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Letter to the Editor

Role of social responsibility in prevention of the COVID-19 outbreak from systems thinking perspective

From December 2019, the public health crisis erupted with the outbreak of a novel virus called coronavirus disease 2019 (COVID-19) that has been associated with significant worldwide mortality. The infected patients by COVID-19 show various symptoms such as severe pneumonia, acute respiratory syndrome, fever or chills, fatigue, nausea or vomiting, sore throat, multiple organ failure, and also the immune patterns of these people are changing with the progression of the disease. According to World Health Organization’s (WHO) reports, it generally has a 5–6 day incubation period and symptoms may appear 1–14 days after exposure to the virus. Human-to-human transmission is stated as the primary and the most important mode of transmission for COVID-19. In addition to the symptoms mentioned, anxiety is a common symptom in patients with chronic respiratory disorders that would significantly reduce their quality of life and have a long-term effect on their mental health. In fact, in most cases, measures of anxiety include physical body symptoms that can overlap with the symptoms of chronic respiratory disease and side-effects of medications.

From an epidemiological perspective, the rapid and accurate diagnosis of COVID-19 is critical to control the spread in the community. The swift current outbreak of COVID-19 has forced governments to implement rigorous policies and use a variety of contrivances to manage virus transmission; therefore, health systems would get enough time to prepare and reduce the impact of the pandemic. While most government actions are effective, they have high social, psychological, and economic costs, and at the same time, their results are not sustainable. Although the WHO recommends that communities and governments be more aware and act consciously, the superior they try, the more COVID-19 mortality rate reduces.

During the transmission and fast spreading of COVID-19, alongside the medical staff’s non-stop efforts to inhibit this pandemic, “Social Responsibility” has been widely noticed. The implication is that almost all political leaders, health experts, and even celebrities have all called us to be responsible until the widespread outbreak of this virus be decreased and its calamitous’ effects are minimized.

To predict and prevent the behavior of COVID-19, it is necessary to deal with the intricate world with many interconnected concepts and factors that not only limit to a specific domain but also have complex and dynamic essences. Hence, it should be understood, managed, and controlled with a holistic and interdisciplinary perspective. In today’s complex world, designing and implementing policies without understanding the underlying mechanisms that cause these complexities is not possible. Accordingly, system dynamics is used to understand the complexities and structural causes of such medley adaptive systems. Because society itself is a dynamic system, this approach by considering the pros and cons of each alternative and influential variable in the model would help policymakers understand the hazardous effect of the COVID-19 outbreak and its multifaceted consequences in society. Actually, systematic thinking help policymakers look at the problem beyond the chain of infection and have a better understanding of decisions with multiple consequences in the face of such a complex situation involving many interconnected factors.

Comprehension of the cause and effect enables us to analyze, sort out, and explain how changes have happened in the existing problems. In fact, by taking the advantages of causal loop diagrams, which reflect the causal connections among components of a system and how changes would affect other components and finally back to itself, we can draw an explicit map of the process of patients infected by COVID-19 and its transmission to others as presented in Fig. 1.

In the absence of COVID-19’s vaccine, countries all around the world are implementing various forms of social responsibility as a policy to reduce the spread of the virus. One form of social responsibility is the social distancing that takes many forms, but the aim is to keep people physically away from each other that delay in its implementation is not as effective as in the early days. Two main influential factors in controlling the COVID-19 outbreak include increase in the quantity and speed of COVID-19 diagnostic tests and correctly applying the social distance regulations. Rapid testing is performing to detect the asymptomatic infected people in the community. Experiments show that severe social distancing rules have the potential to successfully reducing and delaying the disease onset. However, if the rigorous policy of social distancing performs carelessly, a large-scale intervention must be carried out through the extensive and rapid testing to prevent a widespread outbreak in the future.

Within the loops named ‘carelessness’ and ‘environment’ in Fig. 1, COVID-19 asymptomatic carriers can be considered as an exogenous variable that affects the intentions for more social interactions and failing to observe social distancing. If social interactions with asymptomatic coronavirus carriers increase in the community, the risk of the pandemic will increase which will lead to an increase in the number of patients. In the same loop, by timely announcing the number of infected people and identified patients, the number of social interactions and consequently the severity of the pandemic risk would be decreased and over time it can lead to a reduction in the number of cases.

As the number of patients is increasing, the risk of environmental pollution is increasing that results in the growth of the
In this regard, burnout syndrome has become a concern for COVID-19. 'B' represents balancing or negative feedback and 'R' represents reinforcing or positive feedback. COVID-19, coronavirus disease 2019.

In summary, due to the lengthy process of producing the COVID-19 vaccine, most countries are trying to implement various low-cost strategies to slow down the spread of the virus and try to normalize the living conditions in society besides reducing the current recession. Promote social distancing behaviors and widely wear masks are considered as the signs of social responsibility and accompanying people with medical staff and the governments to get out of this crisis.

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S.M. Hosseini Bamakan
Data Science Research Center, Yazd University, Yazd, 89195-741, Iran
