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THESIS

BIO-TERRORISM: STEPS TO EFFECTIVE PUBLIC
HEALTH RISK COMMUNICATION AND FEAR
MANAGEMENT

by

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June 2004

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A potentially serious gap exists in the preparedness of the public health system to respond to terrorism: risk communication. Unless this system is better structured to provide American citizens with a clear understanding of the potential risks and hazards associated with a terrorist event – particularly a bio-terrorism event – citizens not only run the risk of taking inappropriate protective actions, but also of experiencing increased (and potentially debilitating) levels of fear.

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BIO-TERRORISM: STEPS TO EFFECTIVE PUBLIC HEALTH RISK COMMUNICATION AND FEAR MANAGEMENT

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ABSTRACT

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EXECUTIVE SUMMARY

A potentially serious gap exists in the preparedness of the public health system to respond to terrorism: risk communication. Unless this system is better structured to provide American citizens with a clear understanding of the potential risks and hazards associated with a terrorist event – particularly a bio-terrorism event – citizens not only run the risk of taking inappropriate protective actions, but also of experiencing increased (and potentially debilitating) levels of fear.

This thesis argues that risk communication is a vital contributor to successful homeland security prevention, response and recovery efforts. The response of the public health sector to the Anthrax attacks of 2001 offered important lessons for the federal government in successful (and unsuccessful) risk communication. Unfortunately, however, many of these lessons have not been applied by state and local public health organizations – organizations that are likely to be on the front lines of any bio-terror attack. This thesis will also show that state public health organizations are overly optimistic in assessing their capacity for risk communication, and could benefit from capacity-building proposals that can be derived from the 2001 Anthrax events. I analyze these proposals for change and examine how they could best be implemented in state public health emergency response planning.

In a survey I conducted of public health officials in an eleven state region (which includes my own state, Colorado) I found that significant opportunities for improvement exist in their emergency preparedness planning. Of particular concern, is the states' limited risk communication planning. Nonetheless, there was a high level of confidence in the states' perceived level of preparedness to respond and communicate risks during a potential bio-terrorism event.

A number of practical measures might be taken to remedy these gaps in planning. The simplest remedy is promotion of existing tools that facilitate risk communication planning- specifically the *CDCynergy* product discussed later in this thesis under recommendations. Furthermore, the Centers for Disease Control and Prevention (CDC)

should create a mechanism to more broadly share valuable lessons learned from their response to Anthrax. This mechanism or forum could also serve as a site for best practice applications compiled from state and local public health agencies involved in Anthrax and other large scale emergency responses. As a long term solution, the creation of a nationwide comprehensive secured repository of resources, computer based training materials, and communication support products as well as subject matter expert contact information would be beneficial. The repository could address planning deficits with ready-made products and facilitate discussions between public health emergency response leaders across state boundaries enabling uniform solutions to regional shortfalls.

Ultimately, there are various means of addressing planning weaknesses but the solutions depend on the ability to of public health agencies to acknowledge and clearly identify the various aspects of the problem.

I.   INTRODUCTION

A potentially serious gap exists in the preparedness of the public health system to respond to terrorism: risk communication. Unless this system is better structured to provide American citizens with a clear understanding of the potential risks and hazards associated with a terrorist event – particularly a bio-terrorism event – citizens not only run the risk of taking inappropriate protective actions, but also of experiencing increased (and potentially debilitating) levels of fear.

This thesis argues that risk communication is a vital contributor to successful homeland security prevention, response and recovery efforts. The response of the public health sector to the Anthrax attacks of 2001 offered important lessons for the federal government in successful (and unsuccessful) risk communication. Unfortunately, however, many of these lessons have not been applied by state and local public health organizations – organizations that are likely to be on the front lines of any bio-terror attack. This thesis will also show that state public health organizations are overly optimistic in assessing their capacity for risk communication, and could benefit from capacity-building proposals that can be derived from the 2001 Anthrax events. I analyze these proposals for change and examine how they could best be implemented in state public health emergency response planning.

In a survey I conducted of public health officials in an eleven state region (which includes my own state, Colorado) I found that significant opportunities for improvement exist in their emergency preparedness planning. Of particular concern, is the states' limited risk communication planning. Nonetheless, there was a high level of confidence in the states' perceived level of preparedness to respond and communicate risks during a potential bio-terrorism event.

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Ultimately, there are various means of addressing planning weaknesses but the solutions depend on the ability to of public health agencies to acknowledge and clearly identify the various aspects of the problem.

A.   SIGNIFICANCE OF THE PROBLEM

The importance of risk communication reflects the transformation of public health into a key contributor to the war against terrorism. Prior to the 2001 World Trade Center and Anthrax attacks, the role of public health agencies was one of in-depth scientific research and provision of community based health services. Now, the challenge to public health lies in its ability not only to fulfill these roles, but also to provide the public with effective, timely advice on how to respond to bio-terrorism.   Terrorism involving biological agents will place special burdens on public health. In other terrorist attacks, whether they involve conventional means or chemical or even nuclear weapons, the existence of the attack is obvious at the moment it occurs. In bio-terrorism, in contrast, there may be a delay between release of an agent and the appearance of disease, and there may be great uncertainties concerning the nature of the disease, its potential to spread, and the best means of prevention and treatment. These problems will guarantee that public health officials play a central role and will require them to communicate extensively with the public and other officials about risk.

Extensive research on communicating risks from environmental hazards to various publics shows that the risk communication process involves far more than then simply communicating information in a crisis. As risk is defined as a "possibility of loss or injury" it is natural that the public seeks information immediately from valued sources to reduce their anxiety and to facilitate decision-making to protect themselves, their

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families and their communities. Effective risk communication requires specific communication skills as well as an understanding of the influence of spokespersons and messages on the audience.

Research on risk communication also highlights the potential consequences of failed communication strategies. An analysis of different strategies used to communicate the risks of Severe Acute Respiratory Syndrome (SARS) is included in this thesis. This international disease event provided a unique opportunity to examine the pros and cons of various communication approaches used to define the risks associated with an unknown and deadly pathogen. The commodity at stake in the risk communication process is the trust of the potentially impacted community in the messenger as well as the message itself. Since the message is intended to compel the community to take specific actions to protect themselves and their families, this loss of trust ultimately undermines the foundation of the public health response. Furthermore, a poor communication approach sets the stage for increased fear reactions in the populace and a movement away from community wide post-event recovery.

In order to assure that best possible approach to the preparedness process, the crisis and risk communication functions in bio-terrorism response must be critical adjuncts to traditional functions essential to reducing the impact of a public health event. Effective risk communication preparedness and planning will prove to be the most critical determinant of the ability of public health organizations to successfully maintain public trust, reduce fear and uncertainty, and guide effective actions to be taken to reduce impacts to individuals and the community.

B. METHODOLOGY AND THESIS STRUCTURE

To assess the degree to which states have incorporated lessons from the Anthrax attacks, and from emerging best practices and findings in the academic literature, I conducted a survey of officials in an eleven state region. This survey region was selected to include all states within the Department of Homeland Security/Federal Emergency Management Agency (FEMA) Region VIII as well as all states bordering the State of Colorado serving as a central focal point for the purposes of this research. As bio-terrorism events do not recognize political boundaries, the goal of this survey was to determine the level of regional planning as it relates to the potential for successful

outcomes in a public health risk communication process. Data on the timing of the integration of bio-terrorism oriented risk communication efforts to the increased availability of funding was also used to predict the impact of future public health emergency preparedness funding reductions, should they occur. I also integrate the findings from the survey with lessons learned by impacted organizations, such as the CDC, and impacted communities including Palm Beach, Florida and New York City, New York.

Chapter II shows how, until quite recently, the U.S. public health system was allowed to deteriorate and describes recent efforts to address some of these deficits through increased funding for bio-terrorism preparedness. It also reviews responses to the SARS outbreak in China, Canada and Singapore in order to illustrate the impact of different approaches to risk communication. Chapter III summarizes existing research on effective risk communication to show why careful planning and practice are likely to be critical for effective bio-terrorism response, and it reviews lessons learned from the Anthrax attacks and other relevant events. Chapter IV assesses the progress that is being made in applying those lessons learned in an eleven state region of the United States and analyzes the continuing shortfalls in state preparedness. Chapter V offers recommendations for future programmatic change and research. It draws especial attention to the need to develop national standards and templates that could provide guidelines for state agencies, and it stresses the need to maintain the funding commitment to public health so that states can continue to improve their preparedness to respond to possible bio-terrorist incidents.

II.   PUBLIC HEALTH IN BIO-TERRORISM RESPONSE

A.   ADDRESSING DISEASE AS A WEAPON

In the fall of 1992, the Institute of Medicine within the U.S. National Academy of Science released a report called *Emerging Infections: Microbial Threats to Health in the United States.* This report noted that "the emergence of infectious diseases in the United States was genuine and authorities were ill equipped to anticipate or manage new epidemics."[1]   As a result of this report, the Centers for Disease Control and Prevention (CDC) undertook a process to enhance their surveillance capabilities and prepare for rapid response to disease outbreaks. This initiative built upon findings from the annual meeting of the American Society of Tropical Medicine and Hygiene in December 1989 where role-playing an epidemic situation identified weaknesses in the public health emergency response system.[2]   It was obvious that the public health system was challenged when dealing with naturally occurring disease under normal circumstances.

Coupled with these structural public health weaknesses was a growing concern about the potential for use of disease as a weapon. American scientists were actively seeking new tools and processes to identify disease earlier and more efficiently. In 1993, Stephen Morse and ProMED, a research project supported by the Federation of American Scientists, organized a meeting at the World Health Organization (WHO) headquarters in Geneva, Switzerland to discuss ways of monitoring disease and other issues contributing to the public health – agricultural crops, livestock, wild-caught animals, and sampled water supply. During the meeting, Dr. Barbara Rosenberg of the Federation of American Scientists acknowledged,

> The perception is growing that more needs to be done to prevent the emergence of new epidemics. This perception comes from *both* the bio-weapons and public health communities.[3]

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[1] Laurie Garrett, *The Coming Plague Newly Emerging Diseases in a World Out of Balance* (New York: Penguin Books, 1995, Farrar, Straus and Giroux, 1994), 7.

[2] Ibid., 593.

[3] Garrett, *The Coming Plague*, 602.

On May 11, 1993, the CDC staged a meeting to discuss the ultimate disposition of the smallpox stocks. At that meeting, the CDC released information about the bio-weapons program obtained from defectors of the former Soviet Union. Following that fateful meeting, Minnesota state epidemiologist Mike Osterholm remarked that he realized that only public health had the ability to address the disease issues directly tied a bio-terrorism event. In the meantime, "(he was) watching the infrastructure for public health in this country deteriorate."[4]

Not until the late 1990's did the scientific community begin to accept that bio-terrorism was a serious threat. Joshua Lederberg and D.A. Henderson, senior public health leaders in disease eradication issues around the world, came forward to focus the attention of public health on this evolving threat. They scoffed at the concept that naturally occurring disease could not be weaponized, that the public was protected by sufficient supplies of vaccines and antibiotics and that no organization would purposefully seek the skills necessary to release disease on society. According to Henderson, "We know that there are nations and dissident groups that have both the motivation and access to skills to selectively cultivate some of the most dangerous pathogens and to deploy them as agents in acts of terrorism or war."[5] Henderson sought to compel public health to take bio-terrorism seriously. Henderson was supported by CDC's Dr. Scott Lillibridge in a statement of concurrence.

> My extreme concern…is that these events will exploit vulnerabilities in our public health system. The lack of capacity at the local level means [biological] isolates may not be confirmed in a timely manner. Preparedness must include the public health community as a full partner.[6]

The stage was set to alter the approach to public health, but resources were not available to move the concept forward.

On March 20, 1995, the Aum Shinrikyo cult released sarin in the Tokyo subway crowded with passengers making their way to work. In the end, 3,938 people were

4 Laurie Garrett, *Betrayal of Trust – The Collapse of Global Public Health.* (New York: Hyperion, 2000), 488.

5 Ibid., 494.

6 Garrett, *Betrayal of Trust,* 495.

injured in the attack and twelve died. [7] Investigation into this attack revealed that the cult had attempted acts of bio-terrorism earlier utilizing Anthrax, botulinum toxin and Query (Q) Fever and that they had tried to obtain and develop weapons using Ebola. A few days afterward, Joshua Lederberg was called to meet with President Bill Clinton, Vice-President Al Gore and the administration's cabinet to discuss means of preventing chemical, biological and nuclear attacks. Lederberg responded that,

> In the nuclear field there is some room for detection. It is much more difficult in the chemical, and biological area – it is next to impossible.[8]

The Aum Shinrikyo attack served as a wake-up call to the world. There were organizations that not only had the interest in developing weapons of mass destruction but also had the means.

As information evolved on the capabilities of terrorist organizations such as the Aum Shinrikyo, information was also being released about bio-weapon activities in the former Soviet Union. Although when challenged by President George Bush in a 1992 meeting, Boris Yeltsin claimed no knowledge of the Soviet Biopreparat bio-weapons program, he asked General Anatoly Kuntsevich to prepare a report. The report released later that year described a program immense in scope.

> Dozens of killers had been weaponized for missile, rocket, and aerial bomb delivery, including anthrax, Q Fever, tularemia, and a host of viruses. And these weapons were tested over the years on Vozrozhdeniya Island located in the middle of the rapidly receding Aral Sea.[9]

Also in 1992, Dr. Kanatjan Alibekov (Ken Alibek), a bio-weapons researcher since 1975 and the deputy chief of the Soviet program since 1987, defected to the West from Russia bringing with him specific information on the country's weapons program. Alibek claimed that during the time he served in a leadership capacity, Biopreparat employed 32,000 scientists and civilians while the Ministry of Defense maintained a staff of another 10,000 military scientists. When asked where all of these skilled bio-weapons workers went after the fall of the Soviet Union, Dr. Alibek's response was simply

[7] Jonathan B. Tucker, ed., *Toxic Terror – Assessing Terrorist Use of Chemical and Biological Weapons* (Cambridge: MIT Press, 2000), 218-219.

[8] Garrett, *Betrayal of Trust*, 496.

[9] Ibid., 512.

"Nobody knows."[10]   With the uncontrolled availability of resources and technical knowledge from the former weapons programs coupled with interest from hostile nations and terrorist organizations, the stage was set for a potential bio-terrorism event in the United States.

As these apparent and ominous biological threats came to light, it further illuminated the weaknesses of public health as a critical infrastructure. In the late 1990's, the Department of Defense trained 27 cities in terrorism response under the auspices of the Nunn-Lugar-Domenici Act but much of the focus was on traditional first responders. Again, D.A. Henderson stepped to the forefront in saying the purpose of the training was wrong. There needed to be a sustained long-term effort to prepare emergency room and public health personnel, firefighters and police.[11] Between 1997 and 1999, the Federal Bureau of Investigations also trained almost 70,000 hazardous materials response team personnel to respond to a bio-terrorism attack as if it were no different than a chemical attack. Michael Osterholm was quick to point out that this was an ineffective means of addressing use of disease as a weapon:

> Biological weapons cause diseases that exist in nature and may occur spontaneously in human populations…The investigation steps for detection and identification of the agent would be the same as that for a naturally occurring agent. Therefore, the first and most fundamental strategy for dealing with bio-terrorism was to develop effective means for combating all infectious diseases…improving the public health infrastructure and biomedical research capacity.[12]

While the nation struggled with how to prepare to respond to a terrorism threat, Senator Bill Frist (R-TN) and Senator Ted Kennedy (D-MA) were moving forward with the Frist-Kennedy Public Health Improvement Act of 2000. This legislation was intended to strengthen basic and long-standing infrastructure shortfalls in public health while also providing "the first line of defense against terrorism and many other threats to the public health."[13] After the 2001 attacks on the United States, Senators Frist and

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10 Ibid., 513.

11 D. A. Henderson, "The looming Threat of Bio-Terrorism," (1999) 283:1279-82 as quoted by Laurie Garrett, 528.

12 Garrett, *Betrayal of Trust*, 540.

13 Sen. Ted Kennedy, *Frist-Kennedy Public Health Improvement Act of 2000 Update,* [Presentation on-line] (July 2001. Accessed 16 February 2004); Available from http://www.naccho.org/downloadfile2.cfm?filenamex=General380.pdf, Internet: 3.

Kennedy again partnered to craft the Bio-terrorism Act of 2001. This act, co-sponsored by a bi-partisan group of 71 senators, called for $3.2 billion in additional public health funding in 2002 to combat bio-terrorism with a commitment to maintain this level of funding in the coming years.[14] With the identification of interest in the use of bio-weapons by terrorist groups and rogue nations, the availability of technical expertise to create or use bio-weapons, and funding to undertake serious preparedness activities, the culture and focus of public health changed.

B. RISK COMMUNICATION AS A COMPONENT OF BIO-TERROR PREPAREDNESS

Effective public health leadership must include a focus on preparedness and planning not only for disease surveillance, detection and response but also its ability to communicate the associated risks in a meaningful fashion to the citizens of the community. As state health officials strive to address a constantly growing list of public health threats while confronting issues of limited staff and diminishing funds for other health programs, bio-terrorism funding and priorities have proven to be both a blessing and a curse. Public health responsibilities are broad and varied as public health workers strive to communicate on a myriad of prevention and treatment issues. As stated by Seattle Public Health Director Alonzo Plough when discussing the plight of state and local health agencies caught in the crossfire, "Terrorism may be the least of their concerns."[15] Decades of research in risk communication clearly demonstrate that citizens can better understand and emotionally assimilate the details of a risky situation if the information on the risk is from a trustworthy source. Communication researchers noted in 1967 that all messages have both content and relationship elements that transmit information in context based on the association of the sender and the audience.[16] The ability of the public health system to be perceived as a trustworthy communication source

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[14] American Society for Microbiology, *Summary of the Frist-Kennedy Bio-terrorism Preparedness Act of 2001,* [on-line] (Accessed 16 February 2004.) Available from http://www.asm.org/ASM/files/LEFTMARGINHEADERLIST/DOWNLOADFILENAME/0000000557/biobilllsum1765%5B1%5D.html, Internet.

[15] Christopher Conte, "Deadly Strains," *Governing,* [on-line] (June 2003, Accessed 19 December 2003), Available from http://www.governing.com/archive/2003/jun/health.txt, Internet.

[16] P. Watzlawick, J. H. Beavin, and D. D. Jackson, "Pragmatics of Human Communication: A Study of Interactional Patterns, Pathologies and Paradoxes" (New York: W.W. Norton & Co, Inc., 1967) quoted in Marsha L. Vanderford, "Communication Lessons Learned in the Emergency Operations Center During CDC's Anthrax Response: A Commentary," *Journal of Health Communication* 8, Supplement 1 (2003): 11-12.

is dependent on its ability to communicate the risks in a timely and meaningful fashion to the citizens of the community. This thesis will outline the challenges of communicating risk prior to, during and following a bio-terrorism event as well as the relationship between the content of the risk communication message and public health officials as messengers.

As the American people strive to understand technology-based threats in today's world of potential terrorism events on native soil, the effectiveness of public health rests on the ability of the system to communicate the risks to the citizens. In the last two hundred years, public health in the United States has evolved from a mechanism to treat sick mariners who were deemed critical to the new nation's security and trade to a $539 billion organization.[17] This federal organization leads a generally cooperative, though not directly conjoined, affiliation of state and local public health agencies now charged with protecting the nation against a myriad of health concerns including bio-terrorism. The focus and purview of the system has been altered drastically. Public health before September 11, 2001 was able to commit a majority of its time and available resources to meticulously tracking down the origin and impact of diseases and providing detailed guidance for an appropriate response based on thorough scientific research, analysis and debate. The public health system today is called upon to quickly identify and treat diseases purposefully introduced into the population to disrupt and disable the American government and cause fear in its people. When an event occurs, there is no time for thorough testing and scientific validation of assumptions, yet the leaders of the nation, the media and the citizens need to know what to do. The public health system can and will respond. The acid test will be whether the system can and will communicate what it knows and does not know quickly enough and effectively enough that it creates a trustworthy source and whether the nation responds appropriately with minimal societal disruption. Public health bio-terrorism response will not be judged on what it does but on what it says.

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[17] Department of Health and Human Services, *FY 2004 Budget in Brief,* [Budget summary on-line] (Washington, D.C., Accessed 16 January, 2004.) Available from http://www.hhs.gov/budget/04budget/fy2004bib.pdf, 2 of 103.

