

On reading Richard Preston's *The Hot Zone* during the COVID-19 pandemic

Many of the lessons learned during the Ebola outbreak of 2013 are relevant during the current pandemic.

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The earth is mounting an immune response against the human species," wrote Richard Preston, author of the 1994 best seller *The Hot Zone: A Terrifying True Story*.¹ The book is a nonfiction account of how researchers, locals, and governments fought one of the deadliest known viruses—the Ebola virus. "Ebola Zaire is a slate-wiper in humans," he explains in his 1992 *New Yorker* article, "Crisis in the Hot Zone," on which the book was based.² There are many differences between SARS-CoV-2 and the Ebola virus; however, the lessons from the book are even more relevant today as we fight the COVID-19 pandemic.

At the time of writing (early August), it has been approximately 8 months since a pneumonia of unknown cause first appeared in Wuhan City in Hubei Province, China. There are now over 18.6 million cases worldwide and over 700 000 deaths.³ Billions of people around the globe have been ordered to shelter in place. There are different theories on how we got to this point. Some say this is a virus of zoonotic origin (animal to human), emerging from a wet market in Wuhan. Many viruses come from other mammals, and animal to human spillover has happened before. In 2003, SARS-CoV-1 emerged from a market in Foshan, China. There

is irrefutable evidence that influenza originates in birds and pigs and HIV in chimpanzees. The deadly Ebola virus described in *The Hot Zone* may have come from bats. However, the truth is that we do not know. "In biology, nothing is clear, everything is too complicated, everything is a mess, and just when you think you understand something, you peel off a layer and find deeper complications beneath. Nature is anything but simple," Preston writes. Similar to the novel coronavirus, there has never been any definitive evidence to show where Ebola hides. And these hypotheses of etiology will have to wait until after the dust settles and we recover from the first pandemic of our era.

The Ebola virus erupted after its original discovery in 1976, emerging at the end of 2013 and spreading throughout West Africa, affecting countries such as Guinea, Liberia, and Sierra Leone. Similar to any unanticipated event, several factors complicated a decisive public health response. The virus emerged in highly populated urban areas and ravaged unprepared health facilities, intensified by the spread of misinformation. Efforts were further complicated by traditional and religious practices. The World Health Organization (WHO) reports that nearly 60% of all Ebola virus disease cases in Guinea were linked to traditional burial practices.⁴ SARS-CoV-2, too, is changing how the

world buries and mourns its loved ones. Families around the world struggle with the rituals of death. They are urged not to hold funerals, not to touch or, at times, even view the deceased.

The use of scientific method alone without consideration of contextual factors is not sufficient to control an outbreak. During the West African Ebola epidemic, researchers found a "notable resistance against prescribed scientific ways of combating the transmission of Ebola virus in some affected communities."⁵ They concluded that cultural considerations were just as critical in responses against viruses as was our understanding

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of the dynamics of transmission. On 5 April 2020, hundreds of members of the Orthodox Jewish community attended a funeral of a rabbi who died from the novel coronavirus in the Borough Park neighbourhood in New York.⁶ It is a testament that any phenomenon involving human beings takes us to the edge of scientific knowledge and into a realm where rational human action is mediated through culture, religion, and gender. Religious communities around the world, with long-documented histories of mistrust of scientific institutions, face unique challenges when it comes to controlling the spread of COVID-19. This absence of trust is often assigned to a lack of information, which then triggers a flood of statistics about risk from those very same institutions, along with the

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assumption that humans can make decisions in isolation from other aspects of their lives.

The COVID-19 pandemic has demonstrated that problems such as apathy and mistrust between individuals and their governments might be symptoms of another problem—one that overlaps with a sharp decline in social life and leads to an emphasis on individual interests. David Buchanan, a professor emeritus of community health education at the University of Massachusetts at Amherst, once described this as “the deterioration of our ability to discern values that matter, that enable us to live together decently, and indeed flourish.”⁷

This pandemic has been an urgent wake-up call for high-income countries where survival now depends on limiting individual-centred desires for the benefit of others. It is a barometer for our sense of responsibility toward one another in our current political climate. It is no surprise that many governments are struggling to shift citizen behavior. Perhaps upstream of our current crisis is a larger political project that extends beyond the boundaries of health and has roots in the way we structure our lives economically, environmentally, and educationally.

And then there are those who simply cannot afford the price tag of survival. The concept of physical distancing may be an urban dream for those without homes, in shelters, or in remote communities without access to running water or medical treatment. The COVID-19 pandemic has been dubbed “the great equalizer,”⁸ but facts say otherwise. Similar to other outbreaks, the consequences of COVID-19 will be felt disproportionately more by vulnerable communities. Early evidence by ProPublica reported that in Milwaukee County (whose population is only 26% Black), African Americans made up 81% of coronavirus-related deaths.⁹ This isn't simply because of biology, but due to historical injustices that perpetuate social inequities and preserve a lack of safety nets. And the challenges people face in the Western world pale in comparison to those faced by the millions living in extreme poverty in tightly packed Pakistani neighborhoods or South African townships without running water.¹⁰

Globalization has made us vulnerable to one of Earth's greatest threats. Budget airlines allow travelers to fly across the world for

pennies, entering what Preston describes as “the Network”—the web of air travel routes that connect countries around the globe. As we have experienced with COVID-19, a deadly pathogen can travel to the other side of the world within hours. “A hot virus from the rain forest lives within a 24-hour plane flight from every city on Earth,” he explains.

Climate change is a reality as civilization ventures into uncharted territory to exploit natural resources. Smoke rises from the Amazon as illegal mining and logging continue and we encounter the highest rate of deforestation in a decade.¹¹ The opportunity cost of using up nonrenewable resources is the loss of important ecosystems that play complicated roles in regulating our global climate. These environments are home to animals and insects that carry known human pathogens along with those yet undiscovered. As we destroy these habitats, a natural consequence will be the threat of new and emerging viruses, many of which originate from what Preston describes as “ecologically damaged parts of the Earth,” which are being rapidly developed for economic growth.

Unfortunately, economic strength is no match for an invisible pathogen making its way around the world. As did the Ebola outbreaks, COVID-19 has brought into focus the fragmentation and fragility of health care systems. “Chance favors the prepared mind” is a quote Preston repeats throughout his book—one he borrows from French biologist and chemist Louis Pasteur, the man responsible for the world's first vaccines. Perhaps most shocking is how unprepared some political leaders continue to be despite having a wealth of scientific and medical expertise at their disposal, failing to act decisively in the face of a global health emergency. Suffice to say that the combination of a novel infectious virus and a lethal mix of identity politics, misinformation, and fragile health systems has created the perfect storm.

“It's going to disappear,” said President Trump on 22 January 2020. But viruses rarely disappear. In fact, only two have (variola virus and rinderpest), thanks to global vaccination campaigns. As Preston argues, the others retreat for a period of time, out of sight like a hunter invisible to its prey, only to re-emerge when we least expect it. “The more

one contemplates the idea of viruses, the less they look like parasites and the more they begin to look like predators.” ■

Competing interests

None declared.

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