Drawing Insights from the COVID-19 Pandemic: A Candid Examination to Bolster Preparedness for Future Outbreaks

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ABSTRACT: The COVID-19 pandemic presented an array of challenges, characterized by its unpredictability and rapidly changing nature. While often referred to as an "unprecedented" crisis, it is important to recognize the shared traits it possesses with previous pandemics. To fortify society against future outbreaks, continued investment in pandemic preparedness is essential. This paper aims to extract valuable insights from four crucial sectors within Canada's healthcare system during the COVID-19 pandemic. The identified areas of focus include: 1) Addressing the "disinfodemic" by effectively countering the dissemination of misinformation; 2) Promoting justice in resource allocation to ensure fairness and equity; 3) Strengthening healthcare infrastructure to meet the demands of resource-intensive crises like COVID-19; and 4) Mitigating the long-term impact of stringent pandemic-related restrictions. Through an honest reflection on these key sectors, this paper sheds light on crucial lessons learned and paves the way for robust preparedness strategies for future outbreaks.

KEYWORDS: COVID-19, pandemic-preparedness, health policy, misinformation

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Background

If there is one word that would describe the COVID-19 pandemic, it is "unprecedented." Whether through a television commercial, political leaders' speeches, or even Instagram, this word was ubiquitous. In fact, when hearing it now, one can become almost sick of it. It really isn't anything personal though. The common annoyance with "unprecedented" partially stems from its overuse, but it also signifies a scary time for everyone. The Oxford Dictionary defines unprecedented as an adjective that describes something "that has never happened, been done before, or been known before."[1] However, it can be contested that while the COVID-19 pandemic was a distinct and unique era, it was not entirely "unprecedented." While this contention may contradict the opening statement, the word "unprecedented" is instead emblematic of the COVID-19 pandemic as a current public health crisis with many commonalities of previous pandemics. In fact, the viral culprit of the COVID-19 pandemic is "SARS-CoV-2", which stands for severe acute respiratory syndrome coronavirus-2.[2] It should be noted that that the "-2" suffix implies that this is the second viral derivative that the healthcare system has managed. Indeed, its parent virus is referred to as SARS-CoV-1, which was responsible for the 2003 SARS outbreak not too long ago and holds 70% genetic similarity to the latter SARS-CoV-2.[3] According to the World Health Organization, roughly 8,000 people worldwide were infected during the 2003 SARS outbreak, of which 774 died.[4] While this is not nearly on the same scale as the COVID-19 pandemic, where 764,474,387 people have been infected, and 6,915,286 people have died to date, it is an overstretch to label the COVID-19 pandemic, as unprecedented as this ignores the other pandemics that humanity has faced.[5]

Nevertheless, there is no intention to be too critical of a simple word choice made by the media. In all fairness, the COVID-19 pandemic was undoubtedly an unprecedented time in many lives worldwide. However, this form of "tough love" calls for proactivity in the forms of research and innovation so that society is adequately prepared for the next pandemic instead of being blindsided by it.

The seminal idea for the topic of this paper stemmed from an article published in the Toronto Star entitled "We know that there will be another pandemic. Here's what four leading Canadian Scientists are doing about it."[6] Here, the idea of "unprecedented" is refused, which is inspiring. These determined Canadians should be applauded for their dedication, persevering to revamp and improve the current health system despite the apparent lack of urgency and interest surrounding the area of pandemic management, albeit not entirely out of the COVID-19 woods. Dr. Allison McGeer, an infectious disease professor of laboratory medicine and pathobiology from the University of Toronto's Dalla Lana School of Public Health, cautions that "There will be another pandemic. Like death and taxes, it's an absolute certainty … It could happen any time between tomorrow and 30 years from now."[7] Inspired, this paper is put forth to not only reflect on this "unprecedented" time, but also to identify pain points and propose solutions to four key sectors of Canada's healthcare system to ensure that it is equipped with the knowledge and resources to extinguish the virulent spread of the next pandemic at its infancy. Specifically, the four areas that will be discussed in this paper are:

1. Managing the concurrent "disinfodemic" – the uncontrolled distribution of misinformation during the pandemic
2. Promoting justice – both its structural and social derivatives – to ensure that scarce resource allocation strategies are fair and equitable.
3. Bolstering healthcare infrastructure to be able to meet the resource-intensive demands of the COVID-19 pandemic.
4. Minimizing the impact of the long-term ramifications of stringent pandemic-related restrictions

