Today. URL: https://www.medpagetoday.com/infectiousdisease/zikavirus/60129 (accessed 22.01.2018).

susceptibility coupled with the perception of severity, supports the thought of personal threat, which also determines the person's level of engagement in health protective behaviors.

This research takes the protection-motivation theory and the Health Belief Model and relates them together in the same context for the case studies. Previous studies use one method independent of the other to explain behavioral factors, but this study sees the importance of combining them to reach conclusions on if this affects proactive and reactive methods of public health organizations and their responses to emerging and reemerging infectious diseases. The difficulty comes to whether or not this can provide a definite conclusion as to how it influences those actors' actions and behaviors in times of an emergency.

II. 2001 ANTHRAX ATTACKS, SAR, AND H1N1: THE RECOGNITION FOR BETTER INFECTIOUS DISEASE PREPAREDNESS PLANS INFLUENCED BY GLOBALIZATION

In the following chapter this study illustrates how globalization came to influence the threat of emerging and reemerging infectious diseases and examines the events leading up to the development of the International Health Regulations (IHR) created in 2005, then enacted in 2007. The author proceeds chronologically with my analysis: first examining the 2001 anthrax attack in the United States and the lessons learned, then assessing the 2003 SARS outbreak in China and the need for new health response protocol, and lastly reviewing the 2009 H1N1 outbreak.

A. Globalization and Infectious Diseases

Globalization is a characteristic of present times when looking at its process over the years. It can be considered as aspects of environmental changes, economic, development of new technologies, and demographic changes. All of these aspects of globalization have a distinct influence on the emergence and spread of infectious diseases. International travel and trade are commonly cited by most infectious disease experts as key factors in the emerging infectious disease problems occurring around the world. This is not a new concept, as the globalization of public health started in the mid-19th century when the first international sanitation conference and subsequent international gatherings were called out of concern about infectious diseases spreading by means of international travel and trade to Europe and non-European areas.[68] The inadequate sanitation and public health systems in European and non-European regions was another factor that produced the globalization of public health.

With the recent reemergence of infectious diseases, discussions are drawn back to the globalization of public health with a key difference with modern concerns about international travel and trade from prior historical events. This is found in the greatly increased speed and volume of global traffic in the late 20th century. The upward trend in international travel has

[68] Fidler, D. Globalization, International Law, and Emerging Infectious Diseases // Emerging Infectious Diseases, Vol. 2, No. 2, 1996. P. 32.

dramatically increased and now threatens national public health strategies and renders some national strategies ineffective.

Trade between developed and developing countries is at the highest level it has ever been. Due to easier accessibility to goods and services, disease can spread more quickly and is no longer contained to isolated geographical areas. As an example, only 20% of the world's population was living in areas where malaria is endemic, but now that number has risen to 40%.[69] International trade has become so pervasive that it is realistically impossible to monitor the majority of the food supply entering the country for known microbial hazards, new and old.

Today, the emerging infectious disease threat can be largely attributed to deteriorating or nonexistent national public health infrastructures and the decreasing effectiveness of vaccines and medicine.[70] What allowed developed countries to reverse public health's globalization has been rendered inefficient. Two new factors give a better account of the emerging infectious disease crisis compared to the problems of the 19th century. Those factors are: the failure of the internationalization of public health programs; and the shocking deterioration in economic, environmental, and social conditions.[71]

The internationalization of public health in the 20th century, through the health transition concept, was primarily aimed at improving public health in the developing world. Despite eradicating smallpox and other significant processes against some infectious diseases, the global crisis proves that infectious diseases continue to devastate the developing world. Many Third World nations' national public health infrastructures still remain inadequate or nonexistent. Their large supply of antimicrobial medicines made globally available has had no significant impact on their intended users. Additionally, the growth of antimicrobial resistance of such diseases as tuberculosis and malaria can be attributed to the use and misuse of these drugs in the developing world.[72] Exceptional levels of environmental degradation, urbanization, and poverty create

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[69] Institute of Medicine. The Impact of Globalization on Infectious Disease Emergence and Control: Exploring the Consequences and Opportunities: Workshop Summary // The National Academies Press: Washington D.C., 2006.
[70] Mirski, T., Bartoszcze, M., Bielawska-Drozd, A. Globalization and infectious diseases // Przegl Epidemiol, Vol. 65, No. 4, 2011. P. 649-655.
[71] Fidler, D. Globalization, International Law, and Emerging Infectious Diseases // Emerging Infectious Diseases, Vol. 2, No. 2, 1996. P. 32.
[72] Fidler, D. Globalization, International Law, and Emerging Infectious Diseases // Emerging Infectious Diseases, Vol. 2, No. 2, 1996. P. 32.

environments where pathogens – bacterial, viral, parasitic, and fungal – nurture at the expense of human populations. The internationalization of public health started in the mid-19th century has not proven successful to control and prevent the spread of infectious diseases in many states.

The new pathology for the globalization of public health in the era of emerging infectious disease includes five sections: (1) international trade and travel as effective methods for the spread of disease; (2) nonexistent or deteriorating public health capabilities; (3) the failure of internationalization of public health; (4) the reduction of the state's ability to manage its domestic economy and thus to address public health needs; and (5) the development of unprecedented levels of economic, environmental, and social problems that provide pathogens with fertile environments.[73] Developing states fail or are unable to reduce those problems that continue to benefit pathogens due to market globalization. The massive scale of international trade and travel means that the developed world is constantly under threat from the spread of disease. Inadequate public health systems also increase the vulnerability of populations to indigenous diseases. Efforts to combat this new globalization of public health through internationalization confront all the problems created by social, environmental, and economic problems. The globalization of public health in the era of emerging infectious diseases represents a far more complex and intimidating phenomenon that its 19th century predecessor.

B. Amerithrax

Background

Anthrax is a bacterial disease caused by *Bacillus anthracis* with three forms of existing exposure: cutaneous (skin exposure), inhalation, and gastrointestinal (entering through the digestive system).[74] The persistence of anthrax naturally occurring in the environment in the form of dormant spores has been weaponized by several national bioweapons programs. Most nations terminated their offensive bioweapons research in accordance with the Biological

[73] Fidler, D. Globalization, International Law, and Emerging Infectious Diseases // Emerging Infectious Diseases, Vol. 2, No. 2, 1996. P. 32.
[74] Johnston, W.R. Review of Fall 2001 Anthrax Bioattacks // Johnson's Archive, 2007. URL: http://www.johnstonsarchive.net/terrorism/anthrax.html (accessed 07.02.2018).

Weapons Convention treaty in 1972. The United States stopped its programs in 1970, but continued research on bioweapons for defensive purposes.

Before 2001, the last case of inhalation anthrax reported in the United States was in 1976. As soon as a week after the September 11 terrorist attacks on the World Trade Center and the Pentagon and into November, letters filled with a white powder containing anthrax spores were addressed to two U.S. Senators' offices and news media agencies along the East Coast. When the contaminated letters were processed through the postal facilities and when opened on delivery, the powder from within allowed anthrax to be breathed in while floating in the air.

Americans were unaware of this attack, until the first few people became ill with anthrax. The first case of inhalation anthrax was diagnosed on October 4, 2001. During October and November of 2001, there were a total of 11 confirmed cases of cutaneous anthrax and 11 confirmed cases of inhalation anthrax.[75] Seven of the cases of inhalation anthrax were postal workers who had direct contact with the letters or in processing at a postal facility. Of the 22 people who became sick with anthrax within that year, five of them died; all from inhalation anthrax, the most serious form of the disease. Before this event, there had never been a premeditated release of anthrax in the United States. The event became later known as Amerithrax.

Public health response

The bioweapon attack containing anthrax sent through the mail led to unforeseen public health and law enforcement investigations. Investigators from the CDC and the FBI were mobilized to assist state and local public health and law enforcement agencies. The response to the anthrax attack required close collaboration because of the immediate and ongoing threat to public safety surrounded by fear and uncertainty.

[75] A History of Anthrax // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/anthrax/resources/history/index.html (accessed 04.02.2018).

Law enforcement and public health agencies became involved in the investigation of a possible bioterrorism event falling into one of two categories: overt and covert.[76] In the overt event, the attacker claims responsibility for the intent and actions or the nature of the event reveals itself. Law enforcement first detects the event, takes responsibility for leading the first response, and notifies public health officials. The covert event is characterized by an unannounced or unrecognized release in which the appearance of infected or ill victims may be the first indication of an attack. The criminal intent may not be apparent until sometime after recognition. The overt event is clearly a crime, and the site of the incident is a crime scene, and the jurisdiction initially falls under law enforcement. The covert event may not initially be recognized as an attack and public health officials lead the initial inquiry, with the early response focusing on diagnosis, epidemiologic investigation, and medical care. The first case of inhalation anthrax was recognized as a public health issue, falling into the covert category. Once the second suspected case of inhalation anthrax was made evident, law enforcement involvement increased dramatically.

Traditional public health decision-making processes and models were not adequate to deal with the pace, extent, and the complexities of events surrounding the attacks. It was the first time that the CDC had been dispatched to respond to outbreaks of illness occurring nearly simultaneously in five geographic focal points, with the FBI involved due to the fact that the outbreak was clearly an act of terrorism.[77] Anthrax was virtually unknown at the time in medical practice, since few local or federal public health official had ever seen or been involved in assessing a single case of infection. Policies and recommendation differed between states, and between states and the CDC, which caused confusion and inconsistencies in the response, such as incompetence or inequitable treatment of the outbreak. Agencies faced large demands to quickly produce accurate and understandable information and guidance for both public and professional use, with huge amounts of information arriving via email, phone, fax, and news media reports.

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[76] Butler, J.C., Cohen, M.L., Friedman, C.R., Scripp, R.M., Watz, C.G. Collaboration Between Public Health and Law Enforcement: New Paradigms and Partnerships for Bioterrorism Planning and Response // Emerging Infectious Diseases, Vol. 8, No. 10, 2002. P. 1152-1156.

[77] Gursky, E., Inglesby, T.V., O'Toole, T. Anthrax 2001: Observations on the Medical and Public Health Response // Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, Vol. 1, No. 2, 2003. P. 100.

In some instances, local and state public health officials were hesitant to initiate public health actions, such as administering antibiotics, waiting for CDC guidance. Other health departments made decisions before receiving guidance from the CDC, with some conflicting with the recommendations. Confusion surrounded both the CDC's authority to authorize certain public health actions and state officials' responsibility to act on their own accord. One health official recalled, "the CDC still believed [at that time] that only the material in opened letters could aerosolize, and therefore closed letters posed no risk."[78] They recommended an antibiotic prophylaxis for postal workers against the CDC's advice, delaying pharmaceutical resource distribution to those exposed to the danger of infection. Uncertainties about the extent of public health officials' authority and who was at risk of developing anthrax led to political pressures influencing public health actions. The media and elected officials came down on public health officials regarding fairness of distributing antibiotics.

Conflicts of interest and actions among regional jurisdictions posed an issue of reaching consensus decisions and working collaboratively across borders. Many people who work in Washington D.C. live in Maryland or Virginia.[79] Representatives of the governments of those regions signed agreements to coordinate disease surveillance, evacuation, alerts, and other emergency preparedness efforts. Some consistent, regional clinical responses helped to minimize the anxiety for caregivers and patients and lessen the fear. However, protocols only emerged from regional hospitals, not from agencies like the CDC.

The CDC was not well-equipped dealing with the *B. anthracis* disease, lacking scientific data to address issues and inform the public health decision-making process. Their usual careful, step-by-step approach of gathering evidence and investigation disease outbreaks through scientific analysis was not possible in that situation, which caused massive disruption of government, business, and peoples' routines.[80] Obtaining resources for analysis were delayed or even denied due to the complexities of the investigation conducted by both the FBI and the CDC.

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[78] Gursky, E., Inglesby, T.V., O'Toole, T. Anthrax 2001: Observations on the Medical and Public Health Response // Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, Vol. 1, No. 2, 2003. P. 101.
[79] COG Report: 2010 worker flows. "Characteristics of the Northern Virginia Workforce and Labor Market" // Metropolitan Washington Council of Governments, 2010. URL: http://www.nvrp.org/whatnew/gmu-surveypdfs.html (accessed 08.02.2018).
[80] Gursky, E., Inglesby, T.V., O'Toole, T. Anthrax 2001: Observations on the Medical and Public Health Response // Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, Vol. 1, No. 2, 2003. P. 103.

Information changed every day and people had a hard time grasping the situation. This was caused by poor communication among public health officials, the media misinterpreting data, and the public's behavior. The lack of consistent, credible message emanating from the CDC in the early period after the attack has yet to be fully understood and explained.

Several public health agencies were not prepared to meet the demands of the media. There were disputes about who should be responsible for releasing information and the amount to be released to the press, so the media lacked access to reliable information. Few public health departments had access to emergency procurement systems for critical resources. The long and difficult bureaucratic processes to procure tools and equipment were a cause for concern among many public health officials and caregivers. This led to a lack of storage capacities of potentially contaminated items for testing and long work hours and not enough staff to continue the usual public health functions.

The total cost of the anthrax bioattacks were over $1 billion USD, most of it from decontamination of the Senate office building, postal facilities, health care, and procurement of irradiation equipment for irradiating mail.[81] In addition, there were uncounted costs at local levels, which included cleanup and response to false alarms, and lost productivity associated with resultant work stoppages and setbacks. Sampling costs and costs of work relocation also added to the total amount spent for the response to the attacks.

Improving public health preparedness

Local, state, and national health officials in the epicenters of the anthrax incidents identified areas for improvement and strengths in their responses. Previous experience and preexisting planning efforts and exercises helped promote a rapid and coordinated response, but problems arose because of bureaucratic complications and necessary agreements. Communication was effective to some degree, but public health officials had difficulty reaching local and state clinicians to give them guidance. It was reported that the capacity of the public health workforce and laboratory equipment were strained. Officials named three general lessons

[81] Johnston, W.R. Review of Fall 2001 Anthrax Bioattacks // Johnson's Archive, 2007. URL: http://www.johnstonsarchive.net/terrorism/anthrax.html (accessed 07.02.2018).

for public health preparedness: the importance of effective communication, the benefits of planning and exercise, and the importance of a strong public health infrastructure to serve as the basis for responses to public health emergencies.[82]

The failure to communicate a clear and timely message to the public was one of the greatest problems observed during the anthrax attacks. The action the public takes in response to a health emergency can help mitigate casualties and speed recover, or it can cause panic and speed the spread of the disease. This is largely influence by the information and messages they receive from officials. These messages are shaped or even created by the media in the absence of government information. The media seeks to get information out quickly and frequently, who may not receive accurate, complete, or new information at any given time. In a crisis, officials will need to communicate in a way that does not mislead the public, despite having the disadvantage of delayed or incomplete information. The media often gave conflicting advice and information confusing and creating anxiety due to the differences in recommended public actions. Improvement can include: developing a coordinated media strategy, providing consistently accurate, non-conflicting information flow, and preparing public messages in advance.[83]

Adequate resources, well-developed plans, and extensive training are essential for an effective response during a health emergency. Federal, state, local, and even international public health entities and law enforcement must collaborate in all areas of responding to, detecting, defending against, and recovering from an attack.[84] Strengthening civil defense and engaging first responders in training and exercises is a must to simulate a crisis and prepare in advance to minimize casualties and complications when taking action. A clear chain of command for incidents and joint exercises were proposed as a recommended action to improve efficiency and timeliness of a response.

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[82] Bioterrorism: Public Health Response to Anthrax Incidents of 2001 // United States General Accounting Office, 2003. URL: https://www.gao.gov/new.items/d04152.pdf (accessed 05.02.2018).
[83] Heyman, D. Lessons from the Anthrax Attacks: Implications for U.S. Bioterrorism Preparedness // Center for Strategic and International Studies and the Defense Threat Reduction Agency, 2002. URL: https://biotech.law.lsu.edu/blaw/anthrax/dtra02.pdf (accessed 05.02.2018).
[84] Heyman, D. Lessons from the Anthrax Attacks: Implications for U.S. Bioterrorism Preparedness // Center for Strategic and International Studies and the Defense Threat Reduction Agency, 2002. URL: https://biotech.law.lsu.edu/blaw/anthrax/dtra02.pdf (accessed 05.02.2018).

The fragmented system of the U.S. public health infrastructure has resulted in inefficiencies when confronting broader emergencies and has significant implications when enacting a coordinated response to health crises. A focused response requires shared technical information and specialized resources and technology, public information campaigns be coordinated, and preventative measures be delivered rapidly without any delay posed by jurisdictional issues. Institutions on the U.S. state and local levels traditionally work independently, with little communication or coordination outside individual programs, resulting in conflicting or confusing messages, diminishing confidence in the agencies and increasing anxiety among the public and officials. There has been a need to recapitalize the U.S. public and private health infrastructure for rapid detection and an effective medical response through well-trained public health professionals and well-equipped facilities able to deploy resources strategically and quickly.

The experience of responding to the anthrax outbreaks displayed aspects of federal preparedness that need to be improved. The CDC was challenged to meet both extensive resource demands from state and local officials and coordinate the federal public health response during the rapidly developing incidents. The traditional capacity of supporting local response efforts by the CDC were effective, but was not fully prepared to deal with the federal public health response. They had trouble in managing large amounts of information being brought into the agency and in communication with the media, public health officials, and the public. Since an extensive anthrax outbreak had not occurred in the United States in decades, the CDC's resources were strained to provide available clinical tools, such as vaccines and medications and a lack of training for doctors in recognizing and responding to anthrax. The CDC has since acted to implement some improvements. These include creating the Office of Terrorism Preparedness and Emergency Response within the Office of the Director, reinforcing the agency's communication infrastructure, developing capable databases of information and expertise on biological agents, and creating an emergency operations center.[85] In addition, the CDC has also been collaborating with other federal agencies, private organizations, and international public

[85] Bioterrorism: Public Health Response to Anthrax Incidents of 2001 // United States General Accounting Office, 2003. URL: https://www.gao.gov/new.items/d04152.pdf (accessed 05.02.2018).

health organizations, such as the WHO, to develop better clinical tools and provide increased training for medical care professionals during times of public health emergencies.

The CDC is currently working with other federal agencies and health departments across the United States to prepare for an anthrax attack. They recognized the importance of tracking the vulnerable, treating aggressively to minimize the extent of damage, sharing sensitive information, and improving communication among agencies, the media, and the public.[86] There have been developments in ensuring that the United States has enough laboratories and facilities to quickly conduct tests on threatening biological agents and diseases, and providing guidance to ensure the safety and health of workers who would be active during the response in an emergency. There has been an increase in providing funds and guidance to help strength health departments' abilities to respond to public health incidents and training the public health workforce. The biggest activities have included coordinating response and providing resources through the CDC Emergency Operations Center and regulating the possession, use, and the transfer of biological agents and toxins through the CDC Select Agent Program.[87]

C. 2003 SARS Epidemic in China

Background

The severe acute respiratory syndrome (SARS) illustrated the ways in which globalization has changed the description of the infectious disease threat, and the governments' understanding of newer security threats and the needed actions and responses that have been changed to attempt to accommodate them. SARS played a part in bringing these changed understandings and reflected on the previous responses.

