# The Long Shadow of COVID-19

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**Abstract** The sudden arrival of COVID-19 shook the world and evoked varied—sometimes contradictory—reactions from communities, countries, and institutions around the world. The pandemic brought out the best and worst of humanity even as the complex play of factors underpinning the spread of the coronavirus collided in myriad ways to both facilitate and obstruct effective responses. The experience has generated much angst and questions about the way we are organized and relate to each other. And, most of all, it has the potential to reshape our fundamental premises. The effects will be profound going well beyond the pandemic itself to the notions of collective health as a common global good.

If a denizen of outer space had been reading the trillions of signals related to COVID-19 flying around Planet Earth, it would have been alarmed at our imminent demise. But we are still here and this is not the first time that an infectious agent has caused such turmoil.

## Our Fate is Intertwined with that of Microbes

In human history, pestilences have wiped out more lives than famine and violence [1]. And the cost of infectious diseases is somewhere between staggering and incalculable: around USD 8 trillion and 156 million life-years lost in 2016 alone [2].

Our own generation has seen HIV, Ebola, MERS, Zika, and swine flu, to name the well-known ones, apart from influenza which comes around every cold season. Our history is also replete with past pandemics and epidemics including smallpox,

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bubonic plague, and cholera as well as the likes of malaria and tuberculosis that continue to extract huge tolls. We now face the pandemic of antimicrobial resistance—a much greater and more pervasive threat to global health that is not amenable to simple public health tools and tactics [3].

## How Bad is COVID-19?

Depending on the school of public health to which you subscribe, COVID-19 is either just a passing scare or humanity's biggest challenge. And the world's political leaders either follow science, or get their wisdom from social media feeds. So where does COVID-19 rank in the global rankings of disease catastrophes?

In its first two years, the pandemic took more than five million lives but by including other indirectly-caused deaths, the excess mortality was around 10 million [4]. To put that in context, some 120 million people died from all causes over the same period [5]. Thus, COVID-19-related deaths are not insignificant but, in the population-wide demographic sense, a blip. Although several countries had modest declines in life expectancy in 2020, they were already recovering in 2021 thanks to increased immunity after infection or vaccination, as well as more effective treatments [6].

A more serious picture emerges if the metric of prematurely lost lives is used. On that basis, over 20.5 million years of life had been lost globally by January 2021 [7]. Each one was a personal tragedy, regardless of the fact that around 80–90% of deaths were in much older people with very few life years left to them [8]. But equally significant are the many millions of disability-adjusted life years lost from poorly understood long-term physical and psychological symptoms that afflict perhaps half of all COVID-19 survivors [9]. This has been dubbed as long COVID [10].

## When will the Global Pandemic Finish?

The pandemic will not be over until over 90% of the world is either vaccinated or has acquired immunity through natural infection [11]. That is because the dynamics of the spread of SARS-COV-2 mean that unvaccinated vulnerable people are not protected from acquiring the coronavirus by the mass of vaccinated people. In other words, herd immunity is not possible.

Achieving near universal vaccination is a tall order, as we know from endeavors with childhood and other vaccinations. It is not going to happen in the next year or two despite targets set by the World Health Organization, COVAX, and promises by world leaders.

In addition, the current generation of newly invented vaccines does not have 100% efficacy. They also have a short immunity duration. So, booster and repeat vaccinations are going to be needed. Meanwhile, vaccination programs must also

plan to include future generations, with the age of first vaccination trending toward younger and younger cohorts. Further, like all other living organisms, the coronavirus will continue to mutate. The arrival of the highly contagious Omicron variant at the end of 2021, just as the world was getting to live with the previous Delta strain, has created more uncertainty. Will COVID-19 become more dangerous or, based on the experience of some other pathogens, less so? Probably the latter, but that will take much more time and, meanwhile, it is highly risky to bet everything on that.

Meanwhile, vaccine-makers have continued their efforts to improve current efficacy. But they will always be one step behind the virus. That is because it takes time to determine the significance of new variants and sequence their genome, especially in developing countries with limited surveillance and sequencing capacities where a large population of non-vaccinated people is more likely to generate variants. It then takes many weeks to re-engineer existing vaccines, manufacture them at scale, and distribute them around the world.

