



# The Challenges of Risk Perception and Infectious Disease Response: Counteracting Inaccurate Risk Perception



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# ***The Challenges of Risk Perception and Infectious Disease Response: Counteracting Inaccurate Risk Perception***

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## **Introduction**

In 2014 an Ebola epidemic swept through western Africa, killing tens of thousands of people. When a case of the virus appeared in Dallas, TX, the American public began to panic. There was concern that the disease would spread quickly and uncontrollably like it had in Africa. Much of the fear and anxiety surrounding Ebola in the United States was perpetuated by a lack of understanding about the virus and a highly exaggerated perception of the chance of infection; an inaccurate perception fueled by the CDC's poor communication throughout the outbreak. Many Americans did not understand that a main reason Ebola was able to spread so rapidly in Africa was due to lack of personal protective equipment—specifically gloves—, a lack of infrastructure and properly trained healthcare workers, and the traditional burial practices of many of the affected communities (WHO, 2015). In reality, the American healthcare system, with the addition of designated definitive treatment centers and appropriate use of personal protective equipment, is fully equipped and capable of safely containing cases of Ebola virus, which is most commonly spread through contact with infected bodily fluids, similar to HIV.

What motivates most of the misperceptions about diseases like Ebola is fear and a lack

of understanding about disease transmission. Fear is a difficult emotion to overcome. It is a primal response; a survival instinct. It often takes over logical thinking. Panic or an unrealistic level of fear can be one of the greatest challenges facing public health officials during an infectious disease outbreak. Exaggerated fear makes it unlikely that a disease will spread, but it can have a disproportionate economic impact, as was the case with Severe Acute Respiratory Syndrome (SARS) in 2003.

Inaccurate levels of fear can also be a challenge when the situation is reversed and the public's perception of the risk is lower than the reality of the risk. Lower than realistic risk perception is an obstacle health authorities face every influenza season. "The flu" is often used as a catch-all term when people are feeling under the weather and it is difficult for the public to understand how deadly the influenza virus can be. The CDC estimates that during the 2014 flu season there were 707,155 influenza-related hospitalizations and 19,490 influenza-related deaths in the United States (CDC, 2016a), while there was 11,310 Ebola deaths in West Africa that same year (CDC, 2016b). A lower than realistic risk perception of influenza means that many people do not get a flu shot or take any sort of protective measures against infection.

This article examines how risk perception affects the public's ability and willingness to follow recommended actions during a disease outbreak. I also seek to identify the most significant challenges in changing risk perception and provide suggestions for doing so.

### **What Influences Risk Perception?**

Previous research found that the perception of risk, whether it's risk from a natural disaster, infectious disease, or even modes of transportation (i.e. airplane vs. car), has a significant impact on the actions that people take when faced with that risk (Rubin, Amlot, Page, & Wessely, 2009; Elder et al., 2007; Smith, 2006). When it comes to natural disasters, risk perception is often influenced by past experience (Elder et al., 2007). That is to say that if one has lived through a hurricane and had no issues, it is likely they will view an impending hurricane as nothing to worry about. With regard to infectious disease, however, the formation of risk perception is more complicated.

In a 2006 study, Smith (2006) found that risk perception is heavily based in an individuals' feelings of control over infection. This means that if people feel in control over becoming infected, as with diseases like HIV, they have a lower risk perception than cases where they feel they have little control over infection, such as SARS. There is also evidence that when a particular risk is unfamiliar to the affected group, they are likely to perceive it as a high risk event whether it actually is or not (Brug, Aro, Richardus, 2009). An infectious disease outbreak in which there is pre-existing information about how infectious the disease is and how it is transmitted, will create a lower risk perception among the public than a disease that is not scientifically

understood, even if the known disease poses a greater threat.

Lack of knowledge about a disease is a main factor in inaccurate risk perception. A recent study of German citizens found that approximately a third of participants were concerned about Ebola, but that almost 100% of participants would be concerned if a patient from Africa was flown to a nearby hospital to be treated (Rubsamen et al., 2014). The authors believe this overestimation of risk is most likely due to a lack of knowledge about the disease. Only 4% of the participants interviewed correctly identified the route of transmission for Ebola and 75% of participants believed the virus is airborne (Rubsamen et al., 2014). This lack of understanding about the transmission dynamics of Ebola contributed to the rise in risk perception in the two different scenarios (Ebola in Africa vs. Ebola patient at local hospital).

One of the leading scholars of risk communication and risk perception is Peter Sandman. He argues that there are two important parts of risk communication: scaring people and calming them down (Sandman, 1993). In his 1993 book, *Responding to Community Outrage*, Sandman argues, "It follows that experts face two core communication tasks in a risk controversy, not one. The task everyone acknowledges is the need to talk better, to explain that the hazard is low. The task that tends to be ignored is the need to listen better, to hear that the outrage is high and take action to reduce it." For Sandman, the balance between hazard and outrage is vital to effective infectious disease outbreak response because, often times, the public has a difficult time accurately comprehending the threat of the disease.