1. Navigating the Concurrent "Disinfodemic": Mitigating Uncontrolled Misinformation Propagation Amidst the Pandemic Crisis

Another Canadian researcher that was interviewed for the Toronto Star article is a familiar face at McMaster University, Dr. Gerry Wright. Dr. Wright is a trailblazer in pandemic prevention and

response research and innovation, heading the Global Nexus for Pandemics and Biological Threats.[8] Also based out of McMaster University, this interdisciplinary research initiative brings together scholars from all walks of academia, including but not limited to scientists and medical researchers, experts in economics, political and social sciences, public policy and health officials, Indigenous leaders, and industry partners.[9] A holistic approach to research and collaboration that spans a diverse array of disciplines is advantageous for not only curbing the spread of infection, but also is the antidote that combats the spread of misinformation. Dr. Wright says, "the thing that terrifies me is that a person with an iPhone can think they're an expert … That people think their opinions matter just as much as those of people who've dedicated their lives to understanding science – and that this is now almost a widely accepted concept – is going to result in a super-dangerous future."[10]

Misinformation during the pandemic took many forms. The most salient occurrences involved high-profile politicians and influential political dissenters. For example, former President Donald Trump frequently undermined the advice of science experts, proclaiming that the anti-malaria drug hydroxychloroquine was the "silver bullet" to the treatment of illness caused by COVID-19. From March 1 to April 30, 2020, Donald Trump posted 11 times on Twitter and made 65 White House briefings that accentuated the unproven benefits of such therapies, which directly contradicted the evidence-based efforts of developing and distributing the imminent COVID-19 vaccine.[11] Trump's social media presence and voice alone elicited an amplification cascade across media outlets, garnering 300% more impression reach than his usual tweets and more than 2% of airtime of conservative networks.[12] In turn, purchases of hydroxychloroquine and its analogs surged on Amazon by over 200%.[13] Another study showed a grim and strong correlation between the degree of approval of Donald Trump and the case fatality rate associated with the COVID-19 pandemic.[14] While these statistics are shocking, blame mustn't be placed on the public. The masses were bracing for the unknown, doing everything within their control to prepare for the harsh waves of COVID-19. Instead, this highlights the pitfalls of combining politics with science, a critical lesson that can be taken

away from this period. The sway of public opinion during a vulnerable time by powerful influencers via unregulated social media streams had adverse and profound effects, stressing the importance of evidence-based discussion. Wright's concerns are clearly justified.

In his Toronto Star interview, Wright admits that he "understands molecules. I don't understand people."[15] In an effort to do so, the Global Nexus for Pandemics and Biological Threats strips down departmental silos to allow for the spread of accurate, evidence-based information between experts from diverse fields of study. More specifically, "this new school tries to marry both the social sciences and humanities with biomedical and clinical research. Because, to me, that was the biggest gap of the last three years."[16] It is surprising that one of the most significant pain points of the COVID-19 pandemic had really nothing to do with the virus itself, but its hosts (the people). The COVID-19 pandemic not only separated us physically but also divided and pitted us against each other and the government, which further compounded the frustrations and struggles of the pandemic.

Furthermore, not only did misinformation promote unproven therapies, but it also stirred mistrust regarding the COVID-19 vaccine. Most hospitals in Ontario were intolerant of vaccine hesitancy of its healthcare workers, enforcing strict vaccine mandates. These policies aimed to prioritize the safety of the patients as well as the healthcare workers in the hospital setting where outbreaks were frequent and had the potential to wreak havoc. However, this policy also disenfranchised healthcare workers who were genuinely concerned about the COVID-19 vaccine, which could have stemmed from misinformation or other factors.[17] Consequently, many crucial frontline healthcare workers took indefinite leaves of absence from their job, which was especially unideal during the pandemic where human resources were limited. However, Sunnybrook Hospital took an alternative approach to overcoming vaccine hesitancy, which resembles the model developed and promoted by Wright and his team at McMaster University.[18] Through "friendly persuasion," internist Dr. Adina Weinerman debunked misinformation regarding the COVID-19 vaccine. She translated jargon-heavy evidence-based research into health literacy that was

understandable to all healthcare workers at Sunnybrook. As part of her initiative, Dr. Weinerman trained roughly 100 "vaccine champions" to have one-on-one conversations and group huddles with people who could ask questions about the vaccine in a safe and confidential environment.[19] This approach is practical as it does not marginalize and outcast those who are vaccine-hesitant, stripping them of their jobs and livelihood during a stressful time, but instead empowers them with the necessary information required to make an informed decision. Through the deployment of these sessions, Sunnybrook reported that over a thousand of its employees engaged in the program, and that their percentage of vaccinated healthcare workers soared to 95%.[20] From doubtful to decisive, Weinerman and her team created a positive impact that not only allowed Sunnybrook's employees to make decisions about their health on their own accord, but also maintained its workforce on the frontline to ensure that the quality of care delivered to its patients was not compromised.