It is more encouraging that a number of treatments are coming along to reduce COVID-19 mortality and morbidity. These range from the re-purposing of existing drugs to the creation of brand-new molecules [12]. There is also some indication that some may be used prophylactically to ward off severe illness in case of coronavirus infection. This is somewhat comparable to prophylaxis against AIDS given to people with HIV infection. Further to that, perhaps pre-exposure prophylaxis may become possible to be taken by people who are unable to avoid entering high-risk environments such as crowded places. There is a parallel here between prophylaxis against malaria and among high-risk sexual behavior groups wanting to avoid HIV. However, on the flip side, widespread use of such drugs will inevitably lead to resistance and new molecules will need to be engineered.

Therefore, is the glass half-full or half-empty when it comes to future prospects? Optimistic and pessimistic views abound in equal measure, saying more about the personality of the commentator than the known science. The more hopeful view is that, in time—perhaps over the next five years—COVID-19 will become a largely preventable and treatable condition. Meanwhile, new social norms of distancing and masking have contributed a great deal to the reduction of virus spread. These self-protection measures will regress when legal mandates are withdrawn. But many of the habits will get internalized to a significant level, as part of a new culture of preventive hygiene.

The link between coronavirus infection and hospitalization and death has been weakened. Nevertheless, some people will continue to die from COVID-19 because of their extra vulnerability combined with vaccine hesitancy or failure. Society will have to accept this, as we accept many other causes of disease and death—even when they are preventable.

This pandemic is more likely to fizzle out progressively, rather than to exit with a big bang. Declaring pandemics over is not an exact science as they are also a social construct decided by populations and politicians when they feel they can live with a certain level of continuing morbidity and mortality. So, we will know when this pandemic is over not just when WHO says so, but when the composition of our media feeds trends away.

In time, as other microbes create outbreaks and epidemics or even pandemics, COVID-19 will take its place in public health history—and enter the annals of a great collective mythology. We will write and talk about it in the way we do now about the Great Flu Pandemic of a century ago [13].

## Best of Times and Worst of Times

The words of Charles Dickens in A Tale of Two Cities are apt for the age of COVID-19: "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of light, it was the season of darkness, it was the spring of hope, it was the winter of despair" [14].

This encapsulates the opportunities and contradictions that accompanied the pandemic and is bringing out the best and the worst of our life and relations, from personal to global. Of course, this is true of all mega crises which are often necessary to shake us out of our daily complacencies by stirring our senses and sensibilities [15]. We also rationalize our fears by constructing complex causality to explain over-whelming or peculiar phenomena.

But is COVID-19 the game-changer that the accompanying hype suggested? Assessing that involves acres of commentary from which mountains of lessons must be extracted. Punching 'lessons from COVID' into Google throws up billions of results. These extensive narratives consolidate around a few key themes.

## Toward Co-existence with the Coronavirus

Have certain public health approaches and political choices derived there from affected the differing pandemic trajectory for particular countries? Strategies have varied from the zero-tolerance policies and rigid lockdowns of China, Australia, and New Zealand, to the less strict approach in various European countries, including the permissive Swedish way.

Most other countries in Africa, Asia, and the Americas fall somewhere within this spectrum of national policy choices. They titrated their levels of restrictions and controls to what their publics would tolerate and perceptions around reported or measured incidence.

Staying ignorant has also been a strategy. It is the default for many conflicts affected countries such as Syria and Yemen that have limited capacities to test, track, and manage infection. Enhanced ignorance, i.e., downright denial has been the preference of authoritarian states such as North Korea. Finally, there has been the path of doing as little as possible for as long as possible, as in Brazil.

The jury remains out on which strategy will eventually prove to have been the most effective in terms of health outcomes. This is for a number of reasons. First, the

evidence is tainted as different countries have different standards around case definitions, validation, and comprehensiveness of data collection and reporting. Second, the almost infinite variety of the mix-and-match approaches taken by different countries mean that their experiences are quite difficult to compare with consistency. Third, the underlying demographic and vulnerabilities of populations at risk are highly variable, encompassing as they do, different population age structures, and social and behavioral risk factors. Fourth, public health and clinical care capacities and protocols, as well as health system resilience have been variable based significantly on the development status of countries.