As this brief review of studies on risk perception and infectious disease demonstrates, there are several core elements that influence the formation of the public's perceived risk of infection. These include: novelty of disease, level of understanding about disease, trust in public officials, and belief that precautionary actions will be effective. Sometimes these inherent risk perceptions can be difficult to overcome, but they are not impossible. The next section will discuss each of these elements that formulate risk perception and how they can be counteracted to create a more accurate perception of risk.

### **The Challenges of Communication and the CDC**

The Centers for Disease Control and Prevention is the United States' main domestic infectious disease prevention and response organization. Funded, in large part, by taxpayer dollars and typically considered outside the realm of politics, the CDC is designed to operate as the country's leader in public health. Unfortunately, despite employing thousands of talented scientists and staff with expertise in translating complex science for the public, the organization has had problems in recent years communicating appropriate levels of disease risk to the American public. Take, for example, the first domestic transmission of the Zika virus. Zika is a vector-borne virus that is typically mild but can cause birth defects if a woman is infected during pregnancy. Beginning in the summer of 2016, Zika began infecting individuals in an area of Miami and the CDC released messaging telling people to stay away from the neighborhood. While it may seem like the best idea to keep people out of an infected area to avoid further spread of the virus, the messaging from the CDC didn't

provide helpful information about avoiding infection. Rather they ultimately quarantined an entire neighborhood—which will likely do little good since mosquitos don't respect artificial boundaries.

The CDC also struggled with their communication during the cases of Ebola in the United States. In an attempt to correctly inform the public that there was little risk of catching Ebola, they downplayed the risk to the ICU personnel working directly with the patients. Thus, when members of the medical team working on the patient in Dallas became infected with the virus, it created panic among the public. Following this communication blunder, the CDC struggled to maintain credibility and keep public fear of the disease under control.

These most recent CDC communication challenges are in stark contrast to their communication during the 2009 H1N1 outbreak. During this outbreak, the CDC spoke to the public on a regular basis, always remaining heavily information focused with no use of fear. Additionally, they continued to stress that the virus was likely to be "unpredictable" but there were ways that the American public could help prevent its spread.

### **Modifying Risk Perception**

As previously mentioned, there are numerous challenges to overcome when correcting public risk perception during an infectious disease outbreak. Some of these challenges can be more difficult to overcome than others, but with proper acknowledgement of the challenges, it is possible to change public perception. As previously mentioned, novel diseases create a much higher level of uncertainty than known diseases. This can be uncertainty about how deadly it is, how it is transmitted,

and whether scientists and public officials truly understand what is going on. Uncertainty heightens risk perception simply because it creates a fear of the unknown.

One way to counteract this fear is to communicate with the public as often as possible. The more information the public receives, the more likely they are to feel like they are gaining an understanding of the crisis. Interestingly, studies have shown that the information the public receives does not need to be correct in order to reduce uncertainty (Planalp & Honeycutt, 1985; Brashers, 2001). In fact, one study commented that “knowledge that is held with extreme certainty is often inaccurate” (Planalp & Honeycutt, 1985, p. 543). Therefore, if information can simply serve to distinguish between options, making one option more attractive than the other options, it can reduce uncertainty (Brashers, 2001). What this shows is that frequent communication with the public, even when little new information is known, can help to reduce uncertainty and help manage risk perception during an outbreak.

The second element of risk perception, level of understanding of the disease, is closely related to the first. Novelty of disease and level of understanding of the disease tend to go hand-in-hand, but it is important to address them separately because people can have a low level of understanding about a disease that is not novel. For example, Ebola would not be considered a novel virus, but many members of the public had little to no information about how it was transmitted. An alarming number of Americans believe that Ebola is airborne, and this kind of misunderstanding led to higher levels of perceived risk than were appropriate for the cases in the United States. Counteracting inaccurate understanding of a previously

known disease is much easier than counteracting uncertainty around a novel disease because the information is already known and understood by scientists and public officials. The challenge in these cases is helping the public understand the details of the disease. Officials must first listen to the concerns of the public and understand their perceptions before they can begin attempts to modify risk perception. Once an understanding of public perception is determined, it is important for information to be communicated with compassion and concern (Seeger, 2006). Effective communication about realistic levels of threat can help to bring risk perception more in line with reality.

Effectively communicating about a disease relies heavily on the perceived trustworthiness of public officials, however. If public officials are perceived as untrustworthy, then they will likely be skeptical of the information being disseminated and will not adjust their risk perception. The impact of lack of trust can be seen by the unwillingness of individuals to evacuate prior to Hurricane Katrina. There were many citizens of New Orleans, particularly African-American citizens, who did not trust government and the police department to provide them with accurate information (Elder et al., 2007). Because of this lack of trust in government officials, a good many of these citizens chose not to evacuate prior to the hurricane.