Prior to the attacks of 2001, public health as a system was a critical infrastructure in disrepair. As lawmakers witnessed the successes in eliminating diseases such as smallpox and polio, funding was allowed to progressively decrease until the system itself was weakened and under-resourced. Senate Majority Leader, Dr. Bill Frist noted, "over the past two decades, the [nation's public health] infrastructure has greatly deteriorated."[18] The Center for Studying Health Care Change undertook a study in April 1996 to examine the capabilities of the public health system. Their report targets the limited resources in the wake of increasing private health care costs and a changing society with complex health care issues which looks more often to the community based system for care and treatment. Their findings noted:

> Foremost among the pressures on the system are the diminished levels of state and local funding and the increased fragmentation of public health responsibilities among nontraditional partners in the community. As a result of these and other pressures, the tools and strategies used to address the delivery of public health in the past may not be adequate or appropriate today or in the future.[19]

The report quantified the decrease in funding for public health by highlighting that, in 1993, less than 1% of the U.S. health care dollars went to public health. This statistic represented a 1.7% reduction since 1990 alone. Ironically, as dollars decreased, the public health system core capacities required that the system be responsible for "preventing epidemics…[and] responding to disasters."[20] In the face of limited dollars and competing priorities, there was no room to build capacity to respond to emergencies, particularly of the scope experienced in 2001.

On September 11, the nation found itself struggling with issues of ensuring public safety and, almost immediately, the focus of public health changed from generalized community health to addressing concerns raised by a potential bio-terrorism event. The following year, Congress passed the Bio-terrorism Act of 2002 and appropriated $2 billion to support public health and improve the preparedness functions of this

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[18] Bill Frist, M.D., "Public Health and National Security: The Critical Role of Increased Federal Support," *Health Affairs*, Volume 21, Number 6. (November/December 2002:119 (Photocopy) Available from ProQuest.

[19] Centers for Studying Health Care Change, "Tracking Changes in the Public Health System: What Researchers Need to Know to Monitor and Evaluate These Changes," Issue Brief Number 02 (September 1996: 1.

[20] Ibid.

infrastructure to detect and respond to an act of terrorism aimed at causing illness in the populace.[21] Over \$1 billion was spent simply upgrading public health laboratory capacity, and updating and modernizing computer systems in order for agencies to share information rapidly nationwide. The early phases of bio-terrorism preparedness began with establishing the most fundamental mechanisms to determine if an event had occurred and to send a warning to partners in the nation. State and local health agencies were called upon to draft emergency plans, gather and stock protective and communications equipment, and to undertake a rigorous process of training and exercising of their new plans. Paradoxically, there was little focus on planning for crisis or risk communication to the public on a topic that is, at the same time, frightening and technically complex.

Although included in concept through many components of the Centers for Disease Control and Prevention (CDC) bio-terrorism grant funding, it was not until Budget Year Three (2002-2003) that risk communications took a position of relative significance in public health emergency preparedness. In 2001, the nation watched the events surrounding a diagnosis of Anthrax-caused health effects in Florida, Washington D.C. and New York unfold before them while the public health system struggled to identify and quantify the risks for the public. The CDC estimates there are 57 diseases which are likely vectors for bio-terrorism, but for which no countermeasures exist.[22] This statistic alone presents a mammoth challenge to public health communicators should these diseases ever be used as weapons and the communicators called upon to explain them and the potential impacts to citizens. Project Bio-Shield was funded for a supposed \$5.6 billion under the Bio-terrorism Act of 2002 to increase interest by pharmaceutical companies in biomedical research and development of pharmaceutical counter-

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[21] House of Representatives, Select Homeland Security Subcommittee on Emergency Preparedness and Response, *House Select Homeland Security Subcommittee on Emergency Preparedness and Response Holds Hearing on Disease Surveillance Systems.* 108th Cong., (24 September 2003). Accessed through http://www.cq.com. (Accessed 25 October 2003):1.

[22] Progressive Policy Institute, *America at Risk: Homeland Security Report Card* [report on-line] (Washington, D.C., July 2003, Accessed 16 January 2004); Available from http://www.ppionline.org/documents/HomeSecRptCrd_0703.pdf, Internet, 21.

measures.[23]   However, even if Bio-Shield results in positive outcomes for prophylaxing and treating bio-terror victims, public health will still have the responsibility of recommending the course of treatment and communicating the risks associated with its implementation. Without an effective strategy to develop and disseminate information on risk directly to the leadership and citizens of this country, it is likely that the level of fear will increase drastically and negative consequences will result.

C. ASSESSING THE CRITICALITY OF RISK COMMUNICATION: SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

The 2002 Severe Acute Respiratory Syndrome (SARS) outbreak exemplifies the role of effective communication in dealing with a deadly disease outbreak in which limited scientific data is available. It also shows how politics and communications have the potential of becoming intertwined in a public health emergency. During a presentation on public health preparedness, Dr. Kristine Gebbie, Director of the Columbia University Center for Health Policy and Health Services Research, remarked:

> Public health is 'political health'…(and) that requires outside partners. Politics is NOT science based.[24]

Dr. Gebbie's intent was to demonstrate that effective public health preparedness and response will necessitate interaction and communication with many partners both within and outside the health and medical communities. That being said, internal as well as interagency politics are likely to influence the process but cannot stand in the way of necessary public health response, particularly communication. At the same symposium with Dr. Gebbie, Pulitzer prize-winning science author Laurie Garrett outlined the political differences between the public health response and fear reaction to SARS in China and in Toronto. Key to the differences was the availability of risk information and the perceived credibility of the government agency delivering the message.[25]

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[23] House of Representatives, Select Homeland Security Subcommittee on Emergency Preparedness and Response, *House Select Homeland Security Subcommittee on Emergency Preparedness and Response Holds Hearing on Disease Surveillance Systems.* 108th Cong., (24 September 2003). Accessed through http://www.cq.com. (Accessed 25 October 2003):1.

[24] Kristine Gebbie, (Public Health Leadership Symposium, 8 August 2003. Fort Lewis College) Durango, Colorado.

[25] Laurie Garrett, (Public Health Leadership Symposium, 8 August 2003. Fort Lewis College) Durango, Colorado.

D. RISK COMMUNICATION FOR SUDDEN ACUTE RESPIRATORY SYNDROME (SARS)

China, being the first nation to see the presentation of SARS, struggled with the implications of communicating regarding this new and deadly disease. The World Health Organization (WHO) developed a report in May 2003 on SARS and lessons learned for the immediate future. While examining in depth the mechanics of communication to reduce disease transmission, the WHO also identified the politics that play into the ability to communicate outside the health community to control an outbreak. The WHO was able to determine during their epidemiological investigation that SARS first appeared in the Guangdong Province in mid-November 2002 but cases were not reported. This delay allowed this new disease to take hold and spread. This communication delay also increased the possibility of creating a global outbreak. The WHO report states:

> This is the most important lesson for all nations: in a globalized electronically connected world, attempts to conceal cases of an infectious disease for fear of social and economic consequences must be recognized as a stop gap measure that carries a very high price.[26]

The report goes on to talk about the fear created around the world when SARS information was limited or not deemed as trustworthy.

> …this fear of SARS has spread faster than the virus, causing great social unease, economic losses, and some political changes. Unwarranted discrimination has been another unfortunate problem. In such cases, clear, factual, and reassuring messages need to be issued by trusted authorities. Panic is fueled when information is concealed or only partially disclosed.[27]

As opposed to the China situation, the Toronto SARS outbreak provides a midpoint example of risk communication strategies that were effective in some ways and criticized in others. Some of the Canadian dilemmas could be encountered in the United States if we were confronted with a bio-terrorism event. Effective communication was seen as the cornerstone of the city's response plan to stop the spread of the disease. Toronto officials provided constant website updates, daily news conferences and information updates in eight languages, and set up hotlines that handled more than

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[26] World Health Organization, *Severe Acute Respiratory Syndrome (SARS): Status of the Outbreak and Lessons for the Immediate Future,* [report on-line] (20 May 2003, Accessed 20 February 2004) Available from http://www.who.int/csr/media/sars_wha.pdf, Internet, 8.

[27] Ibid.

300,000 calls (47,567 calls in one day at its peak)[28]. At the same time, this robust communication process was seen as a distraction by Canadian public health leaders. While commending Singapore for their communication strategy, Canadian health officials added that the value in the Singapore approach was it "(left) public health officials and infectious disease experts to focus on the outbreak."[29] A Gallup poll of Torontonians conducted while SARS was still taking lives indicated that two-thirds were either "satisfied" (48%) or "very satisfied" (21%) with the government's efforts.[30] This data was in follow-up to another Gallup poll that indicated that 93% of the city's population had heard about the disease and 79% reported following the SARS situation at least one time each day.[31] A community that remains engaged in the communication process as the outbreak unfolds and reports satisfaction with the communicators is an indicator that the process is working effectively.

Unfortunately, as the community showed appreciation for the public risk communication process, the communication strategy within medical facilities in Canada was faulted because of perceived inadequate information provision to their staffs. Over 40% of Torontonians infected with SARS were health care workers.[32] Nurses associations in Canada complained that hospital administrators were not taking adequate measures to protect them from SARS and they were not informed on procedures to follow to stop the spread within the hospitals. During the second SARS outbreak in Toronto, 93% of the disease cases were acquired in a hospital setting.[33]

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[28] Bonnie J. Henry, "Severe Acute Respiratory Syndrome (SARS) Overview" (Presentation at the National Disaster Medical System Disaster Response Conference 2004, 19 April 2004, Dallas, Texas) Written notes.

[29] National Advisory Council on SARS and Public Health, *Learning from SARS – Renewal of Public Health in Canada* [report on-line] (Health Canada Publications, October 2003, Accessed 22 March 2004) Available on-line from http://www.hc-sc.gc.ca/english/pdf/sars/sars-e.pdf, Internet, 32.

[30] Josephine Mezzucca, "Torontonians Rate Government's SARS Response," *The Gallup Organization – Toronto Bureau,* (29 April 2003, Accessed 22 March 2004) Available on-line at http://www.gallup.com/content; Internet.

[31] Josephine Mezzucca, "SARS: Toronto Residents Alert, Not Alarmed," *The Gallup Organization – Toronto Bureau* (22 April 2003, Accessed 22 March 2004) Available from http://www.gallup.com/content, Internet.

[32] National Advisory Council on SARS and Public Health, 32.

[33] Connie Savor Price, "SARS: the Toronto Experience" (Presentation at the SARS Preparedness Conference, 9 January 2004, Denver, Colorado); Written Notes.

Nurses and support staff expressed frustration with communication delays, (and) impractical or unrealistic directives…Hospital employees described a wide range of feelings – including fear, anger, guilt and confusion – as they struggled with personal risks, social isolation, and stigmatization of their families.[34]

Ultimately, this led to critical staff avoiding the work environment and further reduction of the capabilities of an already stressed system. The quality and quantity of the information on SARS had a direct impact – both positive and negative – on the health response in Toronto. In the end, one of the National Advisory Council on SARS and Public Health recommendations to Health Canada was to "develop and provide training programs and tools to support local public health units and institutions in systematically developing, implementing and evaluating crisis and emergency risk communication strategies."[35]

On the other hand, noted risk communication researcher Peter Sandman and his collaborator Dr. Jody Lanard highlight the successful risk communications strategy undertaken by Singapore as it addressed SARS in its population.

Of course the most important factors in managing SARS are medical. But risk communication matters also, and…Singapore has done state-of-the-art risk communication. Typically, leaders and public health officials tend to box with the public's fear, as if trying to knock it out. Risk communication in a crisis is more jiu-jitsu than boxing — respecting the public's fear, allying with it, and helping the public pivot on its fear toward appropriate vigilance, attentive learning, and productive preparedness.[36]

Beyond the strategy of openness used in Canada, Singapore focused on response based on absolute honesty. Drs. Lanard and Sandman distinguish a difference in approach that precluded "over-reassurance" by public officials that can turn and cause the community to feel "outrage, doubt, and sometimes even panic." Rather than focusing on appearing confident, officials in Singapore recognized the lack of clear information and helped their citizens come to terms with the emotions tied to the uncertainty. Most

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[34] National Advisory Council on SARS and Public Health, 41.

[35] Ibid.

[36] Jody Lanard and Peter M. Sandman, "SARS Communication: What Singapore Is Doing Right" [full unpublished version for *The (Singapore) Straits Times*] (6 May 2003, Accessed 20 March 2004) Available from www.psandman.com/articles/sars-3.htm, Internet, 1.

importantly they laid out the pros and cons of difficult decisions and looked to the population to guide decisions and make the best possible choices for themselves and their families. According to the risk communications experts, "Singapore has occupied the middle ground between people's fears on one side and tentative medical reassurance on the other."[37]

In the end, it will be hard to determine conclusively the quantitative impact of the different international SARS risk communication strategies employed. There are significant cultural, political and economic differences between Canada, Singapore and China even as they and 28 other countries addressed a common threat.[38] A simple comparison of strategies is impossible to make. Regardless of the reasons why information was restricted during the SARS outbreak, the fact remains that this limitation has a snowball effect by eroding public trust and promoting fearful reactions. There are critical bio-terrorism response lessons to be learned in the SARS outbreak and the strategies employed to communicate risk to different audiences – the public, the media and the medical community. In a bio-terrorism event in the United States, will a reviving, diffusely organized and generally untested public health system have the ability to rapidly create, coordinate and disseminate definitive, consistent and useful risk information for all segments of the American public? In a country based on free speech and overlapping media markets, how does public health craft and deliver uniform, trustworthy and authoritative messages on diseases caused by an intentional release of a bio-weapon when a gap exists between the available scientific data and the public's immediate need to know? Effective risk communication planning is the most effective approach to resolving these questions.

E.   CHAPTER SUMMARY

Chapter II has examined the crucial role of risk communication planning in laying the groundwork for effective response to a bio-terrorism event. As the goal of public health is to provide information to the public to help them understand the risks and potential losses or injuries, its most critical responsibility is planning how to rapidly

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[37] Ibid.

[38] China Internet Information Center - China Through A Lens, *Latest SARS Figures Worldwide –July 11, 2003*, [on-line] (Accessed 20 February 2004) Available from http://www.china.org.cn/english/features/SARS/62628.htm, Internet.

translate science in a fashion that helps the citizens take the appropriate actions. This charge is particularly challenging for a system based on thorough research and data analysis. Risk communication in a bio-terrorism event will involve translation of scientific information for a lay consumer, most likely while the technical information is still being discovered. SARS provided an opportunity to examine different risk communication approaches to an unknown and deadly disease while the epidemiological investigation was underway. It is useful to compare the benefits and deficits of these different international strategies when developing public health emergency response and risk communications plans within the United States. There are also lessons learned from CDC and communities impacted by the terrorist attacks of 2001 that provide very valuable guidance for public health planning efforts nationwide. In particular, these lessons point to the critical need to provide information rapidly and consistently even when the technical aspects are still in the making. Effective risk communication will not only sustain, if not enhance, trust in the messenger but also reduce fear and injury and mitigate the social and economic impacts of the event on the community.

III. COMMUNICATING RISK AND MANAGING FEAR: THE LEGACY OF THE ANTHRAX ATTACKS OF 2001

Chapter II highlighted the importance of effective risk communication. This chapter examines how risk communication systems have evolved in the aftermath of the 2001 Anthrax attacks on the United States and also analyzes the lessons learned from that response and from other recent public health emergencies that are applicable to state and local public health agencies.

A. ANTHRAX AS A DEFINING EVENT IN THE EVOLUTION OF RISK COMMUNICATION STRATEGIES AND PLANNING

Public health participation in bio-terrorism response has required many changes in its approach to disease investigation as well as its interaction with the public. Traditionally, public health has served a very specific role as a scientific interface in support of the medical community and as a direct service provider to groups in the community that were not served or underserved due to their lack of resources or special needs. The change in mission not only created a movement away from meticulous research and analysis but also brought public health into partnership with law enforcement as well as into a direct advisory role to the community as a whole.

The differences in investigation processes between public health and law enforcement as it applies to bio-terrorism came to light during the investigation of Anthrax in 2001. The nature of public health requires investigation of bio-terrorism as a covert event. The time and place when a disease makes its presence known is indistinct. A person becomes sick with a disease that may have resulted from an intentional act of bio-terrorism and the disease investigators or epidemiologists must trace the events occurring in that person's life leading up to the onset of disease. Law enforcement officers investigate bio-terrorism as an overt event that begins with a terrorist announcing a release of a biological agent or the detection of a crime scene which evolves as the officers trace clues leading to the identification or apprehension of the person responsible.

Public health learned during the Anthrax response the necessity of maintaining a relationship with law enforcement if it was to communicate risks to the community.

> Confidentiality is maintained in public health investigations for the purpose of protecting sensitive patient medical information rather than national security. In law enforcement, confidentiality is also maintained to protect informants and witnesses and to preserve the integrity of the case for prosecution. Before 2001, most public health officials were not familiar with the principles of maintaining the chain of custody of specimens submitted for microbiologic testing so that laboratory results could be used for criminal prosecution…Partnership between public health and law enforcement is prerequisite to sound bio-terrorism planning and response… Each agency offers a unique perspective and opportunities to share information.[39]

Partnership between public health and law enforcement is a precondition to sound bio-terrorism planning and response.   Anthrax response in 2001 set the stage for collaboration between law enforcement and public health as both sought to investigate an unfamiliar event based on their own directives and provide information within their own mandates and limitations.

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[39] Jay C. Butler, Mitchell L. Cohen, Cindy R. Friedman, Robert M. Scripp, and Craig G. Watz, **"**Collaboration Between Public Health and Law Enforcement: New Paradigms and Partnerships for Bio-terrorism Planning and Response*," Emerging Infectious Diseases* [serial online] (2002 October, Accessed 31 May 2004) Available from: URL: http://www.cdc.gov/ncidod/EID/vol8no10/02-0400.htm, Internet, 8.
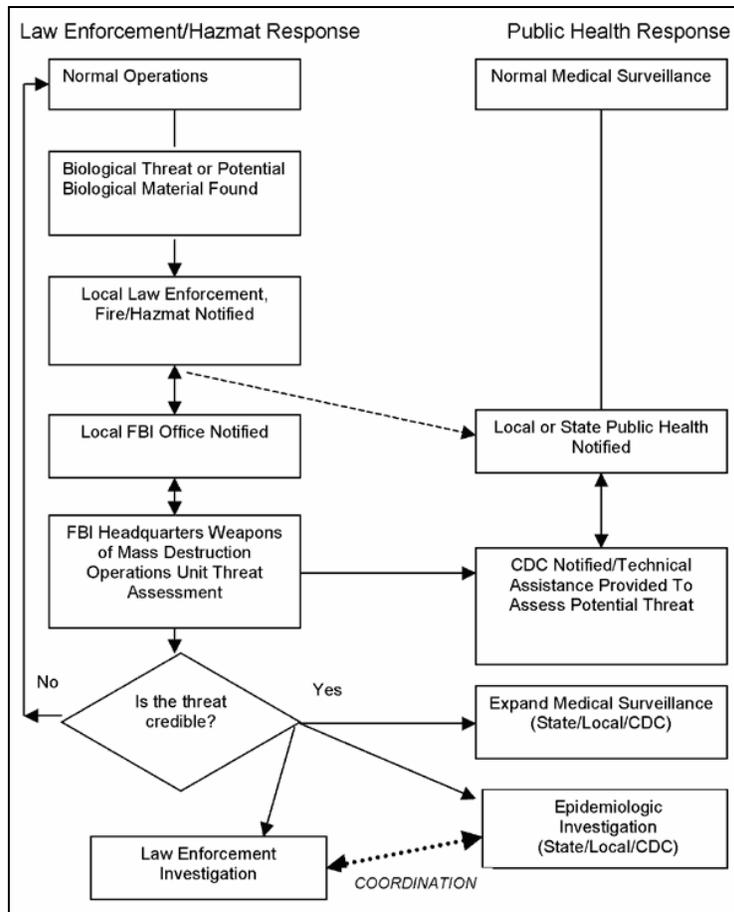
Figure 1.   Coordination Between Public Health and Law Enforcement in Overt and Covert Detection of Bio-Terrorism[40]

In addition to learning how to communicate while working alongside law enforcement when "[c]ollaboration with law enforcement officials generally has not been recognized as beneficial or desirable in public health," the public health system was also addressing its new role of communicating directly to the general public.[41]   Although public health agencies have been tasked with communicating risk directly to the nation in the recent homeland security crisis environment, this has not always been the case.

> Communicating the threat of disease to the public has not always been in the forefront of public health efforts. Federal agencies have focused on scientific accuracy…(and) meticulously recorded the results of public

[40] Ibid.

