



Critique of British Medical Journal Articles on Canada's Response to the COVID-19 Pandemic

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Summary

Many Canadians have called for inquiries and commissions to evaluate the Government of Canada's response to the COVID-19 pandemic. On the 25th of July 2023, the British Medical Journal (BMJ) published an on-line series of articles on health inequities within Canada which were considered by various commissioned authors to have been exacerbated by the COVID-19 pandemic.¹

The series consists of three short essays (two editorials and one opinion piece) and four more detailed analyses. According to the BMJ introduction, the topics covered included, *“data sharing and access, research use and misuse, jurisdictional coordination, vaccine deployment including vaccine equity, and the impact of the pandemic on those in long-term care homes and other vulnerable groups.”*

The lead author for the series noted that its contributors are, *“experts across clinical and research areas including humanitarianism, Indigenous peoples' health and rights, law, medicine, nursing, patient advocacy, policy, and public health, and they represent 13 institutions across Canada.”* However, most of them have received funding from federal and provincial government agencies with at least one admitting to being an advisor to the Bill and Melinda Gates Foundation. Accordingly, the authors cannot be considered as disinterested investigators having no vested interests in the acceptance of their recommendations. Surprisingly, the biased nature of their reporting did not preclude the authors from recognizing the importance of independent experts holding public health decisions to account.

It is suspected that had such experts been consulted, the questionable assumptions made by the authors to advance their arguments would have been revealed. The series of articles is predicated on them believing that, population testing, school closures, border controls, prohibition of gatherings, masking requirements, quarantining the healthy and mandatory mass vaccination programs were how COVID-19 should be controlled. The authors appear to have fully embraced and supported these preventive measures, although they admitted to concerns surrounding the legitimacy of test results and the lack of uniformity regarding the definitions of COVID-19 cases and deaths.

Any discussion on the pandemic must be prepared to challenge the scientific, ethical, and moral foundations of the COVID-19 policies and procedures adopted by various federal and provincial agencies. Rather than accept this task, the BMJ articles use the COVID-19 pandemic as an excuse to adversely criticize how official policies were enacted.

¹ (2023) Accountability for Canada's COVID-19 response. Retrieved from <https://www.bmj.com/canada-covid-series>

It is contended that if all references to the pandemic were removed from the articles, they would remain as reasonable judgments on the inadequacies of Canadian health care in general. However, it is questionable if without the rubric of the pandemic, the articles would ever have been published especially in a British journal.

The BMJ articles recited many of the well-known faults of health care in Canada, they add very little to understanding why Canada adopted COVID-19 policies of questionable utility. As such, their main purpose appears to be one of advancing the opinions and prejudices of the contributing authors.

In this critique, one of the MD, PhD scientists on the Canadian Citizens Care Alliance (CCCA) Scientific and Medical Advisory Committee (SMAC), who has undertaken the lion's share of the review of the BMJ articles in this series has chosen to remain anonymous due to concerns relating to possible workplace repercussions. This was further reviewed by the CCCA SMAC with additional edits and commentary. Each article is judged separately and considered in the order of its appearance in the BMJ series.

In the BMJ editorial by four editors of the journal, there was a call “for an independent national inquiry.”² The concerns raised in the review of these articles are important considerations in any formal inquiry into the Government of Canada’s handling of the COVID-19 pandemic. We must learn from the lessons from the COVID-19 pandemic to ensure that we are better prepared for effective and ethical responses to future crises that require extraordinary measures.

Critiques

1. How Canada’s Decentralised COVID-19 Response Affected Public Health Data and Decision Making

This BMJ article was introduced as “*Tania Bubela and colleagues introduce the analyses of Canada’s covid-19 response, which failed to learn from the 2003 SARS epidemic, leading to unclear and fragmented responsibilities and accountability for data access and decision making.*”³ The overall message of this article advocated the need for homogeneously applied measures across provinces and territories in Canada in response to a public health crisis but failed to critically analyse the nature

² Clark, J., Straus, S.E., Houston, A., Abbasi, K. (2023) The world expected more of Canada. *BMJ*. 382:1634. doi: 10.1136/bmj.p1634

³ Bubela, T., Flood, C.M., McGrail, K., Straus, S.E., Mishra, S. (2023) How Canada's decentralised COVID-19 response affected public health data and decision making. *BMJ*. 382:e075665. doi: 10.1136/bmj-2023-075665. Retrieved from <https://www.bmj.com/content/382/bmj-2023-075665>

of the measures taken during the COVID-19 crisis; hence they implicitly accepted the measures as being appropriate and adequate.

The authors underlined the downside of decentralised public health agencies at different government levels (*i.e.*, provincial, regional, municipal) during the COVID-19 crisis, with the consequent differences in guidelines' implementations, not only across jurisdictions, but also across professional domains (*i.e.*, school boards, universities, hospitals, etc.).

The authors claimed the need to share data across all provinces and territories, ideally using a shared/common way to collect the data in question, so unified recommendations can be easily implemented across Canada. This would imply a more central role of a given single agency (viewed as the necessary coordinator for a more effective deployment of measures), which seems to implicitly fall under federal authority (*i.e.*, the Public Health Agency of Canada (PHAC)).

Even when the authors criticized basic definitions (for example how differently COVID-19 cases, tests and reports were performed in different countries) they use the data provided by these inaccurate definitions to draw conclusions. They claimed that in terms of number of COVID-19 deaths *"Canada fared worse than Australia and better than the US"* and that *"differences may derive from social norms that reflect compliance with public health measures."* Moreover, the authors argued that *"Globally, countries with stricter norms and punishments for deviating from those norms, experienced fewer cases and deaths."* This last claim was supported by two references cited in their article as references #10⁴ and #11,⁵ which compared Canada and Australia performance and which redundantly cited article #10. In reference #11, the claim was made that *"more virulent mutations are on the scene"*, which was contrary to the actual progression of dominating variants of SARS-CoV-2 to less virulent, albeit more infectious forms as the COVID-19 pandemic progressed. Interestingly, reference #10 study only analyzed data until October 2020, or very early in the crisis. Also, this study was based on the highly manipulated application of *"a series of stepwise models to capture whether cultural tightness-looseness explained variation in case and death rates controlling for under-reporting, demographics, geopolitical factors, other cultural dimensions, and climate."* Such models are highly compromised when the underlying assumptions are dubious, such as for example that countries with lower rates of testing relative to the number of documented cases of COVID-19 underreported their COVID-19 cases. The assumption in this case was that asymptomatic cases of COVID-19 were less likely to be captured if primarily sick people were tested. Before

⁴ Gelfand, M.J., Jackson, J.C., Pan, X., Nau, D., Pieper, D., *et al.* (2021) The relationship between cultural tightness-looseness and COVID-19 cases and deaths: a global analysis. *Lancet Planet Health*. 5(3):e135-e144. doi:10.1016/S2542-5196(20)30301-6

⁵ Lewis S. (2021) What Canada can learn from Australia's COVID response. *Policy Options*. Retrieved from <https://policyoptions.irpp.org/magazines/february-2021/what-canada-can-learn-from-australias-covid-response/>

October 2020, rapid antigen tests for SARS-CoV-2 were not commonly available and applied for screening, and if someone is asymptomatic, it would be inappropriate to consider them as a COVID-19 cases as they are not diseased.

If the authors of the Bubela *et al.* (2023) article were genuinely interested in understanding what went wrong with the Canadian response to COVID-19, they should have referenced studies that included data until the end of the crisis (at least until May 2022), instead of claiming that tighter rules produce lower number of COVID-19 deaths using results obtained until October 2020 through modeling. This was when even they themselves accepted that the definitions of COVID-19 deaths were not uniform, hence not comparable.

Bubela *et al.* (2023) also claimed that “Cases and excess death rates over the pandemic varied widely across Canada’s 13 provinces and territories, which are diverse in terms of geography, population density, ethnic diversity, and size, as well as the timing and sequencing of protective measures taken throughout successive waves,” and they presented a figure (Fig. 1) showing the relationship between the stringency index for public health measures and the number of hospitalized patients with COVID-19. However, they did not point out that according to Fig. 1, stricter measures do not seem to clearly correlate with lower hospitalizations (which contradicts their claim regarding the efficacy of stricter rules supported by reference #10), nor that the definition of “hospitalized patient with Covid” was a collection of people experiencing a respiratory infection with a positive PCR test (and who were not subjected to other potential differential diagnosis or diagnosis of co-infection with other respiratory pathogens) and incidental positive PCR with other pathologies. This is especially problematic, since the false-positive rate for detection of SARS-CoV-2 by PCR tests at the thermal cycle numbers applied was typically 90%.⁶ Furthermore, at least 40% of patients that were admitted to hospitals in British Columbia or Ontario, were initially hospitalized for comorbidities and not COVID-19 at the time.^{7,8} Hence, the concept and precise number of hospitalized COVID-19 patients is very elusive.

