

6-20-2014

Crisis Communication: Sensemaking and Decision-making by the CDC Under Conditions of Uncertainty and Ambiguity During the 2009-2010 H1N1 Pandemic

Barbara Bennington

University of South Florida, bbenning@mail.usf.edu

Follow this and additional works at: <https://digitalcommons.usf.edu/etd>



Part of the [Communication Commons](#)

Scholar Commons Citation

Bennington, Barbara, "Crisis Communication: Sensemaking and Decision-making by the CDC Under Conditions of Uncertainty and Ambiguity During the 2009-2010 H1N1 Pandemic" (2014). *USF Tampa Graduate Theses and Dissertations*.

<https://digitalcommons.usf.edu/etd/5181>

This Dissertation is brought to you for free and open access by the USF Graduate Theses and Dissertations at Digital Commons @ University of South Florida. It has been accepted for inclusion in USF Tampa Graduate Theses and Dissertations by an authorized administrator of Digital Commons @ University of South Florida. For more information, please contact digitalcommons@usf.edu.

Crisis Communication: Sensemaking and Decision-Making by the CDC
Under Conditions of Uncertainty and Ambiguity
During the 2009-2010 H1N1 Pandemic

by

Barbara Bennington

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Communication
College of Arts and Sciences
University of South Florida

Major Professor: Eric M. Eisenberg, Ph.D.
Ambar Basu, Ph.D.
Kenneth N. Cissna, Ph.D.
Stephen Turner, Ph.D

Date of Approval:
June 20th, 2014

Keywords: sensemaking, crisis communication, uncertainty, CDC,

H1N1 Copyright ©2014, Barbara Bennington

ACKNOWLEDGMENTS

My first thank-you goes to Dr. Marsha Vanderford who had the idea to develop an oral history of the CDC's response to H1N1 and who offered me the opportunity to participate in the project. Being part of the Oral History project and having the opportunity to meet and interview so many extraordinary members of the CDC leadership team was truly an honor.

I would also like to recognize Dr. David Sencer, M.D. for making the H1N1 Oral History a reality. Without his dedicated support and the extensive network of personal relationships he developed as the longest serving CDC Director (1966-1977), the H1N1 Oral History Project would very likely not have happened. Dr. Sencer's dedication to assisting the CDC during the H1N1 response was also remarkable. Although well into his retirement at age 84 when the H1N1 virus first appeared, he volunteered his time and expertise to support the response. The CDC Director, Dr. Thomas Frieden, commented on this when Dr. Sencer passed away in 2011, saying, "Dave Sencer was a public health giant. And until the end he continued to be a thoughtful and vibrant member of the public health community. At the height of the H1N1 pandemic of 2009, he was here full time, and I said, 'Can I pay you?' He said, 'No, this is a labor of love.'

Finally, I would like to thank Dr. Eric Eisenberg for his thoughtful guidance, brilliant advice, and unending patience. Without his support this dissertation would most certainly not have been written. I am very fortunate and so grateful to have had the privilege of working with him.

TABLE OF CONTENTS

Chapter One: Introduction and Statement of the Problem	1
Focus and Rationale of the Study	4
Organization of the Study	7
Statement of the Problem	7
Government Responsibilities	8
Defining Public Health	10
Mission and Organization of the United States Public Health System.....	12
Public Health Law.....	14
Department of Health and Human Services (DHHS).....	15
Centers for Disease Control and Prevention (CDC).....	17
CDC Organization	17
Surveillance.....	20
Epidemiology.....	21
Laboratory Research Services.....	22
Response Capability.....	23
Public Health Crises.....	23
Pandemic Flu	24
Chapter Two: Review of the Literature	29
Crisis Communication	29
Defining Crisis Communication	30
Differences between Risk and Crisis Communication	31
Practicing Crisis Communication	34
Crisis Communication Models and Approaches.....	35
The CERC Model	35
EIDC	36
Crisis Communication and Public Health: The CDC's Response to the	
Anthrax Attacks	38
The 2001 Anthrax Attacks	39
Impact of the Anthrax Response: A Paradigm Shift.....	43
Evaluating Organizational Crisis Response.....	44
Sensemaking	44
Sensemaking Properties	45
Framing	47
Transparency	49
Components of Organizational Crisis Response	52
Organizational Processes	52
Organizational Practices	55

Organizational Culture	57
Research Goals and Questions	60
Chapter Three: Methods and Data	63
Case Study: The 2009-2010 H1N1 Virus Pandemic	64
The 1918 Flu Pandemic	64
The H1N1 Threat Significance	65
Confirming H1N1/A	66
CDC's Response to the H1N1 Pandemic	69
The H1N1 Oral History Project	70
Oral History Project Interviews	71
Selection of Data	72
Data Gathering	74
Research Site	74
Interviews	75
Interview format	75
Interview questions	77
Final Interview Questions	77
H1N1	79
Response Process- Personal/Organizational	79
Decision-making	80
Internal communication processes	80
Demand for information from the media/public	81
Time commitment for H1N1 response	81
Collaboration	82
Reflection, retrospection, recommendations	83
Chapter Four: Results	84
Research Questions	84
Interview Participants Demographic Profile	85
Education	85
Work Experience at CDC	86
Categories for Data Analysis	88
Data Analysis for Research Question #1	89
Noticing	90
Interacting	98
Enacting	101
Framing	103
Sensemaking Components	107
Decision-Making	109
Data Analysis for Research Question #2	110
Uncertainty and Ambiguity	111
Communication	114
Chapter Five: Findings, Implications, Limitations, and Recommendations	118
Summary of findings	118

Specific findings	119
Planning	124
Disease/Outbreak Modeling	124
Decision Making	126
Additional Observations and Areas for Further Research	130
Limitations	133
Implications.....	136
Process and Procedural Recommendations	136
Other Recommendations.....	140
Conclusion	140
References.....	143
Appendix A: List of Selected Interview Participants and Positions Held During the H1N1	158
Appendix B: Biographies of Selected Interview Participants.....	160
Appendix C: Transcripts of Interviews 1-16	169
Interview # 1. Lynn Austin, PhD, Deputy Director for Operations, Office of Public Health Preparedness and Response	171
Interview # 2. Beth Bell, MD, MPH, Acting Director, National	179
Center for Immunization and Respiratory Diseases	
Interview # 3. Steven Boedigheimer, MBA, Deputy Director, Division of State and Local Readiness, Office of Public Health Preparedness and Response	191
Interview # 4. Jay Butler, MD, Director, H1N1 Vaccine Task Force	198
Interview # 5. Marty Cetron, MD, Director, Global Migration and Quarantine Division.....	210
Interview # 6. Toby Crafton, MA, Chief of Staff, CDC Director’s H1N1 Response Team	218
Interview # 7. Lyn Finelli, DrPH, MS, Lead for Surveillance and Outbreak Response Team, Influenza Division	230
Interview # 8. Daniel Jernigan, MD, Deputy Director, Influenza Division.....	240
Interview # 9. Martin Meltzer, PhD, Senior Health Economist and Distinguished Consultant, Division of Emerging Infections and Surveillance.....	252
Interview # 10. Toby Merlin, MD, Deputy Director, CDC Influenza Coordination Division (ICU)	261
Interview # 11. Glen Nowak, PhD, Director, CDC Media Relations.....	270
Interview # 12. Stephen Redd, MD (RADM, USPHS), H1N1/A Incident Commander and Director, Director CDC Influenza Coordination Unit	285
Interview # 13. Anne Schuchat, MD (RADM, USPHS), Director, National Center for Immunization and Respiratory Diseases; Principal CDC Media Spokesperson for H1N1/A response.....	295
Interview # 14. Michael Shaw, MD, Associate Director for Laboratory Science, Influenza Division.....	304
Interview # 15. Marsha Vanderford, PhD, Director, CDC Emergency Risk Communication System, Emergency Operations Center	310

Interview # 16. Stephanie ZaZa, MD, MPH (CAPT, USPHS), Deputy Director for
Strategy, Office of Public Health Preparedness and Response318

LIST OF FIGURES

Figure 1. DHHS Organizational Chart.....	16
Figure 2. Centers for Disease Control and Prevention Organizational Chart.....	19
Figure 3. Crisis and Emergency Risk Communication (CERC) Lifecycle	36
Figure 4. WHO Pandemic Levels and Recommended Actions.....	68

Abstract

This study focuses on the process of communication between government agencies and the public during crisis situations, and the development of an effective response strategy when a significant threat to public health and/or safety is believed to exist. My specific research interests are (1) the nature of the decision-making process that influences the communicative choices made during such events, and (2) how decision-makers make sense of an evolving, ambiguous, and unpredictable situation, in order to establish credibility with the public, determine the appropriate response strategy, and gain the public's trust in order to influence its behavior. This is a qualitative research study based on a series of in-depth interviews conducted with key staff members of the Centers for Disease Control and Prevention (CDC) regarding the CDC's organizational response to the 2009-2010 H1N1 influenza pandemic. As global public health threats have the potential to significantly affect critical areas of the U.S. economy, national security policies are evolving to include strategic planning for issues related to global public health threats. However, despite having faced several serious public health threats during the past decade, governments worldwide and the global public health community continue to struggle with developing sufficient contingency plans and effective response strategies to meet the challenges of unexpected, highly unpredictable, and potentially devastating public health crises. My research addresses gaps identified in exploring the experience of crisis response participants in order to understand the process of response development. Additionally, I identify practices, processes, and recommendations that will be useful for future response teams confronted with equally challenging emerging threat and/or crisis scenarios.

Chapter One: Introduction and Statement of the Problem

Extreme threats to public health, such as infectious disease epidemics, bioterrorist attacks, or contaminated food or water supplies, have the potential to cause massive disruptions in highly developed and economically interdependent globalized countries. For countries such as the United States, with numerous dense population centers, frequent international travelers, and vulnerable yet crucial infrastructures for food and water supply, these kinds of public health threats are particularly perilous. Global economic interdependencies have increased as a result of expanded international trade, especially in food, clothing, and other basic commodities. Many large U.S. corporations and industries related to international travel (i.e., international shipping, airline and cruise industries) depend heavily on uninterrupted access to worldwide multi-national markets and transportation facilities such as airports and seaports. Losing access to these key infrastructure networks would have substantial and possibly devastating economic consequences.

Since global public health threats have the potential to significantly affect these critical areas of the U.S. economy, national security policies are evolving to include strategic planning for issues related to global public health threats. However, despite having faced several serious public health threats during the past decade, governments worldwide and the global public health community continue to struggle with developing sufficient contingency plans and effective response strategies to meet the challenges of unexpected, highly unpredictable, and potentially devastating public health crises (Gibbons, 2007; Kahn, 2009; Koplan et al., 2009).

The experiences of the 2001 anthrax attacks in the United States, the 2003 Sudden Acute Respiratory Syndrome (SARS) international epidemic, and the 2009-2010 H1N1/A¹ influenza global pandemic are examples of highly disruptive and serious threats to public health with the potential for worldwide social and economic consequences.

The SARS and H1N1 cases also illustrate how the complexity of a public health threat increases dramatically when it involves a *communicable* infectious disease outbreak, as the interconnectedness of our contemporary globalized societies significantly increases the risk of an event in one country quickly becoming a worldwide disaster. Additionally, as a senior official at the Centers for Disease Control and Prevention points out, with the ease of mobility that has evolved from the influence of globalization public health threats and disease outbreaks are less likely to remain confined to one geographic area- whether a city, state, or country (Khan, 2011). Public health security is a new priority for public health officials and a rapidly expanding area of concern for government officials concerned with national security threats.

Non-communicable diseases, such as anthrax (although deadly with the potential to cause severe illness and death) are easier to contain and control once the source of the disease infection is identified, as the infected person is not contagious. Conversely, communicable diseases, such as smallpox or influenza, are not easily contained because every person infected becomes a potential disease transmitter, and is theoretically capable of infecting anyone with whom they have contact (Bryant, Vertinsky, & Smart, 2007).

As a result of the experience with the U.S. domestic anthrax attacks in 2001, the Federal government's response and the roles and responsibilities of the U. S. government agencies

¹ The H1N1 virus strain first identified by the CDC in April 2009 was designated officially as H1N1/A to denote its status as a novel virus. Adding novel to the virus label indicated a combination of flu virus genes and a flu strain not previously seen together and not previously identified in humans. In the literature H1N1/A is usually referred to as H1N1. In this paper, the H1N1/A influenza virus will be referred to simply as H1N1 and the 2009-2010 H1N1 pandemic (Centers for Disease Control & Prevention, 2009).

involved in managing public health threats changed significantly. For instance, the public health organizations of the Federal government, specifically the Department of Health and Human Services (HHS) and its subordinate agency, the Centers for Disease Control and Prevention (CDC), which traditionally functioned primarily as disease prevention and health advisory organizations, became the focal point for all national public health crisis response. As these organizations assumed the primary roles in responding to public health crises, their leadership and the organizational processes for developing and implementing crisis response strategies were closely scrutinized, and often criticized; by the media, elected officials at the Federal, State, and local government levels, other Government agencies, the medical community, and the general public. Suddenly, the actions of the leaders of these key Government agencies and especially their public communication during each crisis received national and international attention.

When a public health crisis arose, or as unexpected and complex health-related threats emerged, these organizations were expected to quickly develop a crisis response strategy that would appropriately manage the effects of the threat. At the same time, they were also expected to keep the public health community informed and communicate clearly and effectively with the public, often without specific or complete information, in a rapidly changing highly unpredictable crisis environment characterized by extreme ambiguity and uncertainty (Bryant, Vertinsky, & Smart, 2007; Freimuth, 2006; Kahn, 2009; Leonard & Howitt, 2007; Vanderford, 2003).

In describing the importance of public communication, particularly during infectious disease outbreaks, several authors have noted that few studies focus on exploring the personal experience and specific actions of the public health officials who were directly involved in the response to a public health crisis (Frewer et al., 2003; Glik, 2007; Holmes, Henreich, Hancock,

& Lestou, 2009; Shore, 2003). Also noted was the lack of research focused specifically on the evaluation (rather than a description) of official public communication, especially the communication of uncertainty, during crisis events (Frewer et al., 2003; Glik, 2007; Holmes et al., 2009; Shore, 2003). My research intends to address these two gaps and in so doing contribute to the existing literature on crisis response and the role of communication.

Focus and Rationale of the Study

This study focuses on the process of communication between government agencies and the public during crisis situations, and the development of an effective response strategy when a significant threat to public health and/or safety is believed to exist. My specific interests are in understanding (1) the nature of the decision-making process that influences the communicative choices made during such events, and (2) how decision-makers make sense of an evolving, ambiguous, and unpredictable situation, in order to establish credibility with the public, determine the appropriate response strategy, and gain the public's trust in order to influence its behavior.

To accomplish these objectives, I explore the processes of and relationship between sensemaking and decision-making by members of the Centers for Disease Control and Prevention's (CDC) senior leadership response team during a specific public health crisis; the 2009/2010 H1N1 influenza pandemic. Using data collected during a series of in-depth interviews with key response participants, I examine how the CDC's senior leadership and crisis response team made sense of the developing H1N1 crisis from its first point of identification and how their decision-making process(s) influenced the development of the CDC's official organizational response and public communication. Particular emphasis is given to two areas:

1) Challenges posed by the need to address multiple organizational goals during a crisis response and

2) The diverse communication needs of different audience groups that constitute what is broadly defined as “the public.”

Different audience groups that would have to be considered would include for example; the general population, other government officials or organizations (e.g., Congress, the Federal Emergency Management Agency (FEMA), the Department of Health and Human Services (HHS), and the broader medical and public health communities, including the international health community, specifically the World Health Organization (WHO).

From a close examination of this case, I hope to learn how the CDC leadership team initially made sense of H1N1 as a public health threat, how they recognized it as a developing crisis, and how/what they decided to do in response. I also hope to gain an understanding of their decision-making processes and the factors that influenced their decisions as they developed and implemented a response strategy, in order to better understand the process of organizational crisis response.

Additionally, because the overall response to the H1N1 pandemic is generally regarded as a success by the CDC and the Federal agencies that were involved, especially in the area of public communication (Schuchat, 2009, November 10), I anticipate identifying practices and processes that will be useful for other/future crisis response teams confronted with equally challenging scenarios. Speaking at a press briefing in August 2010 regarding the overall response to H1N1, the CDC Director, Dr. Thomas Frieden stated, “Looking back over the past year and a half, I think many things went very well” (Frieden, 2010, August 23, p. 1). According to surveys conducted by the CDC and the Harvard School of Public Health (HSPH), it appears that the

American public² also evaluated the Government's response favorably (SteelFisher, Blendon, Bekheit, and Lubell, 2010). Additionally, senior U.S. Government officials such as the Secretaries of the Department of Homeland Security and the Department of Health and Human Services regarded the H1N1 response as a success and in public statements recognized the CDC and the other government agencies for their contributions (Napolitano, 2009, October 21; Sebelius, 2009, October 21).

Senior U.S. government officials also recognized the overall H1N1 response as an example of effective coordination between multiple government agencies. This public recognition and praise was particularly important considering the strong criticism that the Federal government received for their performance in this area during the 9/11 response, especially during the anthrax attacks. Mr. Arne Duncan, Secretary of the Department of Education stated in his testimony to the U.S. Senate Committee on Homeland Security and Governmental Affairs that "interagency coordination and cooperation in the Federal H1N1 effort- from top to bottom- has been extraordinary" (Duncan, 2009, Oct 21, p. 90). During her Congressional testimony on that same day, Janet Napolitano (then) Secretary of the Department of Homeland Security, described the H1N1 response in this way,

Close coordination among Federal departments dealing with H1N1 flu has facilitated a strong response. Our partnerships with HHS, including the Centers for Disease Control and Prevention (CDC), with the Department of Education, and with other Federal departments and agencies continue to play a critical role in

² Throughout the H1N1 pandemic, surveys showed that more than half the U.S. population appeared to have a positive impression of the government's response. In the early days of the pandemic, 54% believed the response of the federal government was appropriate and 39% believed the government had overreacted (Collins, 2009, May 19). In January 2010, 59% of those surveyed believed that public health officials did an excellent or good job in their overall response to the pandemic, whereas 39% believed they did a fair or poor job (SteelFisher, Blendon, Bekheit, & Lubell, 2010, p. 65).

our efforts. Our other partners – from State officials to private sector leaders – have consistently noted that the level of collaboration across the Federal government is unprecedented (Napolitano, 2009, October 21, p. 3).

Organization of the Study

This study is organized in five chapters; Chapter One provides the topic introduction, problem statement, and the study's focus, rationale, and organization. Chapter Two provides my review of the literature and past research. Chapter Three describes my approach to gathering the data, an overview of my data sources, organization of the data, and method of analysis. Chapter Four provides the results I obtained from my data analysis in response to my primary research questions (RQ1) and (RQ2). Key themes emerged from my analysis based on reviewing the data against specific analytic categories and are highlighted. Chapter Five concludes with a summary of my findings, implications, limitations, and recommendations.

Statement of the Problem

Developing public communication messages during an emerging crisis presents a number of unique challenges for any government agency. In the context of a public health and safety crisis or threat, an immediate concern is the establishment of public trust and affirming organizational credibility in a rapidly changing and uncertain environment where either action or lack of action may have serious consequences.

The type of information provided by the responsible government agency and perhaps most important, the way (mode/manner) that it is communicated will largely influence how the public understands the crisis and their response(s). Additionally, the degree of trust in the accuracy of this information provided and the public's perception of the organization's ability to 'manage' the crisis is critical to influencing public behavior. In the early stages of an influenza

pandemic, when a vaccine will not be available, controlling the spread of the disease will depend heavily on specific preventive actions taken by individuals and communities. The level of trust and the public's perception of the responsible organization will depend to a large degree on how well the organization develops its public communication strategy and how effective the organization's leaders and spokespersons are in explaining the crisis and what will be done to address/resolve it. Having the public's confidence and trust will be critical to achieving any goals of influencing or changing behavior (Kahn, 2009; Reynolds, 2007, 2008).

Considering these critical needs, how do decision-makers construct a crisis response narrative that (1) meets the organization's goals of informing, reassuring, and protecting the public and (2) instills sufficient confidence in the organization to insure the public will be influenced to take the actions deemed necessary to manage the threat?

Government Responsibilities

During times of crisis, one of the responsibilities of government agencies ("the government") is to provide timely and accurate information to the public about the current emergency or threat. This is in keeping with a fundamental responsibility of government to provide for and maintain the welfare of its citizens, a responsibility inherent in the 10th Amendment to the U.S. Constitution where "authority over the welfare, safety, health, and morals of the public" is outlined (Lister, 2005, p.4).

Natural disasters such as wildfires, earthquakes or weather related emergencies (floods, hurricanes, and tornadoes) occur with some seasonal regularity, and the public is accustomed to receiving emergency warnings, instructions, situation updates, and other emergency communication from the local municipal or State disaster response authorities when they do occur. Federal authorities tend to become involved in these kinds of events only if, or after, the

crisis has developed beyond the capabilities and capacity of the local responders, or has become a national level threat to public health or safety. However, other crisis events such as acts/threats of terrorism, bioterrorism, or widespread infectious disease pandemics (which fortunately happen far less frequently) have the potential to affect large, often geographically dispersed segments of the population. These extreme circumstances require a crisis response at the national rather than the State or local government level and will likely involve emergency response authorities and organizations of the Federal government (e.g. the Federal Emergency Management Agency (FEMA), the Department of Homeland Security (DHS), and/or the Federal Bureau of Investigation (FBI)) typically from the outset of the threat or crisis event.

Severe public health emergencies such as widespread deadly infectious disease pandemics also clearly threaten public safety and welfare, yet they may not receive the same degree of media attention or public focus as acts or threats of terrorism. While these infectious disease outbreaks may be initially localized in one State or municipality the potential for rapid and widespread contagion due to frequent international and domestic travel patterns in our contemporary globalized society puts them in a unique public health threat category.

Worldwide, the threat to public health from infectious diseases is complicated not only by this increased mobility but also by the widely varying standards of living and the level of public health protection measures in certain geographic areas, particularly overcrowded cities. In these areas, where major international corporations previously had only a small presence, there are now large permanent business centers, such as factories and manufacturing plants. As these business centers continue to develop and expand, the public health problems associated with generally poor public sanitation practices and unsafe food production and preparation methods that may be commonplace in those areas will put the workers (especially foreign workers who

may not be used to living and working in this kind of environment) at significant risk for contracting a variety of infectious diseases (Holmes, 2008).

Additionally, the nearly instantaneous communication channels available today to a large percentage of the global population via the Internet, social media, and satellite television complicate information management by public health authorities. Misinformation, inaccurate reporting, and rumors about a health threat or disease outbreak will be impossible to entirely prevent and difficult to correct once made public.

Serious public health threats such as communicable disease outbreaks which may have the potential for nation-wide impact in the U.S. will require emergency response at the Federal government level and will directly involve the Centers for Disease Control and Prevention (CDC), and its parent organization the Department of Health and Human Services (HHS). Depending on the severity of the situation, these events may even warrant direct response and public communication from government authorities at higher levels, including organizations/agencies traditionally expected to respond to national security threats and/or the Executive Branch of the Federal Government; as was the case with Sudden Acute Respiratory Syndrome (SARS) in 2003 and H1N1 in 2009 (Kahn, 2009; Seeger, et al., 2008; Reynolds, 2007, 2012).

Defining Public Health

In a study published by the Institute of Medicine (IOM), which is part of the National Academies of Sciences, public health was defined as, “the efforts, science, art, and approaches used by all sectors of society to assure, maintain, protect, promote, and improve the health of the people” (Committee on Assuring the Health of the Public in the 21st Century, 2002, p. 20). However, in practice, the responsibility for public health falls primarily to Federal, State, and

local governments. This is not only because existing public health laws and Federal mandates require it, but also because serious public health threats that arise from infectious disease pandemics, food-borne illnesses, or deliberate acts of bioterrorism, are not problems that face only one segment of a population. Their impact is more widespread- in fact, these kinds of threats truly “do not discriminate” and may potentially cross all occupational, gender, generational, and geographic boundaries. This potential to affect, and potentially debilitate, a large percentage of the population in a short amount of time would seriously disrupt the ‘normal’ functioning of society- affecting businesses, forcing school closings, and overburden (if not overwhelm) emergency response and medical treatment facilities. Health care providers and emergency responders would also not be immune to these public health/infectious disease threats and the resulting (potential) loss of their much-needed services will have to be taken into account when planning for a public health emergency response. During these kinds of national crises, government authorities will (theoretically) have additional means and resources available to them to address these potentially widespread problems and issues, for example by mobilizing National Guard forces or other military reserve support. Public health is therefore differentiated from general “healthcare” because it is focused on large population groups, not on individuals. Also, public health officials may have the ability to access additional government resources to provide assistance in crisis and/or emergency response support (Kahn, 2009, Lister, 2005).

One of the earliest definitions of public health comes from C. E. Winslow, who describes it as ‘both a science and an art’ and as a ‘community effort’ aimed at preventing disease infection and transmission, educating the populace on good health and sanitation practices, and organizing medical services to ensure early diagnosis and treatment (Winslow, 1920, pp. 6-7). Public health, as it is understood today, evolved from social and medical practices developed

primarily in the UK, Europe, and the US beginning in the mid-1800s with efforts to control deadly outbreaks of infectious diseases such as cholera and the plague (Last & Wallace, 1992).

Among the fundamental tenets of contemporary public health practices, three are particularly relevant to this study:

- (1) Decision-making based on data and evidence, such as statistics, surveillance, outbreak investigations, and laboratory science;
- (2) a focus on the general population rather than individuals; and
- (3) an emphasis on disease prevention (Koplan et al., 2009, p. 1993).

Public health is described as being “situated at the intersection between disease systems and dynamic social systems, structures, and institutions” (Seeger et al., 2008, p. 7) where a system must be capable of rapid change and recovery after significant impact on normal order or processes, such as immediately following a crisis. One way complex systems re-establish order during and/or after a crisis is with effective communication, whether it is with internal organizational communication or by (external) public communication. Depending on the nature of the emergency or crisis event, especially in the case of a large government organization, both types of communication may be required.

Mission and Organization of the U.S. Public Health System

In the United States, Federal, State, and local laws mandate public health activity. Most of the legal authority for making and implementing public health policies exists at the State government level, with the individual State governments have the primary leadership role especially in public health emergencies and first responder situations (Lister, 2005).

According to the U.S. Department of Health and Human Services (HHS), “The mission of the public health system is to promote the physical and mental health of

communities and populations, and to prevent disease, injury, and disability” (Lister, 2005. p.3). To accomplish this mission, the U.S. Public Health system is organized in a multi-layered hierarchical structure of numerous government agencies ranging from local municipal health departments to the Department of Health and Human Services (HHS) at the national level. In addition to these government organizations, within the overall domestic U.S. public health structure there are also many non-government health agencies and resources such as the Red Cross, public and private hospitals, pharmacies, volunteer organizations, and government, academic, and private medical research centers and laboratories.

In a report prepared for Congress by the Congressional Research Service, the U.S. domestic public health system is described as a complex, generally decentralized, yet highly interdependent system of public and private sector organizations (Lister, 2005). Within this system there are the lead public health agencies and organizations of the Federal government; HHS and all of its subordinate agencies, including the Centers for Disease Control and Prevention (CDC); fifty-nine State and territorial health departments, and more than three thousand county and city health departments (Lister, 2005).

The Department of Health and Human Services has the primary responsibility for public health at the Federal level, but there are other Federal agencies with separate areas of responsibility related to public health. These include the Department of Agriculture (USDA), the Environmental Protection Agency (EPA), the Occupational Health and Safety Administration (OSHA), and the Departments of Defense, Veteran’s Affairs, and Homeland Security. Depending on the nature of a public health crisis any one, or all of these agencies working collaboratively, could have a role in the overall response (Shore, 2007).

Public Health Law

The Public Health Service Act, originally enacted into law in July 1944 by the 78th Congress and amended numerous times since, gives the Secretary of Health and Human Services significant emergency powers, including the authority to declare a situation a public health emergency. The declaration of an emergency situation allows the Federal agencies to take charge of a particular situation or event, and greatly expands the scope of Federal authority. While it has seldom been used, this authority was enacted on September 11, 2001 to allow the Federal Government to assume control of coordinating the response to the terrorist attacks in New York City and Washington DC.

As a result of the gaps and failures in operational response, planning, and coordination for national emergencies and disasters that were identified in the aftermath of the 9/11 attacks (including the subsequent anthrax attacks), Congress passed a number of other laws to further improve preparedness and the response capabilities for national emergencies. The existing law, The Public Health Threats and Emergencies Act (P. L.106-505), which Congress had passed prior to 2001, was replaced by The Public Health Security and Bioterrorism Preparedness and Response Act (P. L.107-188), and became law in 2002. This new law was written to specifically address many of the vulnerabilities and weaknesses of the public health and national emergency response systems and capabilities that became evident during the government's response to the 9/11 attacks. To clarify the roles and responsibilities of Federal agencies and authorities during national security emergencies Congress also mandated the development of an entirely new Federal agency, the Department of Homeland Security (DHS). The Homeland Security Act (P. L.107-296) created the DHS and chartered it to address the significant Federal,

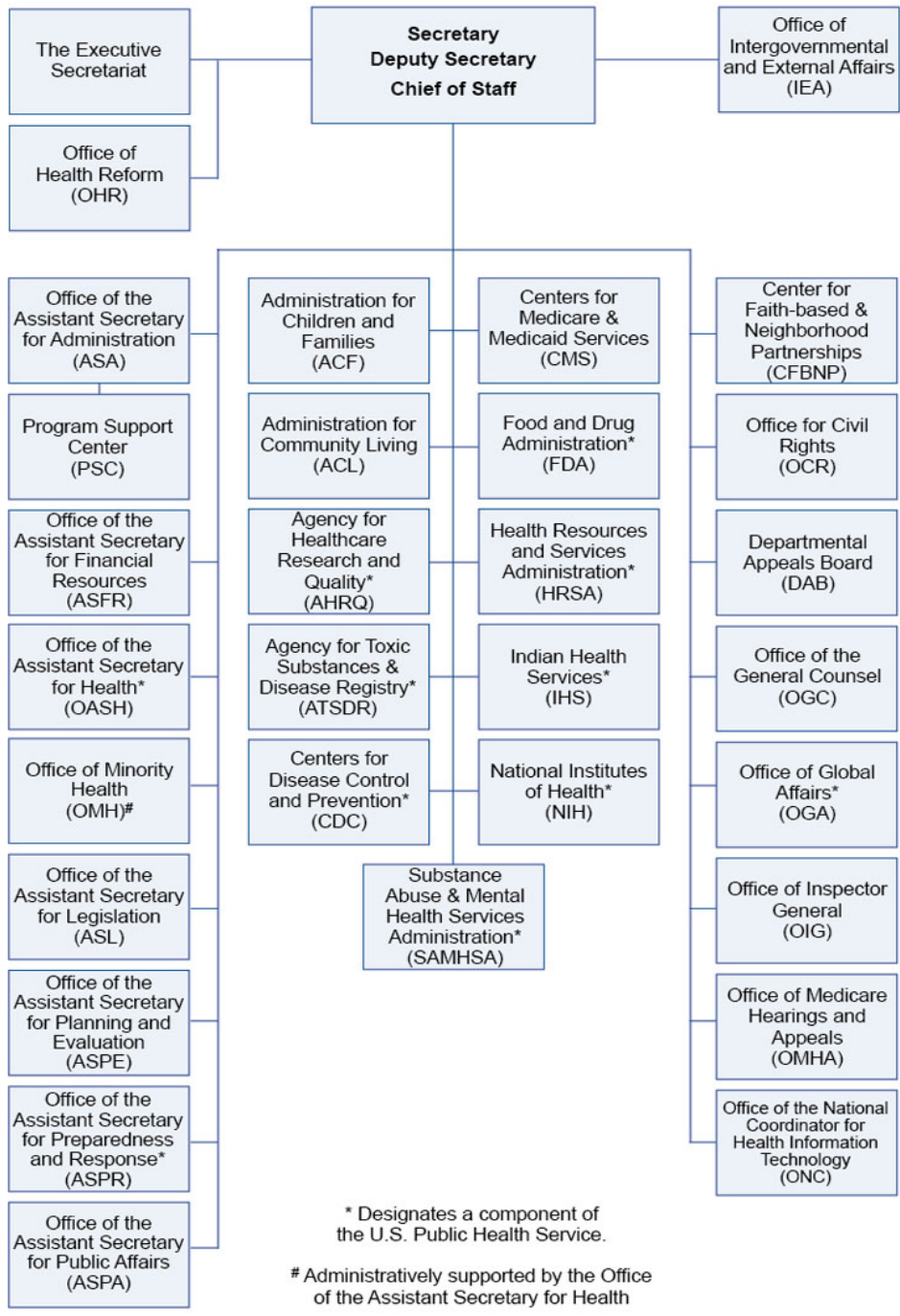
State and local government collaboration, coordination, and other inter-agency operating issues that became evident during and after the 9/11 attacks (Lister, 2005).

Department of Health and Human Services (HHS)

HHS stands at the top of the hierarchy in the large network of Federal agencies and organizations with public health responsibilities. The Secretary of Health and Human Services is a Cabinet level position and serves as the principal advisor to the President on matters related to public health. However, there are numerous subordinate agencies chartered to support the public health mission and to work in coordination with the Department of Health and Human Services. The primary agency for disease prevention and response to disease outbreaks (or other health related events) under the HHS Departmental structure is the Centers for Disease Control and Prevention (CDC). Other important subordinate organizations include: the Health Resources and Services Administration (HRSA), the National Institutes of Health (NIH), the Food and Drug Administration (FDA), and the Agency for Healthcare Research and Quality (AHRQ). However, within the HHS organizational structure, the U.S. Surgeon General (Head of the U.S. Public Health Service) and the CDC have the principal leadership responsibilities for defining and developing public health policies (Lister, 2005). The HHS organizational structure is provided in Figure 1.

Centers for Disease Control and Prevention (CDC)

The CDC was originally established in 1942 as a small organization within the U.S. Public Health Service (PHS) known as the MCWA (Malaria Control in War Areas) (Karnes, 2008). Headquartered in Atlanta, Georgia, its primary mission was to control malaria in the Southern parts of the United States and in the Caribbean. This mission later expanded to address control of other infectious diseases posing threats to military personnel stationed overseas and/or



U.S. Department of Health & Human Services (s.d.). *HHS organizational chart*. Washington, DC: Author. Retrieved from <http://www.hhs.gov/about/orgchart/>

Figure 1. DHHS Organizational Chart.

returning to the U.S. from overseas duty. In 1946 the MCWA was renamed the Communicable Disease Center (CDC) and during the next decade significantly expanded its role and areas of expertise. Throughout the 1960's, the CDC continued the expansion of its role in public health, adding issues of quarantine and occupational safety to its portfolio along with other infectious diseases, such as tuberculosis and polio (Karnes, 2008).

During the 1960's, the CDC also began publishing the *Morbidity and Mortality Weekly Report (MMWR)*, which eventually became one of the pre-eminent journals in the public health community and today serves as a primary vehicle for official public health communication on a wide range of topics. In 1970, the organization was renamed as "the Center for Disease Control" and subsequently in October 1992, it became the Centers for Disease Control and Prevention. This was done to highlight the role of the CDC in disease prevention as well as detection and control ("Historical perspectives: History of CDC," 1996, June 28).

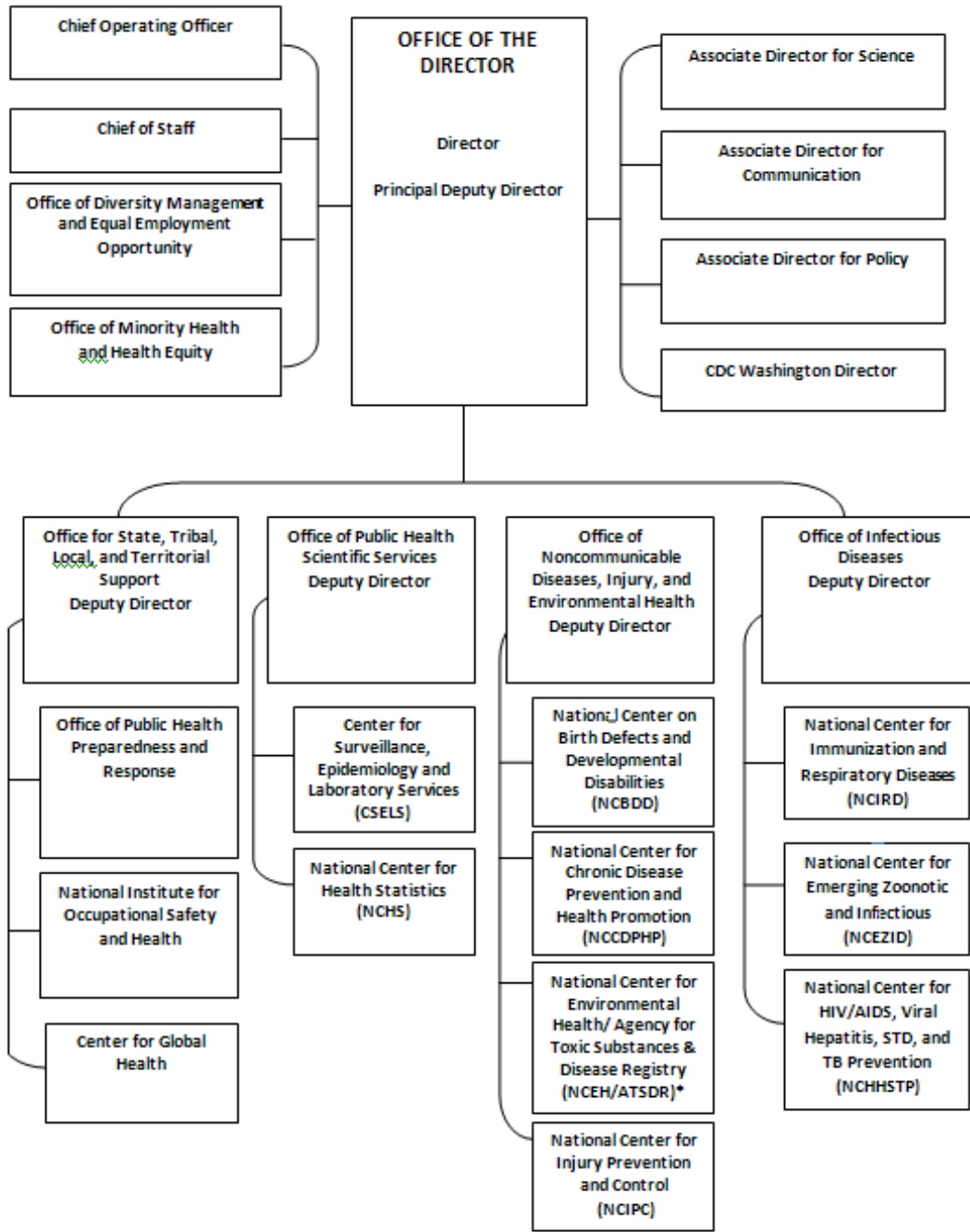
From its modest beginnings with a small staff and limited budget, the CDC is recognized today as the principal agency in the U.S. public health structure. It employs more than fifteen thousand doctors, scientists, epidemiologists, laboratory researchers, and other public health administrators assigned in more than fifty countries with a total reported operating budget for FY 2013 of \$11.2 billion (USDHHS, 2014; CDC, 2013).

CDC Organization

The CDC is organized in a complex network of offices and centers. The Office of the Director, the National Institute for Occupational Safety and Health, the Center for Global Health, and seven other separate offices; Public Health and Preparedness (OPHPR), State and Local Support, Surveillance, Epidemiology and Laboratory Services, Non-communicable Diseases,

Injury and Environmental Health, and Infectious Diseases. Figure 2 provides the current CDC organizational structure.

According to the National Strategic Plan for Public Health Preparedness and Response (2011), CDC's primary operational roles are: domestic and global surveillance, maintaining laboratory research capability and facilities, providing occupational health and epidemiology functions, and responding to public health threats such as anthrax, smallpox, influenza, and outbreaks of other infectious diseases. In addition, complications from food-borne illnesses, contamination of food and/or water supplies, and radiation contamination would fall within the CDC responsibilities. However, CDC's primary role remains disease prevention and it accomplishes this by providing subject matter experts and assistance to State and local health communities in support of public health preparedness, and emergency response. CDC also reaches out to international public health partners for disease prevention assistance worldwide, and in response efforts to global public health threats, doing so through coordination with the World Health Organization (WHO).



* ATSDR is an OPDIV within DHHS but is managed by a common director's office.

Adapted from Centers for Disease Control and Prevention (2014, February 14). *CDC organizational chart*. Atlanta, GA: Author. Retrieved from <http://www.cdc.gov/about/organization/orgchart.htm>

Figure 2. Centers for Disease Control and Prevention Organizational Chart

The Center for Surveillance, Epidemiology, and Laboratory Services (CSELS) is the CDC division where three of the agency's primary missions are centered. These key functions within CDC are fundamental to the agency's overall mission of protecting public health.

According to the CDC the goals of this center are to:

...provide scientific services, expertise, skills, and tools in support of CDC's national efforts to promote health; prevent disease, injury and disability; and prepare for emerging health threats (CDC, 2014, February 24).

Surveillance.

Surveillance is one of the key missions of the CDC and plays a critical role in effectively identifying and tracking disease outbreaks. As such, surveillance is particularly important to the overall public health mission. Surveillance is critical to the early detection of communicable disease outbreaks that will provide the public health community with valuable early warning of outbreaks that could be potential pandemics. CDC defines surveillance as "the on-going, systematic collection, analysis, interpretation, and dissemination of data about a health-related event for use in public health action to reduce morbidity and mortality and for outbreak detection" (Buehler, Hopkins, Overhage, Sosin, & Tong, 2004, May 7, p. 2).

According to the CDC (2013, November 15, para.1), surveillance activities are "the foundation of public health practice" and the CDC's Surveillance Resource Center serves as the primary coordinating office for the public health surveillance community. This community is comprised of the CDC surveillance resources plus the extensive national network of State and local surveillance agencies, field offices, and organizations.

Effective surveillance also depends on the capabilities of the public health infrastructure to "track and forecast important health events including the detection of

any changes in the disease patterns in the community” (Moore, Mawju, Shiell, & Noseworthy, 2007, p. 284). This capability for change detection requires a flexible and adaptive surveillance system- one that makes use of advanced technology for not only data gathering but also for communication. The CDC explains the importance of this capability in this way,

A surveillance system must be flexible enough to adjust to expanding health information needs and to use the best technology to deliver the data when and where they are needed. Surveillance systems that are not easily adapted to changing information needs might not be able to evaluate the impact of new prevention interventions in different population subgroups. Surveillance systems that are not efficient (e.g., the delivery of needed information demands more resources than are available) will not be useful (CDC, 2012, July 27, p. 10).³

Closely related to surveillance is epidemiology, another key role for the CDC in public health preparedness. Epidemiology has been defined as ‘the study of the factors that determine the frequency and distribution of disease in populations’ and a science that involves the identification of patterns in disease transmission. Coupled with surveillance activities, this allows public health officials to determine and measure both incidence and prevalence of a particular disease in a community or population and to search for underlying causes of the outbreak (Hanson & Levin, 2013, pp. 8-9, 172).

Epidemiology.

The Epidemiology and Analytic Methods Program Office (EAPO) is the primary staff office at CDC that is engaged in epidemiologic activities. According to the CDC,

³ “In 2001, the intentional dissemination of Bacillus Anthracis spores and subsequent cases of anthrax in the United States provided an impetus for automating surveillance to enable early detection, rapid characterization, and timely continuous monitoring of urgent public health threats” (CDC, 2012, July 27, p. 1).

EAPO supports public health decision making by advancing epidemiologic methods, analytic techniques, library sciences, health equity, information dissemination and systematic literature reviews (CDC, 2014, February 24).

EAPO accomplishes these activities through analysis and modeling of potential or actual disasters and with key publications for the public health community. EAPO is responsible for publishing the Morbidity and Mortality Weekly Report (MMWR) and the Guide to Community Preventive Services. Both of these publications are highly respected and have a wide circulation within the global public health community. The motto of the EAPO, according to their webpage is; “Good science, well translated, protects people, conserves resources, and mitigates disasters.”

Laboratory Research Services.

Another key public health responsibility for the CDC is to provide Laboratory Research Services. The Division of Laboratory Programs, Standards and Services (DLPSS) is the principal organization within CDC focused on the laboratory science and services mission of the CDC. Laboratory services are key to disease identification and infection confirmation. This mission charges CDC with leadership responsibilities as well as support responsibilities for conducting laboratory science, establishing policy and providing guidance and support to laboratory research services at CDC and at the State and local levels. The DLPSS describes its mission in this way,

To strengthen state and local public health laboratories' ability

To perform their critical role in protecting the public's health through:

- (1) fostering connectivity and collaboration across the laboratory community;
- (2) enhancing integration of laboratory science practice and informatics into public health and patient care;

- (3) developing standards to enhance the performance of public health laboratory systems;
- (4) increasing opportunities for the improving the quality of public health laboratory practices and services;
- (5) increasing the capacity of the laboratory workforce; and
- (6) fostering a culture of efficiency and excellence (CDC, 2014, February 24).

Response Capability.

Perhaps one of the most important roles CDC plays in the public health community is as the national coordinating center for emergency/crisis preparedness and response. The Office of Public Health Preparedness and Response (OPHPR) is the lead organization within the CDC focused on public health crisis/threat preparedness and response. According to their website, OPHPR provides “strategic direction, support and coordination for activities across the CDC organization and with local, State, tribal, territorial, national and international public health partners” (OPHPR, 2012, March 27).

Public Health Crises

Public health crises are described as “severe threats to the physical and psychological security, stability, health, and well-being of the public resulting from complex, nonlinear, and unanticipated interactions” (Seeger et al., 2008, p. 6). Public health crises can arise from a variety of causes and differ significantly in terms of severity and potential for causing widespread harm. Examples include after-effects from naturally occurring disasters such as earthquakes, hurricanes, floods; intentional acts of bioterrorism (e. g., Sarin gas exposure, anthrax infection), or the threat of nuclear contamination whether intentional or accidental. Public health crises can also result from naturally occurring outbreaks of infectious diseases such

as typhoid, cholera, or seasonal influenza; salmonella, *E. coli* bacterial infections, or other types of poisoning from contaminated food and/or water.

The diversity of causes, effects, and varying degrees of severity in public health threats create many different kinds of situations requiring a wide range of response strategies. As such, public health crisis events and possible threat scenarios present unique challenges to government agencies, organizations, and officials tasked with responding to them. Contemporary public health threats are expected to be complex with the potential to affect widely dispersed population groups, potentially on a global scale. Traditional response strategies, which focused on planning and training to contain and manage a localized/ single threat or crisis- and one that was clearly understood and positively identified- are not adequate to meet the challenges of complicated and emergent public health threats where considerable degrees of uncertainty and ambiguity prevail. Successfully managing these kinds of threats will require the public health community to;

- 1) have the ability to engage in ‘a flexible and adaptive manner’
- 2) be able to apply the principles of organizational learning to meet the challenges posed by dynamic and unpredictable threats, and
- 3) strengthen the response capability for future similar or unanticipated crisis events

(Seeger et al., 2008, pp. 16-17).

Pandemic Flu

A severe influenza pandemic may be one of the most complex communication challenges we face (Reynolds, 2007, p. 37).

The CDC defines a pandemic as ‘a global disease outbreak’ and an influenza pandemic as a ‘new influenza A virus for which there is little or no immunity in the human population and which spreads easily from person-to- person’. Another characteristic of pandemic flu is an

atypical number of infections (illnesses) and deaths occurring in a short amount of time (Reynolds, 2007, p. 22, 56). Pandemic flu represents a unique public health threat because influenza outbreaks are unpredictable and highly contagious, often moving from instances of single case confirmations to widespread infections within a matter of days or weeks.

Pandemic flu is significantly different from seasonal flu outbreaks. Seasonal flu is a regular (annual) illness that is also contagious and communicable, but unlike pandemic influenza- a seasonal flu vaccine is available and a segment of the population will have some degree of immunity to the virus either from previous infection(s) or from regular vaccinations. Despite this, the CDC estimates that in the United States every year there are 36,000 deaths from seasonal influenza and 226,000 hospitalizations. However, there is no comparable immunity for pandemic influenza and public health officials know that a vaccine will not be available for many months after the new virus strain is identified (Reynolds, 2007, pp 35-37).

In testimony presented to the U.S. House of Representatives Committee on Energy and Commerce's Subcommittee on Health, Ms. Marcia Crosse, the Director for Health Care at the United States Government Accounting Office (GAO), defined an influenza pandemic as

The emergence of a novel influenza virus, to which much or all of the population is susceptible, that is readily transmitted person-to person and causes outbreaks in multiple countries (Cross, 2005, May 2).

Four years later, in November 2009, in the midst of the H1N1 pandemic, the Director of Strategic Issues for the GAO provided a detailed report to the Chairman of the House of Representatives Committee on Homeland Security addressing key concerns about the potential dangers of a flu pandemic. The report stated,

... an influenza pandemic remains a real threat to our nation and to the world. An influenza pandemic is not a singular event but is likely to come in waves, each lasting weeks or months, and pass through communities of all sizes across the nation and the world simultaneously ... While a pandemic will not directly damage physical infrastructure, such as power lines or computer systems, it threatens the operations of critical systems by potentially removing essential personnel needed to operate them from the workplace for weeks or months (Steinhardt, 2009, July 29).

Despite advances in vaccines and other prevention measures, Dr. Eric Toner, a Senior Associate in the Center for Biosecurity at the University of Pittsburgh Medical Center (UPMC), argues that the threat from pandemic influenza is still seriously undervalued in terms of its bioterrorism potential (Staff, 2007, March 1). While there are many similarities in pandemic flu and bioterrorist event response requirements, in a traditional bioterrorist threat scenario the threat is expected to be confined to a specific or defined geographic area, such as one city or a key transportation node (e. g., subway or airport), and would likely affect only one or a possibly a few populations centers at the same time. Pandemic flu, however, could potentially infect the entire country simultaneously, or certainly within a short period of time, thereby completely overwhelming U.S. medical facilities and treatment infrastructure (Staff, 2007, March 1).

Monica Schoch-Spana, PhD, a medical anthropologist at the UPMC Center for Biosecurity, states that the decision of the U.S. Government to begin ranking flu pandemics with the same type of scale currently used for ranking hurricanes is an attempt to raise public awareness of the severity of the threat posed by influenza. She says,

Americans, even those who don't live in hurricane prone regions, came to understand just how strong an effect a hurricane could have through [Hurricane] Katrina. I believe that they were trying to find a way to define the range of possibilities to an American public most of whom have not lived through even a moderate pandemic flu. Conversations about influenza mostly turn on it being a naturally occurring outbreak, simply because pandemic flu is a regular occurrence, but the origin doesn't really matter. The management challenges are extreme if it is a novel strain and pandemic flu is a great example of an extreme public health emergency (Staff, 2007, March 1, p. 10).

Research has shown that the majority of the population does not take potential or possible threats from disasters or emergencies of all types very seriously. The Red Cross estimates that approximately twenty-five percent of the U.S. population has taken or is likely to take any definite steps to prepare themselves for possible emergencies, regardless of the type of potential threat. Most disaster or emergency preparation (typically weather related events) happens only a short time before the disaster is predicted to occur. Early preparation for a "possible" emergency does not appear to be a popular activity in American culture. Interestingly, the Red Cross also says that within the remaining seventy-five percent of the population some will be "interested in obtaining information about the threat, but will still not take any action to prepare early" however, the majority will do nothing even when provided with clear threat information (Reynolds, 2007, p. 24).

On April 11, 2013 in testimony before the House Permanent Select Committee on Intelligence, the Director of National Intelligence (DNI) James R. Clapper discussed the national security implications of pandemic influenza threats. He noted that the World Health

Organization described one previous influenza pandemic as “the epidemiological equivalent of a flash flood” and warned

An easily transmissible, novel respiratory pathogen that kills or incapacitates more than one percent of its victims is among the most disruptive events possible.

Such an outbreak would result in a global pandemic that causes suffering and death in every corner of the world, probably in fewer than six months (Clapper, 2013, April 11, p. 13).

Chapter Two: Review of the Literature

To address my specific research interests in the sensemaking and decision-making processes that influence the development of an appropriate response strategy and the organizational communication practices employed during crisis situations, I reviewed literature concerning; (1) Crisis communication, specifically in the context of the U.S. Public Health system; (2) Sensemaking and decision-making including the influencing factors of framing and transparency; and (3) Major components of organizational crisis response: (a) processes, (b) practices, and (c) organizational culture/climate and its effects on organizational and individual behavior.

This review focuses on and is limited to crisis communication practices of government organizations and does not include literature pertaining to corporate organizational crises and/or public communication with a stronger public relations and reputation management context. I have also limited this review to literature primarily concerning public health-related crises, excluding other serious crisis events such as natural disasters resulting from wildfires, floods, and/or weather related events such as hurricanes or tornadoes.

Crisis Communication

According to one definition the word crisis derives from “krisis”, a Greek word meaning ‘to separate or to judge’ (*American heritage dictionary*, 2009). Another interpretation provides a somewhat more complex understanding of krisis as a specific point in time, an event- a ‘moment of decision, judgment, or choice’ (Muhren & Van de Walle, 2010, p.1). However, the specific meaning of the term depends on the context of the situation being evaluated and who is defining

a particular situation or event as a crisis (Preble, 1997). The framing of specific events and circumstances as crises is significant in the eventual determination of which organization or agency is responsible for developing and communicating the official response strategy. Who determines that (1) there is a crisis and (2) the severity of the crisis and how it is presented (framed) and/or will be addressed is extremely important to asserting responsibility for and/or maintaining 'control' of the situation.

In literature pertaining to organizations, crises are defined as “low probability, high-impact events that threaten the viability of the organization, are characterized by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly” (Pearson & Clair, 1998, p. 60). To facilitate resolution of these threatening events and to implement response strategies organizations engage in a practice known as crisis communication. Crisis communication is therefore one of the means by which government authorities gain/sustain control of a situation, mitigate social disruption, and manage the public's reaction to a developing crisis, public emergency, or disaster event (Reynolds, 2007; Reynolds & Seeger, 2005).

Defining Crisis Communication

Crisis communication is a complex form of public communication that occurs during (and after) unexpected and highly disruptive events. Crises can result from natural disasters, such as hurricanes, floods, or earthquakes, and from man-made events, such as acts of war, terrorist/bioterrorist attacks, toxic chemical contamination, epidemics/pandemics of infectious diseases, and other disasters similar in magnitude, effect, and importance. In a report prepared for the Department of Homeland Security, effective crisis communication is defined as,

An effort by experts to provide information to allow an individual, stakeholder, or an entire community to make the best possible decisions about their well-being within nearly impossible time constraints and help people ultimately to accept the imperfect nature of choices during the crisis (Meredith et al., 2008, p. ix).

Crisis communication encompasses literature from a wide range of academic disciplines and within this very sizeable body of literature, there tends to be a division between two categories of disasters and crises: natural and anthropogenic. There is also a second divide based on a significant historical event, the terrorist attacks in the U.S. on September 11, 2001. The crisis communication literature reflects distinct differences between works authored “pre-9/11” and “post-9/11”, particularly in the context of public health crises and government response. This divide can be directly attributed to the impact of the unprecedented (and unanticipated) domestic anthrax attacks in 2001 that followed the September 11th terrorist strikes in New York and Washington D.C. While the anthrax attacks were not localized or contained solely in either of these two cities and occurred several weeks after the physical attacks on 9/11, they are considered part of the 9/11 history and have had significant influence in determining how the Federal government (now) responds to public health crises (Freimuth, 2003, 2006).

Differences between Risk and Crisis Communication

Risk communication in the public health context has traditionally referred to public warnings about threats to some aspect of an individual’s health, either from specific behaviors (e.g. smoking, drug abuse, unsafe sexual contact) or from an identified environmental hazard (e.g. potential release of a dangerous substance or toxic chemicals). Risk communication is the basis of public health messages and information campaigns designed to influence/change health-

related behaviors. It is defined as, “the intentional effort to inform the public about risks and persuade individuals to modify their behavior to reduce risk” (Seeger et al., 2008, p. 9).

Risk communication traditionally refers to an “exchange of information among interested parties about the nature, significance, or control of a risk”. Risk communication is most often a component of the pre-crisis stage or planning initiatives in anticipation of crisis situations (Covello, 2003; Seeger, Sellnow, & Ulmer, 2003). Although risk communication occurs in a variety of sectors, (e.g. financial markets, consumer product safety, the insurance industry), in this study, I limit the discussion of both risk and crisis communication specifically to the area of public health.

Risk communication and crisis communication, while often inter-connected; differ significantly in definition and scope. Although risk and crisis communication have some common characteristics and share certain operational features, such as delivery methods (notably mass media) and a basic objective (inform the public), their fundamental goals differ. Risk communication addresses probabilities and potential situations of harm or danger, while crisis communication focuses on a specific event or action that has already occurred or will almost certainly occur in the near future. Risk communication is based on what is already known about a situation (or at least thought to be true) and typically claims a basis in scientific or technical evidence. There is no emphasis, or consideration, on what is not known about a situation, condition, or event. Risk communication messages almost always address likely (future) consequences, are based on some form of persuasive or very compelling ‘evidence’, and are intended to prevent or modify specific behaviors or practices. For example, ‘smoking will cause cancer and heart disease’, or ‘drinking alcoholic beverages during pregnancy may cause birth defects’ (Reynolds & Seeger, 2005, Reynolds, 2007).

Conversely, crisis communication is an on-going process that occurs during the actual crisis event, operating continuously as the crisis unfolds and evolves, until there is some kind of resolution. During crisis events that occur within an organization or situations that affect a single organization, established, effective and well-practiced contingency plans and emergency communication processes can help the organization to respond appropriately, preserve (or regain) order, and maintain a consistent organizational message or position. Research has shown that, during crisis situations, public trust and the government's credibility is strongly influenced by the consistency of messages from the various organizations and a perception of consensus from the leaders directly involved in the crisis response (Freimuth, Hilyard, Barge, & Stokler, 2008; Hilyard, Freimuth, Musa, Kumar, & Quinn, 2010; Holmes et al., 2009; Seeger et al., 2008; Shore, 2003).

For example, in the event of a natural disaster, such as a flood or earthquake, rapid and effective communication is essential to facilitating and coordinating recovery and maintaining an accurate understanding of the situation. Once the immediate crisis event has ended or subsided, a post-crisis communication phase begins and continues until there is consensus that the situation is under control. Crisis communication, as a responsibility of government agencies, in this context is defined as the need to “protect health, safety, and the environment by keeping the public informed” and “to restore public confidence in the [government] organization's ability to manage an incident” (Seeger et al., 2003). In a broader context where the crisis does not involve an official government response (although it could), crisis communication is employed to “prevent or lessen the negative outcomes of a crisis and thereby protect the organization, stakeholders, and/or industry from damage” (Seeger et al., 2008).

Crisis communication addresses both what is known and what is not known about a specific situation. Uncertainty and ambiguity are integral components of crisis communication, which add to its challenging, complicated, and complex nature. One other significant difference between the two concepts relates to the influence of time. Crisis communications (and situations) are characterized by significant time pressure and (often) lack of complete information. Nonetheless, organizations/leaders are expected to provide immediate information and guidance to the public and not to wait until the situation becomes clearer or is 'under control'. For example, in April 2009 during a press briefing in the early days of the emerging H1N1 pandemic, Dr. Richard Besser, Acting CDC Director, made the following public statement:

I want to acknowledge the importance of uncertainty. At the early stages of an outbreak, there's much uncertainty, and probably more than everyone would like. Our guidelines and advice are likely to be interim and fluid, subject to change as we learn more (Reynolds, 2007, p. 14).

Practicing Crisis Communication

The literature I reviewed is limited to crisis communication as practiced by U.S. Government agencies, specifically government agencies within the U.S. public health community (mainly the CDC) and their responses to major public health threats. Primarily this involves literature published post 9/11, focusing on the CDC's response as a public health agency to the 2001 anthrax attacks and the 2009-2010 H1N1 pandemic.

Irrespective of the specific cause of the public health threat or emergency, the basic principles of effective crisis communication are generally applicable to most, if not all health related crisis situations. These principles are summarized by the CDC in their official crisis communication

publications as, “*Be first. Be right. Be credible.*” and tie directly to the main goals of effective public communication in a developing crisis situation, which are:

- (1) Prevent further illness, injury, or death
- (2) Restore or maintain calm
- (3) Engender confidence in the operational response (Reynolds, 2007, p. 1).

Crisis Communication Models and Approaches

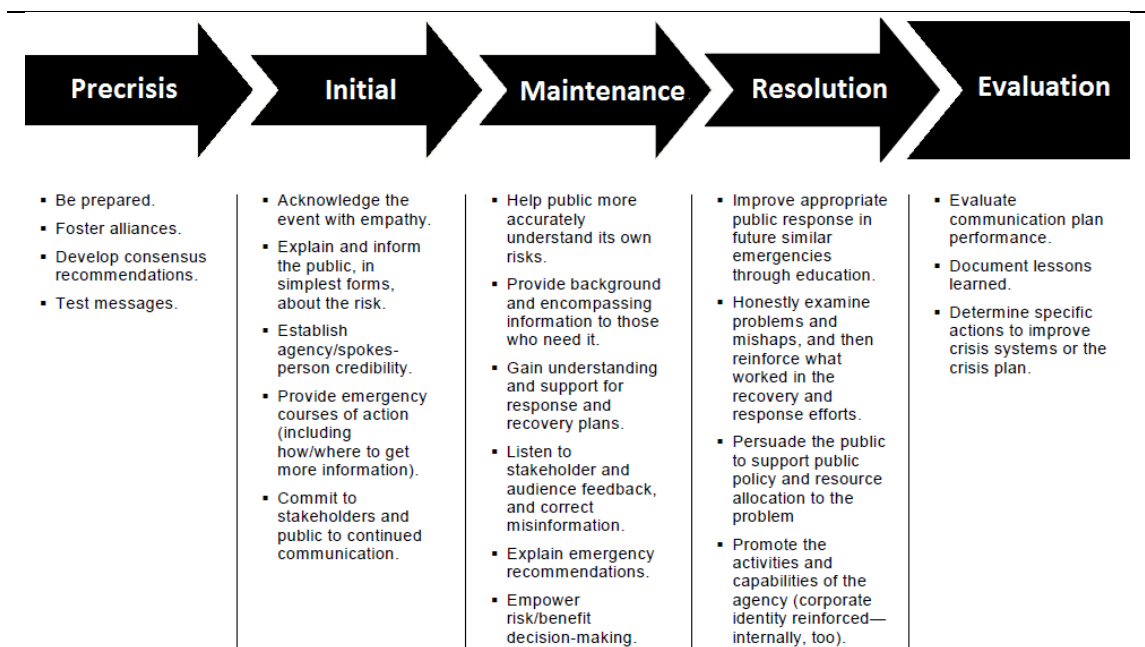
In reviewing the literature on models used in the field of crisis communication I discovered one model and one innovative approach that are of particular use for this study’s purpose. These are the Crisis and Emergency Risk Communication (CERC) model, developed by the CDC, and the concept of the Emerging Infectious Disease Communication (EIDC) as a method or approach to communication during an infectious disease threat or outbreak.

The CERC Model. One of the most significant changes made to previous models and processes for risk and crisis communication was the merger of the two concepts, Risk and Crisis Communication, into a combined model (Crisis and Emergency Risk Communication) known today by the acronym CERC. Dr. Barbara Reynolds, Crisis Communication Specialist at the CDC, and Dr. Matthew Seeger, Professor in the Department of Communication at Wayne State University, developed this model as a direct response to the many problems and communication failures identified in the response to the 2001 anthrax attacks. The CERC model has been widely accepted in the field of emergency response and crisis communication and is currently the standard operating model for crisis communication at the CDC (Reynolds, 2007, Reynolds & Seeger 2005).

According to one of the developers of the original CERC model, the fundamental concept is fairly simple and straightforward:

CERC is a way to talk to people, a set of principles that allows us, in the heat of a crisis when the unthinkable happens, to be able to get a message through to people in a way that they can actually understand it and act on it. (Reynolds, 2012, p.1)

As an integrated model, CERC “builds on the existing literature in the fields of health and risk communication and synthesizes those with crisis communication” (Reynolds & Seeger, 2005, p. 24).



Adapted from Figure 1-1. Crisis and Emergency Risk Communication (CERC) Lifecycle. In Reynolds, B. (2012). *Crisis and emergency risk communication* (2012 ed., p. 9). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from http://emergency.cdc.gov/cerc/pdf/CERC_2012edition.pdf

Figure 3. Crisis and Emergency Risk Communication (CERC) Lifecycle

EIDC. Another important perspective in the field of crisis communication in public health is the concept of Emerging Infectious Disease Communication (EIDC). The threat of a global pandemic and the challenges that governments and health organizations will face in communicating during a pandemic demands new concepts and plans for effective crisis communication to ensure speed and accuracy during an infectious disease outbreak where

uncertainty is a dominant factor. The ability of the government, or other official organizations, to communicate uncertainty to a highly diverse audience with varying levels of education, health literacy, and risk appreciation without sacrificing public trust is crucial to effectively countering and containing the threat. Additionally, consideration of other influencing factors such as public trust, perceptions of power and authority, and cultural biases have to be taken into account by crisis/emergency response planners (Holmes, 2008).

EIDC as an approach is relatively new within the fields of risk and crisis communication and targets potential challenges to public trust and organizational credibility by focusing on communicating *throughout* the emerging crisis constantly providing new information, as it becomes known to decision-makers. The emphasis is on clearly defining risk and developing a communication strategy that will raise public awareness of individual risk and the need to follow official guidance, without creating widespread panic or fear. However it is different from traditional health communication campaigns or health messaging in that it is intended to be fluid, changeable, and responsive to an emergent threat conditions or an unpredictable threat environment. EIDC proponents argue that the best method for accomplishing these objectives is to develop a communication strategy that *adapts* to changing information as the threat emerges and evolves, and recognizes the ethical responsibility of keeping the public fully informed throughout so that individuals can/will make appropriate decisions to take the recommended actions.

EIDC also recognizes a clear need to engage the public in the process, both in preparing for emergencies and during a response, making this process participatory and dialogic. While these factors are regularly discussed as needs in the crisis communication literature and the EIDC is often used as an example of how they could be effectively addressed (Reynolds, 2007,

2012, Seeger & Sellnow, 2008), there is not as yet a formally articulated communication model engaging the EIDC concept, reflecting a need for one.

Traditional health communication models center on the transmission of information (from a recognized “authority”) as the primary means of influencing behavior and encouraging or discouraging a specific action. These kinds of health message campaigns and messages rely principally on what is called the “rational actor” model, which is based on the assumption that simply providing clear guidance based on factual information to the public will be sufficient to change attitudes or behaviors. Research has shown, especially in the case of the anti-smoking health campaigns, that this approach will be effective with some population groups but not with others, even when the message and guidance is clearly understood. Using the EIDC approach, the goal becomes “informed decision-making rather than specific behavior change” which may actually result in the desired behavior change (Holmes et al., 2009, pp. 353-354).

Crisis Communication and Public Health: The CDC’s Response to the Anthrax Attacks

During the anthrax attacks of 2001, the CDC was suddenly thrust into a primary role in national crisis response as the public’s focal point for medical and scientific information. The CDC also became the principal Federal agency responsible for all official public communication during this public health crisis. Consequently, studies and analyses of the CDC and its actions during and after the 2011 anthrax events constitute a significant portion of the contemporary literature related to crisis communication and public health threats published in the last decade. Many of these academic studies and analyses of various aspects of the H1N1/A pandemic were authored by current or former CDC employees, or were based on interviews with CDC employees, which provides a unique perspective from an insider’s point of view (Chess & Clarke,

2007; Freimuth, 2006; Vanderford, 2003; Pollard, 2003; Prue, Lackey, Swenarski & Gantt, 2003).

The 2001 Anthrax Attacks

The condition most conducive to panic isn't bad news – it's conflicting messages from those in authority (Reynolds, 2013. p.39).

The Federal government was strongly criticized for its response to the domestic U.S. anthrax attacks in 2001, particularly with regard to public communication. Responsibility for the government's response to this unexpected and unfamiliar threat fell to the Department of Health and Human Services (HHS) and most directly, to the CDC. At the time, anthrax was not well known in the broader public health community, as infections of the disease were extremely rare in the United States and anthrax infection had not been identified as a potential or likely public health or security threat. Most public health officials at the State and local levels quickly looked to HHS and the CDC for guidance on how to address the developing public health crisis as instances of contamination were confirmed in their areas. Unfortunately, contingency plans for dealing with anthrax outbreaks, especially at the local levels, were generally nonexistent. Also, due to its rarity, many health care providers were not familiar with anthrax diagnosis, prevention methods, and treatment protocols. At a minimum the possibility of anthrax infection as the source of a patient's symptoms would have been considered remote and probably would not have been investigated until many other more likely diseases had been ruled out. Also, at the time the CDC had never planned or prepared to respond to this kind of public health threat- multiple intentional anthrax infections in geographically dispersed areas (GAO, 2003, October).

Unlike the direct attacks on the World Trade Center Buildings and the Pentagon, the anthrax attacks did not result in a high number of human casualties or cause extensive physical

destruction. There were a total of twenty-one U.S. postal facilities located in widely dispersed areas and one private business facility, a publishing office, located in Boca Raton, Florida where anthrax contamination was confirmed. Disease outbreaks were reported in five separate geographic areas: Florida (1st), New York, New Jersey, the Washington DC metro area, and Connecticut. All of the confirmed disease infections were caused by direct contact with active anthrax spores transmitted in pieces of contaminated mail. This resulted in twenty-two confirmed cases of anthrax infection; eleven cases of cutaneous (skin) infection and eleven cases of inhalation (respiratory) infection. These infections ultimately resulted in five deaths, all from inhalation anthrax⁴ (GAO, 2003).

While these infection and fatality numbers may appear small and perhaps insignificant in comparison with the casualty numbers at the World Trade Center and the Pentagon, their psychological effect on the American public, particularly with regard to the public's confidence in the Federal government, was substantial. As a result of the generally negative public perception of the Government's ability to manage such events, and as public fears of future similar attacks continued to grow, there was a significant shift in thinking by the response organizations about the concepts of risk and crisis communication and their relationship to each other during extreme emergencies (Freimuth, 2003, 2006; Kahn, 2009; Reynolds & Seeger, 2005). The response to the anthrax attacks also revealed many weaknesses in the government's ability to respond effectively to an unexpected public health crisis; especially one with the potential to affect widely dispersed segments of the population. The use of the U.S. mail delivery

⁴ Anthrax infections can be cutaneous, gastrointestinal, or inhalation. Cutaneous (skin infection through some form of tactile contact with anthrax spores) and gastrointestinal (acquired from consuming meat from contaminated animals) are the most common type of anthrax and are usually survivable. With proper treatment likely survival rates are 60% for gastrointestinal and 80% for cutaneous anthrax. Inhalation anthrax, which is acquired by breathing airborne anthrax spores, is most often fatal with an estimated survivability rate of 10-15% without treatment. Early and aggressive treatment may improve the likely survivability rate to 55% (www.cdc.gov/anthrax).

system as a means of disease transmission not only involved Federal government authorities from the beginning, but also greatly increased the urgency and pressure to develop an effective response strategy as suddenly nearly all of the U.S. population was potentially at risk. The degree of uncertainty that arose as a result of what appeared to be random targets combined with the potential to reach anyone who might receive deliveries from the U.S. Postal Service, resulted in high levels of public anxiety and fear. The developing public reaction to the growing number of suspected or confirmed anthrax infections and the extensive media coverage of these incidents (some of which included false, inaccurate, or misleading information) put considerable pressure on the leadership of the national response agencies, especially HHS and the CDC, to provide immediate and detailed information to the public. This prompted Government agencies and leaders at the national level to make frequent public statements about the situation, in hopes of averting widespread panic. Unfortunately, this resulted in some (now infamous) public statements by high-level government authorities that were factually incorrect, inaccurate from a medical perspective, or highly implausible. For example, during a White House press briefing on October 4, 2001, Mr. Tommy Thompson, (then) the Secretary of Health and Human Services, publicly stated [regarding the (1st) confirmed case of anthrax in Florida] “ It appears that this is just an isolated case. There is no evidence of terrorism.” In response to a question about how the first victim might have become infected, he answered, “We don't know that at this point in time. We do know that he drank water out of a stream when he was traveling to North Carolina last week”⁵ (Thompson, 2001, October 4, p.2).

⁵ According to the CDC, Anthrax infections occur naturally in wild and unvaccinated domestic animals in many countries including the U.S. Workers can be infected if they are exposed to infected animals or to meat or products (such as wool or hides) from infected animals. Exposure can also occur from contact with water supplies (rivers, streams, ponds) or ground areas that have been contaminated by infected animals. Infection can occur if the individual has a cut, scrape or open wound and comes in contact with anthrax spores which can persist in the environment, particularly soil, for years or decades (www.cdc.gov/anthrax).

