

Communicating Risk During Public Health Crises

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THEME: Adoption of Preventive Measures

Studies focus on preventive measures people can take during public health outbreaks, as well as avoidance strategies that can be adopted. Preventive measures include: hand washing₁; social distancing₂; wearing a mask when outside of the home₃; hand sanitizing₄; cleaning surfaces more often₅; getting the annual flu vaccine₆; health seeking behaviors if showing symptoms₇; hygiene during Ebola₈; and preparedness for access to clean water during a contaminated water incident₉. Avoidance strategies include: avoiding crowds₁₀; avoiding dining out₁₁; avoiding public places₁₂; avoiding or reducing use of public transportation₁₃; avoiding travel₁₄; avoiding visiting hospitals₁₅; direct avoidance₁₆; not leaving home unnecessarily₁₇; and physical contact avoidance₁₇. Several articles examine protective actions in general but did not specify which actions₁₈. Adoption of these measures and strategies vary.

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Adoption of Actions: Across outbreak events such as COVID-19, SARS, and MERS, people most engaged in handwashing¹⁹. The majority of people received the annual flu vaccine⁶; adhered to social distancing guidelines⁷; and wore masks whenever they left the house⁷. Unlike other studies, Kayina et al. (2020) also included health-seeking behaviors as a protective measure, inquiring if participants developed COVID-19 symptoms would they approach doctors, get tested, call the public health helpline, or stay home. Of these options, people indicated they were most likely to approach doctors. Few participants reported they would engage in the other three alternatives. Overall, people who regarded preventive behaviors as useful tended to have a higher adoption rate. In particular, compliance with personal and household hygiene actions was higher than compliance with social distancing¹¹. During COVID-19, people with individualistic worldviews, high general interpersonal trust, low social trust, a low level of perceived risks, and the conviction that risks other than health risks were neglected had less acceptance of protective measures compared with people who held the opposite views²⁰.

Adoption of Avoidance-Related Behaviors: During the Ebola pandemic, participants were most likely to engage in physical contact avoidance⁸. Few study participants (19.6%) reported engaging in public space avoidance and fewer (2.8%) reported avoiding social interaction in response to Ebola. In contrast, during the COVID-19 pandemic, the most common avoidance-related behavior adopted was avoiding crowded places⁵. Still, when out, people were more likely to adopt actions - such as hand washing and wearing a mask - than adopt avoidance-related actions, such as social distancing²¹.

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Of Note: During COVID-19, some locally trusted tribal groups and leaders undertook culturally relevant strategies to promote measures, yet the effectiveness of these strategies to protect the tribes from COVID-19 was not assessed²². However, using culturally relevant materials and cultural brokers has been shown elsewhere to improve adoption of protective actions²³.

Relationship to Demographic Characteristics: Findings are inconsistent across studies. For example, early research on the COVID-19 pandemic suggested age and gender were not associated with adoption of protective actions, including wearing masks, using hand sanitizer, and social distancing²⁴; yet other research found females were more likely than males to wash their hands with soap and avoid dining out and gathering together¹¹. Those who were not employed or who were retired were more likely than white collar workers to avoid public places or avoid using public transport¹¹. In studies measuring general disaster preparedness, some research suggests that older respondents and females were more likely to undertake protective actions²⁵, while other studies do not identify such relationships²⁶ or found older respondents were less likely to mitigate against hazards²⁷. Although demographic differences may emerge, too little is known and careful consideration must be made to where the study was conducted as other factors may influence why certain segments of the population adopt or refuse protective actions in a particular country or region.

Of Note: With respect to community measures, public backlash can occur with measures requiring changes to cultural and religious practices, such as halting in-person religious meetings (Adebisi et al., 2021). A study conducted in Liberia following Ebola indicated high levels of support for curfews, the ban on gatherings, and travel restrictions. People were less supportive of restrictions on burial and cremation practices of infected bodies²⁹.