The authors also presented some “Lessons from the pandemic”, as follows:

1- “decision makers at different jurisdictional levels lack coordination... leading to substantial variation in policy and practice across the country, widely varying hospital admission rates...” This

⁶ Bullard, J., Dust, K., Funk, D., Strong, J.E., Alexaner, D., *et al.*, (2020) Predicting infectious SARS-CoV-2 from diagnostic samples. Clin. Infect. Dis. Cjaa638. doi:10.1093/cid/cjaa638

⁷ Carrigg, D. (2022) Majority of new COVID-19 hospitalizations in B.C. among people admitted for other reasons. The Vancouver Sun. Retrieved from <https://vancouversun.com/news/local-news/majority-of-new-covid-19-hospitalizations-among-people-admitted-for-other-reasons>

⁸ (2022) Ontario’s COVID-19 hospitalizations rise to 1,730, most since mid-February. Canadian Broadcasting Corporation News. Retrieved from <https://www.cbc.ca/news/canada/toronto/covid-19-ontario-april-26-2022-hospitalizations-1.6431094>

implies that the authors of the article are more concerned about the coordination of the policies, but not necessarily their nature, which is what should be scrutinized first.

2- *“Some health professionals joined official advisory committees across the country. Others engaged in social media, sometimes becoming trusted voices that challenged public health leaders. The conflicting messaging undermined public trust over time.”* This is a very concerning claim, since it shows that the authors are advocating for a unique source of information, which should be public health and that health professionals who disagree or draw different conclusions by reanalyzing data, do not have an outlet to voice their findings and concerns. This position is at odds with the authors’ claim regarding data sharing and transparency in data analyses. The claim is supported by reference #43 in their article, which the lead author co-wrote as the second author in reference #43.⁹ This reference presents a concerning view of science communication to the public. The first author, Timothy Caulfield, a professor of Law at the University of Alberta, has very disturbing views about the communication of science and has instrumentally used the concepts of mis/disinformation in science. The citation of this reference questions the authentic will of the authors to an open-minded inquiry.

3- *“health professionals ..., called for improvements in the shortages of drugs and personal protective equipment, workplace conditions, harassment, and burnout that were affecting health workforces, long term care staffing and conditions, and for vaccination access and coverage.”* The authors failed to consider how contact isolation policies and positive PCR tests impacted the number of people out of the workforce, a large portion of which were completely asymptomatic (*i.e.*, healthy). They also fail to consider the consequences that health professionals who chose not to take the vaccines had to suffer (many of whom already had developed natural immunity, which was completely discounted). The loss of health professionals in many Canadian provinces by firing, layoffs, relocation, and early retirement placed a heavier burden on those that were left to attend to patients.

4- *“National Advisory Committee on Immunizations (NACI) made evidence-based recommendations on covid-19 vaccine eligibility but had no responsibility for implementation.”* The quality of NACI’s recommendations were low, as concluded by an extensive critical analysis done by the CCCA SMAC,¹⁰ and the authors did not see the need for a thorough critical analysis of those

⁹ Caulfield, T., Bubela, T., Kimmelman, J., Ravitsky, V. (2021) Let’s do better: public representations of COVID-19 science. *Facets* 6:-23. doi:10.1139/facets-2021-0018 Retrieved from <https://www.facetsjournal.com/doi/10.1139/facets-2021-0018#tab-contributors>

¹⁰ (2022) Why COVID-19 vaccine boosters are unnecessary and not recommended: A critique from the Scientific and Medical Advisory Committee of the Canadian Covid Care Alliance. Retrieved from https://www.canadiancovidcarealliance.org/wp-content/uploads/2022/12/22OC4_CCCA_Response_to_NACI_Guidelines-1.pdf

recommendations. They only remarked on the need for homogeneous application of the guidelines across jurisdictions, implying that NACI's recommendations were correct as they stood.

5- *“PHAC did not have regulations or finalized agreements with the provinces and territories to clearly outline what public health surveillance information to share and how to share it, including case level information on vaccine safety with Health Canada, vaccine developers, and the World Health Organization, delaying information sharing on vaccine safety.”* The authors failed to see that this is at odds with the early vaccine recommendations by PHAC to almost all the population, including very young healthy children and pregnant women with dubious supporting data.

6- *“Public health decisions across jurisdictions in Canada were hampered by outdated health information systems and lack of integration and interoperability between data sources after eight years and C\$130m of investment failed to establish a pan-Canadian technical solution for public health data.”* This seems to point to the authors' single concern regarding a more centralized organization to access all the health data in all provinces and territories.

The authors also presented *“Questions for a COVID-19 inquiry”*:

1- *“We call for a culture of data sharing that enables diverse use by a broader range of users. Public health in Canada will benefit from a common vision and harmonized approach to generation, use, and analysis of data to guide public health decision making and population health benefit.”* The authors claim that a broader range of users will lead to a more harmonized and common vision. However, they fail to explain how this will be operationalized, and they fail to consider that scientists expressing different (sometimes opposite) views during the COVID-19 crisis were simply ignored, when not vilified, defamed, or even fired from their jobs. This does not seem to advance a dialogue with scientists/users who may use the data and arrive at a different conclusion or interpretation. There is also the question of the greater availability of what would be personal information for patients. While this might benefit the population widely, this may be at the cost of individuals' privacy.

2- *“We need tailored public health responses to emergencies, which requires data that are fit for purpose and transparent collection and use in decision making...If cooperation does not occur spontaneously, the federal government needs to use its spending, convening, and other powers to spur action.”* This seems to stress the only concern of the authors for a centralized organization of data-sharing.

3- *“The federal government should compel certain data sharing for pandemic preparedness and response. This needs to be accompanied by improved access to public health data by independent experts who can hold public health decision making to account and by the public and community to improve local relevance and transparency to enhance public trust.”* This is an assertion in contradiction with reality, since there are already independent experts who have independently

analyzed available data, and who disagree with many aspects of the COVID-19 response, but they have not been heard or have been ignored following independent enquiries such as the National Citizen Inquiry into Canada's COVID-19 response.¹¹ So how does having easier access to the data increase the odds for these independent scientists to be heard?

4- *“The inquiry should consider the role of science advice in developing public health measures and replicable models that best included public engagement and political and public trust.”* This consideration of the authors seems to be pointing to better control of the public's response: how to make the public always follow a given guideline without losing trust. This does not touch on the nature of the proposed guidelines, which is in fact what should be critically analyzed and reconsidered. In fact, much of the Canadian Federal Government funding through its agencies has been devoted to improving its methods to convince public acceptance of its policies through psychological manipulations such as nudging techniques.¹²

5- *“Canada's data governance must be overhauled to ensure systematized sharing of data to support better and more coordinated decision making.”* This points to the authors' consideration that more centralized federal control would be beneficial. If there are flaws in the centralized approach, the response would be a nation-wide disaster.

Finally, the authors also present a Box with a series of *“Highs and Lows of COVID-19 response in Canada.”*

Highs:

- *“Canada became one of the most vaccinated countries with >83% of the population receiving at least one vaccine dose in February 2023.”* This point can easily be viewed as a low, considering that RNA platform vaccines were approved with a known Absolute Risk Reduction of around 1%, which was never communicated to the public (the public only received the Relative Risk Reduction numbers -95%- which clearly mislead the interpretation of efficacy) and a questionable profile of adverse events, also not told to the public. Such approval was given by Health Canada based on only two months of field-testing data in human clinical trials, such that there was no data with respect to longer term safety concerns.

This shows an *a priori* acceptance of vaccines as having a positive effect on transmission and the numbers of cases, hospitalizations, and deaths, when the vaccines were never tested for prevention of COVID-19, transmission, nor showed a significant reduction of hospitalization and deaths. They merely reduced the number of cases, which were defined as a symptom (*e.g.*, fever) + positive PCR

¹¹ (2024) Commissioners Final Report. National Citizen Inquiry. Retrieved from <https://nationalcitizensinquiry.ca/>

¹² (2023) You have been nudged. Canadian Covid Care Alliance. Retrieved from <https://www.canadiancovidcarealliance.org/all/youve-been-nudged/>

test result performed under conditions that have a 90% false-positive rate for viable SARS-CoV-2 virus. The numerous flaws of the original Pfizer trial have been analyzed by the SMAC of CCCA (refer to “More Harm than Good” video).¹³

- *“Research collaborations from basic science through to clinical and health services research emerged rapidly to address urgent questions of seroprevalence (e.g., COVID-19 Immunity Task Force), correlates of infection and immunity, and outbreak mitigation factors and engagement of patients in research conduct such as knowledge synthesis.”* This point may be also considered as a low if we recognize that rapid new research endeavors were plagued with mistakes and preliminary/weak results which are difficult to interpret. This included the use of an inferior dried blood spot test that used a single marker (the Nucleocapsid protein of the SARS-CoV-2 virus) for seroprevalence, even though many individuals that recovered from COVID-19 failed to produce detectable antibodies against this protein. Freshly generated information should not be regarded as high quality and should not be used as a guide for public health decisions that affect the entire population, especially when all other dimensions (variables) in the lives of people are ignored, and only COVID-19-avoidance is considered as a desirable outcome.