Mr. Thompson's public statements were problematic for several reasons, not the least of which was the official medical report from Dr. Larry Bush, the physician who treated the first anthrax victim. In his report, Dr. Bush strongly suggested that the anthrax contamination of the facility was very likely a deliberate act of bioterrorism and that the infection of this individual, because of the type of anthrax contracted, had to be intentional. Additionally, at the time of Mr. Thompson's statements it had already been widely reported in the media that the victim died from inhalation anthrax, a form of the disease that is not acquired 'naturally', i.e. from animals, animal products, or contaminated water.

This obvious disparity about the source of the victim's infection generated extensive discussion (and much speculation) by the media that the Government was intentionally misleading the public in order to hide the seriousness of the situation and/or threat to the American people. The Government's credibility with the public suffered substantially as a result of these conflicting statements and what appeared to be deliberate misinformation. These statements also created considerable confusion and contributed to increasing the level of public paranoia about the anthrax threat rather than diminishing it (Freimuth, 2003, 2006; Kahn, 2009; Mebane, Temin, & Parvanta, 2003).

In another example, in New Jersey (where anthrax infections had been confirmed in postal facilities), State public health authorities were actively trying to convince postal workers there was no real threat to their safety, despite specific evidence to the contrary. In fact, news reports had already confirmed anthrax contamination in postal facilities in the Washington DC area. One New Jersey postal union official described the obvious disparity between the government's public statements and their actions in this way:

The [health department official] called everyone into the cafeteria and told us how safe we were. Then four days later the SWAT teams were running in...in their decontamination uniforms.... and the FBI was ordering us out of the building within 30 minutes or they would put us under arrest...[I]t was like something out of a movie (Chess & Clarke, 2007, p.1580).

Impact of the Anthrax Response: A Paradigm Shift.

The Government's flawed response to the anthrax attacks had major and lasting impact on the practice of crisis communication, by all levels of government, from local municipalities to the highest levels of the Federal government. In terms of affecting government response to risk and the practice of crisis communication, the impact and influence of the entire 9/11 crisis is unprecedented but specifically regarding a public health crisis response, the anthrax attacks were the impetus for major change. The issues identified as shortcomings and/or failures in communication by the government authorities became catalysts for fundamentally rethinking the way government organizations interact with the public during a crisis.

The Federal government's response to these events also highlighted serious problems with the ability of the many layers of government response organizations to respond in a coordinated manner with each other and particularly highlighted problems with effective inter-organizational communication during public health crises. This perception was reinforced by the emerging allegations of multiple failures in coordination and information sharing among the 9/11 first responders and the Federal government's response organizations. Recognition of these problems prompted comprehensive reviews of (and changes to) official emergency response procedures and the public communication practices of the Federal government. Put simply, there was one concept and practice of emergency crisis communication by government officials and

organizations prior to these events and a very different concept and practice of crisis communication post 9/11 and post anthrax (Chess & Clarke, 2007; Freimuth, 2006; Mebane, Temin, & Parvanata, 2003; Reynolds, 2007; Vanderford, 2003; Wise, 2003).

Evaluating Organizational Crisis Response

In thinking about how to investigate the process of crisis response development, and draw conclusions about its effectiveness, I identified three analytic frameworks to use in evaluating an organization's response. These are Sensemaking, Decision-making, and Communication. Each of these frameworks provides a unique lens to use in observing and analyzing how a crisis response is developed. Additionally, I have identified three thematic categories; Processes, Practices, and Organizational Culture/Climate that may be useful in analyzing an organization's strengths and weaknesses regarding its ability to develop and implement effective response strategies.

Sensemaking

Sensemaking is an effort by an individual or a group to develop an understanding in a confusing or unfamiliar situation. According to one definition, "a process of how people try to find out the story, the deliberate effort to understand events and how they give meaning to what is happening in order to reduce the equivocality and ambiguity that surrounds them" (Muhren & Van de Walle, 2010, p. 30). The words *process* and *deliberate* are important to consider in any definition of sensemaking that relates to what happens in an emergency or crisis situation where the pressure of timeliness and immediacy of response are critical to success. Effective crisis response demands (of an individual or organization) an ability to (1) quickly determine what is going on, (2) determine what the risks are, and (3) make decisions about what action(s) must be taken. "Deliberate" in this context refers to the concentrated effort to fully ascertain the severity

of the crisis and the risk factors, in order to provide clear and useful information to the decision-makers based on the information available at the time. These decision-makers will then determine the appropriate response based on what they understand, or think they understand, of the situation.

Sensemaking, according to Karl Weick, ‘is about sizing up a situation, about trying to discover what you have while you simultaneously act and have some effect on what you discover’, and ‘usually an attempt to grasp a developing situation in which the observer affects the trajectory of that development’ (Weick, 2001, p. 460). He also contends that participants in a crisis construct/create meaning (enact sensemaking) by reflecting on past (perhaps similar) events and personal experiences. He also argues that through the process of social interaction, participants work to achieve a consensus view of the crisis event or environment thereby establishing a common understanding of the situation (Weick, Sutcliffe, & Obstfeld, 2005).

Sensemaking Properties.

Weick identifies seven properties of sensemaking which he believes have a direct effect on an individual’s capacity for sensemaking and ability to “size up what they face.” He describes these properties as:

- (1) **Social context:** the actual, implied, or imagined presence of others.
- (2) **Personal identity:** a person’s sense of who he or she is in a setting.
- (3) **Retrospect:** things are seen before they are conceptualized – people know what they have done only after they do it.
- (4) **Salient cues:** individuals have preferences for certain cues and they actively select them – affecting their sense of what is happening around them. When cues

become equivocal, contradictory, or unstable, people begin to lose their grasp of what is happening.

(5) **Ongoing projects:** Experience is a continuous flow. Sensemaking is constrained not only by past events, but also by the speed with which events flow into the past and interpretations become outdated.

(6) **Plausibility:** Sensemaking is about coherence, certainty that is sufficient for present purposes and credibility. Plausible sense is constrained by agreements with others, consistency with one's own stake in events, the recent past, visible cues, projects that are demonstrably underway, scenarios that are familiar, and actions that have tangible effects.

(7) **Enactment:** Action is a means to gains some sense of what one is up against. To stay detached and passive is not to improve one's grasp, because much of what any situation means lies in the manner of its response. (Weick, 2001, pp. 461-463).

To support my exploration of the "communicative dimensions of crisis," I draw primarily on Karl Weick's concepts of sensemaking and retrospective sensemaking in organizations. He describes sensemaking as a means of 'organizing to reduce ambiguity', a process that 'involves on-going efforts to transform general recipes into actions and structures' (Weick, 2001, p. 34).

Weick's idea of retrospective sensemaking is useful in exploring how the CDC decision-makers and key response directors used their past experiences with other infectious disease outbreaks and other public health emergencies to guide the development of their response strategy to the novel H1N1 virus. Understanding how the CDC decision-makers enacted

retrospective sensemaking is particularly important in the interpretation of the interview data from participants who were asked to remember and reflect on their actions, thoughts, and feelings as the H1N1 crisis evolved over the period of more than one year. Working with the data I collected in my interviews, I use Weick's seven categories and the related concepts identified by Muhren and Van de Walle (2010) to analyze the sensemaking and decision-making processes of the CDC response team during the 2009/2010 H1N1 pandemic.

Framing.

Erving Goffman believed that understanding an individual's primary frameworks is critical to understanding how they organize experience. He states, "We tend to perceive events in terms of primary frameworks, and the type of framework we employ provides a way of describing the event to which it is applied" (Goffman, 1974, p. 24). Framing, in the context of sensemaking in crisis situations, is about perceptions of risk and uncertainty and understanding the influence of these primary frameworks. Goffman argued that people infer significance in a situation based on primary frameworks developed from their past experiences. Key to influencing their current perception is understanding these past experience frames- and being able to address them effectively- by either confirming or disconfirming the perceptions. He also contends that the less structure and transparency there is during an event, the greater the possibility for distortion; while more structure and greater transparency will lessen the possibility of distortion (Goffman, 1972). In communicating with the public during times of crisis or emergency where health, safety, or survival is at stake this concept of transparency by the government will be key to having credibility and in obtaining the public's trust and cooperation.

In order for the public to recognize a specific situation or threat as a "crisis", a responsible/credible individual or organization must first declare it as such. Framing strategy is

significant in terms of the degree to which public behavior can or will be influenced, the perception of the severity of the threat, and the resources that will be made available to assist in managing the situation. To be responsible and accountable leaders, decision-makers must consider the ethical dimensions of framing a particular event or threat as a crisis. What must decision-makers consider in making the choice to identify an event or threat as an emergency or public health crisis?

In rapidly evolving and emerging novel crisis/threat situations, decision-makers face the difficult problem of communicating the nature of an unknown and uncertain situation to the public in familiar and unambiguous language. They must find a way to ‘normalize’ an abnormal situation and to define an unconventional threat in conventional terms so that a large public audience with a very wide range of education levels, language expertise, and/or familiarity with the immediate threat (such as a specific disease outbreak) can understand the threat/crisis and will be motivated to take the desired action(s). How the threat/crisis is framed (both for and by) the public is crucial to achieving these goals.

Additionally, in the case of national emergencies or disasters the authority of the Federal or State government (usually the President or the Governor) to declare a situation an emergency/crisis also provides the affected area(s) i.e. States or cities access to critical emergency funding and support from national level disaster response capabilities. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (2007) gives the President of the United States the power to invoke a state of emergency, upon the request of the governor, where such an emergency has arisen. The language in the law states:

Any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save

lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States (P.L.93-288, as amended, 42 U.S.C. 5121-5207).

Transparency.

Closely related to the issues of decision-making and information release, particularly in the case of government agencies, is the concept of transparency. Warren Bennis describes transparency as a principle of organizational communication “encompassing candor, integrity, honesty, ethics, clarity, full disclosure, legal compliance and a host of other things that allow us to deal fairly with each other” (Bennis, Goleman, & Biederman, 2008, p. vii). As a factor in a decision making process, transparency can be defined more narrowly as ‘the degree to which information is available to outsiders that enables them to have an informed voice in decisions and/or to assess the decisions made by insiders’ (Florini, 2007, p. 5).

How the transparency ideal influences decision-making processes involving the release of potentially harmful or frightening information -- such as warnings to the public of a developing global pandemic, or of a possible bioterrorist attack is important to consider. In examining the H1N1 case study, the following questions seem relevant:

- What is the role of transparency in EIDC?
- What are the structural, cultural, or organizational constraints influencing the situation and the decision-makers?
- What is the public’s right to know, and what is the Government’s responsibility to manage or control the release of information to prevent panic in the midst of a complex, chaotic, and evolving threat situation?
- Is withholding some information ever justifiable?

- Who has the authority to make these kinds of decisions when public health and safety is at stake?

In looking at this issue, I consider whether there are nuanced interpretations of transparency that are more pragmatic and/or appropriate in responding to certain types of crisis situations. Is the concept of ‘targeted transparency’ (Fung, Graham, & Weil, 2007), where specific organizations responsible for particular aspects of public risk, safety, or behavior, make decisions about the type, scope, and timing of information release, a legitimate and ethical practice?

In the area of public health communication, transparency has a somewhat different definition and role. The following principles and guidelines illustrate these differences;

- Acknowledge uncertainty
- Provide follow-up information as quickly as possible
- Advise patience and flexibility
- Admit mistakes and move on
- Provide advice that fits the context and can realistically be acted upon (Jennings & Arras, p. 18).

In reviewing literature related to transparency it was apparent that despite their stated commitments to transparency goals, many Government organizations and agencies are struggling with the challenges of incorporating the principles of transparency into their operational practices, particularly in the area of crisis communication. All agree that there is a need to inform the public of impending threats and danger, but there is also a felt responsibility to avoid unnecessary alarm and maintain social order and this often presents a significant ethical dilemma (Florini, 2007; Mitchell 2010).

Transparency policies have frequently been in conflict with “right-to-know” policies and the government’s attitude toward becoming more transparent has been slowly evolving ever since Congress passed the Freedom of Information Act in 1966. This tension between openness in government (visibility of practices and procedures) and a desire for secrecy to protect government operations has a long history in American government bureaucratic politics. What is referred to as “a 1st generation of legislated transparency” or “the right-to-know policies” emerged from the 1946 Administrative Procedure Act that mandated public disclosure of Executive Branch proceedings. These policies and mandates for government disclosure of information to the public have continued to evolve with each successive administration and Congress. However, there have been both successes and setbacks in expanding these “right to know” policies, notably the success of the Freedom of Information Act in the 1970’s and conversely the Bush Administration’s efforts to increase the scope of “official secrecy” regulations and policies (information control) beginning in early 2001. These efforts continued and were expanded after the 9/11 attacks with the passage of the Patriot Act and other government measures designed to increase the government’s capability for monitoring actions and/or individuals thought to be of concern from a national security perspective (Fung, Graham, & Weil, 2007, pp. 25-28).

The recent (June 2013) incident, involving the release of highly sensitive information by Edward Snowden concerning a “secret” U.S. Government technical surveillance program, and the continuing debate about the legality of his actions has brought this issue of the Government’s ‘right’ to collect certain information on its citizens and political allies and to withhold information about these programs to the forefront of public debate once again. In an article titled NSA Management Directive #424: Secrecy and Privacy in the Aftermath of Edward Snowden,

the author quotes from Snowden's published statement in which he defends his decision to reveal the NSA surveillance program:

So long as there's broad support amongst a people it can be argued there's a level of legitimacy even to the most invasive and morally wrong program, as it was an informed and willing decision However, programs are implemented in secret, out of public oversight, lack that legitimacy, and that's a problem. It also represents a dangerous normalization of "governing in the dark" where decisions with enormous public impact occur without any public input (Lucas, Jr., 2014, p.1).

Components of Organizational Crisis Response

In reviewing literature related to how organizations respond in crisis situations, I discovered a number of significant issues directly related to the official response to the 2001 anthrax crisis. These issues generally fall within the three thematic categories I identified; processes, practices, and organizational behavior/culture.

Organizational processes

In the category of organizational process, reports and studies of CDC's response during the anthrax crisis highlighted many systemic organizational issues such as problems associated with information 'flows' (both internal and external). These were attributed to complicated hierarchical organizational structures and the existence of policies and regulations that impeded effective internal coordination and complicated the inter-organizational coordination process (Chess & Clarke, 2007; Freimuth, 2003, 2006). Issues concerning the inadequate size and equipment of the physical space allocated to crisis teams and emergency response centers were also noted and cited as factors contributing to a lack of timely and effective staff coordination

that affected the overall response process (Vanderford, 2003). In addition to the physical workspace problems, the lack of sufficient (IT) communication technology (e.g. laptops, desktop computers, mobile phones) allocated to the response staff to support the response operations led to delayed information transmission or resulted in missed information altogether (Arpan & Roskos-Ewoldsen, 2005). Also noted as problematic was the smooth and effective integration of highly technical information in the planning process (Jederberg, 2005).

Other studies cited the lack of any pre-prepared guidance for the organization's communication staff to assist in managing the large volume of media inquiries, and poorly defined or nonexistent procedures for official coordination and collaboration with the media (Freimuth, 2006; Robinson & Newstetter, 2003). Also noted was the insufficiency of readily accessible and useful subject matter specific information resources to respond to what should have been anticipated media and public inquiries, such as 'What is anthrax?' 'How is it contracted?' 'Are all forms fatal?' Unfortunately, due to this lack of prepared/approved guidance (i.e., Frequently Asked Questions) what appeared to be conflicting and sometimes even contradictory information was provided. For example, confusion and outrage resulted when the CDC recommended that postal workers in mail handling facilities identified with anthrax contamination be given the antibiotic Doxycycline as a preventative measure. This was problematic because only a short time prior, the CDC had recommended the employees at the Senate Hart Office building in Washington DC and the NBC television studios in New York (where the presence of anthrax spores had also been confirmed) take the antibiotic Ciprofloxacin (Cipro) to protect against possible anthrax infection. The CDC knew that both drugs were equally effective and that Doxycycline was perhaps even preferred as a preventative treatment due to its fewer potential side effects. However, this information on the differences between the

two drugs was never fully communicated to the postal workers or the public. The medical facts contradicted what the postal workers believed to be true, that Cipro was somehow a “better” drug. Consequently, the postal workers alleged that they were being given “a less effective medication” and were being treated as “second class citizens” (Vanderford, 2003, p. 11).

The public information resources on anthrax that were available were also frequently criticized for being “too scientific” or “too complicated” for the health literacy levels of the general public, sometimes resulting in misinformation due to misinterpretation (Mebane et al., 2003; Prue, Lackey, Swenarski, & Gantt, 2003; Robinson & Newstetter, 2003).

The CDC’s cumbersome clearance (release) process for official statements and information updates was also identified as one of the problematic organizational issues. This process frequently resulted in delays for providing new information to the media, which created the perception (paranoia) that important information was being deliberately withheld from the public. Also cited as a problem was the failure of the CDC leadership to designate a single or “official” spokesperson(s) for the agency, which sometimes resulted in conflicting and contradictory public messages as the media would interview several different “official spokespersons”, often on the same day, whose information and messages were not only not coordinated internally for consistency but were also not reviewed for currency and accuracy. Officials of the government agencies were also criticized for their apparent failure to adequately anticipate the extreme time pressure that the crisis situation imposed on the media staff for rapid response to public inquiries and the volume of media demands for information updates (Chess & Clarke, 2007; Holmes et al., 2009; Prue et al., 2003; Robinson & Newstetter, 2003; Seeger et al., 2008; Vanderford, 2003).

Organizational practices

There are a number of studies that recognize the need for and implementation of certain organizational practices that would contribute to the likelihood of a successful response. Specific recommendations included the use of clear, readable and understandable (e.g. non-scientific) language both in printed materials and from official spokesperson(s), broad dissemination of all available information (both in print and visual media), and timeliness, accuracy, and consistency of messaging (Arpan & Roskos-Ewoldsen, 2005; Covello, 2003; Glik, 2007; Schuchat & Vanderford, 2010).

One practice used to enhance communication between communities or groups with significant differences in culture, language, or other social barriers is the use of boundary objects. Boundary objects facilitate interaction between different communities by “enabling knowledge exchange across organizational and professional borders” and “establish a joint language for representing knowledge” (Carlile, 2002). In this way, boundary objects can be useful to organizations struggling with the challenge of communicating critical information to an audience that includes the public and other professional organizations with different interests, priorities, or agendas (Carlile, 2004).

The concept of boundary objects is used in studies of organizations facing this complex problem of communicating with diverse audiences and/or participant groups involved in solution development. This analytic concept originated in the field of scientific inquiry and derives from studies of specific scientific objects that occupy ‘intersecting social worlds’. These objects often will have different meanings within these individual social worlds but will still be understood well enough to allow them to function as a ‘means of translation’ within and across disparate social and/or professional groups (Star & Griesemer, 1989, p. 393).

In my study of a government agency facing an emerging crisis, I investigated how the organization developed and used boundary objects in developing an effective crisis communication strategy. A key role for boundary objects in this process is to establish some common ground or common understanding of the problem. During its response to the H1N1 pandemic, the CDC created a number of boundary objects to facilitate communication with population groups identified as being at high risk for contracting H1N1. Because these groups differed in age (significantly), gender, and reasons for resisting the idea of vaccination, the boundary objects developed and used to facilitate communication with each 'at risk' group were necessarily different and customized to each group. For example, with the highest risk group, teenagers and college age young adults, the CDC used social media (Facebook and YouTube) as well as web podcasts, widgets, and eCards to communicate their prevention and vaccine campaign messages. Additionally, a concerted effort was made to reach the public via the Internet with a dedicated webpage (www.flu.gov) where daily flu updates were posted as well as short informational videos about how to avoid getting/spreading the flu and the importance of flu vaccinations (Schuchat & Vanderford, 2010, p.479). While these methods of communication may seem commonplace today, providing important information via a website using podcasts and video clips and the use of a social media platform to reach target audiences during a public health crisis was a significant and completely new communication initiative for the CDC.

In order to address (perceived) concerns about the H1N1 vaccine for the next highest risk group, pregnant women, in addition to the electronic media, the CDC developed specialized health message campaigns using printed information (pamphlets, posters, information sheets) that were distributed to community health care providers such as obstetricians, pediatricians, and

primary care physicians where the CDC believed this population group would most likely seek out information on H1N1 risks and answers to concerns about the vaccine.

The CDC's *Morbidity and Mortality Weekly Report (MMWR)* series is also an example of a unique inter-organizational boundary object. While the *MMWR* series are primarily directed toward the scientific and medical communities, these documents are available to the public through the CDC website and can also be accessed via electronic subscriptions from public and/or academic libraries. These publications are often referred to as "the voice of the CDC" and provide an important, easily accessible information resource for the public as well as the global public health community (CDC, 2010, January 15).

It has also been argued that in situations where the immediate problem requires radical innovation for resolution, the use of boundary objects can be extended to facilitate the decision-making process. In a rapidly changing and unpredictable environment where the consequences of the decisions made may have significant repercussions on public safety, the use of boundary objects may help the decision-makers in their process of integrating different or competing perspectives and/or proposed solutions (Dodgson, Gann, & Salter, 2007).

Organizational Culture

In his analysis of The Mann Gulch Disaster, Weick (1993) poses two fundamental questions about organizational response during crises: (1) why do organizations unravel, and (2) how can organizations be made more resilient? In my study, I consider the latter question of organizational resilience and, in particular, investigate the role of communication in developing this critical organizational quality.

How best to determine the organizational process of developing an effective response to an emerging and evolving threat? Karl Weick (2007) refers to this as "managing the

unexpected,” an ability to create ‘resilient performance’ through the creation of ‘mindful infrastructures’ and an organizational culture that encourages a mentality of *mindfulness*. He defines this as,

A mental orientation toward continually refining and differentiating categories, an ongoing willingness and capability to invent new categories that carve events into more meaningful sequences and a more nuanced appreciation of context and ways to deal with it (Weick & Sutcliffe, 2007, p. 88).

How does this concept of mindfulness help an organization adapt to a dynamic crisis environment characterized by high degrees of uncertainty and ambiguity?

According to one definition, organizational culture is “a set of shared mental assumptions that guide interpretation and action in organizations by defining appropriate behavior for various situations (Ravasi & Schultz, 2006, p. 437). An organization’s culture can therefore be viewed as a key determining factor in how the members of the organization will respond during times of crisis. How they understand or perceive the acceptable behavioral norms, leadership’s expectations, the organization’s history, and the perception of the organization’s public reputation all contribute to the understanding of an organization’s culture and what would constitute an appropriate response.

In crisis situations, experience with previous and/or similar situations will be a significant influencing factor in how the crisis is addressed. If the organization is accustomed to frequent crisis response and the members have had experience with either simulated or actual crisis situations, the response process will likely be much smoother and cause far less internal stress and anxiety. The degree of familiarity with crisis response practices and the organization’s member’s level of comfort with each other in a crisis environment is an important aspect of

organizational culture. One definition that takes into account the many and diverse elements that come together under the label of ‘organizational culture’ describes it in this way,

Culture would include the system of values, symbols, and shared meaning of a group including the embodiment of these values, symbols and meaning into material objects and ritualized practices...the ‘stuff’ of culture includes customs and traditions, historical accounts be they mythical or actual, tacit understandings, habits, norms and expectations (Sergiovanni & Corbally, 1984, p. viii).

Another significant hindrance in the overall response effort was failing to take into account important but unrecognized aspects of organizational culture, as it affected organizational behavior and as an influencing factor in determining and defining critical response strategies. For example, evidence of conflict or lack of trust among different response agencies, differing organizational objectives, weak or non-existent inter-organizational relationships, and competition for ‘authority’ in making decisions or public statements (Chess & Clarke, 2007; Vanderford, 2003; Wise, 2003; Zarcadoolas, Pleasant, & Greer, 2005).

The majority of the studies I reviewed are sharply critical of the practices of government organizations, especially the CDC, in these areas. They also emphasize the need to develop more effective crisis communication plans and processes, or to refine and adjust existing plans/processes to current circumstances and conditions. Several studies cite the need to develop an adaptive response strategy with a substantial degree of flexibility that would be successful in situations of emerging and evolving threat scenarios where high levels of uncertainty, ambiguity, and unpredictability exist (Freimuth, 2006; Kahn, 2009; Reynolds & Seeger, 2005).

In addition to the criticisms of the impediments in the communication processes and issues related to organizational structures used by government agencies (particularly with

engaging the news media), there appears to be a consensus in the literature that a critical area for further study and research in crisis communication regarding public health threats is with the quality of interagency and/or inter-organizational collaboration, coordination, and communication (Chess & Clarke, 2007; Freimuth, 2006; Karwa, Currie, & Kvetan, 2005; Millar & Heath, 2004).

Other issues related to the general concept of organizational 'culture' or behavior identified as having a negative impact ranged from leadership's unwillingness (or inability) to diverge from traditional ways of doing business and issues affecting organizational behavior stemming from the public's perceived general lack of trust in 'the Government' (Holmes et al., 2009; Pollard, 2003; Shore, 2003; Vanderford, 2003). One issue clearly related to the concept of an organization's culture is the perceived ability of the organization to cope with uncertainty in a crisis situation. This was highlighted as a one of the most critical issues in developing trust with the public and for maintaining a public perception of having the situation under control. (Chess & Clarke, 2007; Freimuth, 2006; Mebane et al., 2003; Reynolds & Quinn, 2008; Robinson & Newstetter, 2003; Shore, 2003).

Research Goals and Questions

The primary goal of my research is to gain an understanding of the relationship between two separate but interconnected processes-- sensemaking and decision-making during a crisis situation -- and how these two processes influence an organization's response to the crisis situation.

My secondary research goal is to explore the role of communication in shaping and developing the crisis response. My research focus is specifically on a large, complex government

agency confronting an unpredictable, ambiguous, and uncertain threat and its process of developing a response to that threat.

Given my interest in these two areas, I have developed the following primary research questions to guide my data gathering and analysis:

RQ1. How do government decision-makers make sense of an emerging threat or crisis situation in order to develop an appropriate response?

RQ2. When confronted with an uncertain and ambiguous threat, how does a government agency effectively communicate this response strategy?

To address these research questions, I focus on what has been called the “communicative dimensions of crisis” (Seeger et al., 2003); how participants facing an evolving crisis situation make sense of and construct meaning in a climate of extreme uncertainty, where ambiguity and chaos override ‘normal’ or predictable organizational response processes.

Within this context, I ask a number of additional questions:

- What are the organizational processes that determine the dissemination of information to the public during the emerging threat or crisis situation?
- Who makes the decisions about whether and what information is released to the public?
- What factors (i.e., a decision-maker’s personal experience, dominant organizational culture constraints and practices, or the interpretation of the threat context/environment affect this decision process?
- How are the content, format, and timing of the information dissemination determined?

- How and with whom do government decision-makers collaborate in this process and how do they choose to communicate with the public?

These questions guide my exploration of the CDC's organizational response to the 2009/2010 H1N1 pandemic. I explore these questions using the following conceptual frameworks; sensemaking, framing, transparency, boundary objects, and mindfulness.

In Chapter Three, I provide a discussion of my research methods and a description of my research data.

Chapter Three: Methods and Data

The primary method I use in my data analysis is the concept of the Case Study. Case studies are used in a variety of disciplines and can be valuable research tools providing a specific context or event for study. One definition of case studies and how they are structured in social science research comes from Robert Stake's work. He says,

... in the social science literature, most case studies feature: descriptions that are complex, holistic, and involving a myriad of not highly isolated variables; data that are likely to be gathered at least partly by personalistic observation; and a writing style that is informal, perhaps narrative, possibly with verbatim quotation, illustration, and even allusion and metaphor. Comparisons are implicit rather than explicit. Themes and hypotheses may be important, but they remain subordinate to the understanding of the case (Stake, 1978, p.7).

The case I use for my research is the Centers for Disease Control and Prevention's organizational response to the novel H1N1 influenza pandemic during the period from April 2009- June 2010. It is important to note that the data used in my case study and analysis of the H1N1 pandemic was drawn from more than one kind of source. In addition to published literature on H1N1, CDC press briefing transcripts, and transcripts of Congressional testimony from senior Government officials, I also used transcripts from interviews done in support of the CDC's H1N1 Oral History Project. While I conducted the interviews that I used in my analysis this data should be considered a secondary data source as I did not independently develop and select the interview questions that were used. I submitted approximately several drafts of proposed questions and

CDC officials made additions, changes, and deletions to the list. Thus, the final determination of which questions would be used in the interviews was made by the CDC. These interviews were done for one purpose- creating the CDC Oral History- and I am using them for another, as data for my research and analysis of the organizational response to the H1N1 pandemic.

Case Study: The 2009-2010 H1N1 Virus Pandemic

In mid-April 2009 a previously unknown strain of influenza virus, Type A Novel H1N1 (H1N1/A) suddenly appeared in the United States and raised concerns within the international public health community that a potentially devastating worldwide flu pandemic was imminent. The CDC identified this particular influenza strain as a combination of several different types of flu virus genes not previously seen together and one not previously identified in humans (Centers for Disease Control & Prevention, 2009). This outbreak of an H1N1 strain was of great concern to the CDC and HHS because of the history of the H1N1 virus beginning at the start of the 20th century and the expectation in the public health community that another flu pandemic would likely occur.

The 1918 Flu Pandemic

The 1918 flu pandemic, also known as the Spanish Flu, was a significant event in the history of public health and an important influence in how public health policies and practices developed. Current estimates of the impact of the 1918 pandemic include the following statistics:

- Approximately 20% of the worldwide population became ill
- An estimated 50 million people died
- At least 675,000 people died in the United States
- In one year the average life expectancy in the United States dropped by twelve years

Unlike previous disease pandemics and other flu outbreaks the 1918 flu pandemic (which was determined to be a strain of the H1N1 virus) resulted in very high mortality rates among what were considered “healthy young adults.” Illness and death rates were actually higher in adults aged 20-50 years than they were in adults over the age of 50, traditionally a higher risk population group for death due to influenza. The reasons for this unusual disease infection pattern have still not been determined and remain a mystery (Reynolds, 2007, pp. 21-23).

The H1N1 Threat Significance

To underscore the significance of the threat posed by a new (or returning) H1N1 flu virus and the potentially devastating consequences of another H1N1 influenza pandemic, CDC points out that more people died from the 1918 influenza pandemic than were killed in World War 1. It is estimated that approximately 16 million people died in World War 1, while approximately 50 million deaths (worldwide) are attributed to the 1918 flu pandemic. Due to the nature of record keeping at the time, precise records of deaths caused directly by the pandemic flu virus are not available, however, it is generally agreed that somewhere between 675,000 and 700,000 of the deaths attributed to the 1918 H1N1 pandemic occurred in the United States (CDC, 2007, October).

Yet, the 1918 H1N1 virus outbreak, while the most severe, was not the only influenza pandemic in recent history. Other flu pandemics occurred in 1957 (70,000 U.S. deaths and 1-2 million deaths worldwide), and in 1968 a flu pandemic resulted in 34,000 U.S. deaths and more than 700,000 deaths worldwide. However, because the 1918 flu pandemic was caused by the H1N1 virus, the 2009 confirmation of an H1N1 variant in the United States raised fears that this devastating virus may have returned and could potentially have similar, or perhaps worse, consequences for infection and fatalities (Reynolds, 2007, 2012; Kahn, 2009).

Confirming H1N1/A

The H1N1/A virus was positively identified initially in a 10 year-old patient in California on 15 April 2009 (CDC, 2010, June 16). Although there had been several reports of confirmed cases of a novel influenza strain in Mexico prior to this date, this was the first official confirmation of the H1N1/A virus in the United States. On 17 April, a second patient living in California but located more than 100 miles away and without any apparent connection to the first patient also tested positive for the H1N1 virus. One day later on 18 April 2009, following the established protocols, the United States International Health Regulations Program notified the World Health Organization (WHO) of the positive identifications of the H1N1 virus in the United States (CDC, 2010, June 16).

On Saturday, April 25, 2009, the Director General of the World Health Organization, Dr. Margaret Chen, declared that the H1N1 outbreak was a “Public Health Emergency of International Concern” (Chen, 2009, April 25). She recommended that surveillance activities be increased and instances of any flu like symptoms immediately reported to the World Health Organization.

Also on April 25, 2009, New York City officials reported influenza-like illnesses in a high school, and CDC testing confirmed two new cases of the 2009 H1N1 influenza infection in Kansas. Subsequently, another H1N1 infection was confirmed in Ohio, making it evident that the disease was spreading rapidly to widely dispersed geographical areas. On 26 April 2009, based on the recommendation from the CDC following additional confirmations of H1N1 the Acting Secretary of Health and Human Services, Mr. Charles E. Johnson, declared a National Public Health Emergency. A public statement released by HHS explained this action:

The Acting Secretary of HHS determined, as a consequence of confirmed cases of Swine Influenza A (now called “2009—H1N1 Influenza”) in California, Texas, Kansas, and New York, and after consultation with public health officials, as necessary, that a public health emergency exists nationwide involving 2009 H1N1 Influenza that affects or has significant potential to affect national security (USDHHS, 2009).

Two months later on June 11, 2009, the WHO Director General, Dr. Chen, issued a press statement officially declaring H1N1 a global pandemic, stating that “nearly 30,000 confirmed cases [of H1N1] have been reported (to date) in 74 countries”. She also issued a warning about the future progress of the disease saying, “Although the pandemic appears to have moderate severity in relatively well-off countries, it is prudent to anticipate a bleaker picture as the virus spreads to areas with limited resources, poor health care, and a high prevalence of underlying medical conditions”. In her statement to the press, she explained the reasoning that led the WHO to decide to raise the worldwide influenza pandemic alert status from Phase 5 to Phase 6 stating, “On the basis of available evidence and expert assessments of the evidence, the scientific criteria for an influenza pandemic have been met. The world is now at the start of the 2009 influenza pandemic” (Chen, 2009, June 1). Figure 4 describes the WHO pandemic alert levels and recommended actions for each.

NEW PHASES	OVERARCHING PUBLIC HEALTH GOALS
<p>Interpandemic period</p> <p><i>Phase 1.</i> No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk^a of human infection or disease is considered to be low.</p> <p><i>Phase 2.</i> No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk^a of human disease.</p>	<p>Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels. Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.</p>
<p>Pandemic alert period</p> <p><i>Phase 3.</i> Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.^b</p> <p><i>Phase 4.</i> Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.^b</p> <p><i>Phase 5.</i> Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).</p>	<p>Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases. Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development. Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.</p>
<p>Pandemic period</p> <p><i>Phase 6.</i> Pandemic: increased and sustained transmission in general population.^b</p>	<p>Minimize the impact of the pandemic.</p>

^a The distinction between *phase 1* and *phase 2* is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.

^b The distinction between *phase 3*, *phase 4* and *phase 5* is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geo-graphical location and spread, severity of illness, presence of genes from human strains (if derived from an animal strain), and/or other scientific parameters.

Adapted from World Health Organization. (2005). *WHO global influenza preparedness plan: The role of WHO and recommendations for national measures before and during pandemics*. Geneva, Switzerland: Author.

Figure 4. WHO Pandemic Levels and Recommended Actions

CDC's Response to the H1N1 Pandemic

The CDC's response to the 2009/2010 H1N1 pandemic provides an excellent opportunity to explore the relationship between sensemaking and decision-making in public communication when a public health organization responds to an unknown, unfamiliar, and unpredictable crisis. Under the existing federal government structure, the Department of Health and Human Services (HHS) and the Department of Homeland Security (DHS) share the responsibility for coordinating a national response to an influenza pandemic, however, as the 2009 H1N1 pandemic evolved and public health threats became the focus over national security concerns, HHS assumed the primary directing and coordinating role in the response (Steinhardt & Crosse, 2011, June 27).

Within the HHS organizational structure, the CDC is recognized as the agency with primary responsibility for developing and implementing the response strategy and communicating with the public about an infectious disease epidemic and/or pandemic (Kanof & Anderson, 2004, January 30). In developing the official government response to the emerging H1N1 pandemic, the CDC faced many complicated and complex challenges. The issues of communicating effectively with multiple and diverse audiences (publics), balancing multiple organizational goals, the critical need to establish and maintain credibility and gain public trust, and the unprecedented demand for immediate and accurate information from the 24/7 media news cycle were all factors affecting how the CDC developed its crisis response strategy.

This unique infectious disease outbreak, which developed very quickly from a few localized and seemingly unrelated and cases of influenza in the United States into a global pandemic, provides an excellent opportunity to explore and analyze the difficult and complicated

challenges facing government decision-makers who are confronted with a complex, unanticipated, emergent, and highly unpredictable public health threat.⁶

The H1N1 Oral History Project

In January 2010, Dr. Marsha Vanderford, Associate Director for Communications in the CDC Center for Global Health, proposed the development of an official oral history of the organization's response to the 2009/2010 H1N1 pandemic. The objective would be to capture unique insights and observations from the CDC response participants and to create a permanent record of their thoughts, recollections, and reflections as a resource for participants facing similar challenges in the future. The CDC Director, Dr. Thomas Frieden, supported her proposal and approved the H1N1 Oral History project. Dr. David Sencer, a former (and the longest serving) CDC Director (1966-1977) who also assisted the CDC during the H1N1 response as an emeritus advisor, was named as overall project coordinator for the H1N1 Oral History. As a special advisor to the CDC Director during the H1N1 pandemic period, Dr. Sencer participated actively in the development of the CDC's H1N1 response attending high-level decision briefings and meetings as part of the Director's "Team B", and working alongside the senior leadership staff. His personal involvement in the development of the CDC's response strategy, plus his previous long tenure (and popularity) as a CDC Director gave him unique access to CDC staff members whose experiences and recollections were key to creating the H1N1 Oral History record. The strong personal and long-term professional relationships he enjoyed with these CDC members as

⁶ The 2009-2010 H1N1 pandemic affected more than 214 countries (WHO, 2010, August 6). The CDC (2010, May 14) estimates between 14 million and 34 million cases of 2009 H1N1 occurred between April and October 17, 2009 in the United States. In the U.S. 41,914 laboratory-confirmed, influenza-associated hospitalizations were reported to CDC and U.S. deaths estimated to be between 8,717– 18,046 (CDC, 2010, July 30). Worldwide, the death total attributed to H1N1 (by the CDC) during the pandemic period is 284,500. Notably, 80% of the deaths attributed to H1N1 were in people younger than 65 years old (Dawood et al., 2009).

well as their deep respect for him contributed significantly to the successful completion of the Oral History project.

Once the CDC Director approved the project, Dr. Sencer identified and selected specific CDC employees for the oral history project interviews. He based his selection on his knowledge of each individual's current and /or past positions at CDC and the degree of their involvement in the CDC's H1N1 response. Dr. Vanderford subsequently offered me the opportunity to conduct the oral history interviews with these selected employees and she and Dr. Sencer became my principal points of contact at the CDC.

Oral History Project Interviews

An oral history, according to Donald Ritchie (2003, p. 19), "collects memories and personal commentaries of historical significance through recorded interviews. An oral history interview generally consists of a well-prepared interviewer questioning an interviewee and recording their exchange in audio or video format."

The H1N1 Oral History was developed through a series of in-depth interviews conducted with these key CDC staff members and office directors during the period from January 2010 to June 2010. Planning sessions for the project were held in January 2010 and the first Oral History interviews began in early February 2010 following receipt of final IRB approval for the study from the University of South Florida. The planned timeframe for conducting these initial interviews was approximately six months. During this six-month period I traveled to the CDC Headquarters in Atlanta, GA on four occasions. Three visits were devoted to conducting the in-person recorded interviews and one visit focused on separate (not recorded) follow-up interviews. During the final visit I also reviewed the videotape footage for final editing with the

media department technicians and the project coordinator, Dr. Sencer. Each visit was approximately one week in length for a total of four weeks on site at the CDC.

The Oral History Project included twenty-eight interviews, each of which were conducted and videotaped in the television studios located in the CDC Headquarters Building, Clifton Road Campus, in Atlanta, GA. Approximately nineteen hours of High Definition (HD) videotape recordings resulted from these interviews, with each interview averaging 35 minutes in length. The interview video recordings were technically edited by the CDC electronic media department and then copied onto DVDs in individual files. These DVDs and the original video recordings were subsequently archived by the CDC library and are now part of the CDC's permanent document collection. All of the interview recordings are available for review as public records in the CDC library, also located in the CDC Headquarters Building at 1600 Clifton Road, Atlanta, GA. The CDC provided me with DVD copies of each of the interview video recordings, which I used as my primary source material in my data analysis.

Selection of Data.

The videotapes, transcripts of these interviews, and the follow-up interviews I conducted with selected CDC staff members became the primary data sources for my research. I converted the HD video recordings of the interviews to audio only format using a commercial software program (Audio Hijack) and then had the recordings professionally transcribed. This resulted in 147 pages of interview transcripts that I used in conjunction with the copies of the video recordings to conduct my analysis. I reviewed the interview recordings and transcripts and coded them for examples pertaining to; (1) the participants' sensemaking process(s), (2) the internal decision-making process/structure within CDC, (3) the response development, and (4)

description of the communication practices, both internal and external, during the crisis response period.

I reviewed each of the transcripts of the sixteen Oral History interviews I selected for my study and compared the participants' recollections of events and their answers to the interview questions. In this thematic-oriented analysis, I looked for differences, similarities, and insight into their personal sensemaking and the organizational process(s) of decision-making that appeared to have influenced the development of the CDC's response to H1N1.

As part of my literature review for the study of the CDC's organizational response to H1N1, I searched for publications describing and evaluating CDC's actions and public communication during the 2001 anthrax attacks to compare it with the CDC's response to H1N1 during 2009-2010. As the anthrax attacks were the genesis of the current emergency and crisis communication response processes and practices at CDC, reviewing the organization's response during the 2001 anthrax crisis provides an excellent means of evaluating certain aspects of the organization's response to the 2009/2010 H1N1 crisis. In particular I looked for instances where specific response actions during the anthrax crisis were noted as insufficient or problematic and searched for examples of these (or similar) actions during H1N1 to determine if changes had been made to address these shortcomings.

This review of the organization's response to the anthrax crisis also helped to contextualize the decision-making process and the CDC's ability to respond to an emerging threat under conditions of extreme uncertainty. I believe this comparison provides useful insight into how the organization's response during the H1N1 crisis differed from the anthrax response and how the H1N1 "story" was constructed to meet the organization's revised crisis communication goals and practices.

Many of the key CDC decision-makers and response participants involved in H1N1 were also directly involved in the response to the anthrax crisis and that experience very likely influenced their behavior and thought processes in developing the response to the H1N1 threat. The significant level of public and official criticism that was directed at the CDC for the way the 2001 anthrax events were handled, overall, had an impact on the organization's reputation and also provided strong incentive for the CDC leadership to develop different and more effective crisis response strategies and capabilities.

Data Gathering.

This is a qualitative study with primary research based on semi-structured, in-depth, personal interviews conducted with CDC employees who either were previously involved in the CDC's response to the H1N1 pandemic, or were in positions with ongoing responsibilities related to H1N1 during the period April 2009 thru June 2010. A specific position description of each interview participants' role in H1N1 is included in the biographical detail of the interview participants and is provided in Appendix B.

Research Site.

The main campus and headquarters of the Centers for Disease Control and Prevention (CDC) is located at 1600 Clifton Road in Atlanta, Georgia. This was the primary research site for the H1N1 interviews. The CDC has an established position category for Guest Researchers, which allows outside (non-employee) researchers to gain access to CDC offices and employees, as well as internal library holdings, and provides an official organization sponsor. I obtained formal organizational support for my on-site research and interviews at CDC with the assistance of Dr. Marsha Vanderford, (then) Director of the CDC Emergency Communications Division in the Emergency Operations Center, and my official CDC research sponsor.

Interviews

Interviews with twenty-eight CDC employees were conducted and recorded for the H1N1 Oral History Project. Dr. David Sencer, a senior advisor at CDC and member of the Director's H1N1 response team and the Oral History project coordinator, selected these individuals based on his personal knowledge of their positions and official responsibilities during the H1N1 pandemic as well as their background and experience at CDC. This may be considered a limitation of the study as not every individual with key responsibilities during the 2009-2010 H1N1 response participants was included in the Oral History interview process. The individuals who were selected for interviews were chosen based solely on Dr. Sencer's personal judgment and independent decision.

Dr. Sencer conducted three of the Oral History project interviews; I conducted all of the others. Of the twenty-eight total interviews, I selected sixteen to use as primary data sources for this study. The sixteen interviews were selected based on the specific role each participant played in the CDC's H1N1 response and his/her involvement in either (or both) the decision-making process or public communication strategy. A complete list of the sixteen interview participants and their position in the CDC organization during the H1N1 response is provided in Appendix A. Biographic details of the sixteen selected interviewees, including descriptions of their background and experience at CDC and areas of professional expertise are provided in Appendix B.

Interview format

The formal interview process included asking several standard introductory questions of all respondents, designed primarily to initiate conversation and build rapport. However, the interview process was designed to be sufficiently flexible to allow for (and encourage)

considerable extemporaneous response. I intentionally sought detailed narrative accounts of individual experiences for those CDC staff members who were directly involved in developing CDC's H1N1 response strategy.

Open-ended interviews where participants are encouraged to offer personal recollections and observations are ideal for obtaining a variety of perspectives and interpretations of events from those directly involved in the decision-making and communication processes surrounding a specific crisis situation. From these individuals' firsthand experience detailed descriptions of the 'atmospherics' and other important context related information (data) can be obtained as well as information about the organizational and operational processes that were followed or enacted. These personal interviews were useful for comparing different individual accounts, interpretations, and perceptions of the same events as the crisis evolved. Based on the gap identified in my literature review in the area of interagency and intra-organizational collaboration and communication, I was also interested in investigating how this aspect of organizational crisis response affected the CDC's operational practices during the response to the H1N1 pandemic.

From the interview data I obtained detailed accounts by individuals directly involved in the response that provided unique insight into the CDC's decision-making process. I was particularly interested in learning about the perceived influences and/or constraints on the decision-makers from organizational structures and/or established processes in place at the time. Information that I sought included answers to questions such as:

- What were these established processes, if any, that CDC enacted during the H1N1 crisis to facilitate decision-making?
- Were decisions made by a group or were they made by a single individual, and if so, at what level in the organization?

- What was the coordination and collaboration process (and methods) for interagency/intra-organization communication?
- How was information shared, both internally and externally?
- If the organization determined that a single spokesperson should be identified for the release of all information, how was this individual selected?

Interview questions

I prepared a set of thirty-five questions to use as a guide during the interviews; however, the focus of each interview (topic focus) shifted somewhat depending on the interviewee's position in the organization and specific responsibilities during the H1N1 response. For example, questions related to the preparation of messages for release to the public or participation in decision-making forums were not applicable to all interviewees. The questions were designed primarily to be a conversation guide, to prompt personal reflection and to elicit personal narratives, thus the direction of the interviews depended to some extent on the individual participants' responses and was adjusted accordingly.

Final interview questions.

My draft interview questions were reviewed and approved by the Oral History project leader, Dr. David Sencer, and the project sponsor, Dr. Marsha Vanderford, prior to beginning the interview process. Both Dr. Sencer and Dr. Vanderford provided input (and added specific content or additional questions) to my original set of questions. The CDC leadership had specific interests in learning about how certain aspects of the response affected each agency division or office- especially in terms of allocating staffing and budget resources- so questions addressing these areas were included.

The interview participants were not provided with advance copies of the questions prior to their interviews, as one of the goals of the project was to obtain extemporaneous responses.

They were, however, told that one purpose of the interviews would be to capture personal recollections and anecdotal accounts of their individual experiences during the response that might not be included in formal after action reports and that this kind of information was of particular interest. They were also advised that another purpose for making the video records was to document their experiences as reference for use by other responders in future pandemics or other crisis events. Each of the participants signed a release form acknowledging that their interview recordings would be maintained in archive by the CDC and would become part of an official organizational Oral History on H1N1 and would also become public records.

I prepared an additional set of questions for follow-up interviews with selected individuals to allow for any new topics or issues raised during the interviews and/or an interest specifically related to my study related to their role during the H1N1 response that was not of specific interest to the Oral History project. Primarily this focused on the specifics of the decision-making process and practices of one of the Director's advisory groups known as "Team B", which was chaired by Dr. Sencer.

The following list of interview questions were used in the Oral History interviews and reflect both the interest of the CDC in creating a detailed record of the CDC's organizational response to the H1N1 pandemic, and my specific research interests in the relationship between sensemaking and decision-making during a crisis event response. While it was not possible to ask each interview participant every one of the thirty-five questions, I selected questions from each topic area based on what each participant identified as their specific duties and responsibilities in the H1N1 response. For example, I refrained from asking specific questions about interacting with the media when the participant stated that they had not been involved in developing public communication messages and/or interacting with the media.

H1N1.

The initial questions were designed to begin the conversation, build rapport, and encourage the interviewee to remember (relive) the early days of the H1N1 response. As most of the participants participated in the crisis response from the very beginning (April 2009), and nearly a year had passed from the start of their initial involvement, these questions were designed to prompt memories of the events of the early days and weeks of the crisis. They are also designed to determine the degree to which the first notifications raised concerns about a possible or potential crisis.

- Q1. When did you first hear about H1N1?
- Q2. Do you recall how it was presented? Did it strike you as a potential crisis?
- Q3. How/why, did you become involved in the preparedness/response to H1N1?
- Q4. Were you directly involved in day-to-day planning and response strategy development?

Response Process - Personal/Organizational.

As the interviewee begins to remember the details surrounding the early days of the crisis, the next set of questions targets their emotional reaction and immediate response to the unfolding events. Subsequent questions focus on the more concrete procedural aspects of the response as they began to actively develop and implement a strategy to cope with the quickly developing crisis situation.

- Q5. When you first heard about H1N1 what did you think/do?
- Q6. Whom did you notify and how did you contact them?
- Q7. Can you describe the first few days of the initial response period?
- Q8. Were the existing plans activated? Did they work?

Q9. How much of your time initially was devoted to the H1N1 issue? Did this change as the crisis developed?

Q10. What modifications did you need to make to processes or staff organization to respond more effectively to the threat as it emerged/developed?

Q11. How did you go about making these changes?

Decision-Making.

The questions about decision-making were posed to all interviewees, even if they were not in what they might consider a formal ‘decision-making role’. I believe that comparing different perceptions and opinions about key decisions made, and the way they were made, will provide significant insight into the organizational decision-making process during the response and the perception of the organizational culture/environment.

Q12. What do you think were the key decisions that needed to be made in the first few month/months of the response?

Q13. How were these decisions made? Who were the key decision-makers?

Q14. How were these decisions communicated internally and publicly?

Internal communication processes.

For those interviewees who were not involved in the dissemination of information internally, questions in this section focused on how well they felt they were informed of what was going on at the organizational level as the crisis developed, how decisions were communicated within the organization, and how well these communication processes worked. They had the opportunity to provide insight into specific problems or obstacles if they felt they were not kept sufficiently well informed by the CDC leadership and to explain how they obtained information from different sources, if they felt it necessary.

Q15. Can you describe the internal communication processes/means that were used to keep CDC employees informed about the organization's response?

Q16. How well do you think these internal processes worked?

Q17. What were the challenges you faced in getting information to or from CDC staff members?

Demand for information from the media/public.

These questions involving media contact and public communication were asked only of the participants whose duties required them to engage with the media. However, those employees who were not directly involved in providing information to the media were asked for their opinion on how well the CDC did in communicating with the public, based on their observation of the television and press reporting.

Q17. In times of public health emergencies there are often heavy demands placed on organizations for immediate and detailed information about the threat situation. Did you find this to be the case with H1N1?

Q18. How did you manage these demands for information?

Q19. Did you experience (or perceive) any instances of 'media sensationalism'? (inaccurate reports, misleading information, etc.) How did you respond to these?

Q20. What were the communication systems in place at CDC to respond?

Q21. How well did they work?

Q22. Did you find it necessary to modify these systems? If so, how/why?

Time commitment for H1N1 response.

The questions about time commitment and organizational resources are designed to capture information about the kinds of organizational structure and process issues that may have

impeded, or affected individual directorates and office's capability to respond in the most effective way. [Note: The CDC project sponsors had a particular interest in gathering this kind of anecdotal information from participants who were working the staffing and organizational structure issues on a daily basis.]

Q23. How much of your workday was/is devoted to the H1N1 issue?

Q24. Has this changed since the beginning of your involvement?

Q25. Did the H1N1 response require redeployment of organizational resources in your area or in areas that directly affected your operations?

Q26. What changes in organization or personnel did you make?

Q27. How were these change needs identified? Did you collaborate with managers in other parts of CDC or in partner organizations outside of CDC?

Collaboration.

My review of the literature identified a significant criticism of the ability of government agencies to effectively conduct inter/intra organizational collaboration and effectively coordinate across multiple agencies during crisis events. The following questions are designed to elicit personal stories about how internal collaboration was conducted in CDC and to explore any efforts of external coordination and collaboration with colleagues in other government agencies or other organizations.

Q28. Did you engage in active collaboration with other parts/divisions of CDC?

Q29. Can you describe this process? What worked well, what didn't? Why?

Q30. Who were your primary contacts within the organization or outside of CDC?

Reflection, retrospection, recommendations.

With almost a year of time having elapsed since the H1N1 crisis emerged, participants were asked to reflect on their experience and offer suggestions for different approaches or strategies, as well as to evaluate the overall response effort. One of my research goals is to be able to provide recommendations for improving an organization's ability to respond effectively to an emerging and evolving crisis situation and I believe these reflections and suggestions from the participants will provide important context for future response strategists and decision makers and examples in developing those ideas.

Q31. Looking back over the past year, what would you have done differently?

Q32. What could the organization have done differently?

Q33. Overall, how would you evaluate the CDC's response to the H1N1 threat?

Q34. What were/are the strong points? Weak points?

Q35. What recommendations would you offer to someone faced with a similar situation in the future?

Chapter Four: Results

The following chapter outlines the results of my research. I begin by restating my research goals and my primary research questions that guided the analysis of my data. I also provide a demographic description and analysis of the sixteen interview participants I selected for my study including their education, experience, and tenure at the CDC. Following this, I explain the thematic categories I chose to use in analyzing my data and provide selected quotes and excerpts directly from the interview transcripts to illustrate findings in each of the categories.

Research Questions

The primary goal of my research was to gain an understanding of the relationship between two separate but interconnected processes, sensemaking and decision-making during a crisis situation -- and how these two processes influence an organization's response to the crisis. My secondary research goal was to explore the role of communication as an integral part of developing the organization's crisis response. To guide my data gathering and data analysis, I developed the following primary research questions:

- RQ1.** How do government decision-makers make sense of an emerging threat or crisis situation in order to develop an appropriate response?
- RQ2.** When confronted with an uncertain and ambiguous threat, how does a government agency effectively communicate this response strategy?

Interview Participants Demographic Profile

CDC employs a highly educated and exceptionally skilled professional workforce. CDC is unique among U.S. Federal Government agencies with the concentration of (and combination of) medical expertise and academic credentials among its professional staff. The majority of CDC professional staff members have advanced degrees and many hold more than one. Most are board certified medical doctors in addition to having strong academic credentials in public health, public policy, or other public health related fields. The sixteen interview participants I selected for my analysis reflect this rather unusual organizational demographic. (Appendix B provides specific details on their individual credentials and professional experience).

These sixteen individuals have all been publicly recognized as experts in their respective fields and have established impressive professional credentials. They have, individually and collectively, received a wide variety of national and international awards and commendations and have contributed substantially to research in their areas of expertise with years of field experience as well as numerous academic publications. Scientific and scholarly publications from individual members within this group often total more than one hundred, per individual.

Education. Within the selected interviewee group, nine of the sixteen participants are Medical Doctors (MD) and three of these individuals also hold Master of Public Health (MPH) degrees. Five of the sixteen have PhDs and one individual in this group also holds an MPH degree. Two of the sixteen interviewees hold MA degrees and one has an MBA. This educational and professional background will influence each participant's perspective on the situation and establish 'frames' or pre-conceived ideas and points of view that each will bring to the discussion. It is important to recognize how these different frames can potentially influence

sensemaking and decision-making in order to fully understand this multi-faceted process of constructing a shared or cohesive understanding among the group members.

Work Experience at CDC. The selected interviewee group also has significant long-term work experience at CDC. Of the sixteen interviewees, the shortest length of time for anyone in the group to have been employed directly by the CDC (at the time of the H1N1 response) was seven years. There are two individuals in this category and for both their prior professional experience was with organizations related to the CDC, or with organizations directly related to the CDC's mission, providing them with considerable working knowledge of the CDC and an established professional network of contacts within the CDC. The degree of professional familiarity and level of trust all of these interview participants have with each other as colleagues is an important influencing factor in the organizational response development process.

Collectively the interview participants have an impressive number of years of experience working directly for the CDC. Their years of experience range from 7- 24, with an average of 15 years. Most of these individuals have spent the majority of their professional lives within the CDC organization working closely with many of the same colleagues for their entire careers. There are also a number of tandem couples working in the senior levels of the CDC. This along with the many other long-standing personal friendships and professional relationships that have developed is an important dynamic in an organization's culture. As a result of this extensive shared experience and the strong relationships it has helped to nurture, they have come to depend and rely on each other and a significant level of trust and confidence has developed among these individuals. Because these strong relationships exist, in any crisis situation that occurs it is most likely that they will reach out first to members of this community for information, validation/confirmation of information, and direction or guidance on what to do next. It is also

less likely that they will make independent decisions- and more likely that they will seek a consensus based approach to decision-making. Their shared experiences, including experiencing multiple crisis situations together, and their personal connections have created a highly cohesive professional community and a strong sense of affiliation to the organization, creating a distinct CDC identity.

There are also several other significant factors related to this depth of experience and tenure at the CDC to consider as potentially influencing factors in the response development process. First, because of the length of time they had been employed all but three of the participants had worked at the CDC during the anthrax crisis in 2001. Five of the thirteen interviewees who were at CDC during the anthrax crisis were directly involved in that response and the other eight members were either peripherally involved or at least fully cognizant of the anthrax crisis and the CDC's responsibilities. Only two of the sixteen interview group members were not part of CDC in any capacity during the anthrax response. However, one of these two individuals was part of a State public health organization, separate from but connected to, the CDC during the anthrax crisis and was thereby involved indirectly.

Over these many years of working together these participants have developed not only strong professional relationships but also strong personal friendships. This creates a group that has shared considerable day-to-day work experience and professional expertise but also has developed social relationships outside of work that have contributed to their understanding of the CDC's unique organizational culture. It has also shaped the organization's culture in that personal relationships, including marriages, among the senior staff members are more the norm than they are atypical as tends to be the case in other large government organizations. Establishing this sense of cohesion requires a certain commonality of perspectives among the

participants. Fundamental to this process will be sharing similar past experiences, a certain degree of familiarity and professional expertise with the specific issue/threat/problem in question, and a high level of trust and confidence in the qualifications and capabilities of the individuals within the group. The CDC is also unique among government agencies in that its members share similar professional backgrounds and expertise as members of the medical and public health communities. This is another important and atypical characteristic when compared to other large Federal government agencies or organizations where there is likely to be more diversity in background and expertise especially among the senior leadership. At the CDC these top tier leaders are primarily physicians and/or health scientists. The CDC is focused on one mission- public health- and therefore the CDC workforce is predominantly comprised of people with skills in that field. These various factors contribute to a high degree of solidarity among the members of the organization, which supports a strong sense of organizational cohesion and loyalty to the CDC.

Categories for Data Analysis

To begin the process of analyzing the data in my interview transcripts, I first developed the following categories for analysis that tie directly to my primary research questions. These are; Sensemaking, Decision-making, Response, and Communication. Within each of these major categories I created sub-categories to further separate the particular aspects of each of these actions and map them to each research question. Creating these separate sub- categories allowed me to review and analyze the transcript data looking for examples of each of these specific activities. I looked for these examples in the experience(s) of the interview participants as they recollected the steps they took and the procedures they used while moving through their individual sensemaking and the organization's decision-making processes. It was my hope that

by carefully examining specific examples from the recollections of the response participants, especially after they had time to reflect on their actions, I would find useful data and insights regarding the evolution of the organization's response.

Data Analysis for Research Question #1

How do government decision-makers make sense of an emerging threat or crisis situation in order to develop an appropriate response?

To respond to my first research question concerning the process of sensemaking in an emerging threat or crisis, I used three frameworks for data analysis focused specifically on understanding how sensemaking happens. These frameworks are based on (1) Karl Weick's seven properties of sensemaking (Weick, 2001), and (2) an analytic approach to sensemaking derived from them (Muhren & Van de Walle, 2010) that targets three specific actions that take place during sensemaking. They identify these as *noticing*, *interacting*, and *enacting*. Using these specific categories, I analyzed the interview data to determine how the participants' sensemaking processes were reflected in their responses to specific interview questions.

I also included the concept of *framing* as an analytic lens looking for examples in the interviews (explicit or implied) where framing could be clearly identified as an influencing factor in the sensemaking process. Framing is a unique category as it is an underlying (pervasive) influence in each of the specific sensemaking activities- individuals filter and sort information based on their pre-existing 'frames' of experience, expectations, or biases.

I provide direct quotes from the participants' interviews as specific examples of how each of these concepts was demonstrated as the participants recalled their reactions to various events, the actions they took, and provided their observations about the emerging crisis situation as they became engaged in the CDC's H1N1 response.

Noticing

Noticing is probably the very first action an individual takes in sensemaking. The sensemaking process is one of gradual realization and understanding- as events and actions begin to shape a recognition pattern for the observer. Noticing relates to the observer's growing awareness of how a situation is developing and evolving- as certain indicators and signals are recognized. This aspect of sensemaking is directly related to two of Weick's seven sensemaking properties, Salient Cues and Personal Identity. Weick (2001) says that individuals have preferences or predispositions for certain cues and will actively select these from their environment. Many factors such as past experience, assumptions, and established beliefs can influence which cue an individual will respond to, i.e. what they will notice. Choosing to focus on specific actions or activities will affect their sense (understanding) of what is happening around them by either confirming preconceived ideas and expectations or causing others to be missed altogether. Cues or signals that are dismissed or overlooked can also be significant influences on the sensemaking process by skewing the observer's perception or by "confirming" false assumptions based on expectation not on observation. Dr. Marsha Vanderford, Director of CDC's Emergency Communication System during the 2009 H1N1 pandemic, described her initial reaction and that of the people working around her to becoming aware of (noticing) the potentiality of a new H1N1 virus in this way:

You know, it took, I think, a couple of hours [for us] to really get a sense that this was new, this was novel, this was not seen in people before- and then sort of the awareness that this could be- this *could be* the pandemic that we were so concerned about (Dr. Marsha Vanderford, Director, Emergency Risk

Communication System, Emergency Operations Center, Interview #15, lines 22-25, Appendix C).

Muhren and Van de Walle (2010) believe that sensemaking is “grounded in identity construction” and this aligns with Weick’s category of Personal Identity. Using identity as a filter can affect the interpretation of what is happening- and individuals with certain defined roles/positions (especially leadership) will most likely notice different things in (or about) a situation, or they may interpret them differently than will individuals with non-leadership roles. They may also be concerned with the organization’s identity and notice aspects of a situation that could potentially affect the organization’s public reputation or challenge the perception of its identity (role).

In the first set of interview questions, I asked each participant the question, “Do you recall when you first heard about H1N1?” This question directly relates to the sensemaking concepts of *noticing and salient cues* and perhaps also provides insight into the personal identity filters of the interviewee. Every one of the interview participants answered this question affirmatively – and most in very specific detail as to their exact whereabouts and activities when they were first made aware of the H1N1 outbreak. Words used most often in response to the questions included: ‘absolutely’, ‘most certainly can’, and ‘yes, very specifically’. Considering that these interviews were being conducted nearly a year after the first surveillance notice/early warning period for H1N1, I found the level of detail in their responses quite amazing. For example, Dr. Beth Bell answered this question by saying,

I most certainly can [recall] because I was the Acting Director of the Center, NCIRD, [National Center for Immunization and Respiratory Diseases] at that time, in April, and I was actually performing in a choir

concert that Friday night, and had turned off my phone. I turned it back on after the concert and found I had a call from someone in the Flu Division saying they had detected two of these [cases] over the past couple of days and they were concerned. So, I got a, you know, a very comprehensive update about what people were doing about it- sitting there in my car in the parking lot, after the choir concert. It's quite – quite a clear memory of the first time I heard about this (Dr. Beth Bell, Acting Director, National Center for Immunization and Respiratory Diseases (NCIRD), Interview #2, lines 18-28, 32-33, Appendix C).

Another example of a very detailed and vivid memory of the initial recognition that there could be something significant developing came from Dr. Jay Butler, Director of the H1N1 Vaccine Task Force. In response to this question he said,

I can recall the moment very clearly actually because I was not at CDC in Atlanta at the time. I was actually attending the American College of Physicians' Conference in Philadelphia finishing my term as governor of the Alaska State chapter. In sitting in the convocation ceremony and being a little bit ADD, I was getting restless and I pulled out my Blackberry and saw some emails about a new swine flu strain that had been isolated in children in Texas and California. And remember thinking at the time, this does not sound good and particularly with two separate geographic locations. It raised some concerns. And as I was leaving the convocation call, I ran into Greg Poland who is well known as a – someone who's done quite a bit of research and promotion of vaccines and we were talking

about it and both had the same impression that this did not sound – sound good at all. (Dr. Jay Butler, Director, H1N1 Vaccine Task Force, Interview # 4, lines 26-37, Appendix C).

Dr. Stephanie ZaZa also recalled her initial notification of the developing H1N1 threat with specific location and situation details.

I do. I was actually in Washington, DC on a three month assignment. And I was at a meeting of the Institute of Medicine in their building and I received an email from Phil Navin who is the director of our emergency operations center asking me to participate in a call of the Department and CDC regarding some cases of an unusual flu in California. And because the Institute of Medicine building is – I don't know what it's made of, it's Kryptonite or something, and I had to go stand out on the sidewalk to take the phone call because I couldn't get a signal otherwise (Dr. Stephanie ZaZa, Deputy Director for Strategy in the Office of Public Health Preparedness and Response (OPHPR), Interview #16, lines 24-31, Appendix C).

In Karl Weick's seven properties of sensemaking (Weick, 2001) he identifies one as 'Plausibility' – or 'Plausible Sense' - a process of developing coherence, something constrained by agreements with others and consistency with the recent past, visible cues, and familiar scenarios. When asked if she could remember her initial notification concerning the developing cases of an unknown flu (identified later as H1N1), Dr. Anne Schuchat, (then) Acting Deputy Director of the CDC, responded;

Sure. Friday, April 17th, I opened my door at home and my cell phone went off and my colleague Beth Bell was on the phone. Beth was serving as the Acting Director of the Center while I was on this detail to the Office of the (CDC) Director. She was calling to let me know that our lab had found two different children with a new influenza virus that had swine origin. We had been following unusual influenza cases that had swine origin; we'd had one here and one there- over the past two years or so. But these were two children with no contact with each other, or with pigs or any animals apparently, who had a new [flu] strain that wasn't one we'd already seen. So that was when I first knew about it and I, in turn, called [Dr.] Rich Besser who was the Acting [CDC] Director to let him know as well (Dr. Anne Schuchat, Director, National Center for Immunization and Respiratory Diseases, Interview # 13, lines 20-32, Appendix C).

These detailed recollections clearly show that the initial notifications and the initial cues were recognized immediately by each of these individuals as important and significant. Additionally, in reviewing the interview transcripts I realized that six of these sixteen key personnel were not physically located at the CDC, or in Atlanta, when they were first notified of a potential problem or at least a concern about the developing H1N1 threat. Several of them were traveling, including being out of the country, on vacation, or on temporary assignments in other locations. Yet each of them was notified almost immediately and directly- either by a phone call or an email- from a colleague or a supervisor and were made aware that something important was developing. This indicates the senior leaders in the CDC organization have established a strong informal communication network to keep themselves aware of and informed on unusual

or developing situations and significant events- and that it works. For those senior staff members who were at the CDC headquarters when these reports surfaced many reported that they quickly initiated face-to-face meetings to discuss what they knew and to try to determine what was actually happening, or thought likely to happen, based on the information that had been received so far. An example of this kind of response came from Dr. Lyn Finelli. She recalled,

It was April 15th, I was in my office, and one of my colleagues came into the room and said she had just gotten a call from the laboratory saying they had a novel Influenza A isolate and that it was an H1. But we didn't know the type. She thought we should do an investigation. So I gathered my team and we decided to call California to find out about the case. ...

Yeah, in the next few hours, I – I called my Branch Chief, [Dr.] Joe Bresee, and he came down. I called my husband, [Dr.] David Swerdlow, he was then the Associate Director of Science in our Center, and asked them all to join the conference call with California. I thought that as many good heads as we could get in the room was important because this seemed to be a pretty unusual event (Dr. Lyn Finelli, Lead for Surveillance and Outbreak Response Team, CDC Influenza Division, Interview # 7, lines 14-18, 52-56, Appendix C).

An important influencing factor that might determine what individuals notice about a new situation, or how quickly they are able to make sense of what appear to be random and unrelated facts or events has to do with their experience with other (perhaps similar) situations in the past. In the case of disease outbreaks or other serious public health crises this would relate directly to the type and extent of response planning that had been done, the kinds of training exercises that individuals had participated in, or just their general level of awareness concerning warning signs

of potential threats. All of these factors would affect not only the specific details that an individual would notice but will also affect the degree of significance that they would attach to them and therefore not dismiss them as random or unrelated events.

Prior to 9/11, very few U.S. Government or CDC staff members had participated in disaster/crisis planning and response scenarios that involved a domestic bioterrorist threat centered on the intentional (yet random) infection of U.S. citizens. The idea of an anthrax attack, although acknowledged by the U.S. military as a possibility, was considered unlikely and far more likely to occur as an attack on U.S. military forces in a foreign country. The disaster/crisis scenario planning and exercises that were conducted tended to practice responding to what were considered more traditional bioterrorist threats, such as nerve gas exposure or nuclear radiation contamination.

One large-scale tabletop disaster planning exercise involving a critical infectious disease threat did precede 9/11 and took place in June 2001. This exercise, known as “Dark Winter”, presented a hypothetical situation of the intentional release of the smallpox virus in three major cities in the United States. The exercise primarily involved senior government policymakers and members of the media as the response participants. Notably, it did not involve operational level first responders or medical/public health specialists and the response centered on the actions required of senior policymakers and government leaders. Eerily foreshadowing the assessment of the Federal Government’s role in the 9/11 response the exercise was criticized as a complete failure of coordination and collaboration among government agencies and the response was evaluated as ineffective (Kahn, pp 4-5, 179, 2009).

Conversely, the CDC had been engaged in influenza pandemic planning and exercises for many years and regularly practiced responding to pandemic flu threats. Many of the interview

participants commented on how valuable the planning and practice exercises had been as preparation for responding to H1N1. The following two quotes, from Dr. Jay Butler and Dr. Marty Cetron, provide examples of how the participants found their prior planning and exercise experience important and how it helped them as they developed the H1N1 response.

The planning was very beneficial. But the plan is not a protocol. It helped to think through the issues that we needed to deal with but the pandemic that was arriving was little different than the pandemic we had planned for in that a lot of plans were built around a worst case scenario of either of either a 1918 type pandemic or an H5N1 type pandemic with a very high mortality rate. As it turned out, of course, this was a different kind of epidemiology (Dr. Jay Butler, Director, H1N1 Vaccine Task Force, Interview # 4, lines 94-100, Appendix C).

I think the fact that we had been planning for a pandemic for three years or more and had been exercising intensively, sometimes three or four times a year with live fire- real life simulations- really helped us all get comfortable in that environment. In fact, the level of comfort of the interactions, understanding lanes, roles and responsibilities, ways of evaluating and patterns of responding were made much, much better because of all our preparedness, probably in ways that we will never fully appreciate, but to fully emphasize how important it is to go through that preparedness, the planning the development, even if you modify your plans extensively, being familiar with the key decision points, the places where you want more information, the structures in which you're going to share information along the cascade of partners, the systems, was – was really very,

very valuable (Dr. Marty Cetron, Director of Global Migration and Quarantine Division, Interview # 5, lines 203-217, Appendix C).

In both of these quotations it is easy to see that the concept of familiarity, of ‘comfort’ with a/the crisis environment is one that the participants recognize as key to successfully managing and responding in a crisis. This idea reinforces Weick’s idea of Plausible Sense – an outcome of sensemaking based in part on recognizing visible cues, and familiar scenarios. This would also influence their ability to more quickly determine what was happening because their frames (and therefore signals/cues) would be set or at least influenced by the practice exercises they had experienced. They would already be primed to look for specific ‘salient cues’ in the situation. In real life situations this would likely prevent them from missing or dismissing critical indicators due to ‘perceptual blinders’ that would assess certain important cues as too improbable (i.e. 9/11, anthrax) and thereby cause them to misinterpret the situation early on in the crisis.

Interacting

Interaction is key to staying informed in a rapidly changing and evolving situation such as a crisis. Muhren and Van de Walle (2010) position this capability for interaction as a “means to reduce ambiguity and equivocality” as well as a point of verification for information sources and information accuracy. They contend that this process includes such activities as “information exchanges with colleagues, partner organizations and friends, formal exchanges through meetings and informal exchanges through chats over coffee” (p. 31). Having an established network of contacts and resources within the organization is critical to being able to effectively engage in this practice when a crisis occurs. As Dr. Jay Butler (Director of the H1N1 Vaccine Task Force) stated, “An emergency is a terrible time to be exchanging business cards” (Interview #4, lines 111-112, Appendix C).