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THEME: Information

Protective Action and Information about the Hazard or Risk: Exposure to disaster information is positively related to taking protective actions. Generally, participants exposed to disaster information are more likely to engage in disaster preparedness actions³⁰. This finding appears consistent in pandemics, where exposure to different types of information about the risk increases the protective actions taken³¹, particularly for those who are exposed to all preventive information versus only limited information³². This finding may not be as strong for all public health crises, such as water contamination, although more research is needed in this area⁹. Being exposed to all types of preventive information available is positively associated with engaging in preventive behaviors³³. Non-compliance with public health measures (measures such as avoiding crowded places, wearing a mask when going out, and practicing regular handwashing) is positively associated with belief in misinformation about the COVID-19 virus³⁴. People who have direct experience with the hazard itself (as opposed to relying on what they hear from media, experts and authorities) have an increased risk perception of the hazard³⁵.

Awareness and detailed knowledge about a hazard positively impacts risk perception, disaster preparedness, taking protective action³⁶, and supporting community-level interventions³⁷. People often have knowledge about the hazard, its method of spread, and prevention alternatives³⁸. Even so, they may still incorrectly identify symptoms, modes of transmission³⁹, specific aspects of prevention strategies - such as recommended duration of handwashing or appropriate distancing to maintain⁷, and connection to more complex health conditions⁴⁰.

Channels and Sources: The most commonly utilized information channels by participants were the Internet, television, and social media. Other sources and channels identified were radio, print news, family and friends, government agencies,

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health officials, and community leaders. Early COVID-19 research suggests both a person's regular source of health information is the same as their source of COVID-19 information⁴⁰, and a variation in channel preference when comparing age groups⁷. The Internet and social media were most popular for ages 18-35⁴¹, television was most popular for ages 36-60, and word of mouth and radio were most popular amongst those over age 60⁷. Exposure to information coming from multiple sources is associated with increased hazard knowledge and adoption of protective behaviors³¹. Across different hazards - including contaminated water⁹; COVID-19⁴²; the H7N9 outbreak⁴³; and MERS⁴⁴ - the most common initial source of information was national news networks - accessed either online or by television. Other initial sources were social media, family and friends, and authorities or health agencies. Preferring news media as an information channel had a small, significant effect on a person's support for community-level protective action interventions³⁷.

Of Note: During the COVID-19 pandemic, the staff of one hospital reported preferring social media as their health safety information source¹¹. Based on results, social media was used by hospital officials in order to ensure the information on COVID-19 safety measures was shared quickly and to as many

Information Seeking and Sharing: The platforms where people look for information vary across studies. Websites of major news organizations, official government websites⁴⁵, television, and the Internet⁴³ were commonly mentioned. Less common sources were newspapers, health agencies, family and friends, and radio. Feeling anxious about a crisis predicts information seeking from social media, whereas feeling either anxious or angry about a crisis predicts information seeking from television⁴⁶. Looking for information from multiple sources does not imply that a person has a lower or higher risk perception³². People seek information about both the hazard⁴⁷ as well as how best to engage in protective measures⁴². The information they find, however, may not be accurate. People are more likely to

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gather information through interpersonal channels and social media when they believe there is social pressure to engage in that behavior³². Patterns can change over the course of a crisis. For example, in Italy, information seeking peaked on the day after the country's first COVID-19 case was confirmed and again on the day the government enacted a nationwide quarantine lockdown⁴⁸.

Of Note: During the Zika outbreak, travelers sought information from online forums. During the Zika outbreak, information travelers found online was insufficient; they wanted very localized information that could help inform their travel decisions and that type of information was largely unavailable⁴⁹.

Information is commonly shared on messaging media, interpersonal media, social media, and text-based media³². Having an emotional response to any crisis did not predict information sharing on social media; however, feeling angry or anxious predicted information sharing through interpersonal channels such as face-to-face interactions, emails, phone calls, and text messages⁴⁶. People who thought positively about the information they had were more likely to share it with others⁵⁰.