2. Fostering Justice for Equitable Allocation: Addressing Structural and Social Dimensions in Scarce Resource Distribution

Moreover, spreading and consolidating misinformation is not the only factor of COVID-19 vaccine apprehension. In a US survey-based study by Fisher et al., the investigators showed that out of 991 adult respondents who were asked, "When a vaccine for the coronavirus becomes available, will you get vaccinated?", 10.8% reported "no," while 31.6% reported "not sure."[21] In this same study, it was revealed that there were statistically significant differences in the attitudes towards the COVID-19 vaccine between Black and White participants, and that 32.5% of participants refused the vaccine due to a lack of trust of vaccines, governments, pharmaceutical companies, and vaccine development or testing processes.[22] Vaccine hesitancy is a complex issue stratified by social determinants of health, another compelling reason for Wright's interdisciplinary-based solution. Implicit biases are seeded throughout healthcare, and it is vital to weed out systemic racism to ensure that healthcare is

universally accessible and equitable. Another survey-based study by Thompson et al. showed similar results except on a much larger scale, surveying 1835 adults in Michigan.[23] This study took place in a latter phase of the COVID-19 pandemic, indicating that a greater proportion of people are more unwilling to be inoculated by the COVID-19 vaccine (945 participants; 52%).[24] Black participants reported the highest medical mistrust score with a statistically significant result.[25] Empirical evidence suggests that the COVID-19 pandemic disproportionately affected racialized individuals with respiratory comorbidities associated with structural injustices in the healthcare system.[26] Mistrust is only one factor involved in the interplay of racial health disparities observed during the COVID-19 pandemic. Several community partnership-based solutions to this complex healthcare issue include large-scale grassroots initiatives that foster meaningful relationships between healthcare institutions and community-based organizations to form trust.[27] Another approach that has been documented as effective involves allocating funding to community-based organizations to 1) support the career development of people of colour in healthcare and 2) to promote transparency of governmental contracts involving vaccine procurement and distribution by mandating contracts with Black-owned businesses.[28] Through these meaningful actions, the understanding gap between science and people can be filled, which marries utilitarianism with social justice to maximize the benefit of the COVID-19 vaccine for all, irrespective of their racial and ethnic backgrounds.

The marginalization and disenfranchisement of racialized groups stemming from vaccine hesitancy due to historical mistrust in healthcare is not the only injustice that took place during the pandemic. The next topic to be discussed is triaging strategies during the COVID-19 pandemic. Previously, utilitarianism was mentioned, which is an ethical theory that suggests that the most ethical action elicits the greatest benefit for the greatest number of people.[29] During periods of scarcity, like the COVID-19 pandemic, this approach is often embraced as the *modus operandi* to ensure that the maximal number of lives or life-years are saved. On the surface, this approach seems morally reasonable. However, public health directives achieve

this by de-emphasizing the quality of care at the patient level. Instead, they factor in population-based factors, including the probability of survival, the duration of treatment, and the estimated number of resources consumed by the patient during their hospital stay.[30] As a result, younger patients with a better prognosis are typically prioritized due to their more favourable prospect of survival and shorter hospital stay, resulting in fewer healthcare resources consumed and a more efficient patient throughput. This notion was transcribed into the backbone of Ontario's critical care triage protocol for major surges during the COVID-19 pandemic.[31]

According to the Canadian Medical Association, triage is the "process for determining which patients receive which treatment and/or which level of care, and under what circumstances, when resources are scarce."[32] To "save the most lives in the most ethical manner possible," triage systems at hospitals in Ontario were informed to place cancer patients and elderly patients over 65 years old with progressive diseases requiring day-to-day assistance at the back of the queue.[33] Putting this into perspective, nearly 1.4 million Canadians are at least 70 years old and live alone with a disability.[34] To make matters worse, 20% of Canadians fall victim to the "digital divide," meaning they do not have access to the Internet, and 50% of Canadians with a disability require daily assistance with living tasks.[35] The Public Health Agency of Canada recognizes the systemic barriers to healthcare that these individuals face regularly and are now exacerbated by the COVID-19 pandemic restrictions.[36] As a result, these disadvantaged groups were labeled as "vulnerable" in an effort to call for further action by the healthcare system to ensure that no one falls through the cracks during this difficult time.[37]