What started as a local outbreak, the emergence of severe acute respiratory syndrome (SARS) rapidly transformed into a worldwide epidemic. It was the first severe and easily transmissible new disease to emerge in the 21st century. SARS was first reported in Asia in

[86] Blakey, R. "Six months later: Anthrax Lessons learned" // CNN, 2002. URL: http://www.ph.ucla.edu/epi/bioter/sixmoanthraxlessons.html (accessed 09.02.2018).
[87] What CDC is Doing to Prepare // Centers for Disease Control and Prevention, 2015. URL: https://www.cdc.gov/anthrax/bioterrorism/cdc-action.html (accessed 07.02.2018).

February 2003, lasting approximately six months as it spread to more than two dozen countries before it was stopped in July 2003.[88] It is a viral respiratory illness caused by a coronavirus which emerged in the southern Chinese province of Guangdong and has been linked with the handling and preparing of exotic mammals for consumption.[89]

The first case was reported in November 2002 with symptoms that were clinically consistent with atypical pneumonia, and was not given a global alert until five months later. To complicate the issue, cases of avian influenza, influenza A (H5N1), were also present with three deaths among members of a Hong Kong family who traveled to the Fujian Province.[90] It was most likely first transferred from bats to humans, but it went unnoticed until after cases began appearing outside mainland China to destinations such as Canada, Vietnam, and Singapore. An infected resident of Hong Kong was admitted to the Prince of Wales Hospital in the city, causing a major outbreak due to the medical staff not knowing the correct procedures or equipment to handle the virus, which then those infected began to disperse to other areas. On March 15, the WHO issued a rare emergency travel advisory and began to develop a plan to treat and maintain the outbreak.[91]

By July 5th, 2003, the World Health Organization (WHO) proclaimed that the SARS virus had been contained, but by that time, there had been 8,096 cases worldwide and 774 deaths.[92] By that time almost 10% of those infected had died from the virus and had spread to at least 28 countries. It was a previously unknown disease with little immunity to it and limited understanding of the best medical treatment for it. In a world where one person can travel around the earth in a couple of days, it has become very clear that governments and public health organizations, internationally and nationally, have a great responsibility to their own citizens and the rest of the world.

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[88] CDC SARS Response Timeline // Centers for Disease Control and Prevention, 2013. URL: https://www.cdc.gov/about/history/sars/timeline.htm (accessed 12.02.2018).
[89] Institute of Medicine. Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary // The National Academies Press: Washington D.C., 2004.
[90] Institute of Medicine. Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary // The National Academies Press: Washington D.C., 2004.
[91] The operational response to SARS // World Health Organization, 2003. URL: http://www.who.int/csr/sars/goarn2003_4_16/en/ (accessed 14.02.2018).
[92] Caballero-Anthony, M. An Introduction to Non-Traditional Security Studies: A Transnational Approach // Nanyang Technological University Press: Singapore, 2015. P. 188.

International response to the emergency

The management of the global SARS response involved intense daily coordination in the areas of laboratory diagnosis, epidemiology and surveillance, clinical issues, field operations, and animal sources. Six WHO Regional Offices were fully involved in the global coordination of the response, with the Western Pacific Regional Office taking it on full force due to the proximity to where the majority of the cases occurred. The Global Outbreak Alert and Response Network (GOARN), a global technical partnership coordinated by the WHO, was rapidly mobilized in response to the SARS outbreak. GOARN provided a functional platform to mobilize infectious disease experts, clinicians, laboratory experts, medical epidemiologists, logistics experts, virologists, and media experts to address the global public health emergency.[93]

Through GOARN, the WHO coordinated the development of many networks vital in developing standards and tools for containment of the epidemic. To better understand and treat SARS effectively, a virtual network was set up to exchange thoughts, findings, and experiences. Among those involved was the CDC, the Health Protection Agency from the United Kingdom, and EPICENTRE from France. The clinical network linked infection control issues closely with every aspect of the cases examined from investigation and clinical diagnosis to therapy.

Global SARS surveillance monitored the magnitude and spread of the disease to provide advice on prevention and control. The system followed the revised case definitions and reported to the WHO, who distributed tools for its implementation throughout the WHO virtual network to national public health authorities. In accordance with the information received by the national public health authorities, case numbers and data on areas with local transmission were updated daily on their website.

During the SARS outbreak, the WHO became a key organization to assist health authorities with national policy creation and multi-sectoral coordination of preparedness activities and the SARS outbreak response. The country offices in the area, supported by experts

[93] The operational response to SARS // World Health Organization, 2003. URL: http://www.who.int/csr/sars/goarn2003_4_16/en/ (accessed 14.02.2018).

from partners in GOARN and the Western Pacific Region Organization, that strengthened disease surveillance and reporting systems, improved the classification and reporting of cases, advised on infection control, risk communications, field epidemiology, and contact tracing.[94] Laboratory preparedness was a major issue as the winter season arrive in the northern hemisphere with the prospects of increased influenza and other respiratory diseases activity. This potentially leads to a significant increase in requests for diagnostic tests and possible false-positive results and complications. A number of activities have been started in the Western Pacific Region that are aimed at improving preparedness for the disease's possible reemergence, including updating existing guidelines for surveillance and response activities, updating assessment protocol, and developing a preparedness framework and risk assessment.[95]

American response to the emergency

As the global epidemic of SARS continued to spread, China's secretive and misleading response to the outbreak raised the health threat to thousands around the world. The response raised doubts about China's commitment to the WHO due to their vague public health transparency and inaccurate statistical results on the number of cases reported by the government. The U.S. State Department counted at least six cases among American citizens in China, where the number of cases reported was misrepresented. The magnitude of the epidemic was much greater than the Chinese government admitted. SARS then spread to the United States, where 193 people were affected.[96] Officials believed lives could have been saved, and that the situation could have been controlled.

SARS first arrived in the United States from Asia to the state of Florida and started to spread through coughing after a woman returned from visiting Beijing. Federal health authorities and infectious disease experts say that the U.S. mostly escaped the full effect of the

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[94] Institute of Medicine. Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary // The National Academies Press: Washington D.C., 2004.
[95] Institute of Medicine. Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary // The National Academies Press: Washington D.C., 2004.
[96] Tkacik, J. An American Response to China's SARS Failures // The Heritage Foundation, 2003. URL: https://www.heritage.org/asia/report/american-response-chinas-sars-failures (accessed 15.02.2018).

SARS epidemic, due to the aggressive public health measures, and even in part because of sheer luck. According to Alonza Plough, director of public health for Seattle-King County, Washington, "I think that the United States, by adopting a very conservative case definition, allowed for early isolation of individuals and played a role, certainly in containment."[97] No SARS patient in the United States died, although some required ventilators to assist their breathing, and all but two had traveled to areas where the outbreak had been most severe, according to the CDC.

The CDC issued infection control precautions and provisional laboratory biosafety guidelines for handling and processing specimens in mid-March once suspected cases began to emerge in the United States. As the outbreak became more widespread, the CDC began utilizing pandemic strategies for SARS and extended its travel advisory to the affected areas. On April 14, the CDC published a sequence of the virus thought to be responsible for the global epidemic of SARS; identification of the genetic sequence of a new virus is essential to treatment and prevention efforts.[98] By May 6, containment in the United States was declared successful by the CDC with no new probably cases reported in the last 24 hours and no evidence of ongoing transmission.

Lawrence O. Gostin, director of the Center for Law and the Public's Health at Georgetown University Law Center, said that public health laws were archaic and go back to the 19th century and were not enough to deal with a modern health emergency. "The need for public health reform is urgent. It should have provisions for surveillance, vaccination, treatment, isolation, and quarantine in a way that gives decisive powers to health authorities while respecting the Constitution."[99] His model Emergency Health Poers Act had been adopted by 22 states at the time, and said that the question of quarantine revealed the tension between public

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[97] Broder, J.M. "THE SARS EPIDEMIC: THE AMERICAN RESPONSE; Aggressive Steps, and Luck, Help U.S. Avoid SARS Brunt" // The New York Times, 2003. URL: http://www.nytimes.com/2003/05/05/us/sars-epidemic-american-response-aggressive-steps-luck-help-us-avoid-sars-brunt.html (accessed 18.02.2018).
[98] CDC SARS Response Timeline // Centers for Disease Control and Prevention, 2013. URL: https://www.cdc.gov/about/history/sars/timeline.htm (accessed 12.02.2018).
[99] Broder, J.M. "THE SARS EPIDEMIC: THE AMERICAN RESPONSE; Aggressive Steps, and Luck, Help U.S. Avoid SARS Brunt" // The New York Times, 2003. URL: http://www.nytimes.com/2003/05/05/us/sars-epidemic-american-response-aggressive-steps-luck-help-us-avoid-sars-brunt.html (accessed 18.02.2018).

welfare and individual freedom; he settled on the side of public safety as of greater importance and priority.

Since the 2001 anthrax attacks, it was clear that informing the public to follow orders to help stop the spread of disease was of great importance. The strategy of informing the public through news media appearances from public health officials appeared, for the most part, to have been effective. 83% of Americans knew SARS is a disease that requires quarantine to keep from spreading, and 94% would agree to be isolated for two or three weeks if they had contracted the disease.[100]

The lessons learned from the previously mentioned outbreaks garnered an increase in the development of detailed plans for responding to an infectious disease outbreak and led to the creation of the International Health Regulations (IHR) in 2005, which was built on the unique experience of the WHO in global disease surveillance, alert and response, and collaboration with regional, state, national, and other international public health organizations. The regulations defined the obligations and rights of countries to report public health events, and establish a number of procedures that organizations, primarily the WHO, must follow in their work to maintain global public health security.

D. 2009 Influenza A (H1N1) "Swine Flu" Outbreak

Background

On April 15, 2009, the first case of the 2009 pandemic of influenza A (H1N1) virus infection in the United States was diagnosed in a 10-year-old boy in California; two days later, a second case of infection was confirmed in an neighboring country in California.[101] The following two weeks encountered additional cases of infection with this new virus in Mexico, Texas, California, and other states.

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[100] Stolberg, S.G. "Lessons of Anthrax Attacks Help U.S. Respond to SARS" // The New York Times, 2003. URL: http://www.ph.ucla.edu/epi/bioter/lessonsofanthraxsars.html (accessed 04.02.2018).

[101] Jhung, M.A., Swerdlow, D., Olsen, S.J., Jernigan, D., Biggerstaff, M., Kamimoto, L., Kniss, K., Reed, C., Fry, A., Brammer, L., Gindler, J., Gregg, W.J., Bresee, J., Finelli, L. Epidemiology of 2009 Pandemic Influenza A (H1N1) in the United States // Clinical Infectious Disease, Vol. 52, No. 1, 2011. P. 13-26.

The H1N1 influenza virus was composed of a combination of gene segments that had not been previously reported in animals or humans. The gene which codes for an important viral surface antigen was closely related to another gene found in modern influenza viruses circulating among North American swine. The influenza virus was said to have evolved from the 1918 avian pandemic of the same virus and entered human and swine populations at around the same time, but with distinct lineages in both species.[102]

The best documented pandemic of the H1N1 flu virus occurred in 1918, known as the Spanish flu. Estimated to have infected 50% of the world's population, the pandemic had an estimated mortality of 40-50 million people. Possible factors for the high death rates included the unavailability of antibiotics which were not yet researched; basic infection control practices; the destruction of health care facilities as a result of World War I; and the use of Aspirin, which is known to cause pulmonary oedema and hyperventilation in high doses.[103]

The virus is transmitted by respiratory droplets in the air through coughing, sneezing, and touching contaminated surfaces with the virus. The transmissibility of this virus is higher than other influenza strains, with an R0 value at around 2.4 compared to 1.8 for previous outbreaks, which made infection control difficult.[104] The majority of the cases of H1N1 during the 2009 pandemic were mild and self-limiting, but some people developed further complications and others died. The pandemic spread of influenza viruses is defined by a high attack rate and increased mortality levels particularly young adults.

Influenza pandemics occur in waves. The WHO uses a six-phased approach to guide national preparedness plans against pandemics. Phases 1-3 related to preparedness while phases 4-6 signal the need for mitigation efforts. In Phase 1, no viruses being transmitted among animals have been reported to cause infection within humans. In Phase 2, an animal influenza virus is known to have spread to humans. In Phase 3, an animal or human-animal influenza reassortant virus has caused small clusters, but has not resulted in human-to-human transmission

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[102] Hancock, K. Veguilla, V., Lu, X., et al. Cross-reactive antibody responses to the 2009 pandemic H1N1 influenza virus // New England Journal of Medicine, Vol. 361, 2009. P. 1945-1952.
[103] Horimoto, T., Kawaoka, Y. Influenza: lessons from past pandemics, warnings from current incidents // Nat Rev Microbiol, Vol. 3, No. 8, 2005. P. 591-600.
[104] Al-Muharrmi, Z. Understanding the Influenza A H1N1 2009 Pandemic // Sultan Qaboos University Medical Journal, Vol. 10, No. 2, 2010. P. 187-195.

to sustain an outbreak among a community. Phase 4 occurs when such viruses cause human-to-human transmission at the community-level. In Phase 5, the spread of the virus among humans attacks at least two countries in one WHO region. If the outbreak is recorded in more than one WHO region, the final "pandemic phase", or Phase 6, is declared.

The 2009 pandemic virus quickly spread globally, and on June 11, 2009, corresponding with Phase 6 of the influenza pandemic wave, the WHO declared the first influenza pandemic of the 21st century. As of April 2010, laboratory-confirmed infections with the H1N1 influenza virus have been identified in 212 countries and territories overseas with over 15,000 confirmed deaths reported to the WHO; the first flu pandemic in 40 years.[105] Due to its origins from swine, this strain of influenza became known as "Swine Flu".

International response to the emergency

The H1N1 pandemic is the first Public Health Emergency of International Concern (PHEIC) to occurs since the revised International Health Regulations came into force. The IHR played a key role in the global response to the pandemic by facilitating coordinated international action by requiring countries to report influenza A (H1N1) outbreaks as they were initially discovered. The WHO Review Committee determined five factors that framed the events and helped to explain what happened in the pandemic response. They are the limitations of systems that were designed to respond to a geographically central, short-term emergency, rather than a global, long-term, sustained event; the core values of public health; the unpredictable nature of influenza; the WHO's part as a moral voice for health in the world and as an assistant to its Member States; and the threat of avian influenza A (H5N1) and how it shaped general pandemic preparedness.[106]

The main ideology of public health is one of prevention by preventing disease and averting avoidable deaths. Influenza pandemics will continue to occur, and in this sense, are

[105] Pandemic (H1N1) 2009 – update 87 // World Health Organization, 2010. URL: http://www.who.int/csr/don/2010_02_12/en/index.html (accessed 24.02.2018).
[106] Report of the Review Committee on the Functioning of the International Health Regulations (2005) and on Pandemic Influenza A (H1N1) 2009 // World Health Organization, 2011. URL: http://www.who.int/ihr/preview_report_review_committee_mar2011_en.pdf (accessed 22.02.2018).

predictable; however, precisely when, where, and how severe the next pandemic will be cannot be predicted. Since they occur infrequently, there is a tendency to over-interpret the patterns of the past. The response to the emergence of the H1N1 flu pandemic of 2009 was the result of a decade of pandemic planning, largely centered on the threat of an avian influenza A (H5N1) pandemic. H1N1 was different from H5N1 in that the illness did not require hospitalization in the vast majority of cases, and the question of seriousness of the pandemic and how to characterize it became a key challenge.

Considerable effort from years after the implementation of the International Health Regulations had been committed to preparing for surveillance during a pandemic. "Swine Flu" was detected and isolated fairly early, although attempts at containment were too late. Circumstantial alertness during the early phase allowed early assessment by countries, particularly those affected first (Mexico, U.S., and Canada). The integration of clinical, epidemiologic, and laboratory data proved essential and gave important insights into transmission dynamics, disease severity, an anticipated impact of interventions. Studies on the local and national level shared through the WHO proved more valuable than relying on the collection of primary data for analysis in some regions.

Vaccines were the core pharmaceutical preventive intervention method for the H1N1 virus, and has garnered a particular focus for critics citing the uneven and substandard uptake across countries. The development of a pandemic vaccine was a scientific success, but the availability was limited until that seasonal wave had nearly peaked in the Northern Hemisphere. The vaccination covered depended on many factors, including preordering, licensing, availability, logistics, public and professional perceptions and bureaucratic hurdles.[107] The cost of pandemic vaccines was extensive and a loss of public confidence had sometimes been caused by unsubstantiated media report of serious side effects and exaggerations of statistical reports. Even when rich nations donated millions of vaccination doses for use in poor countries, the health agency could not distribute them because it impeded in negotiations with pharmaceutical companies over liability and costs.

[107] Leung, G.M., Nicoll, A. Reflections on Pandemic (H1N1) 2009 and the International Response // PLoS Med, Vol. 7, No. 10.

Communications from the WHO relayed to news conferences also affected their effectiveness during the outbreak. Critics stated that cancelling routine news conferences after the disease was elevated to pandemic status was "ill advised" and questioned its integrity.[108] Some countries could not obtain technical help in their languages and the WHO bureaucracy created an unmanageable number of documents and asked countries to submit counts of laboratory-confirmed cases, creating confusion.

One challenge faced initially during this pandemic was for prompt collection and sharing of clinical data to inform optimal management of critically ill patients worldwide. There was the need to establish clinical research infrastructure prior to the pandemic and a central institutional review board to facilitate data collection and analyses. It has been assessed that clinical management of severe influenza diseases should not be limited to the current antiviral regimen and that there should be greater access to antivirals and influenza vaccines as they are researched, developed, and tested. The supply of vaccines flowed into the countries with advance purchase arrangements before flowing to the poorer countries in a timely manner. The long-term solution gathered from their effectiveness to respond called for improved surveillance, better prevention and control of influenza, and expanded monitoring of disease burden.

American response to the emergency

The CDC's response was long-term and complex, lasting more than a year. The new influenza A virus (H1N1) was first identified in a 10-year-old patient in California on April 15, 2009. Laboratory testing at the CDC confirmed that humans have not been affected by it before. Two days later, a second infection was confirmed in another patient living in California about 130 miles away, with no known connection between the two and that the cases were very similar to each other, and different from any other influenza viruses previously seen either in animals or humans.[109] As the outbreak unfolded, the CDC stayed in close contact with the international health community. On April 18, 2009, under the International Health Regulations, the United

[108] McNeil Jr., Donald, G. "Response of W.H.O. to Swine Flu Is Criticized" // The New York Times, 2011. URL: York Times. http://www.nytimes.com/2011/03/11/health/policy/11flu.html (accessed 25.02.2018).
[109] The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010 // Centers for Disease Control and Prevention, 2010. URL: https://www.cdc.gov/h1n1flu/cdcresponse.htm (accessed 23.02.2018).