In summary, this article, which was part of a series of publications demanding a public inquiry into the COVID-19 crisis response in Canada, seems to be exclusively focused on how to ensure a centralized access and easy use of data, so that the appointed agency makes better use, and communicates to the public a single harmonized message, without losing trust. Presumably, these authors from academic institutions would like to continue to be federally funded towards such an objective now that the COVID-19 crisis has largely passed.

2. Use and Misuse of Research: Canada’s Response to COVID-19 and its Health Inequalities.

This BMJ article was introduced as *“Sharmistha Mishra and colleagues examine how pandemic research could have been used to avoid a homogenised public health and clinical response to COVID-19 in Canada.”*¹⁴ Its aim was to present an analysis of health inequalities during the COVID-19 crisis. The authors claimed that economic marginalization was associated with higher rates of COVID-19 deaths, so there was an implicit proposition that the socio-economic characteristics of marginalized groups favored a faster/larger spread of the pathogen and more lethal forms of the disease. As mentioned above, the accuracy of the definition of COVID-19 deaths should be a matter of debate,

¹³ (2023) More harm than good. Canadian Covid Care Alliance. Retrieved from <https://www.canadiancovidcarealliance.org/all/more-harm-than-good/>

¹⁴ Mishra, S., Walker, J.D., Wilhelm, L., Larivière, V., Bubela, T., Straus, S.E. (2023) Use and misuse of research: Canada's response to COVID-19 and its health inequalities. *BMJ*. 382:e075666. doi:10.1136/bmj-2023-075666 Retrieved from <https://www.bmj.com/content/382/bmj-2023-075666.long>

given the inclusivity of positive-tests and contact history to assign a death as caused by COVID-19 as well as inclusion of deaths from other co-morbidities if they tested positive for SARS-CoV-2 infection. Of course, the transmission of SARS-CoV-2 virus itself would be blind to such socio-economic differences between its victims and the emerging variants proved to be increasingly less virulent.

Throughout the article, little comment was offered about how specific socio-economic vulnerabilities should be addressed (probably because the authors themselves recognize that this type of data -social determinants of health- is lacking), and most of the messaging centered on the importance of assessing infection rates, equalizing vaccination access, and creating collaborative endeavors that would gain the long-lasting trust of minority/marginalized groups and a sustainable policy of data sharing with public health. No consideration was given to the stated socio-economic vulnerabilities as they relate to a wide range of other diseases that account for most deaths in general. Nor was there any comment about the underlying genetic predispositions to certain diseases related to ethnic background. For example, Indigenous people, and those of African, South Asian, and Hispanic descent in Canada are much more prone to type II diabetes than the general population. The article also fails to acknowledge that Indigenous people were actually prioritized for COVID-19 vaccine access, such that young indigenous adults received COVID-19 vaccinations before many seniors and retirees.

Although the analysis of the authors appeared to be multivariate in nature (since the definition of marginalization included the consideration of multiple aspects of a way of living, such as type of employment, number of people living in a household, access to health services, *etc.*), the authors failed to consider two important aspects that may have weighed more in relation to poor health outcomes. One aspect is simply the baseline health/disease and nutrition status of marginalized groups. Health influence outcomes in these groups are problematic not only in the context of an acute critical situation such as the COVID-19 crisis, but also any other health/disease unforeseen challenges, and that represents a bias playing against this group.

The other aspect, which may be more important given that it is readily modifiable, is that these marginalized groups were not exposed solely (independently) to the infectious pathogen and its dynamics of propagation, but they were simultaneously affected by the pathogen and the government measures, specifically the lockdowns that were declared very early in the crisis, when only a handful of cases had been detected in Canada. In other words, we may argue that the impact of the lockdown (implemented before an assessment of the spread dynamics in the non-lockdown society could have taken place) caused a net (and higher) harm in marginalized populations that outweighed the harm caused by the pathogen, or, at the very least, that was not discernible from the impact of the pathogen alone. Lockdowns put not only people living in close quarters even closer for longer periods of time (which is a factor for easier spread of a pathogen), but also cut essential services for these communities (*e.g.*, lack of services related to addictions, lack of attention of other

health problems, increased chance of domestic violence, *etc.*), which are themselves harmful and would lead to worse health outcomes regardless of the presence/absence of any pathogen.

Throughout the different sections of the article, the following specific points stand out:

In its introduction the authors claimed that *“Disproportionate risks of exposures and transmissions are shaped by physical and social networks”* and that *“The same context ... defines what happens ... access to and quality of care.”* This puts the emphasis on the pathogen dynamics and how to treat it and ignores the impact of lockdowns on the social networks that the authors allegedly wanted to consider.

In the section *“Lessons from the pandemic”*, the authors claimed:

- *“The highest rates of cases and deaths were among racially minoritized people, recent immigrants, lower wage essential workers, and those living in higher density and multigenerational households.”*

This is an observation that should be analyzed in the context of other covariables. Specifically, the claim related to deaths gives the impression that any person within these minority groups was equally more severely affected, regardless of their age, nutrition status and comorbidities. More importantly (as stated earlier) the definition of COVID-19 death was very inclusive (people dying with a positive PCR test or history of contact in the absence of testing), so the accuracy of the cause of death remains as a point of uncertainty (*i.e.*, more people in marginalized groups died but to attribute the cause to COVID-19 deserves further analysis). Was there a corresponding increase in all-cause mortality in these groups compared to the general population prior to and during the COVID-19 pandemic? In the face of a pandemic with a non-discriminatory, infectious pathogen, ultimately measures to control it need to consider the population at large and not specific minorities.

- *“Infection risks were highest at the intersection of household density and workplaces, amplified by barriers to accessing testing, isolation support, and early rollout of vaccination and boosters.”* The authors imply that measures such as testing, isolation, and vaccination were successful and explanatory of lower infection rates/better outcomes of the non-marginalized population. Interestingly, there is no consideration of baseline health (*i.e.*, comorbidities) and nutrition status (*i.e.*, obesity), prevalence of addiction problems (which may modulate immune response), *etc.* in these marginalized groups. This may be considered a bias favoring the healthy population selected for comparison. In other words, the better overall health outcomes of non-marginalized people may be explained by their better baseline health status and not by their better access to testing, isolation support, and vaccines. This is in part implicitly admitted by the authors themselves when they say that *“Rates of COVID-19 hospital admissions and deaths remained higher in the lowest income neighborhoods compared with highest income areas in each pandemic wave, despite the province eventually achieving “equality” in two dose vaccine coverage and... hybrid protection... across income.”*

In the section *“Research investments for a tailored COVID-19 response”*, the authors claimed:

- *“...none of the first set of rapidly funded projects focused on long term care, housing shelters, or essential workplaces outside healthcare settings, where outbreaks spread most rapidly.”* Even if spread happened more rapidly in these settings (and this is still a point of contention given that the spread was a function of the degree of PCR testing - with the corresponding level of false positive detection – that was happening in a given place), the authors failed to consider that the number of deaths in long term care facilities (where the highest numbers of deaths took place in the first wave) may be simply explained by the abandonment of the residents, since personnel was dramatically reduced due to the fear induced by government announcements (*i.e.*, many of the workers simply did not go back to work fearing for their security) and by security measures adopted/imposed in these centers (*e.g.*, history of contact with a case would determine isolation of personnel even in the absence of symptoms). The lack of basic care of residents of these centers alone might have weighed more heavily as a determinant of death than the infection of a given pathogen. Moreover, keeping COVID-19 cases in long-term care facilities likely increased the aerosol concentrations of the SARS-CoV-2 virus in the air and increased the viral loads of this respiratory disease pathogen. Lack of access to family and friends also took an emotional toll on the residents that exacerbated anxiety and depression, which can reduce immune function and make the residents more vulnerable to illness.