In contrast, Ontario's critical care triage protocol blatantly neglects these groups, employing ageism and ableism over advocacy and equity. While this may be water under the bridge now, this injustice should stand as a stark reminder for the next pandemic to implement policies that do not exclude anyone from their fundamental civic and human right to healthcare. The civil rights office of the US Department of Health and Human Services issued a statement that effectively consolidates this lesson, stating that "persons with disabilities … should not be put at the end of the line

for health services during emergencies. Our civil rights laws protect the equal dignity of every human life from ruthless utilitarianism."[38] No matter how scarce resources may be, lives from disadvantaged groups should not be traded off for other lives that have potentially a greater chance at survival, thereby reinforcing the lesson learned for the next pandemic that justice should be promoted to ensure that scarce resource allocation and rationing strategies are fair and equitable.

3. Strengthening Healthcare Infrastructure to Address the Resource-Intensive Challenges of the COVID-19 Pandemic

Moreover, triage as a topic of discussion transitions into the third lesson learned from the COVID-19 pandemic, which is that the current healthcare system needs to be bolstered to ensure that it is equipped to handle the resource-intensive demands of the pandemic. At the outset of the COVID-19 pandemic, supplies of personal protective equipment (PPE) quickly diminished, resulting in a nationwide shortage of arguably the most important healthcare resource that mutually protects the patient and the healthcare provider from COVID-19.[39] For the next pandemic, it is paramount that healthcare systems ensure that they have adequate supplies and manufacturing capabilities in place to mitigate the risk of this shortage reoccurring. In the face of uncertainty, other industries and groups stepped up, which aligned with the Global Nexus for Pandemics and Biological Threats initiative's vision and was quite inspiring to observe.[40] For example, the London-Middlesex Primary Care Alliance swiftly responded to imminent shortages of PPE for the primary care physicians in their jurisdiction.[41] A group of volunteers, physicians, and medical students formed a multidisciplinary collaboration where they mobilized efforts to acquire and redistribute community donated-PPE in the London-Middlesex region. In their four-week operation, the group procured and re-distributed over 118,000 gloves, 13,700 masks, 700 wellness kits and reusable cloth masks and gowns.[42] During a time of physical isolation, this grassroots initiative displayed unity for a common cause, resulting in

a meaningful difference that directly benefited their community's primary care physicians.

Furthermore, multidisciplinary teams coalesced to develop and fabricate alternative solutions that could act as safe and suitable substitutes to conventional gold-standard PPE. Several groups around the world simultaneously developed their iterations of a retrofitted full-faced snorkel mask that had dual purpose: 1) to allow for adequate and safe respiration via repurposed medical grade anesthesia filters, and 2) to protect all facial mucous membranes that were potential entry points for the virus, including the mouth, nose, and eyes.[43] Within the McMaster community, the faculty of Integrated Biomedical Engineering Program provided tremendous support to student-led initiatives, offering their facilities for 3D printing. In collaboration with Dr. Michelle MacDonald, Hamilton Health Sciences, and Liburdi Engineering, an engineering firm located nearby in Dundas, Ontario, my brother Matthew and I developed a similar 3D printable mask.[44] Collectively, we mass-printed and distributed over 100 do-it-yourself respirators to North American hospitals and ICUs. We were awarded a COVID-19 Community Response Award from the Government of Ontario for our work. To support Ontario-born initiatives like this, Ontario Health launched the "Ontario Together Fund", which we applied for to request funding and facilities that would allow us to run appropriate and rigorous testing of our functional prototype.[45] The collaboration of many different organizations and industry leaders to produce effective solutions was the "silver lining" of the PPE shortage at the outset of the pandemic. It demonstrated society's ability to be resilient and collaborate in the face of hardship, social distancing, and health resource scarcity. Nevertheless, healthcare planners need to ensure that they do not encounter another issue like this, potentially forcing suboptimal solutions that could put patients and their care providers in harm's way.