While broad global patterns can be detected, it is the subtle differences between nations that are often most enlightening in terms of cause-and-effect conclusions. These have not been studied so well.

Meanwhile, the pandemic's epidemiology has been progressing toward convergence at different rates through different waves of the coronavirus and restrictions to counter them. There is a high probability that, over a relatively short while, prevalence and incidence will ultimately equilibrate toward a generally similar magnitude across the globe. This will be regardless of who got first to the vaccination party or how severe and prolonged were the lockdowns. The arrival of new variants such as Omicron—and future ones yet to emerge—will also 'level the field' for all countries, if previously acquired immunity from vaccination or infection is not sufficiently protective.

## Tolerating Inequality

While COVID-19 has affected all socio-economic groups, it has not afflicted everyone equally. Those who were older and had underlying chronic conditions such as diabetes, cardiovascular, and lung conditions fell away in greater numbers. The prevalence of such non-communicable diseases is greater in poorer people everywhere. In Western nations, this included Black and Asian ethnic minority groups. Elsewhere, they included undernourished, crowded, environmentally polluted communities with limited access to adequate means to practice hygiene and physical distancing.

Thus, it appears that the coronavirus unerringly found the fault lines in society. But this is nothing unusual as most diseases afflict the poor and disadvantaged ahead of others. The inequalities persisted and deepened into the prevention and treatment phases as the COVID-19 saga progressed. The poor—in every continent—were much more impoverished by draconian lockdown measures that meant the loss of employment, especially of the more precarious casual type that the poorest depended on.

That has meant that COVID-19 healthcare-related costs pushed millions of people into deeper poverty on top of the half billion that were already impoverished pre-pandemic because they were paying at least 10% of their income on meeting their basic healthcare needs [16]. The dream of universal health coverage has been set

back at least two decades [17]. But quite a lot of this will have been due not to the direct effects of the virus but restrictions that policy-makers hastily imposed, stopping people from accessing routine healthcare.

Meanwhile, the rich saved money and added to their capital stock. Entrepreneurs with disposable wealth could invest rapidly in biomedical industries related to COVID-19 be it in the manufacturing of personal protective equipment (PPE) kits or in companies making vaccines, medicines, and test kits. Many profiteered from supply shortages and bottlenecks that also pushed up prices [18]. In contrast, poor people—in slums in Africa or refugees everywhere— struggled to access sufficient soap and water to maintain personal hygiene. It is unsurprising that income and wealth inequalities increased sharply and significantly over the first two years of the pandemic [19].

Learning to live with this coronavirus implies, therefore, having to accept the differing fates of rich and poor communities. Therefore, ‘long COVID’ has another meaning in terms of drawn-out worldwide economic and social impacts. Measuring the direct and indirect global financial losses from the coronavirus is inherently difficult, not least because life and other losses are valued differently in an unequal world. Nevertheless, a rough and ready global estimate suggests a price tag of USD 3.4 trillion annually without universal vaccination. The cost is still in the billions as vaccination proceeds [20].

It is uncomfortably true that while some countries will quickly co-exist with the virus, others will continue to die for longer, as waves of the pandemic strike against their fragile public health and medical defenses.

From an economic perspective, it makes sense—harsh as that may sound—to vaccinate the rich first because they are worth more, and therefore, have more to lose. Also, their recovery is essential so that they can get back to traveling, purchasing goods and services, and investing to drive the recovery of the rest of society.

The slogan that ‘no one is safe until all are safe’ is true in public health terms but strictly speaking, not fully so, in economic terms. Of course, that is unfair but unavoidable, at least in the medium term until more effective and acceptable resource-sharing dispensations have been negotiated across and between our diverse nations.

The world was unequal before the pandemic came along and indications are that it will be even more so—afterwards. It is unrealistic to expect the coronavirus response to trigger some massive re-set in hearts and minds, however desirable that is in terms of the ideals around the sort of world most decent people want to live in. Many think that the pandemic shock will be a moral and practical stimulus to make a fairer world. But indications to date are that that may be a task too far for the pandemic response and recovery strategies that have come into play.