- *“...efforts to involve Indigenous communities in the work of the task force were not successful, despite the establishment of an Indigenous Advisory Circle. The advisory circle closed in 2021, partly because of limited time to foster relationships and meaningful community engagement and to establish governance that recognized the communities’ principles of ownership, control, access, and possession for data and biological samples.”* This statement pointed to the concerns of the authors regarding the access to data of communities who want to maintain a measure of control and privacy of their own data.

- *“Canadian government invested C\$2.2bn to establish research “hubs” ...yet...did not invest in community partnerships to build trust.”* This pointed to the concern of the authors about gaining long-lasting access to data through collaborative trust-building investments. How increasing the government/public health/researchers access to data will translate into better health outcomes is not addressed by the authors.

In the section *“Who led research to inform covid response?”*, the authors claimed:

- *“Researchers’ intersecting identities and lived experience shape the questions asked, how research is conducted, and interpretation of results,”* followed by explicit concerns about the low number of women leading research on COVID-19. Interestingly the authors do not even consider that their

claim is mostly relevant regarding the high occurrence of conflicts of interests in academia. Since researchers' experiences guide the questions and interpretation of results in research, the first level of analysis should focus on the source of the money that researchers receive, regardless of their sex, gender, ethnicity, etc. The funding process really depends on whether a grant application has been submitted, and the review process is based on the feasibility and merits of the proposal, and the expertise and track record of the applicants. There are explicit existing Canadian government guidelines for encouraging applications from women and minorities that pre-date COVID-19 by several years.

In the section *"Lack of scholarly diversity in putting research into action"*, the authors claimed:

- *"Epidemiological and clinical research dominated the discourse at advisory and policy making tables, largely ignoring discussion on inequities early in the pandemic. Independent covid-19 science advisory committees of 10 to 50 people were established in early 2020..."* The authors implied that the lack of scholarly diversity is related to lack of more tailored measures for certain communities, yet they again avoid the central question of conflict of interests of the scientists who form these advisory committees, which could have influenced the recommendations and the lack of policies for specific communities.

In the section *"Tailoring research and data informed local responses"*, the authors claimed:

- *"When community leadership and mobilization led to research for a more tailored response, successes ensued. For example, Ontario's real time reporting of cases and vaccination coverage by neighborhood, and across neighborhood level social determinants of health, enabled communities to access aggregated data to monitor the effect of, and to adapt, local strategies."* This assertion implied that the case-report policy and vaccination were successful as mitigating measures, but there was no evidence provided for that. The references used to backup this assertion provided information on the assessment of the differences across neighborhoods regarding infections and vaccination uptake, but that does not prove objective improvement outcomes. Moreover, the authors noted that when vaccine equity was attained, differences in hospitalization and death rates in low-income neighborhoods persisted. Also, the infection-rate analysis (*i.e.*, number of cases) was based on PCR testing, making the accuracy of the infection incidence/prevalence highly questionable, although the authors accept it as precise, which is very concerning.

- *"To conduct research for a tailored public health response, research systems require community trust and models of data governance across diverse communities and settings to be built ahead of a public health emergency."* This pointed to the concern of the authors on how the government should proceed to access data from marginalized/minority communities who do not trust organizations to collect the data, and to better respond to a future threat.

In the section *"Questions for a national covid inquiry"*, the authors claimed:

- *“A national covid-19 inquiry should consider the extent to which the extent, or lack of pandemic focus on social determinants of health, social justice, and differential risks of transmission led to success and failure to tailor protective measures and contributed to morbidity and mortality and health inequalities.”* This claim implicitly assumes the basic “protective” measures as correct, and just need some modification tailored to a certain minority community, as opposed to consider the basic “protective” measure as the root of the problem that led to increased morbidity and mortality. Do the authors suggest that a modified lockdown tailored to a minority group would have been a successful lockdown?

- *“It should also consider ... what mechanisms can promote uptake of research and development of science advice that is inclusive of diverse voices and lived experience in public health decision making.”* This claim contradicted what happened, since diverse voices who raised concerns about public health decisions (questioning the harm/benefit balance of mandating masks in schools and closure of sport activities for youth) were completely ignored. Why were these people, who are part of the communities and the public at large, ignored when the authors claim that they need diverse voices of the public? This questions the authenticity of the authors’ willingness to consider the opinion of the public, including those with appropriate knowledge and credentials that may have disagreed with public health officials.

- *“At the center of research in service of communities, are data about communities and for communities. Research in support of a more specific and tailored response requires our ecosystem—from funders to networks to researchers—to meaningfully develop community trust and support community leadership before the next pandemic.”* The focus is again on getting trust within diverse communities, so data is readily and easily accessible to government/public health/researchers. However, there is a history of data collection by governments and public health agencies that has not always been to the benefit of local communities, and with new and emerging invasive technologies, the privacy of individuals will continue to be further compromised and increasingly vulnerable.

In brief, this article does not see the need of a public inquiry questioning the nature and negative impact of the measures deployed by the government, just that these measures are sufficiently tailored to specific communities that seem more resistant to share data with government organizations. There is a glaring contradiction between the alleged will of the authors to include the participation of the public, while not acknowledging the public voices that raised concerns about the impact of the measures deployed during the pandemic, voices that were suppressed.

3. The Predictable Crisis of COVID-19 in Canada's Long Term Care Homes

This BMJ article was introduced as “*Sharon Straus and colleagues argue that governments in Canada failed residents, families and staff in long-term care homes during covid-19 and coordinated efforts are needed across federal, and provincial and territorial governments to safeguard these populations.*”¹⁵ Its purpose was to present the factors affecting the long-term care homes (LTCH) that contributed to the high number of deaths of their residents during the COVID-19 crisis. Remarkably, the authors easily identified factors that have been known for decades (that is why the title claimed it was a “predictable crisis”) and claimed that had these factors been addressed the results would have been better. This is a simplistic analysis, since it seems self-evident that the resolution of any negative chronic problem would imply a betterment of the residents’ status. However, the authors failed to consider the additional negative impact (and its interaction with pre-existing and well-known negative factors) that the measures imposed by governments had on the residents during the COVID-19 crisis.

The article opens with a series of key messages, some of which deserve detailed analysis, for example:

- “*Three contributors to Canada’s poor performance in LTCHs during the pandemic were inadequate attention to growing resident complexity; longstanding failure to support the LTCH workforce; and a lack of integration within health and social systems.*” These factors have been known as negatives determinants for the health performance under any type of circumstance. These are not specifically related to the COVID-19 crisis, so it does not seem to advance a critical analysis of what was different following the appearance of SARS-CoV-2.

The authors did not consider as contributions how lockdowns affected these facilities, nor the decision of staff not to go back to work due to the messages of fear received through official communications. Once staff were reorganized, they were constantly subjected to isolation and testing policies following contact with COVID-19 cases that would leave them out of work for weeks, further decreasing the already low number of workers.

The authors did not consider the impact of family members being denied access to their loved ones, and how this affected their overall health status and level of care, since many residents depended on these human contacts to survive. More importantly, they failed to see how residents with a positive diagnosis of COVID-19 were subjected to new protocols of potentially lethal medication used to reduce the subjective feeling of lack of air (dyspnea). In Quebec, for example, much higher doses of benzodiazepines and morphine were used for COVID-19 cases, under the pretense that it

¹⁵ Estabrooks, C.A., Ewa, V., Keefe, J., Straus, S.E. (2023) The predictable crisis of COVID-19 in Canada's long term care homes. *BMJ*. 382:e075148. doi:10.1136/bmj-2023-075148. PMID: 37487622. Retrieved from <https://www.bmj.com/content/382/bmj-2023-075148>

was the only way to reduce the unpleasant symptoms, but these high doses were not used for other causes of dyspnea. Later, palliative care specialists were alerted about the lethality of the doses being used, and the protocol was suspended, but that only happened after the first wave and first lockdown had already produced the highest number of casualties in the centers. It is notable that the authors did not consider the adoption of this high-dose medication protocol as a factor that contributed to the high number of casualties in LTCHs during the first wave. Moreover, there were higher levels of antipsychotics usage to sedate residents that were anxious or unhappy about their treatments in LTCH. Some of these drugs like Midazolam undergo reduced metabolism under inflammatory conditions such as COVID-19 and may have contributed to the death of residents.^{16, 17} Finally, the nutrition status, including vitamin-D levels¹⁸ and other supplements were never regarded as potential contributors to the residents' health outcomes.

- *“Fragmented LTCH, health, and public health systems led to variable responses across provinces and territories.”* There was no consideration regarding the nature of the measures adopted in relation to the LTCH, just how they were implemented. Do the authors suggest that if the implementation had not been fractured, then the outcomes would have been better? This is very convenient for the government representatives and their advisors who decided on the type of measures being implemented. Finding the lack of coordination to blame implies a potential intention to repeat the same measures with better coordination next time. This is a very concerning path of analysis.