Misinformation: Different segments of society may be more likely than others to believe false information about public health hazards. Although the COVID-19 pandemic provides an opportunity to compare demographic differences on a global scale, such work is not yet comprehensively available. For example, some research suggests that those susceptible to misinformation are likely older⁵¹, while other research suggests it is more likely among those who are younger⁵². What is clear across early studies is that differences emerge, and may be connected to other factors such as mistrust in science⁵³, exposure to misinformation³³, low risk perception levels³⁴, belief in other rumors⁵⁴, emotions, such as feeling angry⁵⁴, and exposure to certain forms of media - such as electronic media³¹. Belief in some false statements, but not all, is associated with not complying with public health

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measures³⁴. When information is partially true, it can reinforce the misinformation and may make it more likely people will share it with others⁵².

Correcting misinformation is extremely challenging as people might be uncomfortable with the lack of understanding that might follow. They might later confuse inaccurate information with corrected information, they might be more receptive to additional false information they are exposed to later, and people might reject new information because they do not like to be corrected⁵⁵. Indeed, corrective strategies might backfire and reinforce the false beliefs⁵⁶. Corrective information best comes in the form of presenting factual information, rather than a rebuttal, and from trusted government and media sources versus a social peer⁵⁵. Strategies include: using existing organizational sites (rather than creating new web domains that might not appear at the top of web searches); prioritizing which rumors to invest time in debunking and to do so as a coordinated plan rather than responding to individual comments; utilizing alerts and other mechanisms to push accurate and timely information to the public before an information gap develops⁵⁷.

Transparency: People are more likely to trust an individual or organization sharing risk information if they perceive the information as transparent⁵⁸, timely, and clear⁵⁹. Effective transparency will work to ensure people can receive, process, digest, and use the risk information⁶⁰. Thoughtful communication of areas of consensus and uncertainty is important; otherwise information provision can result in less understanding and greater confusion. Efforts to achieve transparency that violate ensuring confidentiality, privacy, and anonymity can break public trust and lead to stigmatization of specific groups⁶¹.

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THEME: Trust

Studies on trust focus on institutions, authorities, government, health professionals, non-governmental organizations, and scientists. Lack of **trust in institutions** increases feelings of outrage and decreases their acceptance of the risk⁶². Diminished trust in institutions can occur then when people do not understand public health measures and see them as mandated (as opposed to voluntary), which can lead to an unwillingness to follow such measures⁶².

Higher levels of **trust in government** positively influenced individuals' use of protective measures for Ebola²⁹ and COVID-19⁵. Trust in government can change as a public health crisis progresses. For example, as the COVID-19 pandemic progressed, there was diminished trust in government⁶³. Experience of hardships that result from the hazard are negatively associated with a person's trust in the government²⁹. Hardships can include those brought about by protective actions, such as ways that lockdowns or restrictions negatively impacted household income, education, and careers⁶⁴.

Trust in health professionals to handle public health outbreaks was higher than trust in government⁶⁵. For trust in health professionals, public health officials⁶⁶, physicians⁶⁷, and hospitals⁶⁸ were most trusted. Factors that influenced trust included the perceived credibility of the health professional and previous experience with the risk communicator or organization⁶⁸. People who are health literate are more likely to trust in health professionals and get vaccinated⁶⁹. Distrust can emerge when people have a low assessment of how information is reported and feel recommendations are overly general and politically biased⁴⁹.

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Trust in non-governmental organizations was found to be high; however, it was not associated with compliance or support for control measures during Ebola²⁹. Compared to other groups, participants had higher levels of **trust in scientists'** understanding of Ebola but lower levels of trust in their ability to produce a treatment or vaccine within one year⁷⁰.

THEME: Risk Perception

Risk perception is a person's subjective judgment about the level of particular risk associated with a particular threat⁷¹ and it impacts how people understand, interpret, and act on messages they receive.

Studies are mixed regarding if people with high risk perception are more likely to seek out disaster-related information³² or if it does not significantly impact this behavior³⁰. Research has shown higher levels of risk perception increases some individual protective actions⁷², and sometimes support for community action⁷³, but not always³⁷. During COVID-19, as cases declined, so too did risk perception, social trust and acceptance of protective measures; but the belief that other risks and hardships were being ignored increased²⁰.

Of Note: In COVID-19, public support for protective measures declined as a result of both the success of measures and increasing tiredness of restriction, which can impact protective measures support in subsequent waves of the pandemic²⁰.

