

VIEWPOINT

Cognitive Bias and Public Health Policy During the COVID-19 Pandemic

Scott D. Halpern, MD, PhD

Palliative and Advanced Illness Research (PAIR) Center, University of Pennsylvania, Philadelphia; and Center for Health Incentives and Behavioral Economics, University of Pennsylvania, Philadelphia.

Robert D. Truog, MD

Center for Bioethics, Harvard Medical School, Boston, Massachusetts; and Department of Anesthesiology, Critical Care, and Pain Medicine, Boston Children's Hospital, Boston, Massachusetts.

Franklin G. Miller, PhD

Division of Medical Ethics, Department of Medicine, Weill Cornell Medical College, New York, New York.

Corresponding

Author: Scott D. Halpern, MD, PhD, Perelman School of Medicine, University of Pennsylvania, 423 Guardian Dr, 301 Blockley Hall, Philadelphia, PA 19104 (shalpern@upenn.edu).

As the coronavirus disease 2019 (COVID-19) pandemic abates in many countries worldwide, and a new normal phase arrives, critically assessing policy responses to this public health crisis may promote better preparedness for the next wave or the next pandemic. A key lesson is revealed by one of the earliest and most sizeable US federal responses to the pandemic: the investment of \$3 billion to build more ventilators. These extra ventilators, even had they been needed, would likely have done little to improve population survival because of the high mortality among patients with COVID-19 who require mechanical ventilation and diversion of clinicians away from more health-promoting endeavors.¹ Yet most US residents supported this response because the belief that enough ventilators would be available averted their having to contemplate potentially preventable deaths due to insufficient supply of these devices.

Why are so many people distressed at the possibility that a patient in plain view—such as a person presenting to an emergency department with severe respiratory distress—would be denied an attempt at rescue because of a ventilator shortfall, but do not mount

COVID-19 could provide the impetus for greater ascendancy of public health ethics over clinical ethics.

similarly impassioned concerns regarding failures to implement earlier, more aggressive physical distancing, testing, and contact tracing policies that would have saved far more lives?² These inconsistent responses may be related to errors in human cognition that prioritize the readily imaginable over the statistical, the present over the future, and the direct over the indirect. Together, these biases may have promoted medicalized responses to and messaging about the pandemic, rather than those rooted in the traditions and practices of public health.

These cognitive errors, which distract leaders from optimal policy making and citizens from taking steps to promote their own and others' interests, cannot merely be ascribed to repudiations of science. Rather, these biases are pervasive and may have been evolutionarily selected. Even at academic medical centers, where a premium is placed on having science guide policy, COVID-19 action plans prioritized expanding critical care capacity at the outset, and many clinicians treated seriously ill patients with drugs with little evidence of effectiveness, often before these institutions and clinicians enacted strategies to prevent spread of disease.

Identifiable Lives and Optimism Bias

The first error that thwarts effective policy making during crises stems from what economists have called the "identifiable victim effect." Humans respond more aggressively to threats to identifiable lives, ie, those that an individual can easily imagine being their own or belonging to people they care about (such as family members) or care for (such as a clinician's patients) than to the hidden, "statistical" deaths reported in accounts of the population-level tolls of the crisis. Similarly, psychologists have described efforts to rescue endangered lives as an inviolable goal, such that immediate efforts to save visible lives cannot be abandoned even if more lives would be saved through alternative responses.³

Some may view the focus on saving immediately threatened lives as rational because doing so entails less uncertainty than policies designed to save invisible lives that are not yet imminently threatened. Individuals who harbor such instincts may feel vindicated knowing that during the present pandemic, few if any patients in the US who could have benefited from a ventilator were denied one.

Yet such views represent a second reason for the broad endorsement of policies that prioritize saving visible, immediately jeopardized lives: that humans are imbued with a strong and neurally mediated³ tendency to predict outcomes that are systematically more

optimistic than observed outcomes. Early pandemic prediction models provided best-case, worst-case, and most-likely estimates, fully depicting the intrinsic uncertainty.⁴ Sound policy would have attempted to minimize mortality by doing everything possible to prevent the worst case, but human optimism bias led many to act as if the best case was in fact the most likely.

Present Bias

A third driver of misguided policy responses is that humans are present biased, ie, people tend to prefer immediate benefits to even larger benefits in the future.⁵ Even if the tendency to prioritize visibly affected individuals could be resisted, many people would still place greater value on saving a life today than a life tomorrow. Thus, if escalating critical care capacity enables the prevention of certain deaths in the short term, it is a more attractive policy option than taking steps that would prevent more deaths over the long term. Similar psychology helps explain the reluctance of many nations to limit refrigeration and air conditioning, forgo fuel-inefficient transportation, and take other near-term steps to reduce the future effects of climate change. More fundamentally, present

bias has in part motivated US governments controlled by both parties to allocate only 2.5% of health funding to public health initiatives⁶ despite the opportunities for better promoting population health through a more balanced policy portfolio.

Omission Bias

The fourth contributing factor is that virtually everyone is subject to omission bias, which involves the tendency to prefer that a harm occur by failure to take action rather than as direct consequence of the actions that are taken.⁷ This bias helps explain why some parents refuse to vaccinate their children, even when they understand that harms are more likely without vaccination. Similarly, controversy about how to allocate ventilators if they became scarce arose in part because planning and implementing such policies seemed to hold potential to actively contribute to causing deaths.

