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Recommended Citation

Stewart, David W. "Uncertainty and Risk Are Multidimensional: Lessons from the COVID-19 Pandemic." *Journal of Public Policy & Marketing*, vol. 40, no. 1, Jan. 2021, pp. 97–98, doi:10.1177/0743915620930007.

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Uncertainty and Risk Are Multidimensional: Lessons from the COVID-19 Pandemic

Journal of Public Policy & Marketing
2021, Vol. 40(1) 97-98
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DOI: 10.1177/0743915620930007
journals.sagepub.com/home/ppo



David W. Stewart

The COVID-19 pandemic is a generational phenomenon, a defining experience for those who have experienced it. Much will be written about the causes and effects of the pandemic as additional data become available. Although not deliberate, there are quasi-experiments underway related to alternative societal responses to the pandemic, such as the reduction of economic and social activity, the degree of social distancing, and the focus of social distancing efforts.

It is too early for any comprehensive analysis of the effects of and response to the pandemic. Nevertheless, there are lessons to be learned or, at least, remembered. This commentary offers a discussion of four of these lessons: (1) the differences between uncertainty and risk, (2) the multidimensionality of both uncertainty and risk and responses to them, (3) the multi-layered character of risk management and public policy response, and (4) the role of marketing in the management of risk and uncertainty.

Uncertainty \neq Risk

The risk of COVID-19 is still unknown. The response(s) has been driven by uncertainty. Risk and uncertainty are different, and it is easier to manage risk (Martin and Stewart 2019). Risk is quantifiable, with known outcomes and known probabilities of these outcomes. Uncertainty exists when there are several potential outcomes, some or all of which may be unknown, and the probabilities of these outcomes cannot be quantified. In the context of COVID-19, the likelihood of contracting the virus remains unknown, though it is increasingly apparent it has been more common than originally thought. This means that its mortality rate is unknown. If morbidity and mortality were known, it would be possible to determine the risk of both contracting and dying from COVID-19. However, even this simple computation is confounded by data problems.

One reason the mortality rate associated with COVID-19 initially appeared high was because it was only recorded when people arrived at a hospital or clinic. This is a reason early models predicted very high death rates. Further complicating matters, individuals who died *with* COVID-19 were conflated with who individuals died *of* COVID-19. The severity of the virus and death rates have been highest among individuals who

have other medical conditions and are older. COVID-19 may have contributed to these deaths, but it may not be the cause.

Risk assessment, with its emphasis on known outcomes and the probabilities of those outcomes, carries with it a sense of control. In contrast, uncertainty is often met with dread, social aversion, and a sense of loss of control. Feelings of dread are a strong determinant of risk perception (Martin and Stewart 2019). Uncertainty is often dealt with by combining data with assumptions, and different assumptions can produce wildly different predictions, as demonstrated by the differences in early models of the contagion and mortality of COVID-19. To deal with uncertainty, it is common to use the most conservative of assumptions, which in most cases produces an exaggerated risk (Whipple 1986). Such an approach—"better safe than sorry"—may be useful in cases of uncertain outcomes that are small and easily isolated, but it is problematic in most contexts. It offers a false sense of control by focusing on a single outcome.

Uncertainty and Risk Are Multidimensional

A problem associated with the management of uncertainty and risk is that actions and policies rarely have a single effect. Even if the optimal public health actions in response to COVID-19 involved shutting down much of the economy and extreme social distancing, these actions must be considered in the context of other outcomes. Such measures have created enormous harm—tens of millions of unemployed individuals, the inability to obtain other types of health care, disruption of education, and huge budgetary deficits everywhere, among others. An ironic outcome of shutting down the economy is that almost half of the decline in gross domestic product has occurred in health care (Klein 2020). But, when confronted with decisions framed as "Two million *will* die if we do not take action, though some people will be unemployed for a short period of time if we do take appropriate action," the trade-offs involved are incomplete and misleading.

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Expert opinion is important, but by definition, experts tend to be focused on a limited number of phenomena. In addition, they are frequently asked for opinions and recommendations in contexts specific to their expertise and in the absence of information about the broader context. While such opinions and recommendations may rest, in part, on data or science, they are only part science. They are also driven by assumptions and bias. It is important to separate the data from the assumptions and debate actions in the context of outcomes based on different, and perhaps more likely, assumptions. The COVID-19 pandemic has made clear that science is never *settled*. Those who argue about settled science do not understand science; all science is tentative or, in the words of Merton (1973), organized skepticism.

For these reasons, it is important that any policy discussion be carried out in a context in which assumptions are clearly stated, the breadth of outcomes is articulated, and biases identified. Prospect theory is well demonstrated by the COVID-19 pandemic through the greater aversion to loss of life than the prospect of cure. Extreme measures are justified to save lives, but very high standards are set for the evaluation and use of a potentially useful drug.

This is a place where marketers can be of help. Marketers routinely examine decisions involving trade-offs and the influence of decision framing. The marketing field also has a deep understanding of measurement and the ways in which measures frame problems. The methods, tools, and theories that are applied to determine the information content of the front of a package or a television commercial can be applied to the study and development of recommendations for policy makers. This would have the advantage of moving the focus of marketing from tactical decisions to greater policy and strategy decisions. Some might argue that this is not marketing. This is a narrow definition of marketing. Anything that affects consumer behavior and market performance is within the domain of marketing, and marketing brings a unique perspective to the study of these phenomena.

Uncertainty, Risk Management, and Public Policy Response Are Multilayered

The COVID-19 pandemic has also made clear that policy is not made at one level—it occurs at many levels ranging from the individual organization, to local government, to state government, to the federal government, to international agencies.

What is optimal at one level may not be optimal at another level or another parallel body at the same level. To be helpful, marketing scholars need to be specific about which policies and policy makers, and at which level(s), their research informs.

The Role of Marketing

Although the COVID-19 pandemic began as a health problem, the pandemic and responses to it quickly created marketing issues. Sheltering in place, social distancing, and shutdown of the economy have changed consumer behavior. The matching of supply and demand, the heart of marketing as a discipline, has emerged as a problem for products as diverse as toilet paper and ventilators. The disadvantages of global supply chains and just-in-time manufacturing, with inadequate buffer stock, have become apparent. Marketing should address these types of problems.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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