[41] Butler et al., 8.

health efforts in medical journals, reaching the public directly was, for the most part, left to the press and others who translated scientific journal information for the lay person.[42]

In spite of the best efforts of the CDC and public health communication workers to develop information quickly and accurately as events unfolded following the discovery of a purposeful release of Anthrax in 2001, this new approach would provide complications as well as many opportunities for learning. This learning would prove beneficial during preparedness for the coming smallpox vaccination phase and other emergency communications processes such as occurrences of SARS, West Nile Virus and Monkeypox. These lessons also provided the impetus for a refocusing of the future mission of public health.

In March 2004, the CDC, the Agency for Toxic Substances and Disease Registry (ATSDR) and the Department of Health and Human Services (DHHS) released a document known as *A National Public Health Strategy for Terrorism Preparedness and Response 2003-2008.* In the introductory message from CDC Director Dr. Julie Gerberding she states that this document "exemplifies (their) leadership and captures (their) vision to protect people's health from terrorist threats through a better prepared public health system."[43] The strategy stresses the need for the public health system to prepare for response and specifically highlights the critical role of communication in effective response:

> Crisis and emergency risk communications planning are necessary in order to reduce problems and confusion during an emergency. Plans, policies, procedures and systems must not only be in place, but publicized across the organization to provide effective communication …not only within CDC/ATSDR, but with external groups, including partners, media and the public.[44]

This strategy sets public health agencies on the path to raise emergency preparedness and risk communication to the forefront of their organizational priorities. The Anthrax events alerted public health agencies nationwide to the potential for bio-terrorism within their

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[42] V. Freimuth, H. W. Linnan and P. Potter, "Communicating the Threat of Emerging Infections to the Public" *Emerging Infectious Diseases,* Vol. 6, Number 4 (July/August 2000): 337.

[43] Centers for Disease Control and Prevention, "A National Public Health Strategy for Terrorism Preparedness and Response 2003-2008" [on-line] (Accessed 20 May 2004) Available from http://www.bt.cdc.gov/planning/tprstrategy/pdf/FinalExternalStrategicPlan4-15-04.pdf, Preface.

[44] Ibid., 28.

communities and also provided an opportunity to collect valuable information on the specific challenges public health agencies are likely to be confront in an event. Ultimately, the Anthrax events confirmed the difficulty in communicating risk when scientific data is not available.

Adding to the challenges imposed by an enhanced mission and new partners, one of the earliest lessons learned by public health during the Anthrax response was the need to change work systems in order to handle the quickly unfolding terrorist events. Although the CDC had a crisis management plan and staff skilled in risk communication, those plans were not developed with a response of this magnitude in mind. CDC information routinely flowed through a rigorous review and clearance process to ensure the highest level of accuracy before it was released. This thorough process did not account for the limited availability of validated scientific information, limited communication staff access to technical leads, nor the endless pressure to inform and explain a new public health threat. Initially, the information developed was intended to target professional public health workers and the medical community and was often difficult for the media or the general public to understand.

Within one week of the first indications of a bio-terrorist attack, CDC had retooled its communications processes and sent epidemiologists and communication teams to the impacted area. As the event spread beyond Boca Raton, Florida to three other metropolitan areas (New York, New York, Washington, D.C., and Trenton/Princeton, New Jersey) the need for public health communication resources grew for response to an event that was clearly different from a naturally occurring Anthrax case. With this leap into the realm of bio-terrorism response, public health entered the cycle of "science making – news making – news delivery." CDC and public health agencies nationwide were confronted with the need to look at their preparedness plans and response resources as well as their processes for collecting, processing and delivering information.
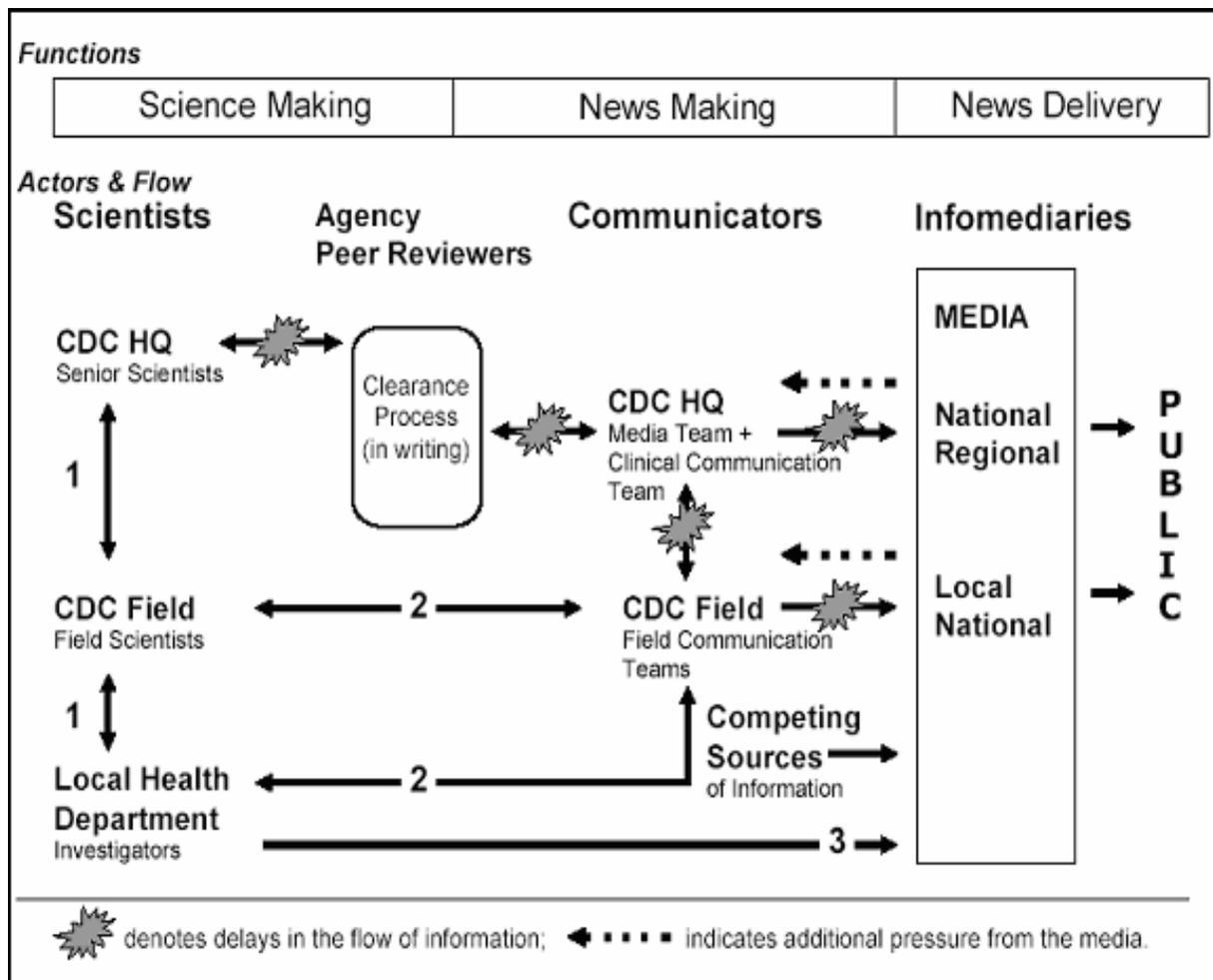
Figure 2.   CDC Communications Flow Early in the Anthrax Response[45]

B.   CRISIS COMMUNICATION LOGISTICS

In order to develop a new way of meeting the demands for information on Anthrax, the CDC created communication teams and brought in the resources of the American Social Health Association (ASHA) to staff an information hotline. CDC designated two teams to work shifts to cover the entire 24-hour news cycle and ensure the development of communication materials understandable by the public and the media. Each team was comprised of approximately 24 individuals. The communications team developed Frequently Asked Questions (FAQs) materials for the affected community, on-site public health workers, postal and decontamination workers, and the lay public, as

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[45] Susan Robinson and Wendy Newstetter. "Uncertain Science and Certain Deadlines: CDC Reponses to the Media during the Anthrax Attack of 2001," *Journal of Health Communications,* Vol. 8 Supplement 1 (2003): 28.

well as web materials. The FAQs were used as an information resource by the media team and the hotline staff while questions compiled by the media team and the hotline staff went back to the communication team to develop other FAQs.[46]

The Georgia Institute of Technology later did a study of the logistics involved in providing crisis and risk communications and identified key components that factored in to the struggles and successes of the process. The researchers found that although the staff interviewed worked in several different areas and functions, common themes evolved on the strengths and challenges.

> Communicators saw a need to prepare for the real work of a large scale crisis…(including) the quick processing and delivery of new information generated by medical investigations. Preparedness in the anthrax crisis played out in three arenas: assignment of space, the uses of technology, and the availability of pre-existing information on the topic of anthrax.[47]

From the beginning, the lack of co-located work space proved to be a difficulty in establishing a viable way to share information in a rapidly changing environment. An emergency operations center (EOC) was created in CDC Headquarters. The EOC workroom was divided into sections to bring together groups addressing issues related to specific sites where Anthrax events had occurred. Unfortunately, the staff developing information for medical personnel was in a building adjacent to the EOC. The staff working with the media was in yet another building. The staff creating the communication tools had to walk between buildings to collect and compile information leading to a reduction in efficiency. Information was available on naturally occurring Anthrax but little actual information was available on Anthrax when used as a bio-weapon. Assembling constantly changing data into meaningful information resources, when communication logistics were cumbersome and access to scientists was limited, became time consuming and inefficient.

To the contrary of findings on CDC operations, the researchers looking at field response found communication efficiencies as communicators, scientists and state/local public health workers were co-located to facilitate the collection and compilation of

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[46] Marsha Vanderford, PhD Telephone Interview by Susan Jones-Hard, Written Notes, 5 March 2004, Atlanta, Georgia and Denver, Colorado.

[47] Robinson and Newstetter, 21.

information. Unfortunately, when not working from a designated location on-site, teams in the field were challenged by the lack of functional communication technology and up-to-date contact information. The researchers quote one communication responder as saying, "I had all this technology hanging off my waist and none of it was working, and everybody was fighting for six LAN lines…one fax machine, one little fax machine for ninety-nine health investigators."[48] As CDC's primary means of communicating with the scientists investigating disease in the field is through electronic methods, technology limitations were a significant challenge.

Since the end of the Anthrax phase the CDC has established an All –Hazards Emergency Communications System (ECS) to rectify some of the difficulties encountered during the response. Twelve specifically selected communicators operate the core functions of the system. These twelve staff members were selected because of their specific training and expertise in crisis and emergency communications, their familiarity with targeted audiences and their ability to translate and channel specific information to their target audience. These key communicators are noted for their ability to work fast and their willingness to work long hours.

The creation of the ECS was a viable solution to CDC internal inefficiencies and redundancies that became very clear during the Anthrax response. Before the Anthrax response each functional component -or "center"-of CDC/ATSDR would launch its own independent communication function once that center had been assigned the technical lead for an emergency event. There was a limited ability to share resources and, unfortunately, a new response approach was built for each new emergency response. In order to allow the carry forward of lessons learned from Anthrax and all subsequent responses, as well as meet the communications needs of many types of communication audiences, the ECS was established. The efficiency of the ECS also allowed the CDC to address the challenge of response to multiple events, while serving as a cross-cutting communication system as well. Ten distinct teams were established within the ECS to create communication materials for targeted purposes. The ten teams are:

- Media
- Public

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48 Ibid., 22.

- Clinicians

- Research

- Web Team

- Public Response Hotline

- Public Health Workforce

- Leadership – designee from the appropriate CDC center office

- Information Management - Coordination group that develops core messages and translations for audiences (literacy/language)

- Policy Makers

According to ECS Senior Medical Advisor Dr. Dan Baden, because of this new approach the CDC "now works more seamlessly with the centers and there is a good understanding of who to turn to for specific information."[49]

Since it was established after the Anthrax crisis, the ECS has been used effectively to handle crisis response and risk communications during the West Nile Virus response, the Smallpox Vaccination initiative, as well as concerns related to SARS, Monkeypox, Hurricane Isabel, the Eastern and Northwestern power outages, BioWatch positives, flu vaccine shortages and the Washington D.C. ricin event. Dr. Marsha Vanderford, Acting Associate Director of the CDC Office of Communications, states that "(the Emergency Communications System) has been absolutely beneficial."[50]

Jana Telfer, the CDC Media Relations lead during the Anthrax response, confirms the value of this coordinated system. During the Anthrax response the media relations function was staffed seven days a week with 12 person teams. She states now they use two sequential teams, but during Anthrax there was not room for two teams working at the same time. Surge capacity was no more than people working longer hours and completing a higher volume of work.[51]

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[49] Dan Baden, M.D., Telephone Interview by Susan Jones-Hard, Written Notes, 20 May 2004, Atlanta, Georgia and Denver, Colorado.

[50] Marsha Vanderford Interview.

[51] Jana Telfer, Telephone Interview by Susan Jones-Hard, Written Notes, 20 May 2004, Atlanta, Georgia and Denver, Colorado.

In addition to the coordinated communication teams, the CDC's interaction with the media has changed. During Anthrax, as with all other previous public health emergencies, media were not allowed on the CDC campus. CDC tele-briefings provided the media access to technical experts by phone but there were no opportunities for television media to broadcast live footage. All follow-up response to the media was one-on-one creating the potential for message disparity. Telfer states that because of lessons learned during Anthrax response:

> TV was allowed on campus for SARS. This was the first time for TV to be present for breaking news and they were able to capture the information as it was said. TV added reach and has made a difference for the public.[52]

C.   MAINTAINING PUBLIC TRUST

1.   Communication, Coordination, Consistency and Value

Because the technical aspects of investigating Anthrax as a bio-weapon were underway while news releases were being developed, the goal of the CDC was to get the most current information out early and maintain the trust of the public. This was particularly challenging as there is no system within the United States that ensures coordination of health functions across public and private sectors and across levels of government. The CDC was intent on coordinating risk communication with local partners in Florida, Washington, D.C., New York, and New Jersey but there was no natural process at that time to facilitate this coordination. According to Dr. David A. Shore of the Harvard University School of Public Health,

> The United States does not have a health care *system.* Rather, we operate as a health care industry, a constellation of unrelated and often fragmented enterprises performing independent functions, often with different (if not competing) objectives.[53]

The challenge for the federal government during the Anthrax response was to determine the nature of the disease as a weapon, communicate this information to the media and the public and try to facilitate a coordinated message from the local community. While the CDC had to focus on global impacts, local public health communicators were faced with the conundrum of addressing those global impacts as

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[52] Ibid.

[53] David A. Shore, "Communicating in Times of Uncertainty: The Need for Trust," *Journal of Health Communications* Vol. 8 Supplement 1 (2003): 14.

they translated them in the context of local social and cultural issues. Although potentially exposed citizens in Florida and at the NBC offices in New York City were treated with Ciprofloxacin, the CDC recommended that local health department provide Doxycycline as a prophylaxis regimen for postal workers in Brentwood, New Jersey. Although the change in the CDC recommendation was based on findings that Doxycycline was equally effective with fewer negative side effects, postal workers interpreted the switch to a less expensive drug as an indication of a lower priority in standard of care and -because of the differences in demographics -potential evidence of racial bias. In order to address this concern, C.A. Walks, the Director of the Washington D.C. Health Department communicated the basis of this change in a presentation before the National Medical Association representing 25,000 African-American doctors across the nation. "With things like this, the first thing we should do is make sure that we're going to get the same medical treatment as everyone else."[54]

During the Anthrax phase, the process of translating science to recommendations for the public entailed challenges beyond the crafting of the messages and coordinating delivery with state and local health agencies. As the previous CDC communication target had been the professional health and medical community, no attention had been focused on ensuring that the communication tools were commensurate with the literacy standards of the general public. Study of how the public health messages directly impacted public understanding of the risks and their subsequent behavioral and emotional response was not the top priority. During a public health emergency it is critical that all those impacted by the event understand the nature of the emergency and take the appropriate steps to mitigate the impact and reduce fear. As noted in a report by three authors representing three aspects of the communication process – public health, the medical community and education - "Communication is also needed to dispel myths, to reduce fears, and, in times of crisis, to alert the public and provide directions for urgent action."[55] The authors found in a review of previous research that most health information documents were

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[54] Felicia Mebane, Sarah Temin and Claudia F. Parvanta, "Communicating Anthrax in 2001: A Comparison of CDC Information and Print Media Accounts, *Journal of Health Communications* Vol. 8 Supplement 1 (2003):76.

[55] Rima E. Rudd, John P. Comings and James N. Hyde, "Leave No One Behind: Improving Health and Risk Communication through Attention to Literacy," *Journal of Health Communications* Vol. 8 Supplement 1 (2003): 104.

tailored to a professional audience and far exceeded the reading level of the general public. They note that findings in education and economics analysis confirm that "the average adult does not have the literacy skills required for tasks in the twenty-first century workplace or for full participation in the activities of everyday civic life."[56] That being said, the challenge of communicating the risks associated with Anthrax to the general public in terms that they understand, that reduce their fear and upon which they will act appropriately is daunting.

During the Anthrax Crisis, it was even difficult to deliver key messages to the American media. On 7 October 2001, the first press release was made discussing the discovery of a positive nasal swab taken from a worker at *The Sun* (the impacted Florida media outlet) suggesting exposure. Although CDC considered an exposure as simply that – that the individual has been exposed to the agent –the media and public began viewing "exposure" as having the disease. Dr. Marsha Vanderford acknowledged the difficulty clarifying this confusion in saying:

> It was hard to explain the presence of a hazard is not the same as an infection. (It was difficult to explain that) finding the presence in the air is not the same as getting sick.[57]

Explaining lab results was also difficult. Neither the media nor the public understood that finding a positive on one test and then a negative on another test did not mean that the first was an indicator nor that it was definitively right or wrong – just a difference in time and place. It was hard to completely explain to the public why public health officials would not just accept the first test as definitive and act upon it.

Regardless of the challenges and complication of response, there was consensus on the operational priority. All three CDC communication leaders interviewed for this thesis agreed that getting out the word quickly is the most critical aspect in a successful response. Dr. Dan Baden, CDC Senior Medical Advisor in the Office of Communications, remarked that the most significant lesson learned during the Anthrax

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[56] Ibid., 108.

[57] Marsha Vanderford Interview.

response was, "Have one consistent message, get it out rapidly and be accurate."[58] However, Acting Media Relations Director Jana Telfer acknowledged, "Getting the message out early is antithetical to scientific investigation."[59]

Unfortunately, even when public health was successful in getting the information out quickly the process of interpreting technical aspects for the lay public was a challenge for the duration of the Anthrax response. The ultimate goal of providing information was to reduce community fear of this bio-weapon and to compel citizens to act appropriately to protect themselves. However, the success in delivering the message is also tied to the ability of the messenger to deliver it. J. Gregory Payne, the Director of Ethics in Political and Health Communication at Emerson College, and Skye K. Schulte, Director of Lead Action at Tufts University, note that mass media and public health priorities have a strong influence on the actions taken by the public but that, "even with pledges for ethical dissemination of information, disconnects often exist between the source of the information and those receiving the message."[60]

The CDC and state and local counterparts were compelled to try repeatedly to explain that the swabs simply lead to an estimation of risk not the likelihood of disease. Public health officials would then need to explain that a series of things happen when they suspect something has occurred and that the swabs are just one in a series of tests used to arrive at the most accurate findings. In spite of repeatedly stating that the swabs were taken as a means of collecting other forms of information for integration into the study of the process, it was not until October 28 (three weeks later) that the first story was published in the Washington Post stating that public health officials were no longer taking nasal swabs because the information was "misleading" as an indicator of potential illness. When reporters had difficulty understanding and interpreting the information on the nasal swabs, it is not surprising that fearful patients began turning to physicians and public health officials for nasal swabs to rule out exposure and, potentially, the disease

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[58] Dan Baden Interview.

[59] Jana Telfer Interview.

[60] J. Gregory Payne and Skye K. Schulte, "Mass Media, Public Health, and Achieving Health Literacy," *Journal of Health Communications* Vol. 8 Supplement 1 (2003): 124.

itself.   Unfortunately, further confounding a confusing and fearful situation, some physicians in Florida would not see patients and referred them back to the local health department, placing additional burden on an already taxed agency.[61]

2. Maintaining Public Trust

Once the information is translated accurately, the next step that public health must consider for successful communication is determining whether the risk communication information will induce the public to take the appropriate steps to address the risk and reduce fear.

Risk communications expert Dr. Vincent Covello notes the critical role of public trust in effective risk communication when the threat is unfamiliar, or when the risk associated with the threat is exotic, direct, involuntary, or of human origin.

