Bioethics during the COVID-19 Pandemic

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The UNESCO Chair in Bioethics and Human Rights (www.unescobiochair.org) was established in 2009 at two universities in Rome, the Ateneo Pontificio Regina Apostolorum and the Università Europea di Roma. The Chair, inspired by the Universal Declaration of Human Rights and Bioethics of UNESCO, offers a university forum for reflection and study to promote the application of bioethical principles in the field of science, medicine, and new technologies.

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CHAPTER ONE

ETHICAL CHALLENGES IN COVID-19 BIOMEDICAL RESEARCH, VACCINATION, AND THERAPY

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Abstract

This chapter provides a scientific summary of COVID-19 and measures to combat the pandemic, including artificial intelligence-based prevention, platform clinical trials, lockdowns, and vaccinations. From an ethics perspective, the themes of this chapter are a proposed global bioethical framework, the Personalist Social Contract, which can unite diverse belief systems and thus our world through shared scientific and political cooperation, followed by describing good, just, and defensible research methods and applications that act as countermeasures against COVID-19. The content is intended to be accessible to a broad audience in terms of belief systems, disciplines, and types of stakeholders. It thus attempts to propose a substantive and timely overview of how our world can be united, both scientifically and ethically, to reduce the impact of the COVID-19 pandemic, speed its resolution, and prevent future occurrences.

Health, financial, and equity impact due to COVID-19: A scientific overview

A. COVID-19: Scientific overview

In its first year, the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV2) infected nearly 100 million people, killed about 2 million, and the Coronavirus Disease of 2019 (COVID-19) pandemic is on pace to

cost almost US$30 trillion within its first 5 years.[1] Despite significant COVID-19-related death and disruption to communities, global data analyzed in the World Health Organization (WHO) Bulletin[2] show survival rates of over 99.7%. Mortality from the COVID-19 pandemic may have been reduced through effective medical countermeasures or responses, both of which were lacking at the end of the first year of the pandemic, as noted by the WHO[3]. The steroid medication, dexamethasone, showed success reducing COVID-19 mortality or deaths, but it has no mortality benefit for the vast majority of people who become sick with COVID-19 (and who do not need supplemental oxygen to breathe). Among those who need supplemental oxygen that is available in most hospitals globally, dexamethasone treatment is effective in reducing the probability (or absolute risk reduction) of mortality by less than 3%[4]. However, among patients who need oxygen in the form of invasive mechanical ventilation, dexamethasone treatment is highly effective, reducing mortality by about 12%[5]. Unfortunately, this treatment option applies only to a small proportion of COVID-19 patients and is not readily available in many hospitals globally, especially during periods of high demand such as in pandemics.

Economically disadvantaged communities and certain racial minorities bear the brunt of the pandemic's impact on health and personal finances. Biomedical interventions and public health countermeasures, instituted by states and health systems that struggled to mitigate the worse effects of the pandemic, have had limited global success. Effective countermeasures incorporating technical developments have been subjected to extensive research but from ethical and fair perspectives, very little has been considered, warranting the need for their examination in this chapter. Public health (including prevention, lockdowns, and vaccination), biomedical (including clinical therapies), and ethical (from a global bioethical framework) perspectives will be discussed herewith. The first objective is to describe current scientific research on COVID-19 and the countermeasures, including the novel use of Artificial Intelligence (AI) as a preventive measure. The second objective is to discuss the ethical

[1] "The Human Cost of COVID-19," 1-8.
[2] Ioannidis, "Infection fatality rate of COVID-19 inferred from seroprevalence data."
[3] Pan, et al., "WHO Solidarity Trial Consortium. Repurposed Antiviral Drugs for Covid-19 — Interim WHO Solidarity Trial Results."
[4] Horby et al. "The RECOVERY Collaborative Group. Dexamethasone in Hospitalized Patients with Covid-19 — Preliminary Report."
[5] McCormick, "How AI spotted and tracked the coronavirus outbreak."

methodology featuring a global bioethical framework, termed the Personalist Social Contract (PSC), which will, in a stepwise fashion, allow a concise analysis to help answer ethical questions that impact diverse communities with pluralistic belief systems, given the pandemic's global scope.