## Our Private Angst

Public health, for all its other wider population characteristics, is still made up of and measured by the sum total of the health of individuals. Ultimately, we fight all ailments, one person at a time. Thus, the person cannot be glossed over or subsumed into an amorphous and impersonal collective. Particularly noteworthy, therefore, are the personal emotions, attitudes, and behaviors evoked by this pandemic. When our lives are upended on a massive scale, it is normal to seek personal sense from shock. Perhaps a special, even spiritual private message amidst the general damage and disruption? Perhaps a hope for something good for us emerging from a terrible disaster?

These sentiments may lead to bargaining with the gods of our misfortunes who need to be pacified by making all sorts of pledges. So, in return for being spared by the virus, we may promise to live more wisely and behave decently toward others. Or, depending on our own underlying personality traits, our lived or observed experiences will have confirmed that the world is nasty and brutish. And some of us may even get self-satisfaction from confirming that we are right to be skeptical or cynical about everything. Our disparate feelings are often powered by the mistrust that we perceive to have grown everywhere, stimulated by a combination of factors.

Alongside matters of life and death, the loss of our most cherished liberties on public health grounds brings existentialist questions to the fore. That means confronting human vulnerability, fragility, and uncertainty. The notion of eternal progress in our affairs has been upended. As our best laid plans made with the greatest circumspection, to travel or make business, for example, come adrift time and time again, often at short notice through dictates from authorities, we are left to ponder: are we really in control of our own destinies?

The more introspective personalities may even start asking basic questions about our own place and contribution to the universe. We may start questioning the worth of our own achievements and the nature of our relationships. It is then but a short step to questioning the meaning of life, and whether it is worth living. It is unsurprising that mental health dysfunctions have abounded in all cultures and societies [21].

These have been manifested in many different ways including increased depression and suicide, as well as domestic abuse and violence that have disrupted many families. Loneliness became a pandemic in its own right as many people died in hospitals without being allowed the comfort of their loved ones around them. On the other end, mothers gave birth without their partners and relatives in attendance. In between, numerous people were incarcerated in care homes, many uncomprehending because of dementia. They were reduced to looking at their loved ones through windows and computer screens.

When the physical act of expressing comfort and compassion is prohibited during peoples' hours of greatest need, it is unsurprising that the world, as a whole, feels as if it is suffering from a post-traumatic stress syndrome. This is quite difficult to treat and may have long-term intergenerational impacts.

## Our Muddled World

The coronavirus has behaved like a complex jigsaw where all the pieces are thrown up at the same time and, while certain pieces are missing, we don't know which ones without trying to first order the picture.

To start with, science itself has struggled to understand the virus and its implications. While a lot got known in a short time, this was not sufficient or fast enough to satisfy the hunger for information and understanding around the world, at a moment in history when we expect science to provide instant and clear answers. Instead, we have seen nuanced and publicly-debated answers with probability estimates attached that are difficult for the statistically illiterate publics and politicians to comprehend.

A classic illustration of the 'evolving science' problem was an early technical argument over the utility of facemasks. Do they protect the user more than the person in front of them? This mattered because it highlighted the selflessness/ selfishness tensions that run through all COVID-19 narratives. It was not helped by other messages asking people to use lower standard and home-made masks, so as to preserve limited stocks of surgical masks for clinical workers. The justification that risks are higher for doctors and nurses tending to sick people than the rest of us was lost as the world panicked. The debate got further snarled up in cultural wars, as the masking idea came from Far Eastern societies where it was more traditional even in pre-COVID times, and ridiculed as such by Western societies.

There were other charged debates around wholescale and long-lasting border closures which public health experience over centuries has shown as being of limited utility against disease spread. Subsequently, the realization that heavily pushed two dose vaccinations are not going to be enough and boosters—perhaps frequently— are needed has challenged people's acceptance.

Meanwhile, confidence in scientists and leading institutions such as the World Health Organization (WHO) also took a knock. The worldwide scientific debate around the clues revealing the origins and spread of the coronavirus was hampered by China's hesitancy in sharing all data in a timely manner. Meanwhile, the public and media wanted clear answers and were otherwise untrained in the nuances and interpretations of incomplete and inconsistent data.