States IHR program reported the 2009 H1N1 influenza cases to the WHO. The cases were also reported to the Pan American Health Organization (PAHO), Canada, and Mexico, as part of the Security and Prosperity Partnership of North America.[110]

On May 1, 2009, USAID established the Pandemic Influenza Response Management Team – composed of its Bureaus of Global Health and Democracy, Conflict, and Humanitarian Assistance – to coordinate the U.S. humanitarian response to the H1N1 "Swine Flu" outbreaks.[111] U.S. aid focused on H1N1 specifically and built influenza pandemic preparedness efforts that began after the 2003 SARS outbreak. As of May 18, 2009, the United States provided more than $16 million to aid countries in Latin America and the Caribbean in response to the outbreak.[112] The U.S. responses to global H1N1 outbreaks were conducted mostly by the CDC and the U.S. Agency for International Development (USAID).

Once the number of cases increased beyond the practicality of individually counting the cases, the CDC reported the number of 2009 cases for the last time on July 23, 2009.[113] Reporting of H1N1 hospitalizations and deaths continued. The CDC continued using its previously existing surveillance systems to track the progress of the outbreak through its transmission, but only provided activity levels and virus characteristics, not individual cases. They worked closely with countries in the Southern Hemisphere to monitor and enhance surveillance for the virus throughout the summer months. Their season began in May 2009, and the countries in the Southern Hemisphere reported that the H1N1 virus was spreading and causing illness along with regular seasonal influenza viruses. The CDC noticed that there were not significant changes in the H1N1 influenza virus circulating in the Southern Hemisphere as compared to viruses isolated from people in the Northern Hemisphere and did not seem to excessively impact the health care systems. The lack of compelling changes in the virus

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[110] The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010 // Centers for Disease Control and Prevention, 2010. URL: https://www.cdc.gov/h1n1flu/cdcresponse.htm (accessed 23.02.2018).
[111] Global – Influenza A/H1N1, Fact Sheet #3 // USAID, 2009. URL: http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/countries/pandemic_influenza/template/fs_sr/pandemic_influenza_fs03_05-18-2009.pdf (accessed 22.02.2018).
[112] Global – Influenza A/H1N1, Fact Sheet #3 // USAID, 2009. URL: http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/countries/pandemic_influenza/template/fs_sr/pandemic_influenza_fs03_05-18-2009.pdf (accessed 22.02.2018).
[113] The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010 // Centers for Disease Control and Prevention, 2010. URL: https://www.cdc.gov/h1n1flu/cdcresponse.htm (accessed 23.02.2018).

indicated that the H1N1 vaccine being produced would closely match the currently circulating H1N1 viruses and would provide people with protection against the 2009 influenza A pandemic.

The CDC influenza laboratory in Atlanta, Georgia, as one of four WHO collaborating centers around the world, routinely received viral samples from many countries, including Mexico; the other three collaborating centers are based in Britain, Japan, and Australia. The CDC develops reagents used to detect subtypes of influenza that are sent to national influenza centers globally for identification and testing.[114] Once the subtype is identified, the CDC develops testing kits that are sent to public health laboratories worldwide at no cost. The organization sent experts out into the field to help strengthen laboratory capacity and train health experts to control the spread of the influenza virus. In addition to the responses taken for the H1N1 pandemic, the CDC supports pandemic influenza preparedness efforts directly and/or indirectly in more than 50 countries; in some cases, sends an expert to work with a WHO country office or a foreign ministry of health, as well as agreements to provide funding.

The CDC response to the 2009 H1N1 pandemic continually progressed to meet the nation's needs as events unraveled and as more information became readily available. However, a consistent latent communications strategy fell short for the entire CDC response. This strategy included the CDC clearly stating its actions and goals in response to the developing situation and notifying what was not known, as well as what was known, influencing the public's confidence in public health officials. The organization regularly defined its goals to "reduce transmission and illness severity, and provide information to help health care providers, public health officials, and the public address the challenges posed by the new virus."[115] Special care was taken to inform state and local public health partners with knowledge of the CDC's activities, as well as regularly collecting feedback from its partners to help ensure that its recommendations were correctly adjusted to what was happening in the field.

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[114] Press Briefing Transcripts: CDC Media Availability on Human Swine Influenza Cases // Centers for Disease Control and Prevention, 2009. URL: http://www.cdc.gov/media/transcripts/2009/t090427.htm (accessed 27.02.2018).

[115] The 2009 H1N1 Pandemic: Summary Highlights, April 2009-April 2010 // Centers for Disease Control and Prevention, 2010. URL: https://www.cdc.gov/h1n1flu/cdcresponse.htm (accessed 23.02.2018).

Infectious diseases are estimated to cause more than 25% of all deaths around the world. The recent number of infectious disease outbreaks in the first decade of the 21st century, such as the H1N1 influenza A and SARS, have raised concerns about how infectious diseases might threaten global security. It is important to state that about 75% of the diseases that have emerged over the past decades have originated from animals.[116] As a result, effective responses to the increasing threat of infectious diseases require a multi-faceted and disciplined approach that brings together stakeholders from a variety of sectors, including animal health and agricultural. Investments that the U.S. and other international players have made to plan for a possible influenza pandemic, and to monitor the spread of other infectious disease, were applied to the global response to the H1N1 pandemic.[117] Questions remain as to the capacity to detect H1N1, developing countries' efforts to create, procure, and distribute antivirals and vaccines, and the possible co-occurrence with the H5N1 avian flu virus to further complicate past efforts and emerge as a greater threat.

E. Conclusions

Globalization has influenced the rate and severity of reemerging and emerging infectious disease on their effects on the modern world. International trade and travel have accelerated the spread of technological advancement, but also the spread of disease. While developed countries grow further through this process, developing states still struggle with public health facilities and capabilities. The internationalization of public health has failed and the needs and quality of public health systems are deteriorating or nonexistent. In addition, the ever-increasing economic, social, and environmental problems in the developing world have cultivated the emergence and reemergence of infectious diseases. The large scale of international mobility through trade and travel put the developed world constantly under threat from the spread of disease in more urban areas that pose a severe risk of transmission between large populations. Dangerous infectious

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[116] Salaam-Blyther, T. The 2009 Influenza A (H1N1) "Swine Flu" Outbreak: U.S. Responses to Global Human Cases // Congressional Research Service, 2009. URL: https://biotech.law.lsu.edu/blaw/H1N1-2009/R40588.pdf (accessed 24.02.2018).

[117] Salaam-Blyther, T. The 2009 Influenza A (H1N1) "Swine Flu" Outbreak: U.S. Responses to Global Human Cases // Congressional Research Service, 2009. URL: https://biotech.law.lsu.edu/blaw/H1N1-2009/R40588.pdf (accessed 24.02.2018).

diseases, as a result of globalization, are brought under attention through different sectors, such as security and international relations, that further emphasize the importance of creating effective preventive methods and response plans to combat these health threats.

As seen in the 2001 anthrax bioterrorism attacks, improving public health preparedness of the United States was a main concern for health officials across the country. Preexisting planning efforts and exercises and previous experience helped promote an early and coordinated response, but bureaucratic complications and cross-state and cross-jurisdiction agreements slowed down the response. Effective communication, the benefits of planning and exercise, and the importance of a strong public health infrastructure became the main areas to improve for future public health emergencies. The failure to communicate a clear and timely message to the public was one of the main areas that fell short during the anthrax attacks. First responders needed to be engaged in training and exercises to simulate a public health crisis to prepare in advance for complications and casualties under an effective chain of command. The U.S. public health infrastructure was a fragmented system, with under-prepared and lack of facilities in the affected areas that resulted in inefficiencies when it tried to enact a coordinated response later on during the crisis. The CDC was challenged to coordinate the federal public health and to meet extensive resource demand from state and local officials, but were not fully prepared on the federal level. The organization recognized the importance of tracking the vulnerable, sharing sensitive information, treating aggressively, and improving communication among agencies, the media, and the public.

The SARS outbreak required the collaboration between many international agencies, with the WHO at the forefront of the response. The Global Outbreak Alert and Response Network (GOARN) provided an operational platform to mobilize experts from different fields to address the global public health emergency. Through GOARN, the WHO coordinated the development of standards and tools for containment of the epidemic. The joint effort monitored the magnitude and spread of the disease to provide advice on prevention and control. However, China's commitment to the WHO raised doubts due to their inaccurate statistical results and vague public health transparency. The U.S. State Department counted at least six cases among American citizens in China, where the number of cases reported was misrepresented. When SARS first arrived in the U.S., the improved and aggressive public health measures helped the country to

mostly escape the full effects of the epidemic. Since the 2001 anthrax attacks, it was vital to inform the public to follow guidelines to help stop the spread of disease. The two previous outbreaks gathered an increase in the development of detailed plans for responding to an infectious disease outbreak and led to the creation of the International Health Regulations (IHR) in 2005 to define the rights and obligations of countries to report events and establish procedures to uphold that must be followed to uphold their work on global public health security.

The considerable efforts after the development of the International Health Regulations helped to detect and isolate the H1N1 influenza virus reasonable early, although it was too late for any attempt at containment. Vaccines were the core preventive intervention method for the virus, but the availability was limited and was distributed late to the poorer national affected by the pandemic. Some countries could also not obtain technical help in their languages as the WHO ceased routine new conferences and its bureaucracy created an uncontrollable number of documents causing confusion. The CDC, acting as one of the four collaborating centers around the world with the WHO, directly or indirectly supported pandemic influenza preparedness efforts in more than 50 countries, but its communication strategy garnered criticism and the public's confidence in the organization wavered. It was seen that effective responses to the increasing threat of infectious disease require a multi-faceted and disciplined approach to bring together those from a variety of sectors, as well as the improvement for detection of disease within developing countries to create, procure, and distribute appropriate preventive measures and treatments.

III. CASE STUDY: EBOLA VIRUS

A. Background

The Ebola virus is an infectious disease that can have a 90% fatality rate and is spread through bodily fluids. The 2014-2016 Ebola outbreak had a 60% fatality rate, which is comparable to previous outbreaks in the Democratic Republic of Congo and in Uganda.[118] The outbreak began in Meliandou, Guinea, in December 2013. The disease was similar to cholera, which is endemic to the region and has similar symptoms – including diarrhea, vomiting, and severe stomach pain – initially leading to reports of a cholera outbreak.[119]

Liberia reported its first cases of Ebola later in March, and there were also suspected but no confirmed cases in Sierra Leona. Guinea's Ministry of Health issued the first alert of an "unidentified disease" and the WHO published this notice on March 23.[120] Later that same day, the African Regional Health Office (AFRO) opened its Emergency Management Systems as a response, however it mistakenly labeled the outbreak as Lassa fever. Médecins Sans Frontiéres and Institut Pasteur joined the investigation activities. Near the end of the extensive investigation, the WHO confirmed on March 23, 2014, one year later, that the outbreak was the Ebola virus disease, and confirmed twenty-nine Ebola-related deaths.[121]

Across the three worst-affected countries, Guinea, Liberia, and Nigeria, as of August 6, 2014, there were 961 confirmed, probable, and suspected cases and two probably Ebola deaths.[122] Under the International Health Regulations (IHR 2005), the Emergency Committee for Ebola concluded that the outbreak in West Africa comprised an extraordinary event and a public

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[118] 2014 Ebola Outbreak in West Africa – Outbreak Distribution Map 2016 // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/distributionmap.html#areas (accessed 08.03.2018).

[119] Signs and Symptoms // Centers for Disease Control and Prevention, 2014. URL: https://www.cdc.gov/vhf/ebola/symptoms/ (accessed 02.03.2018).

[120] Ground zero in Guinea: the Ebola outbreak smoulders – undetected – for more than 3 months // World Health Organization, 2017. URL: http://www.who.int/csr/disease/ebola/ebola-6-months/guinea/en/ (accessed 03.03.2018).

[121] Origins of the 2014 Ebola epidemic // World Health Organization, 2015. URL: http://who.int/csr/disease/ebola/one-yearreport/virus-origin/en/ (accessed 04.03.2018).

[122] WHO statement on the first meeting of the International Health Regulations (2005) (IHR 2005) Emergency Committee on Zika virus and observed increase in neurological disorders and neonatal malformations 2016 // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/1stemergency-committee-zika/en/ (accessed 12.03.2018).

health risk to other states. The Committee, as a result, called for a coordinated international response to prevent the international spread of the virus. On August 8, 2014, WHO Director-General Dr. Margaret Chan declared Ebola a public health emergency of international concern (PHEIC). Shortly after the declaration, the number of confirmed cases and deaths across the three main countries began to grow at an alarming rate. The United Nations General Assembly and Security Council pushed for international support, characterizing Ebola as a threat to international peace and security.

The United Nations Secretary General, Ban ki-Moon in cooperation with the WHO, established the United Nations Mission for Emergency Ebola Response (UNMEER) on September 19, 2014 to coordinate national health systems, international organizations, and Member States efforts in Liberia, Sierra Leone, and Guinea.[123] Financial resources began to flow into the three most severely affected countries, while military resources followed shortly after in September, October, and November 2014. The United States, United Kingdom, Canada, China, France, and Japan contributed military doctors, transportation, and supplies to assist with relief efforts in West Africa. Additionally, healthcare workers were sent from countries, such as Cuba, Britain, France, China, and Brazil.

By the end of the outbreak in March 2016, Ebola had claimed 11,310 lives, and resulted in 28,616 total cases and the PHEIC was officially terminated by the WHO on March 29, 2016.[124] Eight months had passed from the time of the outbreak to the point when Dr. Margaret Chan declared the Ebola virus outbreak a PHEIC. Once the global health emergency was declared, the response from the WHO and other international organizations pledged significant voluntary contributions and bilateral donations. In the following sections, I test the four approaches as explanations for why the response came so late from the WHO and the CDC, but received a lot of resources.

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[123] The role of WHO within the United Nations Mission for Ebola Emergency Response 2014 // World Health Organization, 2014. URL: http://who.int/csr/resources/publications/ebola/who-unmeer.pdf?ua=1 (accessed 06.03.2018).

[124] 2014 Ebola Outbreak in West Africa – Case Counts // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html (accessed 04.03.2018).

B. Organizational explanation for the Ebola response

This study predicts that the more centralized the bureaucratic structures and the greater available assessed contributions dedicated to emergency response categories in the international organizations' budget (H1), the faster the response from the organization. Conversely, the more decentralized the bureaucratic structures and the fewer the available assessed contributions allocated to emergency response categories, the slower the response from the organization (H2). In the following section this study first addresses the CDC's centralized bureaucratic structure and how fast it responded to the outbreak and why it was better prepared and more efficient. The author then addresses the WHO's decentralized bureaucratic structure and how – as a result of misunderstandings and miscommunications between headquarters, the African Regional Health Office (AFRO) and three WHO country offices – the observed response was slower than if the WHO had been more centralized.

The WHO and AFRO were the two main bureaucracies that responded to the Ebola pandemic: the WHO is the world's leading health authority, and AFRO is the African region's branch of the WHO. The focus is on these two bureaucracies as examples of decentralized international organizations to understand the speed of response and the amount of resources allocated to the Ebola outbreak. The CDC served as the main bureaucracy representing the United States that responded to the Ebola epidemic. A focus on the CDC is used as an example of a centralized public health organization structured that is influenced by the U.S. government and its members for its response and direction of resource allocation. It is important to note that other bureaucracies, including humanitarian aid organizations, private organizations, and non-governmental organizations were involved in the response. This study chooses to limit the case study to the CDC, as it functions as the United States' leading health authority connected to the government and assists in global health emergencies, and the WHO and AFRO as they function as the leading health authorities in the area for coordinating and responding to health emergencies.

Centralization

The more centralized a bureaucracy, the faster the response, and the greater the resources allocated to a public health problem. The CDC system is a highly centralized bureaucracy consisting of three branches with a total of 25 different offices and centers under its direct control. The organization is tied to the United States government directly under the Department of Health and Human Services (HHS) and worked with the Department of Defense (DoD) during the emergency.

Since the identification of the Ebola virus in West Africa on March 23, 2014, the CDC was committed to the most intensive response in the agency's history. Over 3,000 staff have been involved, with more than 1,200 deployed to West Africa for over 50,000 total workdays. As a point of comparison, for more than a decade around only 300 CDC staff took part in the smallpox eradication program, one of the organization's most noteworthy international responses and most intensive technical partnerships with the WHO before the current response.

In March and April 2014, the WHO, the Médecins Sans Frontiéres (MSF), and the CDC initially seemed to help diminish the outbreak during the early stages of international aid. However, with the movement of untraced contacts across borders aiding uncontrolled and unmonitored spread, in June, public health authorities realized that the outbreak was not contained or controlled. By mid-2014, the situation had developed into an international public health crisis as the first-recorded multi-country Ebola epidemic. In Guinea, Liberia, and Sierra Leone's densely populated urban areas, Ebola had ongoing transmission occurring in multiple districts, making it hard to control.

Before this epidemic, CDC existence in all three countries was very limited, and much of the early support for the response was given by means of short-term assignments of staff from headquarters in Atlanta, Georgia, and the CDC's international country offices, with deployments lasting around four to six weeks. The CDC had a team of experts out in the field in Guinea within one week after the initial case report. Shortly after the notice of the resurgence and spread of Ebola, the CDC activated its Emergency Operations Center (EOC) on July 9, 2014. The agency committed to supporting and assisting the three-affected African countries' governments by deploying staff comprised of epidemiologists, data managers, laboratory workers, communication experts, public health advisors, logistic and administrative support staff, and

various technical support staff. Since then, the CDC has coordinated over 1,400 deployments to Guinea, Sierra Leone, and Liberia and sent staff to the neighboring African countries of Senegal, Mali, and Nigeria to help prevent the spread of Ebola. In addition, CDC staff also had launched the development of new diagnostic tests, vaccine efficacy, and research to assess therapeutic drugs.

The CDC established Ebola teams inside the countries in collaboration with the U.S. Agency for International Development (USAID) Disaster Assistance Response Team. This team assisted the host country governments and associates as a key advisor on comprehensive response management, thus acting a support in establishing EOCs by using an incident management system (IMS). The CDC, WHO, MSF, USAID, and United Nations agencies worked as external partners with the IMS. Governments of Liberia, Guinea, and Sierra Leone had no prior experience managing a complex outbreak that developed into a humanitarian crisis, and the concept of a single, unified command was new to all three of the countries to manage the response.

