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Systems View of Coronavirus

Sung Won Paek and Larry M. Starr

The declaration of the pandemic by the WHO risks turning the spread of the virus into the spread of fear and phobia. I can't tell you how many incidents I get reports of, Asians not just Koreans being verbally abused and even physically attacked in other countries. Governments must take the responsibility to stop these kinds of incidents, because that is not helpful to generating the spirit of collaboration that we need to overcome this challenge together.

Kang Kyung-Hwa

In an interview with the Korean Foreign Minister

Posted on BBC

Coronavirus Complexities

On December 31, 2019, in Wuhan, China, a patient was diagnosed with pneumonia that appeared to be caused by a novel coronavirus. Viruses are the most abundant and common biologic entity on earth. While some viruses help natural killer cells to support the human immune system that defend against invading bacteria, tumors, and other viruses, the novel coronavirus produces COVID-19 a disease which threatens health and can lead to death.

In the early stages, health agencies predicted the coronavirus would follow the path of other seasonal infections like influenza and fade when the weather became warmer. But as of April, transmission has not yet slowed. Worse, the virus has spread with the number of infected people surpassing 1.4 million. We are immersed in a global pandemic. The prediction was wrong.

Initially, the World Health Organization predicted the mortality rate following infection would be much lower than that of Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) which are also coronavirus-based infections. CDC reported that of 2499 cases of MERS, 861 people died; and of 8098 cases of SARS, 774 died. But so far worldwide deaths now exceeding 83,000 and Italy, Spain, and the United States each have more than 10,000 people dead. The prediction was wrong.

Epidemiologists compared the COVID-19 pandemic to the 2009 H1N1 pandemic referred to as swine flu. From April 12, 2009 to April 10, 2010, CDC estimated there were 60.8 million cases, 274,304 hospitalization, and 12,469 deaths just in the United States due to the virus. But the implications of COVID-19 have impacted much more than people's health. There continue to be complex, chaotic, and disastrous influences of our deepest and widest social systems. The comparison was wrong.

In six days, global financial investments lost \$6 trillion and US stocks lost \$4 trillion. In the US, more than 10 million people have applied for unemployment assistance, hundreds of thousands of small businesses including restaurant and entertainment services closed, and more than 76 million students from Kindergarten to Doctoral programs can attend only online classes. Systems of transportation including the airlines of the world are almost completely shut down, and in Europe, Italy, Spain, and the United Kingdom issued bans on movement across their territories

and set quarantines for visitors who enter. The United States has strongly discouraged overseas travel for its citizens and closed the Canadian and Mexican borders. Most states have closed non-essential businesses and asked people to stay in their homes except when essential for health and safety. Euro news reported that as restraining orders spread to South Asian countries such as India, as well as many South American countries. This affects 3.9 billion people, half of the world's population, who have had their movements restricted. No one has ever seen this kind of problem before.

The responses to the health implications of the virus have not been uniform because of significant geographic, cultural and resource differences regarding the need and implementation of public health services. For example, policies in the US, UK and Italy led to lock-down. In Sweden, the focus is on isolating and treating only confirmed patients which means many citizens can go to restaurants, engage in most normal social activities, and send children to elementary and high school. Comparisons are confusing.

Lock-down is designed to reduce the strain on healthcare systems to provide care and to access supplies of life-saving equipment and devices. Ventilators which are needed for severe cases of COVID-19, personal protective equipment (PPE) including a 75-cent face mask essential to avoid transmission between patients and healthcare responders, and physical space including treatment areas with appropriate equipment and trained people are in critical states of absence. US healthcare logistic and planning experts failed to predict this kind of problem would exist.

More than a Health Problem

We are immersed in a dynamically complex problem affecting many systems of society. We have never previously experienced this kind of situation which helps to explain why everyone was unprepared and why errors were and continue to be made. For this kind of problem there are no experts, for those who try it defies prediction although many are trying to understand its patterns of impact.

While the coronavirus is biological, our responses to it are social. While scientists work on a vaccine and health system professionals work on treatments, for the many additional and interconnected problems, we must change our mindset and think more about how many areas of our world are connected and affected in this problem. Indeed, this more than a health problem: our social, economic, educational and political systems have been seriously disrupted with many unexpected negative outcomes. To navigate we need novel and creative ideas from everyone not merely from health professionals.

How much and how quickly the disease spreads in any community depend to a significant extent on the thinking, decisions and social behavior of citizens who collaborate. While we are repeatedly told the importance of washing hands, maintaining social distance, and covering the nose and mouth, it is up to each person to implement this prescription. In other words, no matter how accurate the information provided by authorities or how effective the campaign to inform the public, compliance remains an individual and community choice.

One way to improve compliance with health advice is to promote that we are all active control agents; not passive followers. Each person is a partner in the protection of our community, and each should create conditions where all can be in safe and healthy. Social distancing, for example, should be presented not as a punishment but as way for people to continue to collaborate, and communicate while also protecting family, community, and the nation. Social distancing is a personal and community obligation.

Distress and Social Language

When a person is threatened, defensive and protective behaviors emerge. When the health threat is described as an invisible enemy, and social, economic, educational and political threats suddenly attack from all sides, emotional frustration and distress can lead to aggression and blame in actions and language.