B. AI-based prevention and mitigation: Scientific overview

Preventing a pandemic from occurring is always the best solution, which is seldom the case. Similar to a forest fire, in the event of a pandemic, reducing the ensuing damage is the only thing that can be done until it runs its course. In public health terms, once sufficient numbers of people have developed immunity against the virus, also known as 'herd immunity', either by becoming infected from and surviving it or becoming successfully vaccinated against the virus, the pandemic may be considered to have run its course.

For the first time in history, there is ample evidence that future pandemics may be prevented using AI. This is achieved by analyzing copious amounts of complex data from multiple sources (such as governments, health systems, conventional media, social media, and prior pandemic datasets), identifying emerging threats from new viruses (typically similar to prior pandemics), and predicting the modes and means of global spread of viruses that result in pandemics. A few examples of how AI can serve this purpose in the context of COVID-19 are presented here. The AI-based Canadian firm, BlueDot, issued the first known warning about the pandemic potential of an undiagnosed flu-like pneumonia outbreak in China (later discovered to be SARS-CoV2) six days before the US Centers for Disease Control and Prevention and nine days before the WHO issued their warnings. In January 2020, BlueDot published the first COVID-19 scientific paper that accurately predicted SARS-CoV2's path to a pandemic.[6] A recent study published in *Nature*, one of the world's top scientific journals, demonstrated that a type of AI called machine learning (ML), when combined with a large biological dataset, detected over 11-fold additional possible associations between coronavirus (the biological 'family' to which COVID-19 belongs) and hosts (such as bats and humans that can be infected by such viruses) and 40-fold more host species than previously known.[7] These findings provide the most

[6] Bogoch, et al., "Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel."
[7] Wardeh, et al., "Predicting mammalian hosts in which novel coronaviruses can be generated."

accurate and complete known list of animals that serve as hosts for emerging coronaviruses to cause the next pandemic in humans. This knowledge serves to develop effective surveillance mechanisms to detect and contain new outbreaks that, if left unchecked, could infect people all over the world. Another study showed that once a new outbreak like COVID-19 is already underway in a certain geographic region (as an endemic), ML when paired with cloud computing (or an on-demand online suite of information technology resources including data storage and analysis) allowed an accurate prediction of COVID-19's development into a pandemic (as an endemic spread to multiple states and continents). This prediction tool identifies temporal patterns of the virus that specifies when a critical number of people will be infected, allowing governments and health systems to better prepare, allocate resources, and protect their populations.[8]

Aside from its use for predicting the identity of viruses, and their spatio-temporal patterns of infection resulting in pandemics, AI can also be employed to identify safe and effective medical and public health countermeasures, which is a revolutionary approach in health management. In traditional statistics, creation of simple datasets and their analysis for the identification of 'cause and effect' associations enables prediction of future outcomes. Using real-world and complex data, often from multiple sources, AI algorithms make accurate predictions that result in rapid, generalizable, personalizable, and reliable results, particularly in COVID-19 drug and vaccine development, despite the absence of specific directions by statisticians to look for certain associations (as in traditional statistics).[9] Consider the similar scenario in the traditional randomized controlled trial (RCT) design, which is the gold standard for proving an intervention is safe, effective, and thus better than the alternative (such as a different treatment or control). An RCT can prove that an intervention safely causes an effect, such as improved mortality compared to a placebo or control, but it is usually expensive and time-consuming, often years, which is impractical during a pandemic raging across the world. It is noteworthy to mention the University of Oxford's RECOVERY trial that produced the fastest results on treatment efficacy and safety of any pandemic study in history.[10] The Oxford team achieved this feat using a new type of study design wherein an

[8] Tuli, et al., Singh. "Predicting the growth and trend of COVID-19 pandemic using machine learning and cloud computing."
[9] Keshavarzi, et al., "Artificial Intelligence for COVID-19 Drug Discovery and Vaccine Development."
[10] Mullard, "RECOVERY 1 year on: a rare success in the COVID-19 clinical trial landscape."

