

## Strategic Implications and Data Analysis for the COVID-19 Pandemic in the Coming Season: Public Policy-Making with a Hazard-Control Perspective

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**Extended Abstract:** As the fatality rates of the COVID-19 pandemic appear to be falling in many parts of the U.S. in August, 2020, the number of positive cases increased early in the Summer of 2020 and many predict the virus will have a return impact in the coming fall/winter season. Strategic decision-makers and those advising them are developing plans for the near and the longer-term future conditions in order to reduce and minimize casualties. The focus of this paper is on analyzing data and identifying critical actions for consideration by these leaders in the very near term. A hazard-control perspective from systems engineering is used as a framework for the analysis in this paper.

In a hazard-control perspective (Woodson et al, 1992), typically risk is assessed based upon exposure to a known hazard and the probabilistic estimate of a negative outcome due to exposure. Further, hazard control methodologies are typically categorized in three ways: 1) control (of the hazard) at the source; 2) control of the path of transmission; and 3) control at the receiver. Exposure at the source in this context stems from a human capable of infecting others. Exposure within the path is critical in terms of defining the mechanisms that can spread the virus, while exposure at the receiver should also include individual factors such as membership in vulnerable populations, e.g., elderly persons and those with comorbidities. A vaccine is useful in controlling risk at the source, and although a number of vaccines are being considered, it is unlikely that a reliable vaccine will be available soon. The most promising of vaccine trials, being conducted by AstraZeneca, have been recently paused due to an explained illness (Fox, 2020). It is hence unclear if and when a reliable vaccine will be available. This leaves two other sources of hazard exposure and risk that need to be considered in the immediate term.

Personal Protective Equipment (PPE) and Personal Protective Behaviors (PPBs) are common categories of hazard path controls. Face masks and shields, hand washing, and social distancing are among common examples. However, reliable data are not easily obtainable for the use of these hazard path controls (Gosavi & Marley, 2020). Furthermore, none of these controls are failsafe as the technology can fail as well as their use being subject to a wide range of human error. Nevertheless, their utilization should be continued and in the immediate term, it is vital that exposure to the vulnerable populations (Gardner et al, 2020) be minimized to reduce the illness and ultimately the fatality rate.

In this paper, hazard control at the receiver will be examined. Specifically, data will be gathered on vulnerable populations and their susceptibility; data will also be gathered on the needs for ventilators required in the coming season in hospitals. In addition to the elderly segment of the population, the virus is also taking a toll on the mental health of the younger segment of the population (Shanahan et al, 2020), leading to higher suicide rates and opioid abuse (Alexander et al, 2020).

**Keywords:** Public healthcare, pandemic, strategic healthcare management, risk management

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