CDC staff were deployed to Liberia and Guinea in March 2014. In July, assignments were increased when the activation of CDC's EOC was initiated. In each country, staff provided guidance through technical support to those involved with epidemiology and surveillance; laboratory capacity; infection control; safe burials; community engagement; case investigation; and the safe transfer of patients thought to have Ebola, dead bodies, and laboratory specimens. As the response transpired and the number of CDC staff in each country increased, CDC-supported staff were sent to areas affected by the outbreak to support ministry of health teams directing case investigations, outbreak investigations, and numerous field surveys in collaboration with the WHO, UNICEF, and MSF; the African Union deployed additional epidemiologists. The CDC played an important role in case funding in all three countries by training staff to manage surveillance activities. The CDC did not send staff to directly provide patient care, but did provide training courses and centers for other deployed clinicians.

To continue to deploy the large number of personnel for an extended period of time, the CDC recruited professionals from state health departments, fellowship programs, and other agencies within the U.S. Department of Health and Human Services along with personnel from its headquarters in Atlanta, Georgia and other CDC offices across the United States. In all three

affected countries, the general response accentuated active surveillance, referral of patients with suspected Ebola for treatment in Ebola Treatment Units (ETUs), rapid case investigation, contact detection, infection control, and safe burials for the deceased. Although the responses in the three affected countries were often similar, the distinct cultural influences, language barriers, and variable degrees of international aid and colleagues available in each country were important differences and approaches that existed.

In the United States, the first case of Ebola diagnosed was imported by a traveler from Liberia revealed differences in hospital provisions and response capabilities. Two nurses caring for the patient were also infected, possibly attributed to a lack of training and underprepared processes. The CDC established Ebola Response Teams composed of CDC experts in clinical care, contract tracing, infection control, environmental waste management, and communications to support health departments on the state and local levels and to send staff to any hospital in the U.S. that has a patient suspected of contracting Ebola. To strengthen protection across the United States and to avert travel restrictions that could possibly impair the response in West Africa, the CDC, along with the U.S. Customs and Border Protection, developed a post arrival monitoring program for those arriving in the United States from those three countries in Africa.

The CDC's response simultaneously directed at controlling the epidemic in West Africa and preparing proactive measures for Ebola in the United States. Key challenges included a skilled workforce for their specialized areas in epidemiologic research, response coordination, the need for infrastructure to isolate contacts, and clinical management. In the early stages of the epidemic, all three countries found it difficult to reach an agreement among partners on specific strategies for the overall response. The long-term need for international health staff showed that the CDC's traditional approach to international work, typically 30 days of deployment, possibly needs to be reassessed for future responses of that degree of severity. Operational presence of the CDC earlier in the epidemic was ideal for an effective response but coordination between Guinea, Sierra Leone, and Liberia posed issues for receiving aid. Therefore, the CDC has established country offices in Guinea, Sierra Leone, and Liberia to help the ministries of health to create plans for potential disease outbreaks in the future.

The epidemic has shown the need for critical improvement in the ability of every country to quickly identify and respond to a health threat and the ability of the global community to

quickly respond in assistance to those affected communities. The Ebola epidemic spread more quickly than the CDC and other agencies within the international community responded. Data management and surveillance systems were strained along with under-functioning national public health systems acted as critical barriers in those affected countries. Stronger disease detection and control systems are needed both nationally and internationally.

Decentralization

The more decentralized an international bureaucracy, the slower the response, and the fewer the resources allocated to a public health problem. Consisting of six regional offices and 150 country offices within each Member State, the WHO system is a highly decentralized bureaucracy. There have been previous efforts to centralize the WHO, but those efforts have failed, and resulted in greater autonomy for regional offices (Figure 3), thus further decentralizing the WHO's structure.

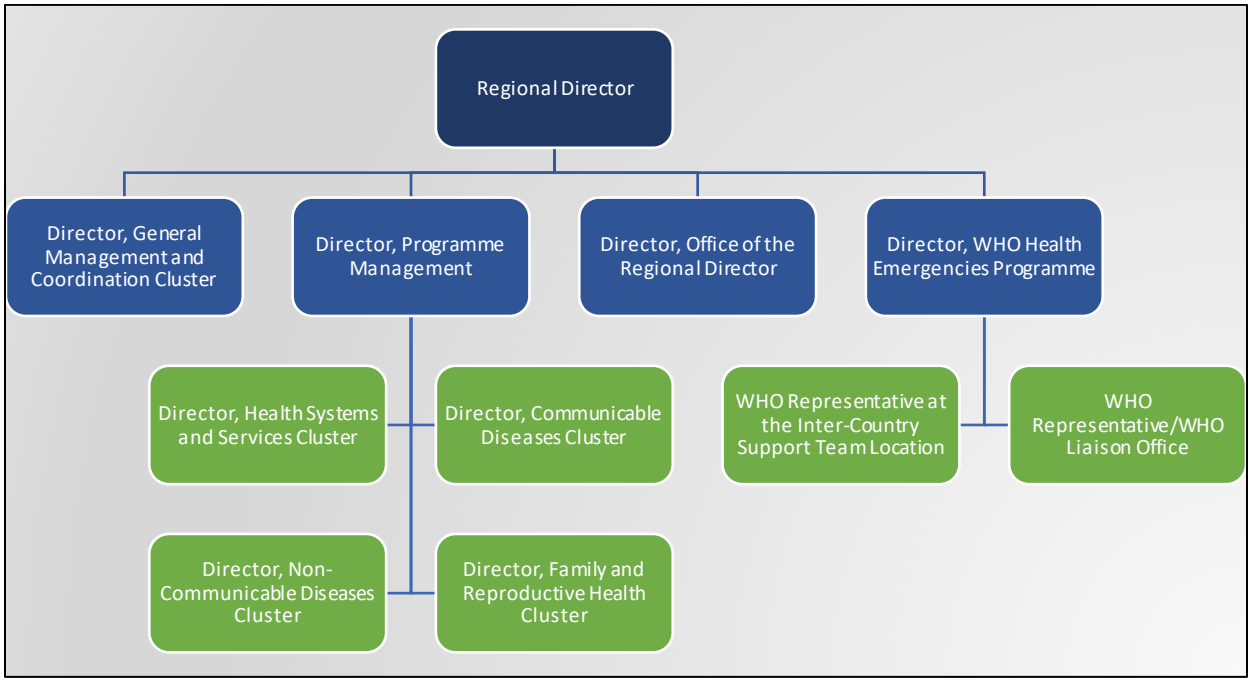

Figure 3. World Health Organization regional office organizational structure.[125]

[125] Organizational Structure // World Health Organization. URL: http://www.afro.who.int/about-us/organizational-structure (accessed 14.02.2018).

The regional offices have near full autonomy to determine their own budget and program planning. AFRO develops programs targeted to address regional issues such as polio eradication. However, headquarters develops its own programs that it expects each and every regional office to also implement alongside their various individual regional agendas. As a result of the diverging roles and goals, cooperation between headquarters and AFRO often fails. In the past, AFRO has been forced to follow paths defined by the WHO headquarters, rather than aim its focus on regional health issues, such as strengthening national and local health systems within the region to deal with pandemics more effectively.[126]

The second key attribute contributing to autonomy within regional offices is the fact that the Member States in each region elect their own Regional Director. This other aspect of regional autonomy embedded in the WHO's organizational foundation makes it impossible for the WHO to act as one single unit, particularly during infectious disease outbreaks. Peter Piot, former head of UNAIDS and a well-known epidemiologist, points to the non-transparent selection process of regional directors as a likely source of some of the dysfunction as the process grasps specific interests that benefit personal agendas of the candidates.[127] The WHO lacked direct control over AFRO from its headquarters and could not respond as a coordinated unit to the Ebola crisis in West Africa, resulting in understaffed and less funding.

The decentralized structure of the WHO and its Member States weakened the Ebola response, and evidence suggests that decentralization is causally linked to a slow response, and small amounts of resources dedicated to the WHO's limited involvement before the declaration of a PHEIC. Problems occurred on the regional level that hindered an effective and quick response. Guinea refused to report its first Ebola case to the WHO, and the Guinean Health Ministry withheld information of suspected cases, which distorted the extent of Ebola's spread.[128] The Guinean economy depends on the country's mining industry, and the government ignored the required reporting requirements under the IHR (2005) fearing that expatriates

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[126] Gale, J., Lauerman, J., Bennett, S. "Ebola Dominates WHO Vote in Struggling Africa Office" // Bloomberg, 2014. URL: https://www.bloomberg.com/news/articles/2014-11-03/ebola-dominates-as-africachooses-who-leader-in-shadows (accessed 03.03.2018).

[127] Biswas, A.K., Hartley, K. "Ebola problem is deeper than it appears for WHO" // Third World Centre, 2014. URL: http://lkyspp.nus.edu.sg/news/ebola-problem-isdeeper-than-it-appears-for-who/ (accessed 02.03.2018).

[128] Morbidity and Mortality Weekly Report (MMWR) 2014 // Centers for Disease Control and Prevention, 2014. URL: https://www.cdc.gov/mmwr/preview/mmwrhtml/su6303a1.htm (accessed 13.03.2018).

working in the mining industry would flee the country, negatively impacting the Guinean economy.[129]

The governments of Sierra Leone and Liberia also hesitated to report the extent of the outbreaks in their countries as they feared similar economic repercussions could occur. Liberian President Ellen Johnson-Sirleaf called for international assistance, but was harshly criticized by Guinea and Sierra Leone, which feared that her calls for help would cause expatriate populations to flee from the region in alarm. The WHO Secretariat in Geneva failed to further investigate the calls for help by the Liberian President on multiple occasions after her initial plea. AFRO subsequently held an emergency teleconference on March 25, 2014, and suggested that the regional director declare an internal WHO grade 2 emergency in order to deploy a regional emergency support tasks force to provide support; this message never reached headquarters.[130]

Fearing that declaring a PHEIC would hurt West African economies, Director General Margaret Chan provided incentive for Ebola-affected states to withhold future voluntary contributions to the WHO's annual budget. Senior directors in Geneva were shown to be informed about the deteriorating situation in West Africa, but refused to declare a PHEIC unless it was as a last resort.

The WHO headquarters could not respond to the crisis prior to March 2014 because they had little knowledge on the ground level. Once headquarters knew of the outbreak, it dropped its responsibility to respond to the growing crisis in order to remain a neutral party out of fear that the three worst-affected West African countries would refuse to donate voluntary contributions and that a PHEIC declaration would negatively impact their economies. Actions such as this only worsened the WHO's zero-growth budget issues. Dr. Chan stated earlier in the crisis that she felt that national governments needed to take the lead in such situations. However, Dr. Laurence

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[129] "Political considerations delayed WHO Ebola response, emails show" // CBS News, 2015. URL: http://www.cbsnews.com/news/politicalconsiderations-delayed-who-ebola-response-emails-show/ (accessed 05.03.2018).

[130] Kamradt-Scott, A. WHO's to blame? The world health organization and the 2014 Ebola outbreak in West Africa // Third World Quarterly, Vol. 37, No. 3, 2016. P. 401-418.

Gostin argues that "if you have governments with such fragile health systems and wide distrust among its own population, the WHO needs to take the lead."[131]

Shortly after the UN Secretary-General Ban ki-Moon stepped in to create UNMEER (UN Mission for Ebola Emergency Response), the WHO declared a PHEIC and it became evident from earlier coordination issues that the WHO system was not coordinated enough to deal with a complex emergency. At this point, physical and financial resources began flowing into West Africa alongside technical help from foreign doctors and military personnel. The Security Council had to establish UNMEER on September 19, 2014 in order to provide a coordinated and centralized response to the outbreak. The UN Secretary-General and WHO Director-General both recognized that earlier failures in containing the outbreak were a result of "logistics capacities, air transportation, mobilizing international expertise, availability of adequate isolation, care and treatment facilities and essential supplies" and the decentralized structure of the WHO headquarters.[132]

According to the Interim Ebola Assessment Panel, UNMEER successfully gathered high level political and financial support but failed to coordinate efforts on the ground in Ebola-affected countries. UNMEER was comprised of six units that reported to the Special Representative of the Secretary General, Bruce Aylward, who reported directly to the WHO Director-General Dr. Margaret Chan. The six units included: Emergency Operations, Emergency Operations Support, Mission Support, Performance Monitoring and Reporting, and Prevention and Preparedness. Dr. Anshu Banerjee was the Director of UNMEER's Emergency Operations. He set up offices in Guinea, Sierra Leone, and Liberia with each one led by an Ebola Crisis Manager who reported to the Special Representative of the Secretary-General directly.[133]

The evidence suggests that the WHO's decentralized structure contributed to a slow response due to coordination and miscommunication issues. However, its decentralized structure

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[131] Flynn, D., Nebehay, S. "Aid workers ask where was the WHO in the Ebola outbreak?" // Reuters, 2014. URL: https://www.reuters.com/article/us-health-ebola-who/aid-workers-ask-where-was-who-in-ebola-outbreak-idUSKCN0HU03Q20141005 (accessed 10.03.2018).

[132] The role of WHO within the United Nations Mission for Ebola Emergency Response 2014 // World Health Organization, 2014. URL: http://who.int/csr/resources/publications/ebola/who-unmeer.pdf?ua=1 (accessed 06.03.2018).

[133] The role of WHO within the United Nations Mission for Ebola Emergency Response 2014 // World Health Organization, 2014. URL: http://who.int/csr/resources/publications/ebola/who-unmeer.pdf?ua=1 (accessed 06.03.2018).

did not vary across cases and cannot alone explain the difference of the WHO and Member State responses between the Ebola and Zika cases. The decentralized structure resulted in significant autonomy for AFRO, whose Member States did not have adequate financial and medical resources to operate independently from the WHO headquarters. I now turn to the epidemiological explanation for understanding the lethality and transmission of Ebola and how it influenced the responses to the outbreak.

There were early setbacks for an effective response by WHO country offices and initial resistance of these offices and the African Region of the WHO to involve the CDC and other organizations. The same problems for both centralized and decentralized bureaucracies in this case of the Ebola epidemic. Once the initial dispute over collaboration between the decentralized bureaucracy of the WHO obtained better control and officially declared the PHEIC, the centralized CDC responded with greater efficiency and ease of internal processes and administrative duties while achieving minimal incidents domestically with two cases being spread in the United States and one death. Even though there were delays on the international scale of response, evidence suggests that the CDC was better prepared and more adaptive to the infectious disease outbreak in West Africa than the World Health Organization.

C. Epidemiological explanation for the Ebola response

This study predicts that the more lethal and the more transmissible the disease, the more quickly an organization will respond and the more physical and financial resources they will allocate to the response (H3 and H4). In the following section, the author examines the Ebola virus's lethality and transmissibility to predict the CDC and the WHO's speed of response and level of resources allocated. With evidence of response time and resources directed to the crisis, I compare my predictions to determine whether lethality, transmissibility, or both impact my two dependent variables.

According to the CDC, the case fatality rate during the 2014 Ebola outbreak was 60%, with some reporting a case fatality rate as high as 70%.[134] With 11,315 confirmed deaths worldwide, and 28,637 reported confirmed cases, this was the largest Ebola outbreak in history.

The Centers for Disease Control and Prevention (CDC) define transmissibility as the "estimations of the basic reproductive number, R0".[135] For example, if R0 were 8, this would mean that for one person infected with the virus, eight additional people would also become infected. During the 2014 Ebola outbreak, the R0 was similar to the R0 in previous outbreaks in Uganda and the Democratic Republic of Congo, estimated to range between 1.5 and 2.2, depending on the area initially measured.[136] Ebola can only be spread through bodily fluids, so it is not very contagious with the proper personal protective equipment, so the R0 value would be lower. Its transmission is minimized through proper and thorough sanitation techniques and use of personal protective equipment such as protective suits, surgical masks, and latex gloves.[137] The CDC cites improper use and lack of protective equipment to be a main contributor to the rapid spread of Ebola. As a comparison measles is a highly transmissible airborne virus with an R0 value of 12-18, so the rate of Ebola is quite small.[138]

Guinea, Sierra Leone, and Liberia have each experienced civil war in the last 20 years that crippled their capabilities to provide public services and develop productive economies. Ebola is highly lethal, but not very transmissible; however, it has serious long-term health consequences for survivors that affect not only population health, but also national economies. The health of Ebola survivors has become a major concern as these countries attempt to reconstruct following the aftermath of the largest Ebola outbreak in history. Survivors experience eye problems such as a burning sensation coming from behind the eye and blurred or cloudy

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[134] 2014 Ebola Outbreak in West Africa – Outbreak Distribution Map 2016 // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/distributionmap.html#areas (accessed 08.03.2018).

[135] Morbidity and Mortality Weekly Report (MMWR) 2014 // Centers for Disease Control and Prevention, 2014. URL: https://www.cdc.gov/mmwr/preview/mmwrhtml/su6303a1.htm (accessed 13.03.2018).

[136] Althaus, C.L. Estimating the reproduction number of Ebola virus (EBOV) during the 2014 outbreak in West Africa // PLOS Current Outbreaks, 2014.

[137] Transmission 2015 // Centers for Disease Control and Prevention, 2015. URL: https://www.cdc.gov/vhf/ebola/transmission/ (accessed 24.03.2018).

[138] Skwarecki, B. "What Is the Scariest Disease?" // Gizmodo, 2014. URL: https://gizmodo.com/what-is-the-scariest-disease-1653943826 (accessed 19.01.2018).

vision. Mosoka Fallah, a Liberian epidemiologist, reported that two third of his patient has severe neurological difficulties in addition to vision impairments.[139] Along with memory loss and chronic muscle and joint paint, this variation and collectivity of these symptoms have been referred to as post-Ebola syndrome.

Many countries affected by the pandemic caused economic disruption in their fragile economies. An estimate by the World Bank gave the total economic impact of Ebola at $2.8 billion, with the worst losses in Sierra Leone ($1.9 billion), Guinea ($600 million), and Liberia ($300 million).[140] This economic decline led to a decrease in overall investor confidence, which then negatively impacted private sector growth and investment. This significant reduction in GDP during the outbreak has resulted in even slower recovery after the pandemic. Large foreign aid from many countries have helped to cushion this blow to West African economies.

Based on the evidence on Ebola's high lethality but low transmissibility, the epidemiological explanation produces an inconclusive prediction. It is not a highly transmissible disease, such as measles or smallpox, with an R0 between 1 and 2, which a slow response and low-resource allocation to be expected by public health organizations. However, due to its high 60% case fatality rate during this particular outbreak, the theory would suggest that the response would be quick and receive a large inflow of resources. Lethality appears to be correlated with increased expenditures, but it does not correlate with the speed of the CDC and the WHO's response to the Ebola outbreak as the WHO's response was eight months after initial Ebola transmission in Guinea.

For identifying a public health emergency as a security issue, both lethality and transmissibility matter for how a securitizing actor frames an infectious disease outbreak. It is the presence of securitizing actors, however, that in the end determines the possibility that an issue is securitized rather than the particular characteristics of a virus. In the next section, I move to the securitization explanation to investigate how speech acts, working up to Director-General Margaret Chan's PHEIC declaration, and reinforcement of security frames following the

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[139] Yasmin, S. "Why Ebola Survivors Struggle with New Symptoms" // Scientific American, 2016. URL: https://www.scientificamerican.com/article/why-ebola-survivors-struggle-with-newsymptoms/ (accessed 06.03.2018).
[140] Physicians (per 1,000 people) // World Bank Group, 2016. URL: http://data.worldbank.org/indicator/SH.MED.PHYS.ZS (accessed 15.03.2018).

declaration affect the amount of resources that the WHO and the United States allocated to the Ebola response. I now move on to securitization to explain the politics of identifying a security issue around the 2014 Ebola outbreak.