RCT was modified to be an adaptive platform trial (APT). Thus, instead of comparing outcomes, for instance between two arms or study groups such as a treatment and a control group among a particular group of patients often for multiple years, the RECOVERY APT rapidly (within a mere 3 months) tested multiple treatments across multiple patient sub-groups to identify the most effective patient *x* treatment combination.[11]

As APTs are for research trial designs, AI is for analytic methodologies (or the stepwise approach to examining data). Before COVID-19, AI had been harnessed to rapidly develop efficacious medical treatments by analyzing real patient data obtained from extensive, simulated studies. The effectiveness of these treatments were subsequently proven in real-world clinical trials,[12] heralding the success of AI to identify promising treatments that can be used in a pandemic. The scientific rigor expected from research conducted during a pandemic is facilitated by the use of AI, which saves time and resources that are in short supply. Identifying the most promising countermeasures (in addition to options such as lockdowns and vaccines discussed below) using AI tools not only offer reliable and trusted research that can withstand scrutiny, but also gives the best chance of real-world success for the most affordable cost.

C. Lockdowns: Scientific overview

How can a pandemic be contained or at least mitigated? Toward this, lockdowns (or Shelter in Place [SIP]) were one of the most drastic and popular early countermeasures adopted internationally, wherein states and businesses encouraged or ordered residents and workers to stay home in the hope of slowing the pandemic's spread and giving time for healthcare systems to adapt to the new reality of caring for COVID-19-infected patients. With limited information available on effective countermeasures early in the pandemic, the WHO carefully recommended lockdowns for "buying time" to "suppress and stop transmission" otherwise states' "health systems may collapse under the weight of the numbers of patients."[13] Six months later, as additional data emerged confirming prior evidence that the net benefit of lockdowns is highly questionable at best, the WHO COVID-

[11] "The Adaptive Platform Trials Coalition. Adaptive platform trials: definition, design, conduct and reporting considerations."
[12] Woo, "An AI boost for clinical trials: Big data and artificial intelligence could help to accelerate clinical testing. Nature."
[13] "WHO Director-General's opening remarks at the media briefing on COVID-19 - 25 March 2020."

19 envoy, David Nabarro, asserted that "We really do appeal to all world leaders: stop using lockdown as your primary control method."[14]

There is a lack of scientific consensus on the effectiveness of lockdowns imposed on nearly 9 of every 10 people worldwide at the pandemic's emergence to slow the spread of COVID-19, save lives, or save enough lives to justify their high associated health and financial costs for this pandemic or those prior. Real-world evidence, including from the non-partisan United States (US) National Bureau of Economic Research and the RAND Corporation, shows lockdowns have no clear effect on reduction in excess mortality (the number of people who died in a current time period compared to prior).[15] A previous RAND study for the biologically-related pandemic influenza[16] directed by the US Department of Health and Human Services under President Obama and the 2020 WHO assessment of COVID-19[17] concluded that there was insufficient evidence to support a clear net benefit accrued from extreme responses such as lockdowns even for the above-stated hope that lockdowns could buy needed time. Further, a growing body of research (typified by a recent University of Chicago study) consistently shows that more people became sick from COVID-19 at their homes with their families while in lockdowns, than at work or school with colleagues or classmates despite the greater contact time with such individuals.[18]

The pronounced financial and inequity costs attributed to lockdowns are reflected in the statistics published in the United Nations World Economic Situation and Prospects mid-2020 report, which identified lockdowns as being the primary cause for the US$8.5 trillion cost of the pandemic's first year and the 10-year extreme poverty growth of 164.3 million people (double the COVID case totals for the first year).[19] The World Bank noted that COVID-19 restrictions may cause disproportionate clinical and financial harm on the principally non-white low and middle income nations,