When there is a lack of trust in government or police as there was prior to Hurricane Katrina, it is a very difficult obstacle to overcome. One of the ways to increase or help build trust is to have one designated, credible spokesperson throughout the outbreak. Appointing one spokesperson rather than having several also helps to

prevent conflicting messages. Previous studies have shown that if there is a lack of consistency in information, people feel unsure about the crisis and are likely to perceive a higher risk from the situation (Brashers, 2001). The more uniform and single-source the information is kept, the more likely the public is to trust what is being said. Additionally, if the individual appointed is viewed as credible by the population they are addressing, there will be a greater chance that the public will trust messaging about the outbreak. Who is considered a credible source may vary based on the affected population, so an understanding of the demographics of the area is necessary to appoint a credible spokesperson.

Finally, the public's belief that precautionary actions are effective or that they are able to accomplish the recommended precautionary measures plays a big role in their perception of risk. If the public does not believe that the precautionary actions will protect them from infection, or they perceive barriers to following the precautionary actions, they will not take the recommended actions. One way to counter this is to recommend actions that are easy for people to complete regardless of their financial or educational levels. A recommendation that people evacuate may not be feasible for those with no personal transportation, whereas recommending avoidance of public places or school closures may be more easily achievable.

### **Infectious Disease Communication Moving Forward**

How do we implement these changes at the federal level? The first, and likely most important, change would be appointing a strong and decisive Surgeon General, who is

empowered by the White House to make independent decisions for the good of public health. This would require the appointment of someone who is not only scientifically and medically qualified, but also someone with the ability to publicly address the nation during disease crises. The Surgeon General is supposed to be viewed as the "Nation's doctor," unfortunately, most Americans likely don't know who the Surgeon General is, let alone what they do. Appointing a Surgeon General with the expressed task of being the spokesperson during infectious disease emergencies could lend continuity to disease response and provide the public with a trusted doctor to look to during times of uncertainty.

One way to help the Surgeon General build a more prominent public profile would be to extend the term of their appointment in order to overlap administrations. Instead of serving 4 year terms, the Surgeon General should be appointed to 10 year terms. The longer terms would help separate the role of the Surgeon General from a political role and provide some amount of institutional memory across administrations when there is a disease outbreak.

Lastly, the communication staff at the CDC needs to work in conjunction with scientists to create messaging that is both accurate to the disease being addressed and straightforward enough to be understood by the whole of the population. The trend towards exaggeration of the risk is only hurting the organization's credibility and creating undue panic among the public. These reforms would go a long way toward creating proper risk perception in the United States.

## **Conclusion**

Infectious disease outbreaks are crises that humans have always face and will continue to face for the foreseeable future. The increase in emerging diseases, advances in technology, and, more specifically, the advent of social media—which allows news to spread more quickly than ever before—has changed the way that infectious disease outbreaks are understood and handled. People are able to form an opinion about a disease or outbreak before it reaches the country they live in. Massive access to information—mainly through social

media—has made it more difficult to help people develop accurate perception of the threat they are facing. Although there are a number of challenges to overcome when communicating about a disease and helping the public to accurately understand it, it is possible to change pre-existing, inaccurate perceptions of the disease and the risk it poses. By acknowledging and addressing the challenges using the recommendations listed above in this article, it is possible to adjust people's risk perception so they correctly understand the threat they are facing.

***The views expressed in this report are those of the author, and do not necessarily reflect the positions of any of the institutions to which she is affiliated, the Scowcroft Institute of International Affairs, the Bush School of Government and Public Service, or Texas A&M University.***

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## **Christine Crudo**

Dr. Crudo received her Ph.D. in 2015 from Washington State University as part of their Individual Interdisciplinary Doctoral Program. This program requires specialization in a minimum of three fields, of which Crudo chose Political Science, Communication, and Veterinary Clinical Sciences/Global Animal Health. For her doctoral work she constructed a mathematical model that allowed for quantified policy and communication inputs to determine how different disease intervention policies and communication strategies impacted the spread of disease outbreak.

Following the completion of her doctoral degree, Crudo worked as a postdoctoral researcher in the Field Disease Investigation Unit laboratory in the Washington State University Veterinary School of Medicine. During this appointment she worked on a variety of projects, including seasonal prevalence of *E. coli* bacterium in dairy and beef cattle, health differences between feeding dairy calves milk replacer rather than actual milk, and the impact of *Bifidobacterium* to the health development of dairy calves.

Dr. Crudo is currently a postdoctoral researcher with the Snowcroft Institute for International Affairs in the Bush School of Government and Public Service at Texas A&M conducting research on various aspects of pandemic disease policy and control.

## **The Bush School of Government and Public Service**

***Mark Welsh, Dean and Holder of the Edward & Howard Kruse Endowed Chair***

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***Andrew S. Natsios, Director and E. Richard Schendel Distinguished Professor of the Practice***

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— Lt. Gen. Brent Scowcroft, USAF (Ret.)