D. Securitization explanation for the Ebola response

Securitization theory predicts that when securitizing actors emerge and frame an infectious disease outbreak in a convincing way, the outbreak becomes securitized, and as result the public health organizations will allocate more physical and financial resources to the emergency (H5). If securitizing actors are absent, the outbreak will not be framed as a security issue but will remain as a less threatening public health issue that will lead public health organizations to allocate fewer resources to the response of the emergency. In the following section this study examines the key actors responsible for securitizing Ebola. Once it is securitized, if the theory is correct, we should see a surge in the public health organizations' allocation of resources to combat the Ebola virus in West Africa and the risk of spreading abroad.

Other countries in the region of West Africa such as the Democratic Republic of Congo and Uganda experienced Ebola outbreaks before, however the 2014 outbreak was the first time in the history of the region that an Ebola outbreak spread across national borders and occurred in Guinea, Liberia, and Sierra Leone.[141] New challenges were presented for containment and coordination across the three-worst affected countries as the Ebola virus spread across national borders. The extent to which the Ebola virus spread throughout West Africa meant a more seriously threatening issue that required precautionary and reactive measures extending beyond traditional public health protocols. Governments of the affected countries, international humanitarian organizations, and the media presented language that successfully framed Ebola as a security issue before the WHO Director-General Margaret Chan declared the PHEIC on August 8, 2014. The organization used the circulating security language in order to justify the decision to declare the Ebola virus as a PHEIC and subsequent increase in physical and financial resources to the Ebola response in West Africa. This study then turns to other prominent actors

[141] Outbreaks Chronology: Ebola Virus Disease 2016 // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/vhf/ebola/outbreaks/history/chronology.html (accessed 07.03.2018).

who reinforced the framing of Ebola as a security threat through speeches and symbolic actions, with a few of the actors in the U.S. including the CDC and President Obama. Concluding the securitization explanation, this research compiles the evidence and draw conclusions based on the securitization framework.

The starting point of securitizing the infectious disease came from the United States when the senior director for Weapons of Mass Destruction, Terrorism, and Threat Reduction at the National Security Council, Laura Holgate, announced the U.S. launch of the Global Health Security Agenda on February 16, 2014 during the emerging Ebola outbreak in West Africa.[142] Holgate explained during the announcement that the Global Health Security Agenda was necessary to "strengthen the ability of the international community to prevent, detect, and respond to infectious disease outbreaks, such as Ebola."[143] Throughout the summer of 2014, the Ebola outbreak increased in activity and spread widely, and it was not until early August, before the PHEIC declaration, that more actors began speaking of Ebola as a serious security threat. Lagos State governor, Babatunde Fashola, directly stated on August 6, that Ebola was a "national security issue" that demanded more attention from the international community.[144] Following on that same day Senegalese President Macky Sall reiterated Fashola's statement: "Ebola is not an African disease. It is necessary to confront Ebola as a threat to humanity."[145] Liberian President Ellen Johnson Sirleaf argued that the worst recorded Ebola outbreak in history "requires extraordinary measures for the very survival of our state and for the protection of the lives of our people."[146] Discussing the Ebola outbreak as a "national security risk", "a threat to humanity", and an outbreak that requires "extraordinary measures" to ensure state survival successfully framed Ebola as an existential threat to international peace and security.

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[142] Global Health Security Agenda // USAID, 2016. URL: https://www.usaid.gov/ghsagenda (accessed 13.03.2018).
[143] "U.S. Officials on Launch of Global Health Security Agenda." Mission of the United States Geneva Switzerland, 2014. URL: https://geneva.usmission.gov/2014/02/14/u-s-officials-on-launch-of-global-health-security-agenda/ (accessed 12.03.2018).
[144] "Ebola: Mapping the outbreak" // BBC News, 2016. URL: http://www.bbc.com/news/world-africa-28755033 (accessed 08.03.2018).
[145] Landler, M. "African Leaders Sit Down with American Investors" // The New York Times, 2014. URL: https://www.nytimes.com/2014/08/06/world/africa/african-leaders-sit-down-withamerican-investors.html?_r=1 (accessed 05.03.2018).
[146] "Liberia's president declares state of emergency amid Ebola outbreak, says some civil rights may be suspended" // The National Post, 2014. URL: http://news.nationalpost.com/news/liberias-president-declares-stateof-emergency-amid-ebola-outbreak-says-some-civil-rights-may-be-suspended (accessed 03.03.2018).

Before the PHEIC declaration, international organizations helped fund the cause to fight Ebola due to it being declared by the first Emergency Committee on August 6, 2014 as an "extraordinary event" and a public health risk to other states. Prior to the PHEIC, the Bill and Melinda Gates Foundation donated $1.1 million USD on July 1, 2014. In addition, the World Bank also contributed and with the Bill and Melinda Gates Foundation, both international organizations dramatically increased their donations to the Ebola outbreak following the PHEIC announcement. However, following the PHEIC declaration, the Foundation made four subsequent donations that totaled more than $12 million USD in August, September, October, and November 2014.[147]

The declaration of the PHEIC is symbolic as the WHO only declared two previous PHEICS for the H1N1 swine flu in 2009 and polio in 2014. It can be interpreted as a symbol that the WHO has recognized the threat to stability and security in West Africa given that the PHEICs are only declared in extreme circumstances. Following the declaration of the PHEIC on August 8, 2014, large amounts of resources began to flow into the three worst-affected West African countries from the WHO, its Member States, other UN bodies, and additional international organizations, such as the CDC.

Other actors reinforced the initial securitization of the Ebola outbreak, which included political leaders within WHO Member States, the media, government officials, and international organizations. They framed Ebola as an international security threat through speeches and symbolic acts. The media reinforced these frames and drew public attention to the outbreak to the rest of the world. The media coverage was "prolific and unbalanced," as the media reported heavily on the few isolated Ebola cases in the United States and argued that this over-coverage of the American cases intensified fears and led to the spread of misinformation via social media; however, it did not constitute securitizing language.[148]

World leaders additionally added to the securitization process. President Obama reinforced French President Francois Hollande on September 16, 2014 when he delivered a

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[147] Statement on the 1st meeting of the IHR Emergency Committee on the 2014 Ebola outbreak in West Africa 2014 // World Health Organization, 2014. URL: http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/ (accessed 22.03.2018).

[148] Yusuf, I., et al. Role of Media in Portraying Ebola in and outside Africa // Journal of Tropical Diseases & Public Health, Vol. 3, No. 1, 2015. P. 1-2.

speech at CDC headquarters in Atlanta, when he allocated 3,000 U.S. personnel and $750 million USD to the relief efforts in Liberia. Obama explicitly framed the epidemic as a grave security threat to the region, and possibly to the whole world. He said, "In West Africa, Ebola is now an epidemic of the likes that we have not seen before. It's spiraling out of control. It is getting worse… And if the outbreak is not stopped now, we could be looking at hundreds of thousands of people infected, with profound political, and economic, and security implications for all of us. So, this is an epidemic that is not just a threat to regional security— it's a potential threat to global security…"[149] President Obama explicitly framed Ebola as a security issue in a speech at the CDC and reinforced this frame when he ordered a deployment of U.S. troops to Liberia. The United States established Operation United Assistance in September 2014 and partnered with USAID to build Ebola Treatment Units with larger patient capacity and health services. He later spoke about Ebola at the United Nations in September 2014 and described it as a "growing threat to global security."[150] Seeing as Obama's securitizing rhetoric did not precede the increased resource allocation, it cannot explain the action; however, it is consistent with the increased resource allocation that is observed throughout September, October, and November 2014.

Quickly after Obama's speeches at the CDC and the UN, United Nations Secretary General Ban ki-Moon distributed identical letters to the Security Council and General Assembly that stated that "the situation has gone beyond being a crisis only of public health" and threatened international security.[151] The United States, which held the presidency of the Security Council, called for an emergency meeting to discuss Ebola following the Secretary General's warning. On September 18, 2014 at that meeting, all fifteen members unanimously passed Resolution 2177, with 130 countries in the General Assembly co-sponsoring it. Resolution 2177, combined with great support from non-Security Council members signals that Member States are

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[149] Garrett, L. "Can the U.S. Army Degrade and Destroy Ebola? // Foreign Policy, 2014. URL: http://foreignpolicy.com/2014/09/16/canthe-u-s-army-degrade-and-destroy-ebola/ (accessed 07.03.2018).
[150] Haglage, A. "Obama Warns UN of Looming Ebola Catastrophe" // The Daily Beast, 2014. URL: http://www.thedailybeast.com/articles/2014/09/25/obama-warns-un-of-looming-ebolacatastrophe.html (accessed 06.03.2018).
[151] "Identical letters dated 17 September 2014 from the Secretary-General addressed to the President of the General Assembly and the President of the Security Council 2014". United Nations General Assembly Security Council, New York City, United States, 2014. URL: http://repository.un.org/handle/11176/89273 (accessed 17.03.2018).

willing to set aside the usual politics within the Council to address an immediate and dire threat. Resolution 2177 specifically noted the threat to post-conflict stability, deterioration of the security and political situation in a delicate region, and impact on food security after the outbreak has been contained.[152] The Council members used language explicitly framing Ebola as a security threat by emphasizing the fragility of the West African nations affected by the Ebola outbreak and potential for state failure.

The United Nations Security Council's further reinforcement of Ebola as a security threat is also symbolic, as it was only the second time that a public health emergency was addressed; the first being HIV/AIDS. In addition, to the resolution, the United Nations General Assembly adopted Resolution 69/1, which further expressed "deep concern about the potential reversal of the gains made by the affected countries in peace building, political stability, and the reconstruction of socioeconomic infrastructure in recent years."[153] The international community was urged to take action to contain and control the crisis because of its social, economic, and humanitarian consequences.

The securitization approach underlines the fact that security language was used to justify the PHEIC and subsequent flow in financial and physical resources dedicated to the response. World leaders, international and humanitarian organizations, and the media further reinforced the framing of Ebola as a security issue through explicit action and implicit gestures. Securitization theory demonstrates how these securitizing actors changed the way that the Ebola epidemic was framed, starting from a health issue to a security issue, and predicts that the Ebola response would therefore receive more resources. Evidence suggests that there were key actors within Member States, the WHO, the CDC represented by President Obama, and other international organizations that fully securitized Ebola before the WHO declared the PHEIC and the subsequent actions that followed. While securitization approach can explain the amount of resources that the WHO, its Member States, and other international organizations, such as the CDC, allocated to the outbreak, the theory suggests a relatively slow response. Since

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[152] The role of WHO within the United Nations Mission for Ebola Emergency Response 2014 // World Health Organization, 2014. URL: http://who.int/csr/resources/publications/ebola/who-unmeer.pdf?ua=1 (accessed 06.03.2018).

[153] The role of WHO within the United Nations Mission for Ebola Emergency Response 2014 // World Health Organization, 2014. URL: http://who.int/csr/resources/publications/ebola/who-unmeer.pdf?ua=1 (accessed 06.03.2018).

securitization is a lengthy and delicate process, rather than a single event, it can be expected that there would be a slow response time. The audience must first become convinced that Ebola is a threat to security, and then additional time is required to coordinate the response. While the securitization explanation cannot provide causal evidence that securitizing Ebola either increase or decreases the speed of the response, the logic behind the theory would suggest that as securitization is a slow process, securitizing Ebola produces a slower response by international organizations and government officials.

E. Protection-Motivation explanation for the Ebola response

The author predicts that when the perception of the severity of and vulnerability to an infectious disease outbreak and recommended behaviors are determined quickly, the more quickly the organization will response and the more resources the organization will allocate to the response (H6). The factor of behavior is taken into account as a measure of specification on the individual level, in addition to the organizational level. In the next section, this study examines the influence that the perception of danger has on the behaviors and actions that an individual leader or organization takes in response to an emerging infectious disease threat.

The WHO's senior Ebola expert, Dr. Pierre Formenty tracked the first 14 cases of Ebola thoroughly as they were reported. He observed that the first cases provided no strong indications, either of the pattern of its transmission or from clinical features of the illness, of just might be the cause. This was especially concerning in a country with so much activity from other multiple killer diseases. High-risk exposures were apparent, such as caring for a sick family member, delivering a baby, or preparing a body for burial, but again gave no decisive clues. No alarm bells had gone off for the government or for the international public health community as no doctors or health officials in the country had ever seen a case of Ebola. As Dr. Formenty noted, it could not be predicted so early on, since the Ebola virus was so unfamiliar. A later WHO investigation revealed that high local population movement from villages to the capital of Guinea and across the border into Sierra Leone would become a major driving force.

The villagers were frightened and shocked, as well as their doctors. The area was infamous for outbreaks of cholera and many other infectious diseases, such as malaria, the most

prevalent and persistent in the area.[154] While being on high alert, the causative agent still evaded health authorities, as the early symptoms of Ebola were camouflaged and mimicked those of many other endemic diseases. As the outbreak continued to spread, the causative agent remained unknown.

A difficult obstacle to control is violence from a shattered, impoverished, and scared population that does not comprehend what has happened and retaliates the only way it can. Health workers in several areas of the three affected countries were attacked trying to enter villages and assisting in medical aid. According to Kolo Bengou's youth league president, Faya Iroundouno, in Guinea, "We don't want any visitors. We don't want any contact with anyone. Wherever those people [international aid doctors] have passed, the communities have been hit by illness."[155] Health workers have said that they were battling two enemies: the emerging Ebola epidemic, which had taken the lives of more than 660 people since March, and fear, which had developed growing hostility toward external aid. In addition, Ebola patients were reported to have been privately "treated", but returned to relatives, possibly infection others.

Fear of diseases are normal and potentially beneficial from a scientific and security standpoint to act as a catalyst for the response. Given the nature of Ebola, fear of the disease during the outbreak was understandable, almost universal. Due to the virus being undetectable to the human sense and no disease symptoms appear at the beginning stages of following infection, these traits evoke fear and dread, as to when the symptoms become evident. Early public health campaigns gave grim messages, such as "Ebola Kills" and unnerving visuals of things, like the fanged fruit bat being a carrier of the virus, that contributed to public fear as well.[156]

Some fear-related behaviors were based on misconceptions and myths, primarily related to modes of transmission, such as through the air, a mysterious "witch plane", or part of an

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[154] Ground zero in Guinea: the Ebola outbreak smoulders – undetected – for more than 3 months // World Health Organization, 2017. URL: http://www.who.int/csr/disease/ebola/ebola-6-months/guinea/en/ (accessed 03.03.2018).

[155] Nossiter, A.: "Fear of Ebola Breeds a Terror of Phsysicians" // The New York Times, 2014. URL: https://www.nytimes.com/2014/07/28/world/africa/ebola-epidemic-west-africa-guinea.html (accessed 04.03.2018).

[156] Shultz, J.M., Althouse, B.M., Baingana, F., Cooper, J.L., Espinola, M., Greene, M.C., Espinel, Z., McCoy, C.B., Mazurik, L., Rechkemmer, A. Fear factor: The unseen perils of the Ebola outbreak // The Bulletin of the Atomic Scientists, Vol. 72, No. 5, 2016. P. 304-310.

international conspiracy.[157] Other myths involved prevention (bathing with salt and hot water) and treatment (traditional healers can cure Ebola; healthcare workers harm rather than heal patients in treatment centers). Experiences of trauma, loss, and change can trigger psychosocial consequences that hinder the treatment process and willingness to accept foreign aid.

One of the most devastating reactions of fear-related behaviors during the Ebola outbreak was the decision of infected persons to refuse or avoid treatment centers in favor of home care, which inevitably accelerated the spread of the disease. Families hid ill relatives out of sight in their homes rather than admit them to newly erected treatment centers. These actions are understandable when outsiders saw Ebola patients enter, but only a portion came back alive and the sight of body bags was unnerving enough. There were also many instances when traditional healers, religious leaders, and family members continued to practice cleansing rituals and burial practices, developing many new cases of infectious.

By late 2014, the problem of home deaths gave incentive for the CDC to launch its "rapid anthropological assessment" of the phenomenon. The rapid response team identified factors associated with concerns about the Ebola stigma, fear of quarantine and lack of food, and limited access to health services for non-Ebola illnesses. The team acknowledged that decisions about if they should seek health care or report the death of a loved one were taken amid "fears and distrust" of public health response efforts.

Many health professionals became afflicted with the Ebola disease themselves, with a death toll of 58% on average, a rate that was 50% higher than for patients from the general population.[158] Some healthcare workers decided to abandon their professional roles rather than risk personal illness, death, and possibly transferring the disease to family members or others. A number of international nongovernmental organizations also withdrew their health care personnel from working in high-risk settings for concern of their health and safety, causing some health facilities to temporarily falter when they were needed most.

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[157] Ebola Came Calling: How Communities in Sierra Leone Faced the Challenge // World Health Organization, 2014. URL: http://www.who.int/features/2014/ebola-community-care/en/ (accessed 11.03.2018).
[158] Shultz, J.M., Althouse, B.M., Baingana, F., Cooper, J.L., Espinola, M., Greene, M.C., Espinel, Z., McCoy, C.B., Mazurik, L., Rechkemmer, A. Fear factor: The unseen perils of the Ebola outbreak // The Bulletin of the Atomic Scientists, Vol. 72, No. 5, 2016. P. 304-310.

In October 2014, the time when the Ebola outbreak was peaking in West Africa, four cases were diagnosed in the United States within one month. While posing only a very small public health threat, the fear response throughout the country was extraordinary in its breadth and magnitude. Confirmation that an Ebola infection had occurred in a U.S. hospital immediately thrust all healthcare systems nationwide into high alert. The broadcast media flared up with a crossfire of accusations. The director of the CDC declared that there must have been a "breach in protocol," yet the center subsequently revised and reissued its own protocol on personal protective equipment five times over the next few months.[159] The four-case scenario provided a powerful and expensive call-to-action to upgrade health care system preparedness.

The coverage on Ebola became the top of TV news lineups throughout October 2014. Indirect exposure of the U.S. population to a very high quantity of fear-encumbered reporting and intimating that the general public was at grave risk became the most impactful psychologically. The news media reported on mistakes, but also failed to report that those mistakes did not reveal a health care system incompetent to prevent Ebola from becoming a public epidemic, magnifying excessive mistrust in the health care system fueling public fear.