Although those who set policies for rationing ventilators and other scarce therapies do not intend the deaths of those who receive insufficient priority for these treatments, such policies nevertheless prevent clinicians from taking all possible steps to save certain lives. Accordingly, policy makers who do not advocate for increasing the ventilator supply, and clinicians who follow triage guidelines, may perceive that they are responsible for the deaths. In contrast, responsibility is more effortlessly evaded for causing greater numbers of deaths through failures to enact policies that effectively suppress viral spread, or those that prevent speeding on highways or easy access to firearms.

Toward Behaviorally Informed Policy Making and Communication

An important goal of governance is to mitigate the effects of these and other biases on public policy and to effectively communicate the reasons for difficult decisions to the public. However, health systems' routine use of wartime terminology of "standing up" and "standing down" intensive care units illustrate problematic messaging aimed at the need to address immediate danger. Instead of emphasizing aggressive medical interventions to counteract cases of current disease, more effective messaging would have focused on counteracting disease spread. If war references were to be used at all, instead of saying "Ventilators are to this war what bombs were to World War Two,"⁸ leaders might have more consistently empha-

sized disease control by saying "You can protect yourself and your family by sheltering in place and practicing physical distancing and handwashing when outside the home. We all have to sacrifice in the short term to win the war against COVID-19."

Second, had governments, health systems, and clinicians better understood the "identifiable victim effect," they may have realized that promoting flattening the curve as a way to reduce pressure on hospitals and health care workers would be less effective than promoting early restaurant and retail store closures by saying "The lives you save when you close your doors include your own."

Third, these leaders' routine use of terms such as "nonpharmaceutical interventions"⁹ portrays public health responses negatively by labeling them according to what they are not. Instead, support for heavily funding contact tracing could have been generated by communicating such efforts as "lifesaving." If committing more resources to testing and contact tracing meant fewer dollars for additional ventilators, leaders could have countered the optimism bias that might favor investing in ventilators using language that clinicians often use with their optimistic but seriously ill patients, such as "While we hope for the best, we must prepare for the worst by curbing further spread."

Fourth, although errors of human cognition are challenging to surmount, policy making, even in a crisis, occurs over a sufficient period to be meaningfully improved by deliberate efforts to counter untoward biases. Government leaders could constrain their own present bias by passing laws that require estimating the effects on lives saved or life-years gained over several years to justify policy responses. Leaders also could improve adherence to measures such as mandatory quarantining by promoting future thinking among their electorates, such as by saying "Following these rules today is the best way to ensure that you and your family will see tomorrow."

By starkly revealing the biases that cloud effective policy making and communication, a legacy of COVID-19 could be that future governments implement policies that reduce morbidity and mortality under worst-case rather than best-case scenarios, consider future harms as readily as present ones, and attend as strongly to hidden deaths as to visible lives. COVID-19 could provide the impetus for greater ascendancy of public health ethics over clinical ethics. If so, as difficult as it may be to imagine now, the pandemic might have served, paradoxically, as a stimulus to improve population health.

ARTICLE INFORMATION

Published Online: June 29, 2020.
doi:10.1001/jama.2020.11623

Conflict of Interest Disclosures: Dr Truog reported serving as a paid member of data and safety monitoring boards for Sanofi, Gilead, and Covance. No other disclosures were reported.

REFERENCES

- Halpern SD, Miller FG. The urge to build more intensive care unit beds and ventilators: intuitive but errant. *Ann Intern Med*. Published online May 7, 2020. doi:10.7326/M20-2071
- Sen S, Karaca-Mandic P, Georgiou A. Association of stay-at-home orders with COVID-19 hospitalizations in 4 states. *JAMA*. 2020;323(24):2522-2524. doi:10.1001/jama.2020.9176
- Sharot T, Riccardi AM, Raio CM, Phelps EA. Neural mechanisms mediating optimism bias. *Nature*. 2007;450(7166):102-105. doi:10.1038/nature06280
- Weissman GE, Crane-Droesch A, Chivers C, et al. Locally informed simulation to predict hospital capacity needs during the COVID-19 pandemic. *Ann Intern Med*. Published online April 7, 2020. doi:10.7326/M20-1260
- Laibson D. Golden eggs and hyperbolic discounting. *Q J Econ*. 1997;112:443-77. doi:10.1162/00335397555253
- Centers for Medicare & Medicaid Services. National health expenditure data—historical. December 17, 2019. Accessed May 27, 2020. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>
- Ritov I, Baron J. Protected values and omission bias. *Organ Behav Hum Decis Process*. 1999;79(2):79-94. doi:10.1006/obhd.1999.2839
- Greenfield J. No, the Covid fight isn't like WWII—and that's bad news. *Politico*. Published May 9, 2020. Accessed June 8, 2020. <https://www.politico.com/news/magazine/2020/05/09/covid-world-war-ii-245252>
- Parodi S, Choucair B, Young S, Bellows J, Grossman D, Liu VX. Kaiser Permanente's system capabilities to suppress Covid-19. *NEJM Catal*. Published June 9, 2020. doi:10.1056/CAT.20.0187