> Only when trust has been established can other goals, such as education
> and consensus building be achieved. Trust can only be built over time and
> is the result of ongoing actions, listening and communication skill.[62]

In a recent survey to determine confidence in federal agencies following the harrowing terrorism events of 2001, the Gallup Organization found that the public placed CDC at the top of the list of agencies trusted.[63]   Although the survey does not elucidate the reasons for this high level of regard, it does note that the Federal Bureau of Investigation (FBI) was also rated highly while the Environmental Protection Agency (EPA) received the lowest score. There appears to be a logical progression from these statistics indicating that the agencies identified favorably were perceived to be providing intelligence on the terrorism events and protective services to the public compelling the public to bestow upon them a higher level of trust. EPA, an agency very actively involved in the recovery phase of both events, was not in a position to provide information and protective recommendations to the public and was likely rated lower as a result.

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[61] Timothy O'Connor, E-Mail Interview, 19 May 2004, Electronic Notes, Palm Beach County, Florida and Denver, Colorado.

[62] V. T. Covello, R. G. Peters, J. G. Wojtecki, and R. C. Hyde, "Risk Communication, the West Nile Virus Epidemic, and Bio-Terrorism: Responding to the Communication Challenges Posed by the Intentional Release of Unintentional Release of a Pathogen in an Urban Setting," *Journal of Urban Health,"* Volume 78, (2001): 382-390.

[63] Heather Mason, "Federal Scorecard: Americans Rate U.S. Agencies" *The Gallup Organization* (30 September 2003, Accessed 23 March 2004) Available on-line at http://www.gallup.com/content, Internet.

Public health seems to naturally receive the benefit of public trust provided the important risk information is provided effectively. In an article aptly titled "What Really Scares Us," risk communications author David Ropiek compares perceptions of risk based on different sources of information.

> We trust certain sources more than others. We're less afraid when a trusted doctor or scientist, such as the head of the Centers for Disease Control and Prevention, explains anthrax than when a politician explains it…the more complicated a risk is, the less we can understand it – and the more we treat it like a snake, just to be safe.[64]

The lesson for public health is that the ability to collect information in a bio-terrorism event is just the first challenge in its response. Only by providing continual updates of known information while acknowledging what is not known will public health lay the groundwork of trust essential to the process of communicating risk

3. Communicating Risk and Reducing Fear

Regardless of the actual damages that result, by definition an act of terrorism is intended to create terror in the population. Terrorism researcher Bruce Hoffman notes that, "Terrorism…is deliberately conceived to have far-reaching psychological repercussions beyond the actual target of the act among a wider, watching 'target' audience."[65] Terrorism events will always be of human origin and have a direct and involuntary impact on the immediate community, the nation, and throughout the world. In spite of the familiarity with terrorism events world-wide, the United States has historically been spared the constant attacks encountered in areas such as Israel. As a result, any terrorism event on U.S. soil– even those using common explosives – will be unfamiliar and exotic and will require agencies to communicate risk.

All public health agencies must ensure that they are prepared to communicate risk to their community following a bio-terrorism event whether or not they are directly impacted. Prior to the terrorism events of 2001, public agencies did not have the resources or any implied responsibility to demonstrate that they had information available on terrorist weapons (including biological agents) health impacts, or recovery recommendations. Most did not, and likely still do not, have the material and human

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64 David Ropeik, "What Really Scares Us," *Parade Magazine,* 30 March 2003:12-13.

65 Bruce Hoffman, *Inside Terrorism* (New York: Columbia University Press, 1998):38.

resources to immediately and effectively launch and maintain a risk communication function. Many agencies will be challenged by the resource requirements of simply investigating a significant outbreak and communicating the impacts locally. CDC and the Anthrax impacted areas learned early on that a terrorist attack will require tremendous assets, skills and response capabilities. A concerted planning process will ensure that all resources are addressed. However, an emergency response plan that does not go the next step and address how the public health agency will communicate disease information and protective actions back to the community sets the stage for a loss of trust and credibility. With the loss of trust and credibility the ability to translate the risk and compel the community to take the appropriate steps is hampered from the onset.

Public health agencies, post-2001, must plan how they will communicate risk in tandem with a law enforcement investigation as well as political oversight that will naturally occur simultaneously. Timothy O'Connor, Public Information Director of the Palm Beach County Health Department, developed a paper called "Managing Media and Other Mass Communication during a Bio-terrorist Incident" which outlines the complexities of handling an event in conjunction with these two components. In his paper, O'Connor discusses the early stages of establishing the credibility and trust immediately when "what affects your community can have an effect on the world."[66] This paper details their process of identifying a credible and knowledgeable spokesperson (Dr. Jean Malecki, Palm Beach County Health Department Director, served in that capacity) and creating a good rapport and trust with the media and key stakeholders in the community, including the impacted business and the postal workers. This process was working effectively, even as up to 100 calls were coming in to this local health agency each hour, until the Florida Governor's Office advised the agency to cancel all news briefings on October 9 (Day 6) because there was "no new news and the issue had become a matter of national security." This was further exacerbated on October 10 when the Federal Bureau of Investigation and the Justice Department issued a "stop order" on the health department news conference 30 minutes before it was scheduled to begin. The FBI then announced they would hold a press conference themselves at an unknown

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66 Timothy O'Connor, "Managing Media and Other Mass Communication during a Bio-Terrorist Incident" (Boca Raton, Florida: Palm Beach County Health Department, 2002 Electronic Copy), 1.

location four hours later. The lesson learned noted by O'Connor was: "a sudden and uncertain shift in events creates public distrust, can imply a major breakthrough…and can lead to false implications."[67]

In order to better understand the impact of these shifts on this intricate communication process, it is important to define risk. Dr. Vincent Covello defines risk as "the probability of loss of that which we value."[68] Because the threat directly impacts important aspects of our lives and, frequently, the most basic human need for safety and security, additional care must be taken to accommodate the sensitivity of those impacted to the way the message is developed and delivered. Through decades of behavioral science research, Covello concludes that 50% of the impact a risk communication message has is based on the ability of the communicator to demonstrate caring and empathy for the victims. In equal measures, competence and expertise on the subject matter, honesty and openness on communicating what is known about the hazard and the demonstrated commitment and dedication to address the threat are also critical.[69]

In a bio-terrorism event, it is critical that all public officials collaborate across disciplines and at all levels to ensure the delivery of consistent messages. Specifically, public health officials at all levels will be called upon to translate the risk in such a way that it will cause the impacted community to take the appropriate steps to reduce the risk. If these officials are routinely visible in communicating health risks in this community and have first established credibility through professional competence and expertise, they have laid the groundwork for communicating risk in uncertain, high stress, low trust situations. These local officials can potentially have a very strong impact on influencing behavior. However, if these officials have not practiced delivering these risk messages when they themselves have limited information and are stressed and frustrated, they run the risk of overshadowing the most critical component of risk communication – caring and empathy. If the impacted audience perceives that information is being withheld, the

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67 Ibid., 6-8.

68 Vincent Covello, Risk Communication Slides, Presentation Materials [presentation on-line] (Accessed 4 April 2004) Available from http://healthlinks.washington.edu/nwcphp/pdf/april02slides.pdf; Internet.

69 Vincent Covello, Center for Risk Communication, [data on-line] (Accessed 4 April 2004) Available from http://www.centerforriskcommunication.com, Internet.

ability of the community to identify those officials as credible and trustworthy is highly unlikely. When the source of the message is deemed to lack credibility, it is not likely that the audience will act upon the guidance provided.
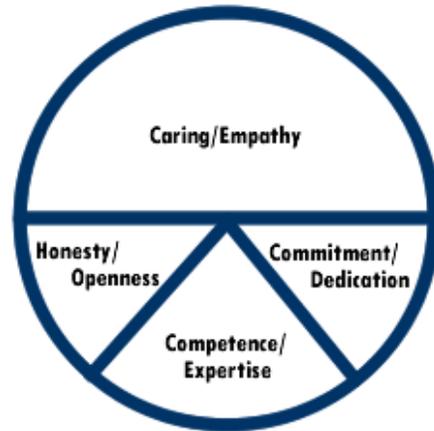
Figure 3.   Key Elements in Trust and Credibility[70]

Beyond the fact that the community will not accept messages delivered by a communicator they do not trust or believe, public health officials attempting to communicate following a bio-terrorism event will be challenged by the public responding out of panic or fear. Unlike naturally occurring disasters where there is an understanding of why or how the event took place, identifiable points of onset, and a general understanding of how events will unfold, it may never be known how or why a bio-terrorism event occurred. After the September 11 attacks on New York City and Washington D.C. communities nationwide pulled together out of shock and horror. In a bio-terrorism event, where the vehicle of terror is a disease, it is difficult to project whether a community will respond in the same cooperative manner or be pulled even farther apart. In most disaster situations, there is not a great likelihood that citizens will panic. However, during the Anthrax events there was evidence that citizens were getting prescriptions for Ciprofloxacin even when there was no indication that they had been or would be exposed to the agent. As the nation recovered from the attacks, government officials provided guidance to people on how to take protective actions – such as being prepared to seal their homes with plastic and duct tape - and businesses preyed on the vulnerability of a frightened nation.

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[70] Ibid.

CDC Media Relations Director Jana Telfer acknowledged the difficulty for scientists to communicate risk in such a way that the public perceives that they and the communicator share the trauma. Telfer explains that the most critical skill for public health agencies is:

> …Understanding what effective risk communication entails. There is an inherent difference between scientific interest and public concerns. Scientists have to acknowledge the human situation. It lets people know you have an understanding of their situation…Scientists must say what they know, what they do not know and how they are going to address the gaps.…Government officials are hesitant to talk about the gaps because it may be perceived as not doing their jobs.[71]

Dr. Peter Sandman's research on risk communication also indicates that it is critical that public health agencies understand, anticipate and be prepared to address the fear as well as the element of public outrage associated with a terrorist attack. Looking at elements of motivation in recovery from a bio-terrorism event it is important to note that this exotic and intentional threat undermines the most basic life processes. Abraham Maslow's Hierarchy of Needs (first proposed in 1954,) identifies that a person must meet their physiological needs as well as ensure they are safe and secure before they will have the motivation to seek a sense of belonging.[72] This community spirit proved critical in the response to the World Trade Center and Pentagon attack and will also be vital in responding to and recovering from a bio-terrorism event and must also be considered during the risk communication process. Public health must be able to communicate with the public in such a way that they will be empowered to protect themselves physically, feel that they are safe and secure and move toward recovery. Public outrage is a natural response of a community impacted by a catastrophic event, particularly if the event occurred because of hostile intent or a transgression of normal standards of morality. Outrage must also be addressed in the public health risk communication planning processes. Risk communication researchers have identified 20 significant outrage factors. They note that as more of these factors are present it is even more difficult to communicate risk, producing a greater likelihood that mistrust, anger and fear will result. In order to address this element, researchers advise that risk communicators work to

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[71] Jana Telfer Interview.

[72] Robert Gynne, *Maslow's Hierarchy of Needs,* [data on-line] (University of Tennessee, Accessed 9 April 2004) Available from http://web.utk.edu/~gwynne/maslow.HTM, Internet.

neutralize public outrage by: finding out what the community wants to know; responding to all requests for information; acknowledging uncertainty; admitting that risk exists; and, releasing information early.[73]

In order to think far enough ahead to effectively collect the resources and hone the skills necessary to reduce fear and public outrage in a bio-terrorism event, risk communication planning is essential. There are many ways to approach risk communication. Public health agencies should select one approach that works best within their organization or community. Risk communication planning has become a standard business function within corporations cognizant that their products could lead to death or injury. This is particularly true after many high profile risk communications events such as the Tylenol product tampering deaths in 1982 and the Exxon Valdez oil spill in 1989.[74]

Although poor risk communication in government agencies does not impact a financial bottom line as it does in private industry, there is an equally detrimental impact to credibility and public trust if public health is not able to effectively deliver key messages. Although there are various ways to prepare for communicating risk, the commonality in the methods is the need for a plan. The most critical aspects of the plan are: 1) establishing communication goals; 2) identifying the various audiences to be reached; 3) developing valuable messages; 4) choosing the best media for the different messages; 5) identifying credible spokespersons and information sources; and 6) developing contingency plans for communication breakdowns.[75]

The health department in New York City is testimony to the fact that effective communication planning is just as important as communication skill. In spite of the availability of staff skilled in communicating risk and even experienced with large impact events, such as West Nile Virus, they were greatly challenged when confronted with a response to the impact of the World Trade Center attacks as well as Anthrax. After 9/11

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[73] Christine R. Barr, *The Art of Risk Communication: Overcoming the Public Fear Surrounding Controversial Projects* [on-line] (Accessed 9 April 2004) Available from http://www.stc.org/confproceed/1994/PDFs/PG5355.PDF, Internet, 54.

[74] Kathleen Fearn-Banks, *Crisis Communications: A Casebook Approach* (Mahwah, New Jersey: Lawrence Eelbaum Associates, Inc., 1996):102-111 and 143-157.

[75] Ibid., 54.

the agency changed its approach to communications. It began developing plans complete with emergency scenarios and messages crafted beforehand. They also established systems that make the best use of their communication staff in a crisis. Sandra Mullin, the Director of Communications and Associate Commissioner of the NYC Department of Health and Mental Hygiene, wrote:

> Until recently, we had not written down a systematic plan of all the actions a crisis warrants. Time and staff deficits made the tasks of thinking through a series of contingent possibilities and associated actions a backburner need. Not so now…we learned through the crisis of 9/11 that not having protocols written down of what to do, what our likely messages are, and who to contact seriously slows down and hampers internal and external communication.[76]

There is no doubt that any health agency in the nation would be challenged by events of the magnitude of the attacks on the World Trade Center. However, if an organization that routinely deals with fast-paced media and addresses the needs of a city of over eight million people is extraordinarily challenged in an extreme crisis, less practiced organizations will be challenged in communicating risk following a bio-terrorist act. Without an effective risk communication process guided by a concerted planning function it is unlikely that the public health agency will be effective in reducing fear.

4. Communicating Risk to Promote Effective Action

Ultimately, the public health goal of communicating risk in a bio-terrorism event is to inform the public in such a way that they will listen to the spokesperson they trust delivering a message that they can understand and upon which they will act to protect themselves, their family, and their community. In order to determine the best person to deliver the most valuable messages in the manner most effective for causing the desired behavior, the CDC and other public health researchers are examining the role of opinion surveys. By surveying how the public responds based on the messages they receive, public health could work to develop messages that promote specific behaviors. This is not the standard process of public health communication. Ironically, the Department of Health and Human Services sponsored HIV/AIDS surveys between 1987 and 1995 but

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[76] Sandra Mullin, "New York City's Communication Trials By Fire, From West Nile to SARS," *Biosecurity and Bio-terrorism: Biodefense Strategy, Practice and Science*, Vol. 1 No 4, 2003 [journal on-line] (Accessed 9 April 2004) Available from http://www.biosecurityjournal.com/PDFs/v1n403/p267_s.pdf, Internet. 272

this significant survey process began years after the epidemic began.[77] By the time the survey process ended, opportunities to change the message to enhance the desired behavior change had already been missed.

CDC's William Pollard also undertook a review of six national surveys of the public's perception before and after the bio-terrorism events of 2001. He examined surveys of assorted groups – the media, health officials and the general public – to better understand how health information is gathered and processed for behavior change. Pollard found that both before and after the Anthrax events most people looked to the media for information. Pollard also found that the number of people who gathered information from public health dropped during the Anthrax response while the interest in collecting information from personal physicians increased.[78] Another survey, on the other hand, demonstrated that the local health department was the most trusted source of information.[79] These surveys would indicate a possible disconnect between the public's interest in receiving risk information from the local health agency as a trusted entity and lack of ready access to the local health agency as an information resource. As actions are most likely to take place after communication from a credible and trusted source, state and local health departments play critical roles in communicating risk leading to the recommended action.

If the goal of collecting data is to confirm or adjust approaches to a problem, retrospective opinion polling is of significantly less value than opinions in the midst of the crisis. Media reports provide valuable information on public perceptions but do not hold the same value as sponsored data collection using scientific methods and controls. In "Using Opinion Surveys to Track the Public's Response to a Bio-terrorist Attack," the authors stress the need for short duration rapid turnaround surveys to help public health craft messages leading to appropriate behavior change. In their article, the authors comment that "epidemics, biological attacks, and battlefield conditions are all similar to

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[77] Robert Blendon, J. M. Benson, C. M. Desroches, and K. J. Weldon, "Using Opinion Surveys to Track the Public's Response to a Bioterrorist Act," *Journal of Health Communications,* Vol. 8 Supplement 1 (2003): 83.

[78] William E. Pollard, "Public Perceptions of Information Sources Concerning Bio-Terrorism before and After Anthrax Attacks: An Analysis of National Survey Data," *Journal of Health Communications,* Vol. 8 Supplement 1 (2003): 97.

[79] Ibid., 100.

political campaigns in that specific events can change the behavior and beliefs of many people in a short time, often a period of a few days."[80] This perspective confirms that constant assessment of public opinion will enable public health to develop messages that influence individual behavior leading to protective actions of the community.

In an effort to assess the value of developing communication tools based on survey findings, the Harvard School of Public Health/Robert Wood Johnson Foundation Survey Project on American's Response to Biological Terrorism undertook a series of telephone surveys between October 24 and 28, 2001. In this survey, the foundation was able to determine which actions the surveyed public was taking to address their concerns about Anthrax. In a very short amount of time they were able to assess the impact these actions were having on the public health and medical communities. They were also able to uncover confusing issues and misperception. However, at this point there is no national planning structure in place that would allow message development to take place based on the concerns identified.

If this data collection process was a common practice in public health communications, officials at all levels could create uniform messages as well as correct or redirect messaging in order to maximize the impact as well as get a more accurate perception of the needs of the community beyond the most vocal population. Dr. Marsha Vanderford of the CDC Office of Communications stated that they are now working with Dr. Robert Blendon of the Harvard Program on Public Opinion and Health and Social Policy to incorporate opinion polling in public health risk communication messages. It was used effectively for mad cow and influenza. The polling was used to identify public misconceptions and their interest in details of where the event falls on the continuum of risk. However, she stops short of stating the CDC is ready to use polling to craft messages during a crisis.

> (Since) Anthrax, public polling has been used to determine if there is a misconception. We don't use it specifically to determine which way a message should go. We are not at that nuanced level yet.[81]

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80 Pollard, 84.

81 Marsha Vanderford Interview.

D.   CHAPTER SUMMARY

Understanding the factors that facilitate or derail effective risk communication processes in public health is critical for maintaining trust and reducing fear following a bio-terrorism event. In this chapter we have addressed the need to identify effective credible and trustworthy spokespersons capable of delivering a message at the appropriate literacy level for it to be useful in affecting behavior to protect individuals and the community. This chapter has identified factors that influence trust as well as ways to craft messages that will lead to a useful link between the messenger, the message, and the needs of the community following a bio-terrorism event. The key factor that will facilitate a strong connection between all aspects necessary to communicate risk is the efficacy of the planning structures that must be intact and practiced to support a communication response of the magnitude of a bio-terrorism event.

This chapter has also expanded on the logistical support components that are critical to establishing and maintaining a public health response to a bio-terrorism event. Without preplanning for staffing, facilities, equipment, resource materials and communication systems necessary during response it is highly unlikely that those resources will be available when the response gets underway. Three organizations with experience and resources – the CDC, Palm Beach County Health Department, and the New York City Health Department – found themselves challenged when faced with this nation's first response to bio-terrorism. Anthrax injured only 22 people in the country – five of which died – but it was responsible for "forever changing the realm of public health."[82] The challenges posed by a response to this limited event will grow exponentially when casualties mount into the hundreds or thousands. Both Anthrax and SARS provided an important opportunity to review the difficulties in addressing an outbreak of unknown origin and etiology. The conundrum of unraveling the science in the midst of informing the public of the associated risk cannot be ignored.

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[82] James M. Hughes and Julie Louis Gerberding, *Anthrax Bio-Terrorism: Lessons Learned and Future Directions* [on-line] (Accessed 30 May 2004) Available from http://www.cdc.gov/ncidod/EID/vol8no10/02-0466.htm, Internet.

IV. THE GROUND TRUTH: A SURVEY OF CURRENT RISK COMMUNICATION PLANNING

To determine the extent to which state public health agencies are actually drawing upon lessons learned from Anthrax and other recent events, and capitalizing upon the emerging best practices at the federal level and analysis in the academic literature, I conducted a survey of officials in eleven states in the region around Colorado on risk communication planning. This chapter summarizes 1) the specific objectives of the survey; 2) its structure and composition; and 3) key findings. The chapter concludes by comparing the survey results with lessons learned from the 2001 Anthrax incidents by the Centers for Disease Control and Prevention and public health officials in Palm Beach, Florida, where the Anthrax was first detected.