They also did not understand that WHO is always bound to be late in issuing its definitive guidance to the world, because the high-quality evidence on which universal action can be recommended takes a long time to accumulate, apart from the time-consuming process to get its diverse range of global experts to agree on a common position. But national health authorities could not wait. Hence, WHO's well chewed guidance on a range of issues, although proved correct over time, was often ignored or adapted, leading to a plethora of different national health policies. That was not aided by the politicization of international health cooperation as COVID-19 became a heavily contested geo-strategic issue.

All these factors have played out in real time to sow confusion and skepticism in public minds. These were then magnified by social media algorithms that shaped the misrepresentations and fake news that spread across a hyper-connected world.

These have undoubtedly contributed to the high prevalence of vaccine hesitancy in all societies and fueled battles between the skeptical publics and concerned public health authorities.

The argument has not been limited to the health sector. As COVID-19 collided with the simultaneous climate crisis, we have been forced to grip the new notion of 'one health', i.e., the interconnectedness of human, animal, plant, and planetary health [22].

But we are not good at dealing with interconnected challenges. And so, we have tended to rationalize COVID-19 by externalizing and rendering abstract our own personal sense of the losses and traumas suffered. Perversely, we have sought comfort by blaming others for our travails—be they failing leaders, institutions, or foreign countries. Thus, we blamed uncontrolled *environmental change* for boosting zoonotic transmission and over-crowded *urbanization* for magnifying vulnerabilities. Chinese *authoritarianism* was pilloried for the original unleashing of the coronavirus and cheap *world travel* for its rapid spread. Rampant *capitalism* was accused for the pandemic's obscenely unequal impacts and the *food industry* for making us fat and vulnerable to the virus's complications. *Social media* was charged with spreading mischief and misinformation. Unchecked *globalization* was arraigned for hollowing out nations who can't produce their own paracetamol or PPE, profiteering *pharma* for not making enough affordable vaccines for everyone, and *geopolitics* for styming multilateral cooperation.

## Mood Swings

COVID-19 has also messed up our feelings. The global mood has swung between self-flagellation at our perceived sins of commission and omission, and self-pride that comes from battling with and mastering the pandemic.

Images of desperately sick patients gasping for breath went viral on social media around the world. As well as videos of people plugged into tubes and machines of all types. Their suffering was pitied as well as admired. And if they survived, their resilience was applauded.

We also applauded health workers battling against the odds. We were shocked to see photos of doctors and nurses emerging after long hours on duty with deep rings under their eyes. We marveled at social workers caring for the most vulnerable. And humanitarians helping isolated or forgotten people. The kindness business has, indeed, thrived as countless neighborhood and community schemes emerged to bring succor to the housebound [23]. This appealed to the better angels of our nature because 'we are in it together', and urged to show solidarity. To be altruistic after the initial panic triggered by the rapid spread of the virus, the world marveled at the speed with which the coronavirus was identified, sequenced, and vaccines invented. Also, how quickly treatments improved. All within little more than eighteen months. In some senses, we succumbed to the narrative on how clever we are, how innovative,

and ingenious [24]. Many key scientists who were responsible for the breakthroughs became superstars. No doubt, some will get Nobel Prizes.

While regretting the many tragic losses of lives and livelihoods, perhaps we regretted even more the passing of an old 'normal' which will never return. Gone was the easy world where we could kiss and shake hands without second thoughts, or pack our bag to go anywhere at a moment's notice, without tests, vaccinations, and passes. Even a trip to a restaurant or shopping mall became a major pre-planned logistic exercise.

We also grieved for lost freedoms that we took for granted, even as despots around the world rejoiced in the legitimacy that the coronavirus has provided to curb basic liberties, in the name of public health. In our heart of hearts, we know that those freedoms will never be fully reclaimed. We also fear that with the next pandemic caused by some other weird bug, the precedents that have now been established are likely to be used to justify further restrictions on human rights, in a world that is, anyway, trending toward authoritarianism, even in the more democratic states.