Moving on, the COVID-19 pandemic weighed heavily on the healthcare system, which calls for a solution that bolsters it to be more resilient and adaptable in future pandemics where there will also be similar surge capacity scenarios. Dr. Srinivas Murthy, another Canadian research leader that was interviewed in by the Toronto Star,

focuses his research on this area of emergency preparedness. He admits that "we thought we had a health system that would be ready for an emergency … we were unable to adapt. We need to figure out why our system doesn't have the resiliency it needs."[46] A modelling study published in the Canadian Medical Association Journal demonstrates that Ontario hospitals that were responsive and implemented early infection control methods did not deplete their hospital inventory of health resources.[47] However, hospitals that experienced a delay in implementing changes such as physical distancing were projected to deplete their inventories within 14-26 days, resulting in the avoidable and devastating loss of 13,321 patient lives.[48] The investigators advise that these adverse outcomes can be circumvented with aggressive measures that aim to increase the number of ICU beds, ventilators, and acute care hospital capacities.[49] Another simple yet effective solution is an Excel-based tool proposed by Krylova et al., which uses a S(usceptible)-E(xposed)-I(nfected)-R(emoved) model coupled with vaccination status to simulate and forecast the case count of COVID-19 in the community, and the resulting demand for hospitalizations, intensive care unit beds, ventilators, health care workers, and personal protective equipment.[50] One of the advantages of this tool is its versatility and customizability due to its over 40 parameters that can be adjusted to the specific needs and nuances of the community as well as the timeline of the pandemic.[51] With pandemic planning tools like this one, hospitals can be proactive and ensure that they have adequate supplies and resources to manage foreseeable outbreaks of COVID-19 or the next pandemic, which has the potential to save many lives. The goals of these solutions align with Dr. Murthy's research interests and goals, which are to create a centralized national platform that shares data about hospitalizations with severe acute respiratory infections between hospitals.[52] Currently, this data is either missing or its reach and validity is limited by jurisdictional siloes, and so it is impossible to take a collaborative and data-driven approach to decision-making during these stressful times.[53] He also wants to initiate and conduct rapid clinical trials around pandemic preparedness to improve routine hospital care.[54] This "trial and error" approach during a non-pandemic time will enable hospitals to quickly and proactively

optimize their routine to surge scenarios to ultimately bolster their resiliency. Overall, the lesson to take away from the health crises involving PPE and hospital surge capacity and other finite resources is that Canada must strengthen the infrastructure of the current healthcare system so that it can withstand the resource-intensive demands of the next pandemic.

4. Mitigating Long-Term Ramifications: Strategies for Minimizing the Impact of Stringent Pandemic-Related Restrictions

The final lesson learned from the COVID-19 pandemic is to consider the long-term ramifications of stringent pandemic restrictions to minimize their collateral impact. The two areas that will be discussed in this context are social distancing and quarantine, as well as the cancellation of surgeries. To start, it is essential to acknowledge that the COVID-19 pandemic, especially its social isolation, took a severe toll on the mental health of all. The lockdown halted all aspects of life, such as outdoor social movement and in-person socializing events, restraining people to the bounds of their home properties. Coupled with job insecurity and economic turmoil, loneliness, depression, and anxiety ensued, warranting the "looming mental health pandemic in the time of COVID-19."[55] A study by Pretorius et al. found that in a total of 337 young adults in South Africa, 73.3% reported symptoms of anxiety in the clinically significant range, and 71.8% reported severe loneliness during the pandemic.[56] This works also suggests a causal relationship between the pandemic restrictions and these adverse symptoms, finding that these elevated levels of loneliness, anxiety, and reduced life satisfaction are statistically significant compared to pre-pandemic times from similar groups.[57] Even more saddening is the findings by Goto et al., which show a major spike in youth suicides during the pandemic compared to pre-pandemic levels.[58] The investigators suggest that this was due to disruptions in social life and underlying mental health issues exacerbated by the stressors from the pandemic.[59] While these restrictions played an essential role in curbing the spread of COVID-19 and subsequent hospitalizations to

prevent hospitals from being overrun (another reason to bolster hospital infrastructure would be to lessen the severity of pandemic restrictions), it is evident that a major toll was taken on youth's mental health. This necessitates a balanced solution for the next pandemic that weighs both physical and mental health. Anecdotally, my virtual volunteer experience with Hamilton youth revealed the pitfalls of the abrupt transition to virtual learning. Specifically, technology is not universally accessible; the "digital divide" further isolates at-risk youth.[60] Some children could not call into the program because their household had only one computer that was being used. Therefore, policymakers must be cognizant of how the pandemic restrictions may disproportionately disadvantage marginalized groups.