During an outbreak, fear-related behaviors have the potential to accelerate the spread of a disease, intensify psychological distress, diminish access to life-saving interventions, and compound psychosocial consequences. Lessons learned in real time during the outbreak were not efficiently distributed, either, leading to preventable cases of disease and loss of life. For future epidemics, public health and other authorities must engage in to do far more to reduce the destructive effects of these behaviors, such as channeling fear into more productive behavior. While the fear of severity and vulnerability of Ebola brought more international attention much quicker, the research cannot conclude that it led to a more efficient response. Miscommunication, misconceptions, and fear gave rise to a response that was unprepared and hard to control. The initial response could have been much quicker and coordinated, while being less hesitant and careless with its actions. In the next case study, the author will provide additional explanations for the response to the Zika virus.

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[159] Shultz, J.M., Althouse, B.M., Baingana, F., Cooper, J.L., Espinola, M., Greene, M.C., Espinel, Z., McCoy, C.B., Mazurik, L., Rechkemmer, A. Fear factor: The unseen perils of the Ebola outbreak // The Bulletin of the Atomic Scientists, Vol. 72, No. 5, 2016. P. 304-310.

IV. CASE STUDY: ZIKA VIRUS

A. Background

Zika is a flavivirus transmitted mainly by mosquitos and was discovered in Uganda in 1947.[160] In 2007, located in the Federated States of Micronesia on the Island of Yap, the first large outbreak of disease caused by a Zika infection was reported. The first cases of local transmission of the most recent Zika virus were reported in Brazil in May 2015. More than twenty countries in the Americas have reported cases of local transmission since then. Colombia also began to report cases of local transmission soon after Brazil. The Pan American Health Organization (PAHO) declared a regional emergency in May 2015 and distributed advice to the affected Member States. The PAHO began coordinating an emergency response, modeled after previous mosquito-borne virus outbreaks in the region involving dengue and chikungunya.[161] The PAHO's strong leadership of Regional Director Carissa Etienne led the regional office to model the Zika response on previous responses and prior experience involving chikungunya.

Four months after the initial reports of local transmission of Brazil reached the PAHO, in October 2015, Brazil then reported an increase in the number of infants being born with microcephaly in its northern Pernambuco state.[162] Microcephaly is a congenital neurological abnormality resulting in smaller skull and brain size in infants. Once the number of Zika cases exploded and began spreading rapidly throughout South and Central America during the summer and fall of 2015, the WHO responded quickly declaring a PHEIC despite having no scientific evidence of a definite link between microcephaly and Zika. Many news reports and health professionals focuses on the disastrous prenatal conditions it had on newborn babies, in relation to microcephaly. Microcephaly occurs as a birth defect during pregnancy where a baby is born with a much smaller head than is normal. It can result when a baby's brain does not develop properly during pregnancy, or stops growing after birth. Babies born with microcephaly often

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[160] Kindhauser, M.K., Allen, T., Frank, V., Santhana, R., Dye, C. Zika: the origin and spread of a mosquito-borne virus" // Bulletin of the World Health Organization, 2016. URL: http://www.who.int/bulletin/online_first/16-171082/en/ (accessed 01.04.2018).

[161] Zika missions to support countries // Pan American Health Organization, 2016. URL: http://www.paho.org/hq/index.php?option=com_content&view=article&id=12156&It (accessed 02.04.2018).

[162] Ladhani, S., et al. Outbreak of Zika virus disease in the Americas and the association with microcephaly, congenital malformations and Guillain-Barre syndrome // Arch Dis Child, Vol. 101, 2016. P. 600-602.

experience severe neurological problems throughout their lives such as seizures, vision and hearing problems, intellectual disabilities, coordination and balance issues, and developmental delays such as learning to speak or walk.[163]

Brazil, Venezuela, and El Salvador shortly after reported an alarming number of patients with Guillain-Barre syndrome (GBS), a neurological disorder that causes short and long-term paralysis.[164] By December 2015, Brazil reported 56,318 suspected cases of the Zika virus in 29 states.[165] On December 8, 2015, the PAHO Director Carissa Etienne activated the Incident Management System and subsequently alerted the WHO headquarters to the rise in microcephaly cases.[166] The increasing alarm within the region led the WHO Director-General to declare the emerging cases of microcephaly and GBS a public health emergency of international concern (PHEIC). The WHO expressed particular concern of the long-term health and economic consequences for the citizens and governments of the affected countries.

At the time of the PHEIC declaration, the WHO estimated that there were approximately one million cases of the Zika virus in 28 countries in the Americas. Reports from Spain, Slovenia, the United States, and twelve countries in Central and South America came in about a relation between microcephaly and other nervous system disorders to the Zika virus with cases of babies born with microcephaly from mothers who had travelled previously to countries with current Zika transmission.[167] Though the Zika virus is not a highly lethal virus, it is extremely transmissible, because it is carried by mosquitoes that are not stopped by borders or other controllable boundaries. The main risk with the Zika virus is its capacity to infect hundreds of thousands of people, some of whom may be expecting mothers.

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[163] Facts about Microcephaly // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/ncbddd/birthdefects/microcephaly.html (accessed 03.04.2018).
[164] Ladhani, S., et al. Outbreak of Zika virus disease in the Americas and the association with microcephaly, congenital malformations and Guillain-Barre syndrome // Arch Dis Child, Vol. 101, 2016. P. 600-602.
[165] Zika Strategic Response Plan // World Health Organization, 2016. URL: http://apps.who.int/iris/bitstream/10665/246091/1/WHO-ZIKV-SRF-16.3-eng.pdf (accessed 05.04.2018).
[166] Strategy for Enhancing National Capacity to Respond to Zika Virus Epidemic in the Americas // Pan American Health Organization, 2016. URL: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=33 (accessed 07.04.2018).
[167] Zika Strategic Response Plan // World Health Organization, 2016. URL: http://apps.who.int/iris/bitstream/10665/246091/1/WHO-ZIKV-SRF-16.3-eng.pdf (accessed 05.04.2018).

For the remainder of the Zika virus case study, this study first proceeds with the organizational explanation to look at the bureaucratic structures of the CDC and the WHO to assess the impact it has on the speed of the organizations' response to the outbreak. Then, the study examines the impact of lethality and transmissibility on the speed and amount of resources allocated to the response using the epidemiological explanation. Next, the study employs the logic of securitization theory to understand the extent to which the Zika virus was securitized and how this impacted the amount of resources allocated to the response. Lastly, the author addresses the protection-motivation explanation and its effects that it has on the speed of response due to behavioral issues on individual and organizational levels. This research argues that the Zika outbreak did not receive a quick response or many resources because it failed to become a security issue. As a result, the CDC and the WHO, with its Member States, did not dedicate additional voluntary-specified contributions to the countries affected by the Zika outbreak.

B. Organizational explanation for the Zika response

This study predicts that the more centralized the bureaucratic structures and the greater available assessed contributions dedicated to emergency response categories in the international organization's budget (H1), the faster the response from the organization. Conversely, the more decentralized the bureaucratic structures and the fewer the available assessed contributions allocated to emergency response categories, the slower the response from the organization (H2). This section proceeds in two sub-sections. First, the issue of centralization and how the CDC's centralized national headquarters results in a faster CDC response is addressed. Second, is the issue of decentralization and how the WHO's decentralized network of headquarter, regional, and country offices results in a slower WHO and its Member State response. The main actors in this outbreak were the PAHO and the WHO, representing the international response, and the CDC, representing the U.S. response and their efforts to contain and treat the outbreak.

Centralization

Using organizational theory in the context of public health organizations, the author predicts that when the bureaucratic structure of an organization is more centralized, the organization's response to an outbreak will be quicker. Conversely, the more decentralized the bureaucratic structure, the slower the organization will respond. This research makes the argument that the CDC's centralized structure led to a quicker initial response than in the Ebola case study, due to the localization and proximity of the outbreak and less resistance from the affected-areas' bureaucracy.

Under the Department of Health and Human Services, the CDC worked alongside many national and international organizations for their response to the emerging Zika virus. The Commonwealth of Puerto Rico, the U.S. Virgin Islands, and American Samoa were the first to experience active Zika transmission during the first stages of the outbreak. The CDC hosted a one-day Zika Action Plan Summit on April 1, 2016 to bring together officials from governmental and non-governmental organizations. The aim of the summit was to help establish a coordinated response and identify gaps in preparedness to the mosquito-borne illness and provide technical support to states that may experience active Zika transmission.[168]

After the first signs of a possible outbreak that could spread in the United States, President Obama requested $1.9 billion USD in emergency funds on February 8 to prepare for, respond to, and protect people from the Zika virus.[169] Prevention was the key usage of the funds, with vaccination research and mosquito control as the forefront of the actions, along with education and aid to affected countries. States and cities could use those funds to invest in mosquito control to drive down mosquito populations by tracking and fixing many places where they can breed. The cost of those control methods was high, but some states and areas, such as Miami, Florida and Puerto Rico, already had previous systems in place.

The first Zika case in the U.S. was reported on January 17, 2016 in Hawaii, where a baby was born with the virus and microcephaly, and whose mother had previously lived in Brazil in

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[168] National Zika Summit Focused on Coordinated U.S. Response // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/media/releases/2016/p0401-zika-summit.html (accessed 05.04.2018).
[169] Frieden, T. Preparing and Responding to Zika Virus // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/zika/zap/pdfs/preparing-and-responding-to-zika.pdf (accessed 02.04.2018).

the last year.[170] The CDC released preliminary guidelines concerning the sexual transmission of the Zika virus and received three likely cases and released a Level 2 travel notice the next day. By March, the CDC reported 193 travel-associated Zika virus disease cases, with no vector-borne cases attained locally (in this case, not caused by mosquitoes in the U.S.).[171] As of May 11, the CDC had confirmed 503 travel cases of the Zika virus in the United States, 10 of which involved sexual transmission. However, no evidence was found that a mosquito had yet bitten any of those people and then spread the infection to another within the country.

The CDC prepared a map to indicate the "potential abundance" of the mosquito population using climate data. Areas as far north as Denver and Salt Lake City were included, where the species of mosquito carrying Zika has never been seen in a potential range vastly exceeding its actual area.[172] The White House Zika website received criticism from experts for including the inaccurate graph on their website. Andrew Monaghan and his colleagues from NASA and North Carolina State University said that Zika will most likely start spreading are areas in the United States where chikungunya and dengue have already been identified, specifically the southern border of Texas and Mexico and southern Florida.[173] If history were to repeat itself, those would possibly be the only places the Zika virus travels in the continental United States.

The CDC's efforts were primarily focused on guidelines for pregnant women, travel and testing guidance, and laboratory tests. However, cases resulting from sexual transmission were more common than expected. As of March 30, 2016, there were 312 travel-associated cases, including 27 pregnant women, one case of Guillain-Barre syndrome, and six sexually transmitted cases, but no locally transmitted cases.[174] Within U.S. territories, there were 3 travel-associated

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[170] McNeil Jr., Donald, G. "Hawaii baby born with brain damage linked to Zika virus" // CBS News, 2016. URL: https://www.cbsnews.com/news/hawaii-baby-born-with-brain-damage-linked-to-zika-virus/ (accessed 10.04.2018).

[171] Zika virus disease in the United States, 2015-2016 // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/zika/geo/united-states.html (accessed 09.04.2018).

[172] Zika estimated potential range maps // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/pdfs/zika-mosquito-maps.pdf (accessed 12.04.2018).

[173] Cohen, J. "So far, Zika is showing up in the United States just where the modelers said it would" // Science Magazine, 2016. URL: http://www.sciencemag.org/news/2016/05/yes-zika-will-soon-spread-united-states-itwon-t-be-disaster (accessed 07.04.2018).

[174] Frieden, T. Preparing and Responding to Zika Virus // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/zika/zap/pdfs/preparing-and-responding-to-zika.pdf (accessed 02.04.2018).

cases and 349 locally transmitted cases, with 37 pregnant women infected and one reported case of Guillain-Barre syndrome.[175] In response to these results, the CDC established the U.S. Zika Pregnancy Registry and the Zika Active Pregnancy Surveillance System in Puerto Rico. The CDC called for collaboration across all levels of government, society, and other affected countries to build sustainable epidemiologic, lab, and mosquito control capacity.

However, there were concerns to what extent the CDC was capable of handling the outbreak when it first began. The CDC lacked the information and resources to effectively track and monitor the Zika outbreak when cases first started appearing throughout the U.S. in 2016; as represented by their model of transmission distribution. The Government Accountability Office's chief scientist said during testimony before a House committee that "agencies still lack the equipment to test for Zika and there's little coordination in controlling the mosquito population."[176] Many state public health laboratories reported not having the equipment needed to run tests on the Zika virus when the outbreak began. Much of the funding for the outbreak dwindled during peak seasons for mosquitoes. Much of the funding the CDC has sent to affected areas, such as Florida, have already spent the aid, largely on killing mosquitoes. In September 2016, Congress approved a $1.1 billion USD package to assist in the outbreak, but removed the Planned Parenthood language, a section largely assisting expecting mothers. This lack of funding for pregnant women affected by the Zika virus greatly hindered the progress and security that public health organizations, such as the CDC, had on the situation. On September 29, 2017, the CDC officially deactivated its response to the Zika outbreak.[177] Although the CDC has discontinued its response, its key personnel and Zika experts are continuing to work on Zika-related activities.

The results of the situations present evidence that the CDC's centralization did not appear to have slowed down its response. This is largely since it was not securitized and treated as a public health emergency and that funds for the outbreak were provided early to aid the response.

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[175] Frieden, T. Preparing and Responding to Zika Virus // Centers for Disease Control and Prevention, 2016. URL: https://www.cdc.gov/zika/zap/pdfs/preparing-and-responding-to-zika.pdf (accessed 02.04.2018).
[176] Emerging Infectious Diseases: Actions Needed to Address the Challenges of Responding to Zika Virus Disease Outbreaks // United States Government Accountability Office, 2017. URL: https://www.gao.gov/assets/690/684835.pdf (accessed 03.04.2018).
[177] What CDC is Doing // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/about/whatcdcisdoing.html (accessed 02.04.2018).

This allowed for a more coordinated and quick response. The extent to which the CDC was effective at combatting the Zika virus depended largely on their capabilities at the beginning of the outbreak. The CDC used much of their funds on mosquito control, travel, sexual transmission, and pregnancy guidelines. This, along with educational programs, gathered national attention towards the Zika virus and directed those possibly infected with the virus. Some medical facilities were incapable of tracking and identifying the virus at first, but there were minimal locally transmitted cases in the United States; excluding high-risk areas, such as Puerto Rico.

Decentralization

Further developing on the logic of organizational theory, this study predicts that when the bureaucratic structure of an organization is more decentralized, the organization's response to an outbreak will be slower. Alternatively, the more centralized the bureaucratic structure, the quicker the organization will respond. The author argues that the WHO's decentralization is the same across both the Ebola and Zika cases, however, the difference in response is a result of stronger leaders at the PAHO.

As mentioned in the previous case study on Ebola, the WHO is a highly decentralized bureaucracy. As the WHO's structure did not become more centralized following the Ebola pandemic, the decentralization variable does not vary between the two cases. The Pan-American Health Office (PAHO) was the regional arm of the WHO responsible for handling the Zika outbreak. While the quicker response from the PAHO does not relate to greater centralization, it does relate to PAHO's stronger leadership compared to AFRO's leadership during the 2014 Ebola virus.

The PAHO had an existing emergency coordination mechanism in the form of its Emergency Operations Center (EOC), which functions as the PAHO's centralized location to coordinate and control health emergency responses.[178] In addition, the PAHO has two separate task forces: the Epidemic Alert and Response Task Force and the Disaster Task Force, which

[178] Emergency Operations Center // World Health Organization, 2017. URL: http://www.paho.org/disasters/index.php?option=com_content&view=article&id=642 (accessed 10.04.2018).

operate through the EOC framework. The EOC then collects, analyzes, and disseminates information to PAHO Member States in the event of a health emergency. The EOC publishes weekly reports to update regional Member States of any new and emerging health threats, even during periods of no health emergencies.

In addition to strong leadership and present emergency coordination at the PAHO, developments in emergency response coordination at the WHO headquarters are essential to consider in evaluating the WHO and Member States' response to the Zika virus. Both the Contingency Emergency Fund and its Health Emergencies Programme (Figure 4) were established following the Ebola response to improve on coordination and its financial limitations that became evident as the Ebola outbreak continued through 2015 and 2016. In a March 2016 progress report on the development of the WHO Health Emergencies Programme, it recognizes that "evaluations of the Ebola crisis… emphasized the need to use 'familiar' emergency coordination mechanisms in future to leverage the investments that donors and agencies have made in such entities."[179]

[179] Progress Report on the Development of the WHO Health Emergencies Programme // World Health Organization, 2016. URL: http://www.who.int/about/who_reform/emergency-capacities/who-healthemergencies-programme-progress-report-march-2016.pdf (accessed 08.04.2018).