But also astonishing has been the overturning of policy orthodoxies. This was when governments and international financial institutions overturned economic orthodoxy to print trillions of dollars to prop up businesses and expand social safety nets [25]. We marveled at the many adaptations that companies, communities, and families made to carry on as best as they can—be it home schooling or zoom connecting. It seemed that we are astonished at our own adaptive resourcefulness [26]. That included our willingness to tolerate lockdowns and other extraordinary limitations to basic freedoms, even though many grumbled and protested.

## Future Hopes and Dreams

The virus also goaded us to improve the way we live. To better organize our health and social systems so as to avoid or deal better with future disasters. Even a new international Pandemic Treaty has been proposed to tackle COVID-19's successors although we are not too good at honoring numerous other existing agreements such as the recently strengthened International Health Regulations [27, 28].

Becoming wise with hindsight also became a thriving industry. There were several sub-texts. One was the launching of investigations into the origin, cause, and mishandling of the pandemic [29]. Another was on forecasting the future. These may help to defuse criticism of present difficulties by time traveling to a safely forgettable past, or to a safely distant 'build back better' future [30].

Often these analyses have had a comparative aspect. They looked at the relative performance of cultures, governance systems, and institutions. As there is always someone worse than us, this helps to shift blame. Another way to divert us from current realities is to invoke distal influences that are so broadly cast as to render real-time decision-makers unaccountable.

There has also been prolific *punditry* around the post-pandemic world. Most projections envisage a digital takeover of life, even as large elements of distancing

continue in our minds and hearts [31]. The emerging world may be a somewhat colder, more robotic place. It may also be much more fearful and cautious as we await the next pandemic or climate disaster. Thus, one enduring legacy of the coronavirus may be our permanently altered perception of risk [32]. Public policies and private practices will default to more risk-averse attitudes. Could the precautionary principle take all the joy out of living?

## Damaged Values

The contradictions exposed by COVID-19 cast a dark show on our core values around health. This will persist long after the pandemic is over. The consequences may be pervasive and profound. To unpack that concern, we need to go back to the beginnings of our global health journey.

For millennia and across all cultures, health has been perceived as an inherent good, i.e., its pursuit was seen as desirable in itself. This got codified as the 'right to health' in the 1948 Universal Declaration of Human Rights and subsequent international laws and covenants [33]. At the same time, the essence of the Hippocratic Oath, dating from 500–300 BCE was universally incorporated in every healthcare system [34].

In the modern era of biomedical ethics, these concepts got summarized into four basic moral principles: autonomy, beneficence, non-maleficence, and justice. Or put another way: healers must respect the individual patient's rights and choices, act in their best interests, do no harm, and be fair in distributing limited healthcare resources to do the best for most people. In time, as globalization evolved, these orientations stimulated the noble notion of 'health for all'—whether our neighbor or a distant stranger. Nowadays, this is called Universal Health Coverage that, over the course of repeated tellings, has become a holy grail [35].

Therefore, it is particularly striking to observe how national and international responses to the pandemic have unwittingly served to largely violate these historical precepts. The 'autonomy' of people was ridden over roughshod by draconian lockdowns and, later on, increasingly coercive attitudes toward vaccination while, simultaneously, restricting the rights of people unwilling to get vaccinated. Favoring the 'beneficence' of reduced negative health impacts of COVID-19 came at the cost of 'maleficence' toward those who suffered greater mortality and morbidity from other conditions—such as tuberculosis and cancer to name just a couple—that were deliberately neglected as service priorities shifted. Whatever the public health justifications, whether pandemic responses have been 'just' is debatable, depending on the perspectives of the winners and losers of this lottery of life and death.

Hence, the notion of health which was an instinctively unifying sentiment for millennia, became a deliberately politicized and highly divisive issue, during this pandemic. This has inevitably led to a wider erosion of the values and principles underpinning international cooperation in this sector. The specialty of global public health is traditionally projected as a moral mission to do the greatest good for the

greatest number of people with priority given to the poorest and most vulnerable. Which reasonable person can disagree with this, not least as it appeals to our own self-image of decency? But COVID-19 has tainted the humanitarian impulse of selflessness with the virus of calculated self-interest. We have been told to wash hands and wear masks to protect our own selves, even as we do this to also protect our loved ones. For most people who do not have advanced saintly attributes, this gets translated into securing your own good first, with the protection of others as a happy side benefit [36].