[14] The Spectator. "The Week in 60 Minutes #6 - with Andrew Neil and WHO Covid-19 envoy David Nabarro."
[15] Agrawal, et al., "The impact of the COVID-19 pandemic and policy responses on excess mortality."
[16] Aledort, et al., "Non-Pharmaceutical Public Health Interventions for Pandemic Influenza: An Evaluation of the Evidence Base."
[17] Nussbaumer-Streit, et al., "Quarantine Alone or in Combination with Other Public Health Measures to Control COVID-19: A Rapid Review."
[18] Mulligan, "The backward art of slowing the spread? Congregation efficiencies during COVID-19."
[19] United Nations. "COVID-19 to slash global economic output by $8.5 trillion over next two years."

including by increasing net mortality through increased economic contraction, particularly for children.[20] There is increasing evidence that lockdowns, even in high income countries such as the US, contribute to much higher death and disease burden on racial minorities including black and Hispanic communities in contrast to white communities amid structural inequities.[21] More than 60% of US jobs cannot be fully online and are predominantly lower-paying positions[22] filled predominantly by non-white workers who face much higher chances of increased poverty due to job losses, impacting their housing and food security, social networks, and health insurance following lockdowns. Prolonged lockdowns force to people to stay home resulting in restaurants and hotels to close shop without reopening due to losses, and infrequent and cancelled transportation can become permanent, and even generational. Not surprisingly, a US National Institute of Health-funded meta-analysis showed that poverty is the leading cause of death (even greater than the world's top health killers of heart disease and cancer) including with its associated adverse effects such as systemic racism, low education, under-insurance, worse environment, lower employment, and higher crime.[23]

Given its high financial and equity cost, and in the absence of a clear medical or public health benefit, there is growing global political resistance to lockdowns. The WHO has stepped up calls to prioritize "targeted interventions" over such indiscriminate lockdowns.[24] Recent debates with John Hopkins University and the Journal of the American Medical Association (one of the world's most influential medical journals) on this topic featured medical and public health researchers recommending a replacement of lockdowns with the standard pandemic countermeasure of focused protections.[25, 26] Such targeted interventions are informed by the historical failures of prior lockdowns, both in terms of challenging enforcement and widespread non-compliance.

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[20] Ma, et al., "The intergenerational mortality tradeoff of COVID-19 lockdown policies: Policy research working paper. No. 9677."
[21] Khazanchi, et al., "Racism, not race, drives inequity across the covid-19 continuum."
[22] Dingel, et al., "How many jobs can be done at home?"
[23] Galea, et al., Estimated deaths attributable to social factors in the United States."
[24] World Health Organization. "Coronavirus disease (Covid-19): Herd immunity, lockdowns and Covid-19."
[25] Johns Hopkins University Interdisciplinary Zoom Webinar Series. "Locking down or opening up? A debate on the best path through the pandemic."
[26] JAMA Network. "Herd Immunity as a Pandemic Strategy."

The emphasis should instead be on respecting the autonomy of the majority of the world's population (who typically have low mortality risk from such pandemics) by allowing them to continue working and thus helping generate the needed resources to protect those at higher risk, including the elderly and immunocompromised populations (with focused protections such as improved sanitation, reduced contact, and early vaccination). These countermeasures may additionally include or be compatible with social distancing and face masking particularly until sufficient vaccination rates are achieved. This was demonstrated in a recent *Nature* publication using real-world patient data obtained from one of the first large cohort studies, which suggested that such measures reduce COVID-19 spread[27]; however, rampant non-compliance and frequently fierce political resistance challenge their efficacy.[28, 29, 30] At the 2021 Summit for the Group of Seven (G7), which brought together the world's largest advanced economies per the Internal Monetary Fund, the Carbis Bay Health Declaration that promoted expedited vaccine development, production, and diffusion as the primary pandemic mitigation strategy, was signed, notably omitting lockdown as a primary pandemic countermeasure.[31]

D. Vaccines: Scientific overview

Vaccines manufactured by the American and German pharmaceutical companies, Moderna and Pfizer, were not only the first two COVID-19 vaccines approved for emergency use by the US Food and Drug Administration (FDA) but were also the fastest vaccines ever developed that received an expedited approval process and approved in less than 12 months. These vaccines were the first to use messenger ribonucleic acid (mRNA) following nearly 30 years of biomedical research into such new technologies[32, 33] and were tested in aggressively-funded phase 3 randomized placebo-controlled human clinical trials that enrolled 65,793 participants.