Several of the interview questions prompted answers that reflected this process of interaction among the response participants. These questions included:

1. Can you describe the first few days of the response period?
2. When you first heard about H1N1 what did you do?
3. Did you engage in active collaboration with other parts/divisions of CDC?

Examples of the kinds of responses that addressed how this process of interaction actually worked during the H1N1 crisis include the following:

And so I would be phoning back and forth and saying, when do I come back and what can I do? I got off the plane and walked the halls – and asked how can I be of use? What do you need to know? And this was like the very early days just when they're trying to figure out what does the virus do, who gets it, how many get it and what happens to them when they get it? (Dr. Martin Meltzer, Sr. Health Economist, Division of Emerging Infections and Surveillance, Interview # 10, lines 46-50, Appendix C).

Participants also reported that they made conscious efforts to get information from contacts and colleagues located outside of the CDC headquarters- in an effort to be as comprehensive as possible, to get as much information as possible, to add to the discussion of what was/was not known at the time. An example of this kind of outreach came from Steven Boedigheimer, Deputy Director, Division of State and Local Readiness,

I think another useful tool that a few of us utilized which may not be captured in an after action report was simply pick up the phone and contact somebody, in a State health department, or a local health department, that we knew or had worked with in the past that was in the epicenter of the response, and validate the

information, maybe gain some insight that we hadn't had. For example, I would pick up the phone and call the Deputy Director in Delaware, Dr. Paul Silverman, and ask him his perspective. Or pick up the phone and call the health officer or the chief operating officer in the Arkansas Department of Health and say, "What are you hearing? How's it working? What do we need to know that maybe we're not getting at?" (Steven Boedigheimer, Deputy Director, Division of State and Local Readiness, Office of Public Health Preparedness and Response, Interview #3, lines 161-171, Appendix C).

In Karl Weick's concept of sensemaking, this process of interaction among the response participants would also support the idea that 'the process of group communication is where participants achieve a consensus view of the event or the environment' (Weick, Sutcliffe, & Obstfeld, 2005). The following three examples given by interview participants reflect an effort to establish a sense of common understanding – through this process of group communication and interaction.

I think we did continue to rely on, you know, our science to figure out what indeed was going on and I- as you probably heard, or have seen, we are all a bunch of people who, you know, believe in trying to actually figure out what is going on to the best of our abilities and use that to guide our policies, our recommendations, and our actions (Dr. Beth Bell, Acting Director, National Center for Immunization and Respiratory Diseases, Interview # 2, lines 231-236, Appendix C).

I did participate in the meetings with Dr. Frieden [CDC Director] and there were, you know, daily or twice daily briefings with him –every morning and every

afternoon at the beginning. First looking at the surveillance data, you know, where is the outbreak was found. We already, at that point, were beginning to identify what it was and isolate what it was- then determining from all the locations and all the reporting was this the same- the same virus. (Dr. Lynn Austin, Deputy Director for Operations, OPHPR, Interview #1, 164-170, Appendix C).

With the State health departments, I think we worked with some partner organizations like ASTO and NACHO and they were absolutely key to our being able to facilitate those conversations and communication with the State and local health departments. They really came through. We had meetings with them. We even detailed a representative from their organization to be part of our team and to be in on the briefings so that they could turn and relay the information to their organizations- the State and local governments (Dr. Lynn Austin, Deputy Director for Operations, Office of Public Health Preparedness and Response, Interview # 1, lines 99-105, Appendix C).

Enacting

Muhren and Van de Walle (2010) define 'Enacting' primarily as a communication activity- 'when people communicate to enable action'. Weick would characterize this as part of the sensemaking process where "Action is a means to gains some sense of what one is up against". Muhren and Van de Walle argue that this practice is extremely important in crisis response as a lack of action at a critical time, or a delay in action (responding) may result in a complete response failure, even if it is only perceived as such and not a failure, in fact. Examples of these kinds of tragic events regularly make news headlines and often cause permanent damage

to the public reputation of the responsible agency or organization that is blamed for the inaction. For example, the (local) city and State government response organizations and the Federal government response agencies were all severely criticized for the perceived lack of effective action during the 2005 Hurricane Katrina response.

According to Muhren & Van de Walle (2010), communication is the foundation for enacting- they contend that communication is what will ‘enable action’. In the interview questions, none of the pre-planned questions were specifically designed to elicit responses to describe how this process of enactment actually worked during the H1N1 response. However, spontaneous responses and responses to other questions did provide interesting insight into how the participants engaged in this process of ‘enacting’. Examples of these responses include the following;

... I didn’t spend more than about 30 minutes in the meeting because the news about Mexico had just come out that morning. That was a Friday morning. And I was pretty much in and out of conference calls the rest of the day....

I remember we were saying, ‘well, what’s next’? And finally I said, I’ve got to go home. I’ve got a State that I need to be in during what sure sounds like is going to be an influenza pandemic (Dr. Jay Butler,⁷ Director, H1N1 Vaccine Task

Force, Interview # 4, lines 39-42, 44-45, Appendix C).

In another example that shows clearly how communication can ‘enable action,’ Dr. Lyn Finelli recalled how her Outbreak and Response Team quickly moved to position reporting assets close to the first confirmed H1N1 infection locations,

⁷ Jay Butler was the State Medical Officer in Alaska during the initial phase of the H1N1 outbreak. However, he moved to CDC to become the Director of the H1N1 Vaccine Task Force, which was his position when interviewed.

Well, during the week, that week of the 20th [April 2009], we decided to send a couple of teams out to the field. So we sent a team to San Diego and a team to Imperial County- a team of EIS Officers and some supervisors to oversee the investigations. When we sent those teams, we were still looking for a swine connection. Then when we heard about the Texas cases, we decided to dispatch a team to Texas, which we did (Dr. Lyn Finelli, Lead for Surveillance and Outbreak Response Team, Influenza Division, Interview # 7, lines 162-167, Appendix C).

Framing

An important component of the sensemaking process is determining and understanding the frames used by decision-makers in responding to an ambiguous threat scenario with very high levels of uncertainty in critical areas, a rapidly changing understanding of the disease, and a continuously evolving definition of risk. This aspect of sensemaking is more difficult to specifically identify as it tends to be a more subconscious activity- often not recognized by the individual attempting to make sense of a complicated situation. Framing in this sense contributes to a mindset that influences the selection and processing of information (cues and signals).

Goffman (1974) argued that people infer significance in a situation based on the primary frameworks developed from past experiences. Key to influencing an individual's perception is in understanding what these past experience frames are- and being able to address them effectively- by either confirming or disconfirming the perceptions. These kinds of frames are (can be) developed from a variety of experiences, such as direct personal involvement in a similar situation or knowledge of another individual's personal experience that is deemed credible. Also having participated in training exercises for similar situations or having engaged in developing plans for possible emergency or crisis scenarios- especially similar situations- will affect how the

(crisis) information presented to the individual is received and perceived. These experiences will construct frames – preconceived ideas and expectations- that may affect the perception of the information being presented or may influence the degree of significance attached to specific events.

Throughout the interviews I found many instances of the participants’ reporting there were general expectations or presumptions about what the “next” flu pandemic would be. These would certainly be considered framing influences. Many participants discussed the extensive planning sessions and practice training exercises that the CDC holds in hopes of preparing for the next influenza pandemic. Their responses indicate that there was indeed a pre-conceived idea (frame) for what the next influenza pandemic would be like and where and how it would manifest. I think it is important to recognize that these expectations had become part of what might be termed ‘conventional wisdom’ within the CDC community- and were not being challenged as false assumptions. The following four examples from the interviews provide insight into what they thought most likely (next) flu scenario would be and exactly what the CDC response team was expecting,

We had been preparing for years for pandemic influenza and I think our – our assumptions were that it would be very likely be Avian Influenza (Dr. Marsha Vanderford, Director, Emergency Risk Communication System, Emergency Operations Center, Interview #14, lines 19-21, Appendix C).

I would say most people were thinking about a pandemic that would emerge in South East Asia that may emerge as a combination of the H5N1 virus and not necessarily a pandemic that would emerge directly in North America or would be

from this specific type of swine-derived virus (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview #5, lines 80-83, Appendix C).

There was a lot of pandemic planning that had gone on, most of which I wasn't very involved in. But there was a whole, you know, infrastructure, and a whole mindset- a whole paradigm in a way- about influenza pandemics and about how to prepare for pandemics that was actually very well developed (Dr. Beth Bell, Acting Director, NCIRD, Interview #2, lines 96-100, Appendix C).

It was more than ironic. I was on- getting on a plane to go to Europe for a conference on influenza and influenza pandemic planning and preparedness- except the pandemic they were talking about was all H5, Avian influenza (Dr. Martin Meltzer, Sr. Health Economist, Division of Emerging Infections and Surveillance, Interview # 10, lines 35-38, Appendix C).

Within the concept of framing is the idea that naming or labeling something (event, situation, person, group) in a particular way is a powerful and significant act- and one that will influence how the event or situation is perceived and/or what an appropriate response would be.

Naming/characterizing a situation as a crisis, or even a potential crisis, brings forward differing views and understandings of that term- and may lead to unintended consequences if the perception becomes that the situation is unmanageable or the authorities lack full control of the situation. The determination of a 'crisis' event, at least in the public health community, is a serious decision and is left to the most senior organizational leaders in the highest levels of the Government's public health structure, i.e., Department of Health and Human Services, the CDC, or the World Health Organization.

One of the interview participants, Dr. Beth Bell, provided an interesting and somewhat different perspective on how framing (labeling) the emerging 2009 H1N1 situation as a crisis was perhaps not the best approach. In her view, *not* calling it a crisis was a better strategy and one that would allow for a more thoughtful consideration of alternatives and how to define the way forward. When asked if/when she recognized the emerging situation as a crisis, she replied;

The whole question of was it going to be a crisis and how was this all going to be played out, I think is a – another question altogether. I have found in general in dealing with these kinds of responses that it's better not to think of it that way. And it's better to just think of what needs to be done, you know, try to think about thinking the most rational science based comprehensive way about what the way forward is, try not to forget things, try to, you know, consider all the considerations and not think about it as a crisis (Dr. Beth Bell, Acting Director, National Center for Immunization and Respiratory Diseases, Interview # 2, lines 60-66, Appendix C).

Another interview participant commented on this same issue, noting that he perceived there was an effort to not label the emerging situation as one thing or another in the earliest days of the investigation, particularly in official (public) communication.

Well, it was very matter of fact- and of course, I was at that time getting it from outside of the Agency [CDC]. I wasn't getting a lot of inside information and it did strike me – there was- there seemed to be an avoidance of the using the word pandemic – at least in the official communication. Yet, everything that was developing over the next several days certainly gave every indication that this

very well could be the beginning of the next flu pandemic (Dr. Jay Butler, Director, H1N1 Vaccine Task Force, Interview # 4, lines 55-60, Appendix C).

Both of these examples could be evidence of a deliberate attempt to engage in what has been called “strategic ambiguity” (Eisenberg, 1984, 2007) specifically in order to allow for a certain degree of “plausible deniability” should this situation not develop into a full-scale pandemic, as feared. Bearing in mind and anxious not to repeat the mistakes made in public communication during the 1976 Swine Flu pandemic (Kahn, 2009, pp 82-85) one could speculate that the leadership in the Government’s public health organizations were employing a strategy of ambiguity by *not* identifying the developing situation as a pandemic threat.

Sensemaking Components

These primary sensemaking components; *noticing, interacting, enacting and framing* comprised the initial period when the response participants struggled to understand what the information they had at the time actually meant and what they needed to do in response. These fundamental sensemaking elements were the basis of their individual and group sensemaking processes– how they comprehended what they were learning and how this information ‘fit’ with expectations and preconceived likely scenarios- their ‘frames’. Despite what they may have been expecting from their experiences and from the past training exercises, the recollections of the participants show that their process of sensemaking was not one of reaching a quick conclusion – even when the data initially appeared to confirm a recognizable or familiar pattern. Instead, it appears that they noticed disparities and anomalies in the data- a testament to their ability to recognize important ‘cues’ and to be open to indications that traditional or conventional (expected) signs or signals were not necessarily going to be found. The participants’ comments show they gradually arrived at their conclusions- in more of a ‘dawning realization’ than a swift

judgment – arrived at by engaging in a deliberate process of thorough data gathering and review, analysis, and extensive group/team communication to consider various possible explanations.

Examples from the participants' interviews that reflect how they engaged in this sensemaking process include the following comments;

Yeah, I think it was a bit of a – a surreal feeling if you will. We had done so many exercises in preparation for pandemic influenza. And everyone, I think had such a heightened sense that this would be such a severe event it- that the repercussions of it would be so dramatic that in the first several days as we were watching this event and trying to gather information, that sense that “oh my gosh”, this is it...this is what we've been preparing for. I think all of those moments of thinking – sometimes it felt like we were still exercising then you realize- no this is real. People are sick, people are- this is spreading. So I think there was a sense- and I can remember several of us that afternoon that we first became aware of it – later it was maybe seven or eight o'clock at night, and there were several of us still in the Joint Information Center, kind of saying to one another...oh my gosh. This is what we've been planning for and preparing for” (Dr. Marsha Vanderford, Director, CDC Emergency Risk Communication System, Emergency Operations Center, Interview #15, lines 34-41, Appendix C).

Reflecting on his sensemaking process during the actual H1N1 crisis, Dr. Marty Cetron made the following observations,

I think one of the challenges- and exciting parts of- of this job is to try to filter, sift through, make sense, validate, and evaluate the quality of the information from different sources- you know- what's more credible, what's less credible.

But when you're hungry for data and you want it faster than it's available- you- you try to take as many inputs as you can while prioritizing getting first hand information- by having boots on the ground where the action's going on (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview # 5, lines 177-183, Appendix C).

In addressing the issue of feeling pressure to make a determination of the disease cause and assess or predict the likely severity of the threat, Dr. Toby Merlin stated,

You know, what I remember as the key focus early on was really trying to get a good handle on what was going on in Mexico City because there was a lot of non-scientific information, a lot of non-verifiable information and trying to get as good a grip as we could on what the actual underlying facts were as well as trying to rapidly determine the extent of disease in the U.S. and turning up surveillance systems particularly in the cross-border states where it appeared most of the disease was occurring. ... Then on the laboratory side, there was this enormous push to characterize the agent and develop diagnostics for the agent to genetically characterize the agent and develop PCR tests that could be used to detect the agent- that was an enormous full court press that was – that turned out to be quite successful (Dr. Toby Merlin, Deputy Director, Influenza Coordination Division, Interview # 11, lines 56-62, 63-67, Appendix C).

Decision-Making

Examples of how decision-making was approached and conducted during the H1N1 crisis show that there were several distinct phases of the decision-making process development. In the earliest days of H1N1, decisions tended to be made quickly and with incomplete or

imperfect information. Later, as the H1N1 threat was more clearly identified and better understood, the CDC's decision-making process evolved into a more formalized structure within the organization and the decision-makers developed definite steps and organizational procedures. The evolution of this decision-making process and the procedures that the CDC developed to structure decision-making will be discussed in detail in Chapter Five as the approach the CDC took has significant implications for meeting similar challenges in future organizational responses.

Data Analysis for Research Question #2

When confronted with an uncertain and ambiguous threat, how does a Government agency effectively communicate this response strategy?

To respond to my second primary research question, which focuses on the role of communication in the development of the response, I developed two analytic sub-categories for Communication- internal and external. Surrounding the communication process and related to my major category of decision-making are the influences of *uncertainty* and *ambiguity*. Interwoven throughout the participants' responses to questions directed specifically at these central ideas are many obvious references to perceptions of uncertainty and ambiguity, although these terms are not always used by the participant in describing the situation. I have included examples of how these factors were recognized and addressed specifically or how the participants perceived the organization to be responding to them more generally. I found it interesting that some of the interview participants provided clear examples of experiencing a high degree of uncertainty, especially during the early days of the H1N1 crisis, but never actually used the word uncertainty to describe what they were feeling or experiencing. Others, however, were very specific in their use of the term and emphatically stated there was a lot of uncertainty

and ambiguity both in what they were observing and in the decision-making process as they gathered new information, analyzed the data they had and continued to refine their understanding of what was developing. Several participants specifically noted the role of communication (both public and internal to CDC) as critical to diminishing this sense of uncertainty and reducing the ambiguity surrounding the situation.

Uncertainty and Ambiguity

In her analysis of leadership and decision-making during epidemics or other public health crises, Laura Kahn (2009) points out that all such threats and crises are surrounded by uncertainty and ambiguity, particularly during the earliest days of the outbreak or crisis event. She argues that leaders confronting public health threats and disease outbreaks are particularly challenged by these conditions as they also face an immediate demand from the public for action/response and detailed information about the situation from the news media which is operating on a 24/7 schedule. The nature of these kinds of threats- health, bioterrorism, disease outbreak- are uniquely unsuited to the demands of immediate response. They often require extensive scientific research and periods of testing to determine their exact cause and true potential for harm. The experts who will likely investigate these threats or crisis events are also by nature and training not prone to making immediate determinations or coming to conclusions precipitously. They are primarily scientists and accustomed to conducting careful research and testing before coming to conclusions. All of these factors are in tension with each other and yet the pressure (and necessity) to provide a credible and immediate response is real.

Further, public health threats and public awareness of them are communicated in near real time with the open availability of the Internet, email, text messaging, and social media conversation forums such as blogs and chat sites. These horizontal and global communication

channels plus the predominance of the television new media as an information source seriously complicate crisis communication and “official” response. The following examples from the interviews provide interesting insight into how these factors of uncertainty and ambiguity were recognized by the CDC H1N1 response team. Addressing the issue of uncertainty specifically Dr. Steve Redd, Dr. Stephanie ZaZa, and Dr. Beth Bell made the following comments,

I think what actually happened is that we learned that we knew less and less about what the situation was- than we thought- and that was a bit unnerving- but keeping a grip on the uncertainty became an important way of navigating; and also, identifying some practical actions to take to find out more (Dr. Steve Redd, H1N1 Incident Commander, Interview #12, lines 84-88, Appendix C).

And so the first I heard about it was on that call and really wasn't quite sure at that point what, if any, role I would have or if this would even really materialize into anything important or major. And at that point, there were I think only a couple of cases and it was an usual virus but nobody really had a very good sense, at least I certainly didn't have a good sense, of what this would turn into. (Dr. Stephanie ZaZa, Deputy Director for Strategy, Office of Public Health Preparedness and Response, Interview # 16, lines 32-36, Appendix C).

Early on we really were trying to figure out how – what was this, what was the, you know, how severe was this, what was the clinical spectrum of illness, how much had it spread, what was this virus, a lot of those very fundamental questions....

And so a lot of the first questions had to do with, you know, why was that; were we missing things; was there something different in Mexico; was it the same

virus, even, and what could, you know, sort of like especially was what our surveillance was telling us about this country accurate, or was there something else that, you know, was missing or that we hadn't really understood or detected (Dr. Beth Bell, Acting Director, National Center for Immunization and Respiratory Diseases, Interview # 2, lines , 70-73, 79-84, Appendix C)?

Speaking of how ambiguity affected decision-making in the early days of the H1N1 response Dr. Beth Bell- part of the senior leadership team and one of the decision-makers- made the following observation;

So I think the way we managed the ambiguity in the response was hopefully to recognize it and then usually somebody made a decision. And usually, it meant that, you know, somebody was pushed out of their comfort level one way or the other (Dr. Beth Bell, Acting Director, National Center for Immunization and Respiratory Diseases, Interview #2, lines 258-261, Appendix C).

It is apparent from these comments that ambiguity and uncertainty were not conditions that inhibited action by the response participants. In fact, it could be said that these were not entirely unexpected conditions- and that the CDC responders just accepted them as part of the problem set. The ability of an organization to function under these conditions indicates that there was a high degree of trust- a culture of trust- among the response participants. This is a characteristic of a cohesive organization- one where the members feel confident enough to make changes, or make decisions, that challenge the existing structures or processes but will not fundamentally challenge the unity of the organization. This kind of organizational culture will thrive in crisis environments because it is likely to lead the participants to new ways of thinking or doing.

Communication

Communication plays a critical role in crisis situations as a mitigating influence on the inherent uncertainty and ambiguity that surrounds crises- especially in the very early stages when information is scarce and sometimes conflicting and the known ‘facts’ are often contradictory. In addressing how the CDC response team recognized the specific role communication played in helping to diminish or alleviate uncertainty and ambiguity in the H1N1 situation, these next two quotes provide excellent examples;

I think the appreciation of communicating what we know, what we don’t know, what we’re doing to learn more and committing in our communications to telling people on a regular basis – updating the information in the news- is probably an important component of helping to ease the uncertainty (Dr. Marty Cetron,

Director, Global Migration and Quarantine Division, lines 100-103, Appendix C).

Risk communication deals with what is known about a situation and is described as “the intentional effort to inform the public about risks and persuade individuals to modify their behavior to reduce risk” (Seeger et al., 2008, p. 9). Crisis communication, on the other hand, deals with what is known *and* what is not known about a given situation. In the following example, Risk Communication is cited as being the basis for the CDC communications about H1N1- however, it is important to note that with the emphasis placed on sharing the uncertainties of the situation and the likelihood that the situation (and guidance) would change there was a distinct commitment to the principles and tenets of Crisis Communication. This is important to note as the CDC has pioneered a new approach that combines both Risk and Crisis Communication practices - the CERC model- and this example provides an excellent rationale for why this was done.

In his interview Dr. Glen Nowak, Director for CDC's Media Relations, commented on how they had consciously incorporated the fundamental principles of Risk Communication and also how uncertainty was addressed;

I think- I hope- that when people look at this they realize that one of the reasons it went so well was because the communications were very good. I think they will see that we followed the tenets of Risk Communication early and often. We shared- and we were comfortable sharing dilemmas with people, acknowledging the uncertainty, telling people what the uncertainty would mean. We were comfortable in telling people that the course would change and when the course changed. You know, we acknowledged that it was going to be disruptive for some" (Dr. Glen Nowak, Director of Media Relations for CDC, Interview # 11, lines 564-570, Appendix C).

The key role of communication in the response development was recognized and acknowledged by almost every one of the interview participants. Overall, the participants were highly complimentary to the CDC's communication staff and of the official communication about H1N1, particularly noting the designated Agency spokespersons, the primary media spokesperson, Dr. Anne Schuchat, and the personal involvement of the CDC Director in the public communication process. One example from the interview transcripts that highlights these sentiments comes from Dr. Lynn Austin who stated,

We also found that communications are absolutely critical. Most of us who are not directly involved in the communications ourselves were glued to the TV sets, you know, waiting, watching the media trucks outside; but we were glued to see

Dr. Besser [Acting CDC Director] , and Dr. Schuchat and then later Dr. Frieden [CDC Director] on television and what they were saying. And coming out of some of the daily briefings, knowing about what, you know, planning on what was going to be said, what – what the status was for the day, and then seeing it on the nightly news was pretty amazing in some ways. But it also showed me that CDC – this is one area I think CDC really excels is trying to share that information with the public (Dr. Lynn Austin, Deputy Director for Operations, Office of Public Health Preparedness and Response, Interview # 1, lines 62-70, Appendix C).

And in that afternoon of discussion about the next steps, one of the things that was abundantly clear was that this was going to probably be of media and public interest for awhile and that we, CDC, had to be prepared to be in front of cameras answering media and policy-maker questions quite frequently and be ready to go and assume that for the next few days, next few weeks, we were going to be having to update people on a regular basis ...

And so one of the systems we did was we instituted daily press briefings.

And if we needed, we – we did a couple of additional smaller press briefings each day. So for the first five, four or five weeks of this, we did a press briefing every single day, including weekends, including holidays, to bring people up to speed. Every day, we got together with the people who were going to be serving as the spokespeople for those press conferences, whether it was Dr. Besser and most of them were -Dr. Besser, sometimes he was joined by Dr. Schuchat, sometimes he was joined by Dr. Cox, [Dr.

Nancy Cox, Director of the Influenza Division] depending on, you know, what the specific issues were, and we looked at what had been reported as of that morning. We looked at what we knew as an agency that was different from the previous day. We looked at how things were playing out and we – we tried to anticipate where the stories might be going, where the media and reporter interest might be going. And we factored all that into trying to figure out what our key messages were going to be that day.

(Dr. Glen Nowak, Director, CDC Media Relations, Interview # 11, lines 170-175, 256-269, Appendix C).

In Chapter Five I provide a summary of my findings based on my data analysis and provide additional detail as to how these key factors I have identified were influential in the development of the CDC's response to H1N1. I also provide my analysis of the likely implications of these findings in terms of addressing threats and crisis situations, discuss the limitations that I have recognized in my study and findings, and offer recommendations for conducting additional research in this area and for organizations or leaders faced with responding to future emergent threats or crises.

Chapter Five: Findings, Limitations, Implications, and Recommendations

Ultimately, disease response is about human behavior, and human behavior is about what people understand and how they think about something. The more- the better-informed people are, we feel, the better choices they can make for themselves to protect themselves and their communities (Dr. Thomas Frieden, Director, CDC, August 23, 2010).

Summary of Findings

CDC's response to the 2009/2010 H1N1 pandemic is recognized as a major success in numerous traditional aspects of organizational crisis response- but the CDC demonstrated particular skill and proficiency in two key areas- public communication during a crisis and the ability to adapt the response to a rapidly changing situation. This *adaptive response capability* is one of the most notable and important findings from this study of how the CDC navigated the H1N1 crisis and has potential implications for organizations of all kinds that are confronted with emerging, uncertain, and ambiguous threats or crisis events. In my analysis of the interview data/results I have identified numerous significant actions taken by the CDC response participants that directly contributed to both the overall success of the response effort but also to developing and implementing this important quality of organizational adaptability- or, in Weick's terms, the qualities of organizational resilience and mindfulness. Words used frequently by the participants during the interviews to characterize the response development included; flexibility, adapt, revise, adjust, evolve, and navigating.

I identified several major categories of action that take place in the first/early stages of sensemaking- *noticing, framing, interacting, and enacting*. These actions are clearly reflected in the response participants' interviews and confirm that they are fundamental components of an individual's or group's ability to make sense of what is happening around them even as the 'facts' change and the crisis situation evolves in a completely unexpected direction.

Specific Findings

In reviewing how the CDC response participants engaged in the process of developing an effective response the following observations can be made:

1) *Noticing and Interacting occurred almost simultaneously*

These two activities were most often joined together by the participants- noticing (recognition of salient cues) was almost immediately followed by some form of interaction- either a form of communication (phone call, meeting, email) or by initiating a specific action or procedure- often as had been practiced in the training exercises and response drills. The participants who reported these kinds of actions did not distinguish between these two activities and tended to view them as a seamless process of response to a known (or expected) cue or signal. It was very apparent that the response participants quickly noticed and understood that a serious threat was emerging just from the initial fragmentary (and disparate) cues they received- although the specific cause of the threat was not yet known. This simultaneous process also speaks to the culture that existed within the CDC organization- the strong relationships between the members- indicating a high level of trust existed between them. A seamless process of noticing and interaction results from this sense of shared trust but also from a point of familiarity with each other's expertise, capabilities, and experience- creating an environment where group members almost instinctively reach out to one another when alerted to a potential threat.

2) *Interaction was on-going from the beginning to the end of the pandemic.*

This was noted by almost every interview participant- the involvement of so many people for such a long period of time – the longest crisis response in their history. Close interaction among the offices, divisions, and staff members was frequently commented on and participants recognized that its effectiveness was enhanced by the close working relationships and strong sense of organizational cohesion that exists at the CDC. This pattern of interaction extended to inter-agency collaboration and coordination and was recognized as highly effective by senior government officials (Duncan, 2009, Oct 21, p. 90; Napolitano, 2009, October 21, p. 3). This was particularly noteworthy as the CDC had been severely criticized for not collaborating or coordinating with other Federal agencies during the anthrax crisis of 2001 (Chess &Clarke, 2007; Freimuth, 2006).

3) *Influence of Frames was evident from participants' responses.*

Three primary frames were evident from the participants' responses to the interview questions. These were;

- a. 1976 Swine Flu Outbreak
- b. 2001 Anthrax Experience
- c. Prior Influenza Pandemic Exercises/Expectations

In the case of the Swine Flu outbreak that occurred in January 1976 and lasted for almost one year, it is important to note that Dr. David Sencer was the CDC Director at that time. The Federal government's 1976 Swine Flu response is generally considered a failure on multiple levels and the CDC and the Department of Health and Human Services were strongly criticized over their actions during the outbreak. The entire incident generated considerable

negative publicity for both the CDC and the Federal government and ultimately Dr. Sencer was asked to resign his position as CDC Director as a result (Kahn, 2009, pp. 82-85).

However, in 2009 during the H1N1 crisis Dr. Sencer was again part of the CDC response to a potential flu pandemic, this time in a key role as a special advisor to the Director and senior leadership staff and Chair of the Director's outside advisory group known as Team B. Dr. Sencer's personal experience, and the history of CDC's experience during the 1976 Swine Flu outbreak, was undoubtedly a framing influence on the 2009 H1N1 response development.

Similarly, the generally negative perception of the CDC's response during the anthrax crisis of 2001 influenced the CDC's leadership and their approach to developing a response to H1N1. While neither the anthrax attacks or the 1976 Swine Flu were directly mentioned (other than an occasional reference to anthrax) by the interview participants, both of these events and their history within the organization clearly influenced the H1N1 response team. Most of the H1N1 response participants had lived through one of these events- anthrax- and in any case all were well aware of the severe criticism that the CDC had endured as a result of the Agency's response to both. It seemed to me that both of these events were a kind of shadow influence on the H1N1 participants, not directly acknowledged or spoken of, but always present in the background and indirectly- almost subconsciously- influencing actions and decisions. Interview participants noted how they consciously reminded themselves of 'how not to do it' in considering various response actions.

The number, frequency, and type of planning and practice exercises for influenza pandemics was also mentioned by almost every interview participant. Even though they acknowledged that they had practiced and prepared for a completely different disease (flu)

scenario than the one presented by H1N1, all agreed that extensive practice and planning had made a significant difference in their ability to develop an effective response to H1N1. The participants noted that merely having had the experience of working together as a team had been tremendously beneficial, and credited this experience as having made the difference in how quickly they were able to determine the actual threat and adjust their plans accordingly.

4) *Uncertainty was recognized and publicly acknowledged.*

From the CDC Director to the Media Relations staff to the individual response participants- everyone acknowledged uncertainty as a significant component of the H1N1 pandemic. Many interview participants stated that they felt challenged by the degree of uncertainty that was confronting them- and as scientists often felt the need to be exact and to find definite answers before stating any possible conclusions. They mentioned feeling somewhat pressured to draw conclusions with imperfect and/or incomplete information and noted that this made them uncomfortable- even though they understood the need to be transparent and to provide information to the public as quickly as possible.

Most participants specifically noted that uncertainty was publicly acknowledged by the leadership from the very beginning of the H1N1 crisis and the CDC spokespersons were very open about it in public communication. They were also careful to state that the information being released was always qualified as ‘subject to change’ as new information became known and that the CDC would revise their guidance to the public when it did. The CDC Director(s) [both Dr. Besser who was the Acting Director at the onset of H1N1 and Dr. Frieden who later became the permanent Director] were very clear in the initial public briefings on H1N1 that the CDC was working with a high degree of uncertainty about the disease outbreak and that the public should anticipate that official guidance might change as new information was discovered and the actual

threat from the disease was better understood. This practice of admitting uncertainty and having incomplete information stood in stark contrast to the public information releases from the early days of the 2001 anthrax incidents where misinformation and erroneous information was presented as fact by senior government officials.

5) Communication was viewed as critical and a means to reduce uncertainty.

Communication was mentioned by every interview participant as being one of -if not the most- critical aspects of the response. The majority of the participants rated the CDC's communication practices, both internal and external, as extremely effective and as having contributed significantly to the overall success of the response effort.

Many commented specifically on the priority placed on communication (and transparency) by the CDC Director.

6) There was an organizational commitment to Transparency.

This commitment was stated repeatedly by numerous interview participants, including those not directly involved in media relations and public communication. The chief media spokespersons frequently mentioned this as a priority for the Agency, as did the CDC Media Relations staff. Other staff members also mentioned this during their interviews citing the importance of keeping the public informed even when the information was not certain or was likely to change. Several interview participants remarked that they believed this had been one of the Agency's strongest points during the response. This commitment to transparency was almost certainly a result of the previous experience during the anthrax crisis where the Agency, the Department of Health and Human Services (HHS) , and the Federal government in general was accused of deliberately hiding and withholding information from the public.

7) *The CDC response was pro-active and adaptive with numerous examples of innovative thinking and willingness to revise/change practices evident in key areas of the response.*

Planning.

Well, I think it's sufficient to say that- that the pandemic that emerged upon us was not necessarily the pandemic that we had anticipated with the greatest probability. However, I think it's also fair to say that all along in our exercises and our planning, *we appreciated that any pre-event planning would need to have inherent flexibility* to adjust the reality on the ground. And so I think there were many decision points along the way in which *we recognized that we would choose options based on how things were unfolding* (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview # 5, lines 66-72, Appendix C).

The ability to make adjustments to plans and expectations.

The biggest issue was- ok- this is not H5N1. It doesn't- we don't know what the mortalities are- there's just a lot of thing we don't know and it's also not on the other side of the world. It's in our country now. What- what do we do? And so *a lot of the work was adapting the plan to the situation that was actually evolving* (Dr. Jay Butler, Director H1N1 Vaccine task Force, Interview # 4, lines 70-73, Appendix C).

Disease/outbreak modeling.

One of the areas where CDC was particularly innovative was in developing new models to predict the spread of the H1N1 outbreak. Since the H1N1 virus was not behaving like a 'normal' flu virus and its transmission patterns did not match the existing models, the CDC had to come up with a new approach. Dr. Martin Meltzer, an economist and specialist in modeling, described how complicated this modeling process was and how they had to think about a

different way to use the data they had in order to make useful predictions about where the disease (likely) would go next and what part of the population was at highest risk for infection.

So we started to produce some early models giving some estimates and the word guesstimate is probably more accurate because at that time, we had not ideas really of the true number of people that were falling ill and even the rates of hospitalization and death were somewhat of a guess. I was using a lot of 1968 type data. I said if this was a 1968 type data pandemic, this is what it might look like -knowing full well it probably wasn't and saying this is an initial estimate. And as we worked on that, we were waiting for better data to come along which it did fortunately and it was a very rare event that we got the better data.

So I started using that. And then we did what's never been done as far as I know in influenza, we used what we called the pyramid model in which you start off at the top with the known lab confirmed reported cases and hospitalizations, and work your way back by going out into the field and doing surveys and getting a sense of who gets tested if they go to the doctor. 'Cause not everybody that goes to the doctor gets tested. So what percentage of people who go to the doctor get tested? And even the step before that-not everybody who's ill goes to the doctor so we did surveys in particular in Detroit and Chicago, but there were other similar surveys in New York and Minneapolis asking people and doctors, if you're ill, do you go to the doctor? And if you're at the doctor, does the doctor test you? And if the doctor tests you, do they send the sample forward to a State epidemiological lab for testing? And if the lab tests, do they send us the report? And again the same with hospitalization. This sort of protocol has actually been

used for a while in food borne diseases, but it's never been used, that I know of prior to this, for influenza or any respiratory disease (Dr. Martin Meltzer, Senior Health Economist and Distinguished Consultant, Division of Emerging Infections and Surveillance, Interview # 9, lines 82-89, 99-11, 112-114, Appendix C).

Decision Making Process

The decision-making processes during the H1N1 response deserve special recognition for being unconventional and innovative and for contributing to the adaptive nature of the CDC response. Participants reported that decision-making could be split into two timeframes or phases- the very early days of the crisis – lasting approximately ten days- and then the second phase that began after the pandemic had been officially declared.

- *Decision-making was participatory and unconventional*

One of the novel approaches that CDC took in structuring their decision-making process was in creating a staff organization known as the Plans Decision Unit (PDU). Dr. Steve Redd, the H1N1 Incident Commander praised this approach and described the way it operated,

We actually used a method of decision-making that was called the Plans Decision Unit so we'd identify a decision that needed to be made, there'd be a group that would sequester, come up with a briefing in a very structured way, including options, pros and cons for options, and a developing criteria for evaluating the options and then recommendations- and we'd talk about that and come up with a- all the important things were actually recommendations even though we called them decisions but we'd come up with a CDC recommendation (Dr. Stephen Redd, H1N1 Incident Commander, Interview # 12, Lines Appendix C).

Dr. Stephanie ZaZa, a key leader of the PDU and one of the principal decision strategists, described the way the group approached developing these recommendations,

...And so they were calling on us to try and run through these processes with the subject matter experts who could provide the data, and could provide some of the reality checks on what those options were. So it was a relatively small cadre of people who were actually in the Plans Unit. If I was given an assignment, so for example, the assignment to do the school closure recommendation, I would then pull in people from the epidemiology unit, from the group of people who thought about school closures in the past and who'd done some of the original planning for that, and I - you know- I can't remember, but for each one, it was generally a slightly different group of people based on their expertise. We always tried to bring in an ethicist to help us think through the issues.

...My feeling is that it is an extremely systematic but rapid method for looking at a lot of information very quickly and bringing it forward to a leader. So it's a very effective method and one that I use all the time because it suits my style, and it suits my need to move very quickly. I do think it will be something that we'll be able to very easily translate to other types of responses (Dr. Stephanie ZaZa, Deputy Director for Strategy, Office of Public Health Preparedness and Response, Interview # 16, Lines 88-98,183-186, Appendix C).

- *Use of outside advisors (Team B) was a significant advantage*

Team B was a special advisory group formed by Dr. Besser [Acting Director] and chaired by Dr. David Sencer. In his capacity as a special advisor to the Director, Dr. Sencer had considerable influence on the leadership team and facilitated a number of working groups and strategy sessions to assist in the H1N1 response. Team B was a small group of highly

qualified, often highly specialized subject matter experts from outside the CDC. Using his extensive personal and professional network or contacts, Dr. Sencer was able to personally reach out to these individuals and ask for their support and advice during the H1N1 response period. Dr. Stephanie ZaZa who had a key leadership role in strategy development during H1N1 described Team B in this way,

...there was a group that Dr. Besser had initiated that they called Team B, which was a group of outside experts from around the country who could weigh in on certain issues and help us think through them from a more practice, or academic, or policy perspective. And a couple of times, in doing decision briefs, we would bring a specific question to them and ask for their input, and then we would take that input and bring it into the decision briefing process itself and use that as a source of information (Dr. Stephanie ZaZa, Deputy Director for Strategy, Office of Public Health Preparedness and Response, Interview # 16, Lines 119-126, Appendix C).

- *Leadership made important decisions about decision-making*
 - 1) Identify decisions that need to be made and prioritize them
 - 2) Communicate often
 - 3) Change when necessary

Examples from transcripts that demonstrate how these were enacted include the following:

And I think in the first few days or maybe a week or so, there was so much activity that the decision making was not very organized and I think that's an important thing to try to get a grip on- is *what are the decisions that need to be made and just the process of identifying them is really helpful* in- to provide the structure that's needed.

...Overall I think we wanted to make sure that information that went out was grounded. And so it was grounded in evidence that if we didn't know the information or, excuse me- didn't know the certainty of the information, that we communicated that. *So we did not wait until we had everything figured out before we would say it* (Dr. Stephen Redd, H1N/A Incident Commander and Director, Director CDC Influenza Coordination Unit, Interview # 12, lines 223-227, Appendix C).

Dr. Daniel Jernigan commented on his perception of the focus on being transparent and timely in releasing information to the public. He stated,

And so we always wanted to make sure that what we provided was something they could use to prevent illness themselves, or to act on. But, *in general, it was the transparency, getting it out very quickly*, and making sure that we were presenting it in a way that they could understand our concern about it, but in a way that would induce panic unnecessarily but we want people to understand the potential problems (Dr. Daniel Jernigan, Deputy Director, Influenza Division, Interview #8, lines 113-117, 123-128, Appendix C).

Commenting on how guidance and decisions were revised based on finding new information or just by gaining a better appreciation of the severity of the threat, Dr. Marty Cetron said,

So these were very difficult decisions [school closings, school dismissal] and I think what we saw was an appreciation of how difficult the decisions were, what CDC's role would be in laying out the risk analysis, laying out some of the options, communicating those challenges directly to senior decision makers both

inside the Agency [CDC] and above – above us in the – in the thinking. And *you saw an evolution of CDC's recommendations around school dismissals based on learning more information about the virus* (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview # 5, lines 126-132, Appendix C).

Additional Observations and Areas for Further Research

An interesting factor that affected some aspects of the early phase of the H1N1 response development was the absence of permanent leadership at both the Department of Health and Human Services and the CDC. The appointment of Kathleen Sebelius as Secretary of Health and Human Services had been delayed repeatedly in Congress and she was not finally confirmed until April 28, 2009. The CDC had announced the H1N1 outbreak publicly 10 days earlier and there had been considerable media attention since the initial announcement. All official communication regarding H1N1 was coming directly from the CDC, primarily in the form of daily press briefings with the Acting Director and Dr. Anne Schuchat, who assumed the role of primary media spokesperson for the Agency.

Response participants, particularly members of the media relations staff mentioned that obtaining Departmental (HHS) clearance for public statements was a difficult and complicated process- and was exacerbated by the lack of a permanent Secretary and a resulting reluctance on the part of the staff to make decisions. On 26 April 2009 the Acting Secretary made a statement declaring H1N1 a national health emergency. This had the effect of making the CDC the single point and authority for information on H1N1 and this shift away from the HHS as the focal point persisted throughout the H1N1 period. CDC participants noted that there was a perception of greater autonomy as a result. However, the CDC was also without permanent leadership until June 2009 and experienced its own internal challenges with new leadership coming on board

during a public health crisis that had engaged nearly every office and division of the Agency. Dr. Richard Besser was the Acting CDC Director during the initial phase of H1N1 until Dr. Thomas Frieden was appointed as the permanent Director on 8 June 2009. Addressing this issue specifically, Dr. Stephanie ZaZa made the following remarks;

...I think that there were – that we were operating in an environment of- of either no appointed leadership or brand new appointed leadership throughout the entire Department and – and CDC was looked to – to lead in that situation and I think that our leadership did an excellent job of stepping in, making decisions, moving things forward, and using data to drive decisions, to not letting the expedient or the easy things drive what they did but to make very, very difficult decisions and then move those forward. And then, in the middle of all that, to educate a new group of appointed and elected leadership, and to make sure that they knew what was going on, I think they did a very good job (Dr. Stephanie ZaZa, Deputy Director for Strategy, Office of Public Health Preparedness and Response, Interview # 16, Lines 223-231, Appendix C).

While the impact of senior leadership transition (and absence) at the agency level and at the Federal Departmental level during a crisis of this magnitude was not a focus of this study, it definitely would be an interesting area for further research and study.

Overall the interview participants regarded the CDC's response to the H1N1 pandemic as very effective and successful. Many stated that they believed the CDC did an excellent job in responding to the H1N1 crisis, under very difficult and challenging circumstances.

Communication, both internal and public, was repeatedly mentioned as a particularly strong area

of the response and one that contributed significantly to its overall success. Addressing this specifically in her interview, Dr. Stephanie ZaZa stated,

The other thing I think CDC did extremely well was laying out a very clear and open and transparent communication process. Making sure that not only were we talking with the people we normally talk to, our State and local health department partners, for example, in frequent- daily- if not multiple times during the day – calls, but also to the public, directly to the public and making sure that our senior leaders were visible and available I don't know how many press availability sessions they did- and talking points and interviews- but it was constant. And I think that the only way to help leader through that kind of situation is to be very active and proactive in a communication portfolio of activities and I think they did a very good job of that (Dr. Stephanie ZaZa, Deputy Director for Strategy, Office of Public Health Preparedness and Response, Interview # 16, Lines 232-241, Appendix C).

One area that was consistently noted by the interviewees as an exception to this general perception of success, however, was with the vaccine distribution program. The vaccine issue in its entirety was very difficult- perhaps one of the most challenging aspects of the response- as it was quickly determined in the earliest days of the crisis that the existing flu vaccines (stockpiled in millions of doses) would in all likelihood not be effective against H1N1. The CDC was confronted with the problem of immediately having to develop an entirely new vaccine, laboratory test it, receive approval for use, and then deploy it to the general population. The most optimistic estimates at the time put the likely availability date of a new vaccine at more than six months after development began, assuming there were no problems in developing the vaccine. Unfortunately, the public was already experiencing the effects of the disease and expectations

were that the CDC would be able to provide an effective vaccine to control the pandemic. Additionally, CDC knew that introducing a new vaccine would raise concerns about vaccine safety and this coupled with the existing public perception problem(s) of who actually needed the vaccine (who was likely to get sick) and the resistance from the highest risk groups- pregnant women, infants (parents), and young adults (primarily ages 18-23) who were not traditionally high risk candidates for contracting seasonal flu - presented the CDC with significant communication challenges. Many interview participants stated that they felt the communication around the vaccine program was the problem- that the Agency had not done as good a job as possible of communicating infection risk, vaccine safety, and most importantly had failed to manage expectations concerning vaccine availability. This aspect of the response was also not a focus of this study, which may be considered a limitation. However, the vaccine program is clearly an area deserving of additional research and study as these same issues will (likely) be recurring challenges in future influenza pandemics and it may be possible to provide recommendations for improving practices and procedures, and especially in managing expectations through effective crisis communication.

Limitations

The Case study approach used in this research may make it difficult to generalize the results and findings as well as the recommendations to other situations and scenarios. Specifically, the public health focus of this case study, the CDC and the H1N1 pandemic, may persuade other researchers that the context limits the study's applicability and may create a perception that the observations and findings are not valid in other crisis contexts. Additionally, the unusual and unique CDC organizational demographic with its highly educated and closely bonded leadership/response team may mean that other organizations may not be able to adopt the

CDC's approach to crisis response and may not be able to implement the recommendations. Qualitative research and studies are sometimes limited with regard to predictive ability due to unique situations and circumstances – thus the in-depth personal interviews and the Oral History project format may also not be applicable to other large government organizations. In fact, this Oral History project was a first for the CDC and the informal and conversational approach used during the interviews may not work as well in other organizations and with different interview participant groups.

A further limitation tied to the interviews concerns the interview data and the Oral History project. As mentioned previously, one individual- Dr. David Sencer, personally selected each interview participant and their selection was based solely on his judgment and decision. This may reflect a personal bias on his part due to friendship and/or a professional relationship history. Although Dr. Sencer had an active role in the H1N1 response effort as a special advisor to the Director and Chair of the Director's advisory group Team B, it is possible that individuals with important roles in the H1N1 response but not as well known to Dr. Sencer may have been excluded from the Oral History interview process. His choices may also have been influenced by his perspective as a former CDC Director where he likely interacted primarily with the most senior CDC staff members. All of the Oral History interview participants that he ultimately selected had many years of experience at CDC and would certainly be considered senior staff, with the majority holding key leadership positions within the organization. This selection of primarily senior staff members to provide accounts of the response process would certainly influence both the overall assessment of the response effort and the specific details of how the response was developed. It is possible that if more junior staff members had been interviewed

their observations and recollections would have provided a very different perspective and perhaps even a different assessment of the overall response effort.

Additionally, it must be considered that due to their seniority, a strong sense of organizational identity, and their leadership roles within the CDC, the interview participants' comments and observations were likely influenced, or at least tempered, by their desire to maintain and/or protect the organization's public reputation. Particularly in light of their shared experience with the 2001 anthrax attacks and the resulting negative perceptions of the Federal government's response capability to address public health crises, these CDC veterans were undoubtedly determined to not repeat the mistakes that were made during that crisis and to present the organization positively. Other constraints or influences that may be important to consider in the responses and conclusions of the interview participants are their background, specific professional area expertise, education, and their language choice(s) specifically relating to threat characterizations, disease severity and potential, and perspectives as medical doctors. Each participant was also made aware that their interview recording would become public record and would be viewed internally at CDC by their colleagues. This factor may also have influenced or tempered their remarks, particularly in cases where their comments might be construed as critical or negative.

There may also be a bias or error in the selection of the data from the individual interviews I used as examples of the designated analytic categories- these interview quotes and excerpts were selected solely by me, based on my understanding of the intent of the question and my interpretation of the participant's response. The interview participants did not review this study so the accuracy of their individual interview transcripts and their agreement or disagreement with the use of their comments to reinforce or demonstrate certain points cannot be

determined or assumed. Additionally, the interview questions focused primarily on specific process and procedural aspects of the response effort and how the response participants managed uncertainty and ambiguity in making decisions during the emerging H1N1 crisis. Other important parts of the response such as details of the vaccine production and distribution problems were not explored in-depth. As many participants highlighted this as an area where they felt the response had not been as good as it could have been and where there was definitely room for improvement, I would recommend this as a topic for future research and analysis.

Implications

The findings from this study have implications for organizations and their leaders that are confronted with emerging and unpredictable threats- or are facing crisis situations where traditional or conventional response actions and plans do not appear adequate. The CDC response participants identified many ‘lessons learned’ and made a number of specific recommendations in terms of organizational processes and procedures for future crisis responders to consider. However, the overarching lesson- or message- has more to do with how developing a certain mindset and mentality- an open-minded and flexible approach to problem solving- is more likely to lead to a successful response than will instituting specific procedures.

The quality of ‘*adaptive response capability*’ as a singular organizational practice and strength is inherent throughout the comments made by the interview participants. The importance and value of being able to develop and implement this kind of response capability is one of the most significant implications for other organizations and leaders.

Process and Procedural Recommendations

The interview participants made a number of specific recommendations for changes in process or procedures, or for organizations planning for potential future crisis situations or threats. These specific recommendations and examples from the interviews include:

1) *Staffing*

Staffing for the response effort was mentioned by several interview participants as a major challenge area for the CDC leadership- primarily at the mid management level where Division or Office Directors were required to release key staff members to join the response team- with no known return date. As the H1N1 response continued for over a year this became a significant management problem. There were no staffing plans to account for a disaster or emergency of this duration- all the details of adding staff to other teams or to a response team unit were suddenly brought to forefront and there were no plans in place. Issues such as office budgets for pay, plans for time off, vacation schedules, on-going projects, and so on all had to be dealt with as they came up and this resulted in a very uneven application of policies and regulations, which caused separate issues. It was also noted that there was not an existing database of experienced people- experienced in different aspects of emergency response- and that this would have been extremely helpful. Instead, managers reported contacting people they knew directly to see who might have certain skills and experience and also if they were available and for how long. There was no simple way to determine who was deployed to foreign locations, when they would return, and so on. This problem is reflected in a comment made by Dr. Lynn Austin:

I believe *the CDC needs to develop a deeper bench*. We often, in these kinds of – depending on the type of area- the type of focus- of a response or an event- it's often many of the same people. And in a short-term response that's okay because people can usually crash on an – on an activity or event work, you know, many hours, work weekends and be okay- then three weeks later or four weeks later can- can slow down a little bit. This was so much more, so much longer that I've found that we

need to – we need to develop more of our junior staff. We need to bring them into the response, have them work side-by side- with the senior people and then give them the opportunity you know over time in an event like this to see- you know, what it’s like and how to respond so that we do develop that deeper bench strength (Dr. Lynn Austin, Deputy Director for Operations, Office of Public Health Preparedness and Response, Interview #1, lines 139-150, Appendix C).

2) *Resource Planning*

Resources, both personnel and monetary, were frequently mentioned by the interview participants as an area where they would recommend improvement in process. For example, Dr. Anne Schuchat notes,

The other thing that was procedurally difficult was funding. In May- the weekend of May 17th or 18th, a couple of us spent [it] drafting out a budget for a vaccination program and rounds and rounds of policy decisions, emergency funds or Congressional appropriates, you know, *but the ability to move money from this part of the Government to another part, from within our Agency to States, to locales to where they can do the vaccinations really took extraordinarily too much time* (Dr. Anne Schuchat, Director, National Center for Immunization and Respiratory Diseases, Interview #13, lines 292-298, Appendix C).

3) *Identify experienced staff*

Being able to identify the right people for certain positions and for the response itself was noted as a challenge by several participants. Steven Boedigheimer commented on this problem stating:

Well, we tried the standard approach of the Emergency Operations Center reaching out across CDC to identify individuals that would be available to come and be part of the task force. But frankly, *the most effective was for our own individuals for example myself, to pick up the phone and call people around CDC. The informal approach actually worked faster for us to identify talented people and get them onboard quickly to offer the support* (Mr. Steven Boedigheimer, Deputy Director, Division of State and Local Readiness, Office of Public Health Preparedness and Response, Interview# 3, 221-226, Appendix C).

4) *Planning and preparedness is critical*

The emphasis that the CDC leadership had placed on table-top exercises and scenario response planning was cited frequently by the interview participants as a significant contributing factor for the success of the H1N1 response. Even though many noted that they had been preparing for and planning for a completely different kind of influenza pandemic- all stated that the experience of working on developing response plans or practicing crisis scenarios was invaluable.

Don't underestimate the huge amount of –of value- in preparedness, and the difference in the ability to confront a crisis, even if it's totally new or not the pandemic you planned for (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview # 5, lines 269-272Appendix C).

3) *Commit to flexibility and adaptability*

And then secondly, don't ever feel wed to the words on –in the planning book and *make sure that there's a complete open mindedness along the way for surprises, for curve balls, for unintended consequences or unforeseen circumstances, and be sure to build in the flexibility to adjust your response – and the wisdom to have-* a

way to get feedback into that response to be able to see new patterns that did- that you might not have thought about in the preparedness phase (Dr. Marty Cetron, Director, Global Migration and Quarantine Division, Interview # 5, lines 274-279, Appendix C).

Other Recommendations.

Based on the analysis of my data, one of the recommendations I make is for the development of a formal model to support and engage the principles of Emerging Infectious Disease Communication (EIDC). In my literature review I was not able to find any working models to apply in support of the EIDC approach to crisis communication. The CDC's CERC model is currently the standard model used for risk and crisis communication in public health, but it is not a model that supports the more emergent and adaptive attributes and characteristics of the EIDC approach, which appears to be the direction that CDC is moving in their approach to crisis response. I would recommend the development of a formal EIDC model, aligned with the CERC model, that would assist crisis response teams in developing communication strategies tailored to specific and immediate situational requirements particularly in the case of an emergent and unfamiliar/unexpected threat or crisis.

Conclusion

The purpose of this study was to investigate the relationship between sensemaking and decision-making- in a crisis environment where the situation is unpredictable, emergent, and characterized by uncertainty. Based on the data from the CDC H1N1 case study, I believe that these two activities cannot be separated but must be engaged in concurrently, as one on-going, fluid process where changing direction, revising decisions, and continually incorporating new information is the organizational 'norm'. Sensemaking must be the goal- not decision-making.

In his book *Making Sense of the Organization*, Karl Weick quotes a firefighting commander who explains that he is most effective in his job when he sees himself as a sensemaker and not a decision-maker. He explains why this is in the following statement,

If I make a decision, it is a possession; I take pride in it, I tend to defend it and not listen to those who question it. If I make sense, then this is more dynamic and I can listen and I can change it. A decision is something you polish. Sensemaking is a direction for the next period. (Weick, 2009, p.5)

Leadership support is not only necessary but critical to develop an organizational culture that encourages this kind of adaptive and flexible response, one that encourages innovative thinking and the ability to look beyond established protocols, to revise and perhaps reverse decisions, to maintain a fluid approach to procedures and decision-making. While none of the interview participants specifically mentioned the principles of organizational learning as described and defined by Peter Senge (Senge, 1990,1994, 2006) it was clear from their comments that the response participants had engaged in these practices and that CDC is an organization with a 'learning' culture, as Senge defines it. In his book *The Fifth Discipline: The Art & Practice of the Learning Organization*, he contends

....in situations of rapid change only those [organizations] that are flexible, adaptive and productive will excel. For this to happen, organizations need to 'discover how to tap people's commitment and capacity to learn at *all* levels'...and further,

While all people have the capacity to learn, the structures in which they have to function are often not conducive to reflection and engagement. Furthermore, people may lack the tools and guiding ideas to make sense of the situations they

face. Organizations that are continually expanding their capacity to create their future require a fundamental shift of mind among their members (Senge, 2006).

Analyzing the CDC's actions during the H1N1 response as an example of a learning organization in practice is also outside the scope of this study, although this would certainly be an interesting topic for a future study. However, just as one good example of how flexible thinking and an organizational willingness to engage with uncertainty rather than to try to simply get rid of it, or ignore it- was reflected by the interview participants, I think it is worth repeating a quote from Dr. Steve Redd, the H1N1 Incident Commander who said,

I think what actually happened is that we learned that we knew less and less about what the situation was- than we thought- and that was a bit unnerving- but keeping a grip on the uncertainty became an important way of navigating; and also, identifying some practical actions to take to find out more (Dr. Steve Redd, H1N1 Incident Commander, Interview #12, lines 84-88, Appendix C).

References

- American heritage dictionary*. (2009). New York, NY: Houghton Mifflin.
- Arpan, L. M., & Roskos-Ewoldsen, D. R. (2005). Stealing thunder: Analysis of the effects of proactive disclosure of crisis information. *Public Relations Review*, *31*(3), 425-433.
doi:10.1016/j.pubrev.2005.05.003
- Bennis, W., Goleman, D., & Biederman, P. W. (2008). *Transparency: How leaders create a culture of candor*. San Francisco, CA: Jossey-Bass.
- Bryant, T. J., Vertinsky, I., & Smart, C. (2007). Globalization and international communicable crises: A case study of SARS. In D. E. Gibbons (Ed.), *Communicable crises: Prevention, response, and recovery in the global arena* (pp. 265-300). Charlotte, NC: Information Age Publishing.
- Buehler, J. W., Hopkins, R. S., Overhage, J. M., Sosin, D. M., & Tong, V. (2004, May 7). Framework for evaluating public health surveillance systems for early detection of outbreaks: Recommendations from the CDC Working Group. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, *53*(RR-5), 1-16.
doi:http://www.cdc.gov/mmwr/PDF/rr/rr5305.pdf
- Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organizational Science*, *13*(4), 442-445.
- Carlile, P. R. (2004). Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries. *Organizational Science*, *15*(5), 555-568.
doi:10.1287/orsc.1040.0094

Centers for Disease Control & Prevention. (2007, October). *Crisis and emergency risk communication: Pandemic influenza*. Atlanta, GA: CDC. Retrieved from <http://emergency.cdc.gov/cerc/pdf/CERC-PandemicFlu-OCT07.pdf>

Centers for Disease Control & Prevention. (2009). *The 2009 H1N1 pandemic: Summary highlights, April 2009-April 2010*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/h1n1flu/cdcresponse.htm>

Centers for Disease Control & Prevention. (2010, May 14). *Updated CDC estimates of 2009 H1N1 influenza cases, hospitalizations and deaths in the United States, April 2009 – April 10, 2010* [Archive site]. Atlanta, GA: CDC. Retrieved from http://www.cdc.gov/h1n1flu/estimates_2009_h1n1.htm

Centers for Disease Control & Prevention. (2010, January 15). *About the Morbidity and Mortality Weekly Report (MMWR) series*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/mmwr/about.html>

Centers for Disease Control & Prevention. (2010, June 16). *The 2009 H1N1 pandemic: Summary highlights, April 2009-April 2010*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/h1n1flu/cdcresponse.htm>

Centers for Disease Control & Prevention. (2010, July 30). Update: Influenza Activity: United States, 2009-10 Season. *Morbidity and Mortality Weekly Report (MMWR)*, 59(29), 901-908. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5929a2.htm>

Centers for Disease Control & Prevention. (2011, September). *A national strategic plan for public health preparedness and response*. Atlanta, GA: CDC. Retrieved from http://www.cdc.gov/phpr/publications/2011/A_Natl_Strategic_Plan_for_Preparedness_20110901A.pdf

- Centers for Disease Control & Prevention. (2012, July 27). CDC's vision for public health surveillance in the 21st century. *Morbidity and Mortality Weekly Report: MMWR* 61(Suppl), 1-40.
- Centers for Disease Control & Prevention. (2013). *FY 2013 budget request summary*. Atlanta, GA: CDC. Retrieved from http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_Budget_Request_Summary.pdf
- Centers for Disease Control & Prevention. (2013, November 15). *CDC Surveillance Resource Center*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/surveillancepractice/>
- Centers for Disease Control & Prevention. (2014, February 24). *Center for Surveillance, Epidemiology, and Laboratory Services: Division of Laboratory Programs, Standards, and Services*. Atlanta, GA. Retrieved from <http://198.246.124.22/OPHSS/CSELS/dlpss/>
- Chen, M. (2009, April 25). *Swine influenza*. [Statement to the press]. Geneva, Switzerland: World Health Organization. Retrieved from http://www.who.int/mediacentre/news/statements/2009/h1n1_20090425/en/
- Chen, M. (2009, June 11). *World now at the start of 2009 influenza pandemic*. [Statement to the press]. Geneva, Switzerland: World Health Organization. Retrieved from http://www.who.int/mediacentre/news/statements/2009/h1n1_pandemic_phase6_20090611/en/
- Chess, C., & Clarke, L. (2007). Facilitation of risk: communication during the anthrax attacks of 2001: The organizational backstory. *American Journal of Public Health*, 97(9), 1578-1583. doi:10.2105/ajph.2006.099267

- Clapper, J. R. (2013, April 11). *Statement for the Record: Worldwide threat assessment of the US intelligence community*, House Permanent Select Committee on National Intelligence. Washington, DC: House Permanent Select Committee on Intelligence. Retrieved from <http://www.dni.gov/files/documents/2014%20WWTA%20HPSCI%20SFR%20.pdf>
- Collins, H. (2009, May 19). *Are you worried?: Swine flu and you*. [CNN Newsroom]. Retrieved from <http://newsroom.blogs.cnn.com/2009/05/page/9/>
- Committee on Assuring the Health of the Public in the 21st Century. (2002). *The future of the public's health in the 21st century*. Washington, DC: National Academies Press. Retrieved from http://www.nap.edu/catalog.php?record_id=10548
- Covello, V. T. (2003). Best practices in public health risk and crisis communication. *Journal of Health Communication*, 8(Suppl 1), 5-8. [Discussion 148-51]. doi:10.1080/10810730390224802
- Cross, M. G. (2005, May 2). *Influenza pandemic: Challenges remain in preparedness: Testimony before the Subcommittee on Health, Committee on Energy and Commerce, House of Representatives (GAO-05-760T)*. Washington, DC: Government Accountability Office. Retrieved from <http://www.gao.gov/new.items/d05760t.pdf>
- Dawood, F. S., Iuliano, A. D., Reed, C., Meltzer, M. I., Shay, D. K., Cheng, P.-Y., ... Widdowson, M.-A. (2012). Estimated global mortality associated with the first 12 months of 2009 pandemic influenza A H1N1 virus circulation: A modelling study. *The Lancet Infectious Diseases*, 12(9), 687-695. doi:10.1016/S1473-3099(12)70121-4
- Dodgson, M., Gann, D., & Salter, A. (2007). In case of fire, Please use the elevator: Simulation technology and organization in fire engineering. *Organization Science*, 18(5), 849-864. doi:10.1287/orsc.1070.0287

- Duncan, A. (2009, October 21). Testimony of Secretary Arne Duncan, U.S. Department of Education [Monitoring the Nation's Response]. In *Hearings before the Committee on Homeland Security and Governmental Affairs United States Senate of the one hundred eleventh Congress first session* [Senate Hearing 111-910 H1N1 flu—2009; pp. 90-99]. Washington, DC: Government Printing Office. Retrieved from <http://www.gpo.gov/fdsys/pkg/CHRG-111shrg51020/pdf/CHRG-111shrg51020.pdf>
- Eisenberg, E.. (2007). *Strategic ambiguities: Essays on communication, organization, and identity*. Thousand Oaks, CA: Sage Publications.
- Florini, A. (2007). *The right to know: Transparency for an open world*. New York, NY: Columbia University Press.
- Frieden, T. (2010, August 23). *Dr. Thomas Frieden's remarks at the 2010 Influenza Workshop for Journalists*. Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/media/transcripts/2010/t100823.htm>
- Freimuth, V. S. (2003). Epilogue to the special issue in anthrax. *Journal of Health Communication, 8*(Suppl), 148-151. doi:10.1080/713851979
- Freimuth, V. S. (2006). Order out of chaos: The self-organization of communication following the anthrax attacks. *Health Communication, 20*(2), 141-148. doi:10.1207/s15327027hc2002_5
- Freimuth, V. S., Hilyard, K. M., Barge, J. K., & Stokler, L. A. (2008). Action not talk: A simulation of risk communication during the first hours of a pandemic. *Health Promotion Practice, 9*(4s), 35s-44s. doi:10.1177/1524839908322111

- Frewer, L. J., Hunt, S., Kuznesof, S., Brennan, M., Ness, M., & Ritson, C. (2003). The views of scientific experts on how the public conceptualizes uncertainty. *Journal of Risk Research*, 6(1), 75-85. doi:10.1080/1366987032000047815
- Fung, A., Graham, M., & Weil, D. (2007). *Full disclosure: The perils and promise of transparency*. New York, NY: Cambridge University Press.
- Gibbons, D. E. (2007). *Communicable crises: Prevention, response, and recovery in the global arena*. Charlotte, NC: Information Age Publishing.
- Glik, D. C. (2007). Risk communication for public health emergencies. *Annual Review of Public Health*, 28, 33-54. doi:10.1146/annurev.publhealth.28.021406.144123
- Goffman, E. (1972). *Strategic interaction*. New York, NY: Ballantine Books.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. New York, NY: Harper & Row.
- Hanson, A. & Levin, B. L. (2013). *Mental health informatics*. New York, NY: Oxford University Press.
- Hilyard, K. M., Freimuth, V. S., Musa, D., Kumar, S., & Quinn, S. C. (2010). The vagaries of public support for government actions in case of a pandemic. *Health Affairs*, 29(12), 2294-2301. doi:10.1377/hlthaff.2010.0474
- Historical perspectives: History of CDC. (1996, June 28). *Morbidity and Mortality Weekly Report*, 45(45), 526-530. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00042732.htm>
- Holmes, N. J. (2008). Communicating about emerging infectious disease: the importance of research. *Health, Risk & Society*, 10(4), 349-60. doi:10.1080/13698570802166431

- Holmes, B., Henreich, N., Hancock, S., & Lestou, V. (2009). Communicating with the public during health crises: Expert's experiences and opinions. *Journal of Risk Research*, 12(6), 793-807.
- Jederberg, W. W. (2005). Issues with the integration of technical information in planning for and responding to nontraditional disasters. *Journal of Toxicology & Environmental Health, A: Current Issues*, 68(11-12), 877-888. doi:10.1080/15287390590912171
- Jennings, B. & Arras, J. (2008, October 30). *Ethical guidance for public health emergency preparedness and response: Highlighting ethics and values in a vital public health service. Prepared for the Ethics Subcommittee, Advisory Committee to the Director, Centers for Disease Control and Prevention*. Atlanta, GA: CDC. Retrived from http://www.cdc.gov/od/science/integrity/phethics/docs/White_Paper_Final_for_Website_2012_4_6_12_final_for_web_508_compliant.pdf
- Kahn, L. H. (2009). *Who's In charge? Leadership during epidemics, bioterror attacks, and other public health crises*. Santa Barbara, CA: Praeger Security International.
- Kanof, M., & Anderson, B. (2004, January 30). *Centers for Disease Control and Prevention: Agency leadership taking steps to improve management and planning, but challenges remain: Report to the Director of the Centers for Disease Control and Prevention (GAO-04-219)*. Washington, DC: Government Accountability Office. Retrieved from <http://www.gao.gov/assets/250/241302.pdf>
- Karnes, K. O. (2008). "What's the story? Framing of health issues by the U.S. Centers for Disease Control and Prevention and major newspapers: A qualitative analysis. [Thesis]. Georgia State University. Atlanta, FL. Retrieved from http://digitalarchive.gsu.edu/communication_theses/36

- Karwa, M., Currie, B., & Kvetan, V. (2005). Bioterrorism: Preparing for the impossible or the improbable. *Critical Care Medicine*, 33(1 Suppl), S75-95.
- Koplan, J. P., Bond, T. C., Merson, M. H., Reddy, K., S., Rodriguez, M. H., Sewankamb, N. K., for the Consortium of Universities for Global Health Executive Board. (2009). Towards a common definition of global health. *Lancet*, 373(9679), 1993-1995.
doi:10.1016/S0140-6736(09)60332-9
- Last, J. M., & Wallace, R. B. (1992). *Maxcy-Rosenau- Last public health and preventive medicine (13th ed)*. Norwalk, CT: Appleton and Lange.
- Leonard, H., & Howitt, A. M. (2007). Against desperate peril: High performance in emergency preparation and response. In D. E. Gibbons (Ed.), *Communicable crises: Prevention, response, and recovery in the global arena* (pp. 1-25). Charlotte, NC: Information Age Publishing.
- Lister, S. A. (2005, March 17). *An overview of the U.S. Public Health System in the context of emergency preparedness (CRS Report for Congress)*. Retrieved from <http://s3.documentcloud.org/documents/240229/an-overview-of-the-u-s-public-health-system-in.txt>
- Lucas, G. R., Jr. (2014). NSA management directive #424: Secrecy and privacy in the aftermath of Edward Snowden. *Ethics & International Affairs*, Advance online publication, 1-10.
doi:10.1017/S089267941300048
- Mebane, F., Temin, S., & Parvanata, C. F. (2003). Communicating anthrax in 2001: A comparison of CDC information and print media accounts. *Journal of Health Communication*, 8(Suppl 1), 50-82. doi:10.1080/713851970

- Meredith, L. S., Shugarman, L. R., Chandra, A. Taylor, S. L., Stern, S., Burke Beckjord, E., Parker, A. M., & Tanielian, T. (2008, December). *Analysis of risk communication strategies and approaches with at-risk populations to enhance emergency preparedness, response, and recovery: Final report*. Santa Monica, CA: RAND. Retrieved from http://www.rand.org/pubs/working_papers/WR598.html
- Millar, D. P., & Heath, R. L. (2004). *Responding to crisis: A rhetorical approach to crisis communication*. London, UK: Lawrence Erlbaum Associates.
- Mitchell, R. B. (2011). Transparency for governance: The mechanisms and effectiveness of disclosure-based and education-based transparency policies. *Ecological Economics*, 70(2011) 1882–1890. doi:10.1016/j.ecolecon.2011.03.006
- Moore, S., Mawju, A., Shiell, A., & Noseworthy, T. (2007). Public health preparedness: A systems level approach. *Journal of Epidemiology & Community Health*, 61(4), 282-286.
- Muhren, W. J., & Van de Walle, B. (2010). Sense-making and information management in emergency response. *Bulletin of the American Society for Information Science and Technology*, 36(5), 30-33. doi:10.1002/bult.2010.1720360509
- Napolitano, J. (2009, October 21). *Testimony of Secretary Napolitano before the United States Senate Committee on Homeland Security and Governmental Affairs, "H1N1 Flu: Monitoring the Nation's Response"* (Written Testimony). Retrieved from <https://www.dhs.gov/news/2009/10/23/testimony-secretary-napolitano-united-states-senate-committee-homeland-security-and>
- Office of Public Health Preparedness and Response. (2012, March 27). *What is CDC's role in emergencies?* Atlanta, GA: CDC. Retrieved from <http://www.cdc.gov/phpr/whatcdcisdoing.htm>

- P.L. 93-288, as amended, 42 U.S.C. 5121-5207 [Robert T. Stafford Disaster Relief and Emergency Assistance Act of 2007]. Retrieved from http://www.fema.gov/pdf/about/stafford_act.pdf.
- Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of Management Review*, 23(1), 59-76. doi:10.5465/AMR.1998.192960
- Pollard, W. E. (2003). Public perceptions of information sources concerning bioterrorism before and after anthrax attacks: An analysis of national survey data. *Journal of Health Communication*, 8 (Suppl 1), 93-103. doi:10.1080/713851974
- Preble, J. (1997). Integrating crisis management perspective into the strategic management process. *Journal of Management Studies*, 34(5), 767-791. doi:10.1111/1467-6486.00071
- Prue, C. E., Lackey, C., Swenarski, L., & Gantt, J. (2003). Communication monitoring: shaping the CDC's emergency risk communication efforts. *Journal of Health Communication*, 8(Suppl 1), 35-49; 148-151. doi:10.1080/713851975
- Ravasi, D., & Schultz, M. (2006). Responding to organizational identity threats: Exploring the role of organizational culture. *Academy of Management Journal*, 49(3), 433-458.
- Reynolds, B. (2007). *Crisis and emergency risk communication: Pandemic influenza* (2nd ed.). Atlanta, GA: Centers for Disease Control and Prevention.
- Reynolds, B. (2012). *Crisis and emergency risk communication* (2012 ed.). Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from http://emergency.cdc.gov/cerc/pdf/CERC_2012edition.pdf
- Reynolds, B., & Quinn, S. C. (2008). Effective communication during an influenza pandemic: The value of using a crisis and emergency risk communication framework. *Health Promotion Practice*, 9(4, Suppl), 13s-17s. doi:10.1177/1524839908325267

- Reynolds, B., & Seeger, M. W. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication, 10*(1), 43-55.
doi:10.1080/10810730590904571
- Ritchie, D. A. (2003). *Doing oral history: A practical guide*. New York, NY: Oxford University Press.
- Robinson, S. J., & Newstetter, W. C. (2003). Uncertain science and certain deadlines: CDC responses to the media during the anthrax attacks of 2001. *Journal of Health Communication, 8*(Suppl 1), 17-34; 148-151. doi:10.1080/713851980
- Schuchat, A. (2009, November 10). *The cost of being sick: H1N1 and paid sick days*. Washington, DC: Committee on Health, Education, Labor and Pensions, Subcommittee on Children and Families, United States House of Representatives. Retrieved from <http://www.hhs.gov/asl/testify/2009/11/t20091110a.html>
- Schuchat, A., & Vanderford, M. L. (2010). Readability of H1N1 information from the CDC web site. *Pediatric Infectious Disease Journal, 29*(5), 479.
doi:10.1097/INF.0b013e3181d1cfd7
- Sebelius, K. (2009, October 21). *2009 H1N1 influenza: Monitoring the nation's response: Testimony before the Committee on Homeland Security and Governmental Affairs United States Senate*. Washington, DC: Committee on Homeland Security and Governmental Affairs United States Senate. Retrieved from <http://www.hsgac.senate.gov/download/2009-10-21-revised-sebelius-testimony>
- Seeger, M. W., Sellnow, T. L., & Ulmer, R. R. (2003). *Communication and organizational crisis*. Westport, CT: Praeger.