- *“Unprecedented coordination and collaboration at federal and provincial or territorial levels are needed to create an integrated health system with funding and accountability.”* This statement seems to have revealed again (since this point is also conveyed in other articles of this series: Bubela *et al.* (2023)³ and Mishra *et al.* (2023)¹⁴) the preference of the authors towards a centralized way of working. There are potential dangers with this type of centralized thinking. Consider what the outcome could have been if the high-dose benzodiazepine-morphine combination had been applied more consistently throughout every single center to every resident with difficulty breathing due to COVID-19; death rates would have been much higher.

¹⁶ Le Carpentier, E.C., Canet, E., Masson, D., Martin, M., Deslandes, G. *et al.* (2022) Impact of inflammation on Midazolam metabolism in severe COVID-19 patients. *Clin Pharmacol Ther.* 112(5):1033-1039. doi:10.1002/cpt.2698

¹⁷ Heath Desk (2021) How is Midazolam being used for COVID-19? Is it dangerous? Retrieved from <https://health-desk.org/articles/how-is-midazolam-being-used-for-covid-19-is-it-dangerous>

¹⁸ Nakatsu, K., Hardie, J., Karrow, N., Pelech, S. (2024) Vitamin D is essential for optimal health. Are you getting enough? Canadian Citizens Care Alliance. Retrieved from https://www.canadiancovidcarealliance.org/wp-content/uploads/2024/01/24JA25_Canada_Vitamin-D_Campaign.pdf

In the section “*Lessons from the pandemic*”, the authors claimed:

- “*LTCH residents were prioritized for the COVID-19 vaccine rollout and by 15 March 2021 95% had received their first dose.*” This implies that the authors believed in the efficacy of the vaccine as advertised by the manufacturer without consideration that the absolute risk reduction (ARR) of mRNA products was only around 1%, and the number of patients needed to be vaccinated for a benefit would be around a hundred or more, but all would be subjected to the potential safety concerns associated with the COVID-19 vaccines. The authors also failed to consider that the clinical trials of mRNA products essentially omitted elderly people with comorbidities, so the implication that mass vaccination would have a large positive effect is not based on the evidence provided by the manufacturers. Finally, there is no consideration about how the high proportion of adverse events related to the mRNA vaccines would impact the overall health status of the frail residents. In nursing homes in Quebec, a third shot of a COVID-19 vaccination was discouraged in the very frail elderly due to poorer outcomes.

- “*Outbreaks and deaths declined but continued; more LTCH outbreaks occurred in 2022 than in 2020 and 2021 combined as vaccination booster uptake varied.*” The authors implied that low/heterogeneous booster uptake was responsible for the higher number of outbreaks, instead of considering the low ARR established from the start, the fact that the virus became more transmissible and less lethal, and that the detection of the outbreaks was always a function of the PCR testing policies, so a higher number of outbreaks might have been reflective of more testing, with a corresponding high false positive rate. Moreover, there is mounting evidence that increased

COVID-19 vaccine boosters increases the risk of getting COVID-19 again as the immune system appears to develop tolerance to the SARS-CoV-2 virus.^{19, 20, 21, 22, 23, 24}

- *“In 2022 COVID-19 was the leading cause of hospital admissions of older adults in Canada.”* The authors implied that COVID-19 is a more severe/lethal disease than respiratory infections caused by other viruses and bacteria, and they did not consider how the incidence and screening for other respiratory pathogens changed during the COVID-19 crisis. For example, the incidence of influenza in the 2020-2021 flu season decreased by over 95%, with only 69 laboratory confirmed cases reported in Canada, and of these, 31 were associated with receipt of live attenuated influenza vaccine.²⁵ Respiratory infections of any type (*i.e.*, viral and/or bacterial) are traditionally one of the most frequent causes of hospitalization (and death) in the elderly population, and the detection of COVID-19 as the cause for higher admissions may be multifactorial in nature, including the lower incidence of influenza and other respiratory viruses infections, including respiratory syncytial virus, and a testing bias.

- *“Compared with before the pandemic, LTCH residents received less medical care, experienced increased antipsychotic use, and had less visitor contact, resulting in social isolation.”* Even though the authors clearly recognize these problems, they failed to connect them with the measures that were imposed on the LTCH residents. These problems are a direct consequence of the lockdown

¹⁹ Shrestha, N.K., Burke, P.C., Nowacki, A.S., Simon J.F., Hagen, A., Gordon, S.M. (2023) Effectiveness of the coronavirus disease 2019 bivalent vaccine. *Open Forum Infect Dis.* 10(6):ofad209. doi:10.1093/ofid/ofad209

²⁰ Uversky, V.N., Redwan, E.M., Makis, W., Rubio-Casillas, A. (2023) IgG4 antibodies induced by repeated vaccination may generate immune tolerance to the SARS-CoV-2 spike protein. *Vaccines (Basel).* 11(5):991. doi:10.3390/vaccines11050991

²¹ Irrgang, P., Gerling, J., Kocher, K., Lapuente, D., Steininger, P., *et al.* (2023) Class switch toward noninflammatory, spike-specific IgG4 antibodies after repeated SARS-CoV-2 mRNA vaccination. *Sci Immunol.* 8(79):eade2798. doi:10.1126/sciimmunol.ade2798

²² Buhre, J.S., Pongracz, T., Künsting, I., Lixenfeld, A.S., Wang, W., *et al.* (2023) mRNA vaccines against SARS-CoV-2 induce comparably low long-term IgG Fc galactosylation and sialylation levels but increasing long-term IgG4 responses compared to an adenovirus-based vaccine. *Front Immunol.* 13:1020844. doi:10.3389/fimmu.2022.1020844

²³ Kizsel, P., Sík, P., Miklós, J., Kajdácsi, E., Sinkovits, G., *et al.* (2023) Class switch towards spike protein-specific IgG4 antibodies after SARS-CoV-2 mRNA vaccination depends on prior infection history. *Sci Rep.* 13(1):13166. doi:10.1038/s41598-023

²⁴ Valk, A.M., Keijer, J.B.D., van Dam, K.P.J., Stalman, E.W., Wieske, L., *et al.* (2023) Suppressed IgG4 class switching in dupilumab- and TNF inhibitor-treated patients after repeated SARS-CoV-2 mRNA vaccination. *medRxiv (preprint).* doi:10.1101/2023.09.29.23296354

²⁵ Nwosu, A., Lee, L., Schmidt, K., Buckrell, S., Sevenhuysen, C., Bancej, C. (2021) National Influenza Annual Report, Canada, 2020-2021, in the global context. *Can Commun Dis Rep.* 47(10):405-413. doi: 10.14745/ccdr.v47i10a02

and contact-isolation policies, which reduced the personnel available to take care of the residents. It is not a consequence of the said pandemic but of the measures.

- *“In a February 2021 report from 22 countries, 41% (325 000) of COVID-19 deaths were among LTCH residents.”* The authors failed to critically assess that this might be simply a reflection of the age and comorbidities of residents in LTCH. This might have also occurred in any flu season of a particular virulent influenza variant, but never were lockdowns and high-dose benzodiazepine-morphine protocols considered as potential solutions for a bad flu season. The point of analysis that the authors failed to ponder is why were these measures thought to be potentially useful for COVID-19, when they were never tested with other respiratory viruses, and had obvious potential counterproductive effects.

In the section “What caused the LTCH crisis in Canada during the pandemic”, the authors claimed:

- *“Residents therefore enter LTCHs later in the trajectory of their chronic conditions and have shorter lengths of stay ... COVID-19 infection further increased resident acuity.”* If these are the conditions of the residents of LTCH, it is surprising that the authors did not consider that extra isolation and reduced care due to lockdowns are determinant factors that could account for the higher number of deaths in this population, regardless of COVID-19. Also, as stated before, extra doses of benzodiazepines and morphine would increase the mortality in this fragile population.

- *“For decades, Canada, alongside many other countries, has failed adequately to support, educate, or remunerate LTCH staff, creating a situation unable to absorb the COVID-19 crisis... The estimated number of LTCH staff in Canada dropped from 4.1 per 100 people aged 65 years and older in 2011 to 3.6 in 2016. Evidence indicates this ratio is inadequate to meet LTCH resident needs.”* The authors failed to consider in their analysis the negative impact of lockdowns and contact-isolation rules imposed on personnel. If the number of staff was already low/inadequate, how lockdowns were not seen as more detrimental than positive is mystifying.