Furthermore, not only did pandemic restrictions halt all aspects of society, like in-person social interactions, but it also cancelled essential healthcare services like surgery. On March 15, 2020, Ontario's Ministry of Health ordered all hospitals in Ontario to "ramp down elective surgery and all other nonemergent clinical activity." This directive was mandated to ration scarce healthcare resources to be diverted to the frontline and to minimize exposure of frontline healthcare workers to COVID-19. I personally witnessed the repercussions of this policy during my co-op work term with the Surgical Oncology Program at Cancer Care Ontario. Attending weekly meetings with Ontario's Regional Cancer Leads, I became aware of the challenges of COVID-19 in each jurisdiction. While there were benefits to ramping down surgeries where the COVID-19 case count was high, surgeries were being cancelled at hospitals, such as in Northern Ontario, where cases were low. Thus, this policy was argued to be overkill. Surgeons expressed concerns over the province-wide cancellation of surgeries, prolonging surgical intervention and increasing the surgical backlog. Inspired by their leadership and advocacy, I put forth my best effort towards learning about the role that public health organizations play and being a part of their mandate. Working with colleagues, we addressed the enormity of the incremental surgical backlog caused by the COVID-19 pandemic. Our efforts resulted in a well-publicized article in the Canadian Medical Association Journal that modelled the enormity of surgical backlogs and the projected timing required to clear the

backlogs, providing rigorous modelling techniques.[61] The results forecasted that the estimated backlog in Ontario was 148,364 surgeries between March 15 and June 13, 2020, with an average weekly increase of 11,413 surgeries.[62] In addition, it was estimated that it would take 84 weeks to clear this backlog, which would incur 719 operating hours, 295 ward beds, and nine intensive care unit beds each week.[63] In another study, the researchers estimated that clearing Canada's surgical backlog would cost additional 1.3 billion dollars per year.[64] Clearly, the ripple effects of this ramp-down are substantial and should have been considered earlier.

However, it is unfair to criticize the cancellation of surgical procedures during this time, considering healthcare planners had no idea what the future of COVID-19 had in store for us. This paper suggests that this be a lesson learned for the healthcare system when it faces this dilemma in future pandemics. Ontario Health eventually resumed surgeries at hospitals in a monitored, careful "phased approach." Still, this rollout plan was slow, and the effects of this vast cancellation on the healthcare system and patients are just beginning to be realized.[65] In another study published in the CMAJ, it was revealed that the pandemic-related ramp-down of surgeries is expected to decrease the long-term survival for many patients with cancer.[66] Overall, while it is important to prioritize public health during the pandemic, pre-existing health issues like mental health and cancer do not resolve during this time. The stringent pandemic restrictions inflicted collateral damage that is now becoming evident. So, a lesson must be learned from this to ensure that a measured and quality-based approach is taken to ensure that everyone's safety, health and well-being is prioritized.

Conclusion

In this paper, four lessons are discussed regarding the COVID-19 pandemic, aiming to improve the healthcare system to ensure that the next pandemic is not an "unprecedented" crisis. The first lesson is inspired by Dr. Gerry Wright: it is equally as important to combat the concurrent "disinfodemic," which can have adverse outcomes on public health and create division during a vulnerable

period. The second lesson to take away is that no matter the difficulty of the situation, particularly regarding resource scarcity, morality should not be sacrificed, and instead justice and equity should be upheld so that health disparities for vulnerable groups are not exacerbated during the pandemic. The third lesson to implement for the next pandemic is that the current health system must improve its infrastructure to be more resilient and adaptable to the volatile resource-intensive demands of the pandemic to ultimately be more prepared to save more lives. Finally, when mandating pandemic restrictions to curb its spread, it is essential to consider the long-term repercussions of such a policy, which organically motivates planning to minimize the collateral damage of the pandemic, such as increased mental health illness, financial and resource burden on the healthcare system, and the reduced long-term survival of cancer patients. While acknowledging a certain degree of hypercriticism towards the decisions and outcomes of the COVID-19 pandemic, the intention behind it is to express "tough love" and ensure preparedness for managing future pandemics. Beginning to see the light at the end of the tunnel, it is worth acknowledging humanity's ability to unite, collaborate, endure, and support one another during this challenging time. The hope is that the lessons learned from the COVID-19 pandemic will lead to positive changes for the future of society.

Notes

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