- Seeger, M. W., Sellnow, T. L., & Ulmer, R. R. (2008). *Crisis communication and the public health*. Cresskill, NJ: Hampton Press, Inc.
- Senge, P. (2006). *The fifth discipline: The art & practice of the learning organization*, Revised edition. New York, NY: Doubleday.
- Sergiovanni, T., & Corbally, J. (Eds.) (1984). *Leadership and organizational culture*. Urbana, IL: University of Illinois Press.
- Shore, D. A. (2003). Communicating in times of uncertainty: the need for trust. *Journal of Health Communication, 8 Suppl 1*, 13-14. doi:10.1080/713851977
- Shore, D. (2007). Understanding the United States public health system. *California Health Policy Forum Issue Brief*, January, 1-4. Retrieved from <http://www.cahpf.org/GoDocUserFiles/207.CHI%20Brief%20United%20States.pdf>
- Staff. (2007, March 1). The fire next time: Pandemic flu, bioterrorism, and ghost of SARS (severe acute respiratory syndrome). *Bioterrorism Watch Newsletter, 6*(2), 9-12.
- Stake, R. E. (1978). The case study method in social inquiry. *Educational Researcher, 7*(2), 5-8.
- Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkley's Museum of Vertebrate Zoology 1907-39. *Social Studies of Science, 19*(3), 387-420. doi:10.1177/030631289019003001
- SteelFisher, G. K., Blendon, R. J., Bekheit, M. M., & Lubell, K. (2010). The public's response to the 2009 H1N1 influenza pandemic. *New England Journal of Medicine, 362*(22):e65. doi:10.1056/NEJMp1005102.

- Steinhardt, B. (2009, July 29). *Influenza pandemic: Gaps in pandemic planning and preparedness need to be addressed: Testimony before the Committee on Homeland Security, House of Representatives* (GAO-09-909T). Washington, DC: Government Accountability Office. Retrieved from <http://www.gao.gov/assets/130/123134.pdf>
- Steinhardt, B., & Crosse, M. (2011, June 27). *Lessons from the H1N1 pandemic should be incorporated into future planning* (GAO-11-632). Washington, DC: Government Accountability Office. Retrieved from <http://www.gao.gov/assets/330/320176.pdf>
- Taubenberger, J. K., & Morens, D. M. (2006). 1918 influenza: The mother of all pandemics. *Emerging Infectious Diseases*, 12(1), 15-22. Retrieved from <http://wwwnc.cdc.gov/eid/article/12/1/pdfs/05-0979.pdf>
- Thompson, T. (2001, October 4). *Press briefing by Ari Fleischer*. Retrieved from <http://www.presidency.ucsb.edu/ws/index.php?pid=47575>
- Tracy, S. J. (2013). *Qualitative research methods*. Malden, MA: Wiley-Blackwell.
- U.S. Department of Homeland Security. (2005). *Emergency planning: National response plan*. Washington, DC: Author. Retrieved from <http://web.archive.org/web/20051231004058/http://www.dhs.gov/dhspublic/interweb/assetlibrary/NRPbaseplan.pdf>
- U. S. Department of Health and Human Services, Office of the Secretary. (2009, August 4). Determination and declarations regarding emergency use of certain in vitro diagnostic, antiviral, and personal respiratory products accompanied by emergency use information. *Federal Register*, 74, (148), 38628-38630. Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2009-08-04/html/E9-18432.htm>

- U. S. Department of Health and Human Services. (2014). *Environmental health*. Retrieved from <http://healthfinder.gov/FindServices/SearchContext.aspx?topic=290&Branch=6&show=1>
- U. S. Government Accountability Office (GAO). (2003, October). *Bioterrorism: Public health response to anthrax incidents of 2001: Report to the Honorable Bill Frist, Majority Leader, U.S. Senate* (GAO-04-152). Retrived from <http://www.gao.gov/new.items/d04152.pdf>
- Vanderford, M. (2003). Communication lessons learned in the emergency operations center during CDC's anthrax response. *Journal of Health Communication*, 8(Suppl 1), 11-12. doi:10.1080/713851961
- Weick, K. E. (1993). The collapse of sensemaking in organizations: *The Mann Gulch disaster*. *Administrative Science Quarterly*, 38(4), 628-652.
- Weick, K. E. (2001). *Making sense of the organization*. Malden, MA: Blackwell.
- Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty* (2nd ed.). San Francisco, CA: John Wiley & Sons, Inc.
- Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). *Organization Science*, 16(4), 409-421. doi:10.1287/orsc.1050.0133
- Winslow, C.-E. A. (1920). The untilled field of public health. *Science*, 51(1306), 23-33.
- Wise, K. (2003). The Oxford incident: Organizational culture's role in an anthrax crisis. *Public Relations Review*, 29(4), 461-472. doi:10.1016/j.pubrev.2003.08.007
- World Health Organization. (2010, August 6). *Global Alert and Response (GAR): pandemic (H1N1) 2009 - update 112*. Geneva, Switzerland. Retrived from http://www.who.int/csr/don/2010_08_06/en/index.html?utm_source=twitterfeed&utm_medium=twitter

Zarcadoolas, C., Pleasant, A., & Greer, D. S. (2005). Understanding health literacy: An expanded model. *Health Promotion International*, 20(2), 195-203.

doi:10.1093/heapro/dah609

Appendix A: List of Selected Interview Participants and Positions Held During the H1N1

Response by the CDC

1. Lynn Austin, PhD

Deputy Director for Operations, Office of Public Health Preparedness and Response

2. Beth Bell, MD, MPH

Acting Director, National Center for Immunization and Respiratory Diseases

3. Steven Boedigheimer, MBA

Deputy Director of the Division of State and Local Readiness, Office of Public Health
Preparedness and Response

4. Jay Butler, MD

Director, H1N1Vaccine Task Force

5. Marty Cetron, MD

Director, Global Migration and Quarantine Division

6. Toby Crafton, MA

Chief of Staff, CDC Director's H1N1Response Team

7. Lyn Finelli, DrPH, MS

Lead for Surveillance and Outbreak Response Team, Influenza Division

8. Daniel Jernigan, MD

Deputy Director, Influenza Division

9. Martin Meltzer, PhD

Senior Health Economist and Distinguished Consultant, Division of Emerging Infections
and Surveillance

10. Toby Merlin, MD

Deputy Director, CDC Influenza Coordination Division

11. Glen Nowak, PhD

Director, CDC Media Relations

12. Stephen Redd, MD (RADM, USPHS)

H1N1/A Incident Commander and Director, Director CDC Influenza Coordination Unit
(ICU)

13. Anne Schuchat, MD (RADM, USPHS)

Director, National Center for Immunization and Respiratory Diseases; Principal CDC
Media Spokesperson for H1N1/A response

14. Michael Shaw, MD

Associate Director for Laboratory Science, Influenza Division

15. Marsha Vanderford, PhD

Director, CDC Emergency Risk Communication System, Emergency Operations Center

16. Stephanie ZaZa, MD, MPH (CAPT, USPHS)

Deputy Director for Strategy, Office of Public Health Preparedness and Response

Appendix B: Biographies of Selected Interview Participants

1. Lynn Austin, PhD

Dr. Lynn Austin is the Deputy Director in the Office of Public Health Preparedness and Response (PHPR) at the Centers for Disease Control and Prevention. Dr. Austin manages the day-to-day activities of the PHPR Office of the Director and management operations for the organization of over 800 staff and budget of \$1.3 billion. She ensures that all business services are provided for operations related to the strategic national stockpile, select agents and toxins, state/local readiness operations, and CDC's emergency operations and response activities. Dr. Austin is responsible for strategic planning and utilization of the use of bioterrorism funds, workforce and career development of organizational staff, organizational budget and financial management, personnel and human resources management, grants and cooperative agreements, facility and space utilization, and information resources. She provides leadership in the resolution of issues that cross organizational lines, aids in determining policy and program objectives, coordinates scientific and program input to the decision-making process, and assists in maintaining a focus on the highest priority public health initiatives. Dr. Austin has been at CDC since 1988, where she has served as the Chief of Staff to the Director, CDC; Deputy Director, Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion; Associate Director, Management Operations, Division of HIV/AIDS Prevention and Assistant Director, Policy, Planning, and Partnerships. Dr. Austin received a PhD in public policy from the Georgia Institute of Technology, a Master's degree in public administration from Georgia State University, and a Bachelor's degree in education and management from Berry College in Rome, Georgia.

2. Beth Bell, MD, MPH

Dr. Beth Bell is the Director of the National Center for Emerging and Zoonotic Infectious Diseases (NCEZID). Most recently, Dr. Bell has served as the Associate Director for Epidemiologic Science, National Center for Immunization and Respiratory Diseases (NCIRD). Dr. Bell joined CDC in 1992 as an Epidemic Intelligence Service (EIS) officer assigned to the Washington State Department of Health, where she was the lead officer in the seminal investigation of E. coli infections from contaminated hamburgers. After EIS, she joined the Hepatitis Branch in the Division of Viral and Rickettsial Diseases and later served as Chief of the Epidemiology Branch in the Division of Viral Hepatitis. She has made numerous contributions in the epidemiology and prevention of viral hepatitis, including spearheading development of policy for the use of hepatitis A vaccine in the United States, leading the division's efforts to prevent foodborne Hepatitis A, and assisting in efforts to expand the use of Hepatitis B vaccination globally. Dr. Bell also served in leadership roles during CDC responses to several major public health events, including the 2001 anthrax attacks, Hurricane Katrina, and the 2009 H1N1 influenza

pandemic. As a member of the senior leadership team for the 2009 H1N1 influenza pandemic response, she provided oversight of policy and scientific direction. Dr. Bell received a BA from Brown University, an MD from Yale University, and an MPH from the University of Rochester School of Medicine. She is a Fellow of the Infectious Diseases Society of America, the American Academy of Family Medicine, and the American Academy of Preventive Medicine, as well as a member of the American Epidemiological Society. She is the author/co-author of more than 125 scientific publications and has received numerous awards for her work including the Alexander Langmuir Prize and the Iain Hardy Award.

3. Steven Boedigheimer, MBA

Steven Boedigheimer joined the Centers for Disease Control and Prevention (CDC) in 2001 as a branch chief in the Public Health Practice Program Office (PHPPO). He was the supervisor of the Health Alert Network during the terrorist attacks on the United States in the Fall of 2001. In 2002 he was named Deputy Division Director for Public Health Systems Development and Research, where he also functioned as the Emergency Coordinator. He was appointed acting Deputy Director of PHPPO in 2003, and in 2005 became the CDC Senior Management Official (SMO) for Arkansas where he supported the Director of the Arkansas Department of Health (Public Health) Emergency Operations Center during hurricanes Katrina and Rita. In 2008 he was assigned to support the Commissioner of the Texas Department of State Health Services during hurricanes Dolly, Gustav, and Ike. In 2009 he was appointed as the Deputy Director of the Division of State and Local Readiness in the CDC Office of Public Health Preparedness and Response. He led the 2009 H1N1 Influenza State Coordination Task Force with the CDC Emergency Operations Center.

Two Delaware Governors and the Secretary of the U.S. Department of Energy have recognized Mr. Boedigheimer for his public health service. He earned a B.S. in Biology and Chemistry at St. Martin's University and an MBA from Willamette University with a focus on business-government relations.

4. Jay Butler, MD, FAAP, FACP

Dr. Jay Butler joined the Centers for Disease Control and Prevention (CDC) National Center for Preparedness, Detection and Control of Infectious Diseases (NCPDCID) Division of Emerging Infections and Surveillance Services (DEISS) in June 2009 as a Program Director to assist with the nation's response to the H1N1 virus (swine flu) outbreak. Before returning to the CDC in Atlanta, Georgia, he served as Chief Medical Officer for the State of Alaska since 2007. Previously, Dr. Butler was the Director of the Alaska State Division of Public Health, and headed the division's Section of Epidemiology. From 1998 to 2005, he was Director of the CDC's NCPDCID/DEISS Arctic Investigations Program and also served as an infectious diseases physician at the Alaska Native Medical Center in Anchorage. Prior to Alaskan assignments, Dr. Butler was a CDC epidemic intelligence service officer for the Wisconsin Department of Health. He is board certified in general internal medicine, general pediatrics, and infectious diseases. He was governor of the Alaska chapter of the American College of Physicians from 2005 to 2009 and chair of the Association of State and Territorial Health Officials Infectious Diseases Policy Committee 2008 to 2009. Dr. Butler is a graduate of

the University of North Carolina Medical School, has completed clinical training at Vanderbilt and Emory Universities, and is board certified in infectious diseases, internal medical, and pediatrics. He has authored or co-authored over 100 scientific papers and medical textbook chapters on infectious diseases and emergency preparedness. His varied professional experiences include working as a physician for two months at a mission hospital in Kenya, leading the CDC field response to the initial Hantavirus pulmonary syndrome outbreak in the US in 1993, and serving as the CDC liaison to FBI Headquarters in Washington, DC during in the investigation of the anthrax attacks in the fall of 2001. He was a team co-leader during the CDC responses to the SARS outbreak of 2003, avian influenza in 2004, and Hurricanes Katrina and Rita in 2005.

5. Martin Cetron, MD

Dr. Martin Cetron is the Director for the Division of Global Migration and Quarantine Division at the U.S. Centers for Disease Control and Prevention (CDC). The Global Migration and Quarantine Division's mission is to prevent introduction and spread of infectious diseases in the U.S. and to prevent morbidity and mortality among immigrants, refugees, migrant workers, and international travelers. Dr. Cetron has authored or co-authored more than 100 publications and received numerous awards for his work since joining CDC in 1992. Dr. Cetron holds faculty appointments in the Division of Infectious Disease at the Emory University School of Medicine and the Department of Epidemiology at Rollins School of Public Health. He received his B.A. from Dartmouth College in 1981, and his M.D. from Tufts University in 1985. He trained in Internal Medicine at the University of Virginia and Infectious Diseases at the University of Washington before joining the CDC's Epidemic Intelligence Service and becoming a Commissioned Officer in the U.S. Public Health Service (PHS) in 1992. His primary research interests are international health and global migration with a focus on emerging infections, tropical diseases, and vaccine-preventable diseases in mobile populations. Dr. Cetron has also been a leader in public health emergency preparedness and response activities at CDC and is a graduate of the Harvard School of Public Health & Kennedy School of Government's National Preparedness Leadership Institute. Since 1992, he has led several domestic and international outbreak investigations, conducted epidemiologic research, and been involved in domestic and international emergency responses. He has played a leadership role in CDC responses to intentional and naturally-acquired emerging infectious disease outbreaks including the 2001 anthrax bio-terrorism incident, the 2003 global SARS epidemic, and the 2009 H1N1 influenza pandemic.

6. Toby Crafton, MA

Toby Crafton is acting deputy director of the Division of Health Informatics and Surveillance (DHIS), formerly the Public Health Surveillance and Informatics Program Office (PHSIPO). Prior to this position, Mr. Crafton served on detail as a senior advisor to the PHSIPO director where he provided expertise and advice related to budgets, spending plans, functional statements, organization charts, and staffing plans for the organization. In his permanent position, Mr. Crafton serves as the program manager for the Influenza Coordination Unit (ICU) within the Office of Infectious Diseases. In this role, he is a member of the ICU's senior leadership team that develops the plans and strategies to ensure that CDC is prepared for an influenza pandemic. Mr. Crafton

manages a budget of more than \$200 million per year. In addition, he was responsible for leading the efforts to address the lessons learned from the 2009 H1N1 Influenza Pandemic response that deal with budget and administrative preparedness at both the state and federal levels. During his tenure at CDC, he has served as the chief of staff for CDC's response to the 2009 H1N1 pandemic, which required him to coordinate the activities of the command and general staffs (approximately 400–500 people) during the course of the response. Mr. Crafton also was part of the team that organized and started the CDC's Emergency Operations Center and the Division of Emergency Operations. He was the first lead for the logistics support team where he was instrumental in establishing processes and procedures for logistically supporting CDC emergency responses and deployments.

Mr. Crafton's federal service career started in 1980 when he was commissioned a second lieutenant in the U.S. Army. He served in positions of increasing responsibility for more than 20 years and retired in 2001. His assignments included various command and staff positions in Army medical units, including combat nits, deployable hospitals, and medical evacuation units. He also worked on the Army staff in the Pentagon where he formulated Department of Defense and Department of the Army policies on subjects that included re-engineering the Army's medical force, the mobilization of personnel for deployments, and public health support for operations during war and support for natural disasters. He earned a masters degree in management from Webster University in St. Louis, Missouri.

7. Lyn Finelli, DrPH, MS

Dr. Lyn Finelli is the Lead for the Surveillance and Outbreak Response Team, Influenza Division, National Center for Immunization and Respiratory Diseases. Dr. Finelli is a graduate of the Bryn Mawr Hospital School of Nursing and received her Bachelor of Science and Master of Science degrees from Columbia University. From 1983 to 1990, she taught pediatrics and public health at Columbia University and was the director of the Pediatric Primary Care Program (pediatric nurse practitioner program). She received her doctorate in infectious disease epidemiology from Columbia University, School of Public Health in 1990. Dr. Finelli began working with CDC in 1990, providing technical assistance in epidemiology to the New Jersey Department of Health, where she held the positions of epidemiologist and acting State Epidemiologist. Dr. Finelli came to Atlanta in 1997 to work as an epidemiologist in the Division of Sexually Transmitted Diseases. In 2001, she joined the Division of Viral Hepatitis as Chief of the Surveillance Team. Dr. Finelli joined the Influenza Division in 2006. Her research interests include influenza-bacterial co-infection, influenza complications including influenza-related pneumonia, and zoonotic influenza. Dr. Finelli is the co-author of more than 150 scientific publications.

8. Daniel B. Jernigan, MD, MPH

Dr. Daniel Jernigan is a Captain in the United States Public Health Service and serves as the Deputy Director of the Influenza Division in the National Center for Immunization and Respiratory Diseases (NCIRD) at CDC. In his current role, Dr. Jernigan serves as senior medical officer and senior Public Health Service officer for the Influenza Division. In addition, he serves as a principle investigator for influenza research and public health

evaluation activities. Dr. Jernigan received an undergraduate degree from Duke University, a Doctor of Medicine from Baylor College of Medicine, and a Master of Public Health at the University of Texas. Dr. Jernigan joined the CDC's Epidemic Intelligence Service in 1994. In 1996, he began serving on assignment from NCIRD to the Washington State Health Department as a medical epidemiologist and coordinator of national initiatives to improve surveillance for emerging infectious diseases. Dr. Jernigan became the chief of the Epidemiology Section for CDC's Division of Healthcare Quality Promotion (DHQP) in 2001. In 2006, Dr. Jernigan joined the Influenza Division as deputy director. Dr. Jernigan has authored peer-reviewed articles and book chapters on various emerging infectious diseases topics, and has supervised outbreak investigations of viral, bacterial, and fungal infections associated with emerging and antimicrobial-resistant pathogens. He has led epidemiology and surveillance teams for national and international responses, including bioterrorism-related anthrax, the emergence of West Nile virus, SARS, the 2009 H1N1 pandemic influenza, and public health management following natural disasters. During the 2009 H1N1 influenza pandemic, Dr. Jernigan served as the CDC lead for all domestic and international epidemiology and laboratory activities for the U.S. government's response.

9. Martin Meltzer, PhD

Dr. Martin Meltzer is the senior health economist and distinguished consultant, in the Division of Emerging Infections and Surveillance Services in the coordinating center for Infectious Diseases (Center for Emerging and Zoonotic Infectious Diseases (NCEZID), at the Centers for Disease Control and Prevention (CDC). His research interests include cost-benefit and cost-effectiveness analyses of health interventions and policy guidelines for use of health technologies, such as vaccines. His expertise is in the analysis of empirical data using a wide array of statistical and mathematical modeling methodologies. Much of his work is multidisciplinary and has included modeling of potential responses to smallpox as a bioterrorist weapon; evaluating the cost effectiveness of Lyme disease and Hepatitis/A vaccination; assessing the economic impact of infectious diseases, from pandemic influenza to dengue fever. His involvement in the response to the 2009 influenza pandemic included providing frequent updates of estimates of impact of the pandemic and estimating the effectiveness of a number of different interventions and developing a workable model to predict disease transmission. Dr. Meltzer has authored more than 140 publications, holds two U.S. patents, and has received many honors and awards, including CDC's Charles C. Shepard award and the James H. Nakano citation. He earned his BS in Agriculture at the University of Zimbabwe (1982), and an MS (1987) and PhD (1990) in Economics from Cornell University.

10. Toby Merlin, MD

Dr. Toby L. Merlin, MD is a Behavioral Scientist in the Surveillance Branch and the director of the Division of Preparedness and Emerging Infections in the National Center for Emerging and Zoonotic Infectious Disease. He is responsible for the CDC's Laboratory Response Network (LRN), infectious disease emergency response coordination, and Emerging Infections Epidemiology and Laboratory capacity programs, Health Economics and Modeling Unit, and Arctic Investigations Program. He previously

served as deputy director of the Influenza Coordination Unit and served as Deputy Incident Commander of CDC's Response to 2009 H1N1 Influenza. Dr. Merlin has been a member and Chair of the Clinical Laboratory Improvement Advisory Committee (CLIAC). He also served on the editorial boards of *Human Pathology* and the *International Journal of Surgical Pathology*, as well as various test committees on the National Board of Medical Examiners and committees of Clinical and Laboratory Standards Institute. Dr. Merlin joined CDC in 2003 from Lovelace Health Systems in Albuquerque, New Mexico, where he served as senior vice-president, chief medical officer, and an officer of the Board of Directors. Dr. Merlin also served as chair of the Department of Laboratories and an elected member of the Medical Practice Board. Dr. Merlin received his BA in philosophy from Yale College and his MD from the University of Florida. He served an internship at Stanford University Hospital and completed his training in pathology at the University of New Mexico.

11. Glen Nowak, PhD

Dr. Glen Nowak is a senior advisor to the Director of CDC's National Center for Immunization and Respiratory Diseases (NCIRD) and a member of NCIRD's senior management team. He provides leadership and expertise in communication science, health communications, risk communication, news media, social marketing and public engagement. He is involved in projects and collaborations designed to increase vaccine confidence and acceptance, address vaccine coverage disparities and to promote adoption of vaccination recommendations. Dr. Nowak directs and collaborates on vaccine and immunization research and evaluation projects. He is also involved in NCIRD and CDC's pandemic influenza preparedness and response efforts. Prior to joining NCIRD's senior management team, Dr. Nowak served six years as the Chief of Media Relations at CDC, including serving as Director of CDC's Division of News and Electronic Media. In this position, he served as the senior media advisor to the CDC director and senior agency managers, and was a senior CDC spokesperson. Prior to joining the Office of Media Relations in June 2004, Dr. Nowak served five years as the associate director for communications at the National Immunization Program at the CDC. Prior to joining CDC in January 1999, Dr. Nowak was an associate professor of advertising and communication at the University of Georgia. In the past twelve years, he has authored or co-authored a number of peer-reviewed journal articles on communications practices, social marketing, and health communications. Dr. Nowak received his BS from the University of Wisconsin-Milwaukee, with majors in both economics and communications. He continued his studies at the University of Wisconsin-Madison, where he subsequently earned an MA degree in journalism (1987) and a PhD in the field of mass communications (1990).

12. Stephen C. Redd, MD, (RADM, USPHS)

Dr. Stephen Redd is a Rear Admiral and Assistant Surgeon General in the United States Public Health Service. He is the Director of CDC's Influenza Coordination Unit, the unit was formed in 2006 to provide a central focus for pandemic influenza preparations at CDC. Dr. Redd is responsible for developing plans for pandemic response, exercising those plans, tracking progress in developing specific capabilities needed for an influenza pandemic, and communicating progress in these capabilities. Dr. Redd joined CDC in

1985 as an Epidemic Intelligence Service Officer, following clinical training. In April 2009, shortly after the H1N1 virus was identified, Dr. Redd was appointed Incident Commander of CDC's H1N1 pandemic influenza response, providing daily direction to all of CDC's pandemic response efforts from detecting the virus through the H1N1 vaccination program. More than 3,300 CDC staff participated in the response during the 11-month activation of CDC Emergency Operations Center. Dr. Redd received his undergraduate degree from Princeton University and his medical degree from Emory University. He trained in internal medicine at the Johns Hopkins Hospital and practices internal medicine at Grady Memorial Hospital and the Cherokee Indian Hospital. He has published widely in the control of respiratory diseases, malaria control, measles epidemiology and elimination, environmental health, and asthma. Dr. Redd has received numerous awards including the Public Health Service Distinguished Service Medal for leading CDC's pandemic response and the Charles Sheppard Award, an annual award for the outstanding manuscript published by CDC authors.

13. Anne Schuchat, MD, (RADM, USPHS)

Dr. Anne Schuchat, Rear Admiral and Assistant Surgeon General, United States Public Health Service (USPHS), is the acting director of CDC's Center for Global Health. Prior to this appointment, she served as the director of CDC's National Center for Immunization and Respiratory Diseases and has worked at CDC since 1988 on immunization, respiratory, and other infectious diseases. Previously, she served as the director of CDC's National Immunization Program (NIP); acting director of the National Center for Infectious Diseases (NCID); chief of the Respiratory Diseases Branch, NCID; and as the initial medical director of the Active Bacterial Core surveillance (ABCs)/ Emerging Infections Program Network, a multi-state collaboration between CDC, state health departments and academic institutions that tracks invasive bacterial infections, informs vaccine and prevention policy, and monitors program impact. She was named an Assistant Surgeon General of the United States Public Health Service in 2006. Globally, she has worked in West Africa on meningitis vaccine studies, in South Africa on surveillance and prevention projects, and in China on SARS emergency response, where she headed the Beijing City epidemiology team for the WHO's China Office. Dr. Schuchat graduated with highest honors from Swarthmore College and with honors from Dartmouth Medical School. She served as resident and chief resident in internal medicine at New York University's Manhattan VA Hospital before beginning her public health career at CDC as an Epidemic Intelligence Service (EIS) officer. She has authored or co-authored more than 180 scientific articles, book chapters, and reviews. She has received the USPHS Meritorious Service Medal, the American Public Health Association's Maternal and Child Health Young Investigator Award, the USPHS Physician Research Officer of the Year, and an Honorary Doctorate in Science from Swarthmore College. In 2008, she was elected to the National Academy of Sciences' Institute of Medicine.

14. Michael Shaw, PhD

Dr. Michael Shaw serves as the Associate Director of Laboratory Science for the CDC's Influenza Division. Dr. Shaw received a bachelor's degree in Biology from Birmingham-Southern College and earned a doctoral degree from the University of Alabama at Birmingham in molecular cell biology in 1980. Dr. Shaw began his work in influenza

during his postdoctoral training in virology at the Rockefeller University in New York and later became a faculty member. Dr. Shaw began working at CDC in the mid-1980s as a visiting scientist. In 1993, Dr. Shaw worked in the Influenza Branch (later the Influenza Division) at CDC. He has served as Associate Director for Laboratory Science since January 2006. In his current role, Dr. Shaw oversees influenza laboratory efforts at CDC for influenza diagnostics, surveillance, antiviral resistance, immunology, molecular genetics and vaccine strain selection. He serves as an advisor for public health policy and pandemic response and laboratory support to the Office of the Assistant Secretary for Preparedness and Response (ASPR), the Biomedical and Advanced Research and Development Authority (BARDA), the Association of Public Health Laboratories (APHL) and the WHO. Dr. Shaw also advises domestic and international influenza laboratory response networks for the WHO Global Influenza Surveillance Network as representative of the CDC WHO Collaborating Center for Influenza.

15. Marsha L. Vanderford, PhD

Dr. Marsha L. Vanderford is the Associate Director for Communications for the CDC Center for Global Health (CGH). Dr. Vanderford most recently served as the Chief of the Emergency Risk Communication Branch, Division of Emergency Operations, Office of Public Health Preparedness and Response, providing leadership for CDC's communication response during public health emergencies, including the 2010 Gulf of Mexico oil spill and the 2009-10 H1N1 Influenza pandemic. Dr. Vanderford earned her B.A. from California Polytechnic State University and her M.A. and Ph.D. from the University of Minnesota. Dr. Vanderford joined CDC in 2000 as Deputy Director of Communication in the National Center for Environmental Health. She has also held positions as Associate Director of Communication Science at the National Center for Injury Prevention and Control, and Acting Associate Director for Communication in CDC's Office of the Director. Dr. Vanderford has served as a technical advisor to WHO and to China's Ministry of Health for the development of global emergency risk communication capacity. Prior to 2000, Dr. Vanderford was a Professor at the University of South Florida with joint appointments in the Departments of Communication and Family Medicine.

16. Stephanie Zaza, MD, MPH, (CAPT, USPHS)

Dr. Stephanie Zaza serves as the Director, Epidemiology and Analysis Program Office (EAPO), Office of Surveillance, Epidemiology, and Laboratory Services (OSEL), Centers for Disease Control and Prevention (CDC). EAPO assures the targeted application of public health sciences to improve population health through research, consultation, practice, training, education, technical assistance, development and dissemination of scientific and public health information. Dr. Zaza came to CDC in 1991 as an Epidemic Intelligence Service Officer. From 2006-2010, Dr. Zaza led preparedness strategy, planning, policy and communications for CDC's emergency preparedness and response activities. In 2009, she developed and led the Community Mitigation Task Force as part of CDC's response to the novel 2009 H1N1 influenza pandemic. Dr. Zaza received her combined Bachelor of Science and medical degrees from Youngstown State University and the Northeastern Ohio Universities College of Medicine in 1990. She earned a master's degree in public health from the Johns Hopkins University in 1995, and

is an alumna of CDC's Epidemic Intelligence Service and Preventive Medicine Residency. Dr. Zaza is board certified in general preventive medicine/public health, and is a Fellow of the American College of Preventive Medicine. In addition, she is a captain in the U.S. Public Health Service and a recipient of numerous Public Health Service and other academic awards.

Appendix C: Transcripts of Interviews 1-16

Interview # 1. Lynn Austin, PhD, Deputy Director for Operations, Office of Public Health Preparedness and Response

Interview # 2. Beth Bell, MD, MPH, Acting Director, National Center for Immunization and Respiratory Diseases

Interview # 3. Steven Boedigheimer, MBA, Deputy Director of the Division of State and Local Readiness, Office of Public Health Preparedness and Response

Interview # 4. Jay Butler, MD, Director, H1N1Vaccine Task Force

Interview # 5. Marty Cetron, MD, Director, Global Migration and Quarantine Division

Interview # 6. Toby Crafton, MA, Chief of Staff, CDC Director's H1N1Response Team

Interview # 7. Lyn Finelli, DrPH, MS, Lead for Surveillance and Outbreak Response Team, Influenza Division

Interview # 8. Daniel Jernigan, MD, Deputy Director, Influenza Division

Interview # 9. Martin Meltzer, PhD, Senior Health Economist and Distinguished Consultant, Division of Emerging Infections and Surveillance

Interview # 10. Toby Merlin, MD, Deputy Director, CDC Influenza Coordination Division (ICU)

Interview # 11. Glen Nowak, PhD, Director, CDC Media Relations

Interview # 12. Stephen Redd, MD (RADM, USPHS), H1N1/A Incident Commander and Director, Director CDC Influenza Coordination Unit (ICU)

Interview # 13. Anne Schuchat, MD (RADM, USPHS), Director, National Center for Immunization and Respiratory Diseases; Principal CDC Media Spokesperson for H1N1/A response

Interview # 14. Michael Shaw, MD, Associate Director for Laboratory Science, Influenza Division

Interview # 15. Marsha Vanderford, PhD, Director, CDC Emergency Risk Communication System, Emergency Operations Center

Interview # 16. Stephanie Zaza, MD, MPH (CAPT, USPHS), Deputy Director for Strategy, Office of Public Health Preparedness and Response

Interview #1 Lynn Austin, PhD, Deputy Director for Operations, Office of Public Health Preparedness & Response

1 Lynn: My name is Lynn Austin. I am currently the Deputy Director for
2 Operations for the Office of Public Health Preparedness and Response.
3 At the time that H1N1 first started, we were called COTPER, the
4 Coordinating Office for Terrorism Preparedness and Emergency
5 Response. And I've been at CDC for 20 – nearly 22 years and I've been
6 with the federal government for 33 years. This was the first time that
7 I've worked up close and personal in – in a response actually while –
8 during my time at CDC.

9 Barbara: Do you recall when you first heard about H1N1?

10 Lynn: Yes. I had only been with COTPER for a month and I had just come in
11 to work on management operations and improving some management
12 organization and efficiency. And we started getting the briefings about
13 H1 just within a month after my arrival. Dr. Rich Besser was the
14 Acting CDC Director and he – his permanent job was actually the
15 Director of COTPER. And so we had an Acting Director in our
16 organization also at the time and we both started receiving the
17 briefings about H1 and what was going on, what the situational
18 awareness. Right at the beginning, it was beginning to look at the
19 surveillance data and what state were reporting, what countries were
20 reporting. It was a lot about surveillance in the very early days.

21 Barbara: And as the response ramped up and as the threat emerged, did you
22 have a sense that this was a potential crisis facing the organization?

23 Lynn: Absolutely. Even though I had not worked so close to an event before,
24 just looking at the surveillance data alone and looking at the growing
25 increases in number of cases, I knew that this was going – going to go
26 on for some time. I had no idea it would go on as long as it did. But it –
27 it did look like it was going to be a long term. My boss, Dr. Dan
28 Sausen, was pulled in to a lot of meetings about it. He was in three or
29 four meetings a day about the outbreak and even as a new senior
30 leader in the organization, I was designated as Acting Director on
31 many, many days while he – many months actually during the time
32 that he was involved in the H1 directly as well as Dr. Besser serving
33 in the role that he did.

34 Barbara: Did you find that you needed to make modifications to plans or
35 practices as a result of the way the threat emerged?

36 Lynn: What I found was that we had to make changes in how we supported a
37 long term strategy for a response. Because, you know, it was – it was
38 very easy for people to burn out because they were working such long
39 hours. People were working, you know, 16 hour days. They were
40 working seven days a week. And as the response geared up to the
41 levels, we were having to, you know, search for staff. We were trying

42 to staff the response and so we realized very rapidly that we needed to
43 develop a very – a much deeper bench of – of individuals who could
44 work the response.

45 And that's not just the scientists, and the surveillance experts, and
46 the epidemiologists, that, includes all of the – the logisticians, and the
47 analysts, and the personnel staffers, and financial people. It – that
48 was what was eye opening to me is that a response is not just about
49 the scientists although they're very – they're the very key part of it.
50 The whole support network that goes in to supporting an outbreak
51 and responding to an outbreak like this requires many, many people.
52 And many people of different job – types of jobs. And that's what I
53 found fascinating but also what was very challenging.

54 Barbara: Did you find that the practices that you implemented for this
55 particular response are practices that you will institutionalize?

56 Lynn: We're actually moving forward to do that because with the H1N1
57 response, you know, you had people who ended up not just working on
58 the response for three weeks or 30 days as we might in like the Haiti
59 response, or with a tsunami, or a tornado or something response. We
60 had people who had to be detailed for quite a long period of time. That
61 actually represented changes to people's performance plans, how they
62 were evaluated, how – how they might be reimbursed because there
63 were actually – when someone is detailed to a response, sometimes
64 they're funding their – their home funding cannot continue to support
65 their salary and benefits during a long term response. So we had to
66 look at alternative ways that we could provide for those salaries and
67 offset those salaries. So we found that getting additional funding for a
68 response is often very critical to being able to respond on a long-term
69 basis.

70 We also found that communications are absolutely critical. Most of us
71 who are not directly involved in the communications ourselves were
72 glued to the TV sets, you know, waiting, watching the media trucks
73 outside; but we were glued to see Dr. Besser, and Dr. Schuchat and
74 then later Dr. Frieden on television and what they were saying. And
75 coming out of some of the daily briefings, knowing about what, you
76 know, planning on what was going to be said, what – what the status
77 was for the day, and then seeing it on the nightly news was pretty
78 amazing in some ways. But it also showed me that CDC – this is one
79 area I think CDC really excels is trying to share that information with
80 the public.

81 I had a lot of people who would call me as well, people who know that
82 you work at CDC, they – they want to ask questions. They want to
83 know, can you find out about this, or vaccine or whether it's
84 recommended for an immunization if you're in certain category groups
85 of people. And I also had two colleague age students and I was, you
86 know, I was worried. I had one that traveled internationally some and
87 I was worried about, you know, their own safety as well as looking at

88 how CDC responds to an outbreak. And I felt very proud of CDC as we
89 responded to this event. I know that there was some things that took
90 longer like the vaccine development. But the fact that we could
91 identify the virus, to have a vaccine developed as quickly as we did,
92 just shows how well CDC is able to come together and work on a
93 solution that quickly.

94 Our support to the states was absolutely critical. My organization was
95 responsible for getting funding out to the state and local health
96 departments. And so it was absolutely essential because that was the
97 frontline of combating this – this disease outbreak. And so not only did
98 we have to get the antibiotics when states would run out and they
99 couldn't get them from pharmaceutical companies, but we also had to
100 respond with funding so they could do the vaccines once we were able
101 to – to get those developed and manufactured.

102 So I think that we worked very, very closely with the state and local
103 health departments during that time as well in trying to address their
104 needs on the front line.

105 Barbara: In terms of practices that you would recommend for going forward
106 when dealing with these agencies, do you have any specific thoughts
107 on that?

108 Lynn: Some of the challenges that we faced probably initially was about the
109 funding, realizing that this was far more than, you know, what we
110 could accommodate in a short-term way. That was initially a little bit
111 of challenge because you're having to respond, you're definitely
112 responding but just not knowing, you know, if the money was going to
113 be there as we moved – continued forward.

114 With the state health departments, I think we worked with some
115 partner organizations like ASTO and NACHO and they were
116 absolutely key to our being able to facilitate those conversations and
117 communication with the state and local health departments. They
118 really came through. We had meetings with them. We even detailed a
119 representative from their organizations to be a part of our team and to
120 be in on the briefings so that they could turn and relay the
121 information to their – their organizations like the state and local
122 governments.

123 And we also had conference calls. Our organization, Division of State
124 and Local Readiness, set up conference calls with the state health
125 departments. I don't think at the time they were occurring daily but
126 they were definitely occurring two to three times a week to keep them
127 apprised of the activities that we were doing and any issues that they
128 were having to try to help them meet their needs on the frontline.

129 Barbara: So have these best practices that you developed been institutionalized
130 for future situations?

131 Lynn: There's actually one of the things that I was mentioned about the
132 personnel and recruiting people to work in an outbreak situation. We
133 found that we – you can't just do that on the fly as we've done with
134 short-term emergencies where people come in. People just kind of
135 collapse on their response and then in 30 days they're back on their
136 regular job. What we found is that we really do need to have a longer
137 term strategy at CDC for being able to bring people in, be able to work
138 on a response a little bit longer but then have people who can come in
139 behind them when they go back to their job. And so we are trying to
140 look now at establishing a – a personnel resource team within our
141 Division of Emergency Operations. We've handled some of this before
142 in the past as part of our operations team; but now, as I mentioned, we
143 have, you know, you have the issues with just who do people report to
144 while they're on this response, they're own performance and just the
145 whole issue of recruiting people. And so we've set up a personnel
146 response team to be in our Division of Emergency Operation and we're
147 working to – to staff that to be able to do this on a – a more standard
148 and operational type basis. That's one area.

149 Another area is tracking on funding. We've begun to institutionalize
150 the way that we capture expenses and approving of expenses. That
151 was something that we found people who needed to be reimbursed. We
152 needed to have a process where their request could be approved so
153 that we were really doing things that specifically related to the
154 response that – that CDC was in – working on.

155 Barbara: As the – as the year progressed and the threat emerged and the
156 organization was forced to confront an emerging threat rather than
157 one that was winding down, did you feel that there were sufficient
158 resources available to meet the demands?

159 Lynn: Yes there were. But at the same time, you know, like I – I – I believe
160 that CDC needs to develop a deeper bench. We often in these kinds of,
161 depending on the type of area, the type of focus of a response or an
162 event, its often many of the same people. And in a short-term
163 response, that's okay because people can usually crash on an – on an
164 activity or event, work, you know, many hours, work weekends and be
165 okay, and then three weeks later, or four weeks later, can – can slow
166 down a little bit. This was so much more, so much longer that I've
167 found that we need to – we need to develop more of our junior staff.
168 We need to bring them into the response, have them work side-by-side
169 with the senior people, and then give them an opportunity, you know,
170 over time in an event like this to see, you know, what it's like and how
171 to respond so that we do develop that deeper bench strength.

172 Barbara: Was your division involved in exercise planning?

173 Lynn: Oh absolutely. Actually, I think that was absolutely critical to our
174 success. When I had worked in the Office of the Director at one point
175 before coming to COTPER, that had been a – a big priority for CDC to
176 have these kinds of preparedness, planning and exercises so that we

177 actually walk through what would happen if it's a pandemic, or what
178 would happen in environmental. And I think that was absolutely
179 critical. We already from those exercises knew who critical key staff
180 would be, and then those people had walked through an exercise that
181 would be similar. Certainly nothing that would be as long term as this
182 turned out to be or even thinking about it being that long term but
183 yes, I think that absolutely was critical to our success.

184 Barbara: Thinking back in the early, early response period, what do you feel
185 were the key decisions that needed to be made?

186 Lynn: That was – that was interesting 'cause I – I did participate in the
187 meetings with Dr. Frieden and there were, you know, daily or twice
188 daily briefings with him, every morning, every afternoon at the
189 beginning. You know, first looking at the surveillance data, you know,
190 where – where is the outbreak. We already at that point were
191 beginning to identify what it was and isolate what it was, and then
192 determining from all the locations and all the reporting was this the
193 same – the same virus. And, you know, the laboratory reporting was
194 critical. Laboratories in the states were getting overrun with
195 specimens. So it was key as to how much do we do sample testing, do
196 we do all testing, of being able to detect then the trend.

197 At one point, we had to decide of counting actual cases versus the
198 alternative count where we would look at the – a percentage. And so
199 that was a key decision point, a key turning point of how we counted
200 because then we would – we would not be able to count actual
201 numbers but we – we had to move past that because we couldn't
202 continue to do, you know, all the laboratory specimens that were
203 coming in anyway.

204 Another – some other key decisions that had to be looked at were the
205 social distancing. You know, what does CDC recommend? What could
206 we recommend? You know, what we know from a science and evidence
207 based perspective versus what is realistic that could be accomplished
208 and what we could recommend from that. So, you know, our own – our
209 own social distancing, when people were sick and yet were involved in
210 the outbreak, you know, we had to make sure people don't come to
211 work when you're sick, even for ourselves and even people on the
212 response team.

213 But those were recommendations and policy recommendations that we
214 – we had to make. We also certainly with the identification of the
215 manufacturer for the vaccine, what – how much the government
216 would buy of the vaccine and all of those were very critical decisions
217 that – that were made along the way.

218 Barbara: In terms of information that was used to support this decision making
219 processes, where – where did your information come from?

220 Lynn: It came from the data. It all had to come from the data of the number
221 of cases. We had to look at what was available – what could be

222 manufactured, the volume that could be manufactured. We had to look
223 then also at who was at most at risk and so that the recommendations
224 could first hit with the – with the earliest vaccines coming out of
225 production, the immunization of the most at-risk populations. Those
226 were definitely key decisions that – that were made,
227 recommendations. But it did look at populations that were affected by
228 the vaccine, I mean by the virus most. So it – it's all definitely data
229 driven.

230 Barbara: Who were the key people involved in this decision making process?

231 Lynn: That would be, you know, Dr. Besser when he was first here, Dr.
232 Frieden, Dr. Schuchat, Dr. Redd, Dr. Bell and many others who were
233 kind of part those directors briefings and – and mainly providing
234 policy recommendations. Ultimately, many of these fell to the Director
235 or later as it progressed in concert maybe with the Director, Dr. Redd
236 and Dr. Schuchat.

237 Barbara: In terms of organizational response to staffing needs, did you have any
238 particular recommendations for the future?

239 Lynn: Yes. You know, I found this with H1N1 and this is also been true with
240 our Haiti response that we're – we're working on right now. We do –
241 we do detail people to the team. So even if it's not something that the
242 people do in their daily job, so I detailed my financial resource director
243 to work with the funding for H1N1. So she worked on that for about
244 three months which left a huge gap with us. We – we couldn't – we
245 couldn't detail people in to fill her job 'cause we were already detailing
246 other people for the response. So it mean – it mean other people back,
247 you know, at the home base or our home organization having to fill in
248 and – and work overtime to fill the gap.

249 We detailed someone to work on the personnel recruitment part of it.
250 And that – we actually had two people on my staff alone that worked
251 directly in the personnel recruitment on – on two different rotations.

252 So I found that for us with OPHPR and then it was called COTPER,
253 that we provided a lot of staff support that are from people who are
254 not even normally part of the response team. They're not people who
255 work in the Division of Emergency Operations, or the Division of
256 Stockpile. These are people who worked in business services in the OD
257 and management office. So people who actually served as the Chief of
258 Staff at – at a point in the very beginning before, you know, it took on
259 under the influence of coordination unit as having the lead.

260 So our organization really jumps in as kind of the first response team
261 and fills some of those key positions. And then over a long-term
262 response, the strategy has to be to bring in other people and rotate
263 other people through to be able to continue to support our own
264 organization but at the same time, give full support to a response.

265 Barbara: Looking back over the year of the response so far, are there things
266 that you felt the organization did particularly well?

267 Lynn: I would definitely say communication was absolutely critical. I think
268 this – the government had to be transparent in what we were doing
269 and I think we really, really did well with that. I think that we, you
270 know, we got the vaccine out there as quickly as we could. It was still,
271 you know, everybody – you rather it be sooner rather than any later
272 but we got it out there just as soon as it could be identified. I think
273 that we worked with the states very well. We brought them into the
274 process very early on and they were absolutely a full partner. We were
275 actually at the point supporting them because they were on the
276 frontlines with the disease in their state and with responding to the
277 disease by the immunizations in their state.

278 Barbara: How about challenges that you feel the organization experienced?
279

280 Lynn: I think the biggest challenge is just the length of time of the response.
281 Prior to H1N1, the longest term response that we have faced was with
282 Katrina, Hurricane Katrina, and the aftermath from that. And that
283 event was maybe four to six months. So this has lasted 11 months by
284 the time it fully closes out. That's a very long time to be in response
285 mode.

286 So basically what that means for my organization is that our Division
287 of Emergency Operation and the CDC Operation Center which we
288 operate has never not been on, you know, just – just monitoring for
289 nearly a year. And so that puts a lot of strain on the organization. It's
290 not impossible, obviously, we've done it and we've done it very well.
291 But it's – it's a long time to be in response mode. So, you know, people
292 put off vacation time, and people put off doing things because we were
293 in a response. We've put off some things with our own planning, our
294 own exercising, our own, you know, operations because we have, you
295 know, part of the organization in – in still in response mode.

296 And so I'm not sure that there's anything we could do differently about
297 that because that's our job but the long-term nature of it, you know, is
298 – is a big strain.

299 Barbara: Do you have any other specific recommendations that you could make
300 in any area for people who are – organizations that are confronted
301 with similar?

302 Lynn: I have been, like I said at the beginning, when I first came to this
303 organization, to COTPER, I was only here a month when the outbreak
304 hit. And I had been incredibly impressed by how organized we were
305 with the response, how people worked so very well together, how even
306 during the response for H1N1 we were able to handle other responses.
307 So if there was a food outbreak, if there was a tsunami in another

308 country, if there was a flooding, we were still able to assemble a team
309 to deal with those responses.

310 So I have been incredibly proud to work in this organization and just
311 see how well they work together and how well they support CDC in
312 responding to an event and one as long-term and as, you know,
313 potentially dangerous as H1N1 was, and yet we were able to mitigate
314 much of what could've happened by how we responded to that.

315 Barbara: Great, well thank you very much.

316 Lynn: Okay. [audio ends 0:25:53.5]

Interview #2. Beth Bell, MD, MPH
Acting Director, National Center for Immunization and Respiratory Diseases

- 1 Beth: Sure. I'm a physician by training and I've been working at the CDC
2 since the early 1990s. I started in the EIS program like many of us
3 physicians and was working in Seattle, Washington when the Jack-in-
4 the-Box outbreak associated with contaminated hamburgers
5 happened. So that was sort of my introduction into public health.
- 6 Most of my career I spent in the field of hepatitis. I'm an expert in
7 hepatitis vaccines and viral hepatitis in general. And for the past, I
8 guess, maybe three year or so, I've been working at the center level in
9 the National Center for Immunization and Respiratory Diseases.
- 10 Barbara: Great, are you currently involved in some aspect of H1N1?
- 11 Beth: Yes. I am, at the moment, leading our efforts to transition all of the
12 H1N1 related activities from the emergency response structure back
13 into our center, into the National Center for Immunization and
14 Respiratory Diseases. So that's essentially all of the surveillance,
15 epidemiology lab stuff which is housed in our Influenza division, and
16 all of the vaccine related activities which are housed in our
17 Immunization Services division.
- 18 Barbara: Great. Can you remember when you first heard about H1N1?
- 19 Beth: I most certainly can because I was the Acting Director of the Center,
20 of NCIRD at that time, in April, and I was actually performing in a
21 choir concert, I believe, on the Friday night and had turned off my
22 telephone because I was performing in a choir concert; and turned it
23 back on after the choir concert and had a telephone call from someone
24 from the Flu division saying well now we've kind of detected two of
25 these over the last couple of days. We are concerned about this, the
26 sort of details that I'm sure you've heard before, no recognized contact
27 with swine, no recognized contact with each other, a novel strain that
28 hadn't been seen before, and so I've got a, you know, a very
29 comprehensive update about what people were doing about it sitting
30 there in my car in the parking lot after the choir concert.
- 31 And so then I, you know, I thanked them and we arranged when we
32 would talk again and then I called Ann Schuchat who at that time was
33 the Deputy – Acting Deputy Director of CDC, and we went through
34 the whole thing and that was sort of – we kind of, you know, went
35 from there basically. So it's quite – quite a clear memory of the first
36 time I heard about this.
- 37 Barbara: Could you describe... [break in audio 0:02:42.5]
- 38 Barbara: Could you describe the first few days of the initial response period?
- 39 Beth: I don't have the clearest recollection of that part of things. You know,
40 there must've been a certain amount of back and forth over the

41 weekend that I don't really remember. But I certainly, you know,
42 remember Rich Besser convening a group of people and us, you know,
43 kind of talking about what the next steps were. But I don't have – I
44 don't remember all that clearly exactly what, you know, we did during
45 that next week to tell you the truth.

46 Barbara: Were you involved in the standup of the EOC at all?

47 Beth: To the extent, I mean, at the time when we were first standing up the
48 EOC, you know, as the Acting Director of the Center, you know, the
49 way that these – the EOC structure is organized, I think, somewhat
50 depends is varied from response to response and it's certainly evolved
51 over the course of this response. But at the beginning of all of this,
52 there was a place at the table for the center directors of all the
53 relevant centers in addition to people who might have a role as sort of
54 – official role in the emergency management structure or whatever it's
55 called, Emergency Command. Anyhow.

56 So as the Acting Director of the Center, I had a, you know, a
57 recognized role to play, seat at the table, and certainly was involved in
58 all of those early conversations from that perspective.

59 Barbara: Did you have a sense in the early days that this was going to be a
60 serious crisis?

61 Beth: Well, crisis is a funny word. I think I certainly had a sense that it was
62 going to be serious. And, you know, I believed our flu experts who said
63 this is worrisome, you know, I think this could be serious and
64 certainly we'd been hearing a lot of reports from Mexico that were
65 concerning and made me think that it was going to be serious.

66 The whole question of was it going to be a crisis and how was this all
67 going to be played out, I think is a – another question altogether. I
68 have found in general in dealing with these kinds of responses that it's
69 better not to think of it that way. And it's better to just think of what
70 needs to be done, you know, try to think about thinking the most
71 rational science based comprehensive way about what the way
72 forward is, try not to forget things, try to, you know, consider all the
73 considerations and not think about it as a crisis. That's just my own
74 experience. But, you know, that's generally the way I tend to approach
75 it. It's serious. We're public servants. We have to protect the public but
76 not that it's a crisis.

77 Barbara: What did you feel were the key decisions that needed to be made early
78 on?

79 Beth: Well, early on we really were trying to figure out how – what was this,
80 what was the, you know, how severe was this, what was the clinical
81 spectrum of illness, how much had it spread, what was this virus, a lot
82 of those very fundamental questions, once again, I think in form by
83 what we were seeing from Mexico, which was suggesting that, you
84 know, there were a lot of young people who were dying, and, you

85 know, a fair amount of mayhem in a certain kind of way. And, you
86 know, we weren't seeing that here in this country early on. We were
87 seeing, you know, we were certainly seeing that it was spreading and
88 that there were a lot of cases but we weren't seeing that same kind of
89 spectrum with a lot of very, very serious cases. And so a lot of the first
90 questions had to do with, you know, why was that; were we missing
91 things; was there something different in Mexico; was it the same
92 virus, even, and what could, you know, sort of like especially was what
93 our surveillance was telling us about this country accurate, or was
94 there something else that, you know, was missing or that we hadn't
95 really understood or detected.

96 So I think early on, very early on, that was really a large part of the
97 question. And in addition to some of the, you know, the scientific lab
98 related questions about figuring out what was this virus, where did it
99 come from, and some of those kind of very fundamental questions that
100 were obviously being worked on in parallel.

101 Barbara: Do you think there was a sense within the organization that this was
102 going to require an entirely different kind of response?

103 Beth: Compared with...

104 Barbara: Previous epidemics.

105 Beth: Oh, previous flu epidemics.

106 Barbara: Previous flu epidemics.

107 Beth: Well, you know, there's a lot of pandemic planning that had gone on,
108 most of which I wasn't very involved in. But there was a whole, you
109 know, a whole infrastructure, and a whole mindset, and a whole
110 paradigm in a way about influenza pandemics and about how to
111 prepare for pandemic that was actually very well developed. And that,
112 I think, was very different than, you know, previous emergencies even
113 not to mention influenza pandemics. We had exercised this, we had,
114 you know, all kinds of activity from the White House, of course a
115 different administration, from HHS, all, you know, involvement from
116 all sectors of government feeding into this pandemic plan; which, as I
117 say, was very well developed with many, many tasks, and many, many
118 segments of people doing this, and that, and the other thing.

119 And so some aspects of – of this, I think, early on felt familiar from the
120 point of view of some of these exercises and I would say that while,
121 you know, the scenario that people were mostly planning for in these
122 pandemic planning did not turn out to be the scenario that happened;
123 and that the fact that the scenarios were different, in fact, as I
124 imagine you may have already heard, I think caused some difficulties.

125

126 But some of the basic, you know, this is what we do, this is how we
127 start off, this is, you know, these are the questions we need to address,

128 these are the people that we need to involve, some of that we had
129 exercised and I think that those exercises in fact turned out to be
130 useful. Some of the conclusions of some of the exercises, I think, had
131 already improved the way that we set up the EOC structure. Some of
132 the difficulties that we had identified in the exercises, we had
133 managed to fix already. And I think a lot of that and a lot of that
134 thinking ahead of times, at time, especially in terms of the process
135 kinds of things internally, really did help in terms of having the
136 general flow of things feel somewhat more familiar than it might have
137 otherwise.

138 Barbara: Within your division, did you feel it was necessary to make
139 modifications to any existing plans or structures that you had in
140 place?

141 Beth: Well our Center is largely responsible for this response. So we
142 essentially, two of our – we have five divisions, one of them is a global
143 division, five divisions, two of the divisions, one of them was – is the
144 Flu division which is obviously 100 percent involved in this. Another is
145 the Vaccination Program division which clearly was essentially, you
146 know, a lynch pin in all of this. And the other two divisions also deal
147 with respiratory disease and so have many – a lot of expertise both
148 laboratory and epidemiologic expertise directly relevant to the issue
149 and, of course, being all from the same Center, people are used to
150 working together.

151 So we essentially suspended just about everything that wasn't
152 essential in order to, you know, focus our attention on this.

153 Barbara: And as the threat emerged and persisted over the long term, how did
154 your division respond to that?

155 Beth: Well our Center, you know, this has been a difficulty I think all along.
156 Many – there were a lot of things that didn't get done. Many, many,
157 many people from all across our center participated in the response. I
158 think, you know, clearly there are some critical things that had to
159 keep going, and in some ways, I think it was more difficult for the
160 people that weren't involved in the response because I think that, you
161 know, there was generally one had to be careful about not sending the
162 message that the other things were not important and to make the
163 other people feel valued.

164 It was also, I think, difficult for the people that were not directly
165 involved in the response to feel like they knew what was going on. And
166 that was something that was very important, I think, to the rest of the
167 Center leadership to under – to know what was going on given, you
168 know, the magnitude of this both from a – just sort of a public health
169 point of view and also from a point of – the point of view of the Agency
170 effort. And that whole issue of keeping the rest of the Agency or in my
171 case the rest of our Center abreast of the developments was actually
172 quite difficult. They – I think many of them found it frustrating trying

173 to figure out who should they talk to, and those of us that were
174 working in the response probably didn't do as good a job as we should
175 have in, you know, kind of going back and going to some of the regular
176 center meetings and letting people know what was going on.

177 Barbara: Could you talk a little bit about the internal communication processes
178 that you used?

179 Beth: Within the response? Well, you know, I think in general, this
180 communication issue was very complicated and very difficult. Part of
181 the reason is that much of the communication, you know, it was a good
182 thing that lots of people above us were interested in this response in
183 general. It was a good thing. And was a good thing – I think it's a good
184 thing that we as an Agency have recognized the importance of media,
185 and communication, and partners, and all of those things.

186 But it makes for having sort of robust communication – it makes it
187 very difficult and challenging because there are many sources of
188 information, they – it's very difficult to get them all channeled through
189 a – a small number of people. It's very difficult for those small number
190 of people to figure out who are all the people that need to know. And –
191 and then even the people who need to know often times don't have the
192 time to – to then sort of spread the word around to all the people who
193 would like to know.

194 So I think all of it was quite – is quite – was quite challenging and
195 quite difficult. I think that, you know, we did a reasonable job of this.
196 We made some mid-course corrections that I think were helpful. We,
197 you know, instituted sort of like an every morning report where, you
198 know, all the task force leads, we would all sit down and just go
199 through everything that, you know, as a group, everything that
200 everybody knew and needed to know, that needed to, you know, go up
201 and, you know, stuff that needed to go down. And I think that that did
202 help. I think that the sort of incident command structure as sort of
203 uncomfortable as I think it is for some of us who are not used to
204 functioning in that sort of very militaristic hierarchical kind of
205 structure, I think that it definitely has its advantages. Even within
206 that, there were several kind of mid-course corrections where we tried
207 to clarify, you know, who was the single person to receive xy
208 information. That also, I think, helped.

209 But in general, I think, it – it's – I don't know concretely what else we
210 could have done better. I think that objectively speaking, it's just very,
211 very hard when you have so many different inputs. You have many
212 competing priorities. The priorities of the people above you may not be
213 the same as the priorities of, you know, the response or of the staff
214 within the response. And everybody wants to know everything
215 yesterday. And so I think all of those things were quite difficult.

216 I think we did a reasonable job especially of the upward
217 communication, our daily Chief of Staff calls, I think was really

218 impressive that all of the -- of senior people actually managed to sit
219 down together every day and I think that that really made a
220 difference,. The communication people had calls every day. We had
221 obviously senior people within our response, you know, focusing on
222 communication. And all of those things, I think, really helped.

223 I think that, and maybe you'll hear this more from some of the other
224 people that you're talking to, I think from the point of view of the
225 people that actually were working in the response, especially the
226 people who had a lot of data that everybody was interested in. For
227 example, the -- the surveillance and epidemiology people. I think that
228 in some ways this was extremely difficult for them. They, you know,
229 were getting requests for data from everybody and their brother, from
230 all over the place with, you know, and some from people who, you
231 know, were very high up, people from the White House would be
232 calling them directly. And it's very difficult for them to say no, not
233 really in a position where they had the power to prioritize, very, very
234 overwhelmed with a huge amount -- huge number of requests for tell
235 me this, tell me that, tell me the other thing yesterday; and people
236 who are very senior scientists, and I think really wanted to be
237 managing their part of the response, according to what they thought
238 was most important from a scientific point of view. And I think all of
239 that was -- was quite difficult for them. And I don't know whether
240 there were ways that the senior people in the response could've
241 improved upon that.

242 But I personally, you know, wish that -- that those folks could've felt
243 less put upon than they did which I -- I mean I think they did feel
244 pretty put upon.

245 Barbara: What were your primary sources of information?

246 Beth: Well, you know, we -- our prime -- first -- I mean scientifically or what
247 was going on, our primary resources of information were from our own
248 people. So, you know, from the people running our surveillance
249 systems, from the people that were working with our international
250 partners, from our laboratories, from, you know, those sort of various
251 parts of our response once we got the vaccination program going, from
252 the people that were dealing with the states with the vaccination
253 program. Those really were the primary sources of information. I
254 think the information from the point of view of what is it that other
255 people are thinking they need, that probably came from someplace
256 else, from our media people who are extremely, you know, helpful in
257 terms of characterizing what the issues were and from, you know, the
258 people in HHS, and who we would hear from daily about the sorts of
259 things that they were concerned about and that they were interested
260 in, you know, kind of managing or helping us manage or that kind of
261 stuff.

262 But I think, you know, in the midst of all of this, I think we all did
263 continue to rely on, you know, our science to figure out what indeed

264 was going on and I – as you probably already heard, or seen, we are all
265 a bunch of people who, you know, believe in trying to actually figure
266 out what is going on to the best of our abilities and use that to guide
267 our policies, and our recommendations, and our actions.

268 I mean, we – I mean sometimes you could say to a fault, that’s what
269 we want to do. I mean I think that the whole question of how do you
270 make decisions with imperfect information and how long do you wait
271 to make a decision, how much information should you have is always,
272 I think, something that’s been, you know, hard for us as an agency to
273 kind of figure out about where you come down in all of that; how
274 nimble do we need to be; how correct do we have to be; It’s very hard, I
275 think, and I don’t think that there’s agreement among all of us about,
276 you know, what the answer to that is.

277 And obviously it depends on the situation. It depends on what the
278 tradeoffs are and many other things. But it – it’s not, you know, it’s
279 not straight forward. I think, as they say, and people have very
280 different points of view about it and I think in this response, there was
281 a lot of some of us felt like, come on, let’s go already. You know, we
282 can’t wait forever. And others would say, wait a minute. You know,
283 this could be wrong. It’s hard to know where to come down with all of
284 that.

285 Barbara: In dealing with this ambiguity, particularly related to the H1N1
286 threat, within your division, how did you manage this decision making
287 in the face of ambiguity?

288 Beth: Well this isn’t – I would say – I mean most of this, you know, after sort
289 of the early days I actually sort of became part of this response. So I –
290 I actually have very little to do with my Center after, I don’t know,
291 May or something or other. So I think the way we managed the
292 ambiguity in the response was hopefully to recognize it and then
293 usually somebody made a decision. And usually, it meant that, you
294 know, somebody was pushed out of their comfort level one way or the
295 other.

296 And I guess, you know, the decision is usually, okay, we are doing
297 something now, or we are waiting. I would say usually the we are
298 waiting people were – there were more of those probably than we are
299 doing something. But it required making a decision. And sometimes it
300 was a decision that was forced upon us by, you know, somebody above
301 us saying the Secretary is going to say – wants to say, blah, blah. Or
302 the Secretary wants to say something about blah, blah, what can she
303 say? And then, you know, well, you just have to kind of, you know,
304 deal with that. And that, often times, I think is – it was some of the
305 issue. Some – sometimes the issues are more policy related issue like,
306 you know, should we issue guidance on this topic right now or should
307 we wait until we have more data.

308 And, you know, for some things, you know, we have to issue guidance.
309 So then do we issue the guidance – what do we say, you know, do we
310 go with the pieces of science that we know, do we – how much do we
311 consider, practical considerations, how much do we weigh the various
312 – all these various components, could we wait to know a little bit more
313 about the disease spectrum, you know. And – and, you know, as –
314 there were certainly a number of guidance that we revised. And
315 sometimes we revised them just because the situation changed, and
316 we knew they needed to be revised. Sometimes we revised them
317 because I think that our balance between, you know, strictness and
318 feasibility shifted, which, you know, it shifts when you get a better
319 sense of how severe the disease is, or how many people are getting
320 sick, or who the people are that are getting sick, or any number of
321 other – whether there’s going to be a vaccine, any number of
322 considerations like that.

323

324 Barbara: In terms of getting clearance for information to be released, how did
325 you feel that process worked?

326 Beth: Well, I was the final point of contact for clearance -- for clearance, for
327 policy, for guidance, for scientific publications. And I think that you
328 will hear a lot of different opinions about how that worked.

329 For many things, I was the final point of clearance here but they
330 needed to be cleared at HHS. And that was a – a difficult sort of
331 challenge which I think improved somewhat over the course of all of
332 this. But, you know, realize this pandemic happened with a brand new
333 administration, no HHS Secretary, really nobody pretty much at HHS
334 when we started, no full-time – no whatever, permanent CDC
335 Director, lots of people in acting positions all over the place including
336 in Washington. And so this whole question of who needed to see what
337 really changed a lot during the course of the response. And how much
338 control they needed to exercise, and who needed to be exercising
339 control also really changed.

340 But when things started, you know, I think, you know, it was just not
341 really clear what needed to happen. I mean, so I – I can remember one
342 of – a document that – an early document and may was in June, that I
343 finished working on and sent for HHS to review and it ended up being
344 circulated to every single op div in all of HHS for comment. And I
345 received back a 20-page spreadsheet with, you know, 200 some odd
346 comments from everybody and their brother. I didn’t know who they
347 were, that I was supposed to – we were supposed to respond to within
348 some amount of time. And I mean this clearly was not a feasible way
349 to deal with an emergency. And I think everybody sort of realized that
350 and said, oh, that’s not going to work, you know, we have to figure
351 something else out.

352 But there were a lot of those kinds of things that happened in the
353 course of – of – of this response. There’s always the issue of, you know,
354 how long does it take to get things cleared, I think that continued to
355 be an issue which, you know, I don’t know that there’s a good answer
356 for that. From my own perspective, I think sometimes the staff feel
357 like they’ve, you know, they spend weeks working on something and
358 they think it’s ready to go and unfortunately, it just isn’t ready to go.
359 And it’s not a matter of, you know, the people take too long to read it,
360 it’s that, you know, they did a great job but they didn’t actually
361 understand or recognize all of the various policy issues. They, you
362 know –it’s not understandable to somebody who’s not an expert in the
363 area. Any number of ways that, you know, those were issues and so
364 that, I think is always a, you know, a problem for people and, you
365 know, it’s something once again I hope that we improved upon over
366 the course of the response but it’s not easy.

367 Another aspect I think that we always struggled with is we had a lot
368 of people working on this response, and they were all very
369 enthusiastic, and they all thought that their own little zone was
370 really, really important, and they really wanted to write something
371 about it, and they really wanted to have, you know, a guidance to
372 every, you know, to, I don’t know, the asthmatics with blond hair. And
373 we didn’t have the best method for surfacing all these things early
374 enough so that we could provide some context for the ones that were
375 priorities, and people should work on, and the ones that were not
376 priorities, and people should not spend their time working on.

377 And so this – this became an issue, especially became an issue for the
378 people who were doing all of the central technical influenza related
379 clearance which is sort of a level below me. I would get the things that
380 they thought – that were kind of, you know, kind of big enough that I
381 would need to read them. But those people sitting in this room, getting
382 all of this stuff to review for technical correct – technic – technical
383 correctness, were just inundated with these massive things about all
384 kinds of topics, many of which, you know, were not appropriate. We
385 didn’t need those things.

386 And so that was something that we tried several times to do
387 something about, to say, look, for everybody’s benefit, for everybody’s
388 moral, to respect everybody’s time, do not come up with an idea of
389 something that you’re going to write something about based on
390 whatever your, you know, group is that you’re working with and send
391 it forward. Don’t do that. You know, if you have an idea, you know,
392 this is the process to have somebody decide – help you decide if that’s
393 a good thing to do or not.

394 I think we had some success with that. Not 100 percent success. I
395 mean, even, you know, within the last, I don’t know, two or three
396 months, I was – I had to say to people, somebody, you know, that gave
397 me something and said, okay, this is ready for you to look at. I’d have

398 to say, -- I had to say, we're not -- this is not -- we can't -- we're not
399 doing this. We're stopping it. That's not great. It's not good to have to
400 do that.

401 So, you know, as I say, I think that's -- that's something that could use
402 some more fixing although I'm not sure how fixed it can be. I mean,
403 then the whole issue of the scientific communications, the media
404 communications and how those fit together is a whole other story. I
405 think in general, we did reasonably well here because our media
406 people are so smart, and they are so respectful of the science, and
407 they're so able to take the science and, you know, make it something
408 that's understandable. And then our communicators, mostly Tom and
409 Ann, you know, did a good job of that. And so I think we didn't have
410 the problems with that aspect of things that, you know, I've seen in
411 other sectors and certainly, you know, we've had at some time --
412 sometimes in the past.

413 Barbara: Besides the media, were there things that come to mind that you felt
414 were done very well?

415 Beth: Well, I think in general we, you know, this -- this was, you know, I
416 mean none of these responses are easy. Now this one wasn't -- also
417 wasn't easy. I think this whole business of everything being in
418 transition was particularly challenging. I think the whole business of
419 getting the pandemic planning stuff and people in sync with what
420 actually happened, and the people that are actually dealing with what
421 was happening, was also very, very challenging. But -- and I think
422 that the question of how the people that really worked day in and day
423 out in this, how they feel about the response, and were they valued,
424 and a lot of those kinds of things, I think, are still not completely clear
425 to me.

426 But I think in general, in terms of people really trying to, you know,
427 work together, figure out what's going on as best they could, provide
428 the best information as quickly as possible, and really, you know, try
429 to prevent illness and death, and work together to try to do that. I
430 think in general, the -- that sort of unifying spirit was pretty well, you
431 know, maintained with some, as I say, I think that in some ways it's
432 easier for people, those of us who at least have some -- are able to see
433 the bigger picture from, you know, talking to people in Washington, or
434 you know, understanding what's going on all across the response,
435 some of the people who were very important leaders in a particular
436 sphere, but maybe, you know, didn't have the opportunity to hear
437 much of that. That, you know, I think, I'm not sure how well that
438 worked, and I'm not sure how well the people who were responsible
439 for, you know, kind of communicating stuff down the chain, as they
440 say, I'm not sure how well that worked mostly just because nobody
441 had any time. You know, you just reach a...

442 Barbara: So looking back over the past year as the organization has responded
443 to this threat, are there any recommendations you would make for
444 future events?

445 Beth: I certainly think that there's room for improvement. How to frame
446 that in the context of recommendations, I guess I would say that
447 finding the time to let the rest of the agency know what's going on in a
448 more, you know, kind of regular kind of a way, I think might've been
449 helpful from, you know, just thinking about things within CDC. You
450 know, we – we snapped up a lot of people and we spent a lot of time,
451 you know, detailing people from hither and yon. And I think that that
452 engendered not the most happiest of feelings in some other parts of
453 the agency. And I think if there were a way that we could have had
454 felt that everybody was participating or at least knew what was going
455 on in some kind of way, that perhaps that would've helped a little bit.

456 I think the other thing just once again from the internal CDC point of
457 view, is that I do remain concerned about how all of the people who
458 worked so, so incredibly hard on this, I mean, you know, I think of
459 some of the people in the lab or the surveillance people who probably
460 haven't had a day off in a year, literally, who, you know, haven't
461 worked for less than 10 or 12 hours a day for a year, I just wonder how
462 – how they're going to feel at the end of all of this and I wonder if
463 there was some ways in the course of this – this response that we
464 could have, you know, at least made them feel like, you know, I mean
465 we did try to – we did make them feel, try to make them feel
466 appreciated, go visit the labs and tell – say all the time how much we
467 really appreciated everybody. But I think sometimes the pressure, you
468 know, to want information from people, to want them to be done with
469 whatever the project is or part of this that we're waiting for the
470 information, and just a lot of sort of inundated with, you know,
471 questions from all over the place. I'm a little con – I think if there were
472 a way that we could control that, if there were a way that we could
473 prioritize so that we could actually give people better guidance about
474 do this but don't do that, this request you really have to deal with, this
475 other request you really don't have to deal with, a way that we could
476 have more control over what it is that we have to provide to other
477 people. And I don't know if that's feasible. I mean given the course of
478 some of these requests, for providing this to this person and that
479 person, perhaps is not feasible to control that.