- *“LTCH staff were isolated and stressed by implementation of restrictive essential visitor policies, lack of personal protective equipment (PPE), lack of infection prevention and control (IPAC) training, fear of contacting or transmitting COVID-19, and grief over resident and colleague deaths.”* The authors implied that PPE has a positive impact (high efficacy) to prevent COVID-19, which has not been established with certainty (*i.e.*, lack of evidence that masks effectively block the virus²⁶). Also, the fear about COVID-19 was a function of how the government communicated the news to the public: always in a sensational, terrorizing manner, with daily counts of unreliable deaths (due to or

²⁶ Pelech, S., Hardie, J. (2023) The effectiveness and risks of masking for COVID-19. Canadian Covid Care Alliance. Retrieved from https://www.canadiancovidcarealliance.org/wp-content/uploads/2023/08/23AU28_PelechHardie_Effectiveness-of-Masks-for-COVID-19.pdf

with COVID-19?). It seems that the non-implementation of certain measures would have sufficed to address some of these factors.

- *“In the first wave of the pandemic, acute care hospitals developed pandemic plans often without adequate consideration of impact on LTCHs such as PPE access.”* The authors again stress their conviction regarding how effective PPE is. They point out that many hospitals sent people back to LTCH to free space/beds in the hospital, but that those people ultimately died in LTCHs: *“in November 2021 and May 2022 respectively, the Quebec ombudsperson and coroner released LTCH reviews on the impact of government COVID-19 decisions such as transferring patients from acute care to LTCHs during initial pandemic waves, where more than 69% of COVID related deaths subsequently occurred. Recommendations included staffing improvements and converting private LTCHs to publicly funded.”* Are the authors suggesting that had there been more PPE or more staff or had the LTCHs been publicly funded, those who were sent back would not have died? This analysis seems disingenuous and biased since the authors failed to consider other very impactful variables, including namely lockdown policies, contact-isolation policies, lack of early treatment, lack of vitamin supplementation, and high-dose benzodiazepine-morphine protocols.

- *“In the initial waves, four primary mandates were implemented at varying times across provinces: declaring a state of emergency, restricting non-essential visitors, mandating masks, and expanding tests to LTCH staff and residents. LTCHs in some provinces, such as British Columbia, initially fared better because of more rapid implementation of these protective mandates.”* This is a very concerning statement because it shows that the authors are in favor of the type of measures implemented and consider the poor outcomes as a function of not implementing the measures early or stringently enough. This suggests that the article is not impartial; rather the authors decided *a priori* what was adequate or not.

- *“...Choosing Wisely Canada guidelines, which recommend against transferring residents to hospital unless their urgent care needs cannot be met onsite...”* The authors only considered the need of urgent care, but there is no consideration about the need of vitamin supplementation (which in many centers was cancelled), the need for early treatments with off-label drugs,²⁷ nor the detrimental (lethal) effect of benzodiazepines and morphine.

- *“Once COVID-19 vaccines were available, vaccination for residents and staff was prioritized over the general population and staff vaccine mandates implemented. Vaccines initially had a substantial impact, reducing infections and deaths among LTCH residents and staff by 90% between January and March 2021.”* The authors only considered a single variable, vaccination, as the reason for the decrease in cases/deaths in January-March 2021, after a full year of crisis. There was no

²⁷ Bernigaud, C., Guillemot, D., Ahmed-Belkacem, A., Grimaldi-Bensouda, L., Lespine, A., *et al.* (2021) Oral ivermectin for a scabies outbreak in a long-term care facility: potential value in preventing COVID-19 and associated mortality. *Br J Dermatol.* 184(6):1207-1209. doi:10.1111/bjd.19821

consideration that the weakest residents (*i.e.*, oldest and with higher number of comorbidities) had already died (April-May 2020), nor that the virus mutated to less lethal forms. They ignore that with at least nine COVID-19 waves in Canada during the pandemic, with at least two prior to the availability of vaccines, that they were regularly spaced apart with similar slopes of increases and decreases in each wave. The period January-March 2021 saw two waves of COVID-19. During this period, for most Canadians that were not vaccinated for COVID-19, there was a drop in their case numbers and deaths compared with the vaccinated. This type of univariate analysis/reasoning simply reflects poor scientific methodology. When complex beings, such as humans, are the population of study, a multivariate analysis, including confounding factors, must be used.

- *“There are no national data on the effect of vaccine mandates on staff retention or illness.”* How a topic as important and consequential as vaccine mandates is not the subject of data gathering is very difficult to comprehend. However, this absence of data seems very convenient if the intention is to reimplement this type of measure. The authors failed to do a critical analysis of the potential reasons for the absence of this crucial information.

- *“Initial restrictive measures were perceived to have devastating effects on residents by increasing loneliness, depressive symptoms, and behavioral problems, although no Canada-wide data are available.”* The authors pointed to the problems related to isolation, which go hand in hand with the lockdown policies. However non-existent the data seems, the authors did not speculate why this data was not publicly available.

Finally, in the sections *“National LTCH standards”* and *“Questions for a national inquiry”*, the authors claimed:

- *“The federal government stated it will not legislate their implementation as LTC is under provincial or territorial jurisdiction. This jurisdictional matter is unlikely to be resolvable without federal legislation accompanied by transfer of significant funds with accountabilities... The federal government has, however, begun early engagement to develop a new Safe LTC Act.”*

- *“We recommended that the federal government commission and implement a data-based assessment of national LTCH standards for staffing, which must be achieved by tying funding to them.”*

- *“Federal funding must be tied to data collection requirements and accountability.”*

- *“Using the inquiry results and the model of the Canada Health Act, we need a universal public LTCH plan that is accessible and funded and where federal funds are attached to relevant evidence-based outcomes, holding LTCHs and provincial governments accountable.”*

These statements point to the preference of the authors regarding centralization of the organization of care. The authors failed to consider that centralizing data collection, research, guidelines'

production (including LTC guidelines), and guidelines' enforcement may lead to the large-scale (global) application of measures that if erroneous may have a catastrophic impact. Indeed, this in part happened, since during the COVID-19 crisis, the measures taken were basically the same across provinces, with no room for dissent once implemented, and the results were poor, especially in LTC, where most deaths took place.

In brief, the lack of in-depth consideration by the authors of the impact of lockdowns, contact-isolation policies imposed to staff and families (if they were granted access at all, which was not always the case), nutritional status of the residents (including low supplementation with vitamins), lack of exercise, lack of early treatment, lack of social interaction with family and friends, implementation of high dose benzodiazepines-morphine protocols for COVID-19 dyspnea, and the low absolute risk reduction and high number needed to vaccinate of mRNA products, make this article's conclusions and recommendations non-evidence-based and lacking objectivity and robustness.

4. Canada's Role in COVID-19 Global Vaccine Equity Failures

This BMJ article was introduced as *"Adam Houston and colleagues argue that Canada needs to reverse its track record from covid-19 and prioritise public need over profits in its domestic investments and global leadership for health."*²⁸ The message delivered in this article centers on the presumed role that Canada played in the unequal distribution of vaccines around the world, and proposes changing policies in the development of local vaccine manufacturers to position Canada as a global health leader.

Naturally, this message implies *a priori* that vaccines are effective, safe and not harmful. Perhaps this view derives from the experience of the authors with standard vaccine technology (*i.e.*, vaccines typically used in the pediatric population), which are based on the administration of a known dose of an attenuated (*i.e.*, harmless) virus or bacteria, or the known dose of a specific antigen (*i.e.*, a molecule/protein of the infectious pathogen). Unfortunately, the authors make the false equivalence between classic vaccine technologies and the COVID-19 genetic vaccines, which never used standard, well-tested technology, but instead employed a messenger-RNA (mRNA) packaged in a lipid nanoparticle or DNA delivered with a defective adenovirus and administered via intramuscular injection (a systemic route of administration, with potential to reach all organs in the

²⁸ Houston, A.R., Liu, J., Habibi, R., Murthy, S., Pai, M. (2023) Canada's role in COVID-19 global vaccine equity failures. *BMJ*. 382:e075149. doi:10.1136/bmj-2023-075149 Retrieved from <https://www.bmj.com/content/382/bmj-2023-075149>

body). This genetic payload enters cells to produce and expose on their external surfaces the Spike protein antigen that caused these cells to be recognized and destroyed by the immune system.