A. SURVEY OBJECTIVES

My survey was intended to illuminate the relationship between the risk communication planning and preparedness efforts, and to assess the ability of the public health system, through effective risk communication, to maintain public trust and reduce fear following an actual or potential act of terrorism. The desired outcome of the survey was a projection of the potential for a successful response to a crisis event that requires public health to respond, communicate risks associated with a bio-terrorism threat and influence the public to take appropriate actions to protect themselves and their community. As one rarely has the opportunity for pre-event/post-event research in emergency situations, conclusions must be drawn from involvement in and perceived success with other related events – in this case, state response to Anthrax events and, to a lesser degree, the smallpox vaccination initiative. The survey region was selected to include all states within the Department of Homeland Security/Federal Emergency Management Agency (FEMA) Region VIII as well as all states bordering the State of Colorado serving as a central focal point for the purposes of this research. As bio-terrorism events do not recognize political boundaries, the goal of this survey is to determine the level of regional planning as it relates to the potential for successful outcomes in a public health risk communication process. Data on the timing of the integration of bio-terrorism oriented risk communication efforts to the increased

availability of funding will also be used to predict the impact of future public health emergency preparedness funding reductions should that occur.

B. PUBLIC HEALTH EMERGENCY RESPONSE PLANNING: SURVEY ELEMENTS

The survey that serves as the centerpiece of this thesis was sent to public health leaders in eleven states to help address two critical questions:

- how important is emergency planning to the successful resolution of a public health crisis, particularly crises involving a bio-terrorism agent; and,

- does risk communication planning lead to a more successful community response during a public health emergency?

This survey seeks to answer these questions by examining numerous related dynamics in this process that should contribute to risk communication outcomes . Factors addressed within the survey include:

- The presence of emergency planning efforts within the surveyed agency;

- The point in time when the agency became actively engaged in crisis oriented risk communication and their reported level of experience with public health risk communication;

- The complexity of the agency's emergency planning process as exemplified by the types of threats the agency's emergency plan addresses;

- The level of use of emergency planning tools within the agency as demonstrated by revision and exercising of the plan as a measure of planning process quality;

- The level of risk communication planning as implied by the thoroughness of the risk communication plan itself; and,

- The commitment of the agency to a planned risk communication process as indicated by the timing during which the agency designated or hired a risk communication specialist or lead.

These factors were selected in order to connect preparedness planning efforts to organizational commitment and perceived successes in communicating risk. The original hypothesis of this thesis was that organizations which started planning earlier, spent more time on the development of their emergency plan, developed risk communications plans and identified staff to lead the effort would report a higher level of preparedness and

success. As the survey results will show, this hypothesis did not hold. To the contrary, by these measures the potential for success was marginal while confidence in past and future success was high.

This thesis examines the presence and quality of the public health risk communication planning efforts within an eleven state survey region. As the person responsible for the public health bio-terrorism preparedness efforts for the State of Colorado, I selected this specific survey region to ascertain the level of preparedness activities within our shared Homeland Security/FEMA region. I was particularly interested in examining preparedness levels in adjoining states which have a direct impact on shared resources and media markets in frontier (reduced access, resources and low population) communities on our shared borders.

C.   ROCKY MOUNTAIN WEST PUBLIC HEALTH PREPAREDNESS

As previously identified, it is the responsibility of public health agencies to prepare to respond to a biological terrorism event. The threat has been identified and federal dollars made available to undertake necessary steps to protect the public from a bio-terrorism event. Since 2002, $260,812,003[83],[84] has been provided to a grouping of state health departments, referred to in this paper as the Rocky Mountain West.

I artificially devised this grouping to collect data on the Department of Homeland Security/FEMA Region VIII states as well as all states bordering Colorado as part of my professional responsibility for public health preparedness activities in Colorado. It was my hypothesis that significant planning efforts were underway in the included states since the influx of nationwide public health bio-terrorism funding after 2001. As most of the states in the survey area have a relatively low population, at least compared to coastal states, they had received minimal benefit from the early phases of national counter-terrorism funding. I sought to ascertain when emergency planning efforts began within

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[83] U.S. Department of Health and Human Services, *Bio-Terrorism Funding by State-City-Territory for Fiscal Year 2002* [report on-line] (Accessed 4 May 2004) Available at http://www.hhs.gov/news/press/2003pres/20030902.html, Internet.

[84] Centers for Disease Control and Prevention, *Continuation Guidance for Cooperative Agreement on Public Health Preparedness and Response for Bio-Terrorism – Budget Year Four,*[guidance document on-line] (Accessed 4 May 2004) Available from http://www.bt.cdc.gov/planning/continuationguidance/pdf/annex_b_funding.pdf, Internet.

each state's public health agency, how those emergency plans came into play, the role of risk communication planning in the agency's emergency planning efforts and their perceived level of preparedness as well as success in communicating risk.

Beyond the hypothesis that active planning was underway, I also proposed that the agencies that demonstrated the most significant planning efforts and had the most highly developed risk communication plans would report the highest level of confidence in their preparedness and level of success in responding and communicating risk in an event involving bio-terrorism. September 11 was selected as a primary delineation date as the terrorism mission and priority for many agencies changed then. Terrorism was no longer simply a concern for other nations. The activities related to Anthrax response (particularly planning initiatives) were selected as a critical event for this survey as they represented the first bio-terrorism event in America with nationwide implications. State public health agencies should have understood while they watched federal as well as other state and local public health agencies investigate and respond to actual Anthrax events and hoaxes the potential of bio-terrorism response in their community and the complexity of communicating risk within scientific limitations.

The smallpox vaccination phase was also studied to determine whether lessons learned and resources developed during the Anthrax phase proved beneficial during these bio-terrorism related proceedings. However, as the smallpox communication target was the medical community rather than the lay public, this avenue proved to be of minimal research benefit.

Finally, I investigated when each state had identified a risk communication lead as an indication of the priority of this function in the planning efforts. Unfortunately, as no question was posed in the survey to determine whether this was the person's primary position or role and the professional/educational background of the individual selected as the risk communication lead, prioritization and continuity of the function could not be conclusively determined.

As part of this grouping, the bio-terrorism grant leaders in the health agencies of the following states were mailed a 20 question survey in January 2004 that allowed them

to select answers indicating when different planning events were undertaken as well as how in-depth the planning process was. They were also asked questions allowing them to rate their resulting level of preparedness and success.

Region VIII States	Border States
Colorado	Arizona
Montana	Kansas
North Dakota	Nebraska
South Dakota	New Mexico
Utah	Oklahoma
Wyoming	

Table 1.   Rocky Mountain West States

As we can only assume that a state public health agency is prepared to respond to a biological event based on their available resources (staff) and expertise (plans, events and exercises) this survey targeted those two factors. While there are many elements that will influence the ability of a state health agency to respond effectively to a bio-terrorism event, I chose to focus exclusively on the agency's preparation and perceived skill at communicating risk to the public. In short, regardless of the operations taking place to investigate and treat those impacted by an event, it will be the ability of the agency to translate those operations to the public in a meaningful way that will determine success.

The survey looks specifically at the preparedness activities before September 11, 2001, after the attacks and during the time of concern about "mystery powders" and Anthrax exposure, and during the smallpox vaccination phase. These three segments in time also mirror changes in federal funding levels and public awareness and concern. As most states are completely reliant on federal funding for this type of activity, an agency that simply undertakes required preparedness activities at a point when funding is available is unlikely to maintain the function should the funding be reduced or eliminated. Of most significance is the relationship of the level of knowledge of a respondent about their state's preparedness activities and their perception of success and preparedness in this arena.

Specifically, the preparedness elements addressed within the survey are:

- The presence of emergency planning efforts within the surveyed agency;

- The point in time when the agency became actively engaged in crisis oriented risk communication and theoretical level of experience with public health risk communication;

- The complexity of the agency's emergency planning process as exemplified by the types of threats the agency's emergency plan addresses;

- The level of use of emergency planning tools within the agency as demonstrated by revision and exercises of the plan as a measure of planning process quality;

- The level of risk communication planning as implied by the thoroughness of the risk communication plan itself; and,

- The commitment of the agency to a planned risk communication process as indicated by the timing during which the agency designated or hired a risk communication specialist or lead.

D.   SURVEY METHODOLOGY

The survey questionnaire was developed with the intention of keeping it simple enough that a respondent need only commit five minutes to circle answers and provide the necessary data. Whenever possible, respondents were asked to skip questions that were not applicable based on earlier answers. This attempt to reduce the time needed to complete the survey created some confusion as some respondents answered the related questions anyway or subsequently answered negatively to questions previously answered affirmatively. This dissonance was accommodated by choosing the answer that matched other associated questions in the survey. Items with specific disconnects are noted in the footnotes. A copy of the survey is included as Appendix A.

Prior to the survey being mailed, my staff in the Colorado Department of Public Health and Environment (CDPHE) Emergency Management Program/Focus Area A, as part of ongoing planning activities, had contacted each state health agency by phone to update our list of actual names and addresses of individuals in leadership roles under the Department of Health and Human Services/CDC bio-terrorism cooperative agreement grant or under the Health Resources and Services Administration (HRSA) grant for

hospitals. This planning matrix was used as the basis for the survey undertaken for this thesis. The grants are broken into seven topic categories known as Focus Areas. They are as follows:

- Focus Area A – Preparedness Planning and Readiness Assessment
- Focus Area B – Surveillance and Epidemiology Capacity
- Focus Area C – Laboratory Capacity – Biologic Agents
- Focus Area D – Laboratory Capacity – Chemical Agents
- Focus Area E – Health Alert Network/Communications and Information Technology
- Focus Area F – Risk Communication and Health Information Dissemination
- Focus Area G – Education and Training
- HRSA - Health Resources and Services Administration (HRSA) Hospital Preparedness

On January 16, 2004, the survey was mailed to 109 individuals or job titles. Of the 109 surveys sent, 24 positions were officially unfilled or did not have a specifically named person acting as the program manager for that function. Of the 109 mailed, 44 or 40.3% of the surveys were completed and returned, although a few had little or no data, primarily because the person was new to the job. At least one survey was returned from every state with the exception of Arizona. In May 2004, a follow-up e-mail request was sent to key Arizona public health bio-terrorism leadership staff without success. Most states received eight or nine surveys. Nebraska demonstrated the most robust staffing pattern by identifying 20 separate leadership positions under the CDC and HRSA grants. Interestingly, three of eleven states have vacancies in more than 40% of their leadership positions, which is likely to have a direct impact on their level of preparedness.

The following table outlines the different potentially funded positions under the CDC bio-terrorism and HRSA grants cross-referenced against the survey response matrix. When contact information was known a survey letter went to that person by name. When the position had not been filled in 2003, the survey letter in January 2004 was sent simply to "Focus Area {x} Manager."

For the purposes of survey data compilation, if the position was filled in November/December 2003, the cell for that state under that Focus Area received an "X." If a survey reply was received from a previously vacant position, that cell also received an "X." An empty cell indicates there was no one identified as filling that position in 2003 and no response to the undesignated letter to that position in 2004. All cells in the HRSA column with "?" indicate that there was no responses from that position and, because I did not have a specific HRSA grant contact list to work from, the default response was classified as "unknown" or "?" unless a reply was received. If a reply was received, the cell became an "X." In some states, the laboratory Focus Areas reside in an agency outside the state health agency and, where contact information was provided, those collaborating agencies were included in the survey. It is entirely possible that this collaboration is occurring in other states where there was no contact information provided for Focus Areas C or D. This contact information gap, however, could indicate a preparedness gap if those resources are not readily available to all state response leaders within that state agency.

A cell containing two "X's" is an indication that during either the contact information phase or the survey response phase, the state health agency stated that one person filled both that job and one of the other jobs. As the time and resource requirement for each grant leadership position is extensive, an individual committed to two positions further limits that agency's potential to address both functions adequately and respond quickly and completely.

STATE	BT Section Chief	A	B	C	D	E	F	G	HRSA
Arizona	X	X	X	X		X	X	X	X
Colorado	X	X	X	X	X	X	X	X	X
Kansas	XX	XX	X				X	X	X
Montana	X	X	X	XX	XX	X	X	X	?
Nebraska	X	X	X	XX	XX	X	X	X	?
North Dakota	X	XX	X	X	X		X	X	XX
New Mexico	X	XX					XX	X	?
Oklahoma	X	X	XX	XX	XX	XX	X	X	X
South Dakota	X	X	X	X		X	XX	XX	?
Utah	X	X	X	X		X	X	X	X
Wyoming	X			XX		X	XX	X	?

X = Position Filled
XX = Two Positions Filled With One Person
[   ] = Unknown/No Confirmatory Response (November 2003 Telephone Inquiry or January 2004 Survey Reply)
? = Unconfirmed HRSA data

Table 2.   State Bio-Terrorism Project Leadership Staffing Pattern

The spreadsheet of survey findings can be found as Appendix B.

E.   SURVEY FINDINGS

I developed this survey with the intent of examining the staff leadership patterns in the surveyed region, the timing and composition of the emergency preparedness plans, and the perceived level of preparedness and success resulting from these products and patterns. The survey in included as Appendix A. Forty-four replies were received from ten of the eleven surveyed states.

In the initial section of the survey, I sought simply to identify the perspective from which the survey respondent was viewing the question. The bio-terrorism project manager should have the most global understanding of the preparedness mandates and capabilities, while those in Focus Area A are responsible specifically for establishing all preparedness activities and products and the Focus Area F staff are specifically responsible for ensuring there are plans and resources in place to communicate risk in a bio-terrorism event. Surveys were only sent to Focus Area Managers but I checked to see if other staff responded on behalf of their manager. Only one survey was received

(Colorado Focus Area C) outside the targeted population. The second survey question queried all respondents about whether or not their agency had an emergency response plan before September 11, 2001 as an indication of whether or not their agency had a focus on emergency preparedness independent of the changes in mission or directed funding. My hypothesis was there would be claims of limited planning with no specific expectation of the distribution of responses by position.

In response to the first two framing questions, of the 44 surveys returned, ten individuals (22.7%) listed Focus Area F, or Risk Communications, as one of their primary responsibilities and another three (6.8%) respondents stated that they had a responsibility for the entire bio-terrorism section in their state. Another six (13.6%) of those surveyed are directly responsible for preparedness planning as leaders of Focus Area A. (One Respondent had responsibility for A and F.) As a group, between these 19 individuals there is disagreement about whether or not their organization had an emergency plan before September 11. Focus Area A and F representatives from five states agree there was a plan, in three states the staff disagreed on whether there was a plan, one state's staff "did not know" and there were no A or F staff from the remaining state responding. There were no A or F respondents from three states, including Arizona. As these A and F leaders are likely to have the most insight into the risk communication planning efforts, it is difficult to ascertain which plans actually existed at that time. The table below provides a breakdown of each state's Focus Area leaders that responded to the survey. Persons filling multiple positions are counted as representing both focus areas.

Survey Questions 2 through 6 were developed to collect specific information on the composition and complexity of the pre-9/11 plans – particularly whether the plan included risk communication planning – and how the plan was used. In total, 64% of those surveyed (N = 28) remarked that their state had an emergency response plan before September 11, 2001, 15.9% (N = 7) stated that their state did not have a plan and 20.4% (N = 9) did not know. Of those 28 responding that their state did have a plan, 13 or 46.4% indicated that their plan was significantly robust and addressed five or more different hazards or threats. Fifteen, or 53.5% of the respondents claiming to have a plan, affirmed their state used, trained on or exercised their plan regularly. Unfortunately of

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the 28 respondents that stated their agency had an emergency response plan, only 8 or 28.5% representing four states said that their plan contained a risk communication component for hazards addressed.   Five of the eight indicated that their risk communication plan included more than five of the 19 listed planning components and three of those five identified inclusion of more than half of the components. However, one of those eight was not sure what aspects or functions of risk communication were addressed in the risk communications plan.

STATE	BT Section Chief	A	B	C	D	E	F	G	HRSA
Arizona									
Colorado	X	X	X	X	X	X	X	X	
Kansas		X	X				X	X	X
Montana			X	X	X		X		X
Nebraska		X	X	X	X	X	X	X	
North Dakota	X	X	X		X		X	X	X
New Mexico	X	X					X		
Oklahoma	X			X	X		X	X	
South Dakota	X		X	X					
Utah						X			X
Wyoming				X			X		

Table 3.   Focus Area Survey Respondents by State

The diagnosis of Anthrax exposure in Florida, Washington D.C., New York and Connecticut in November 2001 put public health agencies in the forefront around the country as agencies addressed the potential for exposures in their communities. In some instances, this was a first opportunity for public health agencies to determine risk of public health impacts and communicate the risks to the public. Questions 7 through 9 were developed to ascertain whether this national public health threat served as an initiating event to spur emergency planning functions, whether the plan included risk communication – a prominent public health function during that phase – how extensive risk communication planning was and whether they implemented their plan.

One of the public health bio-terrorism leaders surveyed stated that his agency developed an emergency plan during this phase, which also contained a risk communication component. Unfortunately, in spite of all the attention paid to this public health hazard, 57.1 % (N = 4) of the survey respondents who stated their agency did not have a plan before September 11 acknowledged that their agency still did not have an emergency response plan by the end of the Anthrax phase. Another eleven did not know.[85] Thirteen of the 29 respondents claiming to have a plan (44.8%) stated that they implemented their emergency plan during the Anthrax phase (between October 2001 and June 2002.)

In drafting Questions 11 and 12, I was seeking to understand how prepared the respondent felt their agency was to respond and communicate risks during the Anthrax phase and how successful they felt their efforts were. The author's hypothesis was that the individuals reporting the most lengthy and comprehensive planning efforts - whether or not plans specifically included risk communication planning – would express the highest level of confidence in their preparedness and resulting success.

The breakdown of perceived level of preparedness of their agency to answer questions regarding the risk of anthrax exposure in their state regardless of whether or not they had a plan is as follows:

Extremely Prepared	0
Very Prepared	10
Prepared	18
Unprepared	12
Very Unprepared	0
Extremely Unprepared	0
No Answer	4

Table 4.   Reported Level of Preparedness to Answer Questions Regarding Anthrax Exposure Risk

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[85] Four respondents that stated they had an emergency plan before September 11, 2001 also claimed not to have a plan during the anthrax phase. This is interpreted as a misunderstanding of the question or an error in response and the first affirmative is accepted for the purposes of this study.

While 40% (N = 2) of the five respondents who noted their agency did not have an emergency plan by the end of the Anthrax phase felt their agency was "Unprepared" to communicate risk, it is interesting to note that 60% (N = 3) of those without plans rated their readiness as "Prepared." Two other respondents who did not know if their agency had a plan also felt that they were "Prepared" while the other three "Do Not Know" respondents that answered the question said they were "Unprepared."

Ironically, seven of the of the 28 that claimed to have an emergency plan prior to September 11 - an assumed indication of preparedness - responded that they felt "Unprepared" to answer questions regarding the risk of Anthrax and the appropriate steps to take to mitigate risk. When comparing the responses to the question of preparedness level to perceived success in communicating risk, one would expect to find direct correlations. As there is no actual measure to determine whether the responses undertaken by the state health agency were or were not successful in communicating about the risks of Anthrax, it is only natural that those who felt prepared would also state that they felt their efforts had been successful. However, when comparing the ratings against each other there is variation between the categories of "Prepared" and "Unprepared" versus "Successful" and "Unsuccessful" indicating the there was a shift of many who felt "Unprepared" ultimately believing that their actions were "Successful." A comparison of the two ratings follows:

Reported Level of Preparedness		Reported Level of Success Communicating Risk	
Extremely Prepared	0	Extremely Successful	0
Very Prepared	10	Very Successful	8
Prepared	18	Successful	25
Unprepared	12	Unsuccessful	3
Very Unprepared	0	Very Unsuccessful	0
Extremely Unprepared	0	Extremely Unsuccessful	0
Not Applicable	0	Not Applicable	3
No Answer	4	No Answer	5

Table 5.   Reported Preparedness for Communicating Anthrax Risks Compared to Perceived Success

Overall, 75% (N = 33) felt they were "Successful" or "Very Successful" in communicating risk. Of the five individuals who stated their agency did not have an emergency response plan by the end of the Anthrax stage, 80% (N = 4) felt they were "Successful" nonetheless and 20% (N=1) claimed that their state was not asked to communicate risk. Five people did not answer the question.

During 2003, the federal government called upon state and local health agencies around the nation to undertake a process of vaccinating health responders against a potential release of smallpox. Once again public health agencies were asked to translate the risk of smallpox exposure to healthcare workers as an act of bio-terrorism versus the risk associated with the vaccine itself. Questions 13 through 18 were developed as indicators of whether this more traditional risk communication function aimed at the medical community would compel state health agencies to develop and use emergency response plans, whether risk communication would be included and how successful they felt they were during this process. As federal grant funding and preparedness mandates were in place in every state by this time, including specific deliverables for smallpox planning and communication, my hypothesis was that plans would be put into place and implemented.