Emotional Response: When sending messages, risk communicators should acknowledge the public's strong feelings⁷⁴, as people who have an emotional response are more likely to gather risk information through official media and social media³². People who are more susceptible to the influence of others' emotions are more likely to adopt preventive behaviors⁷⁵.

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Information seeking and belief in rumors was likely for people who were angry, but it was not a predictor for taking protective action⁷⁶.

People who are anxious are likely to seek information and share information through interpersonal channels, but the research is mixed on whether or not it leads to protective action⁷⁷. People who are at high risk for infection have higher anxiety with respect to the hazard than those who are at low to medium risk²⁴.

People who were afraid as a result of the risk were more likely to take protective actions; however, fear did not predict information seeking⁴⁶.

Many people were very worried about COVID-19⁴¹; but the majority felt confident they could protect themselves from infection⁴⁰, although the proportion of the population who was worried can vary by country⁷. People who were worried about COVID-19 were more likely to believe they were at risk of exposure from infected people or contaminated surfaces while grocery shopping⁷⁸. Interestingly, people who had already received their annual flu vaccine were more worried about the flu than those who had not yet received a flu vaccine⁶.

Of Note: Age can play a role. In one study in China, younger people and those who perceived COVID-19 impact their social life as well as physical and mental health were more likely to be worried about the virus¹¹.

Perceived Susceptibility: Perceived susceptibility is how likely a person feels they may be threatened by the hazard⁷⁹ and can vary by country even when facing the same risk⁸⁰. In some public health crises, higher perceived susceptibility increased probability of vaccination⁸¹, or taking hygiene-related preventive behaviors⁵, but that is not always the case in every event⁸². Perceived susceptibility to infection has been associated with heightened worry about infection¹¹. Education, age, and

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income has been linked to higher perceived susceptibility⁸³, although such factors should be explored in more detail for the population under consideration. Perceived susceptibility also predicts information seeking⁸⁴.

Perceived Severity: Perceived severity involves how serious someone feels the potential consequences of the risk actually will be if they were to occur⁸⁴. It can impact an individual's risk perception, coping mechanisms, and protective actions they may take⁸⁵.

Higher perceived severity increases the likelihood of an individual seeking out information about the risk⁸⁴. Higher perceived severity of H7N9 increased an individual's anxiety about the threat⁴³. High perceived severity of COVID-19 infection was associated with engagement in preventive behaviors⁵. Perceived severity can be high in some public health crises⁸⁶, and low in others⁷⁰. High perceived disease risk is associated with women, older age, and higher perceived death risk⁶.

Of Note: In a comparison of the perceived severity of COVID-19 to their perceived severity of SARS and seasonal influenza, a Chinese sample viewed SARS to be the most severe followed by COVID-19, with seasonal influenza having low reported perceived severity¹¹.

Perceived Response Efficacy and Self-Efficacy: Response efficacy is an individual's confidence that a measure they take to protect themselves or others will be effective against a threat, while self-efficacy refers to how confident an individual is in their ability to control and respond to a threat³⁵.

Perceived response efficacy positively influences an individual's intention to seek health risk information⁸⁴. People do not assess the effectiveness of preventive

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measures equally. They may believe some measures are effective⁸⁷, while believing others are not effective⁸⁸. Communications should be clear on how and to what extent protective measures will be effective against the threat, why the strategy needs to be implemented, and the criteria for its de-escalation.

When people have high levels of perceived self-efficacy, they are more likely to take those protective actions³⁵. Self-efficacy information can be included in information shared with the public⁸⁶. Perceived self-efficacy can vary across a population. For example, in the early stages of the COVID-19 pandemic, university students reported high confidence they could protect themselves from COVID-19 infection⁴⁰, whereas a sample of the general public in Australia reported low self-efficacy in taking avoidance-related distancing behaviors during the pandemic⁵.

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- ³¹ Winters et al., 2018

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- ⁴⁹ Gui et al., 2017
- ⁵⁰ Crook et al., 2016
- ⁵¹ Bapaye & Bapaye, 2021; Wang et al., 2020
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- ⁵³ Agle & Xiao, 2021
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- ⁶² Malecki et al., 2021
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