The authors of this article ignored all the potential problems that this type of technology entails, including: 1) the difficulty to monitor the biodistribution in humans (*i.e.*, determine which cells receive and translate the mRNA or DNA); 2) the impossibility to precisely measure the amount of antigen produced by the human cells (therefore flouting the principle of knowledge of precise dosage of a pharmacological product); 3) the autoimmune response given the display of the protein on the cellular surface (this is the equivalent of putting a target on a previously normal human cell, which by displaying this viral protein on its surface, becomes foreign to the immune system); and 4) the potential future autoimmune cross-reactivity given the molecular resemblance of the viral protein with other human proteins. Moreover, the authors did not present, nor consider the results of the original phase III human clinical trials that led to the approval of these mRNA vaccines, which showed a very low absolute risk reduction of only around 1%, because even only about 0.8% of the unvaccinated clinical trial participants tested positive for COVID-19 over the course of 6 months. They ignored that the efficacy of these vaccines to prevent the disease in the elderly population with comorbidities was not properly evaluated, or that severe adverse reactions were reported in about 5% of vaccinated participants. They failed to note that these vaccines were never tested for their ability to prevent transmission or reduce disease severity following breakthrough infections. They did not appear to appreciate the incredibly high dose of mRNA used in COVID-19 mRNA vaccines (tens of trillions of mRNA molecules modified to increase their stability), the wide disbursement of most of the vaccine lipid nanoparticles throughout the body within 2 days of injection, and the high number of resultant adverse inflammatory effects, blood clotting events and other pathologies reported in the adverse vaccine injury databases maintained by the US FDA (VAERS), the European Medicines Agency (EudraVigilance) and the World Health Organization (VigiAccess). In fact, there have been more reports of injury in these repositories for COVID-19 vaccines than 80 other vaccines combined over the last 31 years. In view of these problems, it is surprising that the authors considered these genetic vaccines as the single most important solution to address the COVID-19 crisis.

The lack of consideration of the weak results of the original clinical trials, and the potential downsides to the massive deployment of this new mRNA vaccine technology, forces the reader to question the objectivity of the critical appraisal provided by Houston *et al.* (2023).²⁸

Throughout the article, the following points stand out:

- *“Inequitable access to COVID-19 vaccines—as well as tests, treatments, and other tools—has cost millions of lives, prolonged the pandemic...”* This assertion implies that the vaccines were effective to contain the disease, which early on was proven wrong since they do not stop infection nor transmission. They also imply that PCR tests were key in the control of the crisis, when this type of

test was never designed as a screening diagnostic tool to quantify number of infectious cases. Such a test is only useful to confirm a case of what appears to be symptomatic for COVID-19. This was a key mistake, since many asymptomatic/healthy people (including essential health care workers) were isolated for weeks due to positive PCR tests results, which were performed at cycle thresholds that had a 90% or greater false-positive rate for active virus. With this statement, the authors reinforced proven wrong concepts. In Canada, in the first year of the COVID-19 pandemic, in the absence of COVID-19 vaccines, there were about 15,000 fatalities related to COVID-19, and in the following year, following the availability of vaccines, there were a similar number of COVID-19 related deaths.

- *“Resolving such tensions (tensions between countries’ domestic responses and their collective global responsibilities) has continued implications, including for the pandemic treaty currently being negotiated by the World Health Assembly.”* The authors did not attempt to critically assess any global policy, implying that global management is the only possible solution. They did not critically appraise the role of the WHO in the poor response to the crisis, including its role in the early declaration of lockdowns. Many of the global guidelines (*i.e.*, mass lockdowns) that most western countries followed were completely new and untested practices that caused unprecedented damage. Why the authors did not ponder these issues is an indication of a myopic view, indicating bias. It is disconcerting that this call for global management is supporting a change in the role of organizations such as WHO from being advisory to one of management with sweeping powers under conditions where this body has the authority to declare a global pandemic, as it did recently for monkeypox, which resulted in about 161 deaths in primarily sexually active homosexual men.²⁹

- *“These tensions are also witnessed within Canada, a high-income country that frames itself as a global health leader yet became one of the most prominent hoarders of the limited global COVID-19 vaccine supply...”* The authors continue to imply that the vaccines were the most important (only) tool to stop the transmission and impact of COVID-19, with no consideration of the potential drawbacks of a global vaccination policy to all age groups, and baseline health status, regardless of the actual risk of the disease. It also ignores the fact that nearly a billion dollars-worth of COVID-19 vaccines in Canada were largely destroyed at the end of 2022,³⁰ because of poor demand by Canadians and the reluctance of other countries to receive the vaccines as donations.

In the section *“Lessons from the pandemic”*, the authors claimed:

²⁹ (2023) 2022–2023 Mpox outbreak global map. Centers for Disease Control and Prevention. Retrieved from <https://www.cdc.gov/poxvirus/mpox/response/2022/world-map.html>

³⁰ (2023) 2022 Reports 9 and 10 of the Auditor General of Canada to the Parliament of Canada. COVID-19 vaccines. Office of the Auditor General of Canada. Retrieved from https://www.oag-bvg.gc.ca/internet/English/parl_oag_202212_09_e_44175.html

- *“Although overprocurement maybe understandable given initial uncertainty about which, if any, vaccine candidates would prove effective, the failure to equitably redistribute doses to other countries in need in a timely manner once it became apparent Canada would have more than enough is harder to comprehend.”* Again, the analysis of the authors continued to be predicated on an indisputable efficacy of the vaccines in use and is therefore a circular reinforcing exercise considering *a priori* vaccines as an unquestionable tool. The authors did not question why early in the COVID-19 pandemic in the summer of 2020, before any phase III human clinical trials were available, that the Government of Canada concluded negotiations with 7 vaccine manufacturers to secure enough doses of the COVID-19 vaccines to inoculate each person in the country about 10 times.³¹ By December 20, 2020, it had pre-ordered enough of the COVID-19 vaccines for 4 doses per person.³²

In the section *“Covax contributor and competitor”*, the authors claimed:

- *“By making extensive bilateral deals with drug companies, Canada and other high-income countries claimed most of the available vaccines and pushed Covax—and by extension low- and middle-income countries—to the back of the queue for receiving vaccines.”* Again, this is more reinforcement of the notion that vaccination is the only solution. Ironically, low- and middle-income countries and developing countries with lower availability of vaccines had lower death rates from COVID-19 per capita than those that underwent heavy COVID-19 vaccination. At the very least, there was no correlation between the degree that populations in countries around the world were vaccinated and the rates of COVID-19 deaths that they experienced.³³

In the section *“Transferring Canadian technology”*, the authors claimed:

- *“...Canada boasts its share of COVID-19 innovations. The most important of these involve lipid nanoparticle technology, a crucial component of the mRNA vaccines. Key research on this originated at the publicly funded University of British Columbia before being spun off into multiple private companies. However, public funding for this innovation has not been effectively leveraged into access, or even affordable pricing, either at home or abroad.”* This statement indicates an *a priori* consideration that lipid nanoparticles were unequivocally safe and effective technology, which is not the case. By unequivocally making these statements in the article, the authors give the false

³¹ (2023) Procuring vaccines for COVID-19. Public Services and Procurement Canada. Government of Canada. Retrieved from <https://www.canada.ca/en/public-services-procurement/services/procuring-vaccines-covid19.html>

³² Rastello, S., Bolongaro, K. (2020) Canada has reserved more vaccine doses per person than anywhere. BNN Bloomberg News. Retrieved from <https://www.bnnbloomberg.ca/canada-has-reserved-more-vaccine-doses-per-person-than-anywhere-1.1533041>

³³ Subramanian, S.V., Kumar, A. (2021) Increases in COVID-19 are unrelated to levels of vaccination across 68 countries and 2947 counties in the United States. *Eur J Epidemiol.* doi:10.1007/s10654-021-00808-7

impression that there is a long track record of this technology being used in the population at large, which is not correct. For example, at McGill university there are currently new projects studying the biodistribution of lipid nanoparticles (*i.e.*, which cells in the body capture these lipid nanoparticles), which proves the lack of knowledge of the pharmacokinetic profile of this type of product prior to their deployment in humans. These studies should have been done before approval of the COVID-19 vaccines, not after. The decades of prior studies with lipid nanoparticles were designed for the delivery of toxic substances to kill cancer cells. Prior to their use in COVID-19 vaccines, this technology had not been previously used in humans for vaccination purposes.

In Box 2 “What factors separated Canada’s rhetoric from reality on vaccine equity?” the authors assert:

- *“The first is the political climate, where the speed of vaccine access for Canadians was a major point of contention in federal politics... Ensuring sufficient access for all Canadians became a cornerstone of Canada’s federal election in September 2021.”*

This is a very concerning statement, because it reinforces the notion that the Canadian government was doing the right thing by providing vaccines to all, hence the utility of using this as a positive point to attract votes. Unfortunately, this only erodes even more into the lack of consideration for informed consent, bodily autonomy, and the possibility that other strategies (such as early treatment and improvement of nutrition or vitamin supplementation) could also have been potential solutions for the COVID-19 crisis. Moreover, it undermines the importance of efficacy and safety testing of new products that could potentially cause more harm than good. Such clinical studies are normally performed over many years and not for just a couple of months before regulatory approval for dissemination to the public.