480 But I think from a Agency, people, moral point of view, it would be
481 helpful if we could do that, if we could say, you know, to people above
482 us, do not, you know, ask directly so and so for such and such. And, as
483 I say, perhaps that's not feasible but I think that there were probably
484 a lot of people within our agency who would've been happy to, you
485 know, have somebody be more of a wall than perhaps we were able to
486 be.

487 So those are some internal things I think that – that I could imagine
488 that we could've improved. I think probably this whole business of who
489 was responsible exactly for what got better but maybe, you know,
490 could be – also could be a lot better. And I think this issue of keeping
491 people who have good intentions on a task which is actually an
492 important one when you have so many people and so many things
493 going on at the same time is something else that maybe, you know, we
494 could've done a better job on.

495 Barbara: Great. Well thank you very much.

496 Beth: Sure. Thank you. [audio ends

**Interview #3. Steven Boedigheimer, MBA
Deputy Director, Division of State and Local Readiness, Office of Public Health
Preparedness and Response**

- 1 Barbara: Good afternoon. We're here today to begin the development of an oral
2 history on the CDC's H1N1 response strategy. And we hope this
3 history record will be useful to future leaders by giving them the
4 benefit of your experience with H1N1 as they confront new and
5 possibly similar challenges. So let's begin with a little background
6 information on you. Could you give us your name and your position?
- 7 Steve: My name is Steve Boedigheimer and I'm the Deputy Director of the
8 Division of State and Local Readiness in the Office of Public Health
9 Preparedness and Response.
- 10 Barbara: And what brought you to CDC? What is your background?
- 11 Steve: Well I spent several years in administrative positions in state health
12 departments from coast to coast, Oregon, Delaware and then CDC.
- 13 Barbara: Are you currently involved in some aspect of the H1N1 response?
- 14 Steve: Over the last few months, I have co-led and then led the state
15 coordination task force and the H1N1 response and the command
16 structure here at CDC in the Emergency Operations Center.
- 17 Barbara. Do you recall when you first heard about H1N1?
- 18 Steve: It was in the spring of 2009 and I was in a little different role at that
19 time. I was the CDC Sr. Management Official for the State of
20 Arkansas on the staff of Dr. Paul Halverson the Director of Health in
21 the State of Arkansas. And I functioned in the State Public Health
22 Emergency Operations Center assisting the State in their response to
23 H1N1.
- 24 Barbara: Great. Do you recall how it was presented to you, the information
25 about H1N1 and did it strike you as a crisis?
- 26 Steve: Well it certainly struck me as an urgent situation. I don't recall the
27 exact means of communication but between information provided by
28 CDC and the senior leadership at the Arkansas Department of Health,
29 we recognized the urgency of the situation and immediately began to
30 collaborate with CDC on a Arkansas response, if you will, to H1N1.
- 31 Barbara: Could you describe generally those first few days of the response
32 period?
- 33 Steve: Well, in the spring of 2009, the Arkansas Department of Health
34 established an incident command structure inside its agency and
35 mobilized its Public Health Emergency Operations Center. So the
36 typical components of an incident command structure were

37 established and the Arkansas Department of Health linked back to
38 CDC monitoring the initial effort at – CDC’s initial effort at keeping
39 state health officials informed through a national telephone call which
40 was held in the spring to get things started. There were other CDC
41 linkages out that occurred at that time both with epidemiologists and
42 public information officers, and monitoring of email communications
43 that came from CDC and certainly the website that CDC maintained
44 to provide information to state and local health officials.

45 Barbara: So were you involved directly in the day-to-day response?

46 Steve: I was involved in the day-to-day response. I had a duty station in the
47 Public Health Emergency Operations Center in Little Rock, Arkansas
48 and helped the state health officials link with the appropriate subject
49 matter experts back at CDC, use whatever means would be available
50 to me to do that.

51 Barbara: And when you came to CDC, how did your role change?

52 Steve: Well it was looking at things from the other side of the lens if you will.
53 On the CDC headquarters, I assumed a role here that had me
54 immediately involved in both helping to shape a funding stream that
55 put public health emergency response dollars in the hands of 62
56 different projects around the country, 50 states, four cities, eight
57 territories. And in the course of a relatively short period of time, from
58 July 31st through the 28th of September, we put \$1.35 billion worth of
59 response funds out to our state and local colleagues in that regard,
60 and then began to an enhanced means of keeping them informed and
61 communicating with them.

62 Barbara: Great. Can you give us any examples of day-to-day activities that you
63 thought were particularly useful?

64 Steve: Well, I think one of the things that was particularly useful was
65 building on the initial experience in the spring of a national telephone
66 conference call strategy to keep both the state health officials and
67 their employees informed of what CDC was doing as well as a national
68 call to keep local health officials informed of the CDC response and
69 answering questions and so forth. So that was a strategy that was
70 initiated in the spring but was certainly refined and built on in the fall
71 of 2009.

72 Barbara: And over the course of a year, has anything changed? Or is that still in
73 effect?

74 Steve: Well, it’s not in effect at this point. We stopped doing that as we
75 transitioned in the nature of the response in January of this year.
76 Over the course, however, from – of time from September through
77 January, there were 23 separate telephone calls held for state health
78 officials and local health officials. On average, probably the state
79 health officials, there were 78 or so callers on those calls and given the
80 number of health officials, that would indicate that more than one call

81 per state although we didn't always have every state on the line. For
82 our local health officials, there are a lot of them. I think our peak call
83 was over 640 individuals had called in from local health authorities on
84 the one call we had in – in October.

85 Barbara: You mentioned a particular call strategy earlier that you wanted to
86 discuss in more detail.

87 Steve: Well, if you'd like, what we could do is recreate the first three minutes
88 of what one of these calls was like, and we pick a typical call, perhaps
89 the 19th of January. As we got near the end of the national calls and
90 our listeners can see how that call was handled and the approach we
91 took; just the first three minutes, take us back in time and actually be
92 there and experience that.

93 Barbara: Great, let's do that.

94 Steve: Well let's do that. If you would like to play the part of the operator,
95 we'll do a little bit of role play here and we'll just create that – that
96 call of January 19, 2010.

97 Barbara: If you need assistance during the call today or you wish to ask a
98 question, please press star one. I will now turn the call over to your
99 moderator, Mr. Steve Boedigheimer.

100 Steve: Welcome from Atlanta, Georgia, the headquarters for CDC for the
101 weekly conference call with state health officials on the H1N1
102 response. This call's being conducted in collaboration with ASTDO and
103 is intended to give you the most current information available on the
104 H1N1 response, and to hear from you about the challenges you face,
105 your questions and most importantly the suggestions you have for us
106 at CDC. We value greatly your participation in these calls. On this
107 January 19th, 2010, we have a full agenda as always. And before I
108 check with our colleagues at ASTDO, Dr. Paul Jarris or Mr. Jim
109 Blumenstock, to see if they have any opening comments, let me run
110 down the agenda for today's call.

111 We're fortunate today in that we have Dr. Dan Sosin, the Acting
112 Director of Public Health Preparedness and Response Office here at
113 CDC with us in the room, and Dr. Steve Redd, the Incident
114 Commander for H1N1. And, as usual, we have a fully packed agenda.
115 We're going to hear from Ms. Chris Kosmos on the status of the public
116 health emergency response grants particularly the status of [inaudible
117 0:08:26.6] Phase IV. The vaccine task force will provide us an update.
118 We have Dr. Paschal Wortley and Dr. Tom Shimabukuro here to tell
119 us about the activities of the vaccine task force. We're going to get an
120 update today from Dr. Greg Armstrong about the MMWR report that
121 was out just recently on vaccine coverage. Also, from Ed Koszowski,
122 we're going to have our epidemiology update today. And from Dr.
123 Eugene McCray, from medical care encounter measures, we're going
124 to hear from them and the latest activities of that task force here at
125 CDC. Probably touch on the N1 95 mask situation while we're doing

126 that. Our communications update will be from Nadia Bellins today.
127 And we're going to spend a few minutes on the Harvard public opinion
128 poll that was in progress just recently. We'll hear from Kerry LaBelle
129 about that. And as always, we'll take your questions, and comments
130 and suggestions between speakers as we move ahead with this call.

131 So again, thank you for participating in today's call.

132 And that would be exactly pretty close to what it was like had you
133 been participating on the 19th of January, 2010, as we opened this
134 national call.

135 Barbara: Great, thank you. This brings us – brings a good question up about
136 inner agency coordination and how effective do you feel the CDC's
137 ability was to coordinate with other agency?

138 Steve: Well, the part of the response that I was particularly engaged in had
139 to do with coordinating with state health officials and local health
140 officials. And I think that we had communication mechanisms in place
141 to get a fair idea of some of the challenges that they were facing. The
142 national calls that we held each week, the one we just re-enacted for
143 state health officials, gave us a pretty good idea of the challenges and
144 concerns they had. The weekly call with local health officials also gave
145 us some insight into some of their concerns, and issues and
146 suggestions. The first time, for example, that we heard about a local
147 health jurisdiction that expanded vaccinations beyond the target
148 groups in the fall, the first time we heard about that was on a national
149 call like this from a small jurisdiction in the state of Washington.

150 In addition to that, we had other means of communication in place,
151 weekly calls with the leadership of the Association of State and
152 Territory Health Officials for example, and the National Association of
153 County City Health Officials. So we were in good connection with
154 leadership. We established this part of the state coordination task
155 force a program where we would bring liaison officers in from those
156 two national associations and they would spend the weekdays with us
157 here in Atlanta in our Emergency Operations Center with the state
158 coordination task force and sit in on the meetings that we were having
159 to discuss policy, and strategy, to carry out a national vaccine
160 campaign.

161 So we had the ability to communicate directly through national calls,
162 through leadership calls, and actually have representatives of national
163 associations sitting with us in the Emergency Operations Center as
164 part of our state coordination task force. So we're thinking that we are
165 much further ahead with this national response than perhaps where
166 we might have been in the past with the way this was approached.

167 Barbara: And have these practices been institutionalized now for future events?

168 Steve: Well, excellent question. We're working in that direction. We certainly
169 are trying to capture all the lessons learned through after action

170 reports, in progress reviews and are in the process of writing that
171 down into more of a procedure. The state coordination task force, for
172 example, is capturing an organizational design, the methodologies and
173 protocols used in the national calls, the way we worked with liaison
174 officers as we call this, the representatives and national association,
175 and getting that down in writing so we can use that in the future.

176 Barbara: Thinking back where you derived your information, where did it
177 mostly come from? What were your sources of information?

178 Steve: Well, certainly the examples that I just gave. I think another useful
179 tool that a few of us utilized which may not be captured in an after
180 action report was simply pick up the phone and contact somebody, in a
181 state health department, or a local health department, that we knew
182 or had worked with in the past that was in the epicenter of the
183 response, and validate the information, maybe gain some insight that
184 we hadn't had. For example, I would pick up the phone and call the
185 Deputy Director in Delaware, Dr. Paul Silverman, and ask him his
186 perspective. Or pick up the phone and call the health officer or the
187 chief operating officer in the Arkansas Department of Health and say,
188 "What are you hearing? How's it working? What do we need to know
189 that maybe we're not getting at?"

190 And those little test methods, if you will, to get what one might get
191 ground truth, I think, were particularly useful.

192 Barbara: In thinking about decision making over the course of the history of
193 H1N1, what do you think were the key decisions that needed to be
194 made early on in the first few months?

195 Steve: Well, you know, this many faceted response and I'm sure that there
196 were key decisions most certainly in the vaccine area, in the
197 epidemiology area, medical care and counter measures, and so forth,
198 across our command structure. Early on, community mitigation was a
199 major issue. So we have subject matter experts in all those areas. I
200 think in the area that I'm most familiar with, in the state coordination
201 task force, one of the challenges we faced and key decisions was how to
202 organize ourselves inside of CDC's incident command structure to
203 bring to the forefront the concerns and issues of state and local health
204 officials who were actually carrying out the vaccine campaign, who
205 were actually making decisions about community mitigation, and were
206 facing those challenges in epidemiology and surveillance.

207 And so for us at CDC, early decisions were how to organize a part of
208 our internal incident command structure, how to design that interface
209 between CDC and state and local health officials. And particularly one
210 of the decisions as a – in a challenge is how do we function across
211 these categorical areas where command structures were set up in the
212 Emergency Operations Center around community mitigation or
213 epidemiology and surveillance. How does the state coordination task
214 force design itself and interface across the command structure so as

215 not to be a bottleneck or barrier, but can facilitate, leverage the effort,
216 to gain better information from the field as we say at CDC, where our
217 colleagues are state and locals are carrying out this, and how do we
218 make sure that we leverage that effort for good communication. One
219 example might be working with our JIC, our Joint Information
220 Center, to identify a daily – the need for a daily email message that
221 contained H1N1 related information aimed directly at state health
222 officials and local health officials, collaborating with the Joint
223 Information Center to establish that type of communication and put it
224 out there without, in some way, interfering with the activities that
225 were already underway inside the command structure.

226 So as I think anxious as people might be to hear how we might make
227 decisions impacting the public. In fact, some of our challenges were
228 upstream from that, how to make decisions about our internal
229 operation so that we could achieve the ultimate goal of getting timely
230 accurate information, and hearing what was going on in the field, and
231 putting that information in the right hands of the right people inside
232 our CDC command structure.

233 Barbara: Great. You've mentioned several times the – after the activation of the
234 EOC that you had additional resources deployed to support you. Did
235 you find that this was something that needed to be longer term than
236 you planned on?

237 Steve: I think one of the challenges is to stand up an internal response
238 structure in a timely way with the right expertise and getting it in the
239 right places at the right time. The state coordination task force inside
240 the incident command structure here was the last task force to stand
241 up. So identifying where the CDC employees were at that could
242 enhance that effort, and to get them in position in a timely way was a
243 challenge that we struggled with, I think, early on.

244 Barbara: Can you talk a little bit about your process of doing that?

245 Steve: Well, we tried the standard approach of the Emergency Operations
246 Center reaching out across CDC to identify individuals that would be
247 available to come and be part of the task force. But frankly, the most
248 effective way was for our own individuals, for example, myself, pick up
249 the phone and call people around CDC. The informal approach
250 actually worked faster for us to identify talented people and get them
251 onboard quickly to offer the support. So I think we – we still have
252 some growth to do in that area, finding and getting people placed in a
253 timely way.

254 We also worked to provide people in our task force in the field as we
255 say. Over the course of this event, the state coordination task force
256 worked with probably 49 different people, CDC employees, to get them
257 placed in 21 different states, or territories or cities to accomplish 37
258 different missions, if you will, to assist that jurisdiction in the H1N1

259 response. We have other parts of CDC's command structure like
260 epidemiology that could provide epi and surveillance support.

261 But in our task force, we were looking for public health advisors that
262 could assist a jurisdiction like the District of Columbia in ordering
263 vaccine in a timely way; or identifying somebody at CDC that could
264 spend a weekend in the District of Columbia observing a mass
265 vaccination clinic and give them advice on the movement of people and
266 supplies and so forth to enhance their effort to manage a group of
267 people and expedite vaccinations in that mass vaccination setting.

268 So finding those kinds of people at CDC was also somewhat of an
269 informal process and somewhat of a formal approach with the
270 Emergency Operations Center advertising and looking for the right –
271 right individuals.

272 Barbara: Thank you. Looking back over the past year, are there any challenges
273 that you recall where you think – wish you would've done it
274 differently?

275 Steve: Well, that's a good question. I would like to think that we could move
276 a little faster in standing up our response, that in the future we won't
277 have to re-invent how a state coordination task force would – would
278 function in a broader incident command structure, that we would be
279 able to turn to a boiler plate procedure as at least a starting point for
280 how to manage national calls with the right subject matter experts
281 and manage the timing and so forth. We learned a lot from this
282 experience. And I think we will benefit from that in the future.

283 Barbara: Do you have any other specific recommendations that you would make
284 for future leaders?

285 Steve: Experience is always helpful. So I would think that if we can identify
286 people in our organization that have experienced what we have just
287 experienced with the H1N1 response, and turn to the experience
288 perhaps along the lines of something that we're doing today, recording
289 for history what we have been through and drawing from that, or
290 going right to individuals that have been there and done that, and
291 taken what they've learned from it, and expanding on that as we face
292 new challenges.

293 Barbara: Great. Thank you very much.

294 Steve: Thank you. [audio ends 0:22:37.3]

**Interview #4 Jay Butler, MD
Director, H1N1Vaccine Task Force**

1 Jay: Jay Butler. I'm Director of the H1N1 vaccine task force. It is February
2 the 18th, 2010, and we're in the sound stage at the CDC in Atlanta,
3 Georgia.

4 Barbara: Thank you. We're here today to develop an understanding of the
5 history [inaudible 0:00:17.6] background information on you. Could
6 you tell us a little bit about yourself, your training, your medical
7 specialization and what brought you to CDC?

8 Jay: Okay. I'm an infectious disease physician, board certified in general
9 internal medicine, general pediatrics and infectious diseases. I've been
10 with CDC a little over 20 years now. While I was a resident at
11 Vanderbilt, a number of my mentors had been through the EIS
12 program. For a couple of years, I kept saying why would I be
13 interested in the CDC? I want to be an infectious disease doctor
14 working in an academic center. But somewhere along the way, I began
15 to – to cave a little bit and got interested, applied to the EIS program,
16 spent two years with the Wisconsin Division of Public Health, came to
17 CDC as a preventative medicine resident for a year in the respiratory
18 diseases branch, and stayed on as a – a staff member; spent seven
19 years with the respiratory disease branch in Atlanta including a year
20 that – in there that I was with the viral special pathogens group
21 during the hantavirus response in 1993. Went to Alaska in 1998 with
22 the Arctic Investigations program and was there until 2005. And then
23 for four years, spent time on a detail to the State of Alaska initially as
24 the state epidemiologist and later as the State Chief Medical Officer
25 serving as the State Health Officer during my last two years with the
26 state.

27 Barbara: Are you currently involved in some aspect of the H1N1 response?

28 Jay: Since June, I've been Director of the CDC H1N1 vaccine task force.

29 Barbara: And when do you – can you recall when you first heard about H1N1?

30 Jay: I can recall the moment very clearly actually because I was not at
31 CDC in Atlanta at the time. I was actually attending the American
32 College of Physicians' Conference in Philadelphia finishing my term as
33 governor of the Alaska state chapter. In sitting in the convocation
34 ceremony and being a little bit ADD, I was getting restless and I
35 pulled out my Blackberry and saw some emails about a new swine flu
36 strain that had been isolated in children in Texas and California. And
37 remember thinking at the time, this does not sound good and
38 particularly with two separate geographic locations. It raised some
39 concerns. And as I was leaving the convocation call, I ran into Greg
40 Poland who is well known as a – someone who's done quite a bit of
41 research and promotion of vaccines and we were talking about it and

42 both had the same impression that this did not sound – sound good at
43 all.

44 The next day I had traveled to Washington for a meeting. I was Chair
45 of the ASTO vaccine and infectious diseases subcommittee at that
46 time and I think I didn't spend more than about 30 minutes in the
47 meeting because the news about Mexico had come out that morning.
48 That was a Friday morning. And I was pretty much in and out of
49 conference calls the rest of the day. Was at the meeting with some
50 ASTO staff and I remember we were saying, well what's next. And I
51 said, I've got to go home. I've got a state that I need to be in during
52 what sure sounds like is going to be an influenza pandemic.

53 So I returned to Alaska. The next month and a half was very hectic.
54 We actually were one of the last states to actually see disease but
55 certainly being ready for when the virus would eventually get there
56 was a big part of my job. The time came through both some pushes
57 and pulls to be leaving the state of Alaska and the opportunity came
58 up to come to CDC to head up the vaccine task force, and I arrived
59 here around June 21st of 2009.

60 Barbara: Do you recall how the information initially was presented when you
61 first heard about H1N1? Was it – did it give a sense of a potential
62 crisis? Was it matter of fact? What were kind of your emotional
63 responses to reading these emails?

64 Jay: Well it was very matter of a fact – matter of fact. And, of course, I was
65 at that time getting it from outside of the – the Agency. I wasn't
66 getting a lot of inside information. And it did strike me – there was –
67 seemed to be an avoidance of using the word pandemic, at least in the
68 official communications yet everything that was developing over the
69 next several days certainly gave every indication that this very well
70 could be the beginning of the next flu pandemic.

71 Barbara: So you mentioned you went back to Alaska. But when – what did you
72 actually do in terms of making preparations and taking steps to be
73 prepared?

74 Jay: Well before I even left Washington that day, had a conference call
75 with our preparedness director and we have spent a lot of time like
76 many state over the past four years preparing for the next influenza
77 pandemic. The concerns about the H5N1 Avian Influenza certainly I
78 think has been a big driver in that. We had done a number of drills
79 even full cabinet-level tabletops with the Governor and Lt. Governor
80 of how we would deal with an influenza pandemic. So in many ways,
81 we had the drill laid out.

82 The biggest issue was okay this is not H5N1. It does – we don't know
83 what the mortalities – there's a lot of things we don't know and it's
84 also not on the other side of the world. It's in our country now. What –
85 what do we do? And so a lot of the work was adapting the plan to the
86 situation that was actually evolving.

87 Beyond that, reaching out to partners in Alaska, there's only one local
88 health department but we also work with the tribal organization. So
89 getting everybody at the table and then working with other
90 departments within state government and, of course, making sure
91 that the Governor is aware of what's going as well as the
92 congressional delegation in Washington. And that was – that was
93 actually one big part of my job each day was to provide a briefing in
94 the form of an email to our congressional delegation as well as to the
95 Governor's office.

96 Barbara: Did you feel you got enough information? Were you satisfied with the
97 information you were getting?

98 Jay: Yes. One of the – the best things that happened early on was the daily
99 conference call, and those occurred about midday for us in Alaska. I
100 think it was later in the day on the – the east coast. And those were
101 occurring seven days a week early on. And there were other calls as
102 well. But that provided a great opportunity to get information directly
103 from the subject matter experts at CDC, and then also to have
104 discussion with the other state health officers to find out what were
105 some of the issues they were dealing with. And that was a great way
106 to have a heads up on things that we may not have yet had to deal
107 with.

108 Barbara: As you were developing your response, did you discover that you
109 needed to make modifications to these existing plans or processes
110 within your organization?

111 Jay: Yes. The – the planning was very beneficial. But the plan is not a
112 protocol. It helped us to think through the issues that we needed to
113 deal with but the pandemic that was arriving was a little different
114 than the pandemic we had planned for in that a lot of the plans were
115 built around a worst case scenario of either a 1918 type pandemic or
116 an H5N1 type pandemic with a very mortality rate.

117 As it turns out, of course, this was a – a different kind of epidemiology.
118 It was a virus that primarily impacted young people. And if you look
119 at it as a pediatric pandemic, it was a pretty bad one because a lot of
120 kids and young adults died. If you look at it in comparison to seasonal
121 influenza, it may not seem like it was that bad because that's a bug
122 that normally kills the elderly, yet the elderly were relatively spared
123 by the H1N1, at least so far.

124 Barbara: In terms of outside coordination with other agencies or even with
125 other parts of CDC in your position in Alaska, how was that
126 communication – how did that work?

127 Jay: A lot of the communication was built on existing relationships. And
128 that's probably where the planning that occurred before the pandemic
129 ever developed really helped because, as they say, an emergency is a
130 terrible time to be exchanging business cards. So we also had the
131 advantage of having it being a small state population wise. So the –

132 having been in the role for a couple of years, you basically knew people
133 and even people that hadn't been directly involved in some of the
134 planning, it was easy to reach out to them.

135 And a good example was developing policy for school closure. That was
136 one where some of the – the guidance coming out of CDC didn't seem
137 to, at least at that time, fit our situation in Alaska. Very quickly, we
138 worked with the Commissioner for the Department of Education. He
139 set up a conference call with all of the – the superintendents in the
140 state. I was able to provide a briefing to them and talk through some
141 of the issues surrounding school closures. And more importantly,
142 listen to them and hear what some of the concerns they had because
143 while there's the health aspects of school closure, there's also social
144 aspects that we had to think about of people who were in an absolute
145 panic and concern that we weren't responding appropriately. There
146 may – that's a factor that we had to consider in terms of making
147 recommendations within the state of what to do about when and for
148 how long to close schools.

149 And that was probably – an important role was to help people look
150 ahead because these superintendents, particularly in the smaller
151 school districts, really had not been often times as much involved in
152 the planning. And helping them to think through the issues of well if
153 you close the schools, what are you going to use as the threshold to
154 reopen. And when you began asking questions as well as just giving
155 information, it was – it really created a great dialogue to be able to
156 work through the problems that were often times unique in each of the
157 – the school districts which really ranged from multi-cultural urban
158 school districts like Anchorage to the North Slope School District. I
159 don't know the exact population but the land mass is about the size of
160 the state of California. It's a very different type of school district than
161 anywhere else probably in the country.

162 So it was – it was good interaction. It was good communication. It was
163 a lot of fun, I'd have to say because none of us knew exactly what we
164 were doing. We were doing the best, making decisions on the
165 information as it come in – it came in. And we had a good – good

166 Barbara: In terms of deciding what information to put out to the public and
167 balancing the need to inform the public and yet being cautious about
168 creating a panic, how – how – what was your process of determining
169 what information should be released?

170 Jay: Well, I'm going to go with the assumption that this question is still
171 based on my – my job during the first two months of the pandemic
172 response as the state health officer. We had worked with our Office of
173 Public Affairs very closely throughout the planning period. So there
174 was a certain amount of okay, this is not just a drill. Let's do what we
175 – we trained for. And that aspect was – was very good. We had already
176 planned through who would be spokes people. I – I was the primary

177 spokesperson. We had some backups as well. And it really became
178 fairly routine.

179 We put out daily press briefings although we – we actually pulled back
180 a little on that because again, we were not one of the states that were
181 seeing the early disease. And so everybody wanted to know was it here
182 yet. Is it here yet? And we kept having to say, no, it's not here yet.
183 This is what we're doing to prepare. For instance, when we began to
184 get anti-virals into the state, we were able to describe that process.
185 We, at that time, just by chance were also opening a new state
186 virology lab so we were able to describe the new technology and new
187 capacity in the state lab that was really remarkable timing that we
188 had that just in time for the number of specimens that we were going
189 to see coming in pretty soon.

190 And then once we actually had a case diagnosed in state, we were able
191 to have a briefing, and have the – the kind of – provide the
192 information to the media in the way we wanted. It – we did have some
193 surprises before then thought. Of course, it was getting into mid-May
194 and we had the cruise season starting and we had cruise ship
195 passengers with influenza like illness. Specifically, we had a
196 passenger that was in Alaska waters in a ship that had already had
197 ports of call in Alaska that had H1N1 infection diagnosed in
198 Washington State. And so coordinating that and helping people feel
199 that particularly given the locals the appropriate guidance of how to
200 deal with that was a challenge. And that was one of those issues
201 where working with the – the media was a little more challenging
202 because it was a weekend, and trying to communicate with some of
203 the small towns where the ship had stopped was – was a challenge.

204 But ultimately we planned ahead for some of the milestones we knew
205 we'd be hitting like the first cases and the first death to be able to be
206 prepared for how we would reach out to the media, and plan to have a
207 press conference, and plan who would do the – the talking, realizing
208 that we had to be flexible with that. For instance, did the Governor
209 want to make any of the announcements? Or would she defer to the
210 Chief Medical Officer which is – or other staff in the department
211 which ultimately is what happened.

212 Barbara: Okay, if you could talk a little bit about your current position and
213 involvement with H1N1 at this time.

214 Jay: Yeah. Well, the H1N1 task force was designed to be the component of
215 the Emergency Operations Center that would address CDC's role in
216 vaccine – the national vaccine program. The goal of the national
217 vaccine program was to provide the opportunity for immunization to
218 every American who wished to be vaccinated. So the components of
219 the task force included an implementation team to work with the
220 states to develop their state programs, a distribution team that would
221 really be responsible for the logistics of receiving vaccine from the
222 manufacturers and then getting it out to states and to providers

223 around the country, a vaccine safety monitoring team recognizing that
224 this was a vaccine that had never been used before and because of
225 some of the experience surrounding the 1976 swine influenza
226 campaign, there were going to be safety concerns, and that we wanted
227 to make sure we really had our finger on the pulse of the safety
228 aspects of this vaccine.

229 There was a team assigned to assess coverage of vaccinations so that
230 we can understand better who was being vaccinated and who wasn't
231 and to get that data as quickly as possible to be able to adjust the
232 program as needed. And we had a – have a vaccine effectiveness team
233 to be able to determine what's the clinical impact as well as the public
234 health impact of the vaccination – of the vaccine in the clinical setting
235 as well as the program at the public health level.

236 Barbara: How did you get the information about who was vaccinated?

237 Jay: The information on who was vaccinated initially came through the
238 countermeasures response administration forum which was designed
239 to collect data primarily on the number of doses administered by age
240 group. And I'd have to say that was probably something that worked
241 in very few states because there was so much that was happening at
242 that time, so much work going on. It was very difficult to get that
243 information.

244 Now at the same time, we had started the weekly national H1N1
245 vaccine survey or – I take that back, NHFS, National H1N1 Flu
246 Survey, which was a telephone based survey, self-reported data, but it
247 was a way to quickly get information on the proportion of the
248 population that had been vaccinated. And then we also had the
249 BRFSS, the national survey that is done annually and there was a
250 specific H1N1 component to that to provide monthly data that would
251 give us more of a – a drill down into risk categories such as pregnant
252 women or health care providers.

253 The NHFS data is usually available late the week after the survey is
254 completed. For instance, today is Thursday and I just, about an hour
255 ago, received the data for the week ending February 13th.

256 Barbara: Do you have any recommendations for improving the way that this
257 information could be gathered and brought to CDC?

258 Jay: Well, one of the questions that we've been asking ourselves is whether
259 or not our – our survey techniques are fairly complicated in terms of
260 the – the sampling methodology and statistical analyses, tell us that
261 much more than the – the quick and dirty polls. And we actually have
262 supported some polling data also through the Harvard Opinion
263 Research group. And then we also – we've – we've sort of compared it
264 to polling done by some of the media outlets. And we found that the
265 numbers are very similar. And it's not entirely clear to us if that may
266 be a way to get this information even more rapidly or not. Certainly I
267 think it's – it's something for the – the next time around or for future

268 lessons in studying seasonal influenza vaccine; or it may be even other
269 vaccines. We need to look hard at how we access specific risk groups.

270 One of the questions we certainly were interested in was whether or
271 not pregnant women were receiving the vaccine or not. It was clear
272 from the epidemiology that pregnant women had a unique risk to
273 severe illness and death from this virus. So that was a very important
274 group to have vaccinated.

275 At the same time, we had the issues of concerns about vaccine safety.
276 There were all kinds of things on the internet about things that people
277 would claim the – the vaccine did. Obstetricians are not clinicians that
278 are often times that familiar with vaccinating their – their pregnant
279 patients. So it was a learning curve for them. And at least some of the
280 preliminary data suggests that that – that was an area where we may
281 have had actually a major gain, that the coverage rates in pregnant
282 women for H1N1 vaccine, as well as the 2009-2010 seasonal vaccine,
283 were much higher than we've seen in – in any previous influenza
284 season.

285 Barbara: Can you talk a little bit about the process that you used in educating
286 both the medical community and the public?

287 Jay: Well actually you just reminded me of an important team in the task
288 force that I forgot to mention earlier. And that's the communications
289 team. The communication team in the task force worked closely with
290 the media office at CDC as well as the Joint Information Center in the
291 Emergency Operations Center to help develop very specific messages
292 for different target audiences.

293 There's a partnership in all of the messaging, specific populations.
294 And an important partnership was the one that was developed with
295 ACOG, the – the obstetricians and gynecologists professional
296 association who are very instrumental in terms of being able to reach
297 out to their members and to provide the most recent information that
298 we had in terms of safety of the vaccine as well as recommendations
299 for use of the vaccine.

300 Barbara: Were you involved in deciding what information was publicly
301 communicated at all?

302 Jay: Sometimes I was, sometimes I wasn't. There certainly was multiple
303 levels of decision making, and often times above the level of CDC even,
304 the decisions about media outreach were done at the department level.
305 There was feedback loops also from our partners in public health,
306 particularly through ASTO, I think, was very useful. An example
307 would be the national influenza vaccination week which normally
308 occurs in late November, early December. We planned to schedule that
309 for early December but our partners in the states were very concerned
310 at that time because we still had demand for exceeding supply. And
311 there was concern about too much of a media push encouraging people

312 to seek vaccination may not be well timed at that – at that time. It
313 would only lead to frustration when people couldn't find the vaccine.

314 So the decision was made at the Department of Health and Social
315 Services level, Human Services level, to delay that into early January.

316 Barbara: Internally within CDC, the communication processes that were in
317 place, did they support you in – in providing the information that you
318 needed? Or did you feel you needed to share information with different
319 organizations internally?

320 Jay: Well within CDC, I think the communication was fairly good. And
321 certainly as we got into the more intense and busier times of the
322 response, Tom Frieden and Ann Schuchat really became the media
323 spokes people for the Agency. And I think particularly Ann became
324 the – the person that became the spokesperson for the vaccine
325 program and the entire pandemic response as well as Tom. But I think
326 often times people will – will think of Ann when – when all this is
327 over.

328 The – the communications within CDC was pretty good. I think
329 sometimes there might have been different ideas at the department
330 level, and how well those communications occurred, I think it's like
331 everything. There's – it looks different from different positions and
332 there has to be communication to work out the best way forward.

333 I have to say, I was very impressed with the savvy of some of the
334 people at the department level who had ideas that I didn't agree with
335 at the time, or I may not even agree with now, but they were right in
336 many – many instances.

337 Barbara: Could you give some examples?

338 Jay: One in particular, actually, what is one in particular that comes –
339 comes to mind? One in particular that – I'm still not sure I'm entirely
340 sure what was the right way, but having seen how some of the media
341 played out, I think this was wise. We had some of the early coverage
342 data in late November. And if we looked at the number of doses of
343 vaccine that had been shipped, looked at the coverage data, and made
344 an estimation of how much vaccine had actually been administered, it
345 suggested that most of the vaccine was being administered within two
346 weeks after shipping. That doesn't happen with any other vaccine. To
347 me, that was just incredible news to go forward with to be able to say,
348 look, this system is working. This program is working. Even though
349 the supply of vaccine is much more limited than we might want, we're
350 getting it out and people are getting the vaccine very quickly.

351

352 The view from HHS was these coverage rates are just horribly low.
353 And, you know, there's two sides of the same coin. You know, for us it
354 was like we can't give vaccine we don't have and this is incredibly
355 quick. I mean people who work in the vaccine field, that actually move

356 a lot of vaccine, were – were pretty impressed with it. Yet, say less
357 than 10 percent of Americans had actually been vaccinated yet was
358 considered very bad news from the viewpoint of HHS.

359 So the decision was made not to go forward with making that
360 information part of the – the media update. I'm not sure – that's one
361 that I'm not sure yet if it's entirely right but as – that was about the
362 time we were starting to get a lot of criticism about lack of availability
363 of the vaccine. We had the issue come up with a report that vaccine
364 had been provided to Goldman Sacs, for instance. And I think
365 everybody pictured Scrooge McDuck getting vaccinated while the
366 pregnant women were not getting vaccinated. And there was a lot of
367 very, I don't know if I'd say negative media, but a lot of concern being
368 expressed in the media that the program was not going well.

369 Barbara: And there was also, I think, certain fear of the vaccine, public fear,
370 rumor of fear? So how – how did you work to counter that?

371 Jay: Yeah, the – one of the – the tools that I found very useful were – was a
372 series of three tabletop exercises that were hosted by Forrest Sawyer,
373 that included both members of the media and the public health
374 community. And I participated in the first and the last one of those.
375 The first one was in Washington in September. The second one was in
376 New York City actually on the day we were launching the – the
377 program. Ann and Tom attended that one. And then the third was in
378 November in Minneapolis and I attended that one along with the
379 Assistant Secretary for Preparedness and Response.

380 Those provided a great venue to have a prolonged conversation with
381 some national – nationally prominent media people who were covering
382 this. And to be able to make some very basic points that – I say basic
383 in that they helped you understand the events once you understood
384 them. For instance, to help everyone understand the concept of
385 background rates of bad events, whether that be spontaneous abortion
386 or Geombre Syndrome, that the vaccine wasn't going to prevent those.
387 So in the population, if there's a set number of cases of Geombre that
388 were occurring in 2008, they're probably going to occur again in 2009
389 but now you're going to have a good part of that population that's been
390 vaccinated and there's going to be a tendency to attribute that disease
391 on the individual level to vaccine.

392 And Mr. Sawyer, I think was very good at, you know, really pushing
393 some of the journalists and – in the tabletop, you know, it was a
394 woman who was vaccinated, who the very next day lost her baby,
395 blamed it on the vaccine. He went to the, you know, a journalist from
396 ABC and said, are you going to carry that story? And when she
397 equivocated he said, let me ask you the question again. Are you going
398 to carry that story? And it really provided a good opportunity to
399 discuss the concept of bad things happen every day. And we tend to, at
400 the individual level, associate those bad things with whatever just

401 preceded it. But in the case of immunization safety, we really do have
402 to look at it at a population level.

403 The other important part of that communication was to be able to
404 discuss what we were doing for monitoring safety to help people
405 understand that we – we were looking for anything that could happen,
406 particularly through the vaccine safety data link, through review of
407 [inaudible 0:30:17.3] reports, as well as some new tools, new systems
408 to be able to assess vaccine safety.

409 And as time went on and more and more data accumulated that the
410 vaccine was safe, it seemed like there was a – a collective sigh of relief
411 and a lot less concern about whether or not the vaccine would be
412 causing harm. Certainly in August, September, even in the month of
413 the program itself, there were a lot of concerns, a lot of things out
414 there on the internet. I used to talk about my midnight hate mail. I
415 got very strange messages from people about how I'd be at the new
416 Nuremburg trial, and how could I look myself in the mirror, and now I
417 would be burning in hell for this vaccine program. Those seemed to go
418 away once the – the program had a couple of weeks under its belt.

419 Barbara: So looking back over the past year or since you've been – since June,
420 in your position, how would you characterize the progression of the –
421 of the event, of the threat, and where do we stand now?

422 Jay: Well, the first three months of the program was really focused on
423 trying to get vaccine into people. And we spent much of the time
424 before October trying to set up a system that we thought could move
425 large quantities of vaccine as quickly as possible. And at that time, my
426 nightmare scenario was we were going to have such a glut of vaccine
427 that our system to move it through was going to be inadequate. And,
428 of course, what ended up playing out is that we had very rapid
429 succession of declines and projections of – of production followed by
430 actual production delays such that we really had a trickle of vaccine
431 never exceeding about 20 million doses a week being available. And so
432 we had to adjust the system to basically push that trickle out as
433 quickly as possible being able to receive vaccine at the depot seven
434 days per week, for example, getting orders from the states and
435 transmitting them to the depots and having same day shipping out for
436 overnight delivery. Doing everything we could to get the vaccine out as
437 quickly as possible.

438 Despite that, it was very hard. Basically, we could not keep up with
439 the demand for vaccine really until the new year. I'd like to say we
440 had about a 28 minute period where the supply and demand matched
441 exactly. By early January, we started having questions about why did
442 the government order so much vaccine because for the first time we
443 actually had vaccine that was – was in depots and not being ordered.

444 Barbara: Is there anything that, looking back in hindsight, that you would've
445 done differently?

446 Jay: Well there's plenty of things that I think I might have done differently
447 in a lot of different levels. I think some things that I probably, at least
448 from my opinion, that it wouldn't do differently, one is the way we did
449 the allocation of vaccine; that the government purchased vaccine,
450 made it available to states on a pro-rata basis so that it was as fair as
451 possible. I think this was an interesting year because we could
452 compare the H1N1 program to the seasonal flu program. And we
453 heard – there was actually a shortage of seasonal flu vaccine this year.
454 I don't think it got as much media attention because of the H1n1
455 vaccine, but we had some pretty concerning reports of price gouging
456 for seasonal vaccine. Some – I know the Connecticut Attorney General
457 was looking into reports of charges of over a hundred dollars a dose for
458 seasonal flu vaccine. And I think we were able to avoid that with some
459 of the planning that went into the H1N1 program back during the –
460 the summer.

461 In terms of things to do differently, I think in our structure of the task
462 force, it would've been good to have had more of the task force
463 physically together. Our distribution team was out at corporate square
464 the whole time and most of the team was based here on the Clifton
465 Road campus in the Emergency Operations Center. Those people were
466 so busy, the hours they were putting in were just amazing. They could
467 not come over here for meetings. So all of our communication was by
468 telephone. And I think as – as good as telephone and even video
469 conferencing is, it's still not the same as being able to be working
470 alongside people.

471 Certainly there's communication issues internally I think we could've
472 done better. We had a lot of work go into being able to communicate
473 but I think sometimes it created some – some busy work that, you
474 know, just an offhand comment would turn into a request that
475 suddenly five people were working on that I'm not sure anybody really
476 wanted the ultimate product of all that work. But I think – this is why
477 we'll have after action reviews. And this is really an ongoing process.
478 In fact, even having this interview now is interesting because it's still
479 not over. We're still dealing with issues related to distribution of
480 vaccine, and moving into the new era. We have vaccine that may be
481 expiring in the next two to three months. If it's not administered, what
482 do we do with it? It needs to be disposed of appropriately and even
483 determining what are the federal regulations for disposal of
484 Thimerosal containing vaccines is, at least on this day, proving to be a
485 bit of a conundrum because there's some conflicting information out
486 there.

487 Barbara: Do you have any final thoughts or recommendations for people faced
488 with similar situations in the future?

489 Jay: Wells, I think where we're at now is in a situation where we want to
490 make sure that we learn from our experience and I'm – I'm very
491 pleased that Dr. Frieden has set that as a priority for the Agency, that

492 we don't lose the experience that we've had here. And I think that's
493 going to be important at several levels. First of all, how do we respond
494 to the next pandemic which could be five years from now, maybe 50
495 years from now; but certainly if it's soon, it's going to be important. It's
496 important for how we do seasonal flu vaccine programs in the future,
497 particularly for 2010-2011. This is going to be a flu season unlike any
498 other because it'll be the first flu season after a pandemic. And if we
499 look at the history of 1968 and 1957, they're very different. I don't
500 think we really know quite what H1N1 is going to do, nor what the
501 2010-2011 flu season is going to look like, when is it going to – when
502 will we see the peak in disease? Will it even be H1N1? Will H1N1
503 mutate? Will we – will it be like 57 and we're going to end up having a
504 B year next year? We – we really don't know.

505 And finally, what can we learn from this experience for any emergency
506 response, particularly one that involves mass administration of
507 countermeasures. I think there's things that we've learned or – and
508 are learning from the 2009 pandemic response that combined with the
509 2001 anthrax response will make us even more able as an agency to
510 respond appropriately to future threats that require antibiotics, or
511 vaccines, or other countermeasures.

512 Barbara: Thank you very much. [audio ends 0:38:23.6]

Interview #5. Marty Cetron, MD
Director, Global Migration and Quarantine Division

- 1 Barbara: ...name, your position at CDC, and maybe briefly give us some
2 background on your training and medical specialization.
- 3 Marty: Sure. My name is Marty Cetron. I'm the Director of Global Migration
4 and Quarantine at CDC. And I've trained in infectious disease and
5 internal medicine and with a focus in international health and tropical
6 medicine. And I also trained in the EIS Program here at CDC in 1992.
- 7 Barbara: Great. And how long have you been at CDC?
- 8 Marty: Since 1992, 18 years next – next month.
- 9 Barbara: Are you currently involved in some aspect related to H1N1?
- 10 Marty: Yes, we're still – we're still involved in H1N1 in a number of different
11 aspects, both the CDC related aspects. We continue to work on and
12 focus on the community infection control issues and how to mitigate
13 the impact particularly with respect to non-pharmaceutical
14 interventions, social distancing, issues around schools and school
15 dismissal, isolation of people at home while they're ill, those issues on
16 the national scale. Also, a member of the WHO appointed review
17 committee that has been asked over the next several months to review
18 the WHO's response to the pandemic as well as its overall response to
19 implementing the International Health Regulations over the last five
20 years since their passage in 2005.
- 21 Barbara. Great. Can you think back to approximately a year ago or so and
22 recall when you first heard about H1N1?
- 23 Marty: I think I first heard about H1N1, you know, early on in the process
24 when there was – as part of the pandemic planning group at CDC for
25 several years prior, we've had regular leadership meetings with Dr.
26 Redd and the CDC director. And we were called together, I think,
27 April 22nd perhaps the first time about the possibility of an unusual
28 event in Mexico and certainly were meeting in those early crucial days
29 around April 24th and 25th when the novel H1N1 virus was
30 characterized and the initial cases were emerging.
- 31 Barbara: Do you recall whether or not that first notice struck you as something
32 that would become a potential crisis? Or did it seem not as serious?
- 33 Marty: No, I think by the nature of the way we were convened in the
34 conference room and by the information that Dr. Nancy Cox, Chief of
35 the Influenza Division, was sharing, I think it struck everybody that
36 this had the potential to be a serious situation although exactly how it
37 would unfold, to what degree of severity, whether it would be
38 efficiently spreading, those were all very important key questions. But
39 I think we all appreciated the potential magnitude of recognizing a

40 novel virus that was causing disease in humans that also looked like it
41 had been spreading from person to person.

42 Barbara: Great. And were you involved immediately and in a day-to-day
43 response for [inaudible 0:32:05.4] organizational processes adapt to it
44 slowly? Were you moved somewhere?

45 Marty: I and – and much of my division was involved right at the outset. As I
46 indicated, we'd been part of pandemic preparedness planning and
47 response and had worked on the national strategy, and the CDC plan,
48 and had drilled and exercised for a number of years, and we stood up
49 into the operational frame work and the emergency operation center
50 immediately as things unfolded in April. The kinds of areas of focus
51 for our – our program and divisions expertise really fell into two large
52 categories.

53 One was what, if any, international border responses might be
54 appropriate, how might they be managed and to look at issues around
55 possible containment of the threats from traveling around the globe;
56 and the second was what specific strategies would be appropriate from
57 a tool kit of interventions before the availability of vaccine in
58 particular. So as I mentioned, the non-pharmaceutical interventions,
59 in particular, the isolation of sick patients, the potential
60 recommendations for family members – exposed family members to
61 stay home or not, decisions around large gatherings, around schools as
62 a place of transmission, around infection control in the home and in
63 the community, those were the large program areas that we were
64 responsible for as well as guidance development for international
65 travelers and the consideration in how people would protect
66 themselves from exposure. So those were the buckets that our
67 program had planned for, exercised in and was called into the
68 response to directly advise the incident commander.

69 Barbara: And how well do you feel that your existing plans work? Did you need
70 to make modifications or had your plans and your exercise scenarios
71 been sufficient to meet the challenge?

72 Marty: Well, I think it's sufficient to say that – that the pandemic that
73 emerged upon us was not necessarily the pandemic that we had
74 anticipated with the greatest probability. However, I think it's also
75 fair to say that all along in our exercises and our planning, we
76 appreciated that any pre-event planning would need to have inherent
77 flexibility to adjust to the reality on the ground. And so, I think there
78 were many decision points along the way in which we recognized that
79 we would choose options based on how things were unfolding.

80 Now, as a specific example, I'd point out that the United States had
81 anticipated or developed a pandemic severity index, a framework for
82 appreciating that all – not all pandemics would be of the highly most
83 lethal sort akin to the 1918 virus and that depending on the severity

84 of the virus, different types of measures may or may not be
85 appropriate.

86 So to that degree, our planning was appreciative of the need to be
87 flexible. On the other hand, I would say most people were thinking
88 about a pandemic that would emerge in southeast Asia, that may
89 emerge as a combination of the H5N1 virus, and not necessarily a
90 pandemic that would emerge directly in North America or would be of
91 this specific type of swine-derived virus. So there were certainly many
92 curve balls that required us to adapt and learn, you know, frequently
93 especially in the early days with great degrees of uncertainty and
94 having to make decisions early on about which pathways or directions
95 one might take.

96 Barbara: Great. And how – could you talk a little bit about that process of
97 decision making when you encountered those areas of uncertainty?

98 Marty: Well, those are always great challenges with the emergent of a new
99 thread or a new virus and that is you don't know at the beginning how
100 bad is it going to be, how severe, how widespread will it – what will
101 the scope of the outbreak be geographically, in a community
102 containable, or will it spread extensively around the globe. One doesn't
103 know whether the – the casualty or the fatality rates will be very high,
104 which specific populations will prove to be the most vulnerable, will
105 the treatments be effective. Many, many uncertainties. How bad is it
106 is probably the biggest one. The early news from – from Mexico was of
107 young healthy people getting quite sick, being hospitalized and dying
108 within very short time, within a week of coming to the hospital. So
109 those types of uncertainties are – pose, you know, really strong
110 challenges.

111 I think the appreciation of communicating what we know, what we
112 don't know, what we're doing to learn more and committing in our
113 communications to telling people on a regular basis updating the
114 information in the news is probably an important component of
115 helping to ease the uncertainty. But often decisions have to be made
116 within complete pictures and – and those are just the realities of
117 dealing with public health events and crises.

118 Barbara: Okay, would you be able to give any participate examples of
119 something that fell into that category where you – you were thrown
120 one of these situations and then ultimately it was addressed or
121 resolved?

122 Marty: Sure. I think probably the most poignant example of the challenging
123 decisions that had to be made from our perspective in the scope of
124 work that we deal with were issues around schools and school
125 dismissal, and the potential for the schools to serve as big amplifiers of
126 transmission. So we had early news from Mexico – Mexico City about
127 severe disease and young health people dying, and then the first
128 outbreaks into the United States were often returned – people

129 returning from vacations and spring break and heading back to
130 schools and universities. And so, for example, the first outbreak in
131 New York City in – in a high school in, I believe it was in Queens,
132 posed some really difficult challenges. What should be the appropriate
133 recommendation for whether those schools should stay open, or at
134 what threshold they should consider dismissing students, if they
135 should at all, recognizing the degree of disruption that that would
136 place – that the intervention would place on the community, and
137 balancing that against the risk of having a large scale outbreak of a
138 very severe virus that was propagated in – in a school setting. You
139 know, this was also made very poignant by the – the death of a school
140 official, administrator, principal or assistant principal.

141 So these were very difficult decisions and I think what we saw was an
142 appreciation of how difficult the decisions were, what CDC's role
143 would be in laying out the risk analysis, laying out some of the
144 options, communicating those challenges directly to senior decision
145 makers both inside the Agency and above – above us in the – in the
146 thinking. And what you saw was an evolution of CDC's
147 recommendations around school dismissals based on learning more
148 information about the virus. So as the outbreak progressed in New
149 York City even among school children, it did not appear to our direct
150 observation in New York City to be as lethal as the reports initially
151 coming out of Mexico were. And this helped attenuate the guidance.

152 So early on, the very last week of April, the guidance was for schools
153 that were having outbreaks to consider in addition to keeping sick
154 people home, to dismissing the other school kids to prevent explosion
155 of the outbreak and spread. But as we learned more about the – the
156 severity and the less severe nature of this virus and those outbreaks,
157 we dialed back that recommendation to be one where schools would
158 not necessarily dismiss wholesale but in fact would – would shift
159 toward sick people staying home and making individual school-based
160 decisions within – at the local level based on the nature of the
161 populations within those schools. So schools that had very vulnerable
162 children living on the margin who's respiratory systems were
163 compromised by underlying disease, may make one decision but
164 schools in general with health populations may make different
165 decisions.

166 So CDC recommendations and guidance evolved and was flexible to
167 the new learning that happened over the course of that first week.
168 And so by May 5th, the school decisions and recommendations had
169 been reversed.

170 Barbara: Great. And how would you evaluate the sources of information in
171 terms of adequacy? Were you getting enough information? Where did
172 it come from? Where you frustrated by not receiving certain kinds of
173 information?

174 Marty: Well, in these kinds of settings and with a virus that spreads as fast
175 as influenza where an incubation period might be only two days and
176 the number of people infected could double every two days, you could
177 never get as much information as you want, as reliable information as
178 you want, stream or as fast as you want it. So the truth is that in
179 these settings with this type of pathogen, Mother Nature has the hand
180 up on us in terms of speed and in terms of the behavior of the virus is
181 going to outpace our ability to know everything we'd like to know
182 about it.

183 Even the lag time that we need to make decisions regarding whether
184 to commit to making influenza vaccine against this strain, come with
185 a long lag time, five to six months. And so decisions are always
186 compressed, the making of those decisions is always compressed into
187 that setting of uncertainty.

188 The kinds of sources that we – we basically tried to cover as many
189 basis as possible and, of course, ground truthing and getting eyes, and
190 ears, and shoe leather epidemiology in the middle of the action where
191 things are going on are the preferred and best approaches to getting
192 information sources rather than relying on second and third hand
193 reports. That's not always possible and the public health response is in
194 the context of a whole of society, a multi-department, multi-
195 government, multi-level response. And so information flows were
196 coming in from many, many directions including media reports,
197 including rumors, including stories from – from the ground at the local
198 and community level, through state health departments, through
199 partners in – in many different settings, through embassies in foreign
200 governments, through our partners at ports of entry. And what I think
201 one of the challenges and the exciting parts of – of this job is to try to
202 filter, sift through, make sense, validate, evaluate the quality of the
203 information from different sources, you know, what's more credible,
204 what's less credible. But we sort of – when you're hungry for data and
205 you want it faster than its available, you – you try to take as many
206 inputs as you can while prioritizing getting first-hand information on
207 the ground by having boots on the ground where the action's going on.

208 Barbara: Great. So thinking back and sort of taking a step back and looking at
209 big picture over the past year, are there – are there things that you
210 think CDC should have done, or could have done differently?

211 Marty: You know, overall, I'm really proud of the CDC response and that of
212 our leadership and colleagues all the way down to every individual
213 that was working so hard in their specific lane, filling their
214 responsibilities. Clearly as we look back, there's not only lessons
215 learned in the positive sense of things that were done, I think, very
216 well, but there's also things that in retrospect you might look at and –
217 and do differently. One of the things that I think that was done
218 particularly well is the early communication that our CDC – acting
219 CDC Director, Dr. Richard Besser, had at the time, was really

220 tremendous at his ability to provide factual information, particularly
221 to the media and the public, the right – striking the right tone and
222 balance between what’s known, what’s unknown, what we’re doing to
223 resolve the uncertainties, what people can do to empower themselves
224 to respond to the situation and it’s uncertainty, and communicating in
225 abundance over and over again on a daily basis and updating that
226 source of information. I think this is an area where CDC particularly
227 shined in terms of that response.

228 I think the fact that we had been planning for a pandemic for three
229 years or more had been exercising intensively, sometimes three or four
230 times a year with live fire, real life simulations, really helped us all
231 get comfortable in that environment and the Emergency Operation
232 Center. In fact, in those early days, many people commented by day
233 three or day four when the exercise might have ended, you know, you
234 pinch yourself and you say, is this real or is this just end of exercise,
235 time to quit and debrief. And in fact, the level of comfort of the
236 interactions, understanding lanes, roles and responsibilities, ways of
237 evaluating and patterns of responding were made much, much better
238 because of all our preparedness, probably in ways that we will never
239 fully appreciate, but to fully emphasize how important it is to go
240 through that preparedness, the planning, the development, even if you
241 modify your plans extensively, being familiar with the key decision
242 points, the places where you want more information, the structures in
243 which you’re going to share information along the cascade of partners,
244 the systems was – was really very, very valuable.

245 That said, I think there’s also – it’s also clear that some of the things
246 we had hoped to have in place when the pandemic would happen some
247 point in the future, we weren’t – we weren’t ready for, hadn’t fully
248 matured. So some of our alternative surveillance systems, some more
249 novel approaches through surveillance, using the internet, or
250 syndromic reporting from hospital emergency rooms, you know, we –
251 we probably wished we had been further along in the development of
252 some of those systems at the time.

253 Some of the cascading consequences around interventions,
254 community-based interventions that have both significant benefits but
255 also high potential for harm, all of the information about those
256 cascading effects were under, you know, were being evaluated and
257 researched. But those data weren’t fully matured by the time so we
258 were still left with – with significant areas of uncertainty.

259 We hadn’t fully resolved some of the challenges around our mask and
260 respirator use guidance. And, of course, those, you know, still remain
261 as – as difficult contentious issues. Understanding fully the – the full
262 spectrum of how to deliver counter measures from a strategic national
263 stockpile, not just when to push it to a state but also how to appreciate
264 the amount of time it takes on a – on a practical basis to get – to go
265 from pills in a pallet in a warehouse to pills on the pallet in the mouth

266 of a patient in a timely way to make a difference from a public health
267 prospective are areas that, you know, we had not fully appreciated all
268 the challenges in place in that and some of those issues didn't fully
269 come up in our exercises.

270 So these were clearly areas of improvement. Logistical and legal
271 obstacles. Although there was an effort in legal preparedness
272 planning, some of the things that came up with emergency use
273 authorizations, or off labeled drug uses and things like that always
274 remain a challenge.

275 I think we – as much as we always understood how important
276 communications and the partners would be and I think we – you
277 always under estimate the amount of person, hours and time it takes
278 to simply communicate and make sure everyone who needs to know,
279 and wants to know, and is hungry for information is getting that level
280 – the kind of information they want in a timely manner and adjusting
281 the resources of the response to be sure that we pay significant tribute
282 to the importance of that communication, can always be improved on.

283 That being said, you know, the emergency communication group that
284 Marsha Vanderford led in her team in the [inaudible 0:49:43.8] was
285 really outstanding and stellar.

286 And then finally, another lesson I think that was important to – to see
287 in real time, this was one of the longest crises responses that I
288 remember being engaged in at CDC over my 18 years. And we have
289 done a lot of them. But even the bigger ones like SARS, you know,
290 went on for three months and not 12 months.

291 And so finding the right rhythm and pace to sustain a major public
292 health response over that duration of time, having the resources in
293 place in terms of numbers of bodies that were needed, making sure
294 people were spelled to get rest time, I mean, I think that was the
295 marathon nature of this as opposed to the sprint approach to big
296 outbreaks and crises isn't always appreciated till you – till you get into
297 it. And that too proved particularly challenging.

298 Barbara: Wow, that's great. Wonderful. So I guess in – just in closing, I – are
299 there – is there a particular recommendation or any other suggestions
300 that you would – in general, that you would like to offer for the future?

301 Marty: Well, a couple – I think a couple highlights is don't underestimate the
302 huge amount of – of value that preparedness and planning, exercises,
303 revisions and iterations, you know, they really, really make a big
304 difference in the ability to confront a crises, even if it's totally new or
305 not the pandemic you planned for. And then secondly, don't ever feel
306 wed to the words on – in the planning book and make sure that there's
307 a complete open mindedness along the way for surprises for curve
308 balls, for unintended consequences or unforeseen circumstances, and
309 be sure to build in the flexibility to adjust your response and the
310 wisdom to have – a way to get feedback into that response to be able to

311 see new patterns that did – that you might not have thought about in
312 the preparedness phase.

313 So Team B is another example of that where there’s an external group
314 of people that can watch the situation and help provide input to
315 maintaining sort of broad situational awareness and help keep us on
316 focus.

317 And then third, communicate, communicate, communicate and have
318 your best communication team and tools as a very, very high priority
319 in how you handle the response particularly in appropriately setting
320 expectations and forecasting steps to help relieve the anxiety that
321 comes with uncertainty. I think those would be the – sort of the three
322 big lessons from my perspective.

323 Barbara: Oh, that’s terrific. Absolutely great. Thank you so much.

324 Marty: Thanks very much Barbara. [audio ends 0:52:36.0]

**.Interview #6. Toby Crafton, MA
Chief of Staff, CDC Director's H1N1Response Team**

1 Toby: Okay, my name's Toby Crafton. And as part of the response, I was
2 what they call the Chief of Staff which, pretty much responsible for
3 the command staff, the operations logistic situational awareness. Most
4 – most everything but the scientific folks that responded, I was
5 responsible for coordinating their – their efforts. Budget was a – was a
6 huge part of my role in managing the – ended up being close to \$2
7 billion that we got from the federal government to respond to H1N1.
8 So I was responsible for setting up procedures to manage the money
9 and to make sure that we spent it efficiently.

10 What brought me to CDC, I started here in 2003. I retired from the
11 Army. I was a medical service corp officer. I stationed here at Atlanta
12 at Fort McPherson and retired from the Army. And actually went to
13 work for myself doing – my own business and that – did that for two
14 years, and then I found out that they were starting an operations
15 center here at CDC. They didn't – hadn't had an operations center.
16 We'd gone through the 911 response and the anthrax responses and
17 they didn't have a cohesive way to respond back then. They did but
18 they didn't have what we now know as an operations divisions and an
19 operations center.

20 So they were just starting one up and I found out about it and there
21 was a contractor that was responsible for coming in and setting that
22 up and I actually knew him from the army. So I called him and – and
23 got a job here to help establish the operations center. And so I did – I
24 did that for about 2 ½ years, set up the Division of Emergency – help
25 set up the Division of Emergency Operations. Went through SARS,
26 Hurricane Katrina in that job. And then started looking for something
27 different and found this job over in the influenza coordination unit
28 which was an organization that Dr. Gerberding, the previous Director
29 had set up when the federal government got a little bit concerned
30 about an influenza pandemic and H5N1 was circulating throughout
31 the world. And there was a lot of concern about another pandemic.

32 And so Dr. Gerberding established this entity called the influenza
33 coordination unit when what was then the center – the Coordinating
34 Center for Infectious Diseases. And so I started over there, and that's
35 where I have been working ever since when the pandemic started.

36 Barbara: Do you remember when you first heard about H1N1?

37 Toby: I do. I was actually in Las Vegas. My wife and I love to go to Las
38 Vegas and we were on vacation in Las Vegas when my Blackberry
39 started going off quite a bit and there was email traffic about this
40 potential influenza outbreak in Mexico, and then, of course, we found
41 it in California. And that's when it started. And so I was almost at the

42 end of my vacation out there anyway so we – we came back and that’s
43 when it started.

44 Barbara: Do you recall how it was presented to you and if – did it strike you as
45 a crisis at that time?

46 Toby: Well, it – it – pandemic start, generally start off small and then grow
47 to be quite large. And so there was – there was this disease outbreak
48 in Mexico and then there was this disease that – outbreak in
49 California, and once the two were linked, and it was determined that
50 it was a novel virus, one that had not been found in human’s before,
51 that it was – it was of concern at that point. And I don’t think it was –
52 I don’t recall that everybody was in a real panic mode at that point but
53 there was certainly a lot of concern and we were doing everything we
54 could to determine what it was and – and how it was spreading, and
55 obviously at that point, we knew that we were into probably the next
56 pandemic.

57 Barbara: Do you recall when the EOC was activated?

58 Toby: It was probably officially activated, as I recall, maybe a week after all
59 that. So, and of course, it started off small and grew to be quite large.
60 And so at the end of – when it was all said and done here, there was
61 probably close to 3,000 people that responded at some -- in some way
62 to the – the pandemic, whether – it wasn’t all 3,000 people at the same
63 time but over the course of the – the – what nine months or 10 months
64 that we’ve been involved in it. There’ve been about 3 – a little over
65 3,000 people that have in some way participated in the response.

66 So it started off as probably 20 people and then grew from there.

67 Barbara: Were you involved in the day-to-day operations for the response from
68 the beginning?

69 Toby: Yes, I’ve been operating out of the – we normally are in Building 1
70 here on [inaudible 0:04:58.1] and we have been operating out of the
71 EOC since I think it was around the 23rd of April, later in April, we
72 officially activated and pretty much the entire influenza coordination
73 unit which is about 17 full-time people, a lot of the flu division, the
74 senior leadership, much of the NCIRD leadership moved over and
75 started occupying space in the Operations Center. And from there, it
76 just – it grew. What – what – what typically the Operations Center
77 does is operate under what we call the National Incident Management
78 System or the Incident Command structure which is a structure that
79 is sort of dictated by the Department of Health and – Department of
80 Homeland Security.

81 And so we started out using the standard response organizational
82 structure under NIMS, the National Incident Management system.
83 And we did that for a while for realized after a month or so that that
84 really wasn’t working well for us and that we – we needed to re-
85 organize the structure to better meet our needs. And so we sort of took

86 everything and flipped it upside down and created five task forces
87 aligned with the major functions that we were performing in the
88 pandemic. And those – those five task forces, one was the epi-lab and
89 surveillance task force which was – ended up being the largest task
90 force. And early on in the pandemic, of course, we didn't have a
91 vaccine but we stood up a vaccine task force because we knew that the
92 development of a vaccine was one of our primary – what was one of
93 our biggest priorities to – I mean that's the best way to protect people
94 in – in – and reduce mortality, morbidity is to get a vaccine that's –
95 contains the virus that you're – you're talking about. And so we
96 developed a vaccine task force which grew to be quite large and ended
97 up toward the latter part of the response was the biggest – was the
98 biggest task force.

99 And then there was another one called medical care and
100 countermeasures which dealt primarily with all of our
101 countermeasures. In this particular response, primarily focused
102 around anti-viral medication and protective masks, and protective
103 equipment, and dealt a lot with infection control, guidance and that
104 sort of thing.

105 Then there was another one called the community measures task force
106 which dealt with all the non-pharmaceutical interventions that we
107 were dealing with which they're – they're biggest thing in – in sort of
108 August, September timeframe was dealing with school closures, and
109 whether to recommend school closures, and how we were going to
110 track school closures and everything. So they were sort of responsible
111 for managing everything that we did that – to try to prevent
112 transmission not using pharmaceuticals or anti-virals. So that's four.

113 Then the fifth one was we – we realized that since the state and locals
114 – it really was a response at the local level, the state health
115 departments and local health departments were going to be
116 responsible for implementing most of these recommendations that we
117 were putting out that we created a state and local coordination task
118 force to make sure that we were coordinating with the state and local
119 health departments, and the state health officials as much as we
120 possibly could.

121 So we – we sort of took the standard NIMS structure and turned it all
122 upside down, and created these five task forces which you won't find
123 in NIMS at all. But it actually worked and it was – it was the way
124 that we will in the future plan to respond to a pandemic.

125 Barbara: And have you institutionalized these changes somehow?

126 Toby: Well, we are. We're, you know, we're – we're in the process of doing –
127 we've done several in-progress reviews to look at where we – or what
128 we've done and how we can improve things, both things that we could
129 improve to make them effective during this response and then things
130 that may take a little bit longer to institution that we couldn't

131 probably do in this response that we'll need to do in the inter-
132 pandemic period between pandemics. And so now that we – it looks
133 like this one may be coming to an end, it's not over yet 'cause we're
134 still – we're still watching for flu in the spring and in the summer
135 because in – in the past, we have seen spikes in those time periods,
136 and another wave if you will.

137

138 But – so we're still monitoring for disease but it's nothing like it was,
139 of course. We are going to institutionalize as many of these things and
140 we're – we're going to end up doing a final after action review, an after
141 action report, and a corrective action plan that will institutionalize a
142 lot of these things that we've learned.

143 But one of the things that we will definitely institutionalize is this
144 organizational structure.

145 Barbara: And – did you find your other existing plans were adequate for your
146 needs? Or did you make modifications to those?

147 Toby: No, we had to make huge modifications because I mean the
148 assumptions in our planning process were based around an H5N1
149 kind of response, and it starting somewhere else. And so basically
150 what happened was it was not an H5N1 and it started here, actually
151 in Mexico but we, you know, it came here real quick.

152 And what we were – what we were expecting was that it would start
153 somewhere in – in Asia and we would have several weeks before it
154 came to the United States, and that's not what happened at all. And,
155 of course, most of our planning was around a real severe pandemic, an
156 H5N1, where the mortality rate is up around 60 percent for that virus.
157 And in this – this particular pandemic was not anywhere near that
158 severe. So we – we need to do more planning around general scenarios
159 and general principles as opposed to specific viruses. And a lot of our
160 planning in the past was done around a specific virus.

161 Barbara: You mentioned that there was a – a great deal of planning that went
162 on. Did you create a planning team or how – how were the decisions
163 arrived at?

164 Toby: Yea, that's a good question. We started several years ago. Of course,
165 when it was the Bushy administration at the time, got concerned
166 about a pandemic because of the H5N1 virus circulating, they created
167 a – a couple of plans and those plans cascading down to us. And in one
168 of the things called the implementation plan, the implementation plan
169 gave all of the different departments taskings, things that we had to
170 do to be prepared, or what we thought we would need to do to be
171 prepared for a pandemic. And so a lot of our activities in 2006, 2007,
172 2008, were based around this implementation plan and things that –
173 that the federal government and the White House were telling us that
174 we needed to do.

175 So one of the things that we did at that point in time was we – we –
176 we hired a contractor and the contractor is MPRI, is – and I don't
177 know what that stands for, we just call it MPRI, which are basically
178 they – they hire a lot of retired military officers that come in and know
179 how to do planning, that they'd been planners in the military and, of
180 course, the military's real good at planning. So we hired them to come
181 in and write our – write the CDC's pandemic influenza operations
182 plan. And, of course, it was a good plan but it was again a lot of the
183 assumptions were like I described earlier around H5 starting
184 somewhere else and having time to do some of these things when in
185 fact that didn't occur. So nobody rushed to their bookshelf, and pulled
186 off the plan and opened it when the thing started. [

187 break in audio 0:12:47.6]

188 Barbara: ...oh, the existing plans. Right.

189 Toby: Yeah, I was talking about MPRI and our existing plans, and nobody
190 ran to the...

191 Barbara: Right, so I'll go back to existing plans that were in place and did you
192 need to modify any of those. You mention that there were existing
193 plans in place. Did you find you needed to modify any of those?

194 Toby: Yeah, it was – there was a lot of modifications required because as I
195 said earlier, we had our – some of our basic assumptions in the early
196 planning process was around an H5 kind of an outbreak which
197 would've been much more severe starting somewhere else in the world
198 specifically in Asia which would've given us several weeks to prepare
199 and do things when in fact, that didn't occur. And so we had – we had
200 a nice plan but nobody ran to the bookshelf and pulled it off when the
201 pandemic started to see what we were supposed to do. I think the –
202 the benefit of having the plan was all of the work that went into
203 building it, and all of the collaboration, and coordination, and the
204 thinking, and the discussions that took place to build the plan, is
205 really allowed us to be very flexible when we realized that the
206 pandemic that was unfolding had nothing – didn't look anything like
207 the pandemic that was planned for in the plan.

208 There was a lot of stuff that was still valuable and we could use but
209 there was much of it that we couldn't use because of the way it
210 unfolded.

211 Barbara: Can you recall any specific challenges that were new in this case?

212 Toby: Well, of course, the fact that it started hear and it – it – I mean one of
213 the things that we did early on was – was invest quite a bit of money
214 in the planning process on developing new diagnostic tools to be able
215 to – to determine what – what kind of flu it is and actually the – that
216 test was used in California to determine that it was a novel strain of
217 influenza that we were dealing with. And so that – there was a real
218 beauty behind and we could see that our investments had really paid

219 off there because without that, it may have been another few weeks
220 before we realized what we were dealing with.

221 Of course, the earlier – and the benefit of it starting somewhere else is
222 that you get a seed strain of the virus that’s – that’s causing the
223 pandemic, and you can start making a vaccine. And so – and hopefully
224 if it starts somewhere else, you have three, four, five weeks to get the
225 vaccine process rolling before it gets to our borders. But in this case,
226 we didn’t have that time at all. So trying to – to make sure that our
227 surveillance systems were functioning, and that we – be able to get
228 information in a timely manner, that was part of the – that was a real
229 challenge for us was getting information in – in a timely manner.

230 Of course, understand that most of the responses that we’d dealt with
231 here at CDC are very local responses. They are in one place or two
232 places. I mean Katrina domestically the response was probably as – as
233 big as any response we’ve ever dealt with, maybe with the exception of
234 9-11. But, I mean, we were real, real involved in the Katrina response.
235 But when you think about it, that was in one place, well two places if
236 you count Mississippi and – but, so, it – getting information from a
237 small area, you’re dealing with one or two health departments, or one
238 state, getting information is not nearly as hard as it is dealing with 62
239 project areas, 50 states, territories, in – in the big cities that we deal
240 with.

241 The good news is that have they’re seasonal flu every year, not that
242 that’s good news, but in this case, having surveillance systems in place
243 that – that – that do that surveillance every year is helpful. The
244 problem is with our current surveillance systems that we had in place
245 when it started, was they don’t provide real timely information.
246 There’s a lag of – of several weeks and the information that we get for
247 seasonal flu and – and that was not adequate to maintain pace, or
248 keep up with the pace of the spread of the pandemic.

249 So that was a real challenge for us as well. What we – we did was –
250 there was – there are other systems out there that – that you can buy
251 or lease or – or not lease but you purchase the data from retail
252 pharmacy, companies out there that that’s what they do is generate
253 data like this and it’s –it’s –it’s a little more timely than the
254 information that we were getting. And so Dr. Frieden, when he came
255 in as the new Director, having come from New York, he was – he was
256 real interested in timely data.