That is why solidarity messaging around COVID-19 has often fallen in a semi-deaf no man's land, exemplified well by the struggles of the COVAX facility to get enough vaccines to poorer countries or exhortations to pharma to share their intellectual knowhow to scale-up vaccine manufacturing [36, 37]. Also by the debate on border closures and travel restrictions that has been a hallmark of COVID-19 response. We have long realized that diseases don't stop at the front door or national frontier, even if their entry gets delayed for a short period of time. Therefore, to ensure our own safety, conventional public health policy usually required exerting much greater effort in securing the safety of others, rather than in locking yourself in and locking out all others. But this has been trumped by the coronavirus.

In olden days, when health was a matter of individual chance or, at best, an uncertain partnership with one's healer or god, selflessness predominated. Perhaps that was seen as akin to a 'spiritual vaccine' that earned us some heavenly points. That was prudent insurance at a time when the chances of dying from all sorts of diseases were very high. But with tumbling mortality rates came the possibility of longer, healthier lives; doing good to others became optional.

At the same time, a broader backdrop of change has been occurring in the health sector. Our progressive technocratic world has required greater institutionalization of the health notion and its incorporation into domestic and global economies. With that came an increasing array of health professionals, bureaucrats, plans, strategies, objectives, budgets, and metrics. Thus emerged the modern organizational set-up, whether under health ministries in the public sector or as corporate businesses. In either case, all institutions are rationally incentivized to serve their own set missions, i.e., their behavior is geared toward self-interest even if they are composed of many selfless individuals. Perhaps that is why we see so much COVID-19 nationalism in relation to border restrictions and vaccine hoarding: national health missions must do what they are obliged to do: look after their own first.

As health became more and more of an institutionalized business, nations were encouraged by the global multilateral enterprise to compete on the Millennium Development Goals and now, Sustainable Development Goals [38, 39]. These paradigms see health as an outcome, but even more, as input toward creating stronger nations. That necessitates the further instrumentalization of health. For example, health expenditure is required to be justified by demonstrating a return in terms of more productive societies [40].

Therefore, slowly but steadily, health has come to be visualized, no longer, as an intrinsic good that is to be enjoyed for its own sake. Instead, it has become an input to a process that must generate wider economic benefits. For example, better

maternal and child health services mean healthier babies (intrinsic good) who grow up to be strong workers (instrumentalized good). A similar calculation is implicit in COVID-19 responses.

Ultimately, if healthy and strong workers are seen to make strong nations, it is then but a short step for policy-makers to postulate health as a strategic security concern that is legitimate fodder for geo-political rivalry. Also, when a disease breaks out and spreads widely, the country that recovers faster gets an advantage over others. The pandemic has provided the perfect case study for such rivalry among nations.

It explains why the global COVID-19 response has been marked by so much contention and acrimony right from the very beginning. Which country is to be blamed for the origins of the virus? The coronavirus has driven us apart and not brought us together because the underlying health moral base has been instrumentalized and securitized. COVID-19 did not cause this. It has simply accentuated the trajectory we were already embarked upon.

On this analysis, what does the post-COVID future hold for global health? The positive aspect of a securitized health field is more investment in medical science, discovery, and invention, including via the fields of artificial intelligence, health surveillance, and big data collection and analytics [41–44].

The negative aspect is that these are the same security-related technologies that can infringe basic human rights and liberties, make wars more effective and efficient, hollow out democracies, and keep autocrats permanently entrenched [45–47].

Whether good or bad, our health is now a matter of national security, and all of us are conscripted as soldiers. We are duty bound to be healthy so as to be strong. Just in case we are required to compete more fiercely—even fight—others.

So, there is indeed a ‘long COVID’ syndrome that is not just the many months of persistent viral symptoms that millions suffer from. It is a permanent shift in our previous benign and uncritical notions around our personal and collective health. This will never be the same again.

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