According to the Rocky Mountain West public health survey, of the five individuals who stated their organization did not have an emergency plan during the Anthrax phase, two had a plan before the end of the smallpox vaccination phase. Three individuals who answered "Do Not Know" to other planning questions indicated they had an emergency plan by the end of that phase.[86] Along with the incorporation of these new plans, existing plans were becoming more robust. Thus, among the 44 survey responses, 86% (N = 38) confirmed that by 2003 they had an emergency response plan.

Of the five new plans, four had a risk communication component. By the end of this phase, most respondents indicated that their risk communications plans were relatively robust with many identifying eight or more key communication components. Eighteen of the 44 respondents (40.9%) reported using their risk communication plan to advise healthcare workers or citizens of the risks associated with smallpox vaccine or

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[86] Four individuals that had earlier reported having a plan reported that they had no plan at the end of this phase. It is likely they interpreted this to mean a smallpox specific plan as required by CDC.

vaccinia. Ten of the 44 (22.7%) reported using their emergency plans to guide how they established their immunization clinics. When asked how successful they thought their agency was in communicating risk during the smallpox phase, the breakdown of responses was as follows:

Extremely Successful	3
Very Successful	13
Successful	19
Unsuccessful	2
Very Unsuccessful	0
Extremely Unsuccessful	0
Not Applicable	2
No Answer	5

Table 6. Perceived Success in Communicating Risk During Smallpox Vaccinations

One respondent noted in the comments section that he would rate the ability to communicate risk to agencies as "Successful" but their ability to communicate to the public as "Unsuccessful." This statement identifies a significant issue as public health struggles to provide lay interpretation for the citizens of the community as opposed to technical data for an informed professional health community. This same respondent also commented in this section that "Currently, and in the past, we provide info as needed to individual situations as they arise." The reported successes coupled with the respondent's comments potentially indicate a continuation of "business as usual" in state public health agency response rather than a shift in mission approach and enhanced or expanded emergency preparedness prioritization. The comment particularly points to a lack of ongoing preparedness planning in providing risk communication of indistinct technical information to the lay public if the need had arisen to expand the smallpox vaccination to include the general public.

As an indicator of improvement, a comparison between levels of perceived success on risk communication during the Anthrax case versus the smallpox case is as follows:

Reported Level of Success Communicating Risk	Anthrax	Smallpox
Extremely Successful	0	2
Very Successful	7	11
Successful	23	18
Unsuccessful	3	2
Very Unsuccessful	0	0
Extremely Unsuccessful	0	0
Not Applicable	2	2
No Answer	4	4

Table 7.   Reported Success Communicating Risk During Anthrax Events Compared to the Smallpox Vaccination Process

This table implies that improvement in perceived success has, in fact, occurred. There is one less rating in the "Unsuccessful" category and six more at the "Very" or "Extremely Successful" rating. With significantly different communication targets between the two events coupled with a difference in time frame – Anthrax communication being targeted to the lay public, government officials and first responders and the smallpox communication targeted at informed health care professionals one year later – it is difficult to correlate the improvement to increased communication skill. Perhaps this finding simply notes a connection of the former public health communication function with the medical community. However, if the positive effect was tied to acquired knowledge and expertise over time, it is a positive indicator for enhanced preparedness.

In order to look for a relationship between the level of risk communication preparedness and the commitment of the state health agency to the function as indicated by designation of staff, the survey explored the timing of hiring a risk communication/Focus Area F lead. In drafting Question 19, I sought to determine the

relationship between the time when a risk communication lead was hired and the respondent's perception that his or her agency is prepared to communicate risks associated with a bio-terrorism event in their state. I hypothesized that an organization that had a risk communication lead prior to September 11, 2001 is likely to be an organization committed to ensuring an effective communication structure. Federal funding became available between September 2001 and December 2002 and hiring during that phase could indicate that lack of funding was previously a barrier in addressing the agency's risk communication structure long term. Responses in the 2003 to 2004+ range could indicate that risk communication is important but perhaps not a priority in that state's emergency preparedness structure. The same could hold true for those answering "It is a shared responsibility." A response of "We have no plans to identify/hire" and "Unknown" would indicate a relative lack of importance for risk communications functions or a very low priority, at best. The breakdown of responses on communication lead hiring was as follows:

<9-11-01	10
>9-11-01 & <12-31-02	8
2003	7
Currently identifying/hiring	4
2004	1
No plans to identify/hire	0
Shared responsibility	3
Unknown	7
No answer	4

Table 8.   Time Frame for Hiring a Risk Communications Lead

It is encouraging to note that 40.9% (N = 18) of all respondents noted that their agency had hired a risk communications lead before the end of 2002 – an indication of an organizational priority. The survey itself does not query whether the individual in charge of that function is also in charge of all agency communication functions, whether they have training in risk communications or what percentage of that person's time is split

with other bio-terrorism grant functions. As mentioned earlier, while eight of 44 respondents said their primary position was in Focus Area F (Risk Communications), two said they were responsible for Focus Area F as well as another function.

The final survey question asked was how prepared the respondent's agency is to answer questions regarding the risks associated with a bio-terrorism event in their state and the appropriate steps to mitigate the risk. The breakdown of responses was as follows:

Extremely Prepared	1
Very Prepared	16
Prepared	20
Unprepared	2
Very Unprepared	0
Extremely Unprepared	0
No Answer	5

Table 9.   Preparedness to Communicate Bio-terrorism Risks and Mitigation Steps

In total, 84% of the respondents indicate they feel prepared to respond to a public health emergency and communicate risk. Interestingly, the hypothesis that respondents from agencies with the most lengthy and comprehensive planning process would also express that their agencies were most prepared did not prove out across the board. Each of the three people claiming that their state had no emergency plan reported they felt their agency was "Prepared" to answer questions regarding risks.

As mentioned earlier, it is easy to speculate but virtually impossible to quantify the value of an emergency planning strategy when evaluating an effective response to a crisis. Connecting elements of emergency planning to the success of an emergency response process that may never be implemented or could be implemented tomorrow renders this process highly subjective. Unfortunately, as lessons learned by the CDC and

public health responders in New York and Florida demonstrate, a "trial by fire" of your emergency preparedness level in the midst of a response to a bio-terrorism event may impact success as well as the agency's perceived trustworthiness in the future.

F.   DISCUSSION

We know from anecdotal reports that communities, just like businesses that plan ahead how they will respond to a crisis, are less likely to suffer long-term damage. We can document preparedness changes over time in high-impact disaster areas forced to establish plans to mitigate damage. We can also presume that since other organizations routinely tested by disasters work to establish messaging protocols that it is also vital that state health agencies that are not as frequently challenged do the same.[87]

It is impossible to determine conclusively whether planning will play the decisive role in actual success during a public health emergency or crisis situation.   Most communities do not measure or evaluate their emergency planning standards even in traditional emergency management organizations. Emergency planning in public health is no different. There are very few standards or agreed upon approaches that will ensure an effective response, little less a response that includes communicating a message in understandable terms that will compel citizens to act in their best interests and the best interests of their community. What we can show, however, is that organizations that routinely respond to emergencies - such as police and fire departments and military organizations- plan and practice constantly so that the emergency response behaviors become second nature.   Public health agencies routinely address community health concerns but very rarely in an emergency situation and virtually never when there is little or no scientific data on the actual risks. It is safe to assume that the skills derived of constant emergency preparedness and practice are not well developed in most public health agencies. This is not an indication of the effectiveness of the agency overall but simply the development phase the public health system finds itself in and the newness of its emergency preparedness mission and resources. It is also possible to surmise that

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[87] American Red Cross. "Talking About Disaster: Guide," *American Red Cross Disaster Services Webpage.*(Available on-line) Available at http://www.redcross.org/disaster/safety/guide.html, (Accessed 20 March 2004.)

individuals skilled in health communications assume that those same skills will apply equally when validated information is limited, community concerns or fears are high, and the pressure to communicate rapidly and effectively is paramount.

Many of the Rocky Mountain West states share the same media markets and, in some cases, citizens in one state may only have "local" media coverage from a media market of an adjacent state. Even when a state develops effective plans to provide risk communication to its citizens the adjoining states may not have planned at the same level, thereby rendering the planning efforts of the residents' state ineffective for communicating risk to its citizens. The planned risk communication messages may not reach all the citizens of the state. As there are no requirements that all states undertake communication planning that is integrated regionally or nationally there are no resources to make sure all states are capable of delivering effective messages, little less that the messages from various states in the region are consistent.

Colorado shares its borders with five other states. The major media markets in Colorado are Denver and Colorado Springs. These two media markets serve the bulk of the population of the state, which resides along the eastern side of the Rocky Mountains (called "the front range.") There are also small cities, including Ft. Collins, Greeley, Pueblo and Grand Junction that have several local radio and print media outlets as well as television bureaus connected with the front range broadcast media. The communities around the outer edges of the state (often called "frontier communities" because of their sparse population, limited resources and remote location) will receive information on risks associated with bio-terrorism from the neighboring state. The following figure shows the counties and tribal nations within the State of Colorado, divided up according to Homeland Security All-Hazard regions, and from where those citizens receive their local news:

Figure 4.   Likely Risk Communication Information Sources for Colorado Residents

Although it does not preclude successful response, it appears from the survey of the public health bio-terrorism leaders in the Rocky Mountain West that there is marginal or uneven planning underway for how they as organizations will communicate risk in an emergency. At the very least, there are no collaborative planning efforts among these states at this time. One of the most significant issues of note is the disparity in reporting about the status or content of their emergency plan from individuals working in the same state – generally the same office - on the same project. One explanation is that many of the people responding to the survey stated they were new and that they were simply unaware of what was in place. Normally lack of knowledge in this adjustment phase is completely understandable. However, in a crisis situation, if the key emergency response leadership are unaware of the direction or priorities of their organization it is likely that the leadership will be delayed in response or, worse yet, working at counter-purposes with each other. The variation in responses may also indicate that the state health

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agency's planning process is a formality only and that the process does not migrate beyond the bookshelf of the individual compiling the plan therefore rendering it essentially meaningless.

Furthermore, as the most important value in the planning process is derived of the relationships formed and conversations undertaken during the planning process, it is a likely assumption that their ability to interface effectively and cooperatively with external agencies during an emergency is significantly hampered. If there is not a coordinated communication effort (whether that is within the organization or with partner agencies) there is an elevated chance that conflicting risk information will be provided within a community, state or region. This is particularly true for areas with overlapping media markets. When conflicting information is released, confidence in the source of the information is diminished and the groundwork is laid in that community for a significant increase in fear reactions and reduced effectiveness of the indicated response.

G.   INCORPORATING PREPAREDNESS LESSONS LEARNED

Based on my interpretation of the survey findings, I assert that the most effective means of addressing planning shortfalls is to learn from the experiences of agencies that found themselves in a like response position during the terrorism events of 2001. I conducted interviews with the two persons who led the communication efforts of the CDC during the Anthrax event as well as the individual brought on board afterwards to address communications challenges the agency confronted. Marsha Vanderford, Ph.D., is the CDC Acting Associate Director, Office of Communications, working directly under Julie Gerberding, MD, MPH, Director of the Centers for Disease Control and Prevention and Administrator of the Agency for Toxic Substances and Disease Registry (ATSDR). Dr. Vanderford coordinated the CDC communications response to the Anthrax events in all of the impacted regions. Jana Telfer, M.A., also of the Office of Communications, directed the media relations functions for the CDC and was interviewed to gather lessons learned from communicating risk to the national media. Dan Baden, M.D., Senior Medical Advisor in the Office of Communications, CDC Office of the Director, was appointed after the Anthrax events had taken place for the purposes of helping address risk communications challenges within a new CDC emergency response structure and

facility, called the Emergency Communications System or, simply, the ECS. The common focus of all three CDC interviews was the explanation of the communication challenges posed and resources required to launch a response to a bio-terrorism event.

CDC acknowledges that over 81 spokespersons were used to communicate during the Anthrax event and that some were removed from that assignment because, in spite of their expertise on the science of the event, they lacked the specific skills necessary to translate the risks to the media and the public. Dr. Vanderford, who led their communication functions during the Anthrax event, stated:

> We need a fairly deep bench. We try to use a few spokespersons that are familiar to the public and can speak across the spectrum of issues and topics and subject matter experts on specific details. […] A press officer helps the spokesperson with talking points and spokespersons and scientists get routine media training.[88]

Vanderford remarks that CDC changed its approach to risk communication after Anthrax.

> None of the scientists and subject matter experts thinks that communication is not important or part of the science anymore. Communications staff is always at the table now. Emergency communications work hand in glove with scientists to create and deliver the messages.[89]

Changing the CDC approach to integrate communications with the operational priorities required planning to the point that they established the ECS shortly thereafter. According to Dr. Baden, their new planning approach now includes four different preparedness levels:

- WATCH – the agency is following potential events;

- LEANING FORWARD – the agency is preparing, developing materials, and identifying communication gaps;

- ENGAGED – An event appears to be beginning. The agency is collecting more materials and resources and the system is preparing to activate; and,

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[88] Marsha Vanderford Interview.

[89] Ibid.

- ACTIVATED – An event is confirmed. CDC deploys staff and is working closely with communication leads in the agency's centers, institutes and offices. Lists are developed and maintained of what each team is doing.[90]

In spite of the obvious planning and risk communication preparedness activities underway at CDC, when discussing the role of state preparedness planning in determining the potential for communication success during a response Dr. Vanderford adds:

> In reality, many risk communication practices and strategies have been in place for decades. Doing good communication practice means having the skills and the knowledge of communication processes. Developing an actual plan is a good way to get people to think about communication but it is a disservice to people with good skills to believe they can't communicate effectively without a plan.[91]

Any time there is an implied critique of state activities by federal agencies there is the potential for disagreement and perceptions of oppressive funding oversight. However, states will not be compelled to plan effectively if not provided standards and guidance from lessons learned to highlight the potential implications of being ill-prepared.

The Florida Department of Health serves as an excellent example of the value of planning as well as risk communication planning. The Palm Beach County Health Department had significant experience responding to a myriad of public health emergencies prior the Anthrax events in Boca Raton in October 2001. This agency - serving a population of over a million through six health centers - also had staffing resources beyond the standard generally available in the survey group.[92] They also had a very active emergency preparedness structure and still found themselves challenged by bio-terrorism. Timothy O'Connor, Public Information Director for the Palm Beach County Health Department, also completed the survey developed for the Rocky Mountain West health departments. By all accounts they were very well prepared to respond to bio-terrorism. The Palm Beach County Health Department had and routinely used an emergency response plan (that included an extensive risk communication component)

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[90] Dan Baden Interview.

[91] Marsha Vanderford Interview.

[92] Palm Beach County Health Department, Website homepage [on-line] (Accessed 20 March 2004) Available from http://www.pbchd.com, Internet.

prior to 2001. They considered themselves "Very Prepared" but were, nonetheless, confronted with the struggles resulting from a response that required 12 people working 12 hour shifts for three weeks. O'Connor classified their response as "Work until you drop (because) time is of the essence."[93] Since that time their emergency planning process has "all been revamped, re-evaluated and expanded" including establishing cooperatives with other agencies and developing inter-local agreements to support future response.[94] Luckily, Florida Health - as part of their planning process - had designated spokespersons with good preparation and skills and was able to communicate successfully in spite of the challenges confronting them.

It is entirely possible that when a public health emergency occurs in the Rocky Mountain West region, the states will rise to the task, organize their internal emergency response functions, and clarify issues related to defining the hazards and explaining the risks to the lay public and the media effectively. As noted previously, public health officials address community and state-wide public health concerns every day. However, response to an actual public health crisis – particularly a bio-terrorism event – will call upon organizational, communication skills and leadership skills that far surpass the day-to-day operations. The Florida Anthrax response is a case in point. Some individuals will be comfortable moving into an emergency response role and assuming daunting tasks without a great deal of practice while others will need a repeated process to learn how to effectively assimilate their routine approach to an emergency situation. This transition holds true in communicating risk in a crisis.

Without an element of planning within the state, little less between adjoining states, the stage is set for public health in the Rocky Mountain West to create confusing and detrimental risk communication processes should the region be impacted by a bio-terrorism event. Distance and geological barriers alone blur the boundaries and capabilities from one state to another. In states with sparsely populated regions such as those included in this survey, citizens in the distant reaches of the state often express

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[93] Timothy O'Connor Interview.

[94] Ibid.

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greater affiliation with a neighboring state because of easier access to their metropolitan areas. Ineffective risk communication planning in one state will naturally impact media reports viewed in neighboring states and, consequently, public reaction and response.

H. CHAPTER SUMMARY

The survey of state public health agencies reviewed in this chapter was intended to provide a snapshot of state preparedness activities in Colorado and its region. I was looking for trends and timing of these activities as these relate to the availability of funding and the perceived prioritization of the newly established public health emergency response mission. The findings from the survey, while giving encouraging signs that progress is being made, also indicate that because of decades of system-wide neglect public health may not be getting far enough fast enough if a bio-terrorism attack occurred. Providing historical data on the approach to bio-terrorism preparedness in this nation serves as the underpinning necessary to truly understand the level of difficulty associated with transitioning public health into a fully prepared emergency response resource. The survey confirms that absolute changes have not taken place. Years of continued support coupled with improved access to threat information will be necessary to prompt an acceptance of an actual mission change and expanded emergency preparedness approach.

It is understandable that public health emergency planning before 2001 was limited. Prior to the terrorist events of September 2001, it was not a primary mission in public health and most, if not all, state public health agencies lacked the staffing and financial resources to seriously undertake this type of activity. However, with the drastic escalation in funding, the future will show whether the public health system has truly accepted emergency preparedness and response as an integral mission or whether the efforts described by survey respondents are simply a manifestation of a generous funding opportunity.

Furthermore, it is only through response to an actual event that states will determine whether the plans they have in place are adequate to organize their emergency response efforts. Public risk communication capacity will be critical to effective public health response and there appears to be a sense that this readiness exists. It remains to be seen if this confidence is an artifact of communication successes with the medical

community or whether those resources are truly in place. Potentially this confidence may be exhibited simply because these agencies have never been directly involved in a risk communication activity undertaken without the benefit of irrefutable technical content and the luxury of time and assume it will be no different than standard public health communication functions.   If this is true, the logical recommendation follows that standards be established for risk communications training in all state public health agencies and that all risk communicators have ready access to uniform nationwide risk communications resources developed for state dissemination.

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V. SUMMARY AND RECOMMENDATIONS

A. PUBLIC HEALTH PREPAREDNESS THROUGH PLANNING

In 1875, while introducing his Public Health Act to British Parliament, Prime Minister Benjamin Disraeli remarked that:

> Public Health is the foundation for the happiness of the people and the power of the country. The care of the Public Health is the first duty of a statesman.[95]

This quote highlights the importance of public health systems in maintaining the welfare of a nation. This role was confirmed by the *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* which states: "Hospitals, clinics, and public health systems play a critical role in mitigating and recovering from the effects of natural disasters or deliberate attacks on the homeland."[96] A recent report from the Council for Excellence in Government found that in spite of efforts in recent years to prepare and inform the public "there is an information gap that exists now between citizens and government." Three-fourths of the citizens interviewed felt that another attack would occur soon but they did not know how to protect themselves. Furthermore, "citizens said they were most worried about bio-terrorism, followed by chemical weapons, nuclear weapons, suicide bombings, airplane hijackings and, lastly, cyberterrorism."[97] Conversely, resources committed and preparedness activities undertaken nationally do not seem to mirror these community priorities.

This thesis has documented the vital role of public health as critical infrastructure in response to a bio-terrorism event but has also shown the structural weaknesses of a system in disrepair and generally unaccustomed to response to catastrophic emergency

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[95] National Advisory Council on SARS and Public Health. *Learning from SARS – Renewal of Public Health in Canada,* [report on-line] (Health Canada Publications, October 2003, Accessed 22 March 2004) Available from http://www.hc-sc.gc.ca/english/pdf/sars/sars-e.pdf, Internet, 220.

[96] U.S. Department of Homeland Security, *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* [strategy on-line] (Accessed 31 May 2004) Available from http://www.dhs.gov/interweb/assetlibrary/Physical_Strategy.pdf, Internet, 41.