257 And so we ended up leasing – not lease – purchasing through
258 contractual mechanisms some of this more timely data. Whether or
259 not it – in the end it made a difference is hard to say and I think the
260 jury’s still out on that. We are – we are looking to potentially keep
261 some of these more timely data systems in place for the long term for
262 seasonal flu to see if we can make them better for our needs in the
263 next pandemic.

264 Barbara: Could you describe the internal communication processes that you use
265 to keep the leadership of CDC informed?

266 Toby: Yeah, sure. It was – it was a real challenge as you can imagine. There
267 are – there’s a lot of moving parts. There’s a lot of different
268 organizations that respond. And the part of the biggest problem here
269 at CDC in my opinion is for these kinds of activities. And again, I’m
270 going to kind of revert back to my – my past which is the military. And
271 in the military, we do a thing called we train as we’re going to fight.
272 And almost everything we do in the military, even day to day, has
273 some relation to how we’re going to do things when we go to war. And
274 even the – the reporting procedures, and the SOP’s, and how we
275 maintain equipment, is all – so everyday we’re doing things like we’re
276 going to do it when we go to war. And that helps build discipline, and
277 builds communication systems, and even the structure that you’re at
278 in peace time, typically when you go to war, that same structure just
279 moves to the theater of operations and continues to operate.

280 So you’re boss’s, boss’s boss, is probably the same when you’re in Iraq
281 that it would be if you were at Fort Bragg for example.

282 What we do here at CDC is that when we have a response, we don’t –
283 we don’t operate during a response like we do day to day. So during a
284 response, there is no NCIRD, and there’s no CCID, and there’s no
285 ICU. It’s all – all that goes out the window and we come into this
286 response structure that unless you are a part of the division of
287 Emergency Operations or the Office of Public Health Preparedness
288 and Response, you don’t do this day to day.

289 And so learning how to communicate, and keep people informed, and
290 report and all that is all brand new to people when they leave Building
291 1 and they come over here to the EOC. And so one of the things that
292 we did starting in, I don’t know, 2007 maybe, was we started an
293 exercise program where we – we, and people got really tired of doing
294 it, but Dr. Redd, our – our Director, saw the value in exercising,
295 training as we’re going to fight. And so we would – we would do these
296 three and four day exercises where we would pretend like and MPRI
297 would help facilitate these exercises where we would be in the middle
298 of a pandemic and we would have to develop our structure and all
299 that. And, of course, the exercises were based around that – that NIM
300 structure I told you about that didn’t work.

301 But learning how to communicate and to report was – what was one of
302 the biggest benefits of doing these exercises. So to get back to your
303 original question, communications and keep people informed is very
304 hard. And we established a series of regular meetings where the task
305 force leaders, and the other leadership of the response, came together
306 on a routine basis, usually a couple of times a day, maybe three times
307 a day, to share information and to get guidance from the director, and
308 from the – from the incident manager, and that sort of thing.

309 But even with that, it – there was a lot of holes in our – in our
310 communication. And I honestly don't know how to fix that. I mean, it's
311 – unless we're going to do our day-to-day jobs like we're going to do
312 when we respond, or we're going to respond like we do our day-to-day
313 jobs which is not very functional either, I think we're going to have to
314 just do the best we can and when the – when an event occurs, we hope
315 that the people that are in those leadership positions have done it
316 before, they've been through this one, or they've been through the
317 exercise program. And so going forward, our exercise program, which
318 we're going to continue for pan flu, probably not going to do one this
319 year but we'll probably start up again in 2011, we will do those
320 exercises based on the task force structure that I talked about and not
321 the NIM structure. So we'll at least have a good starting point to – to
322 help with that.

323 But – and every day, we were kind of modifying things. If something
324 wasn't working, we changed it. And so people have to be – have to be
325 open to change and to – and to – I think the other thing is – is the
326 culture at CDC is one where people want to have hundred present
327 solution. They want to have I exact. They want it to be perfect and
328 again, from my previous experience, it – in a response, it's very seldom
329 is it going to be 100 percent and you have got to be comfortable
330 making decisions with less than a hundred percent of the information,
331 and knowing – knowing that it may not be exactly 100 percent correct.

332 And early on, there was a lot of apprehension of doing that. And then
333 as things go on, and went on, I think people became a little more
334 comfortable with operating in that zone where they weren't 100
335 percent sure that they had the right answer.

336 Barbara: So in dealing with this ambiguity, what – did you have any particular
337 strategies you employed to increase the level of comfort?

338 Toby: Not really. No. We just – we just – we forced people to – to make
339 decisions. And I think, you know, HHS was more involved in this
340 response than any I've ever seen and I've been through several here at
341 CDC starting with SARS. And HHS's involvement in this was
342 unprecedented which, I don't think was a bad thing. and every day the
343 Chief of Staff at HHS had a teleconference with our incident manager,
344 often times the CDC Director and other senior leadership, the Chief
345 Health Officer, to talk about strategy and to try to make decisions
346 about going ahead. And so I think that helps somewhat. But it's still
347 cultural, it's still engrained that, you know, we've talked about
348 physicians earlier and, you know, physicians like to have, for the most
349 part, scientists like to be exact. And – and response is not an exact
350 science. And our surveillance systems don't provide exact information.

351 And so, its – it is by nature, ambiguous and it's just – I think the more
352 people were doing it, the more comfortable they got with it but they're
353 still not totally comfortable.

354 Barbara: You mentioned earlier challenges you encountered with appropriating
355 the funding that you received. Could you elaborate on that?

356 Toby: Yeah, it – it was – that was a real challenge. We – when the pandemic
357 first started, we had carry over funds that we had – in 2006, congress
358 – in 2006 and 2007, congress appropriated about \$470 million to CDC
359 through a supplemental appropriation that was no year funds that we
360 could carry over from year to year to help us continue to prepare for a
361 pandemic. And then in 2008, we got an annual appropriation in –
362 instead of the supplemental, we got an annual appropriation and we
363 still are getting an annual. It's part of the CDC's budget authority now
364 aligned for pandemic influenza.

365 But that carry over money, we used and were using, and had some
366 carry over in 2009, when – and so when the pandemic started in April,
367 we still had carry over funds that were available. And we didn't have
368 any money – congress had not appropriated any money yet for the –
369 for the pandemic. So the only money CDC really had to start our
370 response was this carry over funds. And so we – we used a lot of our
371 carry over money that we had from 2006, 2007, initially to start the
372 response.

373 And mainly, early on, a lot of that was travel and deployments of
374 teams. So we did a lot of that. We did a lot of buying of equipment for
375 the labs 'cause they were – their work load significantly increased.
376 And then congress appropriated money for – for the response and
377 CDC, when it was all said and done, got about \$671 million out of that
378 appropriation. It was about \$2 billion total for CDC. A lot of that, most
379 of that, went out through a new grant to the states called the Public
380 Health Emergency Response Grant, or cooperative agreement. There
381 is – the – Well, PHPR manages a huge cooperative agreement now it's
382 called the Public Health Emergency Preparedness Cooperative
383 Agreement and they send out millions of dollars to the states every
384 year.

385 And so we got money to go out to the states and locals to prepare for
386 the vaccine campaign primarily. But so imagine this influx of, you
387 know, close to \$2 billion coming in – in a matter of a few months. It
388 came in in – not all at once but several different segments. But when
389 we got the first segment, it was about \$200 million. And we realized
390 that there was no real procedures in place in the Operations Center to
391 – to manage that kind of money.

392 And so what we did basically was identify the activity areas to epi and
393 surveillance, vaccine, medical care and countermeasures, sort of align
394 with the – we didn't have the task forces then but we created these
395 budget categories that actually ended up – the task forces sort of
396 aligned to those. And I'd like to say we planned it that way but we
397 didn't.

398 So we created these budget activities and each one of the people that
399 were responsible for these sort of activity areas, told us that they
400 needed to – to respond in terms of projects, and how much money it
401 was going to take. And then we just – we got all of their information
402 together, and created a purchase request process where they would
403 have to – and we allocated a certain amount of this \$2 million to each
404 one of those project areas. And then there were certain people in those
405 project areas that could approve the use of those funds. And we just
406 started processing these purchase requests through the Operations
407 Center.

408 So we created a whole new infrastructure that had never been there
409 before basically to manage all of this money. And we're still – we still
410 have some money that we're figuring – trying to – actually this week,
411 we're – we're working with the – and the hard part now is we're
412 working with task forces then, but now that the response is kind of
413 tapering off, we've got a start now working with the programs not –
414 'cause the task forces are not permanent organizations.

415 And so we're now having to take the money that we have left and
416 some money that we haven't allocated and start working with the
417 programs to allocate the remaining money. So it's – it's been a huge
418 challenge and the concern that I have quite frankly is going forward in
419 the next year or two when the IG, and the GAO, and others come in to
420 do audits that we're able to show where all this money went. And I'm
421 – I'm confident that we are – are probably 98, 99 percent, we can – we
422 can show what – where it went. So we got a real good trail of what we
423 spent it on. Probably some of the things, you look back, probably we
424 shouldn't have spent money on. But at the time, in the middle of the
425 response, you didn't have a lot of time to think, you know, long term,
426 is this really the best long term kind of investment when we could've
427 been doing this, but instead we did that. But considering the time
428 frame, and what was going on around us, and the fact that we just got
429 all this money sort of appropriated and dumped on us, if you will, at
430 one time, I thought we did a pretty good job of managing it.

431 Barbara: Do you, in looking back over the past year, have any specific
432 recommendations you'd like to make for future challenges like this?

433 Toby: Yeah. I mean, well one thing we got to do is – it was so – it was so
434 rewarding actually to see, you know, 'cause again, I – and I hope I
435 don't bore everybody, but going back to my previous life, training was
436 extremely important. I mean you cannot go to war unless you were
437 trained to do so. And so instituting these exercise programs was
438 probably the best thing we ever did. And it was fun to watch people
439 from CDC who don't under – who didn't at the time understand
440 exercises and the importance and they would come to these exercises
441 kicking, and screaming, and complaining, and all mad, and huffy, like
442 I don't have time to do this. This is crazy. And – but then, after about
443 the first month or two of the response, the pandemic, you hear them

444 say, boy it's a good thing we did those exercises 'cause it really, really
445 helped.

446 So I think, to – to train and to prepare yourself for the unknown, and
447 for – what you think maybe – now again, the exercises we did were
448 against a completely different scenario, but it didn't matter. It was –
449 it's the processes, and the procedures, and the things that you learn,
450 and how you interact and communicate during those exercises that I
451 think was real important.

452 And it doesn't matter what the disease is. It could be any disease that
453 we're responding to but the – the exercise program, and the federal
454 government's picked up on this, and they're doing the same thing.
455 There are those national level exercises and all that, so exercising I
456 think is critical and I say we're going to continue doing that for
457 pandemic preparedness even though we've just gone through one.
458 There's a lot of things that we're going to do different and we learned
459 that we've got to continue to do.

460 And a lot of these procedures, staffing was a huge problem. Getting
461 people, you know, you never – CDC never has a problem getting
462 people to respond to an event, or to a catastrophe for about a month.
463 And then after a month, people like – I got another job I have to do,
464 and you know, my boss is telling me I've got these reports to do, or
465 that I've got this to do, or that to do. And so getting people to dedicate
466 two, or three, or four months of their time to come over to respond, if
467 it's not their job, you know, the flu division, flu is their job. So none of
468 them are – are – are, you know, saying anything about being here. But
469 folks that are in chronic or in some other area, HIV or anything, that
470 this flu is not their job, to get them to give up what they're doing for
471 three or four months, is really asking a lot.

472 But you can't respond to something for a year without those people
473 coming and doing that. And one of the – the other thing that we
474 learned early on was we were having people rotate for two weeks. And
475 to get an epidemiologist or somebody that works in HIV or in chronic
476 to come in, they may be a totally capable epidemiologist, but they
477 don't understand flu. And so to get up to speed with what's been going
478 on, may take a week, 10 days, and then they're rotating out because
479 you've got them in for two weeks. And so we – we learned early on
480 that – and that's pretty typical for most responses, two weeks. That
481 unless you got them for two months, they're – you're wasting their
482 time and our time as well; 'cause by the time they get up to speed to
483 what's going on, they're –they're rotating off again unless they're there
484 for a while.

485 So we've had – we've had people that have been here for the whole
486 nine months, 10 months, now I guess it is, that weren't part of flu,
487 that came over on a detail and they're bosses just said, this is
488 important, go do it. Other bosses said, you can go for two weeks but
489 you can't go for longer. So we've got to figure that out at CDC. We just

490 have to. I mean we're going through the Haiti response right now.
491 They're having the same – exact same problems with staffing that we
492 had in H1N1.

493 The other thing we did was we created a staffing team, a staffing task
494 force, brought in folks from HRC to staff that and we did a term hires,
495 FTE hires, and we brought in PGO. PGO's always a part of the
496 responses and they're wonderful, but they – we brought in folks to
497 help us figure out how to bring in staff on contracts as well to help add
498 some continuity to the response because there was – there was all this
499 turnover that was just killing us. So I think that's important as well.

500 Barbara: Great. Thank you very much. [audio ends 0:34:53.9]

Interview #7 Lyn Finelli, DrPH, MS
Lead for Surveillance and Outbreak Response Team, Influenza Division

1 Lyn: My name is Lyn Finelli. I work in the Influenza Division in the
2 epidemiology branch and I am the team lead for surveillance and
3 outbreak response.

4 Barbara: Could you tell us a little bit about your back ground at CDC? How long
5 you've been here?

6 Lyn: Sure. I've worked with CDC for 19 years. I was first located in a state
7 health department as an assistant to the state epidemiologist. And
8 then for two years, I was a state epidemiologist in the State of New
9 Jersey. I came down to CDC in 1997 and worked in the division of
10 sexually transmitted diseases, spent about two years there and then
11 worked in the division of viral hepatitis for six years, and I've worked
12 in influenza for three years.

13 Barbara: Are you currently involved in some aspect of the H1N1 response?

14 Lyn: Yes, I am the lead for epidemiology and surveillance for the response.

15 Barbara: Do you recall when you first heard about H1N1?

16 Lyn: I first heard about H1N1, I was in my office on April 15th and one of
17 my colleagues came into the room and said that she'd just gotten a call
18 from the laboratory saying that they had a novel Influenza A isolate,
19 and that it was an H1. We didn't know the [inaudible 0:01:17.2] type.
20 She thought that maybe we should do an investigation.

21 Now, a little bit of background on this, in 2007, 2008, the Council of
22 State and Territorial Epidemiologists made novel Influenza A virus
23 infection, a nationally reportable condition. So since that time, we'd
24 had sporadic reports of novel Influenza A infection. They were all
25 swine, at that time, and up until that time, there were 13 cases and
26 we'd done fairly routine investigations. Almost all of the people who
27 had novel Influenza A H1N1 infection had contact with swine.

28 And so on that first day, we thought this would be a typical swine flu
29 investigation.

30 So I gathered around my team and we decided to call California and
31 find out about the case.

32 Barbara: Did it strike you at that time that it might be a potential crisis or were
33 you thinking it was more routine?

34 Lyn: Absolutely not. I mean I had just done, over the last two or three
35 years, 13 of these investigations and we were almost always able to
36 link the case with swine exposure. And so I thought that it was going
37 to be a routine swine flu investigation. They're all fine, and they're all
38 interesting, so I was looking forward to it. But I didn't – it was not

39 within the realm of possibility to me at that moment that it would be
40 as unusual as it turned out to be. It wasn't until two days later, on
41 Friday the 17th, that I realized that this might be very different from
42 what we'd experienced before.

43 Barbara: And what brought you to that realization?

44 Lyn: On Friday the 17th, I myself got a call from the laboratory saying that
45 they had a second novel Influenza A virus infection case from a county
46 which is next to adjacent San Diego County where the first case was
47 from. The second case was from Imperial County. Like the first case, it
48 was a child and we – we decided to, at that moment, muster as many
49 people as we could in California to talk to them about the two cases
50 and likely exposures. It still – I still thought since it was two children
51 and most of these cases had been children, I still thought that it was
52 likely that they had a common link or swine exposure. But we – we
53 were very concerned at that point, not because – not because both kids
54 were from California, but because they were from California but from
55 different counties. Our alarm was raised just a little bit.

56 Barbara: Can you recall the activities and what took place in the next few days?

57 Lyn: Yeah, in the next few hours, I – I called my Branch Chief, Joe Bresee,
58 and he came down. I called my husband, David Swerdlow, he was then
59 the Associate Director of Science in our center, and asked them all to
60 join the conference call with California. I thought that as many good
61 heads as we could get in the room was important because this seemed
62 to be a pretty unusual event. We arranged a conference call with
63 California and it took place about 9 PM on the 17th. They had all of
64 their important folks on the call, and they had San Diego County and
65 Imperial County on the call with them. And so we looked back and
66 tried to figure out where both of these children might have been
67 exposed. We had already interviewed the family of the first case and –
68 and there was no recollection of swine exposure in that first little boy.
69 This is often sometimes the case where people need to be prompted
70 about events that took place in their environs in order to remember
71 the swine exposure.

72 The second – the second little girl was not interviewed yet. And so the
73 weekend, over the weekend on Saturday and Sunday, we had a series
74 of conference calls, both days, many, many hours, and we worked
75 directly with the nurse who went to the family's houses of those two
76 cases. Now one red herring which was not a red herring at first 'cause
77 we didn't know what happened, but in – in the first part of the
78 investigation of the little girl, she had gone to a county fair and she
79 had not – not had direct contact with swine but visited the swine area.

80 And so we thought, aha, this is it. We just have to find out how the
81 little boy has contact with the Imperial County Fair. Did he go
82 himself? Did a classmate go? And so we really sat down – we sat down
83 the road at that point of trying to dig up as much swine exposure on

84 these two kids as possible. By Sunday night, both parents had been
85 interviewed many times and we just could not link the San Diego boy
86 to any swine exposure. We were looking forward to interviewing the
87 kids in his classroom and we did find, on Monday, that they had
88 visited the zoo and there was a pig at the zoo which they had some
89 contact with. So we, again, were down the path of looking for swine
90 exposure among these two kids.

91 By Tuesday or Wednesday, let's see that would be the 21st or 22nd, it
92 looked like we weren't going to be able to connect him with swine. And
93 that was right about the time that we heard about two cases in Texas.
94 When we heard about these two cases in Texas on Tuesday or
95 Wednesday, I was really alarmed. I – I was willing to think that
96 maybe we could have a source of this first little girl in Imperial
97 County with contact with swine, and the boy with no contact – I was
98 willing to accept that there might have been somebody in his
99 classroom that'd visited the fair and that he'd gotten sick from them.
100 But once I heard about the two cases in Texas, I was very concerned.

101 One of the reasons that I was so concerned was I made the connection
102 between these Texas cases, these California cases and rumors from
103 Mexico that I'd been hearing for the last three weeks. About three
104 weeks before this event, about the first of April or last week of March,
105 we started to hear about outbreaks, small outbreaks in villages and
106 small towns of severe respiratory disease where some people were
107 hospitalized, and we had a couple of conference calls within CDC and
108 with our colleagues in Mexico to figure out what were – what the –
109 what the origin of these outbreaks were. The influenza division along
110 with the respiratory diseases branch and the division of viral diseases
111 has an unknown respiratory outbreak working group. And so when we
112 hear about respiratory outbreaks and there's no obvious pathogen,
113 then we do a joint investigation.

114 So we'd had a number of working group conference calls over the last
115 couple of weeks, and then we'd also heard rumors of a large outbreak
116 in Veracruz and smaller outbreaks in adjacent places or nearby places.

117 Now when we talked to Mexico and talked amongst ourselves, there
118 always seemed to be some sort of reason for these outbreaks. In one
119 case, they said they did viral culture and got some Influenza B
120 viruses; in another case, they said that they had adenovirus infection;
121 and in another case, they said there was RSV. But – and – and so
122 initially when I heard about the cases in San Diego and Imperial
123 County, I didn't connect them to Mexico.

124 But here I was, on Tuesday or Wednesday, hearing about cases in
125 Texas also adjacent to Mexico, and hearing about cases in San Diego
126 also adjacent to Mexico with many people who go back and forth
127 across the border in both places. And I – I became really alarmed.

128 At that point, you know, we were meeting as a group every day,
129 meeting with our Branch Chief, Joe Bresee, and the people in our
130 division. At that point, I would not say that we thought that it would
131 be widespread. I think we thought that this was potentially a big
132 outbreak but we weren't quite sure whether it was the pandemic or
133 not. And in fact, for about a week after that, we – we very sincerely
134 asked each other many times during the day, do you think this could
135 be the pandemic? We – we really didn't know and one kind of ironic
136 thing was we did five pan influenza planning exercises, functional
137 exercises in the EOC and we all hated them. And although we
138 recognized the value of them, especially after the third or fourth one
139 where we were started to pull ourselves together, this event and the
140 way that it unfolded just reminded us all so much of those pan flu
141 exercises that it started to creep into our consciousness that this in
142 fact could be the pandemic.

143 And then I think on Wednesday – Wednesday the 22nd, we heard
144 about a potential outbreak in New York City. And then it seemed like
145 this was extremely widespread. And so we were – we had had – we
146 had submitted an IHR on Friday night the 17th and – to let WHO and
147 [inaudible 0:10:42.8] know. And so we started to engage with our
148 international colleagues because it was too much of a coincidence that
149 we'd heard about the rumors in Mexico, that we'd had cases adjacent
150 to Mexico, and that the outbreak may have been initiated in New York
151 City from kids who had traveled to Mexico during their spring break.

152 So at this point on Wednesday or so, the pieces started to fit together.
153 In addition, Mexico was still having outbreaks and they had sent some
154 viruses for identification, for characterization, to Canada. And we
155 knew this on Wednesday night. And we – we knew that we would
156 know the results on Friday, and the results were going to be kept
157 quiet until they were absolutely certain. But we were very much
158 looking forward to the characterization of those viruses.

159 We, at this point, I asked – I have a number of EIS officers in my
160 group and I asked Fatimah Dawood who's now a second year and was
161 a first year officer and an extremely stellar one, to write – start to
162 write up these cases for the New England Journal of Medicine, and
163 that we would help her but we wanted to publish these cases as
164 quickly as possible. I also asked another EIS officer of mine, [inaudible
165 0:12:03.3], to write up for the same companion – companion journal –
166 companion piece for the journal, an article about the 13 sporadic cases
167 that we'd seen and the degrees of person-to-person transmission that
168 we saw among those cases. And so we got started on our academic
169 work.

170 By this time, it was Thursday. We decided that Fatimah should do a
171 late breaker at the EIS conference which was taking place this week,
172 the first week of the outbreak, and that she would make a public
173 announcement about the cases. And so we worked all night with her

174 on Thursday night to prepare her presentation, myself and Tony
175 Fiore, another person in my group. And she announced to the world
176 about the investigation about the cases in Texas and New York and in
177 San Diego and in Imperial County. And in one – and in one hour later,
178 at 12 noon our time, Mexico made the announcement that they had
179 H1N1 virus identified from those outbreaks in Mexico. And so we
180 knew that if not a pandemic, this was a multi-country outbreak.

181 Barbara: So as it was becoming clear to you that this may be, in fact, a
182 pandemic event, what were the key decisions that you felt needed to
183 be made at this time?

184 Lyn: Well, during the week, that week of the 20th, we decided to send a
185 couple of teams out to the field. So we sent a team to San Diego and a
186 team to Imperial County of EIS officers and some supervisors to
187 oversee the investigations. When we sent those teams, we were still
188 looking for a swine connection. Then when we heard about the Texas
189 cases, we decided to dispatch a team to Texas which we did. And in
190 addition, the – another sort of interesting and complicating factor was
191 the little boy in San Diego had traveled to Texas himself, to a different
192 city, while he was ill on an airplane. And once we knew that we were
193 dealing with something that looked fairly wide spread, we worked
194 with our colleagues in Global Migration and Quarantine to do a trace
195 back to the plane and to the passengers of the plane to make sure that
196 no staff or passengers were ill post-flight with that little boy who was
197 still ill.

198 And so we – we set up some field investigations. We also set up but did
199 not execute right away an investigation to the New York City
200 Department of Health to look into the Queens school outbreak. And
201 we – we really needed to do something about surveillance. So we, over
202 that week on – on Thursday, let's see, like the 23rd or 24th, I forget
203 which – what the date was, we started to work in the EOC and started
204 to set up some teams there. And one of our ideas which was something
205 that we did during the pandemic exercises, was have this thing called
206 a regional team. And the regional team consists of 10 people who are
207 each assigned five states and who call the states once or twice a day,
208 or less than that if necessary, to get situation awareness.

209 And so we stood up the regional team on Thursday so that we could
210 get reconnaissance from states. We called all the state laboratories
211 and asked them to immediately type and subtype their viruses, and if
212 they had an unsubtypable virus, to send it to CDC right away.

213 We initiated, although it took a little bit longer than this, initiated
214 daily surveillance from our influenza like illness network providers.
215 We have about 4,000 providers in the U.S. who provide weekly data to
216 us and we reached out to them to see if they could provide daily data.
217 We also reached out to laboratories to see if they could provide daily
218 data from their laboratories.

219 In addition, we reached out to our 122 cities vital statistic offices and
220 asked them for daily data as well. And so, we tried to tune up and
221 enhance and make more timely all of our surveillance systems so we'd
222 have the best information that we could get as quickly as we could get
223 it.

224 By – all during this week, I was attending the EIS conference while
225 talking on cell phones with my teams. And we were in the process of
226 recruiting new fellows for the following year so I felt like it was really
227 essential that I be there. On Saturday, the day of interviews of the
228 fellows, you can imagine that our positions got a lot of interest because
229 the rumor was about – about a potential pandemic. We had a lot, a lot
230 of people to interview and I – I believe it was on that day, on
231 Saturday, that we found out about cases in Kansas.

232 So by the end of the first week or week and a half, we knew about
233 cases in six states. We had 10 confirmed cases and we had ongoing
234 evaluations in six more states. So it just unfolded very quickly. Most
235 people in the early days of case identification had some connection
236 with Mexico and there was not yet wide spread outbreaks. It took
237 about another week for that to happen.

238 Barbara: In terms of the plans that you had in place within your division to
239 respond to such an event, did those meet this challenge or did you
240 need to make modifications?

241 Lyn: As I said before, we had done five pandemic influenza exercises and I
242 think we sort of invoked that model and I think that model was 80%
243 good. The – the area in which we didn't do so well was information
244 technology. We did not have a way to convey information about cases
245 from states to CDC electronically. And we only had fax and telephone,
246 and we could attach an attachment of a case – scanned case report to
247 an email, but we didn't have an electronic conduit. We'd been trying to
248 work that out for a couple of years with our IT colleagues but it just
249 never really came to fruition. But it was a huge gap.

250 So, my husband, David Swerdlow, had worked for almost 20 years in
251 food borne diseases and on Saturday and Sunday he brought over a
252 team from foodborne and we set up an FTP site where we could convey
253 electronic data from states in the form of spreadsheets transmitted
254 that way. And that was our first line list to find out about cases. And
255 so he brought over about six or seven people who stayed with us for
256 about two weeks to make sure that that way, that conveyance of data,
257 was working.

258 In addition, the following Monday, the 27th or so, we reached out to
259 our IT colleagues here in the former NICV and they started
260 developing web based applications for us to convey our information.
261 Those applications weren't up and running until May 6th. So from the
262 20s of April until May 6th, we used the – the system that foodborne
263 had set up for us.

264 Barbara: Did you find you needed to make staffing or other organizational
265 changes within your own division?

266 Lyn: Well, you know, I was so absolutely preoccupied with my team that I –
267 I don't know what went on in the Division as a whole, but I normally
268 supervise about 30 people. And my team grew to about a hundred in
269 the first week and to 170 by the second or third week. And so I had to
270 make a cohesive organizational unit out of those 170 people with team
271 leads for different discrete teams. And so we, you know, this – this is
272 not a very interesting part of what we do but we've really had to work
273 very hard to carve out teams with specific responsibilities, find people
274 in the Agency to lead those teams and to supervise the folks under
275 them. And so we went from 30 to 170 pretty quickly.

276 Barbara: In terms of internal communication processes, what means did you
277 use to keep CDC informed of what you were doing?

278 Lyn: Well, from the 24th of April, which I think was Wednesday or
279 Thursday, I did my first director briefing and I briefed the director
280 every single day, seven days a week, for about six weeks when the
281 director briefing went to three days a week and stayed at three days a
282 week until two weeks ago. And so, I – I personally prepared and
283 briefed the CDC Director over a hundred times over the last 10
284 months.

285 Barbara: And were there any other communications internally coming out of
286 your office other than those briefings?

287 Lyn: There were a million, yeah. There – there were daily situation reports.
288 There were slide sets that came out of my office. You know, my office
289 is surveillance. And so almost all of the data from this outbreak came
290 from my group, came from this group of 170 people. And we did – we
291 did this report called the POTUS report. It's the President of the
292 United States report where by 9 PM, we sent to HHS a report for the
293 President to read upon arising the morning. The last POTUS report is
294 tomorrow and we're very glad to be finished with that.

295 We did a number of contemporaneous briefings to HHS and inside the
296 agency. And we received internally about 15 data requests per day
297 and externally about 30. So we did have to prioritize and triage those
298 requests but the team was very busy creating packages of information
299 both for, you know, internal CDC leadership, HHS leadership, DAH
300 leadership and the media.

301 Barbara: In those processes, were there any particular challenges that you
302 would like to highlight?

303 Lyn: I think for me, a necessary but very, very difficult challenge was the
304 24 hour news cycle. We have surveillance systems which are good and
305 they have a lot of people who submit data to them. The sample sizes
306 are very good. But daily data are very difficult. And the signal-to-noise
307 ratio needs to be taken into account because you can get information

308 and misinterpret it if it's just a single snapshot, or the sample is not so
309 large, or biased in a way. And we were, you know, Rich Besser when
310 he was Director, was required to do a news briefing every day at, I
311 think, one o'clock. And so we would give the director briefing in the
312 morning and then from 11 to 12, or 10 to 12, go through all the data
313 and try and think about what was safe and stable to present for Rich's
314 press conference.

315 And that was extremely challenging. I think had there been a press
316 conference once a week, we would've had this really neat tied up
317 package, this very stable information. But that – that was particularly
318 challenging to create a stable package, new information every single
319 day without making a mistake.

320 Barbara: Did you have any involvement in clearing information that would then
321 be presented publicly?

322 Lyn: Well, I – I created and cleared information for the – the Director's
323 press conferences every day, if that counts.

324 Barbara: Could you talk a little bit about the process you used in determining
325 what information should be released?

326 Lyn: It was no structured process. My day consisted of going to meetings
327 most of the day, having the data cranked – we – we were running
328 three shifts of the team. So having the data cranked out on evenings, I
329 would get a look at the data about 10 PM and I would work until
330 about 12:30 AM packaging that for both accuracy and for just validity.
331 And then that would go into the director briefing the next day where
332 the data would be discussed, and then we would decide, as a group,
333 what we should present at the press conference.

334 Barbara: Did you feel that you were getting sufficient information to adequately
335 inform the public?

336 Lyn: I think so. I think, you know, not – not because of any of my good work
337 but because of the good work of people who came before me in
338 surveillance and especially Lynette Brammer who was is the Domestic
339 Surveillance Chief and the architect of flu surveillance as it is at CDC.
340 We had very good systems and we, for what they were worth, they
341 performed beautifully and I feel – I feel really good about the
342 information that was presented and I feel like we didn't make too
343 many mistakes.

344 Barbara: In thinking back over your involvement over the past year, are there
345 areas where you felt the organization responded particularly well?

346 Lyn: I think we did a really nice job with communications in general. I
347 think much to the credit of the flu communications team, Erin Burns,
348 Doug Jordan, Nicole Richardson, they were – and Carolyn Bridges
349 who's the ADS in our group, they were busy the entire day, and
350 evening and night crafting messages. And I think the work that they
351 did was really superb and I think that one of the reasons that the

352 Agency looked so good during the response was because they have flu
353 subject matter expertise, they'd been working with flu for many years,
354 some of them, Erin I think, over 10 years and they knew how to take
355 the stuff that my team – the data and the technical information that
356 my team cranked out and make it into a digestible message for the
357 public.

358 And so I think communications wise, we did really well. I think CDC
359 as an Agency did extremely well in terms of – and this again is a
360 technical thing and maybe not so interesting for this interview or for
361 the public, but we did particularly well defining the epidemiologic
362 parameters of the outbreak very early on. We identified and defined
363 the reproductive rate. We identified the attack rate both household
364 and community. We knew what the generation time was and the
365 incubation period really early on from those teams that we sent out to
366 the field. And I think CDC as an Agency made a real – a really – a
367 really excellent scientific contribution through defining these epi-
368 perimeters by, you know, our New England Journal article was
369 published on May 5th and had 600 cases contained; and in that article
370 were these epi-perimeters defined.

371 So if you just count the days from April 15th when I got the first call, it
372 was only about 20 days before – between the first call and the
373 publication of our New England Journal paper which really described
374 the outbreak in a very expansive way given the time.

375 Barbara: Do you feel or can you think of any particular areas where you might
376 have wanted things to be done differently?

377 Lyn: Yeah. I mean, many; and some remediable and some not so
378 remediable. We in the influenza division, despite the fact that we have
379 a fairly big division and a really nice and very senior epidemiology
380 branch. Our bench was not deep enough. And we worked way too
381 hard. We needed some relief and one of the things that the agency did
382 not provide was support for that. You know, the H1N1 response was
383 an – “an” Agency priority, not “the” Agency priority. And it's up to
384 people like the Director of the Agency to decide that. But that meant
385 that all of the people that came to help us on our teams were there
386 because they were volunteers and they weren't bound to us.

387 And we, at times, had extremely spotty coverage and many of us slept
388 less than five hours a night for the first four weeks because we just
389 didn't have the relief that we needed to go home.

390 Barbara: Do you have any final thoughts or recommendations you'd like to
391 make for anyone who might find themselves in a similar situation?

392 Lyn: Well, I think one thing that the agency could do to get ready for the
393 next emergency response was work – is to work very hard on the
394 information technology piece. I think there's a way for us to create a
395 shell data transmission message and that specifics of the pathogen or
396 whatever could be stick in at the end. But for us as an Agency not to

397 have a way to convey electronic data, in the beginning of the response
398 was not good. But I think we have a breather and we can create that
399 and I think there can be some sort of generic IT piece created.

400 I also think that the Agency needs to think carefully about staffing
401 this kind of response. In the beginning, people were here as volunteers
402 because of their own goodwill. They sometimes showed up, they
403 sometimes didn't and they left us in the main influenza division
404 without help some of the time. And I think the Agency needs to come
405 out with a strong message to volunteers that they have to come, and
406 they have to be there for a certain number of weeks which is fixed, and
407 they have to prioritize making sure that people who are in the core
408 area of the response get the kind of rest that they need because I think
409 many of us were really very exhausted.

410 Barbara: Great, thank you very much.

411 Lyn: You're welcome.[audio ends]

**Interview #8 Daniel Jernigan, MD
Deputy Director, Influenza Division**

1 Dan: My name is Dan Jernigan. I'm the Deputy Director of the Influenza
2 Division at CDC.

3 Barbara: And can you tell us a little bit about yourself, your background, what
4 brought you to CDC, how long you've been here?

5 Dan: I trained as an internist in internal medicine in 1991 to 1994. And
6 then came from internal medicine residency training to the Epidemic
7 Intelligence Service, the EIS, in 1994 in the respiratory diseases group
8 at CDC from 94 to 96. And then after that, worked in the Office of
9 Surveillance on emerging infectious disease surveillance in Seattle for
10 three years; and then came back, worked in that same office in the
11 National Center for Infectious Diseases; and then transferred to the
12 Division of Healthcare Quality Promotion which is hospital infections.
13 And then after that, worked for awhile in the NCID Office of the
14 Director as the Associate Director for Science, and then took the
15 Deputy Director position in 2006 in the influenza division.

16 Barbara: So clearly you are involved in H1N1.

17 Dan: Uh huh (yes).

18 Barbara: Do you remember, can you recall when you first heard about H1N1?

19 Dan: About the novel H1N1...

20 Barbara: Yes.

21

22 Dan: ...that we identified? It turns out actually that a part of our pandemic
23 planning was to develop better diagnostic tests. And so those were in
24 two sort of ends of the testing spectrum. They were the – the side that
25 was the surveillance side where referenced laboratories would be
26 testing with the more complex PCR type tests. And for that, we helped
27 develop a new test for that.

28 The other end of the spectrum is at the clinician's side at the point of
29 care. And so working with HHS, we actually had a diagnostic test that
30 was a –an experimental device that was in clinical trials in San Diego.
31 And so this device by a company called Meso Scale, was able to detect
32 Influenza A, Influenza B, the subtypes Seasonal A H1 and Seasonal A
33 H3, and also two types of – of H5.

34 And so this device was actually in use in a clinical trial in San Diego
35 County and picked up what's called an unsubtypable. And that
36 unsubtypable means that if this device found it was Influenza A but it
37 didn't match any of the seasonal subtypes, and so it was an automatic
38 flag for further testing.

39 And so the further testing eventually landed that specimen at CDC
40 where we found out that it was this novel swine origin Influenza A.
41 And so that device actually, by chance, really happened to pick up the
42 first recognized case.

43 The second case that was picked up was also in – in south – in
44 southern California that was picked up through a CDC surveillance
45 system called the Border Infectious Disease Surveillance system
46 where we were working with the naval health research center for
47 doing testing and so that one was picked up the same way, an
48 unsubtypable result.

49 And so within a couple of days, we had two cases from two different
50 place; one picked up by chance with this experimental device; the
51 other picked up because of a CDC surveillance system. And so those
52 really pointed to a problem with swine flu. And up unto that point,
53 whenever we had swine flu cases, we looked very closely for swine
54 exposure. And so for both of these cases, we looked very hard and
55 could not find any exposures.

56 The case in Imperial County which is just on the other side of – of
57 Mexico, had gone to the Imperial County Fair where there were lots of
58 swine but the swine had all been slaughtered and so we weren't able
59 to do any testing of those – of those pigs to see if by chance they were
60 carrying the same of the H1N1.

61 The other case from San Diego County, the 10 year old boy, had been
62 to the San Diego Zoo where he had actually had some contact with a
63 pig that was on a leash that was led around the San Diego Zoo so
64 people could pet it. And so that one we actually were able to swab. We
65 had to get legal consent to do that. The – I guess the pig had to give
66 consent but we were able to swab that pig but only after they had
67 anesthetized it. And a nasal [inaudible 0:04:24.5] swab of that pig
68 turned out to not have the H1N1.

69 So we ended up not finding any link with the swine. This was all
70 within several days of the first recognition but very soon after the
71 determination that this was the same set of sequences, the gene
72 sequences matched some sequences that had been done from patients
73 in Mexico where there was a very different characteristic of – of
74 influenza disease down there. And so that – once that happened and
75 the whole complete character of it changed, and luckily there were a
76 lot of things in place that allowed us to move very rapidly. But I think
77 we were lucky to be able to pick up those two cases when we did and
78 give us that amount of time to get prepared, and to get things going in
79 terms of assisting with a lot of diagnostics.

80 Barbara: So in this earlier period, did this strike you as a potential crises?

81 Dan: With the first two cases, we had had over the five years or so, prior 11
82 or so cases of H1N1 where there were people that were picked up that
83 had the swine type H1 or other types of swine flu that did not have

84 any further transmission. So you might have one or two family
85 members, but not any forward transmission. And so with the first two
86 cases when we started looking, we did not see any other unsubtypable
87 Influenza A's in the community; we didn't see a lot of problems with
88 increased ICU visits, or hospitalizations, or deaths associated with the
89 flu. And so things did not point toward the type of pandemic that
90 everyone had been preparing for and that was a very severe pandemic.

91 And so we were assured, reassured in terms of the – the kind of
92 severity we were seeing or not seeing, but once we saw the connection
93 with Mexico, we had to figure out exactly what was going on 'cause we
94 – we were seeing something very different than what they were
95 seeing.

96 But early on, we had been – we had learned through a lot of
97 experiences with the Avian Flu and with some other swine flues that
98 we'd had some media coverage of, but it was important to get out there
99 very early. And so we prepared the information in an MMWR very
100 quickly. Tom Skinner from the Division of Media Relations was very
101 instrumental in making sure that we were quick to put out something
102 so that people could hear about it; 'cause his concern and our concern
103 was that we don't want to appear to have information that we're
104 withholding from the community if there's something that they can do
105 about it.

106 And so we felt that it would be important to find other cases by
107 announcing it, but also, it would allow clinicians to know that perhaps
108 they should treat different or test more in order to find these cases. So
109 even before we knew any connection with Mexico or the – even the
110 potential that there was a pandemic that had emerged, we had
111 already put that information out through an MMWR, we had a press
112 conference, we were available for press availability, but then also, we
113 put onto the web the sequences of the genes. And so that was done
114 very early not only because we wanted to be transparent, but also
115 because there was a growing movement, if you want to call that,
116 among a number of countries to think of influenza viruses as
117 intellectual property.

118 And so by putting the sequences out there, we essentially made the
119 statement that we're not going to try and make money off this, we're
120 not going to try and say that this is CDC's material. We wanted to be
121 sure that everyone had as much access to the sequences and to the
122 subsequent vaccines, and drugs, and things that would be made from
123 knowing that information. So that was a trend that was started very
124 early in terms of transparency, getting information out, translating it
125 to the community, and giving the tools to the community so that they
126 could make appropriate prevention measures.

127 Barbara: Can you talk a little bit about the process involved in determining
128 what information to release to the public?

129 Dan: Yeah, I think overall we wanted to make sure that the information
130 that went out was grounded. And so it was grounded in evidence that
131 if we didn't know the information or, excuse me, didn't know the
132 certainty of the information, that we communicated that. So we did
133 not wait until we had everything figured out before we would say it.
134 We also wanted to make sure that the way we said it was hitting at
135 least two audiences, one, the clinical and public health audience that
136 needed to have it at a certain technical level, but also the general
137 community. And so for that, there was lots of work with plain
138 language and other approaches to make sure that people – the right
139 people were getting the right information to have action with.

140 And so we always wanted to make sure that what we provided was
141 something they could use to prevent illness themselves or to act on.
142 But in general, it was the transparency, getting out very quickly, and
143 making sure that we were presenting it in a way that they could
144 understand our concern about it, but not in a way that would induce
145 panic unnecessarily, but we did want people to understand the
146 potential problems.

147

148 One other thing that I think was very helpful that Dr. Schuchat did
149 very well was to foreshadow certain things and so we would have a
150 series of press conferences set up. And so we would try and anticipate
151 what information would be at each press conference. And periodically,
152 we would have information that was emerging that was not ready to
153 be presented simply because we were still collecting that data. But the
154 trend that that information was saying, that is maybe cases were
155 increasing, or pregnant women are more – having more problems with
156 the disease, she was able to foreshadow that so that when that
157 information was finally presented in its more formed manner, that
158 people were ready for it. We were – they were already beginning to
159 talk about. And so I think that was very helpful for there not being
160 surprises of information but also of a sense that we were always
161 letting them know at the level that we knew when we knew it.

162 Barbara: In terms of the Influenza Division's organizational structure, did you
163 make modifications or changes to your staffing?

164 Dan: Well, our Influenza Division was set up in a traditional manner and
165 that is there's an epidemiology group that has a domestic and an
166 international component to it, and a lab side of the house that has
167 three branches that focus on different parts of the virus. And so we
168 were structured essentially to pick up our entire division and move it
169 into the response. And so, as you know, when there's a major
170 response, we initiate the incident command structure. And so the
171 leadership within our division became leadership within the response,
172 but that overall response hierarchy was separate from the CDC
173 bureaucracy, and that's for a number of reasons but its mainly to
174 make sure the decisions can be made quickly, that resources can be

175 accessed quickly, people can go out and the kinds of things that need
176 to happen quickly can happen quickly without having to go through a
177 lot of bureaucracy.

178 But that also means that the people that are participating in it
179 have to recognize a different structure. For us, our laboratories
180 functioned almost within their normal structure. Our epidemiology
181 group was greatly enhanced with a lot of folks that came in but the
182 overall structure in the second half of the pandemic was a much bigger
183 enterprise than certainly our division and much bigger than what we
184 had in the initial wave of the pandemic.

185 Barbara: And how – how was that structured?

186 Dan: The second part?

187 Barbara: Yes.

188 Dan: The – the first part was actually structured more typically in terms of
189 having an incident commander. I was serving as the Senior Science
190 Officer and we have what was called a technical specialty unit that
191 had oversight of most of the technical aspects, the intelligence
192 gathering surveillance and so forth.

193 When we moved to the second half, we needed to get into a much more
194 robust larger enterprise and that had a vaccine task force, it had an
195 epi and lab task force that had the laboratory informatics and a whole
196 lot of other parts of it, the surveillance, but also we had a medical care
197 countermeasures task force. We had a community mitigation task
198 force. And the – the largest and perhaps the most critical at that point
199 was the vaccine task force. And so that's one that took care of all the
200 distribution issues, monitoring coverage, monitoring vaccine
201 effectiveness and so forth.

202 Barbara: So was that structure already in place, or something that you
203 developed?

204 Dan: That had to be developed. And so the vaccine task force was the one
205 that really did not have a home in the previous structures. And I think
206 that reflected something that we had learned because of the response,
207 the pandemic respond, and something we hadn't appreciated in our
208 earlier exercises.

209 As a part of pandemic preparedness, we would have exercises two or
210 three times a year, you know, two 48 hour duration exercises where
211 we had hundreds of people playing as if the pandemic was happening.
212 And in those, we got a lot of time spent on the beginning, and borders,
213 and airports, and mayhem in the streets, that kind of thing in terms of
214 scenarios, but we never adequately got to the issues of vaccine
215 delivery.

216 And so the – the decisions before the pandemic were more of having
217 pods of vaccine that would get shipped somewhere, and they'd open

218 up, and people would start vaccinating. People would line up. And that
219 just didn't make sense in the current environment.

220 And so we ended up going through vaccine delivery approaches that
221 were much more similar to have vaccine is normally delivered, you
222 know, outside of a pandemic, and so utilizing existing structures. And
223 so if we had a little more time or if we had focused more on that part
224 of the – the response, I think we might've had a better idea of what we
225 would need in terms of delivering vaccine and making sure that we
226 had all the right connections with the appropriate state agencies that
227 do that kind of work.

228 Barbara: Were you involved in the policy decision unit?

229 Dan: Uh huh (yes).

230 Barbara: Could you talk about your involvement?

231 Dan: Yeah. That actually came out of some of the exercises. Early on, we
232 were using the traditional incident command structure and that has a
233 plans unit. It has a logistics unit, a finance unit and an operations
234 unit. And the work that CDC does in outbreaks is almost all
235 intelligence gathering, its surveillance. It's information that leads to
236 decision making and recommendations.

237 Incident command in the traditional sense is something to respond to
238 wildfires, to earthquakes, to hurricanes, where there's a defined event.
239 There's usually a defined location where it occurs and you have a
240 bunch of people who are doing things. And so the plans unit says
241 what's the weather, how many places are on fire now, and then says, I
242 need these units to go over there and cut down trees, and clean the
243 roads up. That's a different need than what we had for the – for a
244 pandemic, for any large outbreak really.

245 And so over a series of really almost years, we rearranged that
246 incident command approach to be much heavier in the gathering of
247 information, development of recommendations, implementation of
248 policy because while we weren't cutting down trees, and cleaning
249 roads, our products were the recommendations that we put out and to
250 get implemented through other people that are actually doing the
251 operations.

252 And so what we found was that there needs to be a time and a space
253 where people can think, where it's not so noisy, that it's not complete
254 mayhem happening all the time. The – the urgency of the moment can
255 always prevent you from thinking ahead. And so we knew that we
256 needed to have that. And so Toby Crafton who served as the Chief of
257 Staff during the – the response, and I, and a few others, came up with
258 this notion of the plans decision unit which we envisioned as a
259 separate place, with people assigned to do thinking and planning so
260 that they could not be picked up and put on TV, they wouldn't be
261 picked up to go to some meeting that was urgency needed, they would

262 be there to think, and they would have access to the subject matter
263 experts, and they would have access to resources that they could ask
264 questions, how many children are in school every day; and how many,
265 you know, whatever question needed to be answered.

266 And so that through exercises became a really helpful thing because
267 we actually would cue up policy decisions that needed to be figured out
268 for pandemic preparedness so that they could get figured out during
269 the exercise which was really pretty helpful.

270 And so when the pandemic actually hit, we just simply continued that
271 process where people were brought in, they were educated on decision
272 making, there were, you know, a set science to that that was followed,
273 they would identify the facts, the assumptions, they could come up
274 with three courses, four courses of action. They would weigh each of
275 those with criteria and then present that to leadership where a
276 decision then could be made.

277 And so it helps us to have a record of what we did in terms of big
278 policy decisions. It also is a – a way to demonstrate confidence, I think,
279 to people outside of us that we were thinking clearly about expensive
280 disruptive types of interventions and making sure that all of the sides
281 were weighed and that the evidence was helping us to make the best
282 decisions.

283 Barbara: In terms of getting information to support decision making, can you
284 talk about that process?

285 Dan: About how we got that information? It comes from different places.
286 And I think some of our experience in anthrax, the response in 2001,
287 was there were very few people that were subject matter experts. And
288 some of the information was based on data from a long, long time
289 earlier. And so I think we in the division had a number of subject
290 matter experts that had been working on flu for awhile. But we also
291 had people from throughout the agency that have expertise in
292 different aspects of things, vaccine delivery, vaccine adverse events
293 and things like that. And so we were able, because of that approach, to
294 pull from those subject matters within the – the agency.

295 We also had a thing called Team B which is a group that was set up of
296 outside individuals who met frequently, sometimes twice a week
297 sometimes more, to have questions cued up to them and they would
298 provide that information to us. And so sitting on that group were
299 people that had managed the swine flu outbreak, people that had done
300 a lot of enormous interventions with small pox, people from
301 academics, people from public health, even people with skills in – in
302 communication. And so we were able to access their, you know, smart
303 brains through that approach but also we brought in people as well.

304 We had liaisons from other federal agencies here. We had liaisons
305 from the Association of State and Territorial Health Officers and the –
306 the National Association of County and City Health Officers, the

307 Association of Public Health Labs, Council of State and Territorial
308 Epidemiologists, all of those folks at different times we either had on
309 site or we had routine communication with. And so as decisions were
310 developing, they could be piloted with those individuals and they could
311 help refine them.

312 Barbara: And once – once the decisions were – were arrived at, how was this
313 communicated internally within CDC?

314 Dan: Well, the plans decision unit would cue up, they would present it to
315 the leadership, generally the incident commander, and those decisions
316 then would either be made on the spot or they would be thought about
317 and then a – a follow up would be given to the director at the next
318 director's update which at that point was every morning.

319 And so we would communicate it to the director, the director would
320 then determine whether or not that was the right decision, and then
321 given that, it would be communicated through various means. If it was
322 a policy decision, it would have to be sent out through all of our
323 channels. If it was to clinicians, we would use our COCO calls which
324 are clinician outreach calls. If it were to the public health
325 departments, we had routine calls where those would be sent out. We
326 had mechanisms for sending out health alert network advisories
327 which are documents that get sent out through fax or through web.
328 We would post it on the web. We would do press releases. There were
329 a number of different ways that we were able to do it and to send out
330 that information but also to target it to the specific groups that needed
331 to hear it.

332 In terms of communicating it within the response, that was done
333 through basically live broadcast of all the director's updates that
334 anyone could access from various different places around the Agency.

335 Barbara: Were you involved at all in communication with the public?

336 Dan: Yes. We had to do a number of on-camera interviews, and media
337 interviews, tele-briefings and things like that.

338 Barbara: In terms of getting information cleared for presentation to the public,
339 what was that process?

340 Dan: I think there was a core group of maybe 10 or 20 individuals who were
341 having that kind of external interaction – the external interaction
342 where if you screwed up, people would know about it. And so that
343 group, I think, was fairly tightly connected by space. We were close to
344 one another and often were able to hear each other give those updates.
345 And so, through the process of discussing it in the plans decision unit,
346 through the process of discussing it at updates, people were able to
347 know what the right language was, what the approach was, but then
348 also there was a regular approach to having talking points developed
349 almost daily where those talking points were in plain language, what

350 the major issues of the day were, what the policy decisions were, and
351 what our plans and communications to the public were.

352 Those were made available to anybody but we sent those out also
353 through all the professional societies so that state health officers and
354 state epidemiologists who were also doing media interviews were
355 using the same language and saying the same thing at the same time.
356 So we tried not to get out of sync either in terms of the content or in
357 terms of the timing.

358 Barbara: Thinking back to the early days of the response, what do you feel were
359 the key decisions that had to be made?

360 Dan: A number of them, I mean, very early on we had to decide are we
361 going to stand this thing up because it's – it's really the – the thing
362 we've been thinking about, or are we going to try and manage this as a
363 smaller operation. And so that became pretty clear that it was in our
364 best interest to get way out in front of the problem and not try and be
365 building up too late. And so we did lean forward and stand up the
366 Emergency Operations Center and so forth.

367 So that was a key decision. A lot of other key decisions are whether or
368 not we would begin to produce all of the reagents that we ended up
369 sending out. We elected to do that very quickly and were able to send
370 out the kits to all the state health departments that do the testing
371 almost in real time with the demand for the testing which was – that
372 was a good decision to make that happen quickly.

373 We also did have some resources, financial resources, available that
374 we could access quickly. But I think people were wise to delineate
375 what they needed early for a big response and then get that request
376 for resources into the pipelines 'cause that's not something that
377 happens immediately. And so by doing that, we were able to have
378 resources at the right time to do the right size of response and not
379 have to scale back because we simply didn't have the resources.

380 Barbara: In terms of organizational resources, did you make changes to staffing
381 or procedures in any way?

382 Dan: Yeah. We changed to the structure of the way we were doing the EOC
383 hierarchy halfway through in the summer when we did have a time
384 where it was a little bit slower and we knew that we were likely to
385 have a lot of disease in the fall. That was a change that we did.

386 We changed periodically some of the – the ways that information was
387 flowing up to the director. I think that helped out a lot. But also, there
388 were a few individuals that stayed on through the whole response
389 which was key, I think, and to make sure that they didn't get too tired
390 and not able to continue, we did have a number of people that were
391 helping to support them and could step in at any point and do their job
392 for them.

393 Plus, we did have human resources set up in cycles so every three
394 weeks or so, people would be in and out of the response and that's a lot
395 of logistics. And so I think that's some kudos to the folks in the
396 Division of Bioterrorism at Preparedness and Response for really
397 helping out to try and figure out how many people were needed, when
398 they were needed, and start cuing them up because the response
399 would've just ground to a halt if we'd not been able to do that.

400 Barbara: And have those organizational practices been institutionalized for
401 future events?

402 Dan: It's hard to say 'cause we're – we're still – the Emergency Operations
403 Center's still active right now. It's not that much going on but I'm sure
404 it will be. And these are things that we had practices but never had to
405 actually put into a real response of this size and this duration. And so
406 clearly, the things that we've done now would get implemented in any
407 large response. And there are things that we had an idea that we
408 needed, there were people that were assigned to do it, but the – the
409 formal home of it, I think is much clearer now than it was before.

410 Barbara: So in thinking back over the past year, are there things that stand out
411 to you that were done particularly well in the response?

412 Dan: Well personally I think the – the diagnostic testing was done very
413 well. And so this is something where we had devices that were in the
414 field for clinical trials that detected the first case. Once we knew there
415 was something unusual, the machines that were in the public health
416 labs had been put there only three or four months earlier, the reagents
417 that those machines used to do the testing, we had a mechanism that
418 had just gotten in place the fall prior that we were able to send out all
419 of those through a contract lab. We were able to match the demand
420 pretty well. We had very few public health labs that actually got really
421 overwhelmed. We knew how many people they might need for each
422 public health lab, how many machines they would need for different
423 amounts of specimens that needed to be tested. There was a lot of
424 planning there that really paid off. The first case was actually
425 detected at CDC using a PCR test that they had just finished
426 validating or had been working on. And so that made it easy for us to
427 be able to take that, put it into a kit and be able to send it out once
428 FDA had given us the approval to do that.

429 So that's something that I think went very well and it's really
430 important too because if you know with certainty cases that are
431 occurring in multiple places in the US, and you can begin to count
432 those, and you can begin to say, you know, who is this in, is it in
433 pregnant women, obese patients, etc., when is it occurring, what's the
434 transmission dynamics. If you have a really good test for that, it
435 makes the rest of the – the work a lot easier because it takes a lot of
436 the guess work out of it.

437 Barbara: ...of information that you received or felt you should have, did you feel
438 comfortable with what you got or feel there were areas where you
439 didn't get the information you needed?

440 Dan: Well, I think the – there were a couple of things before the pandemic
441 actually started from the – the agricultural side. The surveillance
442 among swine for what influenza viruses are circulating, that
443 information we just were not getting. And in part, because it wasn't
444 being done. They really did not have a – a formal way of collecting
445 specimens from swine. There are a lot of reasons why people don't
446 want to do that. I think they're dis-incentives for the farmers. There's
447 dis-incentives for the large manufacturers. But I think had we had
448 better surveillance, not just in the US but in other places, we would've
449 maybe picked this up. We would've at least had an idea about what
450 the spectrum of different kinds of influenza viruses were out there. We
451 might've had tests that had already been validated with these unusual
452 influenza viruses so that we would be even that more prepared to
453 detect it and to ramp up if we needed to.

454 And so those are things I think that we will be doing better hopefully
455 through some collaborations with other federal agencies and other
456 state agricultural agencies. The other part is information about what
457 was happening in Mexico. And so there's – there's a really difficult job
458 that people that try and monitor these disruptions in other countries
459 have. And so they need to try and determine is some problem of
460 increased pneumonias in a country far away, is that something I need
461 to worry about, how do I get more information about that? You know,
462 I've got 20 of those a week. Which one is the one that really is the one
463 that matters?

464 And so that's a science that needs to be developed better, monitoring
465 open source data, understanding of what these kinds of problems that
466 are occurring, these disruptions, which of those do we need to follow
467 up on and which ones are something that we actually have to begin
468 responding to.

469 So those two things I think would've helped us with a little earlier
470 detection. There were some regulatory things that needed to be fixed
471 as well. Our –our country has very good regulations for making sure
472 that things that get done on people, tests, and things that go into
473 people, vaccines, that those are safe, and that they're giving accurate
474 results.

475 However, in an emergency, those regulations don't do very well. And
476 so we got around that with some new things called the Emergency use
477 Authorization that FDA had but there's a real need for there to be a
478 more nimble approach to regulation that would've – would've helped
479 us out and would've made our response, I think, a little bit quicker.

480 In addition, when it came to doing the vaccine campaigns and getting
481 vaccine delivered, we had some ways of getting vaccine out but we

482 hadn't completely figured that part out. And so I think there's a lot
483 more to learn about that. And even maybe setting up things like
484 school located vaccinations to do each fall that essentially become
485 almost a – a dry run for a pandemic or for some other large response
486 that requires vaccination.

487 So getting the – the pillars at a state that do preparedness, and the
488 pillars that do vaccines, and the pillar that does communicable
489 disease, or the stove pipes, if you want to call them that, getting ways
490 that they're working together on a routine basis, I think, will help out
491 for future responses. And that's something we thought about for a long
492 time but we just haven't had the ability to make that happen before.

493 Barbara: So do you have any final thoughts or recommendations you'd like to
494 make?

495 Dan: I think one thing that was pretty clear is that in terms of pandemic
496 preparedness, that having multi-use platforms were very helpful.
497 There are platforms for surveillance like the emerging infections
498 program or other kinds of programs like the vaccine safety data link
499 that are used currently but when the pandemic hit, we could just
500 ramp up the work they were doing, or target what they were – the
501 kinds of questions they were asking, or the cases that they were trying
502 to find. And so that's a real important lesson that we keep platforms
503 for surveillance like that running and ready, and then when we have
504 problems, we can turn them on.

505 Another multi-use platform is the devices that we do our testing on.
506 And that if we have a device that can do flu, we should have that same
507 device be one that can do anthrax and respiratory [inaudible
508 0:04:41.6] virus and other kinds of emerging pathogens so that it can
509 be rapidly used and we don't have to think about shipping devices, or
510 training people, or anything like that. So a multi – multiple use
511 platform makes a lot of sense both from a surveillance platform and
512 from the devices themselves, but also, having a warm base. That's a
513 term that the manufacturing industry uses for having a level of
514 manufacturing capacity that can be rapidly increased. And so for
515 diagnostic test manufacturing, we had that at CDC through a
516 contract. We were able to increase it. That's a – that was a very useful
517 thing that that notion of having a warm base, like having a warm base
518 of people that vaccinate each year in schools. That's a warm base of
519 activity that can be ramped up quickly but it requires you to figure out
520 how that can be used normally, how you're going to routinely have it
521 apart of public health, and then how that can be ramped up using the
522 same people, same interactions and same collaborations that are
523 necessary for routine use.

524 Barbara: Great. Thank you very much.

525 Dan: Thanks. [audio ends]

Interview #9. Martin Meltzer, PhD
Senior Health Economist and Distinguished Consultant, Division of Emerging
Infections and Surveillance

- 1 Martin: My name is Martin Meltzer. I'm a senior health economist and a
2 distinguished consultant in the division of Emerging Infections and
3 Surveillance Systems.
- 4 Barbara: Thank you. We'd like to begin with just a little background
5 information. Could you tell us a little bit about yourself, your training,
6 your specialization and what brought you to CDC?
- 7 Martin: Certainly. My three degrees are all in applied economics, in fact,
8 agricultural economics. And for the first five years after my PhD, I
9 worked at the University of Florida in Animal Health Economics. And
10 then in 1995, CDC started the – what they called the Prevention
11 Effectiveness Program which is a post-doctoral program for health
12 economists. So we arrived, five of us, and just about the first
13 economists that CDC had integrated into their system full time. So
14 that was just under 16 years ago.
- 15 And one of the first projects actually I started working on then was in
16 pandemic influenza program. Dr. Nancy Cox who was and still is
17 Division Chief of the influenza, asked me could I work on some model,
18 some estimates of the next potential pandemic. And being green, I
19 said, sure, not realizing how difficult it was.
- 20 But that resulted in a paper in 1999 that presented some estimates of
21 what would happen if a 1968 type pandemic would occur again in the
22 U.S. And that paper and the numbers became the basis of a lot of
23 planning, programs and planning tools that we produced and put on
24 the internet and were used by federal governments, state, local and
25 even international and other national organizations and governments
26 around the world for planning back then. But that was some years ago
27 already when we first started thinking about pandemic.
- 28 When you first started with pandemic planning, the national
29 pandemic plan was something like 40 pages long if you counted each
30 page very carefully.
- 31 Barbara: Are you currently involved in some aspect of H1N1?
- 32 Martin: Absolutely. I was involved in the response itself. And right now,
33 involved in a lot of the writing up and analysis of the data that we've
34 collected, and writing out explaining full and peer review journals,
35 and other formats exactly how we calculated the numbers that I was
36 part of the team that calculated numbers for decision making and
37 what we did over time.
- 38 Barbara. Do you recall when you first heard about H1N1?

39 Martin: Oh absolutely. It was more than ironic. I was on – getting on a plane
40 to go to Europe for a conference on influenza and influenza pandemic
41 planning and preparedness except the pandemic they were talking
42 about was all H5, Avian Influenza. And all though the conference,
43 there were these papers, presentations about what might happen if
44 H5 based pandemic were to occur. And every day, in fact, every hour,
45 do get reports and updates about this pandemic that was beginning to
46 evolve based on H1. And, of course, it had greatly different
47 characteristics than anything anybody had assumed for H5. So whilst
48 the papers, and all the planning and comments for H5 were very
49 interesting, and indeed they're still pertinent, they didn't have very
50 much to do with H1N1 that was circulating.

51 And so I would be phoning back and saying, when do I come back and
52 what can I do? And I got off the plane and walked around the halls
53 and say, how could I be of use? What do you need to know? And this
54 was like the very early days just when they're trying to figure out
55 what does the virus do, who gets it, how may get it and what happens
56 to them when they get it.

57 Barbara: Did you have a feeling that this was a potential crisis looming?

58 Martin: Yeah, I think the word we can drop is potential. This was a genuine
59 crisis at – it was obvious to me from the very beginning that this met
60 all the criteria of a pandemic strain. It was human adapted, it was a
61 strain that nobody had seen before, at least, at that time we thought
62 so until we got confirmation of the people over 60 later on. It did
63 spread, and it did cause illness, and it did cause health outcomes –
64 adverse health outcomes such as death, and hospitalization amongst
65 those who had contracted disease from it. So there was no doubt in my
66 mind that this was it.

67 Barbara: So how did you become involved in the actual response to H1N1?

68 Martin: Well, as I said before, I've actually spent the past 15 years been
69 involved in influenza pandemic planning producing simple models.
70 And I do emphasis that, simple math models, to put on the web to help
71 people plan and prepare. And literally when I returned from that
72 conference, I went to the Incident Response – the Emergency
73 Operations Center here at CDC and basically said, what can I do to
74 help? What do you need to know? How can I help? And essentially I'd
75 take the approach with modeling. It's not what can I do and why this
76 should be useful. I try to go the other way and say, what do you need?
77 And if you need something, an estimate, or an idea, or a decision
78 analysis, let me think about it and see if I can come up with something
79 that would help you.

80 So the first couple of weeks was literally walking around talking to
81 people trying to understand what it was that they thought was their
82 biggest problems, and what they needed most help with in terms of
83 decision making.

84 Barbara: So how did you then begin to work on your models and your decision
85 trees?

86 Martin: Well, the first part was the simple obvious questions which were, you
87 know, who should we vaccinate. We have some ideas. They had a
88 straw list which was, in fact, eventually the list pretty much adopted
89 by the ACIP. But did it make sense? Were they missing somebody?
90 Did it – was it worthwhile to vaccinate these people once we began to
91 get a better idea of how many people were sick, and what was
92 happening to them, what would likely to be the value of vaccinating
93 those groups.

94 So we started to produce some early models giving some estimates and
95 the word guesstimate is probably more accurate because at that time,
96 we had no idea really of the true number of people that were falling ill
97 and even the rates of hospitalization and death were somewhat of a
98 guess. And I was using a lot of 1968 type data. I said if this was a 1968
99 type data – pandemic, this is what it might look like knowing full well
100 it probably wasn't and saying this is initial estimates. And as we
101 worked on that, was waiting for better data to come along which it did
102 fortunately and it was a very rare event that we got the better data.

103 Barbara: Where did you get your information?

104 Martin: Well originally, as I said, we had to use 1968 because when you start
105 off, although you might have some initial field data, you really don't
106 have any population size data. So we – we knew this wasn't as bad as
107 1918, thank goodness, and for that we should be eternally thankful
108 and grateful. But we did know that it was spreading. Some of the
109 initial data that I saw reminded me of the lower limits of 1968 in
110 terms of risk of going to the hospital, the risk of dying given that you
111 were ill. And I said, this looks a lot like 1968, the very mildest
112 portions of it.

113 So I started using that. And then we did what's never been done as far
114 as I know in influenza, we used what we called the pyramid model in
115 which you start off at the top with the known lab confirmed reported
116 cases and hospitalizations, and you work your way back by going out
117 into the field and doing surveys, and getting a sense of who gets tested
118 if they go to the doctor. 'Cause not everybody that goes to the doctor
119 gets tested. So what percentage of people who go to the doctor get
120 tested? And even the step before that. Not everybody who's ill goes to
121 the doctor so we did surveys at particularly Detroit and Chicago, but
122 there were other similar surveys in New York and Minneapolis asking
123 people and doctors, if you're ill, do you go to the doctor? And if you're
124 at the doctor, does the doctor test you? And if the doctor tests you, do
125 they send the sample forward to a state epidemiological lab for
126 testing? And if the lab tests, do they send us the report? And same
127 again with hospitalization.

128 This sort of protocol has actually been used for a while in food born
129 disease, but it's never been used, that I know of, prior to this, before
130 for influenza or any respiratory disease. But it allowed us to calculate
131 multipliers that is for every hospitalization, I could now assume, at
132 least from the early days in April, May and June, that approximately
133 2.7 persons were hospitalized for every person that we got recorded.
134 And this allowed me therefore to draw up estimates and have a better
135 idea of what actually H1N1 was doing as opposed to trying to guess
136 based on data from 1968.

137 Barbara: What do you think were the key decisions that needed to be made in
138 these first few weeks and months?

139 Martin: I – I think to me, as an economist and modeler, some of the most
140 interesting things when I got off the plane, the decision of how much
141 vaccine to buy had already been made. And so they separated out the
142 decision between buying vaccine and using vaccine. So the first
143 decision had already been made very quickly and I think very
144 appropriately.

145 The second decision was who gets it, who's to the front of the line
146 because we knew even back in the 90's that no matter how much
147 vaccine was ordered, vaccine production takes time and there's going
148 to be a production line. And who gets the first doses off the production
149 line? Who goes to the front of the line? And we'd been discussing this
150 for a number of years, various scenarios, various options, various
151 benefits and downsides of who goes to the front and who goes to the
152 back. And so one of the most critical decisions was the ACIP
153 recommendations about who should be vaccinated first. And the ACIP,
154 as you know, gave a list of people who should be vaccinated first. But
155 they also had another list within that list of what if there's a shortage
156 of vaccine? Who's the most important to vaccinate first? And that was
157 the most critical decision in our response as far as I'm concerned
158 because that then defined the whole nature of the vaccine related
159 responses.

160 The other critical decision was the use of anti-virals. One of the key
161 decisions was no large scale use of anti-virals for prophylaxis because
162 of a number of reasons, one of them, they were concerned that we'd
163 use too much of the anti-virals up front and probably have very little
164 impact overall in stopping the spread of the disease fast enough. And
165 also, the great concern that wide spread use of anti-virals early on
166 might generate drug resistant strains of the drug – of the flu making
167 the use of the drug later on when you need it for serious cases almost
168 ineffective.

169 So there was some very careful considered thought about who should
170 get anti-virals and why and under what conditions. And again, it was
171 decided that for most people, since this was a mild form of illness if
172 you have no serious sequela and you were not needing hospitalization,
173 a lot of people would become ill but they could recover very well

174 without the aid of any anti-viral drugs. There was recommendations,
175 as you know, for people with high risk conditions to get it to prevent
176 them from going to hospitalization because we also knew fairly early
177 on that a large proportion, a majority of people in hospital, were those
178 with pre-existing medical conditions. And so those were the people
179 that were targeted for use with the drugs.

180 So those basic decisions up front about what to do with the response
181 resources in terms of vaccine and anti-virals, who should get it, clearly
182 defined the rest of the response. Everything about the response from
183 them on led from those primary decisions.

184 Barbara: Can you talk a little bit about how these decisions were arrived at and
185 who were the decision makers?

186 Martin: Well, the – the decision was talked back and forwards. I don't think
187 there's a central office that made the single decision and then told
188 everybody else. From what I saw, was that people here at CDC in the
189 Incidence Response Command took an input from the subject matter
190 experts here, they conveyed it up to Washington and Department of
191 Health & Human Services; people at Health & Human Services
192 provided input and a collective, as far as I'm concerned, a collective
193 decision came about. Of course, obviously it had to be agreed upon and
194 vetted by the very highest levels within HHS, but it wasn't a decision,
195 or any of these decisions, were not made in the absence of input. And
196 indeed, for example, the ACIP recommendations were led mostly by
197 the ACIP. And HHS later basically endorsed them, said we will go
198 with them. There was no argument. There was no saying can you get
199 the ACIP to revise the recommendations significantly. That did not
200 happen as far as I could see.

201 So the main point there was a lot of this was done by committee and
202 input from a variety of experts who knew a lot about influenza and
203 were able to read what little data we had in the early days very
204 accurately and build on with their knowledge, a great deal of
205 knowledge, of what influenza was and how it moved through society.

206 Barbara: Could you talk a little bit more about the types of models that you
207 used?

208 Martin: Okay, I, personally based on a lot of experience, I emphasized simple
209 models that are reduced very often to a spreadsheet. There is a
210 difference between simple and simplistic models. The simple models,
211 you strip down to just the essential. Simplistic, is when you leave out
212 an important element. There's a fine line sometimes between the two
213 which is a simple model and which is simplistic and sometimes it's a
214 matter of subjective opinion as to whether a model is simple but okay
215 versus simplistic and versus bad.

216 The reason however I emphasized simple models in this response was
217 because several factors, one, the incident response command here at
218 CDC often wanted answers in a very short turnaround time. I'd get a

219 call at six in the evening and can they have something by ten in the
220 morning. So you don't have time to do a whole lot of programming and
221 fancy. And two, there's that I wanted to and I did, able to share the
222 models around to people who were not modeling experts but could sit
223 down and pretty much most of the time open a spreadsheet on a
224 computer and click away and see what ifs. What if I change this
225 number here? What if I change that number here? And many times we
226 didn't even have a few hours. It would be can we come back with an
227 answer within half an hour of what if we change this. Not a problem if
228 you build a simple model.

229 If you have large scale models running on supercomputers, that is a
230 challenge. Also, you then have to have large teams of people
231 constantly programming and re-programming. So this – this was a
232 decision based on over a decade of experience of using these. They're
233 not the exact limit of modeling. They're not the end all and be all, but
234 they do have value and use, particularly when people are in tight
235 corners, they don't have time and the – always the pressure to think
236 about all the nuances and they want just the basics and what's the
237 essential elements going into that I need to concentrate on to make a
238 decision.