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[27] Kwon, et al., "Association of social distancing and face mask use with risk of COVID-19."
[28] Fischer, et al., "Mask adherence and rate of COVID-19 across the United States."
[29] Haischer, et al., "Who is wearing a mask? Gender-, age-, and location-related differences during the COVID-19 pandemic."
[30] Alves, "Survey says 90% Indians aware, but only 44% wearing a mask; discomfort key reason for non-compliance."
[31] G7 leaders to agree on landmark global health declaration.
[32] US Food and Drug Administration. "FDA Takes Key Action in Fight Against COVID-19 By Issuing Emergency Use Authorization for First COVID-19 Vaccine."
[33] Ball, "The lightning-fast quest for COVID vaccines — and what it means for other diseases."

Moderna and Pfizer had their mRNA vaccine platforms identified two months before COVID-19 became a pandemic. Indeed, Moderna finished their design within 48 hours of the online publication of the SARS-CoV2 genome and 21 days before the first lockdown in China's Wuhan region occurred.[34, 35] An mRNA molecule is a single-stranded RNA, which is coded by a gene's DNA and is essential for a cellular ribosomes to make the related protein.[36] Traditional vaccine platforms are based on disabled versions of live viruses or their proteins that trigger the body's immune system to learn and retain antigenic memory for defense against future exposure to a virus. In the case of vaccines developed by Moderna and Pfizer, only mRNA coding for the SARS-CoV2 spike protein was used as a vaccine. This approach substantially reduced the time required to create, test, and produce these vaccines by eliminating the extensive time involved in growing and weakening live viruses or removing the pathogenic elements, as required for conventional vaccines.

Concurrent with the above technical advancement was history's largest public and private funding of a revolutionary new approach to biomedical research wherein the stages of RCTs (preclinical and phase I, II, and III in which human participants are randomly assigned to one arm to receive a treatment such as the vaccine versus a placebo or other control) were executed simultaneously. Advances in research and funding made COVID-19 vaccines possible, but they must also be produced to scale to combat the pandemic. Given our global interconnectedness and pandemics' blindness to state borders, toward the end of 2020, the world's wealthy nations pivoted from regional vaccine creation to global production by tapping pre-existing extensive global infrastructure already in place. India has led the world for decades in rapid and large-scale vaccine production—including making half of the globe's vaccines pre-pandemic—partnered with high-income nations including the US, Japan, and Australia, who committed $200 million to make one billion COVID-19 vaccines for both developed and developing nations.[37] By early 2021 or just shy of a year after the pandemic's emergence, the Serum Institute of India, which makes nearly 2 billion vaccines annually, met their quota for such states and shifted to producing COVID-19 vaccines for richer Western nations.

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[34] AJMC Staff, "A Timeline of COVID-19 Developments in 2020."
[35] Nature. "Nature's 10: ten people who helped shape science in 2020."
[36] National Human Genome Research Institute. "Messenger RNA."
[37] Bellman, "U.S. taps Indian COVID-19 vaccine production prowess to inoculate Indo-Pacific."

The speed, safety, efficacy, and scale of production of mRNA vaccines underscore global hope as evidenced by the G7's Carbis Bay Health commitment to feature vaccines as the primary pandemic countermeasure when prevention and containment measures fail. Yet it should be noted that cultural resistance and barriers to access, particularly in poorer and certain racial communities, can limit the benefit of vaccines.[38]

COVID-19 countermeasures: Ethical overview

A. Why and how to do an ethical analysis

Pandemics require global political—and ethical—cooperation for prevention, mitigation, and recovery. We may know how countermeasures scientifically accomplish the above, but political unity is needed to actualize and enact these, which implicitly also requires our ethical unity (at least agreeing on certain basic values and principles that make those actions justifiable to us individually and communally). Without such shared values and principles (even self-seeking ones), can we unite to accomplish anything? This calls for the need for an ethical framework that allows the world's diverse belief systems to converge on shared principles to enable an ethical defense of the fit-for-purpose countermeasures, including the ones that are appropriate and their means of implementation. In this context, the PSC can be a compelling ethical framework to achieve the above for *political*, *practical*, and *philosophical* reasons.

