

## Coronavirus and Risk Analysis

George Santayana wrote “Those who cannot remember the past are condemned to repeat it.” The coronavirus disease (COVID-19) pandemic has revealed many failures in different countries and systems that have combined to yield lethal consequences. Such failures, as well as actions in ongoing responses, contain elements that many members of the Society for Risk Analysis comprehend and that have been well researched and understood in the risk analysis field, but that have not yet been assimilated into the institutional responses.

Some of these key concepts from risk analysis include the following:

- Perceptions of risk can be amplified or attenuated by a variety of factors including perceived dreadfulness, lack of controllability or unfamiliarity, as well as social and news media (Renn, Burns, Kasperson, Kasperson, & Slovic, 1992; Slovic, 1987).
- COVID-19 is novel, unfamiliar, and dreaded, and therefore, strong social amplification of perceived risks was not unanticipated. However, formal analysis and training in risk assessment, disease modeling, and risk communication can and should be used to help promote accurate assessments of risks, effects, and uncertainties.
- Communications have sometimes been in absolutes with a message of certitude (e.g., that transmission is only by droplet).
- Some have compared the risks of COVID-19 to other, more familiar, risks, for example, number of automobile fatalities or the seasonal flu. Risk comparisons may be useful, but should be carefully done to convey accurate information without misleading. A risk that people perceive to be relatively controllable (e.g., car accident or seasonal influenza) should not be used to put an involuntary hazard in perspective. Similarly, using the seasonal flu for comparison may evoke the wrong mental models (Morgan, Fischhoff, Bostrom, & Atman, 2002), because there is no

immunity against SARS-COV-2 and the mortality rate seems to be higher for some subpopulations.

- While SARS-COV-2 (the agent responsible for COVID-19) appears to be newly emergent, risk assessment has been applied to the related SARS-COV and MERS viruses (Watanabe, Bartrand, Weir, Omura, & Haas, 2010). Undoubtedly, there are differences, but the data and conclusions that risk assessment has developed (including quantitative exposure assessment and dose response) are complementary to insights from epidemiology and medicine. Integrating these different approaches could support more robust decision-making.

Initial high illness and mortality rates in many countries—and highly variable rates across and within countries—will eventually decrease, although resurgences may follow. Risks of relaxing stringent mitigation must be balanced against costs to societal infrastructures and economic impacts. Decision and risk analysis skills in formulating and assisting these decisions at different levels of government and on different time scales will be important for a productive dialog.

It is likely that effective vaccines, and prophylactic or therapeutic drugs will become available, hopefully later this year. Any such intervention inevitably carries risks of side effects, and the concept of risk–risk balancing is a key concept from risk analysis that should inform upcoming policy deliberations.

While we all look forward to better days, we will get to them with less anguish if decisionmakers understand that public responses to policy recommendation and dictates depend on public trust in authorities. Trust can be built (and earned) by methods written about in this journal for decades. First, trust requires belief in the science. This requires government officials to be clear about what they are doing, why, and when—for example, when they expect a vaccine, better test kits and other steps to be completed. Second, trust in decisionmakers requires

clear and frequent communications. People want to hear from a medical expert and an epidemiologist, not a communications expert. Third, trust requires recognizing, although not necessarily accepting, people's values and beliefs. To date, in much of the world, there has been relatively little emphasis on what science is doing, and communications about policies and rationales have been numerous but inconsistent. This may be unavoidable when a crisis begins, but risk communication teaches ways to do better. People need to hear about positive steps that give reasons for hope and build trust in decisionmakers. Explicit links should be forged between public, national, or other values and responses to the virus. These values could include trust—where warranted—in demonstrably sound science, government financial institutions, and public policy and risk management institutions to take well-considered actions to protect public health and the economy.

Risk analysts and risk analysis researchers should not be shy about contributing our skills to important policy developments during this crisis. We should be bold in learning from these events for future applications, and in documenting what we think we have learned so that others may benefit from and improve upon it.

The entire team of editors at *Risk Analysis* welcomes papers on these and related topics that COVID-19 engenders.

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