239 Barbara: Can you talk a little bit about the Policy Decision Unit?

240 Martin: Yeah, the Policy Decision Unit to my mind was a unique feature of the
241 response down here at CDC. And I think it was – I think it was an
242 absolutely tremendous idea and a good, very, very good addition to
243 how CDC responds to these crises. I – I've worked on the ones for
244 SARS, small pox, for anthrax and decision making was – is and still –
245 was and still is, made around a table with a group of experts, and as a
246 committee essentially or a group of people around the table that make
247 input information, absorb it, digest it and come out with
248 recommendations. The thing is, it's not particularly formal.

249

250 The Policy Decision Unit follows a very formal methodology which I
251 think is a good way for several reasons. One is it makes sure that
252 there's a group of people who know something about this, they put in a
253 set of expertise opinions and data into the initial set of data that you
254 use to answer the question. You also spend a lot of time asking what is
255 the question. And in fact, there's a very, very rigorous well-set protocol
256 that they follow, and part of it is that we discuss it, we talk about the
257 data, and then there's a break where you go back to the leadership.
258 Somebody goes back to the leadership and says this is what we think
259 is the objective, the question you asked. Do you agree with it? Do you
260 want a change with it? If we answer it, is this of help to you? And they
261 get – the leadership can then say well, no, since we last talked to you,
262 we've changed our mind or when you put it like that, I realize that's
263 not quite what I want to know. So can you please alter the question
264 somewhat and come back to us?

265 Again, very formal in that the question is very directed, people that
266 might with to go off on other topics, not allowed to because you're
267 going to just answer the single question. Also, you come down with
268 three, maybe five at the most, particular courses of action, options,
269 how do you answer this. You go through the pros and cons. And what's
270 most interesting to me as an economist is then you have three to five
271 particular courses of action. How do you choose? How do you weigh
272 them against each other? Because the one thing about public health
273 that most mathematical models, including in economics, don't account
274 for is in fact there are many objective functions that you're trying to
275 simultaneously meet in public health. Mathematically, models meet
276 one objective function at a time. Here at public health, you're trying to
277 perhaps meet three, four, five. One is, will this get the maximum
278 number of people vaccinated? But also, will this make people retain
279 their faith in public health?

280 Well, those are perhaps sometimes even diametrically opposed
281 objective functions. But you can, in this process, list out all those
282 important objective functions that you – that the group thinks must be
283 addressed, and you can weigh each [inaudible 0:18:34:1] then say
284 okay, we agree with you and your recommendation; or no, we want
285 option one although you recommended option two. We can see why you
286 picked option two but there's a couple of other things that we want to
287 take into account that you didn't discuss or has occurred since we –
288 you started this and we want option one. And sometimes they even
289 pick, well, you've got three courses of action. We want course of action
290 four.

291 Although this might seem a failure then when the policy makers pick
292 a recommendation that the rest of the group, the Policy Decision Unit,
293 didn't pick or recommend, I would say, in fact, no. The point of the
294 Policy Decision Unit was to collect all the available data, digest it,
295 distill it, quickly, come up with some courses of action, look at the pros
296 and cons, think of it in depth, and again, very important, think of the
297 various means about which you'd measure the value of each of those,
298 the objective function, does it meet this objective function? Yes or no.
299 Does it meet it well? Yes or no. And then present that result. And in
300 doing so, that focuses the attention of the Incident Command to what's
301 really important. A

302 And if they come up with a different recommendation, or indeed they
303 come up with another option, that, in fact, indicates success because
304 you've got them to the point where they say, now I understand what's
305 really important. And the Policy Decision Unit really was helping the
306 policy makers decide what's most important. And it was unique. We've
307 never done this before at CDC. And if ever – when this next happens, I
308 hope to see another unit like that again run. Flexibility, people at the
309 top, it takes a certain talent, special kind of person to run one of those.
310 They've got to be very flexible. They've got to deal with a lot of high
311 strung personalities. Got to be able to realize that at some point you've

312 got to get to the answer and that you've still got to brief the
313 leadership. And indeed, the leadership up here has to take your
314 recommendations or thoughts from the – further up the chain of
315 command and explain to them why it is.

316

317 The other important thing was that following, you had two pieces of
318 writing from it. You had the slide sets with your comments on, and
319 there's also a memo. And even if the memo was basically said we don't
320 agree with the recommendation, there's still a record of how we
321 reached that – the recommendations, how the data were taken, and
322 the information distilled. And again, I think that's far more formal
323 process than we've ever done before in all the years I've been here at
324 CDC and I've been involved in a number of these responses now.

325 Barbara: How are these decisions then communicated internally and publicly?

326

327 Martin: Well internally, the – within the EOC, the Emergency Operation
328 Center within CDC, the way it's set up with constant frequent
329 meetings and a very well organized structure, organization structure,
330 it's very easy to set out once a decision's been made, let it flow down
331 the organizational chart. And that's one of the aspects as well is that
332 an organizational chart of who was responsible for whom was set up
333 right at the beginning. So everybody had a good idea of their role and
334 what was expected. But it also allowed for information to at least flow
335 down most of the time and flow back up most of the time. And so most
336 of us would know and understand what decisions have been made.
337 And then the big issue was communicating it up to Washington and
338 the media, which I fed information to. I didn't actually go up to
339 Washington too often. Sometimes I did. Or on the phone more often.
340 But – and also to the media.

341 And again, from the very beginning, we had a very carefully designed
342 plan about who was going to tell the media. And essentially, from – as
343 far as I'm concerned at down here at CDC, we had one or two spokes
344 persons who addressed the media directly, and then, of course, we had
345 our media communications team that deal with, you know, the written
346 emails. And we always worked through them. In other words, there
347 would be a technical question for me might be some question on the
348 estimate of the number of cases, hospitalizations and deaths which is
349 fine. I deal with that all the time. But it would go through the media
350 people and they would act as intermediary between – between us and
351 the media. And there's a couple of very good reasons. One is if we just
352 were to take every single question ourselves openly, it would be an
353 never ending stream of people at our door and questions. And two is
354 that if we do that, then after a while, we don't know what's going on
355 elsewhere because we're so busy and we can't always link this, what

356 we're talking about, into the main message that we're trying to get
357 across. And public health, very often, is all about the messaging.

358 I found it fascinating many times. I'd present the numbers to the
359 incident command team and they would say well – first thing they'd
360 say, well okay, what's the public health message about this? You
361 know, how can I perhaps give a few comments about interpreting it?
362 But many, many times, it was – the first concern was what does this
363 mean about our communications? How do we explain it to the people?
364 Does it mean we have to change policy? If so, how do we change the
365 policy and how do we communicate it? Things like that.

366 So communications was at the far and center of this response. And I
367 think they did very well. It's always stressful. Nothing's perfect but I
368 think we have to be given high marks on how we communicated out. I
369 mean I do understand that some people are unhappy. But I think the
370 number of people that are unhappy versus the number of people that
371 thought we gave out adequate and enough information and explained
372 things, I think, was far greater than the number of people that were
373 [inaudible 0:24:30.4] unhappy.

374 Barbara: So looking back over the past year, are there any things that you
375 would have done differently or would have recommended be done
376 differently?

377 Martin: It's sort of like other people think the pandemic's over, to me, it's still
378 in the middle of the pandemic and writing it up, and thinking about it.
379 Would it be different? Very little that I can see at this point. Maybe in
380 two or three years I might think, you know, this – the one defining
381 feature of the pandemic response as you know it was the delay in
382 getting vaccine; or, to put it the other way, the epidemiology of how
383 the disease spread and who it infected, it came early. We've never seen
384 a pandemic or even a flu season come this early and this hard. And so
385 that meant that we are always behind the 8-ball in terms of vaccine
386 delivery.

387 And there are limits to what the technology can do in terms of vaccine
388 production and delivery. And so we got caught. And obviously what we
389 would like is a perfect vaccine that we could produce and stockpile.
390 That's been a goal of ours and we've had – spent lots of money in the
391 past researching different types of vaccines. They haven't panned out.
392 And we have to accept there are always limitations in our technology.

393 So the biggest impediment to a perfect response was pretty much
394 outside our control. And as far as I'm concerned, would – if we were to
395 do it again, would we like to have the vaccine product – produced and
396 delivered early? Sure. Do we have to accept the fact that perhaps it
397 won't be? Absolutely. Can we control the speed at which the pandemic
398 arrives as it did in fall? No. That's just the nature. In fact, it was
399 fascinating to us just – during the summer there was a low level of
400 disease throughout the nation. What that did was like seed it. And the

401 moment schools went back, they had this explosion of cases right
402 across the country; and as I said earlier, unlike anything we've really
403 seen. That – that much activity, that really in the year,
404 unprecedented. And you can't plan for that. You can't say, oh, we
405 could've done better. That just wasn't feasible.

406 Barbara: So do you have any final thoughts or recommendations that you would
407 make?

408 Martin: Well, I think – I think – I would like to see planning that says take the
409 good parts. Like for example, the surveillance that allowed us to
410 produce the [inaudible 0:26:55.5] model with the multipliers that
411 enabled us to produce simple models that got a handle and – they're
412 estimates. They're not accurate head counts. They're not accurate
413 census. But it allowed us to provide estimates that we think are quite
414 reliable and useful to policy makers.

415 I'd like to see that become embedded in the response type of thinking,
416 the dogma, the protocol that we do, that type of surveillance upfront;
417 and, right away, without question. There isn't do we need it?
418 [inaudible 0:27:27.1] It can be very time consuming, and it can be
419 expensive and it can, in fact, bother a number of people 'cause we ask
420 a lot of people. But more the better. And I think it proved itself. We
421 couldn't have done anything that we did in terms of modeling without
422 that. And in fact, it is interesting to me that, as far as I know and I've
423 yet to see on any other websites from any other countries, estimates
424 like we've produced.

425 Other countries have produced and posted estimates, for example, of
426 laboratory confirmed cases, hospitalization, and deaths which is very
427 appropriate. But in terms of extrapolating based on what they know of
428 the multipliers and what does each case that record, how many does
429 that represent unrecorded, I haven't seen any other work done.
430 Doesn't mean it hasn't been done but it hasn't been widely publicized
431 as us. And I think that went along way to the media and the public
432 understanding the relative impact, and why this was a pandemic, and
433 why we needed to get vaccinated when the vaccine was available. And
434 so, working to ensure that we can replicate this again and again, is I
435 think to me, the number one priority. I don't think it's overly
436 complicated. I just think it means a lot of hard work and making sure
437 that it's upfront.

438 Barbara: Great. Thank you very much.

439 Martin: Surely. [audio ends 0:28:43.1]

**Interview #10. Toby Merlin, MD
Deputy Director, CDC Influenza Coordination Division (ICU)**

- 1 Male: The first thing you want to do is start with the name.
- 2 Toby: Okay, my name is Toby Merlin and I am Deputy Director of CDC's
3 Influenza Coordination Unit.
- 4 Barbara: Thank you. We're here to develop an understanding of the [inaudible
5 0:00:17.2] could you tell us about your training and your
6 specialization?
- 7 Toby: Sure, glad to. I trained, I went to medical school at the University of
8 Florida in Gainesville, Florida, and trained as a pathologist in both
9 anatomic and clinical pathology at Stanford and University of New
10 Mexico. And I was on the faculty at the University of New Mexico
11 really specializing in pathology of infectious diseases and
12 microbiology. And that's where I began my connections with the CDC
13 serving on advisory groups for the CDC. And I actually came to work
14 for the CDC in 2003, and I came to work at the CDC on projects –
15 developing laboratory capacity for HIV Aids in Africa working
16 primarily in Tanzania but also doing some work in Zimbabwe and
17 South Africa also did some work in Batswana. And then in 2007, I
18 moved to the Influenza Coordination Unit to be Steve Redd's Deputy
19 Director.
- 20 Barbara: Great, thank you. Are you currently involved in the H1N1 issue?
- 21 Toby: Oh yes. I have been Deputy Incident Manager for the CDC H1N1
22 response so I have been involved in CDC's H1N1 response really since
23 the response began in late April of 2009, so going on 10 months.
- 24 Barbara. Can you recall when did you first heard about H1N1?
- 25 Toby: Oh yes, I – I may have – I may have – I guess everyone has good
26 remembrances of this but I was on vacation and I – I woke up in my
27 hotel room in Istanbul Turkey and there was a strange set of emails
28 about swine flu being detected in two children on a test device that the
29 CDC had deployed as part of its development. And I was getting ready
30 to return from vacation and I didn't make all that much of it. I
31 thought it was odd. We had been experiencing swine flu detection in
32 human beings with refinements in our detecting abilities over the past
33 couple of years and it was just sort of an odd thing. And I got back to
34 Atlanta the next day and wasn't even scheduled to call back to work
35 and I called Steve Redd and asked what was up and he said oh, you
36 probably better come in. And I remember saying, isn't this just
37 another one of these small swine flu outbreaks? And he said it looks
38 like it's something much larger. That was before I knew anything
39 about what was going on in Mexico. So. I should've stayed in Turkey.

40 Barbara: Did it strike you at that point that it might be a potential crisis? Or
41 when did it become clear that it was a larger issue?

42 Toby: It became clear to me once the size and scale of what was going on in
43 Mexico became clear, and that the virus was the same virus. It was so
44 then obvious that this was way beyond anything we had experience
45 previously in terms of human outbreak of a novel influenza virus. I
46 mean we, you know, there'd been these little sputters of detections of
47 swine cases in a couple of people but nothing that crossed
48 international borders.

49 Barbara: So how did your day to day operations change or what happened as a
50 result of this?

51 Toby: Well, we left our cozy offices in Building 1 and moved to the CDC
52 Emergency Operation Center. And the Emergency Operations Center
53 was essentially stood up for the response fairly quickly and all of a
54 sudden, we, you know, quickly moved from having a small operating –
55 the ICU is a small group, from having a small group of about 15-18
56 people to having hundreds of people in the Emergency Operations
57 Center and running an operation that would begin at, you know, three
58 or four in the morning and end at nine or 10 at night with people
59 spanning the night. It really accelerated very, very rapidly.

60 Barbara: So could you describe a little bit about the early days of this response,
61 what was taking place? What happened?

62 Toby: You know, the – what I remember as the key focus early on was really
63 trying to get a good handle on what was going on in Mexico City
64 because there was a lot of non-scientific information, a lot of non-
65 verifiable information and trying to get a real as good a grip as we
66 could on what the actual underlying facts were as well as trying to
67 rapidly determine the extent of disease in the U.S. and turning up
68 surveillance systems particularly in the cross-border states where it
69 appeared most of the disease was occurring. And then so that was on
70 the – at the – then on the laboratory side, there was this enormous
71 push to characterize the agent and then develop diagnostics for the
72 agent so to genetically characterize the agent and develop PCR tests
73 that could be used to detect the agent. And that was an enormous full
74 court press that was – turned out to be quite successful.

75 Barbara: Did you feel you were getting enough information at that point? Or
76 the right kind of information?

77 Toby: That's a – yes, I think – yeah. I – I do think so. I think the hardest
78 problem was Mexico City. You know, we have very well established
79 surveillance systems that have been tested and are used for seasonal
80 influenza in – in the U.S. And we're familiar with the data and we
81 have established laboratory networks for the U.S. Mexico City was all
82 together a different matter. We did not have reliable laboratory
83 testing. We had relationships with people in Mexico and Mexico City
84 that were very good relationships but these people were also very,

85 very busy themselves trying to deal with an emerging crisis. So I think
86 that that – you know, what was going on in Mexico City was – it
87 would've been nice to have been able to have more discrete verifiable
88 information than we did initially.

89 Barbara: Did you have existing plans in place to deal with an emerging threat?

90 Toby: Oh yes. That – that – that's something I think that we all feel quite
91 good about as part of the major national pandemic influenza
92 preparedness initiative that began in 2005. And as a direct result of
93 the president's initiative and congressional funding, we had been
94 working to develop plans to respond to an influenza pandemic and we
95 had had multiple exercises of responding to the emergence of a
96 pandemic in the CDC EOC. So we all sort of knew our roles. We –
97 none of – none of this was really something that we were not prepared
98 for. We were surprised at the emergence in Mexico and we were
99 surprised at the emergence from swine rather than H5N1. But I think
100 we felt quite prepared; so much so that during the initial phases of the
101 response, people would forget and refer to it as an exercise because it
102 felt very much like an exercise. It felt very much like the exercises
103 we'd been through over and over again except this one was real. It
104 stopped feeling like an exercise after about two or three weeks when
105 we couldn't stop it and – and go back to our regular jobs. It, you know,
106 it – it clearly had a life all its own but we – we all I think felt very well
107 prepared.

108 Barbara: So as the virus – as the threat expanded, did you find that you needed
109 to make any changes either in processes or within your organizational
110 structure to meet the demand?

111 Toby: Yea, we made – initially for me, I had assumed a role initially running
112 the Plans Unit doing decision briefings. But it became clear that Steve
113 Redd who was the Incident Manager needed a – a shadow Incident
114 Manager. He needed someone who could do the things he couldn't do
115 because he was being pulled in multiple different directions. So I
116 moved out of the Plans Unit and actually became the Deputy Incident
117 Manager and took on this role of going to those things that Steve
118 couldn't and sort of, I think shadow's the best word, shadowing his
119 leadership.

120 Then we actually – our major organizational challenge occurred in
121 June after the initial outbreak and after the characterization of the
122 virus and the initial response. A lot of the people who were working on
123 the response went back to their regular jobs. We had not built a
124 structure that would staff the response indefinitely. And we found
125 ourselves with losing critical staff that we needed to actually run the
126 response. And we spent a lot of time in June and July essentially
127 trying to build a staffing structure so that we – we could staff to
128 continue the response. So I think all of us found ourselves particularly
129 in June and July moving from not just running response but running

130 response and building a human resources organization to staff the
131 response which was – none of us had anticipated.

132 Barbara: Could you talk a little bit about the Plans and Decision Unit that you
133 mentioned?

134 Toby: Sure. Part of our exercises had included development of a unit that
135 would be dedicated to preparing decision briefings for the CDC
136 Director or the response leadership on issues, and taking the
137 information and providing them with standardized briefings and
138 options so – and the notion is to remove the variability in – in decision
139 making that’s often – that often comes from people presenting things
140 in different ways, and different formats, and having a standard format
141 for presenting the – that facts and assumptions, the criteria for the
142 decision, the options, and Rich Besser who was then the Director and
143 Steve Redd very much liked this – liked having this – this certainty, at
144 least the reliability of a way of having briefings presented.

145 The Plans Unit also ran Team B and Team B was a group of outsiders
146 led by David Sencer the former CDC Director, and at the time, David
147 Bell who was a senior leader from within CDC, a group of outsiders
148 who would provide an outside perspective on what was happening and
149 decisions we were making. And that information was summarized and
150 fed up to CDC leadership.

151 Barbara: Great, thank you. So in terms of information that flowed into the
152 Decision Making Unit, the Plans Unit, could you talk a little bit about
153 where it came from and how you felt that process worked?

154 Toby: We were gathering the information by recruiting subject matter
155 experts from the response to inform these briefings. So if it was
156 something that involved deployment of strategic national stockpile
157 assets, we would bring in people from the strategic national stockpile
158 and people from the Influenza Division who had expertise in anti-viral
159 use would bring people from HHS that were involved in acquisition of
160 anti-virals and decisions about the strategic national stockpile. If it
161 was a decision about school closures, we would bring in people who
162 had developed CDC’s community mitigation strategy, people who were
163 working on the epi-aids that were taking place in communities that
164 were experiencing outbreaks who could help us understand what was
165 going on with school closures in those communities.

166 Barbara: Great. Do you feel that the process worked well and that you were well
167 informed?

168 Toby: Well you know, the – I do. The – there’s always a fog of war aspect to
169 making decisions in the absence of complete information. And I guess
170 my response is, I didn’t – I did not personally expect us to have
171 complete information, and I expected that we would be making
172 decisions with the best information that was available. I think Rich
173 Besser certainly was very comfortable with that and most of the
174 response leadership was comfortable with that. When you do that, you

175 make decisions that when you have more information later on you
176 change that decision, you change that direction. I think the best
177 example, you know, the – the best example of a changed decision is
178 that our initial guidance on school closure was – we had a
179 recommendation for pre-emptive school closure that schools would
180 close as soon as there was evidence of infection in the school, in the
181 community, to try to dampen down the spread of disease in the
182 community.

183 As we got information about the severity of disease caused by this
184 virus and the extent of the infection and the public dismay over the
185 school closures, we moved to a guidance for what we called a reactive
186 school closures that we recommended that schools stay open, that sick
187 students stay away from school and that schools really only close if – if
188 there were no longer enough staff and students at the school to
189 warrant keeping the schools open or enable the schools to stay open.

190 Barbara: Could you talk a little bit about the internal communication processes
191 that you used and developed to keep CDC employees informed about
192 what you were doing?

193 Toby: Well, you know there's – I – I think there are – there were at least two
194 communities that we needed to focus on internally and one was
195 actually the response community. The response really has ranged
196 from having hundreds of people involved to its estimated 1,500 people
197 involved. And we needed to take steps to just make sure that
198 everyone involved in the response knew what was going on. And that
199 was largely accomplished through our standing meetings. We had
200 director's briefings every day and broadcast of those standard
201 meetings to people in the EOC, and people who could call in so that
202 everyone, we tried to see that everyone felt that they could listen in to
203 the briefings for the CDC Director and understand what decisions
204 were being made.

205 Then we worked through the communications department to have
206 periodic communications and I think they went out weekly updating
207 CDC staff in general on what was going on. I can tell you in
208 retrospect, I think that people who weren't in the midst of it probably
209 didn't get a sense of the acuity of it that people working the response
210 got.

211 Barbara: Great. Could you talk just a little bit about the decisions that you did
212 make in terms of how you prioritized them or in the early days what
213 did you feel were the key decisions that had to be made?

214 Toby: There were several in the early days – I think there were several key
215 decisions that needed to be made. One early issue was related to
216 borders and what to do at borders and whether to close the U.S.
217 border with Mexico, whether to implement some type of screening at –
218 of international travelers. And the decision was made early on to not
219 close the border and not do that. It was – we had in our exercises

220 visited this over and over again. We clearly understood that once
221 disease was established in the U.S., there was marginal if any benefit
222 that would come from screening travelers or closing borders. But we
223 also knew that there was a communications issue with that that many
224 people, lay people, felt that that was something that you should do. So
225 that – making that decision and advocating for that decision was
226 clearly important.

227 Another key decision was whether to deploy assets from the CDC's
228 strategic national stockpile, particularly anti-virals, oral anti-virals,
229 and if so, how much and where to. And that was a complicated
230 decision where actually the initial recommendation from the Plans
231 Unit was a much – a small deployment of anti-virals from a portion of
232 the strategic national stockpile to a small number of affected states.
233 And that was the recommendation. The actual action taken was
234 deployment of 25% of the strategic national stockpile in sort of pre-
235 arranged trounces to all states. So there was a decision made to really
236 lean very forward in the deployment of anti-virals.

237 You know, there were decisions around, you know, how – deployment
238 of – of staff to Mexico and decisions about how far to proceed in
239 providing diagnostic testing, not just domestically but internationally.
240 The decision was made to provide test kits essentially to every country
241 internally that was capable of receiving test kits and working with
242 them. So those were sort of a number of early decisions.

243 Barbara: Great, thank you. So almost a year later, has your time commitment
244 and involvement with this changed?

245 Toby: Yes. There was a period of time I would say from April, wow, into the
246 summer where I was working as many hours as it was possible to
247 work. And – and only getting a fraction of the work that I thought I
248 needed to do done. I moved to, you know, not being able to really had
249 to prioritize what I was able to work on and some things didn't get
250 done. I'm now back to a stage where I actually leave the CDC at a
251 normal time of day and feel that most of my work has been done. And
252 that actually feels quite nice.

253 Barbara: So looking back over the past year, are there any things that you
254 would've done differently?

255 Toby: There are – yes. Yes, several things. I mean I think – I think we all
256 would have, you know, retrospective knowledge's always brilliant. I
257 think we would all have much sooner implemented a staffing plan for
258 the response to enable us to keep up staff. It was – it was really a
259 problem to – to – to have a deficit of staff in the summer and was we
260 were entering the fall. I think we would have made much clearer and
261 more rapid decisions about our infection control recommendations. We
262 had initial precautionary infection control recommendations by
263 actually late May there was an interest in re-examining them and
264 moving back from them.

265 But this is an issue that rapidly we lost control over and there were a
266 number of sort of competing interests in trying balance the issues of
267 infection control versus worker protection in an atmosphere of
268 incomplete information, an atmosphere of no – no – often unpublished
269 information and strong opinions. And I think it is something that we –
270 we just felt events had got control of the situation. You know, we
271 ended up not being able ourselves to make a recommendation without
272 going outside of the CDC to the Institute of Medicine and asking the
273 Institute of Medicine to do a rapid turnaround review of the evidence
274 and provide that back to us. And I think given it to do over again, we
275 would've taken a different approach on that.

276 I – actually in terms of the development and deployment of diagnostic
277 devices, I think that worked famously. I don't think we would have
278 done anything differently on that. And in general in our
279 communications strategy, I think our communications were very good.
280 I think, you know, it – Rich Besser who was CDC Director in April and
281 May, was an extremely capable communicator. I think the transition
282 between Rich and Tom Frieden left a period of time that – a period of
283 time where there was no full-time CDC Director on board, and where
284 Rich was acting in no Secretary at HHS and it really created
285 communications challenges.

286 So given it to do over again, I mean, that's something to avoid. But
287 that's just sort of uncertainty we had to deal with. If you don't think
288 about this in terms of emergency response, but working in a political
289 environment there – there – you can be in situations where the
290 political leadership is simply not there; or just coming on and not
291 familiar with the issues and building their own staff and that creates
292 an enormous challenges.

293 Barbara: Thank you. Do you have any final thoughts or recommendations?

294 Toby: I – it's going – it's going to sound probably a little like preaching to the
295 choir or saying things that are obvious but you can't – you can't over
296 rate being prepared. The things that worked best were the things that
297 CDC had been preparing for for the last four years. And the reason the
298 diagnostic testing went so well is that people in the laboratories and
299 Influenza Decision and Dan Jernigan, in particular, had made great
300 effort to plan out how the testing would be done, planned out how the
301 testing would be developed to get FDA clearance of antecedent devices
302 that an antecedent that were placed in state laboratories to develop a
303 mechanism for manufacturing and distributing test kits once there
304 was a need to do this, it was still a huge amount of work but it
305 wouldn't have been possible without all that preparation. So the
306 ability to stand back from a situation and realize that you are going to
307 need diagnostic testing capability, you're going to need enhanced
308 surveillance capability and lay the groundwork for that is really
309 absolutely critical.

310 Barbara: Great, thank you very much.

311 Toby: Oh, you're welcome.

**Interview #11 Glen Nowak, PhD
Director, CDC Media Relations**

1 Barbara: If you could please give us your name and current position.

2 Glen: My name is Glen Nowak. I'm the Director of Media Relations for the
3 Centers of Disease Control and Prevention. I'm also the Acting
4 Director of the Division of Electronic – of News and Electronic Media
5 here at CDC.

6 Barbara: Great. And could you give us a little background information on
7 yourself? Your training, what brought you to CDC, how long you've
8 been at CDC?

9 Glen: I've been formally part of CDC for about 12 years. I came to CDC from
10 the University of Georgia. I was an assistant then and subsequently
11 an associate professor of Advertising and Public Relations at the
12 Grady College of Journalism at the University of Georgia. I came to
13 Atlanta to the University of Georgia in 1989. And when I first arrived
14 at the University of Georgia, I began doing projects for the CDC as a
15 visiting communication scientist.

16 Most of those projects were with the division of HIV Aids Prevention.
17 And they ranged from helping them test public service
18 announcements to helping them organize focus group and other
19 research, and even getting involved in some of the behavioral science
20 interventions that they did.

21 In about 1999, I believe, I applied for a job as the first Director of
22 Communications at the National Immunization Program at CDC and
23 was offered that position. And I joined CDC in 1999 as the first
24 Director of Communications for the National Immunization Program.
25 I was the Director of Communications and stayed in that office in
26 communications and I did that for about five years. And then I was
27 asked to come over on a detail to become the Acting Director of Media
28 Relations at CDC. And four years ago, I became the – I formally
29 became the Director of Media Relations at CDC.

30 And so I've been involved with CDC for – for probably close to 20
31 years. A lot of my early work was in HIV Aids Prevention. Then I went
32 to Immunization, and more recently I've been involved in all the – all
33 the different topics and issues that touched CDC as Director of Media
34 Relations.

35 Barbara: Great. Well, we're particularly interested in your involvement with
36 the H1N1 pandemic response. So if you could think back to last
37 spring, do you recall when you first heard about H1N1?

38 Glen: I first heard about H1N1 probably a few weeks before the public did.
39 One of my press officers, Tom Skinner, had brought to my attention
40 some research – some findings from the Influenza Division that said

41 that they had found a novel influenza virus. And it involved a couple
42 of children in California, I believe, and he had been talking to them
43 about how they were going to make that information publicly known.

44 And so I was involved in some of those early conversations perhaps
45 about a week before we held our first press briefing on this novel
46 H1N1 virus. And so I would say probably around April 17th, April 18th
47 is when I first became aware of H1N1.

48 Barbara: And when you were involved in these discussions, can you think back
49 to sort of the climate, the feeling in the discussions? Did you think
50 that this was a potential pandemic or did it strike you as a crisis or –
51 what was the general feeling?

52 Glen: Well, the general feeling when this was first brought to -at least our
53 attention in media relations- was that this was something that we
54 probably should think about bringing to public attention sooner rather
55 than later, and that wasn't so much based on the number of children
56 who had been affected because that point, it was only about two and I
57 believe both of those children had recovered from their illness and it
58 was not very remarkable.

59 But given the interest that there had been over the past few years in
60 pandemic flu and the potential for flu – flu viruses to call a pandemic,
61 we thought that it would behoove CDC to try to bring this to people's
62 attention sooner rather than later because if this did turn out to be the
63 cause of – of more illness or – or serious outbreaks, it would've been
64 better for the agency in terms of its credibility, in terms of being
65 transparent, to have brought this to people's attention very early on.
66 And we knew that when we made that recommendation that – that we
67 also had to be very careful that at that stage we had no indication or
68 no idea that this would turn out to be a pandemic flu virus.

69 At that point, what we had was a novel influenza virus that had
70 caused some cases of illness, that may have caused other cases and we
71 were in the process of – of trying to figure that out as an agency. And
72 so what we wanted to do is make sure that we notified people, alerted
73 them to the possibility that this virus has the potential to cause
74 illness, but also put that information to a – into a context so that
75 people weren't unduly alarmed based on the information we had.

76 Barbara: So in the first few days of your initial response period, were you
77 working primarily within your own division, your media division, or
78 were you working with other parts of CDC?

79 Glen: We were working with other parts of CDC. We're working very closely
80 with the influenza division and our influenza experts. We were
81 working very closely with the CDC Office of the Director. I – I was in
82 meetings with – with Acting Director Richard Besser as well as Dr
83 Ann Schuchat who at that point was part of his senior leadership
84 team. And we had a number of conversations early on about the – the
85 importance of making sure that this information got out in a timely

86 manner, and that when we put the information out that we put it out
87 in the appropriate context.

88 And so one of the things that we did was we did hold a press briefing
89 on, I believe it was like April 23rd or 24th, and it featured not Dr.
90 Besser but – but Dr. Schuchat and Dr. Nancy Cox. And one of the
91 reasons for that was based on the number of cases that we were aware
92 of, based on the lab results that – that we had as of that date. We
93 decided that – that was the best way to inform people without causing
94 undue alarm.

95 When the CDC Director is part of a press briefing, it really heightens
96 things. And so we wanted to make sure that we wanted to get people's
97 attention but we also wanted to keep it in step with the information
98 that we had.

99 Barbara: Right. So what was – do you recall what was the general public
100 response to that press brief or did you feel that the media recognized
101 the severity of what you were discussing, the potentiality?

102 Glen: Well, very early on, I – I think it was hard for them to put in context.
103 In fact, the day before that press briefing, we – we had a call and what
104 we call a background briefing with I believe about five major reporters
105 to let them know what we were going to be talking about the next day.
106 And we talked to news media that is often the very first to report on
107 something. And so we talked to a reporter from Associated Press, from
108 Reuters, from CNN. And we told them what we knew.

109 We told them that we had discovered this novel virus, that the virus
110 had called illness in at least two children, both of those children had
111 recovered without any notable difference in the severity or course of
112 illness from – from seasonal flu, that we had other samples that were
113 on their way to CDC to test, but it was a relatively small number of
114 samples. It was probably less than 10 or around 10 or 12. And at that
115 point, we did not know if this virus had caused other disease, or if that
116 virus – the virus was causing disease currently. And most of those
117 reporters chose not to write a story based on the initial briefing. A
118 couple of them did a little story and said basically what I just said
119 which is – which was that the CDC had discovered this novel
120 influenza virus, it appeared to have caused some – some illness, it
121 wasn't clear that it had caused any additional illness and it wasn't
122 clear it was still – still causing illness.

123 And then after our – our press briefing on the 23rd, we did have more
124 media stories and again, a lot of the media interest at that point was
125 not so much in the two cases that we had confirmed, but in the
126 number of test results that – that – that CDC was still – number of
127 cases that were still being analyzed. And because that number was
128 still relatively modest, again at that point, most of the news media
129 was – was pretty conservative and cautious in how they approached
130 the story.

131 Barbara: Great. Where – where were you getting your information about what
132 was happening and developing?

133 Glen: Pretty much directly from the subject matter experts involved. When –
134 when something like this happens, we – we go right to the subject
135 matter experts at CDC to – to learn from them what they know, and to
136 see what their thinking is, and how – how they think it will play out. I
137 was also in a number of meetings with the CDC, with the Acting CDC
138 Director and the CDC leadership team related to this.

139 Barbara: And could you describe a little bit about the internal communication
140 processes that were being used at CDC in order to keep the CDC
141 employees informed about what was going on?

142 Glen: Well, you know, very early on, again the processes were mostly
143 between those people who were directly involved in it versus, you
144 know, a broader way of communicating with a lot more employees.

145 And at that point, it was, you know, again, when you go back to that
146 period in time, we had relatively limited information. We also know
147 that as a matter of course given what CDC does, they do identify novel
148 viruses all the time. That's – that's not an unusual thing for CDC to do
149 given the business it's in. And we also identify influenza viruses that
150 have what look like unique characteristics. With further research,
151 they may turn out to be, you know, similar to viruses that – that are
152 already known.

153 And so at that point, it was very important for us to – to keep things
154 in – in that kind of a context knowing again that – that there is a lot of
155 – a lot more interest in influenza viruses and as a result of that extra
156 interest on both the public, and the media and the healthcare
157 community in influenza viruses, we probably – we had a great
158 obligation to make known what we knew about that virus sooner
159 rather than later, even though I, as I mentioned, at the point that we
160 were talking about this, we started talking about this, we only had
161 two children who had been impacted and we only had about seven to
162 10 samples that were on their way to CDC.

163 Barbara: So as time went on and the situation became increasingly more dire,
164 and more cases were reported, and the Emergency Operations Center
165 was activated, and CDC began a more – a more coordinated response,
166 who did your role with the media change?

167 Glen: Well I guess – I guess one – one important transition I should – I
168 should probably elaborate on a little bit, we did our press briefing on
169 April 23rd with Dr. Schuchat and Dr. Cox. And at that point, we
170 thought that we pretty much had brought people up to date and we –
171 what we said in the press briefing that we would let people know more
172 as we knew more. Our anticipation when that press conference ended
173 was that we probably weren't going to be back with an update for at
174 least a few more days, perhaps another week or so.

175 About three hours after that press briefing though, Dr. Besser got
176 word from Canadian health officials that they had been testing
177 samples from Mexico where – where a country that had been
178 experiencing a lot more severe disease at that time had been in the
179 news because many people had died from influenza or influenza-
180 related complications.

181 And so about three hours after that first press conference, we were
182 brought back down to the Emergency Operations Center to get an
183 update from Dr. Besser about the situation in Mexico. And at that
184 point when we – when we realized that this virus had contributed to
185 much more illness than – than what we were aware of previously, had
186 probably been responsible for a lot more severe illness, at that point,
187 we realized that we – we probably were going to be back
188 communicating to the public and the media the very next day, and we
189 were probably going to be dealing with Dr. Besser, as the Acting
190 Director of CDC.

191 And in that afternoon of – of discussion about the next steps, one of
192 the things that was abundantly clear was that this was going to
193 probably be of media and public interest for a while and that we, CDC,
194 had to be prepared to be in front of cameras answering media and
195 policy maker questions quite frequently and be ready to go and
196 assume that for the next few days, next few weeks, we were going to
197 be having to update people on a regular basis.

198 Barbara: Right. Often times in public health emergencies there are really heavy
199 demands placed on organizations for immediate and very detailed
200 information about the threat. In this case, there were a lot of
201 unknowns and uncertainties, so how did you deal with that?

202 Glen: Well, one of the first things we did to deal with the unknowns and
203 uncertainties is if you look at the transcripts of Dr. Besser's first press
204 briefing, one of the things that we did was we – before we gave an
205 update in terms of what we knew about this virus and the number of
206 deaths it was causing, we had Dr. Besser spend about two minutes
207 giving reporters in the media kind of a lay of the land, telling them
208 what to expect in the coming days and weeks. He told them up front
209 that, you know, the information we were talking about this day was
210 likely to change and change in ways that were not predictable, that
211 there was going to probably be considerable uncertainty, there would
212 be uncertainty for probably long periods of time and we would have to
213 act and make decisions in light of uncertainty, that our decisions may
214 change; they may change quickly, and without notice, and people
215 should be prepared for that; that states, and communities, and
216 countries across the world may take different actions, different steps
217 in term of preventing, and combating, or treating illness caused by the
218 virus; that that would not be surprising; people should not be
219 surprised by that; in fact, that was a good thing because it would help
220 us in terms of identifying best practices.

221 And so I think that setting the stage was a really critical step and it
222 was – it was something that we came back to quite often in those first
223 couple of weeks because we made the assumption that many reporters
224 as – or as this grew in scope and scale, more reporters were – were
225 coming – becoming interested. New reporters were coming online and
226 we wanted to make sure everybody was operating from the same
227 course out of assumptions.

228 And so one of the things that we – we did take a lot of effort or made a
229 big effort to do was to make as many of our assumptions explicit to try
230 to guide people, particularly the reporters and the public in terms of
231 how things may play out, and to foreshadow things that may change
232 so that they wouldn't be surprised and be critical or – or become
233 negative as a result of change.

234 Barbara: I recall, and I think you probably do, during the period of time as it
235 was developing, there was considerable media sensationalism for lack of
236 a better term. There was inaccurate reports, misleading
237 information, web postings. How did you manage that, or attempt to
238 manage that, or did you have any role with that?

239 Glen: Well, I think at first I put that in perspective. I – I think the vast
240 majority of the media coverage was very accurate. We – we monitored
241 the media on – on an hourly basis. And I got reports every day and I
242 think if you do this for a living and you see the full scope of media
243 coverage, I think one of the things that impresses – that impressed me
244 was that the vast majority of the media coverage was correct.

245 Some stories, as would be expected, probably were more
246 sensationalistic; but again, a lot of those people were – were dealing
247 with the same uncertainty that we were dealing with as an agency in
248 terms of trying to anticipate where this was going. There had been a
249 lot of – of hype and warnings about pandemics over the last five years.
250 A lot of people had warned the people in the public that if a pandemic
251 or the next pandemic came that many people could be harmed, many
252 people could – could die. And so there was – there's a – a lot of work,
253 ground work that had been laid, many – much of it probably not
254 intentionally, that caused a lot of people including some in the media
255 to come to this – this – this new virus with the expectation that we
256 were on the cusp of something very dramatic and very tragic.

257 And then you also had – what – one of the media conventions is – is
258 they will seek out experts, and they will seek out experts who will
259 provide them with the full range of opinions, and projections and
260 estimates. And very early on, nobody had a good crystal ball. And as a
261 result, many in the – many stories included projections and estimates
262 that – that in retrospect seem quite extreme. But you had a lot of
263 people trying to get their – their – their voice out through the media.

264 And then websites are always, I think, going to be a challenge. I think
265 the expectation that – that you can get every website to run your

266 perspective, provide your information, cover this like you would – you
267 would like it to be covered is completely unrealistic. And what you’re
268 better off shooting for is the vast majority of them being in concert
269 with your messages and I think we achieve that. But – but to expect
270 that there would be no media hype, I think, is unrealistic. Public
271 health, I remember an expert in public health once told me public
272 health is about one foot on the brake and one foot on the gas. And I
273 think you saw that throughout – throughout the last – through the
274 months of this pandemic.

275 Barbara: Good. You mentioned decision making a while ago. I was wondering if
276 you could talk a little bit about the process of how you made decisions
277 in the media relations division about what information to share with
278 the public, when to share it, how much to share and so forth?

279 Glen: Well, very early on, we realized that we were going to have to have a
280 regular basis in the media. Part of that was just sheer survival. The –
281 when something like this takes off, we get more media calls than you
282 can handle on a one-on-one basis. And so you have to then switch the
283 systems to manage that volume of media.

284 And so one of the systems we did was we instituted daily press
285 briefings. And if we needed, we – we did a couple of additional smaller
286 press briefings each day. So for the first five, four or five weeks of this,
287 we did a press briefing every single day, including weekends,
288 including holidays, to bring people up to speed. Every day, we got
289 together with the people who were going to be serving as the spokes
290 people for those press conferences, whether it was Dr. Besser and
291 most of them were Dr. Besser, sometimes he was joined by Dr.
292 Schuchat, sometimes he was joined by Dr. Cox, depending on, you
293 know, what the specific issues were, and we looked at what had been
294 reported as of that morning. We looked at what we knew as an agency
295 that was different from the previous day. We looked at how things
296 were playing out and we – we tried to anticipate where the stories
297 might be going, where the media and reporter interest might be going.
298 And we factored all that into trying to figure out what our key
299 messages were going to be that day.

300 One thing we also tried to do every day before we did a press
301 conference was to think in terms of if this press briefing or this
302 interaction with the media works, what would or should the headlines
303 be for most of the stories? And so we tried to make sure that we had
304 that kind of communications discipline, not just knowing what were
305 the two or three key messages that we want to deliver, but to also
306 know what the bigger umbrella message was. And so we – we spent a
307 lot of times thinking about, you know, what our – what our – some
308 potential desired headlines.

309 We also tried to make sure that we coordinated and disseminated our
310 key messages with a wide range of others who might be called upon by
311 the press. And so once we did a press conference, we made sure that

312 we distributed our key messages widely. We distributed them to state
313 and local health officials through their public affairs offices. We
314 distributed them to partner organizations. We developed lists of
315 people who were getting called by the media to – to be experts and to
316 be quoted in stories, and we worked to provide them with our key
317 messages.

318 They didn't have to agree with us but at least you want to make sure
319 that they accurately portrayed what CDC's messages were.

320 Barbara: Did you experience any sort of, pressure's probably too strong, but any
321 sort of emphasis on the need for more transparency or any pushback
322 from the media or any sort of a challenge from the media that perhaps
323 CDC was not being completely forthcoming with the public? Did that
324 occur at any time?

325 Glen: No, not really. In fact, we got way the opposite phenomenon. After
326 about four or five weeks, I had reporters asking me are you – when are
327 you going to stop doing these daily briefings, telling me that we had
328 worn them out which was – which was a highly unusual event. But no,
329 throughout – throughout – we made every effort and it was – and we
330 had the full support and endorsement of Dr. Besser and Dr. Schuchat
331 that whatever media inquiries came our way, we would look at them
332 and we would – we would evaluate them and we would try to do as
333 many as possible; not obviously, we had to – had to make sure that we
334 prioritized Dr. Besser and Dr. Schuchat's time. And so that meant
335 that – that entities that could reach large numbers of people like
336 CNN, Associated Press, and Reuters, and Washington Times, you
337 know, were our top priorities. But we made sure we cast our net as
338 widely as possible, that we – if it wasn't Dr. Besser and Dr. Schuchat
339 doing the interviews, that we found appropriate subject matter
340 experts to talk to the – to the media outlets that were calling us.

341 We sent an invitation to media to come to CDC to observe. And again,
342 Dr. Besser fully endorsed that strategy and I know it made some
343 people nervous because we had media in the Emergency Operations
344 Center, and we had them there very early on. We had media at CDC
345 and once they're here, you know, they all want to go in different
346 directions but each one of them had to have a press person assigned to
347 them to make sure that they didn't go places where they couldn't go
348 since they weren't federal employees.

349 And then in August, we spent – we invited about 50 or 60 media to
350 come to CDC for a two-day workshop that they could – that was on the
351 record, they could spend time talking to our experts.

352 [break in audio 0:23:04.8]

353 Looks good. Looks fine. Alright, I guess we'll have to start that
354 question somewhat over, right? I can't remember the question.
355 Barbara, you want to ask a question?

356 Barbara: Okay, well were you finished talking about the workshop that went on
357 with Dr. [inaudible 0:23:27.4] being there and were – had you
358 completed that thought?

359 Glen: Well, I guess I could pick up that thought. One of the – one of the
360 things that we did that I think was very helpful was we invited about
361 50 or 60 media to come to CDC for a two-day workshop in August. And
362 it was on influenza, on H1 – 2009 H1N1 influenza, but it was designed
363 to give them a chance to talk to our experts on the record. We brought
364 almost all of our flu division experts into that workshop at some point
365 in time. And we – we gave them an update, not just on the current
366 situation, but we also talked about how the thing – how H1N1 might
367 unfold in the fall, how the influenza vaccine situation may unfold in
368 the fall. We talked about the differences between H1N1 – the 2009
369 H1N1 flu and seasonal flu which we also anticipated in the fall. And
370 we – I think we achieved a really helpful forum for answering their
371 questions and getting our – our key messages out.

372 And when we issued the invitations, our expectations were pretty
373 modest. We were hopeful that maybe 15 to 20 news organizations
374 would accept our invitation, and I think we had a response rate
375 probably about 95, 96 percent. And we had to move from – from a
376 small conference room into one of the large auditoriums to
377 accommodate all the media interest. And we had all the major media
378 here giving us pretty much their undivided attention for two days.

379 Barbara: Great. Would you say that they're – your primary means of
380 communicating with the public was through television media or did
381 you have other message that you used?

382 Glen: Well the – I think we used a number of methods. Television's
383 obviously the most visible, reaches large numbers of people. A lot of
384 people do get their information and news from TV. But I think equally
385 important and probably not quite as recognized is – television relies on
386 – on probably a handful of other media for their information. And so
387 it's very important for us to get our – our messages into the Associated
388 Press stories, into the Reuters news service stories, onto CNN because
389 often times those three media influence what many of the TV stations
390 are doing, and how they're thinking, and whether they're covering a
391 story, or whether how – how they're covering a story. And so, they're
392 equally important.

393 We also used a wide variety of social media as well as purchased
394 media, donated media. So the TV was probably the most visible but
395 probably equally important was with some of the print media as well
396 as some of the – the other broadcast media such as radio.

397 Barbara: Could you talk a little bit about how you used social media and what
398 you used?

399 Glen: Well, social media, we did a number of things. We developed a
400 Facebook page. We developed a Twitter account so people could follow

401 us through Twitter. And I think at one point, there were 1.2 million
402 Twitter followers just on the H1N1 alone.

403 We – one – probably one of the key things which is – which is the
404 realm of new media but – but probably is not something that many
405 people would ever notice, a lot of people come to CDC's website for
406 information. And they will simply cut and paste that information and
407 then re-purpose it and post it on their website. We know, for instance,
408 state and local health departments do this a lot. They come to CDC's
409 website, and they will cut and paste information, and put it on their
410 website. Sometimes they'll credit CDC. Sometimes they won't. That –
411 that's fine.

412 But one of the challenges with that approach is that when we update
413 information on our website, they may not know we updated it. And in
414 H1N1, there was a lot of updating happening on web pages that were
415 related to – to this virus, to prevention measures, to our
416 recommendations.

417 And so one of the things that we developed that falls in the realm of, I
418 guess, new media was something called Content Syndication. And
419 through this effort, what we did was we – we reached out to
420 organizations such as local and state health departments and said, if
421 you would like to use our content, or we noticed you're using our
422 content from our website, we'd like you to sign up. And if you sign up,
423 you can, through this Content Syndication effort, when we update a
424 web page on the CDC website, it will automatically updated on your
425 site. You won't have to do anything.

426 And so that way, we can be sure that you have the latest information
427 and you can be sure that you have the latest information from CDC.
428 And that's something that we think has got much wider applicability
429 but it was a break through because it helped us maintain or helped us
430 achieve more consistent information on local and state – state and
431 local health department websites.

432 Another tool that had been developed was something called flu.gov
433 and flu.gov was run by the Department of Health and Human
434 Services. This content syndication program enabled us to help them
435 with flu.gov. They could again take content from CDC's website and
436 when we updated it on our website, it would automatically be updated
437 on flu.gov.

438 Barbara: That's great. In terms of the information that you decided to post or
439 share, can you talk about the process that you went through for
440 clearance of the information or how – how was that managed?

441 [break in audio 0:28:59.7]

442 Glen: ...your original question.

443 Barbara: Okay, so the first thing would be about your process of deciding what
444 information to share, how you – how you worked that process, who
445 made the decisions about what information to share and...

446 Glen: The [inaudible 0:29:24.0] go back to your original question.

447 Barbara: Okay, so the first thing would be about your process of deciding...

448 Glen: We're good to go so you can go – go to your original question.

449 Barbara: Okay, so the first thing would...

450 Glen: Well, in terms of what information to share, as I mentioned, one of the
451 things that we knew is that very early on, we were doing a daily press
452 briefing. And so one of the first factors in terms of what information to
453 share was what do we know today that we didn't know yesterday.
454 What new information is there that is of relevance, of pertinence,
455 public health value, that we should share with people today. And I
456 think those were probably the, you know, the major criteria was, you
457 know, what is new, try to look at how relevant or pertinent it is to a
458 wider audience, whether and how it had public health implications
459 and making sure that we gave them those public health implications.

460 We also would look forward and we would say, you know, what are the
461 things that could happen, or will be happening – happening in the
462 next two, three or four days, that we may benefit from foreshadowing,
463 letting people know what options are under consideration. And most of
464 those conversations, I guess, started our flu branch, our flu division.
465 But they quickly involved CDC senior leadership.

466 You have to remember, all these parties, all the major parties were
467 getting together in the morning as – at – as part of a director's update.
468 And so we media relations were present with about 15, 16 other senior
469 leaders including those involved in the response, those involved in
470 monitoring what was happening, those involved in vaccines. And so
471 every day, very early in the morning, we like the CDC Director heard
472 the updates and those updates were one of the most critical factors in
473 terms of giving us a sense of what were the possibilities to talk about
474 that day.

475 We then would have conversations with senior leadership at – at the
476 Department of Health and Human Services. We would give them some
477 idea of what we thought could be the major topics for the press
478 briefing that day or for – for public updates. We also looked at what
479 was possibly going out to the healthcare provider community, to
480 clinicians, in terms of information to see whether that had anything
481 that we should be aware of, and be mindful of, and bring to people's
482 attention. And so we would go through that process every day. We
483 would then develop, draft some key talking points, some key
484 messages, some possibilities, circulate those probably by about 11
485 o'clock in the morning; and I say 11 o'clock in the morning because we
486 typically were doing our press briefings around noon or one o'clock.

487 And so two hours before those press briefings, we would circulate what
488 we thought was a pretty good draft to HHS, to the flu branch, to the
489 CDC OD, to the Acting Director, have them take a look at the
490 information, get their reactions, their edits, their suggestions, do
491 another iteration, re-circulate that, do another iteration, re-circulate
492 that. And then very often, we were working right up to 10 minutes
493 before the press briefing in terms of sharpening and honing our
494 messages.

495 Barbara: In your own organization in the media division in responding to
496 H1N1, did you find it was necessary to make organizational changes
497 whether in terms of process, or staffing, or resources of any type?

498 Glen: We – very early on, we – we realized that we did not have enough
499 regular staff to – to maintain the hours, and pace, the schedule that –
500 that this required. We have a relatively small number of press officers
501 who are in the CDC Office of the Director. And that – that’s probably
502 ranges from 12 to 15 on any given day depending on where you sit
503 with vacancies and people who are on vacation or out sick.

504 This required – we knew pretty much a – a seven day a week, 24 hour
505 capability. And so one of the first things we did was we – we put out a
506 call to try to find all the people in the organization at CDC who had
507 either been part of our office in the past, or whose jobs entailed
508 working with the media, if only on a part-time basis, or who had skills
509 that could be used as part of this.

510 And so, for instance, there are people who are really good writers. And
511 one of the things that we need was – was talking points and key
512 messages. So if we could find people who were good writers, that
513 helped us enormously. They didn’t have to be people who had
514 experience dealing with the media and with the press, but they could
515 do some of the other work that goes on in terms of being able to do an
516 effective media response.

517 And so we brought in a number of people on detail. We brought in
518 some people through outside contracts to kind of build up our staff. We
519 worked to build a work schedule that made sense in terms of
520 sustaining people for long period of time. And then the other thing we
521 did is – is again, we work with state and local health officials, public
522 affairs officers and we had daily calls with them, shared our
523 information with them so that we could direct some of the people who
524 are calling us to the right people in the states to be able to answer
525 their questions.

526 And again, it was a way of taking some of the burden off of us in terms
527 of handling media questions. But the biggest thing we did was – was to
528 make sure that we did these – these daily briefings and got the media,
529 our staff and our spokes people into this daily rhythm, this daily habit
530 of knowing at one o’clock every day the CDC would give an update.

531 Barbara: Okay. Great. I guess my last question would be just in terms of
532 evaluating what you thought worked well, perhaps were challenges
533 that were unanticipated, things that did not work so well. Any – any
534 thoughts along those lines?

535 Glen: Well, I think – I think what worked well, there – there were a number
536 of things that – that helped us have an effective response. I think it
537 started with the recognition of – of CDC’s leadership, that it was going
538 to be important to meet the demands, the communications and media
539 demands, that we had to meet them head on, and start right from the
540 beginning with the expectation that we had to be open, we had to
541 place a very high priority on answering the questions of the media.
542 ‘Cause if you don’t start with that priority, you never recover.

543 And so – so from the word go, Dr. Besser and the CDC senior
544 leadership had made a commitment that this is going to be in the
545 media, and we’re going to do whatever we can to meet the demands of
546 the media, to make the media – to make ourselves assessable and
547 available to the media, and so that we can reach the public through
548 the media. And I think that was the first really important thing that
549 that worked.

550 Second, was following through on that. It’s easy to say that but as Dr.
551 Besser and Dr. Schuchat can probably attest, they were probably
552 putting in, you know, 20 hour days. And we were probably placing 10
553 hours of demands on them some days in terms of the media demands.
554 And they – they never hesitated. They went wherever they needed to
555 go. This can involve significant travel, whether it’s going to
556 Washington, DC, whether it’s going to New York, whether it’s going to
557 downtown Atlanta. And so that was very important.

558 I think another thing that worked really well was – was the approach
559 that we took which was trying to figure out what were our desired
560 headlines, and what could come up in the next couple days that – that
561 could change so that we could foreshadow those things. I think that
562 that really helped us stay ahead of things thinking – thinking like the
563 media in terms of where the story was going, and how it may switch,
564 and how it may change. I think that was extremely effective.

565 Making sure that we circulated our key messages as widely as
566 possible to both internal parts of CDC as well as to external audiences,
567 I think, was extremely helpful because in many cases the state and
568 local health departments were scrambling. They too are – were
569 sometimes understaffed and so they greatly appreciated having our
570 key messages and they were able to tailor our messages for use in
571 their state or their community. And I think that was extremely
572 helpful.

573 I think one of the – one of the challenges, talking about challenges,
574 was that no matter how many people you send your key messages to,
575 no matter how many people you have invited to be part of your

576 process, there are still going to be some you miss and some of those
577 will be internal. And so I think one of the challenges that unfolded
578 was projections and estimates. There were a lot of people including
579 government officials and government agencies outside of CDC, some of
580 them at HHS, some of them outside of HHS, that were making
581 projections and estimates based on things that they probably had
582 read, or heard, or seen, as part of pandemic planning; but when they
583 made those estimates, however well intentioned, that set us – that
584 created some difficulties. I think one area was in terms of projections
585 about number of doses of vaccine.

586 We at CDC, if you look at our messages in June, we were very careful
587 to say we don't know if we'll even have vaccine. You know, many
588 times, things go wrong in the vaccine production process. We've seen
589 that happen with seasonal flu. And so we made a decision at CDC not
590 to get into the – into making estimates or projections regarding doses
591 of flu vaccine.

592 Unfortunately, others including some work for the federal
593 government, did make projections. And those projections then were
594 extrapolated or projected on to CDC, and we had a hard time getting
595 people to understand that those projections were – were – were just
596 that. They were – they were guesses. And we spent a lot – we – I think
597 we lost some momentum trying to backtrack and talk about, you
598 know, why there wouldn't be so many doses available at a certain
599 date; when if we had stayed what we thought was the best strategy at
600 CDC which was to be very cautious, very conservative about
601 projections, I think it would've worked out better.

602 But again, I think it speaks to the complexity and the number of
603 people that – you know, the media will call upon anybody and
604 everybody. Sometimes you can – you can – you can guess or – or based
605 on expert judgment have a good idea of how many people or who those
606 people may be, but you'll never be able to guess all of them. And – and
607 I think that's one of the challenges.

608 And I think another challenge is just understanding and recognizing
609 that – that after a while, different reporters want to write different
610 stories. And so while 80 percent of the media may be covering things
611 the way you would like them to cover, when you have an event like
612 this, there's always going to be reporters who are going to stake out
613 purposely so, different ground, different issues. And that could be a
614 challenge for – for everybody when they do that but I think you have
615 to expect that that's going to happen and not – not be surprised. And I
616 think that took some people by surprise that there would be some
617 reporters who'd go in different directions.

618 And in terms of staffing, I think – I think staffing is always going to be
619 a challenge because you – you – you really have to staff for – for day-
620 to-day operations. But you do have to be able to put in place plans that
621 enable you to surge more quickly. And I think we learned some things

622 in this process about steps that we have to take in the future to be
623 able to build capacity or bring on additional capacity faster. We – we –
624 it probably took us an extra couple of weeks to figure that out. So I
625 think – I think one of the things that we learned is that we have to
626 have to have steps in place to be able to do that more rapidly within a
627 matter of days versus weeks.

628 Barbara: Great. Do you have any final recommendations that you would like to
629 offer for the future?

630 Glen: Well, I think – I think I hope that when people look at this that they
631 realize that one of the reasons it went so well was because the
632 communications was very good. But if they look further, I think they
633 will see that, you know, we – we really did follow the tenets of risk
634 communications early and often. And so we shared – we were
635 comfortable sharing dilemmas with people, acknowledging the
636 uncertainty, telling people what the uncertainty would mean. We were
637 comfortable in telling people that the course would change and when
638 the course changed, we did, you know, we acknowledged that that was
639 going to be disruptive for some.

640 But that – that just was part and parcel for the territory. And so I
641 think we were always mindful that part of our job in communications
642 was – was guiding, and setting the appropriate expectation level. And
643 if you don't set the appropriate expectation level, you know, a lot of
644 this goes much worse.

645 Barbara: Thank you very much. This is...[audio ends]

**Interview #12. Stephen Redd, MD (RADM, USPHS)
H1N1/A Incident Commander and Director, Director CDC Influenza
Coordination Unit**

- 1 Barbara: Good afternoon. If you could please give us your name, just
2 acknowledge the date, and where we are, and your present position.
- 3 Steve: My name is Steve Redd. It's February 18th, 2010, and we're at the
4 CDC Clifton Road Campus in the basement of Building 19, I think.
- 5 Barbara: And your present position?
- 6 Steve: My present position is the Incident Commander for CDC's H1N1
7 response and I've been doing that since last April. Before that, I was –
8 I am the Director of Influenza Coordination Unit which is responsible
9 for organizing CDC's pandemic preparedness work.
- 10 Barbara: Great, thank you. Well, what we want to do today is develop an
11 understanding of the history of the H1N1 virus as a public health
12 threat and CDC's response to this threat as it emerged. We are hoping
13 to create an oral history of the CDC's response to this public health
14 issue and are interested in details of your role and participation in the
15 CDC's response. These are key to helping us document the events and
16 processes that shaped the organization's response. And we hope this
17 oral history record will be useful to future leaders by giving them the
18 benefit of your experience with H1N1 as they confront new and
19 possibly similar challenges. So we're hoping you will recall in as much
20 detail as possible your experiences in recognizing and developing
21 strategies and practices to cope with H1N1 as it emerged and grew
22 into a global health issue. So if we could start with a little background
23 information on you. Could you tell us about your training, medical
24 specialization and what brought you to CDC?
- 25 Steve: Well, I went to medical school at Emory so I'm trained as a medical
26 doctor. And during one of the summers of medical school, I worked at
27 CDC in the Co-STEP Program in the Reproductive Health Program.
28 So that, both from the proximity to – to Emory and working here that
29 summer, when I finished my training in internal medicine, or as I was
30 finishing it, I – I did the EIS program. I came to CDC in 1985 and I've
31 worked in a lot of different parts of CDC since then, in bacterial
32 diseases, in international health, in malaria, in the measles work, for
33 about eight years in environmental health with the asthma program
34 there, and for the last four years, I came to work on flu in the spring of
35 2006 as a new unit was being formed to manage the preparedness
36 work that CDC was doing. This was in the days of bird flu and a very
37 high priority was put on being prepared for bird flu pandemic. So that
38 what I've been doing -- I had been doing, between that period of April
39 2006 and April 2009.
- 40 Barbara: Are you currently completely involved in the H1N1?

41

42 Steve: Completely since last April. Yes.

43 Barbara. Since last April. So do you recall when you first heard about H1N1?

44 Steve: Well, the – there were – there were a couple of different things that
45 happened and I remember the date of April 15th. We – as part of our
46 preparedness work, we had a weekly meeting to review progress in
47 getting prepared for a pandemic. And part of that was kind of in a new
48 thing that had happened and there was a single case of – of swine flu
49 virus that had been identified. In fact, the person had recovered before
50 the identification was made at CDC. So we heard about this case from
51 San Diego. It was detected using a machine that was a prototype that
52 we were developing under contract to identify influenza virus
53 infections and the – the thing about this particular infection, when it
54 was originally identified, is it wasn't a seasonal virus so it wasn't the
55 normal H1N1, it wasn't an H3N2, it wasn't a V virus, it wasn't H5N1,
56 it was an Influenza A virus. So that led to a series of laboratory
57 investigations that eventually identified it as something that had
58 never been seen before. It was a single case and we – the really –
59 people wondered if this was the kind of thing that had always been
60 happening; we just never had the capability to detect it.

61 And what the investigation that was going on was intended to identify
62 the – the pig, or the farm, or the county fair that the person had been
63 to that – where they had acquired the infection. So that was the very
64 first day. On Friday, April 17th, I was actually in Galveston with my
65 ex-boss giving a talk about pandemic preparedness, and a second case
66 of the same infection was identified that was in a different county and
67 there was no obvious connection between those two cases. And that
68 next day, on the 18th, it was a Saturday, we had a conference call with
69 the California Health Department. It was a couple of hours. And one
70 of the early decisions that I think was a really important one was at
71 the end of that call the decision to draft an MMWR Article to notify
72 the public of these two cases from – and it was to be published early
73 the following week. And I think that initial decision to get that out –
74 out of CDC – if we hadn't done that, we would've never ever caught up
75 because during that week, more cases were identified. These from
76 Texas and then a couple of days after that, cases from Mexico that
77 were very severe were identified. So that was – that kind of launched
78 everything.

79 The Wednesday, the 22nd, is when we activated the Emergency
80 Operation Center. We had three locations in the US of these cases.
81 And the first, that Thursday night, the 23rd, was when the severe
82 cases from Mexico were identified. And that led to a lot of discussion
83 with the – HHS, the Department on what our next steps were, how we
84 were going to try to figure out whether this was a severe illness, or not
85 severe, because the cases in Mexico were very severe and the cases

86 that we'd identified were not very severe. Most of the people had
87 actually recovered.

88 So it really sort of cascaded from there. And we knew we were going to
89 be very busy after that Thursday for a long time.

90 Barbara: So it, early on, struck you as a potentially serious crisis?

91 Steve: It did. I think that the – it was probably those cases, the sort of third
92 round of cases from Texas that made us know it was going to be
93 widespread. And then shortly after that, when severe cases were
94 identified that – I think what actually happened is that we learned
95 that we knew less and less about what the situation was than what we
96 thought. And that was a little bit unnerving but kind of keeping a grip
97 on the uncertainty became an important way of navigating; and also,
98 identifying some practical actions to take to find out more.

99 Barbara: Do you recall what steps you took immediately in the first few days
100 and what those actions were?

101 Steve: Yeah, I think that the – the biggest initial thing was that MMWR
102 article which I think was published on the 21st of April. But a series of
103 guidances were developed after that relating to treatment, to infection
104 control, practices, and some decisions about whether to recommend
105 that people who are exposed to the case receive anti-viral drugs and
106 that all took place in those first few days. I think that probably after –
107 well, and then on that phone call on the Thursday night when the
108 severe cases were identified, we sort of organized the response into a
109 couple of categories of activities. And I'm not sure we were actually
110 organized in this way but it was a way to kind of plan what we needed
111 to do the first being to understand what the situation was and there
112 was epidemiologic investigations and laboratory work in that area.

113 The second was to do things to treat people and control the disease so
114 kind of the intervention zone which included the question of travel
115 advisories and movement restrictions, treatment, protection for
116 workers who would be exposed to the illness and the development of a
117 vaccine.

118 And then the third thing was the – the third big category was
119 communication and putting as much information as we could out
120 about what we knew, what we were doing to find out more.

121 Barbara: And what was the process you used in putting the information out to
122 the public?

123 Steve: The first, well, there was the MMWR when the cases in Texas were
124 identified, there was a press conference that Anne Schuchat was the
125 spokesperson. She was the acting Deputy Director of CDC at that
126 point. And when the cases in Mexico were identified, Rich Besser, the
127 acting Director, gave a press conference and described what was going
128 on. I think that was really at a very uncontroversial decision also. I
129 should – I think was very – very correct going that route as well.

130 Barbara: And organizationally, did you notice some impact immediately and
131 change – any changes that needed to be made?

132 Steve: Well, on the Wednesday after the Texas cases were identified, we
133 organized in the Emergency Response – the Emergency Operation
134 Center and we used the model that we had exercised the previous
135 October so it was actually a kind of familiar setting except it was real
136 instead of not real and so that – yeah, in fact there was one person
137 that – it was Marsha actually, Marsha Vanderford who a couple of
138 times talked about the exercise when she was describing the event. So
139 it was actually a pretty familiar environment because of the exercises.

140 Barbara: So you had existing plans in place?

141 Steve: We did. We had – this really had been my job before the response had
142 been developing an operations plan and exercise program that we
143 were doing with contractors but we organized – we'd had five
144 functional exercises where we pretended that there actually was a
145 pandemic occurring and we gave briefings, did interviews with the
146 press, all the things that we would have to do during a real response.

147 Barbara: Did you find you needed to change anything or modify anything?

148 Steve: We – we were constantly changing things and I think at that – if that
149 – that's one bit of advice is that you should never hesitate to change if
150 it seems like change is needed. And so one – one example of something
151 that – and I think there were other examples that could be really
152 similar but in the first few days, there was a first was a real burden of
153 notifying the other parts of government, and other governments as
154 well. And so it was pretty chaotic. Things were – be called to a
155 conference call with people from the White House, or Health and
156 Human Services, or getting calls from the Department of Homeland
157 Security, or Department of State.

158 And on one day, we – we – our originally planning had been to have 60
159 minute briefings. And on one day, we – the – there's something that
160 was happening at 8:30 so we had a 30 minute briefing. And it turned
161 out that that 30 minute briefing, that that was actually the right
162 length of time for the briefing and so from that day onward, we kept it
163 30 minute briefings. But it was really the conflicts that we couldn't do
164 a 60 minute briefing that led us to the 30 minute briefing. So that –
165 that sort of thing was occurring quite frequently.

166 Barbara: So in terms of the CDC's internal communication processes, could you
167 offer some insight into the – how that worked in this case?

168 Steve: Sure. I – I would put that in kind of two levels. One was people who
169 are working on the response that we had, a daily briefing of the
170 Director, and we also had several meetings to coordinate our activities
171 through the day. And I actually think those coordination meetings
172 were extremely important in keeping everybody on the same page and
173 evolved with throughout the response that during April and May we

174 had daily 4 or 5 PM meetings for an hour where we talked about
175 either something that was evolving or strategy issue or did a decision
176 briefing. And we backed off from that in June. We reinstated that in
177 August so there was a lot of tinkering with the daily schedule.

178

179 The other part of the response though was for the rest of CDC and so
180 initially I think it was a conference call, it might have been a video
181 conference, but we had a briefing of – of – of Center Directors and
182 Division Directors and we did that for several weeks as the situation
183 was evolving. I think that the – keeping everybody apprised of what
184 was happening in the Emergency Operation Center, that might be
185 something that we could've done better particularly in the lull
186 between the intense activity of April and May, and what might've seen
187 like a lull to other people but was even more intense activity in June,
188 July and early August. So we did briefings of Center – the Center
189 Director, our group, a Division Director group, just describing what
190 the activities were.

191 It was hard to do enough of that to – I think probably the rest of CDC
192 might have felt during that period that there wasn't as much going on
193 as there actually was.

194 Barbara: Did you feel that you got as much information as you needed?

195 Steve: I did. And – and I think that was partly because of my role was to
196 know and coordinate the information flow from the response upward.
197 So I think that that – that's probably something about the – using the
198 Operation Center that really the organizational entities largely melted
199 away and people worked as a team in that – in that net environment. I
200 think that – we – partly that was the result of the exercises and that
201 kind of knowing that you – you might normally work in a certain
202 division or branch; but in the response, we're a single team and new –
203 yeah, there's a new organizational structure that we have to work
204 within.

205 Barbara: And how was that communicated to everyone, the new structure?

206 Steve: It – there – we had a chart and we were constantly changing that also.
207 I mean one of the – one of – speaking of sort of memories from those
208 early days, I – it was pretty long hours the first week or two and I took
209 a, sort of a night off and went to my son's trumpet concert. And I was
210 feeling pretty good about the response and I realized that there were –
211 I didn't really have a clear sense of actually who reported to me and
212 that was kind of – made me recognize that maybe it wasn't so clear to
213 people. And so there were two people that were kind of floating in the
214 upper parts of the response that we actually made up titles for and
215 had them report to me. So that – that was a way that we had to kind
216 of keep things structured. And I do think that that, you know, was
217 something that was constantly changing. Probably got really finalized
218 in June and July with a – a task force structure that we had an

219 epidemiology surveillance and laboratory task force, a vaccine task
220 force, medical care, encounter measures task force, a community
221 mitigation task force, a communications – I’ve said that but – let’s see,
222 we had four, or six, a media and – media and communications, and I’m
223 forgetting the sixth. Let’s see, anyway, there was a sixth one. It’ll
224 come to me. Maybe I’ll ask for that to be edited [inaudible 0:34:55.5]
225 the tape.

226 Barbara: Would you recommend this task force structure be part of a protocol
227 for response?

228 Steve: Well, we’re going to document that wasn’t the way we had responded
229 in the exercises and I think for a pandemic response, it’s the right way
230 to organize, and probably it doesn’t so much matter exactly how it’s
231 organized as that it actually is organized, and that people have
232 responsibilities, and that the leadership of those task forces keep
233 people below them apprised of what’s going on. I’m not sure that the
234 exact structure is so important as the fact of having a structure.
235 Actually, I thought of the last task force too, it was the state and local
236 coordination task force which was kind of a cross cutting task force
237 but did a lot with the funding and the organized communication with
238 the state and local health departments and other partners.

239 Barbara: Good. In terms of decision making, if you can think back early on,
240 what do you feel were the key decisions that needed to be made in the
241 first few weeks and months?

242 Steve: Well, the – I think the – was – is really, you know, in terms of things
243 that we actually did, make decisions, or provide recommendations,
244 develop guidance, and then some of the real specific things like
245 shipping, counter measures, anti-virals, and personal protective
246 equipment that got shipped to states. Those – those were kind of the
247 few things that we actually did so a lot of what we were doing was
248 channeling information and making decisions or recommendations.

249 And I think in the first few days or maybe week or so, there was so
250 much activity that the decision making was not very organized and I
251 think that’s an important thing to try to get a grip on is what are the
252 decisions that need to be made and just the process of identifying
253 them is really helpful in – to provide the structure that’s needed. We
254 actually used a method of decision making that was called the Plans
255 Decision Unit so we’d identify a decision that needed to be made,
256 there’d be a group that would sequester, come up with a briefing in a
257 very structured way, including options, pros and cons for options, and
258 a developing criteria for evaluating the options, and then
259 recommendation and we’d talk about that and come up with a – all the
260 important things were actually recommendations even though we call
261 them decisions but we’d come up with a CDC recommendation.