B. Why and how to use the PSC: Politically

Politically, almost every nation has already come together as member states of history's largest political organization, the United Nations (UN), and thus states commit themselves to the UN's philosophical foundation which is explicitly described in the 1948 *Universal Declaration of Human Rights* (UDHR)[39] and operationalized in its Sustainable Development Goals (SDGs).[40] The UDHR centers on the intrinsic value or dignity of each human being, which thus gives rise to an individual's rights and the duties of others to defend them and of the individual toward the human

[38] Salyer, "Confidence in the COVID-19 vaccine grows in UK and US, but global concerns about side effects are on the rise."
[39] The United Nations. Universal Declaration of Human Rights. 1948.
[40] United Nation Sustainable Development Goals.

community, which excludes no one. Monlezun et al.[41, 42, 43] articulate this unique foundation as the PSC with its formal definition and defense as a novel ethical framework integrating modern and classical philosophy: it is an ethical system based on classical natural law ethics (arguing that humans naturally know to do good and avoid evil), rooted in a knowable Thomistic-Aristotelian metaphysics that is neither religious nor non-religious (arguing that humans can know the most fundamental causes of existence and meaning including what is good, what is a good human life, and what is good human action), and expressed as a modern social contract (similar to the later Rawlsian social contract describing how diverse and even secular belief systems can unite in a shared conception of justice or good action that respects the rights of others).

C. Why and how to use the PSC: Practically

Practically, the PSC is the only global bioethics framework that formally unites our diverse belief systems both religious and non-religious, including Buddhism, Christianity, Confucianism, Daoism, Hinduism, Islam, Judaism, folk religions, and secular liberalism, which account for over 99% of the global population.[44] Even modern ethical systems (i.e. utilitarianism or the social contract), typically in the post-European Enlightenment tradition, attempt to do so but practically exclude 84% of humanity who identify with belief systems with metaphysical foundations that supersede intellectual constructs as the utility maxim or Rawlsian conception of justice belonging to the above systems.

D. Why and how to use the PSC: Philosophically

Philosophically, the PSC is logically defensible both internally (i.e. no logical contradictions) and externally. The latter is anthropologically compatible or who we commonly understand ourselves to be, and rooted in a defensible metaphysics, which nearly all modern philosophy rejects and thus ultimately makes it difficult, if possible at all, to justify. This notion is similar to how any clinical trial has a difficult, if not impossible task, to

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[41] Monlezun, *The Global Bioethics of Artificial Intelligence and Human Rights.*
[42] Garcia, et al., "Convergence of human rights and duties: towards a global bioethics."
[43] Monlezun, "Getting (human) value-based payments right: neuroeconomic personalism in Thomistic-influenced human rights and duties-based global bioethics (THRD-GB)."
[44] Pew Research Center. "The changing global religious landscape."

prove drug A is better than drug B when its critics reject even the underlying biology that describes how humans respond to either drug. The PSC thus may be defensible in a way that modern ethical systems are not, and intelligible to modern audiences (and open to their insights into individual human experience including of pluralism) in a way that classical systems are not.

E. Ethical analysis of COVID-19 research, vaccination, and therapy

Thus equipped with a common scientific and ethical understanding, let us analyze COVID-19 research and countermeasures that are deemed good and right. Considering the PSC, the most ethically defensible research is that which incorporates an AI-supported platform study design, where possible, such as with RECOVERY and mRNA as with the Moderna and Pfizer vaccines, in addition to sufficient funding and timely approval. In the above cases, these methodological advancements allow expedited, but reliable, results that do not sacrifice sufficient confirmation of efficacy and safety. They thus optimally honor human dignity and as such, each person's rights to "life, liberty and security of person" (UDHR, Article 3), the ability for each person to "share in scientific advancement and its benefits" (Article 27), and of "equal access" to such goods as a "public service" (Article 21); these are requirements of justice given "[a]ll human beings are born free and equal in dignity and rights" (Article 1). Similarly, AI-based prevention should be ethically prioritized over any other countermeasures, and once an endemic emerges and risks approaching a pandemic or already has reached that point, vaccinations should be prioritized over lockdowns given the high efficacy and safety with low cost of the former in contrast to the questionable efficacy if at all and high cost of the latter. The ethical priority of prevention and vaccinations is most pronounced for lower-income and developing nations (including the ethical duty of richer nations to lend support for the above) who disproportionately bear the burden of pandemics.