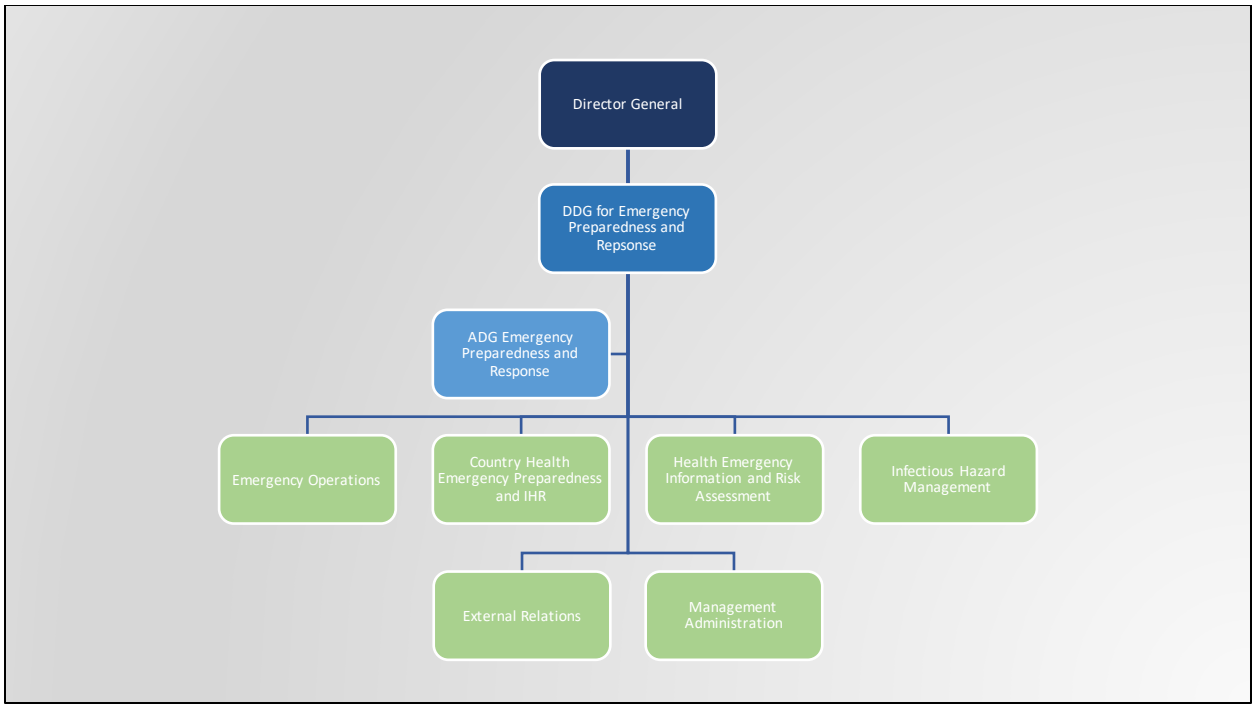

Figure 4. WHO Health Emergencies Programme organizational structure.[180]

The WHO established the Programme in cooperation with all six Regional Directors to consolidate the budget, rules, workforce, and the chain of authority under a single framework for an emergency response. The new Programme contains a single budget and staff plan that is developed in consultation with senior WHO staff and regional directors. The Health Emergencies Programme created a single set of standard operations procedures for rapid disbursements of funds from the recently created WHO Contingency Emergency Fund (CEF) that was finalized in February 2016 and ready to be implemented in time for the Zika response.[181]

When the Incident Management System (IMS) was activated, the WHO headquarters coordinated the global response to the Zika virus. The IMS was another new program developed following the Ebola outbreak to coordinate international, regional, and country level responses

[180] WHO Health Emergencies Programme // World Health Organization, 2016. URL: http://www.afro.who.int/about-us/programmes-clusters/who-health-emergencies-programme (accessed 10.04.2018).
[181] Progress Report on the Development of the WHO Health Emergencies Programme // World Health Organization, 2016. URL: http://www.who.int/about/who_reform/emergency-capacities/who-healthemergencies-programme-progress-report-march-2016.pdf (accessed 08.04.2018).

by assigning responsibility to each level on the basis of the WHO-designated threat level.[182] The IMS, based on the level of health threat (Grade 1 being the lowest threat level, and Grade 3 being the highest) indicates which level of the organization is responsible for coordinating all aspects of the response. The organizational level responsible for coordinating the Zika response following the new IMS guidelines coordinated efforts across 23 agencies to respond to the Zika outbreak within 10 days of the PHEIC declaration by the WHO headquarters.[183] The Office for the Coordination of Humanitarian Affairs (OCHA) coordinated with the reformed emergency and response systems of the WHO. OCHA then deployed staff to assist with inter-agency communication and coordination among the 23 United Nations agencies to prepare a Zika strategic response plan and budget. However, as of March 2016, the Programme remains greatly underfunded after only receiving $26.60 million USD in funds and pledges out of the $100 million USD target, with only $6.89 million USD having been disbursed to hand four other crises in addition to the Zika virus.[184] In May 2016, the WHO requested funds of $17.7 million USD, but only received $2.3 million, leaving a funding gap of $15.3 million.[185]

Given the evidence from the Zika case, decentralization did not appear to slow the response from the international community. Rather, the organization's decentralized nature allowed the PAHO's strong leadership to respond autonomously within the Americas even before the WHO recognized the need for international involvement. The PAHO's strong leadership was able to draw international attention towards the Zika outbreak, which likely encouraged a quick response from the WHO and its Member States even though Zika was classified as a public health crisis and not a security threat.

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[182] Zika Strategic Response Plan // World Health Organization, 2016. URL: http://apps.who.int/iris/bitstream/10665/246091/1/WHO-ZIKV-SRF-16.3-eng.pdf (accessed 05.04.2018).
[183] Progress Report on the Development of the WHO Health Emergencies Programme // World Health Organization, 2016. URL: http://www.who.int/about/who_reform/emergency-capacities/who-healthemergencies-programme-progress-report-march-2016.pdf (accessed 08.04.2018).
[184] Progress Report on the Development of the WHO Health Emergencies Programme // World Health Organization, 2016. URL: http://www.who.int/about/who_reform/emergency-capacities/who-healthemergencies-programme-progress-report-march-2016.pdf (accessed 08.04.2018).
[185] Zika Virus Outbreak Global Response // World Health Organization, 2016. URL: http://apps.who.int/iris/bitstream/handle/10665/207474/?sequence=1 (accessed 06.04.2018).

C. Epidemiological explanation for the Zika response

The more lethal and easily transmissible the disease, the quicker and more plentiful resources an organization's response should be. Conversely, if a disease is less lethal and less transmissible, the response will be slower and have fewer resources allocated to the response. In the following section this study assesses the lethality and transmissibility of the Zika virus and how these two independent variables affect the speed of response and resources allocated by the CDC and the WHO. While being a highly transmissible virus, Zika is not a lethal virus. The measured R0 value of the virus was estimated at around 3.8, with an R0 of sexual transmission less than one at 0.23, thus being a more transmissible disease than Ebola, but with significantly less fatality rate.[186] As a result, the epidemiological explanation produces inconclusive predictions that require further political explanations. Examining lethality and transmissibility of the Zika virus in greater detail as I do in this section would provide a greater understanding of the complexity of international health emergency responses.

Because most people who are infected with the Zika virus either experience no or very mild symptoms and the recovery is quick, there is no measured case fatality rate for the virus. According to Ladhani et al., 80% of those infected with the Zika virus remain asymptomatic and those who do develop symptoms experience mild muscle aches, headache, or fever for a period of four to seven days.[187] A very small proportion of people infected with the virus in the most recent outbreak have suffered from Guillain-Barre syndrome (GBS), which is a nervous system disorder where the immune system attacks areas of the nervous system.[188] The syndrome destroys the myelin sheath, or insulation, surrounding the axons on which nerve impulses travel, thus inhibiting transmission of nerve signals and resulting in temporary or long-term paralysis.

Some individuals have died from Zika, due to underlying health conditions. Though doctors hypothesize that the small number of deaths are Zika-related, they have not been able to demonstrate a casual linkage between subsequent death and the virus as a result of underlying

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[186] Nishimura, et al. Preliminary estimation of the basic reproduction number of Zika virus infection during Colombia epidemic, 2015-2016 // Travel Medicine and Infectious Disease, Vol. 14, 2016. P. 274-276.
[187] Ladhani, S., et al. Outbreak of Zika virus disease in the Americas and the association with microcephaly, congenital malformations and Guillain-Barre syndrome // Arch Dis Child, Vol. 101, 2016. P. 600-602.
[188] Questions About Zika // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/about/questions.html (accessed 02.04.2018).

health issues. In April 2016, a man in his seventies died primarily from internal bleeding that doctors say could have been a "rare immune reaction to the [Zika] virus."[189] Later, in July 2016, an elderly patient infected with the Zika virus at a Utah hospital died, however, he had underlying medical conditions that made it impossible for doctors to determine the definitive cause of death. In March 2016, researchers from Florida State University, John Hopkins University, and Emory University found overwhelming evidence that Zika leads to birth defects in fetuses, though the link between Zika and neurological abnormalities was unclear.[190]

Though the Zika virus is not highly lethal, it is a highly transmissible virus because it is spread through a common species of mosquito known as the *Aedes aegypti*, or the yellow fever mosquito. This species of mosquito resides in South and Central America as well as in the Caribbean. Though primarily transmitted through this species of mosquito, the Zika virus can also be transmitted through sexual contract with an infected individual.[191] The Zika virus remains in the bloodstream of an infected individual for approximately a week after initially contracting the virus, and, in some cases, was detectable in the blood up to 54 days after the individual was initially infected.[192] Recent studies illustrated that the Zika virus can remain in semen for up to three months, adding to the confusion over Zika's longevity in the human body. This finding raised concerns about continual Zika virus transmission even after health authorities subdue mosquito populations. Due to the high number of babies born with microcephaly, particularly in Brazil and Columbia, national health systems will be strained as they cope with larger numbers of patients requiring intensive medical care. As microcephaly is a life-long condition, caregivers and parents will also have to care for children born with the disease, which could impact on their ability to work outside of home. As of March 2016, the WHO predicted

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[189] Fox, M. "Congress Finally Passes Zika Funding Bill; Provides $1.1 billion" // NBC News, 2016. URL: http://www.nbcnews.com/storyline/zika-virus-outbreak/congress-finally-passes-zika-fundingbill-n656866 (accessed 08.04.2018).

[190] Dennis, B., Sun, L.H. "A Zika breakthrough: Scientists detail how virus can attack fetal brain" // The Washington Post, 2016. URL: https://www.washingtonpost.com/news/to-your-health/wp/2016/03/04/a-zika-breakthrough-scientists-detail-how-virus-attacks-fetal-brain/?noredirect=on&utm_term=.949d41723d9d (accessed 02.04.2018).

[191] Questions About Zika // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/about/questions.html (accessed 02.04.2018).

[192] Zika Virus Symptoms // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/symptoms/symptoms.html (accessed 01.04.2018).

that 2,500 babies would be born with microcephaly if the current trends continue throughout 2017, and even more in 2018.[193]

Given the long-term neurological effects that are linked to Zika, the virus represents a much different threat than the Ebola virus. While it is much less lethal, it is highly transmissible. The Zika virus does not hurt the majority of people it affects, yet it has the potential to cause long-term consequences for babies born with microcephaly, a life-long condition with larger economic consequences for governments. National health and education systems, as well as the parents themselves, will face greater economic challenges in caring for and education growing numbers of children severe developmental delays and other health complications related to microcephaly.

To add to the trouble, health officials failed to advise women to postpone pregnancy, fearing that it would interfere with women's reproductive rights. Dr. Thomas R. Frieden, director of the CDC, said he followed the advice of Dr. Denise J. Jamieson, chief of the agency's women's health and fertility branch, who said it was "not a government doctor's job to tell women what to do with their bodies."[194] Head of the Zika emergency response at the WHO, Dr. Bruce Aylward, called pregnancy "a complicated decision that is different for each individual woman."[195] Out of religious concerns, many specialists were restricted with advice on birth control. While experts praised the CDC for its efforts and results on creating new Zika tests and sending them to state laboratories quickly, more effective tests that identify past infections were needed. Most countries did not focus enough on preventing sexual transmission, with not one of nearly 1,000 cases diagnosed in New York City was transmitted by a local mosquito by the end of that year.

As mentioned at the beginning of this section, the hypotheses on lethality and transmissibility produce inconclusive predictions. The high transmissibility of Zika necessitates a quick and resource-rich response from the CDC and the WHO. Conversely, the low lethality of the Zika virus should lead to a slower response with fewer resources allocated by the organization. Efforts

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[193] Sun, L.H. "Zika: More than 2,500 babies born with microcephaly in Brazil, WHO predicts" // The Washington Post, 2016. URL: https://www.washingtonpost.com/news/to-your-health/wp/2016/03/22/zika-in-brazilmore-than-2500-births-with-microcephaly-who-predicts/?utm_term=.8d162eacb381 (accessed 02.04.2018).
[194] McNeil Jr., Donald, G. "How the Response to Zika Failed Millions" // The New York Times, 2017. URL: https://www.nytimes.com/2017/01/16/health/zika-virus-response.html (accessed 12.04.2018).
[195] McNeil Jr., Donald, G. "How the Response to Zika Failed Millions" // The New York Times, 2017. URL: https://www.nytimes.com/2017/01/16/health/zika-virus-response.html (accessed 12.04.2018).

to develop tests identifying Zika were conducted relatively quickly, but the follow-up responses fell short of being effective and quick, with ill-advised actions or none at all. Political correctness surrounding reproductive rights and religious beliefs were the main factors restricting action taken by the CDC, the WHO, and its Member States in those countries affected by the Zika virus. Further political explanations are necessary to develop a more complete understanding.

D. Securitization explanation for the Zika response

When securitizing actors are brought forward and set to frame an outbreak in a persuasive way, this should lead to the CDC and the WHO to allocate more physical and financial resources to the emergency (H5). However, when no securitizing actors emerge, the outbreak will not be securitized and will remain a public health issue, resulting fewer resources allocated to the outbreak. In this section, this study assesses the extent to which the Zika virus was securitized. Statements are examined from national leaders and international organizations along with media reports to identify potential securitizing actors and security language. Based on the predictions of securitization theory, it can be expected that if the Zika outbreak was fully securitized, large amounts of resources would go towards the cause to the affected states from the CDC, the WHO, and its Member States. The research finds that securitizing actors did not effectively reframe the outbreak as a security issue, and instead, remained a public health concern that called for a long-term response and received few resources from the CDC and the WHO as a result of this. Affected Member States were left to regional and national strategies despite, central headquarter involvement coordinating the response and disbursal of financial resources.

The PAHO treated Zika as a regional emergency beginning in May 2015, and issued a statement on the Zika virus describing the virus's potential to infect millions, prior to notifying the WHO headquarters.[196] In November 2015, the Brazilian government declared that the Zika outbreak qualified as a "national emergency" due to its unprecedented spread, however, the government did not report any other security concerns resulting from the outbreak.[197] Laurie

[196] Kelland, K. "The world health organization's critical challenge: Healing itself" // Reuters, 2016. URL: http://www.reuters.com/investigates/special-report/health-who-future/ (accessed 04.04.2018).
[197] Zika Strategic Response Plan // World Health Organization, 2016. URL: http://apps.who.int/iris/bitstream/10665/246091/1/WHO-ZIKV-SRF-16.3-eng.pdf (accessed 05.04.2018).

Garrett quoted the minister of health in Brazil, Marcelo Castro, on January 28, 2016, as saying that the Zika virus "has already gone from being an epidemic to an endemic disease… meaning Zika may now be a permanent feature of the nation's ecology," and ended the article by saying that "public health leaders and politicians had better brace for a very long haul on Zika," suggesting that it was not an emergency but a long-term public health issue.[198] This type of health issue would require a sustained response, rather than a surging response similar to the CDC and WHO Ebola response in 2014.

The WHO declared a PHEIC shortly after the dramatic rise in the amount of microcephaly and Guillain-Barre syndrome (GBS) cases in Brazil and Columbia in the latter half of 2015. The Emergency Committee originally recommended a PHEIC in February 1, 2016 based on an exceptional batch of microcephaly and other neurological disorders reported in Brazil.[199] There was no evidence that the Zika virus was associated with microcephaly and GBS at the time of the announcement, but it was declared with the rationale that the infection required urgent and coordinated research needed to be conducted to determine the cause of the increasing number of cases. In their statement, the Emergency Committee justified the PHEIC as the clusters occurred in countries recently infected with the Zika virus, and there was no other plausible explanation for the clusters of microcephaly and GBS.[200] There was no security language used by the WHO to describe the outbreak, but instead emphasized its long-terms effects on those affected by microcephaly and GBS. Other organizations, such as the CDC, followed suit by declaring it as a public health emergency. By March 22, 2016 Margaret Chan stated that "the status of Zika has changed from a mild medical curiosity to a disease with severe public health implications."[201]

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[198] Garrett, L. "The Zika Virus Isn't Just an Epidemic. It's Here to Stay" // Foreign Policy, 2016. URL: http://foreignpolicy.com/2016/01/28/the-zika-virus-isnt-just-an-epidemic-its-here-tostay-world-health-organization/ (accessed 03.04.2018).
[199] Fifth meeting of the Emergency Committee under the International Health Regulations (2005) regarding microcephaly, other neurological disorders and Zika virus // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/zika-fifth-ec/en/ (accessed 05.04.2018).
[200] WHO Director-General briefs the media on the Zika situation // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/zika-update-3-16/en/ (accessed 04.04.2018).
[201] WHO Director-General briefs the media on the Zika situation // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/zika-update-3-16/en/ (accessed 04.04.2018).

Contrary to earlier discourse from affected governments, the WHO, and health writers, Vice Presidential candidate Tim Kaine classified Zika as a "national security issue."[202] His rhetoric mimicked earlier framing from U.S. Health Secretary Sylvia Burwell who explicitly stated that "Zika has a significant potential to affect the security of U.S. citizens."[203] Gostin and Hodge, two prominent global health researchers who reported on these two security actors, similarly characterized Zika as a national and global health security threat, which encouraged greater resource allocation.

American news outlets portrayed the Zika outbreak as a highly dangerous virus whose effects on newborn babies were much more common than scientific evidence showed.[204] The risk of a baby being born with microcephaly to a Zika-infected mother is between one and thirteen percent.[205] Public demonstrations and mainstream media focused on images of mothers holding infants with the birth defects of microcephaly as if to show any pregnant woman infected with Zika would give birth to a baby with the disorder. One CNN report announced that Zika is "prompting worldwide concern because of an alarming connection to a neurological birth disorder and its rapid spread across the globe."[206] The media particularly emphasized Zika's impact on major events, such as the Rio de Janeiro 2016 Olympics in Brazil.

The American media also circulated other stories focused on Zika's purported "deadliness." CNN reported on three Zika-deaths in Venezuela and one in Utah, however left out key details to make the deaths appear to be as a result of the virus. Headlines made it seem as if the virus was the definite leading cause of death, when other factors, such as a preexisting condition in the Utah case, also played a role. In the Venezuelan cases, the report failed to mention the lack of adequate medical supplies to treat those infected with Zika.

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[202] Gostin, L.O., Hodge, J.G. "Zika prevention is a matter of national security" // Time, 2016. URL: http://time.com/4449287/zika-prevention-national-security/ (accessed 05.04.2018).
[203] Gostin, L.O., Hodge, J.G. "Zika prevention is a matter of national security" // Time, 2016. URL: http://time.com/4449287/zika-prevention-national-security/ (accessed 05.04.2018).
[204] CDC Concludes Zika causes Microcephaly and other birth defects // Centers for Disease Control and Prevention, 2016. URL: http://www.cdc.gov/media/releases/2016/s0413-zika-microcephaly.html (accessed 09.04.2018).
[205] Sun, L.H. "For Zika-infected pregnancies, microcephaly risk may be as high as 13 percent" // The Washington Post, 2016. URL: https://www.washingtonpost.com/news/to-your-health/wp/2016/05/25/for-zikainfected-pregnancies-microcephaly-risk-may-be-as-high-as-13- percent/ (accessed 02.04.2018).
[206] LaMotte, S. "5 things you need to know about Zika" // CNN, 2016. URL: http://www.cnn.com/2016/01/26/health/zika-what-you-need-toknow/index.html (accessed 01.04.2018).

The American media also reported heavily on local transmission once Zika began spreading throughout Miami, Florida. With Miami being one of the most heavily infected places in the continental United States, the reports failed to mention that despite there being a high number of Zika cases due to local transmission, none of the infected people were hospitalized, since most recovered without medical attention.[207] Also, the media did not focus on why the WHO declared a PHEIC; it was not declared about Zika, but the babies being born with microcephaly, and the steep increase in the number of people with Guillain-Barre Syndrome rather than the virus itself. The media reaction, particularly in the United States, incited fear within the American public leading many to believe that the virus caused birth defects in all babies born to Zika-infected mothers and that death was also likely as a result.