262 So that was a pretty rigorous process designed to make sure that we
263 weren’t forgetting something important. And I think it – it worked

264 pretty well once we got it going. The first big decision was about the –
265 the recommendations for school closure. And that was – the – the
266 exact date was kind of the end of the last week of – of April, beginning
267 of May. And what was clear to us – the – the planning that we had
268 done was that if there were severe pandemic, there'd be pre-emptive
269 closure of schools for up to 12 weeks. And we – when we first saw
270 these cases, they weren't as severe as what we thought a – a pandemic
271 like 1918 with a 2% mortality would look like; but we weren't sure.
272 And so we initially had kind of a middle ground where if a case was
273 identified in a school, we recommended closing the school for seven
274 days initially as the first part of that recommendation.

275 But we were hearing from health departments that that seemed a
276 response out of proportion to the problem and that a less restrictive
277 option seemed to make more sense to people who were in the field.
278 And these were people we knew well that were kind of on the front
279 lines that we respected. And we fed that into this decision making
280 process and we ended up over about a four or five day period
281 recommending not doing this reactive school closure but closing
282 schools when the educational mission couldn't be accomplished,
283 recommending that sick children be sent home and not attend school
284 until they were – actually, initially, it was for seven days during that
285 period.

286 So that was an example of – of having recommendation that was made
287 not in the decision making process and then trying to examine it and
288 we backed off from it in a – in a – what I think was a very sensible
289 way to do that. And school closures dropped precipitously after that.

290 Barbara: Do you recall how that decision making group was formed and who
291 was involved?

292 Steve: For that particular one, Stephanie Zaza was the person that convened
293 the group and did the briefing, but there were a number of people from
294 different parts of CDC that had expertise either in flu or in the – this
295 community mitigation procedures. I don't know the exact people that
296 were on, you know, did develop the briefing but it was a separate unit
297 from the – a defined unit within the response.

298 Barbara: But you were – it was within your organization?

299 Steve: Yes.

300 Barbara: So, you were...

301 Steve: Right. We just made the assignments as what the decision briefings
302 need to – or what decisions we needed a recommendation on.

303 Barbara: And then once the recommendations or decisions were arrived at, how
304 did you communicate those internally?

305 Steve: Well, I think we weren't quite so strong on this as the other but what
306 – ideally we drafted a memorandum that summarized what the

307 decision was, what the reasons were, what the options were and that
308 could be a vehicle for communicating both to the CDC Director and
309 then above. And I think that, in those early days and the response, our
310 integration with the rest of the Department wasn't nearly as good as it
311 got to be later on. And some of that was that people were just starting
312 their jobs in the new administration and we didn't know who they
313 were and we didn't have a forum to do that. I think that's actually one
314 of the strengths of the – I guess probably from June on that we
315 participated in a daily teleconference with the Chief of Staff and the
316 leadership of HHS, the – the [inaudible 0:41:13.8] Nicky Lurie, Laura
317 [inaudible 0:41:15.5] who was the Chief of Staff, Tony Fauci from
318 NIAID, Jesse Goodman from FDA, and that – that was kind of the
319 core group that we had a daily kind of discussion of issues.

320 Barbara: So overall, would you say that there was, in your view, from your
321 perspective, the response was effective or do you feel that there were
322 areas where things could've been done differently?

323 Steve: Well, I think both. I think that certainly – I do think it was effective. I
324 think there were – are lots of things that we could've done quicker or
325 done better. Probably from the standpoint of the overall response, the
326 biggest issue was the – the development and production of – really the
327 production of vaccine and what we know now is that large quantities
328 of vaccine became available after the fall wave. And so the opportunity
329 to prevent those cases just like the '68 and '57 pandemic that the
330 vaccine became available after the bulk of disease. So that – that – it
331 was a disappointment. I don't think there's anything that the response
332 could've done to make that go better.

333 I think tied to that though was a not very good communication about
334 the uncertainty around the availability of vaccine that I think people,
335 state health departments and the public felt that we promised that
336 vaccine would be available sooner than it was available.

337 Barbara: There was also a little public fear of the vaccine that became almost a
338 rumor to some extent?

339 Steve: That's true. I hate that – I kind of think that we were pretty good
340 about that actually that there was a – a sense that the – this was a
341 new virus therefore the vaccine had to be a new vaccine therefore
342 there was more uncertainty about the safety than there was; when in
343 fact, that wasn't the case that – it was a new virus but it was very
344 closely related to flu viruses at all kinds. And the methods that were
345 used to produce it were exactly the same as are used for seasonal
346 vaccines year in and year out. And the – the – really what happens
347 every year is that there's a – or almost every year is that the strains
348 that are used to produce the vaccine change. And so this was really
349 like a strain change in the vaccine. And I think that there was an
350 element of – where, you know, just from the polling that we did that
351 people thought this vaccine was more dangerous than seasonal
352 vaccine and less likely to protect than a seasonal vaccine was. And

353 probably – it's actually probably more likely to protect because it's
354 such a close match with – with the circulating virus that's not always
355 the case with seasonal – seasonal viruses and seasonal vaccine.

356 And the safety, it turned out to be exactly the same as seasonal
357 vaccine, very safe. I think that's it's hard to communicate without the
358 experience that we had but as we did accumulate experience we were
359 able to communicate that. I think this was also something that was
360 really important was the effort that we put into monitoring for
361 adverse events that might be related to the vaccine, that this was a
362 big focus of work at CDC and also a structure for collaboration within
363 the Department was set up. This was kind of in the August,
364 September, October time frame.

365 Barbara: So, along those lines, would you have any recommendations based on
366 your experience for perhaps some redeployment of organizational
367 resources or organizational structural changes?

368 Steve: Well, I think we – I would say that overall in the response, we had
369 funds for preparedness that we were able to convert into response
370 funds right away. And in the spring, there were a lot of enthusiasm for
371 the response so it was easy to recruit people into the response. Funds
372 were appropriated for the response over the summer so that – that
373 helped us. I think internally we didn't really have a problem with
374 financial resources. There were issues with having enough people to
375 do the work particularly during the summer when the focus – it was
376 out of the media temporarily or at least at the same kind of fevered
377 pitch, but we weren't able – we have challenges recruiting enough
378 people to work on the response during that – that kind of summer, not
379 really – not really a lull from there's still disease transmission but I
380 think we did kind of fall below the – the numbers needed.

381 That – we did get that righted during August and had lots and lots of
382 people doing the right work from August through – through December
383 and January. But I think this is really – it is a big challenge. I would
384 say that there were three kind of organizational challenges to keep
385 things running. One was personnel, so keeping enough people and
386 actually keeping track of all the people. The other was the thing that
387 we talked about earlier, that Plans Decision Unit. That was hard to
388 keep staffed. And the third area was policy that we – we recognized
389 during the summer that we needed a strong policy presence and it
390 really wasn't until October until we got that staffed adequately. But
391 that was – that was really valuable once we got the right kind and
392 right number of people in the policy area.

393 Barbara: So looking back over the past year, are there things you would've done
394 differently with knowing what you know now?

395 Steve: Well, there are little things but I think the biggest one would've been
396 to – for the vaccine development to have really worked harder to – and
397 this is not so much me but for the overall response, to make sure that

398 we were not giving overly optimistic projections for vaccine
399 availability. I think that was probably the biggest – the biggest thing
400 that didn't happen the way that it should have. Everything else, you
401 know, wasn't perfect and there's room for improvement but that was
402 really the big thing.

403 Barbara: So, do you have any final thoughts or recommendations you'd like to
404 add?

405 Steve: Well, I guess in terms of for the next person that leads one of these
406 responses, I think one of the things that is really important to
407 recognize is when more structure is needed and also to recognize when
408 there's too much structure. And when there's not enough structure,
409 people will be confused and the efforts won't be as effective as they
410 could be because they'll – people'll be wondering if they're doing the
411 right thing. If there's too much structure, people will be in meetings
412 all the time and will be communicating rather than doing the work. So
413 I think that there's a constant adjustment of that balance between too
414 much structure and excessive rigidity and not enough structure and
415 chaos. And, you know, I think that's where the – the leadership is to
416 kind of get that in the right zone, and recognizing that there are going
417 to be periods that are just inherently confusing.

418 Barbara: Good. Well, thank you very much.

419 Steve: Sure. [audio ends 0:48:48.3]

**Interview #13. Anne Schuchat, MD (RADM, USPHS)
Director, National Center for Immunization and Respiratory Diseases;
Principal CDC Media Spokesperson for H1N1/A response**

- 1 Anne: Dr. Ann Schuchat. I'm the Director of the National Center for
2 Immunization and Respiratory Diseases at the CDC.
- 3 Barbara: Thank you, Ann. I wonder if we could begin with a little background
4 information about yourself, your training, medical specialization?
- 5 Anne: Sure. I'm a physician. I'm an internal medicine specialists and I've
6 been at the CDC for 22 years. I came here for the Epidemic
7 Intelligence Service Program and I stayed. I was – began with
8 Infectious Diseases and I've worked in Infectious Diseases and
9 Vaccines for my whole career, going from EIS Officer to Medical
10 Epidemiologist, Branch Chief within the Respiratory Diseases Branch
11 and Bacterial Diseases. And then most recently became the Center
12 Director for the new Center – National Center for Immunization and
13 Respiratory Diseases. Is that enough?
- 14 Barbara: Are you currently involved in some aspect of the H1N1 response?
- 15 Anne: Yea, since the beginning I've had a major role in the H1N1 response.
16 When the response began, I was actually serving as the Acting Deputy
17 Director for CDC during the transition. But my long-term job as
18 Center Director for Immunization and Respiratory Diseases meant
19 that I've been involved in pandemic planning, and then had a lead role
20 in the response as well.
- 21 Barbara: Can you recall when you first heard about H1N1?
- 22 Anne: Sure. Friday evening, April 17th, I opened my door at home and my
23 cell phone went off, and my colleague, Beth Bell was on the phone.
24 Beth was serving as the Acting Director of the Center while I was on
25 this detail to the CDC's Office of the Director. She was calling to let
26 me know that our lab had found two different children with new
27 influenza virus that had swine origin. We had been following unusual
28 influenza cases that had swine origin. We'd had one here, and one
29 there, over the past two years or so. But these were two children with
30 no contact with each other, or with pigs or animals apparently, who
31 had a new strain that wasn't one we'd already seen. She let me know
32 that and talked about what the team was doing to work with
33 California in further evaluation and planned on, you know, putting
34 together an MMWR report on this.
- 35 So that was when I first knew about it and I in turn called Rich Besser
36 who was the Acting Director to let him know as well.
- 37 Barbara: And when you first heard about this, did it strike you as a potential
38 crisis situation?

39 Anne: Well, I think that it was interesting because this was a strain that was
40 different and it – the principal of the thing was that we needed to
41 really get to work with California and understand whether there were
42 more of these. The illness involved had already re – improved. The
43 kids were better and so it wasn't necessarily a crisis but it was what
44 we call a potential public health event of international concern. And so
45 that why we eventually ended up reporting it through the
46 International Health Regulations.

47 So Beth really went through the couple things that were critical, what
48 was going on and, you know, many of the right things were being
49 done. So it was interesting and not necessarily tipping me off as a
50 crisis but certainly something I immediately called the Director about.

51 Barbara: When do you feel that the Organization began to take this as an
52 emerging crisis?

53 Anne: Well, we – I would say, by the following Wednesday, we – we had a
54 weekly – we had, for years, been having a weekly Wednesday morning
55 influenza pandemic update bringing people from different parts of the
56 agency together to talk about what was going on. And that particular
57 Wednesday was during the Epidemic Intelligence Service conference,
58 the EIS conference. It's once a year. It's kind of out on the suburb of
59 Atlanta.

60 And so I knew that, you know, Rich Besser was planning to be at the
61 conference and decided no, I should be at this flu meeting in person. I
62 had to be at the conference 'cause I was moderating a session and
63 called into it. And I think the discussion on that Wednesday morning
64 about what else we knew because we'd found a few more cases by then
65 was, you know, the next level. And then, of course, it definitely became
66 a crisis on the Thursday when we – Thursday, April 23rd, when we had
67 the first press conference and later learned about the confirmation in
68 Mexico. So the press conference for us was just seven U.S. cases,
69 everybody's better, we don't know if it's something or nothing. And by
70 that night, we definitely knew that Mexico's very severe cases were
71 the very same virus.

72 Barbara: Can you describe the events of the first few days after that?

73 Anne: Right, well the – the Thursday was a really big day. You know, the –
74 the – for me, I did this press conference together with Nancy Cox
75 which is unusual. We usually do press conferences, you know, after big
76 meetings or when there's an article coming out. But this was actually
77 news that we were making. And then we had a – a conference call
78 later that evening with leaders at Health and Human Services to
79 make sure they understood the details that we were then aware of and
80 could discuss it with other leadership across the government.

81 That evening was this incredible thunderstorm in Atlanta. You've
82 probably been talking to people about it. And so, you know, I know –
83 remember sitting there on the phone with lightning and thunder just

84 really loud and this conversation where Rich was really explaining to
85 HHS the likelihood that this was going to be a big problem and
86 helping them – they were generally new to this whole area as new
87 appointees or – not even – we didn't have a Secretary yet. So it was
88 with other leadership who were newly – newly there to convey, you
89 know, what we did and didn't know at this point.

90 And as I got off the phone, I had a voicemail from Nancy Cox sharing
91 with me the discussion she'd just had with collaborators in Mexico
92 about the virus and the details we knew then. And then later that
93 night, I was phoned by a colleague who had been called by a colleague
94 of his who had just got out of a meeting with the President of Mexico,
95 the Cabinet meeting that the Mexican President had about what was
96 going on in Mexico and should we basically shut all the schools down
97 in Mexico.

98 So that evening was fairly intense in terms of going from seven cases
99 who were pretty much okay to Mexico was closing their entire school
100 system and was very memorable. The next morning, our Emergency
101 Operation Center was fully activated. There were, you know, instead
102 of a handful of people, the place was full and we began a non-stop
103 intense effort over the next – the next, you know, weeks. And then, of
104 course, it's turned into months.

105 Barbara: What do you think were the key decisions that needed to be made in
106 the first few weeks or months?

107 Anne: Okay, so the first several days there were a number of decisions. The
108 issues involved what do we do with the border? What's going on with
109 Mexico and are there travel – needs for changes in travel advisories?
110 Should we distribute the anti-viral medicines we have? How should we
111 do that? To all states? Just to the ones that know they have cases?
112 What level of severity does this thing have? What are we to do for
113 schools? What should we do for anti-viral use? Should it just be for
114 sick people or should it be for prevention? Should it be for everyone
115 who's sick or just some people? How long should things be closed? If a
116 school is closed, how long should that be? What guidance should we
117 give doctors about testing? Should they test everyone? Do we want to
118 know about everyone? What about contacts? Do they need special
119 precautions or not of people who are confirmed to be ill? Really, there's
120 dozens of major decisions.

121 And then a handful of major policy ones by, you know, we went
122 through many rounds of interim guidance on the school issue, and the
123 anti-viral issue, the mask issue that you probably have talked to
124 others about, or – and 95 respirators. But by June, we were really
125 focusing in on decisions about a vaccination program, both – early
126 decisions about buying vaccine, antigen, buying Adjuvant and then
127 subsequent decisions about what type of program might we need.

128 We had to make most of those decisions early in June because they
129 were pretty much related to a budget request that was going in for
130 emergency funding.

131 Barbara: Who were the key decision makers in this process?

132

133 Anne: You know, there were several kinds of decisions and so some of the
134 decisions that were of vital importance to the health care professionals
135 or to the public were not that controversial, issues about who ought to
136 be tested for the virus or really how to use the anti-viral medicines.
137 We had a large technical specialty unit with experts in a lot of
138 different areas and they would develop content and then it would be
139 reviewed by higher levels of the response.

140 The first 10 days or so of the response, I think, the policies and
141 decision making was really internal to CDC. And then as then as the
142 people in very senior leadership positions at HHS arrived, we entered
143 a more formal policy development and review process phase. And so
144 the, you know, materials would often cross disciplines so people within
145 CDC, different groups, would get together about best ideas and work
146 these things out. And then for really major decisions like release of the
147 anti-virals to the states, we had formal decision briefs here at CDC
148 that went through a rigorous structured process presented to the CDC
149 Director or Acting Director, decision made and then recommendations
150 given to the Secretary or her agent.

151 Some of these guidances that we were developing required other
152 departments or other agencies within HHS to opine. And so that was
153 coordinated out of the Chief of Staff's Office at Health and Human
154 Services. For something like the vaccine planning, this was – there
155 was a leadership group across HHS with one or two of us from CDC, a
156 couple of people from HHS, Office of the Secretary, BARDA, somebody
157 from NIH, somebody from FDA, the – usually that core group of us
158 making decisions about how much vaccine antigen should we buy?
159 What about the Adjuvant? What about fill and finish of vaccine
160 products? When do would make these decisions?

161 And then CDC pretty much developed and proposed the strategy for
162 vaccination and then we presented that in multiple ways to the
163 Secretary and then across the government to the National Security
164 Staff or Homeland Security Staff at the White House. So those were,
165 in June, decisions that were then linked to budget requests to OMB so
166 they really did need this broad support.

167 Barbara: And how were these decisions communicated both internally at CDC
168 and then publically?

169 Anne: Well for things like the anti-viral recommendations or who should be
170 tested, we have a number of networks that we use to notify health
171 professionals, to notify the public health labs. We have our Joint

172 Information Communication Center, the JICC, basically can push a
173 button and have a health alert advisory or warning go out to selected
174 groups. We use the MMWR for many of our important guidance
175 documents and we did extremely frequent press briefings. So we were
176 doing them daily for a while and we also used webcasts and other
177 channels to disseminate information, not just as news, but as ways to
178 really reinforce our message with the target audiences.

179 Barbara: Often times in public health emergencies, there are very heavy
180 demands placed on the organization for immediate and detailed
181 information about the threat situation. Did you find this to be the case
182 with H1N1?

183 Anne: Yea, we had a, you know, it was extremely intense. I've been part of
184 our response to Anthrax, and SARS and, you know, West Nile virus a
185 little bit, but Hantavirus long ago and I think that this is, by far, the
186 most intense response we've had both because of the newness of the
187 problem, because it started here in the U.S. and because a pandemic is
188 sort of the mother of all health threats.

189 Also, because we're in a 24/7 media, internet, news environment and
190 because a this began during a transition in leadership when it could
191 have been in different circumstances that the focus was not on us but
192 was on another part of the government but partly because this
193 information was – we had the information as CDC working with the
194 state and local health departments and having the lab, and partly
195 because we didn't actually have a Secretary of HHS at the time this
196 began and we didn't have an Assistant Secretary of Preparedness and
197 Response. The new one hadn't arrived yet.

198 There were reasons that – or we had one who was going to be leaving.
199 There were reasons that CDC was the natural place to be at the spot
200 light but we certainly, incredible intense interests by the public and
201 the media and, of course, we have a means now to serve that demand.
202 And we had a policy, you know, we were asked to and we probably
203 would have had this anyway but, HHS said we don't want you to turn
204 any media request down. And so we had to figure out how to meet
205 those needs which were huge and both did them by the daily press
206 events and by feeding lots of information out but really by being
207 available for live and taped radio, TV, you know, in person standup
208 kinds of things nonstop. And so it was several of us who were doing –
209 doing the media at that point.

210 Barbara: How did you manage media sensationalism of H1N1, inaccurate
211 reporting misleading information?

212 Anne: I think that we did really well but a couple things helped. One is that
213 a number of us have had risk communication training and for crisis,
214 public health crisis, risk communication is the best communication
215 strategy so the idea of the – the audiences needs were not unfamiliar
216 to us. The other thing is that we, over the year, really worked very

217 closely to anticipate the media's needs. Glen Nowak runs our media
218 office and really was brilliant with his. And HHS did a really nice job
219 as well.

220 We had a workshop for about 50 journalists last August to bring them
221 in here for two days to hear directly from all the scientists in great
222 detail, and from some of us spokes people in less detail, so they'd know
223 what to expect. And then HHS organized three different table tops
224 with reporters in three different cities. The Secretary did work at the
225 White House which I accompanied her on to reach out to print,
226 broadcast and wire reporters twice, and two rounds of those in, I
227 think, the summer. We did two rounds o those to get people familiar
228 with what might be happening, what kinds of things we don't think
229 are stories but they might want to do as stories and give them a
230 common base.

231 In spring, of course, we had to build off the relationships we already
232 had. We didn't have those kinds of things. But actually a lot of the
233 media had been through a pandemic table top years before. So the
234 concepts might have been scary but they were familiar to some of the
235 core media.

236 And then I really think our – our press office was fantastic in
237 preparing us and the Administration had this wonderful policy which
238 was they wanted science and health experts speaking about this. They
239 didn't want politicians. And so we were thrown into being the spokes
240 people.

241 Barbara: In terms of balancing the need of the Organization to inform the
242 public and yet not panic the public through – through the media
243 communication, how – how did that process work?

244 Ann: Well, you know, when you study risk communication in public health
245 crisis, you actually learn that people don't tend to panic. And so
246 whatever the music is on the radio or the TV coverage, you know,
247 panic isn't a natural response usually for this kind of thing. So I think
248 that we had key principles that we wanted to be accurate. We wanted
249 to be rapid. If we could be talking about something before others, you
250 know, we might be able to – to provide the base for the story rather
251 than have to be in a reactive mode. And that we were committed to
252 acknowledge uncertainty, that we weren't going to say we were sure
253 about things when we weren't. And unfortunately, with influenza, it's
254 very hard to be sure about things.

255 So the media interest was the greatest when the uncertainty was the
256 greatest. But we were still viewed as credible sources even with
257 acknowledging the – the many unknowns. And then we really had, I
258 think a commitment to transparency to say, you know, we're working
259 on that. We don't have it yet. We'll get it to you when we can. We're
260 really trying to make sure it's right by the time we give it to you.

261 And I think that with this climate of, you know, just the natural
262 expected suspicions that people have, all the different theories and
263 such, you know, our being as transparent as possible and as, you
264 know, honest as possible, that we don't know everything, that some of
265 these questions you have that might turn out to be right, we need to
266 look into it.

267 So it was, you know, it was both building on communication science
268 and the – the science base that we had.

269 Barbara: So looking back over the past year, from your perspective, are there
270 things that CDC could've done differently?

271 Anne: I think that there's always room to improve. And so there are process
272 issues where something's were harder to do than they should've been,
273 and there are some more fundamental decision making where I think
274 we're really going to need time to help us figure out whether a
275 different anti-viral strategy might have been better. You know, I – we
276 decided to focus, you know -- based on a number of factors, we focused
277 on anti-viral medicines for those who were severely ill, or people who
278 had milder illness with risk factors to get worse. If we'd been more
279 liberal, anybody with any kind of symptoms might -- there have been
280 fewer unexpected complications. Would the healthcare system have
281 done worse because more people would've been showing up to get the
282 anti-virals? Countries did different things and so I think in the next
283 few years, we'll learn a lot about different approaches.

284 So I think that's one question that I wonder about because I know
285 there are, you know, that there are many different ways you could've
286 approached this. I think that certainly some countries decided to go
287 for adjuvant vaccine. We decided not to. By deciding not to go for
288 vaccine, we essentially were stuck with this very slow delivery of
289 vaccine the first month or so of the program. And that was the same
290 time when disease was really on the upswing. I think in retrospect, it
291 was the right decision because we were trying to balance what was
292 acceptable to people with, you know, the idea that there's a known
293 track record for non- vaccine. But I think, you know, one could wonder
294 if we'd – was there any way that we really could've gotten a lot more
295 vaccine quickly given the manufacturing problems. Certainly other
296 ways to monitor and improve that are needed. But from our
297 standpoint, how else could we have gotten a lot of vaccine quickly?
298 Well, maybe by adjuvant. So I think it was the right decision but it's
299 one that I also wonder about.

300 Barbara: You mentioned some processes that you felt could have been improved
301 or – or adapted differently?

302 Anne: Yea, I mean I think a good thing about our response was we really
303 tried to self-correct. You know, there were times where, you know,
304 with an emergency operation center; we had, you know, dozens,
305 probably hundreds of desks of different groups that were focusing on

306 different issues. There was a period where, you know, guidance
307 documents and information were coming from like all over the place
308 and we realized it was taking more time to go through these things
309 than to – than it merited. And that we needed to put a stop on, you
310 know, everybody initiating their own guidance document for this tiny
311 little niche group.

312 And so I think that there – those processes improvements were
313 needed. Could we, you know – or sometimes it took us longer to make
314 the corrections. I think the key process thing that was a struggle for
315 us was the staffing and what looks, from the outside world, like the
316 pace of a response is very different than what a response really needs.
317 So from the world's perspective or the public's perspective or really
318 CDC at large's perspective, April and May were the big times. And
319 June onward, everything was fine.

320 Whereas, for our response, April and May were the discovery
321 investigation phase but June onward, we knew we were going to be
322 having to have evidence based guidance for schools, and evidence
323 based guidance for travel, and evidence based guidance for businesses
324 and we were going to have to have a massive vaccination program
325 planned out to the Nth degree. And it was quite difficult for us to get
326 the staffing you needed quickly in the summer as it was easy to get
327 the staff in the spring when the response was just so obviously in the
328 news.

329 The other thing that was procedurally difficult is the funding. We, you
330 know, May – the weekend of May 17th or 18th, a couple of us spent
331 drafting out a budget for vaccination program and rounds and rounds
332 of policy decisions, emergency funds or Congress appropriates, you
333 know, but the ability to move money from this part of the government,
334 to another part, from within our agency, to states, to locals, to where
335 they can do the vaccination really took extraordinarily too much time.

336 And so the process of how you fund this kind of response and can
337 really be nimble, I don't think we did well despite people were working
338 non-stop, you know, we got our first guidance out, you know, people
339 worked through the July 4th weekend to make sure on that Tuesday,
340 this thing was ready to go and could be posted by the time of this big
341 summit we had.

342 I think that money aspect, had we had a whole lot of vaccine quicker,
343 which would've been great, I'm not sure we would've had the things in
344 place to deliver a ton of vaccine quickly. So that's – that's a process
345 thing that needs a fix.

346 Barbara: Do you have any final thoughts or recommendations that you would
347 like to make?

348 Anne: Well, I think it's been really important that we were taking pandemic
349 seriously before this started because as an agency and with our state
350 and local public health partners, we were, you know, this didn't come

351 out of the blue. A lot of the things that were difficult, we'd thought
352 about. We didn't have answers for all of them but we – we'd try to, you
353 know, improve the systems and the communications and so forth. I
354 think the – the – there are a lots of things I could say for whoever has
355 to be the spokesperson next time about ways to try to do as good a job
356 as possible there. But I think as an agency, a key message is that
357 working together with the other parts of the federal government, and
358 together with the state and local government, rather than having
359 completely separate operations has to be essential to any kind of
360 public health response.

361 Barbara: Great, thank you very much.

362 Anne: Sure. Okay. [audio ends 0:25:29.5]

Interview #14 . Michael Shaw, MD
Associate Director for Laboratory Science, Influenza Division

- 1 Michael: Michael Shaw. I'm Associate Director for Laboratory Science, the
2 Influenza Division, here at CDC in Atlanta. Today is Thursday,
3 February 28, 2010.
- 4 Barbara: Thank you. We're here to develop an understanding of the history of
5 the H1N1 virus as a public health threat and the CDC's response to
6 this threat as it emerged. We want to create an oral history of the
7 organization's response to this public health issue and particularly
8 your role and participation in the CDC response. This is key to helping
9 us document the events and processes that help to shape the
10 organization's response. We hope this history will be useful to future
11 leaders by giving them the benefit of your experience with H1N1 as
12 they confront new and possibly similar challenges. So may we begin
13 with a little background information on you. Could you tell us about
14 your training, your medical specialization and what brought you to
15 CDC?
- 16 Michael: I started in influenza actually when I began graduate school in the
17 1970s. And my first year in graduate school was when the 1976 swine
18 flu incident occurred, the outbreak at Fort Dix, New Jersey. I am
19 basically – I've been primarily influenza ever since. After I got my
20 PhD, I was at the Rockefeller University in New York for a post-doc in
21 Virology Laboratory working with Purnell Choppin, an old influenza
22 person. I was there, became a faculty member. I left there and came to
23 CDC in mid-1980s as a visiting scientist. Then, to University of
24 Michigan at Ann Arbor, Department of Epidemiology which also has a
25 very rich history of influenza. Some of the very first influenza vaccine
26 work was done there. And then after a permanent position opened up
27 at CDC in 1993, I came back here in the Influenza Division. It was
28 just the Influenza Branch at the time and I've been here ever since.
- 29 Barbara: Are you currently involved in some aspect of the response to H1N1?
- 30 Michael: Yes, very much. Our division was the front line. We're the ones that
31 got the first specimens. It was our group in the laboratory that
32 actually identified the virus, was able to tell that it was something
33 different. So we've been in it from the very beginning and will
34 continue to be in it long after most of the people in the Emergency
35 Operation Center stood down.
- 36 Barbara: When did you first heard about H1N1?
- 37 Michael: Well, this particular strain, it was when we first got the specimens
38 and figured out that there was something unusual. It was the – the
39 week after Easter I remember because I was home at the time with
40 my grandsons and had some conference calls, talking about the lab
41 results that had come in, and toward the end of that week was when

42 we realized it truly was something different and we had to get the
43 notification out to basically the rest of the government and to WHO.

44 Barbara: Did you – did it strike you as a potential crisis situation or some
45 serious threat emerging?

46 Michael: Well, at the very beginning, we suspected that it was just another
47 swine influenza that had jumped to humans because these happen
48 maybe three or four times a year. It was only when we got the second
49 case that was unrelated with the same virus, and then a few days
50 later discovered it was in Texas, and the same day we discovered it
51 was the same virus that was in Mexico, everything sort of came
52 together at that point and we realized that it was much, much
53 different from what we'd seen before.

54 Barbara: So when you recognized the – the novelty of this or the uniqueness of
55 this, whom did you notify and what actions did you take?

56 Michael: Well, the first notification goes up the chain. The Director of our
57 center, Ann Schuchat, was one of the first ones notified. Steve Redd,
58 Toby Merlin and the Influenza Coordination Unit, and it went up to
59 the CDC Director who was – Rich Besser – was acting Director at that
60 time. So that was a standard protocol to send it up like that; and they
61 in turn notify HHS in Washington who while at the same time we had
62 been notifying colleagues and WHO and a formal notification was
63 made by the U.S. Government to WHO under the International
64 Health Regulations.

65 Barbara: Could you describe the first few days of this initial response period?
66 What happened?

67 Michael: Well, the first few days, it was making sure everyone who was
68 supposed to know knew and to get as much information out to our
69 partners. Our Influenza Division at CDC is – is a WHO collaborating
70 center in the Global Influenza Surveillance network. There are other
71 collaborating centers in London, Tokyo and Melbourne. So there was a
72 conference call held among these WHO partners at the same time. We
73 shared the information we had, the genetic sequence information we
74 determined at that time and that was not just to let them know what
75 was going on here but so that they could sort of set up the alert in
76 their own countries to see if they were seeing anything similar. So it
77 was on several different levels. There was a ramping up of the
78 laboratory activity here to increase the diagnostics and the – the
79 molecular analysis of the virus, making sure that all the partners in
80 Washington were notified, plus all our partners in WHO.

81 Barbara: Did you find that you needed to make any modifications to your
82 routine business practice or the way that you were doing – conducting
83 business every day?

84 Michael: Well, as – as part of the process, we started sending out the
85 notifications to public health laboratories in the US, requesting

86 specimens, requesting information of any unusual outbreaks they
87 were seeing because this was right at the end of the regular flu season
88 and usually activity is going down. We knew since the virus was in
89 Mexico and that Mexico was a very popular destination for college
90 students going on spring break who were coming home at about that
91 time, it – it – it was logical to increase the surveillance on college
92 campuses too. We very quickly heard about outbreaks in New York
93 City. The specimens started coming in which meant that we had to
94 ramp up our own laboratory activities. Basically people were working
95 around the clock, seven days a week. We started talking to other
96 laboratories at CDC to get assistance from them. And it was soon after
97 that the Emergency Operations Center was activated and we – we
98 started expanding in general all of the laboratory aspects of what we
99 were doing.

100 Barbara: I feel like there was a period of time where you had planning to do in
101 response and perhaps you could talk a little bit about within your own
102 team or organization, the kinds of planning exercises you went on and
103 how you enacted them.

104 Michael: Well, we'd had quite a few exercises during the pandemic planning
105 where we had worked out the – the reporting chain in the Emergency
106 Operation Center. That we could activate pretty quickly. Everyone
107 knew what they were supposed to do. The trick here [inaudible
108 0:08:17.1] was actually ramping up the laboratory activities because
109 that involves expanding into space basically we didn't have because
110 we had already been cramped before the outbreak hit and we had to
111 figure out how to do a lot more work, in basically the same amount of
112 space, with the same number of people. There were a lot of volunteers
113 from other groups who were willing to help. And we couldn't have
114 gotten through it without that.

115 But there were also problems that – that were popping up that we
116 hadn't anticipated. For example, since this was essentially a swine
117 virus and we – we tried to get away from that word, but it did come –
118 it was a swine origin virus. That means that USDA was concerned
119 about it as well. And for transferring animal pathogens within the US,
120 USDA has control over that. So at the beginning, there was the
121 possibility that USDA would have put restrictions on shipment of the
122 specimens if they could be classified as animal pathogens. That would
123 have greatly inhibited our ability to get specimens from these different
124 outbreaks all around the country. So it required some pretty close
125 work with our colleagues at USDA to make sure that restrictions like
126 that weren't put in place, and that we were able to ship specimens
127 quickly.

128 Barbara: Can you give us an idea of approximately how much of your time was
129 devoted to the H1N1 issue?

130 Michael: Well, it – it rapidly consumed just about all of the time. My position is
131 as Associate Director of Laboratory Sciences means that I'm primarily

132 overseeing the three lab branches in the Influenza Division and since
133 they're the ones that first detected the virus, they were the only ones
134 essentially in the world that could've diagnosed it at the time. It
135 required not just getting our own group up but getting the reagents
136 and the tests to the place where we could get them out to other
137 laboratories so that they could do the testing and not everything
138 would have to come to us. That was something we did very quickly
139 and it required us working with FDA too because they have to clear
140 the assay before it can be released for diagnostics. And that was done
141 really in record time, in only like two weeks after identification of the
142 virus. We had these assays out to all the US public health laboratories
143 in well over a hundred laboratories worldwide. So that was a
144 tremendous effort that we were able to build on some structure we
145 already had in place as part of our planning when we didn't know
146 what the next pandemic was going to be.

147 Barbara: Did you find that the time commitments changed as the virus spread?
148 Or did it seem to remain constant?

149 Michael: It did change because in the beginning there was a heavy emphasis on
150 the diagnostics. The people wanted to see if the virus was in their
151 community, was in their state, if it was spreading. After the tests were
152 out there and it was pretty clear the virus was essentially everywhere
153 in the country, the emphasis shifted more to looking at if the virus
154 was developing resistance to anti-viral drugs, if the virus was varying
155 very much because one of the first things we needed to do was – was if
156 the virus was fairly constant, fortunately it was, that made it easier to
157 find a vaccine strain because it meant that they were all essentially
158 alike.

159 So there are a lot of things that had to be scaled up rapidly because
160 just of the nature of influenza. It's a very variable virus so we had to
161 solicit specimens from different areas, from different age patients,
162 from different levels of severity to make sure they had a good picture
163 of – of everything that was going on.

164 Barbara: Did you feel that you got enough information? Were there areas where
165 information was lacking?

166 Michael: I think from the – the US, we got a great deal of very useful
167 information. The problems started occurring when it was spreading to
168 other countries where often these other countries were
169 understandably very – they were getting hit pretty hard themselves.
170 And they had enough trouble keeping up with their own diagnostics to
171 take the time to pack up some virus and ship it off to us so we could
172 look at it. So there were times when we would've liked to have known
173 better what was going on for example in Central and South America
174 and we did send our own people down to train, to help them get their
175 labs up and running. But that's – that's nothing new. That's always
176 been a problem getting – getting current representative specimens
177 from all over the world.

178 Barbara: So looking back over your experience over the past year, what would
179 you have done differently?

180 Michael: Well, actually not much. I think it went very well at the beginning,
181 extremely well. It would've been nice to have – had an idea of what
182 was going on in Mexico earlier than we did. It took a while. We were
183 getting conflicting information for one thing. The outbreaks were
184 scattered around in Mexico. There were reports, it was flu reports, it
185 wasn't flu and, you know, if – if we'd been able to get the specimens a
186 little earlier, it might've given us probably not a lot of time but a
187 couple of weeks, maybe even a month earlier, getting the vaccine out.
188 It could've headed off a lot of the – the fall wave of the virus in this
189 country if we'd had the – the vaccine earlier.

190 Barbara: And do you think the – the main issue with getting the vaccine earlier
191 was related to getting the specimen information?

192 Michael: It was because no one was willing to commit to say that this is a good
193 vaccine strain to use until you have enough information about the
194 circulating viruses to know that it's a good representative. And that
195 just requires data, and data requires time. And that's something you
196 can't speed up.

197 Barbara: Is there a way through maybe external coordination or other agencies
198 that this process could be improved?

199 Michael: In this particular case, it was pretty much our ballgame. All of our
200 planning for pandemics had been assuming it was going to start in
201 some other part of the world, we would have some advance warning.
202 None of our planning included us being an affected country and it
203 definitely didn't include us being the one where the virus was first
204 identified. So we didn't have that advance warning that was factored
205 into all of our pandemic preparations. We were literally right in the
206 middle of it from the beginning and it had clearly spread to multiple
207 places, California, Texas, Mexico, before we even knew it was there
208 which is why I say if we had – I mean, it's – as a scientist you're
209 reluctant to say definitely about anything but it's about as definite as
210 you can get that this started in Mexico. And that gets back to the – if
211 we had gotten down there earlier, gotten specimens earlier and saw
212 that something unusual was going on, it probably wouldn't have
213 stopped the pandemic but it would've given us a little advance
214 warning to get things ready before it – these outbreaks started in the
215 big cities.

216 Barbara: So, in closing, what would you have any particular last thoughts to
217 add or recommendations that you could make?

218 Michael: Well, one – one thing I'd like to emphasize is that, you know, in a
219 situation like this, you really appreciate how – how devoted the people
220 in the laboratories are and they're – they often don't get the credit
221 they deserve. They're the ones that are actually in there working with
222 these specimens that are coming in from the field. They're the ones

223 that actually identified this virus to let us know that something
224 unusual is going on and these people were putting in long hours, not
225 taking time off. They were – I mean, this is what – this is why they go
226 into this field. This is why you choose this as a career. It's the people
227 who are running on adrenaline and they did an incredible amount of
228 work in a short amount of time. And I think everybody surprised
229 themselves. They didn't know they could do so well until the – the gun
230 was pointed at your head.

231 Barbara: Good. Thank you very much. [audio ends 0:17:48.8]

Interview #15. Marsha Vanderford, PhD
Director, CDC Emergency Risk Communication System, Emergency
Operations Center

- 1 Barbara: Could you give us your name and your current position?
- 2 Marsha: Marsha Vanderford and I am the Director of CDC's Emergency
3 Communication System. I'm also the Branch Chief for the Emergency
4 Risk Communication Branch in the division of Emergency Operations.
- 5 Barbara: Are you currently involved in some aspect of H1N1?
- 6 Marsha: Yes, we are still activated in support of H1N1, the response, even
7 though things are ramping down. The Emergency Operations Center
8 has not been deactivated yet and so whenever it's standing up, the
9 Emergency Communication System also stands up.
- 10 Barbara: Do you remember when you first heard about H1N1?
- 11 Marsha: Yes. We were in an after action session from an exercise we had done
12 the week before on hurricanes. And in the middle of that active – or in
13 the middle of that emergency after action activity, I got an email
14 saying something about H1N1 and I remember standing up and
15 leaving the meeting and going back into the Emergency Operations
16 Center to find out that there was confirmation of H1N1 and that
17 people were in the process of determining whether or not there was
18 going to be activation of the Emergency Operations Center in
19 response.
- 20 Barbara: Was there a sense that this was an emerging crisis?
- 21 Marsha: I don't know that I understood it at the moment. We had been
22 preparing for years for pandemic influenza and I think our – our
23 assumptions were that it would be very likely be Avian Influenza. So I
24 – I didn't know quite what H1N1 meant in the spectrum of different
25 kinds of strains of flu, but it – you know, it took, I think, a couple of
26 hours to really get a sense that this was new, this was novel, this was
27 not seen in people before, and then sort of the awareness that this
28 could be – this *could* be the pandemic that we were concerned about.
- 29 Barbara: Could you describe the first few days of this initial response period?
- 30 Marsha: Yeah, I think it was a little bit of a – a surreal feeling if you will. We
31 had done so many exercises in preparation for pandemic influenza.
32 And everyone, I think, had such a heightened sense that this would be
33 such a severe event and that it – it – it – that the repercussions of it
34 would be so dramatic that in the first several days as we were
35 watching this event and trying to gather information, that sense that
36 oh my gosh, this is it. This is what we've been preparing for. And so I
37 think all of those moments of thinking – sometimes it felt like we were
38 still exercising; that – and then you realize, no, this is real. People are

39 sick. People are – this is spreading. So there – for – I think for us in
40 the Joint Information Center which is where the Emergency
41 Communication System sits during an activation, I think there was a
42 sense – and I can remember several of us that afternoon that we first
43 became aware of it, it was maybe seven or eight o'clock at night, and
44 there were several of us still in the Joint information Center, kind of
45 saying to one another, oh my gosh. This is what we've been planning
46 for and preparing for. And at that point, of course, we had no idea how
47 it would unfold, how rapidly it would go but it sure fit from everything
48 we knew the kind of virus that we could anticipate to turn into a
49 pandemic.

50 Barbara: Were your existing plans activated?

51 Marsha: Yes, we have – the Agency had and still has an operational plan for
52 pandemic influenza. We also have a national response plan, and CDC
53 has emergency operation plans, so lots of different layers of plans. And
54 at the moment of activation, the Emergency Communication System
55 occupies the JIC and begins the process of reviewing information
56 that's available, begins gathering information from the media to try to
57 determine what's being said, begins to assemble teams and call people
58 into the Joint Information System – or Center. So all of those things
59 begin happening as per protocol.

60 Barbara: Did you feel that your existing plans met the current situation?

61 Marsha: Well, I think we had been – I think that all hazards plan in terms of
62 how we fit into the organization, the kinds of channels, and
63 distribution and outreach that we were expected to do, all of those
64 kinds of plans that in a sense were content free, those operational
65 plans, I think, yes, worked very well. There were many plans that we
66 created in different places for a pandemic influenza communication
67 outreach.

68 And -- for example, I served on the World Health Organization
69 Communication Sub-task group that developed the implementation
70 and the revision to the implementation guidelines for pandemic
71 influenza. And we had just met two months – a month and a half
72 before this meeting we had in Leone to layout the objectives for
73 communication that fit within the objectives for response as a whole.
74 But all of those assumptions were based on very severe, fast growing,
75 very deadly strain of pandemic influenza.

76 So I think many of the things that we were prepared to do in the first
77 couple of weeks, we were moving in that direction because it was
78 moving quickly, was spreading, nobody quite knew yet what the
79 severity would be. And then suddenly, it was – it was – there was kind
80 of a turning point where I think we realized maybe the first wave was
81 not going to be as severe. And so many of the materials that we
82 developed, many of the objectives that we had for communication

83 didn't fit the reality of that first wave; and then subsequently didn't
84 actually fit the second wave that we had in the fall either.

85 So much of the work that we had done pre-H1N1 was to develop
86 camera ready materials, guidance for the public, for schools and so
87 forth, that as we went through the process, we found were not
88 appropriate for this incident. And so we found that we actually had to
89 start over on many of the things that we sent out to the public because
90 we didn't have – the assumptions of the plans weren't realized in the
91 event.

92 Barbara: In terms of the process you used to quickly recreate these materials,
93 how did you go about that?

94 Marsha: Well, we didn't recreate exactly the same materials. This turned out,
95 especially at the very beginning, I would say, April – late April, all the
96 way through the middle of the summer, to be a guidance driven
97 communication response. And what I mean by that is that the Agency
98 scientists rapidly put out interim guidance for response, for
99 professional audiences, for epidemiologists, for state health officers,
100 for laboratorians, for clinicians. And then from those guidance
101 documents, the communications staff rapidly developed fact sheets,
102 talking points, key points, Twitter messages, text messages, buttons,
103 widgets, RSS feeds and so forth. Those things were taken from the
104 guidance documents and then disseminated through channels and
105 partners.

106 And so the process of going from a highly technical document into
107 public lay audience versions of that was a lengthy one, and sometimes
108 a difficult one because it's hard to go from highly scientific messages –
109 guidance to very easy-to-understand public messages. So the – the
110 answer to the question was it easy to go back quickly to those public
111 messages we developed earlier and re-purpose, it wasn't. It – it took
112 longer than we hoped. So the technical guidance was out there much
113 more quickly and we think effectively. It took us much longer than to
114 translate those and clear those with the scientists for use by the
115 public.

116 Barbara: Is there anything in particular you could recommend in the future to
117 make that smoother?

118 Marsha: You know, it's a hard – I think that was one of our big challenges in
119 communication was that we had a really, you know, expert scientist
120 but a shallow bench. And so the same people who were creating these
121 materials, were also trying to clear audience – lay audience versions of
122 them. And so, you know, when – when these two priorities clash, are
123 we going to issue new guidance documents or update old ones, are we
124 going to spend those energies actually clearing documents for the
125 public that would be more easy – easy to understand, you know,
126 guidance documents win. And so it took us quite a while to do – and
127 sometimes we never got down to the appropriate literacy level.

128 I think the last time we really did a hard look at our web content, for
129 example, it's about 11th grade. And, you know, health communication
130 guidelines on literacy would tell you that you probably ought to be
131 focused on about the 6th grade reading level. And, of course, that has
132 nothing – I mean that's – that's not even dealing with health literacy
133 which is another complicated issue. So that was one of our challenges.
134 And – and I think the – the way to address that is obviously – the best
135 way would be to have more people able to do clearance who aren't also
136 necessary for doing the guidance documents themselves.

137 Barbara: In times of public health emergencies, there are often very heavy
138 demands placed on organizations for immediate and detailed
139 information about the threat situation. Did you find this to be the case
140 with H1N1?

141 Marsha: Sure, and particularly in the first weeks, maybe couple months of the
142 – the event where people were wondering, is this really going to be the
143 severe pandemic we've been waiting for. Our media relations division
144 led by Glen Nowak did a remarkable job of meeting the intense media
145 demands, putting our CDC Director, Dr. Rich Besser, the Acting
146 Director at that time, in front of media daily, sometimes we even did it
147 more than that, answering questions, disseminating guidance and so
148 forth. We also had big demands on our CDC info, the public inquiries
149 line. In terms of numbers of calls, we had lots of requests for, you
150 know, key messages, translations of fact sheets and so forth.

151 So, yeah, we were pretty swamped. I think to give you a sense of – of
152 the response, we started on April 22nd on the H1N1 site, at that point,
153 which was Swine Flu because it had not, at that point, been known to
154 transfer to humans. There was one page and on that day, there were
155 6,000 views of that page. Two days later when we had a confirmation
156 of human cases, then we started to build that capacity. By the middle
157 of July, we had 500 pages of content up and the highest day of views
158 was, I think, sometime in July, was eight million views in one day.

159 So you can kind of see the demand for information just in terms of the
160 number of hits and the change – web page views and the number of
161 changes over that time.

162 Barbara: So in managing the demands, these increasing demands for
163 information, did you find it necessary to make staffing changes...

164 Marsha: Oh sure.

165 Barbara: ...organizational changes?

166 Marsha: Sure. We have in the Emergency Risk Communication branch which
167 is the core, 24/7, 365 communication response branch, we have a little
168 over 30 people. During the time of the spring response, we had in the
169 Joint Information Center which is where all the communication staff
170 comes together, most of it anyway, over 300 people in sometimes three
171 shifts a day across about 15 different teams.

172 Barbara: Did you feel that the communication systems in place at CDC were
173 adequate to respond?

174 Marsha: I think the systems themselves were – were quite strong, were
175 targeted in the right ways. We have some teams that are targeted
176 toward particular audiences such as clinicians. We have some teams
177 that are focused primarily on channels such as web or hotline. And so
178 I think we had covered really the systems that were needed but we
179 didn't always have enough staff to keep up with the demand.

180 Barbara: How about the issue of media sensationalism, inaccurate reporting,
181 misleading information and so on?

182 Marsha: Yeah, I – I think we were very fortunate. We do media monitoring
183 every day. We monitor print, and internet, and television, and radio,
184 and – no, we don't do radio. That's – that's not – that's right. TV,
185 internet, print, blogs, Twitters; and for the most part, the information
186 that was in those media were – were accurate. Sometimes our key
187 messages were not always what we would hope. One of the things you
188 always know with – with media is that the first time you list
189 recommendations for what people can do to protect themselves, they're
190 covered. But we know that people need to be reminded over and over
191 again, especially if a response is long. And the media don't – they don't
192 repeat those very often.

193 So we would find sometimes it wasn't so much that the information
194 wasn't correct but it didn't always include all the things we would
195 hope and that people needed to know.

196 Barbara: In terms of making decisions about what information to release to the
197 public, can you talk about that process?

198 Marsha: There – I think – CDC's default position is really to transparency.
199 We're very fortunate in the leadership we have and, of course,
200 President Obama made very clear as he came into office just before
201 H1N1 hit that there was an expectation of transparency. And so the
202 default position is if we have information that helps protect people,
203 that helps people to do their jobs, and it is cleared and – and verified
204 to the extent that, you know, we could, based on the best information
205 we had, our scientists were very proactive in – in – in wanting to get
206 that information out. And I think just the fact that we did media
207 events almost every day for the first two months and very often what
208 was presented in – in those briefings was before we even got stuff up
209 on the web. That would be the daily update and there would be new
210 information announced in the press conference before it was even
211 cleared to go on the web, I think is – is evidence that – that was, I
212 mean, it was pretty clear that that was our high priority.

213 Barbara: Would you describe the web as being the primarily communication
214 channel with the public?

215 Marsha: No, I – I think, you know, people – news media obviously played a
216 major role in getting people’s attention, in keeping H1N1 in the public
217 awareness even when it got into the summer and the fall when people
218 were not as likely to be attending to it. The website is – is kind of the
219 comprehensive information repository, if you will, so that news media,
220 you know, we can be as complete as we want to in explanations but
221 they’re not going to pick up all of that. So what we hope is that the
222 awareness and the attention that people paid to the media would then
223 drive them to the CDC website where they could look for more
224 information. CDC’s website was the primary website for this response.
225 It was much more comprehensive. We know from our colleagues
226 around the world, the other communication counterparts that – that
227 we work with, that they turned to CDC for information; and even the
228 WHO, you know, the links and so forth, we know that a lot of WHO
229 traffic came to CDC’s website.

230 Barbara: Do you feel that you received the information that you needed in order
231 to create public messages?

232 Marsha: Absolutely. Communication at CDC is very fortunate. There are a lot
233 of places where communication’s kind of an afterthought, after
234 everyone decides what needs to be done, then communication is told to
235 get it out the door. That’s not the case here. Communicators are at the
236 table during briefings. They have an opportunity to brief the Director,
237 to brief senior leadership about what recommendations we have for
238 communication messages. Communicators were embedded in every
239 task force and so even though our Emergency Communication System
240 has the role of coordinating across all of the communications, there
241 were communicators working with the vaccine task force to develop a
242 full campaign for vaccine promotion in the fall; there were
243 communicators sitting with community measures group to talk about
244 social distancing, school closure measures, developing tool kits that
245 would help businesses to create plans and execute them should they
246 have needed to do so.

247 So communication really is an integrated part, I think, of all of our
248 interventions with people understanding that it’s not enough to make
249 the recommendation that you have to consider how it’s going to be
250 communicated at the same time.

251 Barbara: Have these practices been institutionalized for future crises?

252 Marsha: Yeah. The processes of integration of communication into our
253 interventions is institutionalized in all of our emergency planning, so
254 there’s an annex or a separate plan for hurricanes, and for nuclear
255 events should those occur, for bio-terror events. And there’s always a
256 section about how communication works within that system. Right
257 now, we are working on Haiti – the Haiti responses for the earthquake
258 and we are at the table making recommendations, working through
259 the process of developing and disseminating messages. So even before

260 H1N1, those processes were in place and they continue afterwards as
261 well.

262 We have done some different kinds of management of communication
263 in the H1N1 response that's different because it's been such a long
264 one. But I think the inclusion of communication within all of the
265 interventions and planning is still the same.

266 Barbara: In terms of internal communication processes with CDC employees,
267 how did you communicate with them?

268 Marsha: Within the Joint Information Center, there is a desk and the
269 concentration of the team that sits at that desk is for CDC employees.
270 And so throughout this event, there were articles written for the CDC
271 Connects which is our internal web communication forum. There were
272 all hands meetings in which our Director talked about what was going
273 on. There were announcements, you know, from the Director to CDC
274 employees. So I think the way we set up our Emergency
275 Communication System really works to the advantage here because it
276 would be easy to forget your own employees, and you shouldn't
277 because you need their support, and they need to know what's going
278 on as well to protect themselves, as well as to understand how their
279 Agency's playing a role. And we have a team whose focus is on
280 communicating to CDC employees. And so whatever's going on,
281 however we update or talk about issues, that group's role is to
282 communicate it to our employees in the same way as the clinician
283 communication team's role is to look at what's going on and say, what
284 is that needs to be communicated to clinicians out of this information.

285 So having teams that are focused either on channels or audiences
286 helps us not to lose somebody in the pile.

287 Barbara: So in thinking back over the past year of your experience, are there
288 things that you would do differently?

289 Marsha: I think so. At the very beginning of the response, we were organizing
290 all of the communication pieces. And at that point, I think we were
291 trying to sort out what the best organizational structure would be.
292 And over time, I think because of the length of the event,
293 communication got very diffused across a lot of organizations. And I
294 think we were very busy at the beginning in just trying to respond. I
295 think I would have spent more time really thinking organizationally
296 about sort of the long haul instead of getting quite as focused on the
297 response. But it's very hard to do that because there's a million things
298 to be done. And thinking across the long haul is the hardest thing to
299 do when you're in the middle especially of, you know, an intense
300 activation.

301 Barbara: Do you have any other specific recommendations that you would make
302 for future events?

303 Marsha: Planning without locking yourself in. We – we had communication’s
304 staff at work for years getting ready for pan flu. And one of the things
305 that we did to make sure that we would get, you know, our feet on the
306 ground right away was to develop camera ready what we thought were
307 sure fire evergreen messages. And they were beautiful pieces of work
308 done, thoughtful pieces of work done, tested messages done. We spent
309 a lot of resources doing that. And I think what we know now and we
310 probably knew then but we were so sure that – that this would, you
311 know, be a more severe event was that we probably need to be more
312 focused on shells, templates that could be quickly adjusted rather than
313 things that were really camera ready. I would say that – that may
314 have been the thing that – that if we could do it again I would do
315 differently.

316 Barbara: Great. Thank you very much.

317 Marsha: You’re welcome. [audio ends]

**Interview #16. Stephanie ZaZa, MD, MPH (CAPT, USPHS)
Deputy Director for Strategy, Office of Public Health Preparedness and
Response**

- 1 Stephanie: My name is Stephanie Zaza. I'm the Deputy Director for Strategy in
2 the Office of Public Health Preparedness and Response at CDC.
- 3 Barbara: Great. And how long have you been with CDC?
- 4 Stephanie: I've been with CDC for 19 years, and I've been in this position for the
5 past four years. And in a variety of roles, within this position, I've
6 mostly focused on strategy, high-level strategy and policy for CDC
7 regarding preparedness and response generally but also specifically
8 for flu planning. And as part of pandemic planning, I had been trained
9 as one of four or five CDC leaders who could run a very specific kind of
10 decision planning process. And we had done a fair amount of
11 exercising for that process during the several years leading up to the
12 H1N1 response. So I've been involved not only in some general
13 planning and policy for preparedness and response but also some very
14 specific training for influence pandemics.
- 15 Barbara: Great. And are you currently still involved in some aspect regarding
16 H1N1?
- 17 Stephanie: I am. I've been asked to work on some issues in follow up to how we
18 look at our response using oral anti-virals, and how we could
19 potentially improve our ability to not only get those anti-virals
20 distributed from federal asset control in our stockpile but then how do
21 we move those to the states, and then how do we do a better job of
22 tracking those anti-virals in the states and making sure that the
23 people who need them get them. And we've just started that process so
24 I'll be working on that over the next future weeks and months.
- 25 Barbara. Great. Thinking back to about a year ago and the first initial cases of
26 H1N1, do you recall when you first heard about H1N1?
- 27 Stephanie: I do. I was actually in Washington, DC on a three month assignment.
28 And I was at a meeting of the Institute of Medicine in their building
29 and I received an email from Phil Navin who is the director of our
30 emergency operations center asking me to participate in a call of the
31 Department and CDC regarding some cases of an unusual flu in
32 California. I And because the Institute of Medicine building is – I don't
33 know what it's made of, it's Kryptonite or something, and I had to go
34 stand out on the sidewalk to take the phone call because I couldn't get
35 a signal otherwise.
- 36 And so the first I heard about it was on that call and really wasn't
37 quite sure at that point what, if any, role I would have or if this would
38 even really materialize into anything important or major. And at that
39 point, there were I think only a couple of cases and it was an usual

40 virus but nobody really had a very good sense, at least I certainly
41 didn't have a good sense, of what this would turn into.

42 Barbara: And when did you – when do you recall becoming aware that this was
43 in fact going to become a crisis event?

44 Stephanie: Well, it was very rapid after that. You know, the next couple of days,
45 there were a lot of calls and I got pulled off of pretty much everything
46 else I was working on on that assignment which was coming to an
47 end. And Mr. Navin actually contacted me and asked me to serve as
48 CDC's liaison in the both the CDC Washington office and in – with the
49 Assistant Secretary for Preparedness and Response since I was
50 already on the ground in DC.

51 And so I began attending meetings pretty much all day every day
52 including that first weekend. And I think I realized at that point that
53 regardless of the number of cases, this was going to be a big deal and a
54 big response, and that we were going to have to move quickly to figure
55 out what was going on, and if it was going to materialize into
56 something substantial. So I think it was within a day or two, but it
57 was – it was still unclear, I think, even into the first week just how
58 many cases there would be, whether or not it would really turn into
59 anything important. And at that point, I don't recall that the
60 relationship to the cases in Mexico had been established. So it was
61 still really evolving very fast.

62 Barbara: Alright. I understand from your bio that you were involved in either
63 leading or being part of the Plans Unit for the pandemic response? Is
64 that correct?

65 Stephanie: That is correct. I was actually still in Washington. My – it was about a
66 week after that first phone call. And I got a call from Steve Redd late
67 one evening as I was walking back to my apartment. And he asked me
68 to return to Atlanta to assume leadership for some important decision
69 briefings that needed to be made regarding some of our community
70 mitigation measures. So he, in particular, was interested in having me
71 come back and lead a process to help the Agency think through
72 whether or not we should be recommending school closures, which was
73 a very, very big part of the initial response, particularly in New York,
74 and it was costly, and it was very, very difficult to implement, and
75 there were a lot of questions about whether or not we should be
76 recommending that.

77 So I did come back to Atlanta and the second weekend, it was the first
78 weekend in May, began sitting down with a group of people who could
79 provide some of the original – some of that very early data about the
80 epidemiology, and the cases in schools, and children, and teachers,
81 and what we were seeing, and to work through what our options were
82 regarding making this recommendation, and then being able to take
83 that, summarize it and bring it back to leadership group to help them
84 understand what their options were and to make recommendation. So

85 it happened within the first week. I came back to Atlanta and began
86 that process with that particular decision briefing, and then worked
87 on that over the next several weeks.

88 Barbara: And could you describe a little bit the organization in the Plans Unit,
89 and the other people who were involved, and how they were selected to
90 be part of it?

91

92 Stephanie: Uh huh (yes). If I recall, the Plans Unit leadership, I – Toby Merlin
93 was the original leader of the Plans Unit piece that was about decision
94 briefing. There’s a separate element of planning which is the more
95 operational planning which Dave Kennedy and David Maples led in
96 terms of the basics of incident management. But that wasn’t really
97 part of the – the Plans Unit per se that did the decision briefings. Toby
98 Merlin led that. And if I recall, it was me, and perhaps Lisa Koonin,
99 and Lisa Rotz. I actually can’t remember. There were a few other
100 people who had been trained to do this particular method of – of
101 options analysis, and recommendations, and decision briefings.

102 And so they were calling on us to try and run through these processes
103 with the subject matter experts who could provide the data, and could
104 provide some of the reality checks on what those options were. So it
105 was a relatively small cadre of people who were actually on the Plans
106 Unit. But then, if I was given an assignment, so for example, the
107 assignment to do the school closure recommendation, I would then
108 pull in people from the epidemiology Unit, from the group of people
109 who thought about school closures in the past and who’d done some of
110 the original planning for that, and I, you know, I can’t remember, but
111 for each one, it was a generally slightly different group of people based
112 on their expertise.

113 We always tried to bring in an ethicist to help us think through the
114 issues. We would bring in, depending if it was an issue around using a
115 medication, we would bring in somebody from our stockpile program
116 and make sure we brought clinicians in. We would bring in people who
117 understood the particular population that we were trying to affect so
118 we brought in some folks from our Division of Adolescent and School
119 Health for the decision briefing around school closures. So it depended
120 on the issue who we brought into the room for that decision brief.

121 But the Plans Unit itself was actually a fairly small group of people
122 who either led the decision briefs or supported those decision briefings
123 in terms of scheduling meetings, preparing materials and so on. And
124 the two people that I worked with very closely who provided excellent
125 program management, were Mark Frank and Denise Bouvier, and
126 they were just instrumental in keeping the process moving, and
127 making slides, and getting the slides from the – from the meeting
128 room to the executive conference room, and making sure we had
129 everything. They were really terrific.

130 Barbara: Okay, great. And where – what were your sources of information? Did
131 you get – have external sources, internal sources, a combination? And
132 did you feel that you were receiving adequate information for your
133 decision briefs?

134 Stephanie: We had – we generally started with internal sources of information so
135 we were trying to make our decisions based on the data that we were
136 collecting through our surveillance, and lab, and epidemiology
137 programs. And then, we, in a couple of cases, there was a group that
138 Dr. Besser had initiated that they called Team B, which was a group
139 of outside experts from around the country who could weigh in on
140 certain issues and help us think through them from a more practice,
141 or academic, or policy perspective. And a couple of times in doing
142 decision briefs, we would bring a specific question to them and ask for
143 their input, and then we would take that input and bring it into the
144 decision briefing process itself and use that as a source of information.

145 So it wasn't so much having that group vet the decision, but having
146 them provide input on a specific question or specific piece of the
147 decision so that we could use that information to help craft a better set
148 of options and a better set of sometimes the criteria we needed to use
149 to evaluate the options. So we often used only internal sources of
150 information when it was a very technical question. But when it had
151 overtones of policy or major practice decisions, we would generally ask
152 our Team B folks as a very convenient source of sort of reality
153 checking to weigh in on some of the issues.

154 Barbara: Could you think back to the earliest – the earlier days and do you
155 recall what were in the beginning key decisions that you felt or the
156 director felt needed to be made in the first weeks and months?

157 Stephanie: Uh huh (yes). Well as I mentioned, the first – the very first decision
158 brief we did was a very important one on school closures. It was early
159 May, schools were going to be in session for at least another month or
160 two months, and so these decisions about school closures were
161 extremely important. Right after that, we were asked to look at a very
162 important decision around whether we should recommend that
163 colleges, in particular, should cancel commencement exercises. These
164 are a very big deal. They're costly. They bring people from all over the
165 country, if not all over the world, together.

166 And so we were asked to look at that question and provide a
167 recommendation and then write guidance around that. We were asked
168 to look very early on at the issue of whether we should recommend
169 that healthcare workers use N95 respirators versus masks. And that
170 one, I actually don't know how that one ever resolved. I was pulled
171 into a different set of activities before we concluded that one.

172 And then there was another very interesting briefing very early on
173 that they requested a decision briefing on around the use of the
174 previous year's seasonal vaccine. There was some – it was the end of

175 the vaccinating season for the 2008-2009 vaccine, and there was a
176 question as to whether there was any potential use for that vaccine,
177 and it would be expiring at the end of June, and there was, I think, a
178 million doses left in our own federal stockpile. And so there was a
179 question about whether or not we should be using that for something.
180 And so we – those were the four that I was asked to lead a process, to
181 develop options and provide a recommended approach for CDC.

182 Barbara: Great. And has that – do you know or has the Plans Unit become sort
183 of institutionalized in crises response? Is it something that will
184 happen – will be triggered automatically in the future because of your
185 experience?

186 Stephanie: I think so. My understanding is that they're trying to build that into
187 the more generic response profiles. This really did come about in
188 pandemic planning and was something that one of our major
189 contractors brought this method forward and said this could really
190 help as we were – this was the group that had been contracted with us
191 to – to help with our exercise program for pandemic flu over the
192 previous three years. And they suggested this approach as a way to
193 help think through very tricky decisions, to very quickly analyze
194 options and bring recommendation forward. It was very successful.

195 In the exercise program, I think it was instrumental in the actual
196 response and my understanding was that the same contractor was
197 asked to develop a more generic approach and training program for
198 other staff at CDC to learn how to do this and how to lead this
199 approach. My feeling is that it's an extremely systematic but rapid
200 method for looking at a lot of information very quickly and bringing it
201 forward to a leader. As a matter of fact, I ran this process on a
202 completely different issue for a completely different disease with a
203 group of subject matter experts who had never seen this method
204 before, and in two hours, were able to very quickly move through a lot
205 of very complex data and facts, and move to figuring out what our
206 options were to recommend to the director of CDC, and to take this
207 forward to the Department for a decision.

208 So it's a very effective method and one that I use all the time because
209 it suits my style, and it suits my need to move very quickly. And I do
210 think that it will be something that we'll be able to very easily
211 translate over to other types of responses. It's a matter of socializing
212 it, I think, making people more familiar with it, getting additional
213 people trained to lead the process and to also find ways to do it a little
214 bit more quickly. We've – we were initially doing these over the course
215 of a full day or even day and a half, and we've been able to learn how
216 to do it more quickly, and to sort of pre-populate some of the pieces of
217 the decision process, and then let the group actually have something
218 specific to chew on rather than starting with a blank slate.

219 So I think we have a – some steps to take to – to make it more
220 generalizable and to take it forward, but I think it's very useful and I

221 think we'll be using it. I'm already using it so – in my regular course of
222 daily business.

223 Barbara: Great. So taking a step back in sort of the bigger picture, looking at
224 the organization's response generally to H1N1, how would you
225 evaluate it and could you point out strong points or areas where
226 perhaps could be improved?

227 Stephanie: Well, you know, over all, I – my perspective has always been that we
228 did a very good job under very unusual circumstances of not only a
229 pandemic that played out in very different ways than we'd ever really
230 planned for or thought about and we were very flexible and able to
231 move into this different scenario. It was really very different from
232 what we'd planned for. I – so I think we did a good job in being flexible
233 and learning as we went.

234 We also, for better or worse, and I think most of the time it was for
235 better, had – when questions came up or when we weren't sure what
236 to do, we purposefully said what is the – what did we plan for? What
237 did we practice? Let's do that first and figure out how we need to be
238 flexible within that. So we had these very excellent plans to fall back
239 on and start with so that we weren't making everything up as we
240 went. So we were, I think, very flexible within a systematic and
241 practiced approach that we'd been practicing over the previous three
242 years in our exercise program. So I give us full marks on being able to
243 respond quickly, and effectively, and flexibly given the nature of the
244 scenario as it played out.

245 The other very unusual thing that was going on, as I'm sure you're
246 aware, was that the political structures were not in place at – when
247 this all started. We did not have a confirmed Secretary of HHS and
248 her senior staff were not in place until some point in the first couple
249 weeks. She was confirmed on May 4th or 5th which was, you know, full
250 week into it and to her credit, jumped on a very steep learning curve
251 and really did, I think, a great job of stepping into the breach and
252 making sure that the Department had what it needed to do what it
253 needed to do.

254 But that said, I think that there were – we were operating in an
255 environment of – of either no appointed leadership or brand new
256 appointed leadership throughout the entire Department and – and
257 CDC was looked to to lead in that situation and I think that our
258 leadership did an excellent job of stepping in, making decisions,
259 moving things forward, using data to drive decisions, to not letting the
260 expedient or the easy things drive what they did, but to make very,
261 very difficult decisions and then to move those forward. And then, in
262 the middle of all that, to educate a new group of appointed and elected
263 leadership, and to make sure that they knew what was going on, I
264 think they did a very good job.

265 The other thing I think CDC did extremely well was laying out a very
266 clear, and open, and transparent communication process, and making
267 sure that not only were we talking with the people we normally talk
268 to, our state and local health department partners for example in
269 frequent, daily if not multiple times during the day, calls, but also to
270 the public, directly to the public and making sure that our senior
271 leaders were visible and available. I don't know how many press
272 availability sessions they did, and talking points, and interviews. It
273 was constant. And I think that the only way to help lead through that
274 kind of situation is to be very active and proactive in a communication
275 portfolio of activities, and I think they did a very good job on that.

276 We did a good job in, as I said, in following the plans and making sure
277 that when we were asked to do something, we were asked to, for
278 example, distribute anti-viral medications from our federal stockpile
279 to the states, moved the entire, you know, allocation that we were
280 asked to move, within seven days to all fifty states, to the four major
281 cities that we work with directly, to eight territories including those
282 very far away in the South Pacific. So, you know, we were able to do
283 that. We were able to implement, design, develop and disseminate a
284 laboratory diagnostic kit within, I think, two weeks to the state
285 laboratories so that they could do their own testing.

286 So there were a number of things that I think we did very well that we
287 had planned for, prepared for, we thought about and did, and made
288 decisions about very quickly and were able to do.

289 The things that I think were challenging were some of the things that
290 we didn't do as thorough a job planning for. We had done some
291 planning around community mitigation measures, for example, school
292 closures, and risk-based border strategies, you know, do we keep
293 people from coming into the country or leaving the country. But again,
294 we had planned for a completely different scenario and our – our
295 triggers for implementing those types of pretty stringent activities
296 were all based on a much more severe disease. And we had, I think a
297 very difficult time adjusting to a disease where it was very unclear
298 what the overall severity was, and to distinguish that from some of the
299 very severe cases we were seeing in subpopulations, and how do you
300 make decisions then about closing a school when the people at most
301 risk were not necessarily all of the school children but a subset of
302 those children. And I think that was just very, very difficult. I'm not
303 sure how other kinds of planning might have helped in that situation
304 but that is definitely something that I think we need to look at.

305 We also had a very hard time once we sent anti-virals out to the states
306 really having – being able to track what happened, and did the people
307 who needed them get them, and that's further complicated by the fact
308 that – the stockpiled drugs that we were using are also available in
309 the commercial market. So it's very difficult to know when those two
310 different supplies mix together how they're being used. So that was a

311 big challenge and one that we know we need to confront not just for flu
312 but for any other scenario when we're providing medications our
313 ability to make sure that they're getting to the people who need them,
314 not just to the state health department, but to the – the population is
315 something we need to look at a little bit more carefully.

316 I think those were the – the big things regarding some of the things
317 we could've done better. You know, it's hard to say, we were very
318 flexible. We could always have but, you know, people, I think, will say
319 we could've been more flexible. I think there were some challenges
320 with vaccine in terms of meeting expectations because we didn't get as
321 much in the way – as many doses as we thought early on from the
322 manufacturer. So again, was that a – a communication issue? Was it a
323 real issue of availability of vaccine? And how do we do that better?
324 And how do we set expectations for what's going to come and when it's
325 going to be delivered, I think, are important.

326 So those – I think those are the big strengths and weaknesses from
327 what I observed. I'm sure there were others.

328 Barbara: Well, that's great. So just in closing, do you have any other
329 recommendations or suggestions you'd like to – to give for the future?

330 Stephanie: I think that, for me, the most important lesson I learned was that we
331 had done so much planning, and so much exercising in it, I think,
332 really, really paid off in this particular situation, that we were able to
333 rely on that, and use that, and be flexible within what we places had
334 learned in that exercise program. As an Agency, we do not have the
335 resources, and have not been able to either secure or – or reprogram
336 resources to be able to do that for most of our other scenarios that we
337 might be asked to lead through a response. And I think that this was
338 such a valuable piece of the experience that I – I hope that we'll be
339 able to take that lesson and apply it to some of the other areas where
340 CDC will have a – a major role to play, and we need to make sure
341 we're ready to do that and we've done some exercises, and we've
342 rehearsed how we're going to do it, and where some of the challenges
343 are that we may not even anticipate. I think that was the places
344 where we had the biggest problems were the things we didn't
345 anticipate. And so, not even knowing through an exercise program
346 what some of those are really leaves us behind the 8 ball. So I would
347 hope that that's for other parts of the Agency that have other
348 scenarios to contend with. To me, that's probably the biggest issue.

349 Barbara: Great. Well, this is wonderful and thank you very much.

350 Stephanie: You're welcome. [audio ends 0:26:38.6