[97] Chris Strohm, *Americans on Homeland Security: Ready and Willing but Uninformed,* [on-line] (25 May 2004) Available at: www.govexec.com/story_cfm, (Accessed 2 June 2004.)

events.[98] Decades of political indifference and inadequate funding for this essential system led to these structural weaknesses and now public health leaders nationwide must strive to meet the challenges inherent to bio-terrorism response. The question remains whether these public health leaders are truly focused on bio-terrorism, or at least, emergency preparedness, or simply perceive this as a tangible funding mechanism to shore up their organizational shortfalls until public health falls from the national radar screen yet again. Rebuilding the system will take time and enduring support. Additional resources and imperatives must accompany this support to move the system beyond "stabilized" to "prepared" to face the challenges of a bio-terrorism response.

Furthermore, this thesis has established that the only way for public health to adequately prepare to respond to a bio-terrorism event is through a concerted planning effort and, specifically, planning efforts that address the pivotal public health response issue – risk communication to the public. The public health response challenges to the Anthrax attack and SARS outbreak provided an important opportunity for public health to examine its emergency preparedness policies and strategies as well as to analyze its methods of communicating on an unknown disease as science was being made. Case studies from China, Toronto, and Singapore outlined three different approaches to communicating risk as well as the effect of that strategy locally as well as internationally. Singapore was lauded by risk communication experts for its direct approach, while Canada received praise from the public and scathing criticism from the medical community. China, however, was faulted nationally and internationally for not only their unwillingness to communicate information on the risk but their efforts to withhold information on the outbreak entirely. A Journal of the American Medical Association (JAMA) article comparing SARS responses in Hong Kong and Canada included among five key lessons learned two that reinforce the conclusions of this thesis:

- Because of its preventative and population focus, the public health system is consistently overshadowed by other areas of health care…investments in public health are vitally important for health protection…; and,

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98 The White House, *Defending Against Biological Terrorism*, [on-line] (Accessed 28 April 2004) Available from http://www.whitehouse.gov/infocus/bio-terrorism/index.html, Internet.

- Communication within health care and the public health system, with the media and with the public, and between nations is a cornerstone of crisis management.[99]

A recommendation was made in the report that health agencies "train institutional, public health, and health care leaders in risk and crisis communications."[100] It is likely that these lessons and recommendations could be applied globally in SARS as well as in bio-terrorism response.

Chapter III addressed critical dynamics that come into play when attempting to communicate risk and the public fear and distrust that develop when the communication efforts are ineffective. Researchers agree that there are specific elements of risk communication that are different from typical modes of communicating in a crisis. Risk communication includes elements of choice and potentially serious consequences resulting from those choices. In order to prepare to provide effective risk communication, potential emergency scenarios must be created, credible and experienced spokespersons must be identified and coached, messaging must be considered, audiences must be identified, and methods of communication must be addressed. Through a successful communication effort there is a greater likelihood that fear will be reduced and that effective steps will be taken by the public to ameliorate the situation and move toward individual and community-wide recovery.

More than virtually any other service that public health provides, communication of health information rapidly, effectively and credibly is necessary to maintain the trust of the public beyond the confines of the emergency event taking place. Once lost, public trust is a commodity that is very difficult, if not impossible, to regain. Communicating in an emergency is also difficult and resource intensive. By coupling the need for resources with an inexperienced communicator in an emergency situation - particularly a communicator that is insensitive to the emotional impact of the words and gestures - public health agencies have a true recipe for disaster. Planning will allow the agency to

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[99] C. David Naylor, Cyril Chantler and Sian Griffiths, "Learning from SARS in Hong Kong and Toronto," *JAMA*, 26 May 2004, (Vol. 291, No. 20):2487.

[100] Ibid., 2486.

gather resources, examine and practice potential emergency situations, develop messages beforehand and practice delivery and increase confidence in the process should the system be required.

Unfortunately, Chapter IV demonstrates that emergency planning as well as risk communications planning has not been a high priority in the Rocky Mountain West. After more than two years of bio-terrorism funding from DHHS/CDC, many of the surveyed states continue to show leadership staff vacancies or attempt to meet staffing requirements by assigning leaders in multiple roles. A few states in the region still do not have definitive plans for how they will respond to an emergency as an agency, let alone how they will coordinate with federal agencies and neighboring states while also communicating directly with the public. Granted, in spite of limited planning efforts, effective responses do result following unplanned events and some individuals may show a natural ability to communicate risk even in situations where the information is limited and ambiguous. However, health agencies must consider that during a bio-terrorism event, their staff may be experiencing concern for themselves, their family and their community, which can easily undermine the most highly trained and skilled communicator. Add in confounding factors - such as exhaustion, media presence and logistical challenges – without a planned support system to correct or augment these deficits, the organization risks losing its capability to reduce fear and influence behavior in the preferred direction.

Ironically, resources have been developed for state and local health agencies to facilitate effective communication planning but state and local planners may not be familiar with them nor have the time available to study them or implement their usage. CDC contracted with the Oak Ridge Institute of Science and Education (ORISE) to update and redesign an internal communication planning system used by them since 1998. In February 2001, *CDCynergy* was released and participants from public health agencies around the nation were trained as trainers by CDC and ORISE in cooperation with the Prospect Center of the American Institutes of Research. Since then, the product has expanded to include simple-to-use templates and numerous resources to provide the

framework for an emergency risk communications plan.[101]   However, since its initial promotion and distribution it is unknown how widely publicized the product remains. As the lead public health planner for Colorado since 2000, I was not included in the early product distribution process. The history of the product on the CD notes that "Because many health communication groups at the CDC were hesitant to adopt either the original or the newly revised version of CDCynergy, the Director of the Office of Communication, Dr. Vicki Freimuth suggested that the various Centers, Institutes, and Offices (CIOs) of the CDC be approached with the idea of developing tailored editions of CDCynergy."[102]

According to the CDC, over 7400 copies of the CDCynergy CD-Rom were distributed and more than 3800 public health workers around the nation were trained in its use[103] However, with new and changing staffing patterns, I was unable to ascertain if the distribution of this dynamic tool was ongoing and whether the associated training cycle meets the needs of state health departments. Although state health agencies generally sponsor their Communications Directors as members of the National Public Health Info Coalition which routinely provides CDCynergy training at its meetings, this coalition does not necessarily include Focus Area F (Risk Communication) leaders and definitely does not reach public health planners working under Focus Area A (Preparedness Planning and Readiness Assessment). It is possible that plans have not been developed in the survey region simply because of lack of awareness of this valuable product.

In summary, this research project has led to three critical findings. First, little planning and practice is underway specifically aimed at preparing state public health departments to communicate risk in a bio-terrorism event. Second, staffing patterns in public health emergency response leadership may be so austere that there will be great difficulty rapidly organizing a coherent response strategy. And third, if state public health cannot organize a rapid emergency response function it will immediately fall behind on the essential requirements of effective risk communication:

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[101] Centers for Disease Control and Prevention, *Emergency Risk Communication CDCynergy: Your Guide to Effective Risk Communication Planning,* [CD ROM] 2002.

[102] Ibid.

[103] Dan Baden Interview.

Have one consistent message. Get it out rapidly. And be accurate.[104]

B.   RECOMMENDATIONS

If states are going to be prepared to respond to bio-terrorism, each state health agency should be accountable for the development and use of a reasonable emergency response plan. The Rocky Mountain West states have received more than $260 million for bio-terrorism preparedness yet many states have yet to hire staff or establish emergency plans. Because of the dire situation in public health prior to the advent of federal bio-terrorism funding, it is necessary for public health agencies to have dual purposes for the money expended but, nonetheless, the intent of the funding is to prepare for emergency events. To facilitate the process, CDC or the Department of Homeland Security should outline planning templates that would not only assist state agencies in planning across state borders but also across disciplines in accordance with the National Response Plan. The CDC funding to states currently comes with a long list of deliverables to be completed but without significant resources and tools, such as a planning template, to get projects underway. These templates could also serve as a vehicle for uniformity across state borders to ensure that populations served by media markets outside their state would receive the same services and messages as they would from their own state leadership. An obvious component of these planning templates would be products to establish at least a rudimentary risk communication plan.

Ironically, the first "Public Health Initiative" identified in the Public Health section of the *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* states that public health will: "Designate trusted communicators."[105]

Specifically when addressing this initiative, the strategy states:

> HHS will work with state and local public health officials to identify, appoint, train, and prepare recognized subject matter experts to speak on behalf of the public health sector in times of crisis. These appointees would act as important envoys of homeland security information to communicate consistent, accurate information, as well as to inform, instruct, and reassure the American public.[106]

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104 Ibid.

105 U. S. Department of Homeland Security, 41.

106 Ibid.

Having studied the preparedness activities of this region, I recommend that the Department of Health and Human Services (HHS) seriously examine the status of this initiative in state and local health agencies. If risk communication planning is limited in some parts of the nation as implied in the survey, there is a potential that risk communication planning is limited elsewhere in the nation.

It would also be helpful if HHS clearly and readily established standards by which state subject matter experts could be identified and trained as well as provide a forum through which this pool of experts could regularly receive uniform continuing education and contact with their colleagues in neighboring states. Following the thread established in the *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets,* I searched for "communications training" in the HHS website as this would be a likely approach for state leadership attempting to address this training mandate. Even after launching the search from the "Disasters and Emergencies" page the only links provided were to training information on food safety, health science librarians, AIDS, Food and Drug Administration, informatics and National Institute of Health clinical training. There was also has a link to training for an actual bio-terrorism program - the National Pharmaceutical Stockpile (now called the Strategic National Stockpile) – but it did not show any stockpile training dates scheduled after September 9-13, 2002.[107]This proposed forum or information portal should serve as a centerpiece of a communication repository for sharing resources and lessons learned for the purpose of incorporating best practices from emergency planning efforts and response activities nationwide. On the positive side, CDC has made great strides in creating valuable emergency and risk communications materials available on their website (http://www.cdc.gov/communication/emergency/erc_overview.htm). This function should be supported and further enhanced to serve as a receptacle of information for organizations without plans or communication resources when faced with an emergency situation.

Unfortunately, as public health was faced with an abrupt infusion of money for bio-terrorism response without stable infrastructure to support it, many optimal

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[107] U.S. Department of Health and Human Services. [home page on-line] (Washington, D.C., Accessed 31 May 2004.) Available from http://www.firstgov.gov/fgsearch/index.jsp, Internet.

approaches will be unavailable in the short term. The learning curve has been steep for individuals unaccustomed to emergency planning and an actively-promoted centralized information clearinghouse would facilitate the learning process. CDC should also develop template messages and informational materials (translated into multiple languages) and make them available through their website. Granted, each event is different and key messages will need to be adjusted to accommodate the unique nature of the event, but standardized language provides critical resources in the first hours and days and lays the groundwork for the development of consistent risk communication nationwide.

Risk communication training curricula should be developed by CDC that would allow states to facilitate face-to-face coaching of their own potential spokespersons in the subtleties of risk communication, much like CDC has done with its spokespersons since the Anthrax events. State and local health agencies have skilled spokespersons but their specific risk communication training is likely limited. The subject matter expert forum recommended above is an excellent first step but state and local communication experts must develop relationships with and confidence in the skill level of their subject matter experts serving as spokespersons should an event occur. Skill-development training should be crafted for maximum convenience and the least negative impact on the schedules of these already tightly scheduled individuals. Risk communication must be integrated into the agency's organizational culture and practiced continually to be effective when the time arrives.

Lastly, risk communication objectives should be incorporated into all bio-terrorism exercises supported by federal funds. Organizations rarely believe that their building will burn someday but they carry out fire drills regularly to ensure that the knowledge of the appropriate steps will be instilled if that time ever comes. State and local counter-terrorism exercises frequently focus on explosive and incendiary scenarios, as well as chemical and radiological agents rather than biologics. These exercises provide a scene from which to operate, and allow more hands-on interaction - particularly for traditional first responders and emergency managers -, but they do not help this nation prepare to respond to bio-terrorism.

Often traditional first responders engage in bio-terrorism exercises using Department of Homeland Security money without even a requirement to actually involve public health partners. This situation cannot and will not happen in a real bio-terrorism event where the epidemiological investigation occurs in public health agencies, clinics, hospitals and laboratories.

Furthermore, when bio-terrorism exercises are undertaken, the focus is frequently on the mechanics of decontaminating and treating the victims and providing prophylaxis. Recently, the process of forensic epidemiology has come into exercise play but rarely has the risk communication component been tested. As the situation in Florida demonstrated, states must have a plan on how public health risk communication and law enforcement investigation will work in tandem to reduce the fear in the community and lead to effective protective strategies without compromising the criminal investigation. There should be a requirement for every state to periodically test its inter-disciplinary effectiveness during scheduled exercises to identify problems – whether skill based, logistical, or technology-based. These communications exercises should include federal as well as local partners identified in the state's emergency plans.

C.   AREAS FOR FUTURE RESEARCH

Ideally, a survey to determine the preparedness level of public health to communicate risk in a bio-terrorism event should have a more varied sample than eleven states tied together primarily by geography. It would be valuable to ascertain whether the planning strategies employed by public health agencies within the Rocky Mountain West – an area with generally low population density – are similar to or different from those used where the population is dense and support resources are closer at hand. Often in the western states where topography and climate are barriers for connecting jurisdictions, there is confidence in being able to handle an event with little or no outside help. This sense of confident independence may have stifled the interest in planning. On the other hand, it is possible that plans were not developed simply because emergency preparedness was not a primary focus of public health before September 11, 2001 and the agencies did not have the staff or funding to undertake those processes.

Potentially, a sample survey of state public health planning activities throughout the nation coupled with a survey of reported interest and commitment of the leadership in the emergency preparedness mission would be insightful. Public health funding support has been limited in recent years and it is likely that these agencies perceive that the current support and mission priority as time limited. Without additional research, it is difficult to hypothesize the impact of this leadership perception on the extent and prioritization of emergency planning efforts. It is also safe to say that if this funding is not maintained long term, public health leadership will return to traditional roles and priorities with the expectations that they will respond to the best of their capabilities to emergencies when they occur as they did before 2001.

A more narrowed study would be valuable to learn more about the level of experience, training and focus that the Rocky Mountain West Focus Area F or risk communication project leads possess. It is quite likely, based on the survey findings outlined in Chapter IV, that these responsibilities have been tacked on to other grant activities or absorbed by the communications staff of the agency without regard to the specificity of the function. It is conceivable that a public health communicator used to a standard mode of communicating will need specialized training and resources to become accustomed to this new approach. Based on the lessons learned from the CDC response to Anthrax, the communicators will be stretched thin under the best of circumstances. A person charged with leading the communications function as well as another project will probably find themselves unable to adequately address both. As discussed in Chapter III, a lack of emphasis on effective risk communication will likely impact the fear reaction in the community and post-event recovery.

Finally, it would be interesting to research how the leadership of the state health departments surveyed perceived the level of preparedness within their state. If there was confusion or disparity within the leadership of the various bio-terrorism project areas within a state agency, it is likely that the information is even more limited at points farther removed from the hub. Overall, much research needs to be done to outline what constitutes "prepared" in public health emergency response – above and beyond terrorism. As public health is new to the emergency response field, there is a vast difference in interpretation of the hazards public health should be able to address, the

roles of public health in emergency response and the standards that should be applied to ensure progress is being made. CDC is scheduled to release performance indicators in the coming year to serve as benchmarks upon which preparedness metrics can be built. This is a start, but if there are no uniform standards of preparedness it will be difficult to measure progress and ensure a level of public health capacity nationwide.

In December 2003, Trust for America's Health, a Washington-based organization chaired by former Senator Lowell P. Weicker Jr. (R/Ind-CT) and including retired Senator Mark Hatfield, (R-OR), released a state-by-state scorecard of public health emergency preparedness and resultant vulnerability. Overall, the report concluded that although progress had been made in improving emergency communication networks, laboratory capacity and "initial bio-terrorism plans…states have achieved piecemeal progress, but that a full-scale effort to comprehensively fix the nation's public health system is falling short."[108] The study noted that these positive changes took place when the federal government increased funding from $67 million in fiscal 2001 to $940 million in fiscal 2002 but noted that: "…the overall preparedness effort has been compromised by the impact of state budget crises, the lack of priority placed on addressing systemic weakness and the failure to eliminate bureaucratic obstacles."[109] If public health is to successfully prepare to address bio-terrorism, limitations in ability to communicate risk will be secondary to its ability to sustain the focus on the effort at all.

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[108] Martin Edwin Andersen, "States Barely Better Prepared for Bioterror, Study Says," *CQ HOMELAND SECURITY* (Washington, D.C., 10 December 2003) Congressional Quarterly Inc. Available at: http://homeland.cq.com.

[109] Ibid.

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APPENDIX A. ROCKY MOUNTAIN WEST PUBLIC HEALTH SURVEY

A. PAGE 1

State referenced: WY   UT   SD   ND   OK   NE
(please circle)   KS   NM   AZ   MT   CO

Your affiliation: Focus A   Focus B   Focus C   Focus D   Focus E
(please circle)   Focus F   Focus G   HRSA   All (BT Project Manager)

Your level of responsibility: Program Manager   Program Coordinator Epidemiologist

Planner   Trainer   Communicator   Other (please specify)_____

1.   Did your agency (state health department) have an emergency response plan before September 11, 2001?   Y   N (Skip to Question 7)

2.   Which hazards/threats did your emergency plan address? (Circle all that apply)

Natural hazards   Communicable   Environmental   Chemical   Mass
              disease outbreak emergencies/haz mat Terrorism Casualties

Radiological   Food borne illness   Bio-terrorism   Radiological
Emergencies   Terrorism

3.   Did you use (discuss/revise) your plan regularly before September 11, 2001? Y   N   N/A

4.   Did you practice (train on/exercise) your plan before September 11, 2001? Y   N   N/A

5.   Did this plan include a risk communication plan to explain the risks associated with the particular hazards addressed?   Y   N (Skip to Question 7)

6.   If your plan included a risk communication plan, did it address the following key components? (Please circle all that apply, as you know it)

Communication Problems Defined	Communication Problem Analyzed/Goals Set (background)
Identified and Profiled Audiences	Developed Communication Objectives/Strategies/Tactics
Identified Settings/Channels for Messaging	Outlined Communication Activities/Materials/Methods
Identified Communication Partners	Identified Communication Resources
Outlined Communication Tasks/Timelines	Internal/Employee Risk Communications Plan
Identified Spokespersons	Pre-scripted Key Messages on Hazards/Agents/Risks
Special Populations Identified	Communications Plan for Special Populations
Identified/Collected Contact Numbers	Identified Process to Maintain the Risk Comm Plan
Developed Public Communications Plan	Identified Person(s) Responsible for Activating Plan
Developed Media Communications Plan	I am unsure what our plan contains
Other (please specify)_____	

7.   Did your agency develop an emergency plan before the end of November 2001 (anthrax phase)?
      Y   N (Skip to Question 11)   Already had a plan (Skip to Question 10)

8.   Did this new plan have a risk communication plan included? Y   N (*Skip to Question 10*)

9.   If your new plan included a risk communication plan, did it address the following key components?
     (*Please circle all that apply*)

Communication Problems Defined   Communication Problem Analyzed/Goals Set (background)
Identified and Profiled Audiences   Developed Communication Objectives/Strategies/Tactics
Identified Settings/Channels for Messaging   Outlined Communication Activities/Materials/Methods
Identified Communication Partners   Identified Communication Resources
Outlined Communication Tasks/Timelines   Internal/Employee Risk Communications Plan
Identified Spokespersons   Pre-scripted Key Messages on Hazards/Agents/Risks
Special Populations Identified   Communications Plan for Special Populations
Identified/Collected Contact Numbers   Identified Process to Maintain the Risk Comm Plan
Developed Public Communications Plan   Identified Person(s) Responsible for Activating Plan
Developed Media Communications Plan   I am unsure what our plan contains
Other (please specify)_____

10.   Did your agency use/implement its emergency plan before the end of the anthrax phase? (Between
     October 2001 and June 2002)   Y   N

11.   How well prepared was your agency to answer questions regarding the risk of anthrax in your state
     and the appropriate steps to take to mitigate the risk?