The security frames put forth by Burwell, Kaine, Gostin and Hodge, and the American media did not become the persuasive frame for the Zika outbreak. In December 2016, epidemiologist D.A. Henderson, contrary to earlier characterizations of Zika as a security threat, advised the Obama Administration that Zika's threat to the United States did not warrant the fear and concern that it had triggered.[208] Henderson further characterized the U.S. government reaction as disproportionate to the threat level, since most people who get infected with the Zika virus do not even know they have it.

The fifth meeting of the Emergency Committee on the Zika virus on November 18, 2016 ended the PHEIC for microcephaly and GBS related to Zika following the initial framing of Zika as a new and highly transmissible global public health issue that required further research. Instead, the statement from the meeting urged affected countries that "a long-term plan for Zika would be necessary as health and education systems would have to bear the burden of more children with neurological complications and cognitive delays as a result of microcephaly."[209] The report also demanded that affected Member States in collaboration with the WHO required a

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[207] Zika Virus Symptoms // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/symptoms/symptoms.html (accessed 01.04.2018).
[208] Cohen, J. "So far, Zika is showing up in the United States just where the modelers said it would" // Science Magazine, 2016. URL: http://www.sciencemag.org/news/2016/05/yes-zika-will-soon-spread-united-states-itwon-t-be-disaster (accessed 07.04.2018).
[209] Fifth meeting of the Emergency Committee under the International Health Regulations (2005) regarding microcephaly, other neurological disorders and Zika virus // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/zika-fifth-ec/en/ (accessed 05.04.2018).

"sustained program… with dedicated resources to address the long-term nature of the disease and its associated consequences."[210] The framing of the Zika virus required both a short and long term approach to address its related long-term effects and suggests that the virus did not become a security threat, but remained a public health issue.

Since the WHO announced the PHEIC on February 1, 2016 and implemented its Strategic Response Framework and Joint Operations Plan beginning on February 14, 2016, the total amount of funding from February to July 2016 increased from the initial $56 million USD to $112 million USD over the course of the whole outbreak.[211] The WHO and Member State response to the Zika crisis lacked resources. Funding requests show gaps between the funds requested and the funds received. Despite not being framed as a security threat, the CDC received much more financial resources for the Zika outbreak. On February 8, 2016, President Obama requested $1.8 billion in emergency funds for several agencies. On September 29, 2016, he signed a continuing resolution that provides $1.1 billion in emergency funding for the Zika response.[212] However, on the same day, the CDC deactivated its response to the Zika virus, but its staff will continue their efforts on Zika-related activities

The study argues that securitizing factors from both the American point-of-view and the international point-of-view represented by the WHO and its Member States were not convinced that the Zika outbreak was a security issue. The allocations of resources differed from both the CDC and the WHO, with the CDC receiving more contributions for its national emergency response. Had Zika been fully securitized, it could be expected to see larger amounts of financial resources dedicated to the emergency response. Instead, WHO Member States were reluctant to allocate resources to respond to Zika. Based on past securitizing processes within the United States, it could also be expected to see even greater resources allocated to its response to Zika, though they determined that the contributions for this event were sufficient. Characterizing the Zika virus as a long-term public health issue requires a steadier, years-long stream of resources

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[210] Fifth meeting of the Emergency Committee under the International Health Regulations (2005) regarding microcephaly, other neurological disorders and Zika virus // World Health Organization, 2016. URL: http://www.who.int/mediacentre/news/statements/2016/zika-fifth-ec/en/ (accessed 05.04.2018).
[211] Zika: Response funding // World Health Organization, 2017. URL: http://www.who.int/emergencies/zika-virus/response/contribution/en/ (accessed 07.04.2018).
[212] What CDC is Doing // Centers for Disease Control and Prevention, 2017. URL: https://www.cdc.gov/zika/about/whatcdcisdoing.html (accessed 02.04.2018).

to address health and economic consequences of the Zika virus. Securitization theory on its own cannot explain the CDC, the WHO, and its Member States' response to the Zika outbreak. One final explanation that focuses on the public's reaction provides additional insight into the behavioral aspect of responding to international health emergencies.

E. Protection-Motivation explanation for the Zika response

This study predicts that the perception of the severity of and vulnerability of an infectious disease outbreak influences individuals, including leaders and securitizing actors, behavior and how quickly their recommended actions are taken, thus leading to a more efficient response and control over the situation with greater resources (H6). In addition to the organizational level, the factor of behavior is considered as an influential aspect in a coordinated response to health emergencies or security threats. In the next section, this study examines the influence that the perception of danger has on the behaviors and actions an organization or acting individual takes during the time of an emergency.

The opportunity for pathogens to reach unfamiliar places with respect to their original areas is one of the negative aspects of globalization. Lifestyle changes and the decrease of natural barriers makes it very difficult to discern the boundaries between different areas. The most common method the Zika virus spread was due to travelers, how visited infected areas at the time of emergence and returned to their respective countries. The rise in global temperature has extended the season in which mosquitos thrive, resulting in more time for them to bite and infect humans. The efforts to restrict the movement of people and goods to counteract the spread of an infectious disease is extremely challenging.

The psychosocial implications related to the Zika outbreak may have been more dangerous than any potential intense physical effect. Whenever the threat is characterized by an emerging disease, the insufficient medical treatments and scientific data greatly affect the behaviors of important actors and the public.[213] Fear of infectious disease often motivates people

[213] Cenciarelli, O., et al. Zika virus: the fear travels by mosquitoes – Social and psychological impact of the outbreak // Biomedicine & Prevention, Vol. 1, No. 47, 2016.

to protect themselves, but it can also produce negative psychological effects. Additionally, misinformation or the lack thereof leads to confusion and doubt in the authorities' guidance.

The reason behind the WHO issuing its global health emergency in February 2016 was evidence that suggested the link between birth defects, such as microcephaly, to the Zika virus in Brazil, Columbia, and El Salvador.[214] There is a fine line between providing important, reliable health information and instigating fear among the public. The virus did not have nearly the same effects as Ebola, where the threat of fatalities was high. However, Zika had a higher transmissibility and easily crossed borders. Governments across the world issued travel warning for the countries where the tropical fever had been detected. Early in January 2016, the CDC advised pregnant women to halt travel to 14 Latin American countries because of the virus, and stated, "Until more is known and out of an abundance of caution, pregnant women should consider postponing travel to any area where Zika virus transmission is ongoing."[215]

Locals began wearing long sleeves in the heat and used mosquito repellant to ward off the carriers of the virus.[216] Tourism industries saw drops in ticket sales to Latin America and even Florida of the continental U.S. Many people expressed concern about continuing their already-booked tickets abroad and wondered if they should cancel their trip. Pregnant women were of the most concerned of their safety, and some even left their countries temporarily to a safer location. Those southern territories had mosquitoes prevalent all year-round and requested assistance in combating the insects. Fear of those insects brought a quick response from areas that normally had mosquito control measures already in place. Pesticides were sprayed along beaches in areas around southern Florida, even discouraging visitors to those areas.

The outbreak of Zika in Brazil aroused considerable media interest due to the upcoming Olympic and Paralympic Games in Rio de Janeiro. Brazilian official had said the Olympics would not be canceled due to the Zika virus and only state that there is a risk to pregnant women.

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[214] Baker, D.E. Zika Virus and the Media // Hospital Pharmacy, Vol. 51, No. 4, 2016. P. 275-276.
[215] Holpuch, A. "Zika virus by the numbers: travel advisories issued across the world" // The Guardian, 2016. URL: https://www.theguardian.com/world/2016/jan/26/zika-virus-travel-advisories-us-canada-uk-eu-australia (accessed 05.04.2018).
[216] Sesin, C. "Fear of Zika Impacts Daily Life, Travel in U.S., Latin America" // NBC News, 2016. URL: https://www.nbcnews.com/storyline/zika-virus-outbreak/fear-zika-impacts-daily-life-travel-u-s-latin-america-n512291 (accessed 02.04.2018).

The greater danger to the Games during the situation in Brazil was its precarious economy and massive expense to host the Summer Olympics, estimated at nearly $2 billion USD and experienced its deepest recession since the 1930s.[217] The U.S. Olympic Committee announced that it hired two infectious-disease specialists to advise potential Olympians who are worried about the outbreak.

In addition to travel and pregnancy hazards, uncertainty surrounding the Zika virus felt much more worrisome than the evidence alone suggests. During the first months of the outbreak, there were no vaccines developed to prevent the virus. People felt powerless that there was no immunity or sense of control and did not know how to protect themselves. The more readily available something is to one's awareness, the more attention is brought to the risks. The media played a huge role in advocating the need for treatment and reliable information on how to feel protected by the Zika virus. The most concerning consequences of the virus was communicated to the world in a visual way: in the form of photographs of babies with the neurological disorder microcephaly possibly, and later, linked to the virus.

Zika's typical symptoms are mild, and some do not realize that they have the virus and goes away without them ever knowing. While the epidemiological explanation shows that the lethality and transmission did not influence the speed of the response and the amount of resources allocated by the CDC and the WHO, it is evident that the preventative measures, such as mosquito control methods, warning signs against Zika-related birth defects, and the possible susceptibility influenced the speed of the response in the protection-motivation explanation. The scientific data of possible transmission and lethality rates were irrelevant to the general public, who took preventative measures during the early stages of the outbreak once it was declared a public health emergency. While some disregarded the travel and safety guidelines, most took caution out of risk of contracting the virus due to the widespread and dramatic coverage that surrounded the outbreak. The reaction in the United States was shown to have been much quicker and more efficient than the Ebola reaction possibly due to the close proximity of danger and graphic images of the results of the diseases that can affect newborns and pregnant women.

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[217] Bannon, T. "Zika virus and Rio Olympics: dangers, precautions, fears" // Chicago Tribune, 2016. URL: http://www.chicagotribune.com/sports/international/ct-zika-olympics-spt-0212-20160211-story.html (accessed 10.04.2018).

V. CONCLUSIONS

The United States combats emerging and reemerging infectious diseases primarily through centralized, governmental organizations. The main actor in this field is the Centers for Disease Control and Prevention organization that takes care of public health across the country. The proactive and reactive roles that the United States takes are vital to understanding and responding to public health emergencies, which could possibly affect the country directly.

A timely and proportional response is essential to infectious disease outbreaks. Those with the power to control the processes and systems that operates in a society are assigned responsibilities to effect the changes necessary to limit the spread of an illness and provide preventive measures and guidelines for the public to follow. Controlling emerging and reemerging infectious diseases can demand coordination and drastic measures between many actors, national and international, making the ability to respond an image of the capacity of a governing system, specifically the CDC compared to the WHO and its Member States. When good governance is not present, the chances of disease appearing becomes greater. An aggressive response can also be hindered at the same time, and the failures of governance can result in challenges to social cohesion, political legitimacy, and economic performance. Despite high costs and a high degree of uncertainty, there is the need for effective coordination of actions during the time of a public health emergency.

One in every four deaths in the world can be attributed to disease. Humans are not the cause of this issue, and is usually not considered a valid security issue. This research argues that, as a multidimensional concept, health security is closely interconnected with all major spheres of security: military, political, economic, societal, and environmental. The conditions in which infectious diseases arise and thrive depend on those factors and are indirectly influenced as to its effect on a state. The effects of diseases are diverse and hard to control, but with proper preparedness response plans and preventive measures, they can be contained and lessen the blow they have on society.

The United States is allocated large amounts of financial resources and funding to the actions against infectious diseases often given little attention. This primarily relies on strategies to mass distribute drugs to adults and children living in affected areas. Powerful actions, mainly the CDC, are improving their effectiveness to suppress misinformation surrounding the severity

and transmissibility surrounding the infectious disease outbreaks presented in this study. The problem lies within the political and bureaucratic system and mishandling of important guidelines for the public to follow.

Infectious diseases are not only dangerous since they can be used as a bioweapon, but also because the spread of disease in hard to surveil and treat when little is known about them. Disease can ravage a developing country's economy and people. Globalization has accelerated this process to the developed world and endanger those in urban areas and other areas where pathogens cultivate and thrive. Increased travel and trade allow for infectious diseases to spread to areas where they have never been experienced before and have evolved to resist vaccines and other medical treatments to the point where health professionals struggle to produce effective methods to contain and treat diseases.

In the case of the 2001 anthrax bioattacks, once the disease was released, there was little public health officials could do to prevent the initial spread of the disease to postal workers who handles the letters and where they were delivered to their destinations. Possibly the United States was not ready to handle such an attack, as the 9/11 terrorist attacks were one week earlier. It was not imaginable that this type of security threat could affect the United States after they increased security and were on guard for more possible terrorist attacks. Public health officials' response was hectic and disorganized and lacked clear communication between the federal, state, and local levels. It was clear that an effective public health preparedness plan was needed to be proactive to prevent the outbreak of a disease within the nation's borders.

Ebola and Zika were used as the two main cases for this study to illustrate the past proactive and reactive roles in responding to infectious disease outbreaks that affected the United States directly and their involvement on the international scale with the WHO as a comparison. This study revealed interesting results based on four explanations: organizational theory, epidemiological theory, securitization theory, and protection-motivation theory. Through the comparison of the two cases, the research has provided conclusions for those four explanations.

The conclusions for the Ebola and Zika outbreaks demonstrated similar results, yet with some important differences between the two situations on a few accounts. The study finds that the organizational and securitization explanations work together in influencing the speed of response and resources that the CDC and the WHO allocated to the response. The type of

bureaucratic structure of public health organizations consolidated its coordination between its agencies and member states when it was more centralized. In the case of Ebola, the CDC's response acts both at preparing for Ebola in the United States and controlling the epidemic in West Africa. The organization faced many key challenges, such as development of a skilled workforce and initial clinical management, but kept the outbreak under control with minimal cases while providing assistance in West Africa even before the declaration of a PHEIC. The WHO, however, were delayed due to country offices and initial resistance and lack of coordination in regional agencies. This problem of cooperating with the local public health agencies and affected-countries' governments persisted for both organizations. Even though there were delays on the international scale of response, evidence suggests that the CDC was better prepared and more adaptive to the Ebola outbreak in West Africa than the WHO. In the case of the Zika outbreak, this is where there was a critical difference. The Pan-American Regional Director recognized the Zika outbreak shortly after Brazil and Colombia reported sharp increases in the number of microcephaly and GBS cases. The organization's decentralization allowed the PAHO's strong leadership to respond autonomously within the Americas before the WHO recognized the need for international involvement. Due to American public health organizations' previous experience with mosquito-borne illnesses, they were better prepared and much quicker at responding to the outbreaks, both internationally and from the CDC domestically.

When securitization occurs, as in the Ebola case, this encourages WHO Member States to donate voluntary contributions to the response. The Ebola response was slow likely because securitization is a long process that requires time to frame an issue as a security threat and convince the relevant audience that the issue is a security threat. I find that the role of leadership was important in coordinating a fast response to the Zika outbreak and gathering some resources when securitization did not occur. African Regional Director, Dr. Luis Sambo repeatedly ignored calls and emails from WHO headquarters and country offices in the region, in turn slowing down the WHO's response time. In the absence of securitizing actors to successfully frame Zika as a security threat, Dr. Etienne's responsive leadership was essential for directing international attention toward the Zika outbreak and possibly garnering more resources as a result. In the United States, President Obama immediately provided a great sum of over a billion USD for the outbreak. While the response time was faster than if it had gone through the process of

securitization, it can be said that framing an infectious disease outbreak would indeed grant more funding overall, though at a much slower pace, and possibly in vain.

During an outbreak, fear-related behaviors have the potential to accelerate the spread of a disease, intensify psychological distress, diminish access to life-saving interventions, and compound psychosocial consequences. Due to the hardships of learning from experience during an emergency, preventable cases of disease and loss of life were greater than they could have been. While the fear of severity and vulnerability of Ebola definitely brought more international attention much quicker, I cannot conclude that it led to a more efficient response. Miscommunication, misconceptions, and fear gave rise to a response that was unprepared and hard to control. The initial response could have been much quicker and coordinated, while being less hesitant and careless with its actions. During the Zika outbreak, the virus didn't have nearly the same effects as Ebola, where the threat of fatalities was high. The international community and the U.S. health organizations issued very specific guidance regarding Zika. The most concerning ramifications of the virus was communicated to the world through images of babies with birth defects as a result of the Zika virus. Zika's typical symptoms are mild, and some do not realize they have the virus and goes away without them ever knowing. With the Olympic Games in Brazil occurring during the same time, there was fear of the athletes' and spectators' safety. Never have the Olympic Games been touches so directly by a threat of infection. While the epidemiological explanation shows that the lethality and transmission did not influence the speed of the response and amount of resources allocated, it is evident that the preventative measures, such as mosquito control methods, warning signs against Zika-related birth defects, and the possible susceptibility influenced the speed of the response in the protection-motivation explanation. The scientific data of the possibility transmission and lethality rates were irrelevant to the public, who took preventative measures during the early stages of the outbreak once it was declared a public health emergency.

Based on the evidence on Ebola's high lethality but low transmissibility, the epidemiological explanation produces an inconclusive prediction. It is not a highly transmissible disease, such as measles or smallpox, with an R0 between 1 and 2, which a slow response and low-resource allocation to be expected by public health organizations. However, due to its high 60% case fatality rate during this particular outbreak, the theory would suggest that the response would

be quick and receive a large inflow of resources. Lethality appears to be correlated with increased expenditures, but it does not correlate with the speed of the CDC and the WHO's response to the Ebola outbreak as the WHO's response was eight months after initial Ebola transmission in Guinea. The high transmissibility of Zika necessitates a quick and resource-rich response from the CDC and the WHO. Conversely, the low lethality of the Zika virus should lead to a slower response with fewer resources allocated by the organizations. Efforts to develop tests identifying Zika were conducted relatively quickly, but the follow-up responses fell short of being effective and quick, with ill-advised actions or none at all. Political correctness surrounding reproductive rights and religious beliefs were the main factors restricting action taken by the CDC, the WHO, and its Member States in those countries affected by the Zika virus.

These cases have shown that the United States is more capable of responding to infectious disease outbreaks than it was previously a decade ago. The first major cases of the 21st century, anthrax, SARS, and H1N1, demonstrated the need for public health preparedness plans and the issue of the political system and security actors not addressing health emergencies with their full attention, disregarding it as unnecessary expense of labor and funds. It became apparent, however, that infectious disease affect more than just society, but also economies, the environment, and political systems. Globalization has accelerated the spread of disease and brought new diseases to different parts of the world. International relations provide support in the times of an infectious disease outbreak, but the problems still exist. Developing countries are struggling with capable public health facilities and funding. The research of preventive treatment for infectious disease is still quite slow and costly. Much of the world is not prepared for a serious outbreak and do not devote enough resources until it is well past the first reported case and declaration of the PHEIC. The United States still needs better preparation and resources to combat emerging and reemerging diseases. It was shown in the case studies that the CDC could have been more effective if they were more proactive and if their reaction to the outbreaks were more coordinated and communicated between the federal, state, local, and international levels.

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