The Chinese government unquestionably dealt badly with the epidemic when it started, being more concerned with defensively protecting their need for face, status and power. They used denial language rather than directly dealing with the health of its citizens. This behavior hurt people in China and Chinese living around the world. Had the government acted transparently about this infectious disease, others would more likely have behaved safely and many illnesses and deaths could have been prevented.

When the virus was increasingly perceived as a threat by US medical professionals, some policymakers advocated defensive protective action by closing borders to China. Those who perceived less threat from the virus or more threat from an opposing political party called these actions racist. As not everyone understood the threat equally, there was polarity. But as the situation is now clear to all, closing the border saved lives.

Referring to COVID-19 as the “Chinese Virus” may be an example of emotional frustration and distress leading to aggression and blame. No one suggests Caesar salad be renamed Mexican salad because it was created in Mexico. While mistakes – intentional or not – were made, using this blame language increases violence against Asians, and promotes ignorance and discrimination. The US has a long and unhappy history of this. There is no place for it when we are all threatened.

Wearing a face mask when interacting with others in a global pandemic is defensive protective, and medically rational. Covering the mouth and nose reduces transmission of the virus between people even if maintaining social distance. While wearing a face mask is common in China and other Asian countries, in the US, wearing a face mask in public has suggested a person may be carrying a disease. *China Daily* reported “some Asians who wear face masks in the US have experienced discrimination, and even been assaulted. Is it a cultural difference or purely discrimination?” Social or cultural background and health interact with fear in this complex nonlinear problem.

Everyone outside their home is advised to wear a face mask because people are becoming infected by those who have no symptoms; many are dying. By following this prescription, we

can save the life of a neighbor and family. If a medical mask is not available, a substitute can be made from personal clothing and used effectively. Wearing a mask expresses the social language that each person is aware of this problem and trying to protect our community.

Learning from the Past

We have failed to learn from the past. After several previous infectious disease exposures, it was recommended that all US hospitals should dedicate a significant portion of resources to preventing infectious diseases with special programs. But many hospitals did not comply with this prescription. With the perception that the US was well-prepared for any future exposure following the global pandemic from the 2009 H1N1 influenza outbreak, the Obama Administration did not rebuild the federal stockpile of N95 respirator masks. The Trump Administration also did not envision the complexity of our current situation so after three years the current administration also did not rebuild the stockpile. In addition, with greater perceived threats from other sources, the President's Security Council Pandemic Response Team was eliminated and restructured into a counterproliferation and biodefense directorate. These are social system failures.

There is no silver bullet for this complex problem affecting health, social, economic, education, political and other areas of society. Identifying, testing, manufacturing, distributing and delivering billions of dosages of a COVID-19 vaccine will take approximately a year. This will not solve the problem because a vaccine can't address the lost revenue to federal agencies, states, cities, private industries, nor the millions of lost jobs, and the multiple fractures in our interconnected society. What we do how, however, is very important. We must begin by identifying important characteristics of what we want such as improving trust and collaboration between public and private communities and improving social systems and social language.

Start Now

We need to start immediately. We need to be motivated by the past and present, but we must begin to design the future we want right now. It must be feasible and desirable by democratic processes, and sustainable in the complex environment in we now all exist. This last point is critical. There is no return to the past; only moving forward. There is no new normal, next normal or any normal; normal is gone. There is only how to operate in the increasing complexity of our world.

Selecting candidates for public office and for organizational leadership positions must be based on their capacities to formulate and navigate complex problems. They must be skilled at enabling collaboration among diverse stakeholders. Treating complex problems as simple, blaming others, denying personal responsibility and seeking personal praise should be considered weaknesses.

In Korea, the COVID-19 response involved putting resources into speeding up diagnostic tests and tracing the path of confirmed patients to find infected people before the virus could spread. We need to evaluate this approach and determine if and how this can be done in US.

In New York, with a shortage of medical personnel and protective equipment in medical centers, private health care volunteers and equipment in other locations were sought. We need to consider designing a system with a much broader community and extended storehouse of supplies are available for a broad definition of emergencies. Having procedures to mobilize private medical resources to assist the health of the public require a design and preparation now.

Education was forced to go online. We can now design systems that support conceptual, practical and reflective teaching and learning whether face to face or online. We can design technologies that are easily integrated into any channel that support the personal interactions and experiences that are most valued by learners. We must redesign the business model for higher education so that they can operate more effectively in changing contexts and crises.

The travel, entertainment and restaurant systems were decimated. We can now rethink and redesign their business models and processes. These should be considered essential social experiences because we are social beings. Interconnecting over shared meals and establishing intimate experiences are critical to the fabric of our lives. We must find a way to maintain them in complexity and chaos.

No one envisioned the kinds of problems that emerged from the novel coronavirus nor had anyone considered its interactive scope. Now is the time to begin to redesign our processes and systems so that when confronted again we can cope and navigate better. Everyone needs to be a partner in these redesigns and each of the health, social, educational, and other systems must be integrated because it is their interconnections that coproduce and give meaning to our lives.

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