Extremely   Very   Prepared   Unprepared   Very   Extremely
Prepared   Prepared   Unprepared   Unprepared

12.   How successful do you think your agency was in communicating risk during this anthrax phase? If
     your agency was not asked to communicate risk, please circle "N/A"

Extremely   Very   Successful   Unsuccessful   Very   Extremely   N/A
Successful   Successful   Unsuccessful   Unsuccessful

13.   Did your agency develop an emergency plan before the smallpox vaccination initiative of 2003?
          Y   N (*Skip to Question 18*)   Already had a plan   Don't Know (*Skip to Question 18*)

14.   Did your emergency plan have a risk communication component?
          Y   N (*Skip to Question 18*)

15. If your new plan included a risk communication plan, did it address the following key components?
    (Please circle all that apply)

Communication Problems Defined

Identified and Profiled Audiences

Identified Settings/Channels for Messaging

Identified Communication Partners

Outlined Communication Tasks/Timelines

Identified Spokespersons

Special Populations Identified

Identified/Collected Contact Numbers

Developed Public Communications Plan

Developed Media Communications Plan

Other (please specify)_____

Communication Problem Analyzed/Goals Set (background)

Developed Communication Objectives/Strategies/Tactics

Outlined Communication Activities/Materials/Methods

Identified Communication Resources

Internal/Employee Risk Communications Plan

Pre-scripted Key Messages on Hazards/Agents/Risks

Communications Plan for Special Populations

Identified Process to Maintain the Risk Comm Plan

Identified Person(s) Responsible for Activating Plan

I am unsure what our plan contains

16. Did you use the risk communication component of your plan to advise health care workers and citizens of the risks of smallpox or vaccinia?   Y   N

17. Did your agency use its emergency plan to plan for and establish your immunization clinics?
    Y   N

18. How successful do you think your agency was in communicating risk during the smallpox immunization phase? If your agency was not asked to communicate risk, please circle "N/A"

Extremely Successful	Very Successful	Successful	Unsuccessful	Very Unsuccessful	Extremely Unsuccessful	N/A

19. When did your organization identify/hire ONE individual to manage its risk communication process?

<9-11-01	>9-11-01 & <12-31-02	2003	We are currently identifying/hiring	2004+	We have no plans to identify/hire	It is a shared responsibility	Unknown

20. How well prepared is your agency to answer questions regarding the risks associated with a bio-terrorism event in your state and the appropriate steps to mitigate the risk?

Extremely Prepared	Very Prepared	Prepared	Unprepared	Very Unprepared	Extremely Unprepared

21. In the remaining space and on the back, please feel free to identify concerns and lessons learned in communicating risks to the public and the media during a public health emergency.

Thank you for your time. Please return the completed survey to Susan Jones-Hard in the enclosed envelope or fax it to 303-691-7811 **before February 10, 2004.**

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APPENDIX B.   PUBLIC HEALTH SURVEY RESULTS

Respondent	Q 1	Q 2 Circled	Q 3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
Data Entry	Y, N, DNK	# Circled	Y, N	Y, N	Y, N	#, U	Y, N, P, DNK	Y, N	#, U	Y, N	EP, VP, P, U, VU, EU	ES, VS, S, U, VU, EU, NA	Y, N, P, DNK	Y, N	#, U	Y, N	Y, N	ES, VS, S, U, VU, EU, NA	#	EP, VP, P, U, VU, EU
CO1	Y	6	Y	Y	N		P			Y	P	NA	P	N	6	Y	N	VS	3	P
CO2	Y	8	Y	0	N		Y	N		N	VP	VS	Y	Y	9	Y	Y	S	2	VP
CO3	DNK						DNK				P	S	P	Y	9	Y	N	U	2	P
CO4	Y	5	N	N	0	U	DNK				P	S	DNK					S	8	VP
CO5	N						DNK				U	S	Y	Y	0	Y	N	S	3	P
CO6	Y	9	N	N	Y	2	P			0	U	S	Y	Y	9	N	N	VS	2	P
CO7	Y	10	N	N	Y	3	P			1	U	S	Y	Y	10	N	N	VS	3	P
KS1	N						N				P	S	Y	Y	U	Y	Y	S	2	VP
KS2	Y	2	N	Y	N		P			0	P	NA	Y	Y	17	Y	N	S	2	P
KS3	Y	3	Y	Y	N		P			Y	P	S	P	N				S	1	VP
KS4	DNK	1	0	0	0	0	DNK	0	0	0	0	0	0	0	0	0	0	0	0	0
KS5	N						N				U	NA	Y	Y	U	Y	Y	ES	2	VP
MT1	N						N				P	S	N					S	3	P
MT3	DNK	0	0	0	0	0	DNK	0	0	0	0	0	DNK	0	0	0	0	0	0	0
MT2	DNK						DNK				U	S	DNK					NA	4	U
MT4	DNK	0	0	0	0	0	DNK	0	0	0	0	0	DNK	0	0	0	0	0	0	0
NE1	Y	1	Y	Y	N		N				U	S	Y	Y	8	Y	N	VS	3	VP
NE2	Y	3	Y	Y	Y	7	Y	Y	12	Y	VP	S	Y	Y	16	Y	Y	ES	8	VP
NE3	Y	2	N	N	N		P			Y	P	S	P	0	0	0	0	S	7	P
NE4	Y	3	Y	Y	0	0	P			Y	0	0	P	0	0	0	0	0	0	0
NE5	Y	8	Y	N	Y	12	P			0	VP	VS	P	Y	12	0	0	ES	1	EP
NE6	Y	2	N	Y	N		N				U	U	Y	Y	8	Y	Y	S	3	P
NE7	Y	2	N	Y	N		N				U	U	Y	Y	8	Y	Y	S	3	P
NE8	N						N				U	S	N					S	5	P
NE9	DNK						DNK				P	S	Y	Y	11	Y	Y	VS	8	VP
ND1	N						N				P	S	N					S	2	P
ND2	DNK						DNK				P	S	DNK					VS	1	VP
ND3	Y	1	Y	N	N		N				VP	VS	N					VS	1	VP
ND4	Y	7	N	Y	Y	7	P			Y	VP	VS	Y	Y	16	Y	N	VS	7	VP
ND5	DNK						DNK				P	S	DNK					VS	1	VP
ND6	DNK						DNK				U	0	DNK					0	8	0
OK1	Y	2	N	N	N		N				P	S	P	N				S	8	P
OK2	Y	3	Y	Y	N		P			Y	P	VS	Y	Y	U	Y	Y	VS	8	VP
OK3	Y	3	N	N	N		Y	Y	7	Y	P	S	P	Y	9	Y	N	S	4	P
OK4	Y	2	N	N	N		N				P	S	P	N				S	8	P
NM1	Y	1	Y	0	N		P			Y	U	S	Y	Y	0	Y	Y	S	4	P
NM2	Y	5	Y	Y	N		P			Y	P	U	Y	N				U	4	U
SD1	N						Y	Y	2	N	VP	S	N					VS	1	P
SD2	Y	1	Y	Y	N		Y	Y	15	Y	P	S	N					NA	2	P
SD3	Y	5	N	N	N		P			N	U	S	N					VS	7	P
UT1	Y	7	Y	Y	Y	13	Y	Y	15	Y	VP	S	Y	Y	16	Y	Y	S	1	VP
UT2	Y	7	Y	Y	Y	13	P			Y	VP	VS	Y	Y				S	1	VP
UT3	Y	6	Y	Y	Y	U	P			N	VP	VS	P	Y	U	Y	N	S	1	VP
WY1	Y	6	N	N	N		P			N	VP	VS	P	N	2	N	N	VS	1	P

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BIBLIOGRAPHY

American Red Cross. "Talking About Disaster: Guide," *American Red Cross Disaster Services Webpage* [on-line] (Accessed 20 March 2004) Available from http://www.redcross.org/disaster/safety/guide.html, Internet.

American Society for Microbiology. *Summary of the Frist-Kennedy Bio-Terrorism Preparedness Act of 2001* [on-line] (Accessed 16 February 2004.) Available from http://www.asm.org/ASM/files/LEFTMARGINHEADERLIST/DOWNLOADFILENAME/0000000557/biobilllsum1765%5B1%5D.html.

Andersen, Martin Edwin. "States Barely Better Prepared for Bioterror, Study Says," *CQ HOMELAND SECURITY* [journal on-line] (Washington, D.C., Congressional Quarterly Inc., 10 December 2003, Accessed 12 January 2004) Available from http://homeland.cq.com, Internet.

Baden, Dan M.D. Centers for Disease Control and Prevention. Telephone Interview by Susan Jones-Hard, 20 May 2004. Written Notes, Denver, Colorado and Atlanta, Georgia.

Barr, Christine R. *The Art of Risk Communication: Overcoming the Public Fear Surrounding Controversial Projects*, [on-line] (Accessed 9 April 2004) Available from http://www.stc.org/confproceed/1994/PDFs/PG5355.PDF.

Beiser, Barbara. Program Manager, Focus Area F, Colorado Department of Public Health and Environment. Interview by author, 19 May 2004. Written Notes and E-Mails. Interview by E-Mail – Denver, Colorado.

Blendon, R. J., J. M. Benson, C. A. DesRoches, W. E. Pollard, C. Parvanta, and M. J. Herrmann, "The Impact of Anthrax Attacks on the American Public," *Medscape General Medicine*, Vol. 4, Number 2, 17 April 2002, Available on-line from http://medscape.com/viewarticle/430197, Accessed 20 March 2004.

Blendon, R. J., J. M. Benson, C. M. DesRoches, and K. J. Weldon, "Using Opinion Surveys to Track the Public's Response to a Bioterrorist Act," *Journal of Health Communications,* Vol. 8 Supplement 1 (2003).

Butler, Jay C., Mitchell L. Cohen, Cindy R. Friedman, Robert M. Scripp, and Craig G. Watz. "Collaboration Between Public Health and Law Enforcement: New Paradigms and Partnerships for Bioterrorism Planning and Response" *Emerging Infectious Diseases* [Serial Online] (2002 October, Accessed 31 May 2004) Available from: http://www.cdc.gov/ncidod/EID/vol8no10/02-0400.htm, Internet, 8.

Centers for Disease Control and Prevention, *A National Public Health Strategy for Terrorism Preparedness and Response 2003-2008*, [On-Line] (Accessed 20 May 2004). Available from http://www.bt.cdc.gov/planning/tprstrategy/pdf/FinalExternalStrategicPlan4-15-04.pdf, Internet.

Centers for Disease Control and Prevention, *Continuation Guidance for Cooperative Agreement on Public Health Preparedness and Response for Bioterrorism – Budget Year Four* [Guidance Document On-Line] (Accessed 4 May 2004) Available from http://www.bt.cdc.gov/planning/continuationguidance/pdf/annex_b_funding.pdf, Internet.

Centers for Disease Control and Prevention, *Emergency Risk Communication CDCynergy: Your Guide to Effective Risk Communication Planning,* [CD ROM] 2002.

Centers for Studying Health Care Change. *Tracking Changes in the Public Health System: What Researchers Need to Know to Monitor and Evaluate These Changes,* Issue Brief Number 02 (September 1996.)

China Internet Information Center - China through A Lens, *Latest SARS Figures Worldwide –July 11, 2003*, [On-Line] (Accessed 20 February 2004) Available from http://www.china.org.cn/english/features/SARS/62628.htm, Internet

Conradi, Melissa. "A City Survives SARS – NLC Delegation Learns Lessons in Toronto," *Governing* (August 2003).

Conte, Christopher. "Deadly Strains," Governing*,* [on-line] (June 2003, Accessed 19 December 2003) Available from http://www.governing.com/archive/2003/jun/health.txt.

Covello, V. T. R .G. Peters, J. G. Wojtecki, and R. C. Hyde. "Risk Communication, the West Nile Virus Epidemic, and Bioterrorism: Responding to the Communication Challenges Posed by the Intentional Release of unintentional release of a Pathogen in an Urban Setting." *Journal of Urban Health,"* Volume 78, (2001).

Covello, Vincent. Risk Communication Slides, [presentation on-line] (Accessed 4 April 2004) Available from http://healthlinks.washington.edu/nwcphp/pdf/april02slides.pdf, Internet.

Fearn-Banks, Kathleen. *Crisis Communications: A Casebook Approach*. Mahwah, New Jersey. Lawrence Eelbaum Associates, Inc., 1996.

Freimuth, V., H. W. Linnan and P. Potter, "Communicating the Threat of Emerging Infections to the Public" *Emerging Infectious Diseases,* Vol. 6, Number 4 (July/August 2000).

Frist, Bill M. D., "Public Health and National Security: The Critical Role of Increased Federal Support," *Health Affairs*, Volume 21, Number 6. (November/December 2002) 9. (Available from ProQuest.)

Garrett, Laurie. *Betrayal of Trust – The Collapse of Global Public Health*. New York: Hyperion, 2000.

Garrett, Laurie. *The Coming Plague – Newly Emerging Diseases in a World Out of Balance.* New York: Penguin Books, 1995; Farrar, Straus and Giroux, 1994.

Gebbie, Kristine and Laurie Garrett. Public Health Leadership Symposium, (8 August 2003. Fort Lewis College, Durango, Colorado) Transcribed Notes of Karen O'Brien.

Gynne, Robert. *Maslow's Hierarchy of Needs* [on-line] (Knoxville, TN, University of Tennessee, Accessed 9 April 2004). Available from http://web.utk.edu/~gwynne/maslow.HTM, Internet.

Harrington, Caitlin. "Hauer: Germ War Outbreak Could Keep Health Care Workers at Home," *Congressional Quarterly Homeland Security*, 11 December 2003.

Henry, Bonnie J. "Severe Acute Respiratory Syndrome (SARS) Overview" (Presentation at the National Disaster Medical System Disaster Response Conference 2004, 19 April 2004, Dallas) Written Notes.

Hoffman, Bruce. *Inside Terrorism*. New York, Columbia University Press, 1998.

Hughes, James M. and Julie Louis Gerberding, "Anthrax Bioterrorism: Lessons Learned and Future Directions*,"* [on-line] (Accessed 30 May 2004) Available at http://www.cdc.gov/ncidod/EID/vol8no10/02-0466.htm, Internet.

Kennedy, Ted. *Frist-Kennedy Public Health Improvement Act of 2000 Update,* [Presentation On-Line] (July 2001. Accessed 16 February 2004); Available from http://www.naccho.org/downloadfile2.cfm?filenamex=General380.pdf, Internet.

Lanard, Jody and Peter M. Sandman. "SARS Communication: What Singapore Is Doing Right" [Full Unpublished Version for *The (Singapore) Straits Times*] (6 May 2003, Accessed 20 March 2004) Available from www.psandman.com/articles/sars-3.htm, Internet.

Mason, Heather. "Federal Scorecard: Americans Rate U.S. Agencies," *The Gallup Organization,* [on-line] (30 September 2003, Accessed 23 March 2004) Available from at http://www.gallup.com/content, Internet.

Mebane Felicia, Sarah Temin and Claudia F. Parvanta, "Communicating Anthrax in 2001: A Comparison of CDC Information and Print Media Accounts, *Journal of Health Communications* Vol. 8 Supplement 1 (2003).

Mezzucca, Josephine. "SARS: Toronto Residents Alert, Not Alarmed," *The Gallup Organization – Toronto Bureau* (22 April 2003, Accessed 22 March 2004) Available from at http://www.gallup.com/content, Internet.

Mezzucca, Josephine. "Torontonians Rate Government's SARS Response," *The Gallup Organization – Toronto Bureau (*29 April 2003, Accessed 22 March 2004) Available from http://www.gallup.com/content, Internet.

Mullin, Sandra. "New York City's Communication Trials By Fire, From West Nile to SARS," *Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science*, Vol. 1 No 4, 2003 [journal on-line] (Accessed 9 April 2004) Available from http://www.biosecurityjournal.com/PDFs/v1n403/p267_s.pdf, Internet.

National Advisory Council on SARS and Public Health. *Learning From SARS – Renewal of Public Health in Canada* [Report On-Line] (Health Canada Publications, October 2003, Accessed 22 March 2004] Available from http://www.hc-sc.gc.ca/english/pdf/sars/sars-e.pdf, Internet.

Naylor, C. David, Cyril Chantler and Sian Griffiths, "Learning From SARS in Hong Kong and Toronto," *JAMA*, Vol. 291, No 20 (26 May 2004):2483-2487.

O'Connor, Timothy. "Managing Media and Other Mass Communication During a Bio-terrorist Incident." Boca Raton, Florida: Palm Beach County Health Department, 2002. Electronic Copy.

O'Connor, Timothy. Palm Beach County Health Department, E-Mail Interview by Susan Jones-Hard, 19 May 2004. Written Notes, Palm Beach County, Florida and Denver, Colorado.

Palm Beach County Health Department. Website Homepage [On-Line] (Accessed 20 March 2004) Available from http://www.pbchd.com, Internet.

Payne, J. Gregory and Skye K. Schulte, "Mass Media, Public Health, and Achieving Health Literacy," *Journal of Health Communications* Vol. 8 Supplement 1 (2003).

Pollard, William E. "Public Perceptions of Information Sources Concerning Bioterrorism Before and After Anthrax Attacks: An Analysis of National Survey Data," *Journal of Health Communications,* Vol. 8 Supplement 1 (2003).

Progressive Policy Institute. *America at Risk: Homeland Security Report Card* [Report On-Line] (Washington, D.C. July 2003, Accessed 16 January 2004); Available from http://www.ppionline.org/documents/HomeSecRptCrd_0703.pdf.

Robinson, Susan and Wendy C. Newstetter. "Uncertain Science and Certain Deadlines: CDC Reponses to the Media During the Anthrax Attack of 2001," *Journal of Health Communications* Vol. 8 Supplement 1 (2003).

Savor Price, Connie. "SARS: the Toronto Experience" (Presentation at the SARS Preparedness Conference, 9 January 2004, Denver, CO) Written Notes.

Shore, David A., "Communicating in Times of Uncertainty: The Need for Trust," *Journal of Health Communications* Vol. 8 Supplement 1 (2003).

Ropeik, David. "What Really Scares Us," *Parade Magazine,* 30 March 2003.

Rudd, Rima E., John P. Comings and James N. Hyde, "Leave No One Behind: Improving Health and Risk Communication Through Attention to Literacy," *Journal of Health Communications* Vol. 8 Supplement 1 (2003).

Strom, Chris. "Americans on Homeland Security: Ready and Willing but Uninformed," *Government Executive* [Journal On-Line] (25 May 2004, Accessed 2 June 2004) Available from www.govexec.com/story_cfm, Internet.

Telfer, Jana. Centers for Disease Control and Prevention, Telephone Interview by Susan Jones-Hard, 21 May 2004, Written Notes, – Denver, Colorado and Atlanta, Georgia.

The White House, *Defending Against Biological Terrorism*, [Report On-Line] (Washington, D.C., Accessed 28 April 2004), Available from http://www.whitehouse.gov/infocus/bioterrorism/index.html, Internet.

Tucker, Jonathan B., ed., *Toxic Terror – Assessing Terrorist Use of Chemical and Biological Weapons*. (Cambridge: MIT Press, 2000.)

U.S. Department of Health and Human Services. [Home Page On-Line] (Washington, D.C., Accessed 31 May, 2004.) Available from http://www.firstgov.gov/fgsearch/index.jsp, Internet.

U.S. Department of Health and Human Services, *Bioterrorism Funding by State-City-Territory for Fiscal Year 2002* [Report On-Line] (Accessed 4 May 2004) Available from http://www.hhs.gov/news/press/2002pres/states.html, Internet.

U.S. Department of Health and Human Services. *FY 2004 Budget in* Brief [Budget Summary On-Line] (Washington, D.C., Accessed 16 January 2004.) Available from http://www.hhs.gov/budget/04budget/fy2004bib.pdf, Internet.

U.S. Department of Health and Human Services. *Images From the History of the Public Health Service. Introduction: Two Centuries of Health Promotion*. [On-Line] (Washington, D.C., Accessed 16 January 2004.) Available from http://www.nlm.nih.gov/exhibition/phs_history/intro.html.

U.S. Department of Homeland Security. *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets*, [on-line] (Washington, D.C. Accessed 31 May 2004.) Available from http://www.dhs.gov/interweb/assetlibrary/Physical_Strategy.pdf.

U.S. House of Representatives, Select Homeland Security Subcommittee on Emergency Preparedness and Response. *House Select Homeland Security Subcommittee on Emergency Preparedness and Response Holds Hearing on Disease Surveillance Systems.* 108th Cong.,(24 September 2003). (Accessed 25 October 2003) http://www.cq.com].

Vanderford, Marsha L. Centers for Disease Control and Prevention. Telephone Interview by Susan Jones-Hard, 5 March 2004, Written Notes, Denver, Colorado and Atlanta, Georgia.

Vanderford, Marsha L. "Communication Lessons Learned in the Emergency Operations Center During CDC's Anthrax Response: A Commentary," *Journal of Health Communication* 8, supplement 1 (2003).

Watzlawick, P., J. H. Beavin, and D. D. Jackson. "Pragmatics of Human Communication: A Study of Interactional Patterns, Pathologies and Paradoxes" (New York: W.W. Norton & Co, Inc.), 1967.

World Health Organization. Communicable Disease and Response. *Severe Acute Respiratory Syndrome (SARS): Status of the Outbreak and Lessons for the Immediate Future,* [Report On-Line] (20 May 2003, Geneva, Switzerland Accessed 20 February 2004); Available from http://www.who.int/csr/media/sars_wha.pdf, Internet.

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