Conclusion

Despite the devastating clinical and financial cost of COVID-19, the pandemic has catalyzed the historic scientific and ethical success of faster, cheaper, and safer countermeasures including prominent use of AI-driven prevention, platform trials, and aggressively funded and approved mRNA-based vaccines, in addition to the growing global consensus on the duty to

share the above resources particularly for the benefit of the neediest people in many nations. This chapter has sought to summarize both the scientific aspects of the above countermeasures and how to analyze them ethically, through the PSC, in an accessible manner for broad audiences from diverse belief systems and disciplines. As we begin to see the end of COVID-19, may we dare to hope that it is the dawn of a new scientific and ethical era united as one global human family, to face future shared threats together for the benefit of each person.

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CHAPTER TWO

WHY IS THE COVID-19 PANDEMIC UNPRECEDENTED?

JOSEPH THAM

Abstract

One of the most often mentioned words to describe the COVID-19 pandemic is "unprecedented." Why is it so different this time? This paper will examine the changes in our perception that make this pandemic indeed unprecedented. Globalization and the accessibility of communication and social media make the situation much more pressing. The number game gives us a false sense of control. There is a misconception about medicine due to the increased availability and effectiveness of technology, but scientific knowledge is not as definitive as the media portrays. All these perceptions, expectations, and inexact science mixed with political and economic implications have generated anxieties. The paper will offer some reflection regarding our post-COVID-19 future.

Introduction

The most common word used to describe the COVID-19 pandemic is 'unprecedented', when it first appeared. However, compared to the mortality rates of all the epidemics recorded in human history, we discover that the COVID-19 pandemic barely makes it to the top 10 at the time of this writing. Therefore, in what way is the COVID-19 disease unprecedented? Compared to past pandemics, what has changed with COVID-19? The following reasons make COVID-19 "unprecedented":

i) Globalization – Due to rapid developments in communication that contracted both time and space, our world has shrunk. Events that occur elsewhere have become instantaneous and near resulting in

fear and the impact of the epidemic in a faraway place seems to be just around the corner.

ii) Media and social networks – News of a critical disease outbreak in a distant land are delivered almost immediately, triggering a sense of insecurity and panic and generating a tense atmosphere. Compounding this is the proliferation of fake news that one can appropriately refer to as an "infodemic."

iii) Relationship with health and medicine –Advances in medicine have given the impression that all ills can be cured. Death due to ailments has become unacceptable. Threats to human wellbeing have topped the priority of every governmental agenda.

iv) National budgets and expectations – The presumed panacea of medicine and hope for humanity has become an illusion because expectations cannot be met in the face of unexpected outcomes of the pandemic

We will examine some of these factors in detail below.

Our Relationship with Technology

Particularly in the last 100 years, medicine has made great leaps of progress, forging a new relationship with medicine and technology. With the advancement of medical science, human life expectancy has doubled or tripled compared to past centuries. Whereas a 100 years ago, human life expectancy was around 40 years old, the current average life expectancy is 85, which can be attributed to drastic improvements in living standards and healthcare. Indeed, countries are spending a significant portion of their national budgets on healthcare.

With COVID-19, many people, for the first time, are faced with many uncertainties because Hollywood and TV series offer the false notion that medical information and remedies are quick and straightforward. However, people are unaware that medicine is an inexact science. For example, several public debates questioned the effectiveness of masks to prevent spread of COVID-19, and whether social distancing should be one, two, or three meters apart. Scientists could not agree because of the lack of relevant research. A single fact like use of masks might require different studies and trials, followed by scientific debates, counter experiments and contradictory