- *“Early in the pandemic, concerns were raised about industry conflicts of interest on Canada’s opaque COVID-19 vaccine task force. Industry lobbying increased substantially during the pandemic, including around the TRIPS (Trade Related Aspects of Intellectual Property Rights) waiver negotiations.”* This is a key point that the authors should have investigated in more depth. Conflict of interests of researchers, in relation not only to the private sector, but also the government (*i.e.*, researchers who benefit from government funding for their research) is inextricable from decisions and guidelines that the researchers will end up producing. Any advisory board, or task force should be free of conflict of interests or should have enough members who are independent, to minimize bias. These individuals should be inert to financial, career and political pressures.

- *“As of mid-2023, the pricing reforms, already scaled back considerably in the face of legal challenges, have come into effect on paper but stalled once again at the implementation stage... emerging government policies focus heavily on promoting intellectual property as an economic driver, without corresponding reference to public access...”* These considerations are merely commercial in nature, looking into the business side of procurement of drugs and vaccines, without

any ethical consideration regarding the potential conflict of interests that the promotion of intellectual property could have on the level of safety and effectiveness of the products.

In the section *“Revisiting domestic production”*, the authors claimed:

- *“...covid-19 has spurred new policies and public investment to rebuild capacity in Canada. Some of this capacity is publicly funded but privately held, such as Canada’s C\$415m investment in Sanofi’s (flu) vaccine plant.”* The authors present the approach of public funding of private companies as a viable option without considering the conflict of interest never mind the financial risk that this strategy entails. This is exemplified by the loss of at least \$133 million dollars in an investment made by the Government of Canada for a Medicago facility in Quebec City to produce a COVID-19 vaccine.³⁴ The authors should have considered the potential biases that government guidelines will have if the government itself is behind the production of certain products. In other words, is it realistic to expect that a government that promotes vaccination of all its population will put equal effort in detecting, researching, and addressing adverse events related to the vaccination?

Moreover, the arguments that the authors put forward regarding the local production of vaccines, only reinforces the narrow focus on vaccines as the only tool to counter infectious diseases. In the context of COVID-19, Health Canada should have considered how to prevent/improve comorbidities, from better nutrition, exercise, affordable supplements, and how to expand/research off-label use of safe and inexpensive drugs.

- *“Government owned capacity has increased too, including revitalizing the National Research Council’s Clinical Trial Material Facility and, importantly, constructing the Biologics Manufacturing Centre, which was completed in 2021 with the capacity to produce two million doses a month.”* The authors fail to consider the conflict of interests of the government itself regarding the production and commercialization of products that are allegedly needed to fight potential future health crises, which are declared by the government. With the aggressive marketing campaigns funded by government to promote COVID-19 vaccine uptake, this will be even more problematic in the future as it becomes more financially vested.

In the section *“Rethinking domestic strategies and global health”*, the authors claimed:

- *“Canada has the opportunity to translate overdue reforms into positive global health outcomes, not just for COVID-19 but also for other serious public health threats.”*

The authors do not elaborate on the meaning of “global health outcomes.” What does this mean? How is this different than the previous goals of the Health Ministry and Public Health Agency?

³⁴ Osman, L. (2023) Feds recover \$40M from defunct Quebec vaccine developer Medicago. CTV News. Retrieved from <https://www.ctvnews.ca/canada/feds-recover-40m-from-defunct-quebec-vaccine-developer-medicago-1.6680395>

Moreover, what are these reforms? Why are they considered necessary? None of this is explored by the authors, and this type of general statement seems like a broad acceptance (a sort of “carte blanche”) of reform by government potentially in a centralized fashion.

- *“Exciting research is happening in Canada, but the country needs effective strategies to get research from the laboratory to the patient and make resulting products affordable and accessible.”* There are no details provided by authors about how to expedite the translation of laboratory research into clinical applications (*i.e.*, from bench to bedside). This is very concerning, because the speed of this translation to reach the public may be at the price of oversimplifying regulatory steps that are necessary to ensure public safety. Moreover, it is surprising that the authors only consider new research and new products and how to quickly manufacture them and release them to the market. There is no consideration of simpler preventive approaches, including nutrition, supplementation with vitamins, and use of older and inexpensive drugs that could be repurposed (*i.e.*, off-label use) to improve the health status of the population, particularly in low to middle income countries. For those in healthcare research, translation from basic to applied research has been a constant problem for decades.

In the section *“Act internationally to encourage innovation and equity”*, the authors claimed:

- *“Promoting innovation and equitable access to medical technologies at the international level also means adopting a principled Canadian position in ongoing negotiations to develop the proposed pandemic instrument, as well as related processes such as amending the International Health Regulations. These negotiations present a vital opportunity for Canada to advocate for and implement legal measures that promote equitable access to health technologies for all, including technology transfer, access to pathogen and benefit sharing mechanisms, and the primacy of public health over profits, particularly during public health emergencies.”*

The authors present equity in medical technologies as a solidary solution to all health problems and propose general measures to be applied globally. It is interesting that the other articles in this series have advocated for centralizing the collection of data, data analysis, and guideline development and enforcement. The concern of the authors regarding how Canada could extend the application of new medical technologies to other countries, seems to just enlarge the same type of approach internationally. Instead of diversifying the prevention and treatment approaches to infectious diseases, the answer seems to be "let's produce new innovative products (which are very difficult to adequately test in short timelines, especially if there is a crisis) and distribute them (which implies commercializing them) to not only rich countries (which can pay for them), but also to poorer countries by implementing policies that lower the prices for the later. This leads to the question: who is the ultimate financial beneficiary of this only innovative technology approach to treat health issues? It is ironic that the authors consider that Canada may be a leader in putting public health over profits, when the government was/is also actively implementing policies to have almost 100%

of the population consuming a new product (*i.e.*, mRNA-vaccines) that generates record profits to private companies, which are, at the same time, in partnership with the government to expedite the translation of new technologies to clinical use. The glaring feedback loop of conflict of interest that the authors fail to point out, makes the reader wonder about the quality of the analysis presented in this article. Also, considering there is strong evidence that SARS-CoV-2 was a genetically engineered virus from a foreign country, perhaps the equitable sharing of pathogens might not be such a good idea.

Finally, in the section “*Questions for a national covid inquiry*”, the authors ask the following question:

- “*What can Canada do to achieve its desired role of global health leader, not only in its own eyes but those of the rest of the world?*” By asking this question the authors accept *a priori* the notion of a global approach to solve health problems for the world. Unfortunately, the authors failed to consider that globalization may simply lead to a larger scale deployment of erroneous policies, which could be detrimental on a larger scale. This has already happened during the COVID-19 crisis, when lockdowns were implemented in most western countries with very poor outcomes, although governments still minimize the profound negative impacts that these lockdowns have had. The authors are unable to recognize (or at least have the will to critically assess) that globalization of the same erroneous measures (such as mass lockdowns) have the potential to be even more harmful. Instead, they call for more globalization and central control by organizations such as the WHO, which are largely subservient to funding from private interests, and the US and Chinese governments. As mentioned earlier the WHO declared monkey pox as a world pandemic, even though just over a hundred sixty people died from this virus. This declaration was against the recommendations of a WHO advisory panel, which was overruled by the WHO Director General Dr. Tedros Adhanom Ghebreyesus.³⁵ Once a pandemic is declared, this provides the excuse for imposition of emergency powers by many governments. Ultimately, the public must wonder how open-minded and critical these authors really are. Are they the best placed scientists to claim for an inquiry when they seem to have *a priori* decided what measures need larger/better implementation (*i.e.*, more extensive distribution of poorly tested mRNA products)?

In brief, this article seems to myopically focus on equity concerns regarding how low/middle income countries could have been better served in a health crisis by having access to the latest products available in the market (*e.g.*, by rerouting the excess of vaccines from rich countries to poor ones). The authors seem exclusively concerned about the high cost of new treatments and new

³⁵ (2022) WHO Director-General’s statement at the press conference following IHR Emergency Committee regarding the multi-country outbreak of monkeypox – 23 July 2022. World Health Organization. Retrieved from <https://www.who.int/director-general/speeches/detail/who-director-general-s-statement-on-the-press-conference-following-ihr-emergency-committee-regarding-the-multi-country-outbreak-of-monkeypox--23-july-2022>

technologies, and how these novel products could be made available not only in rich countries but also in poor ones. In other words, how to grow the market for new medical technology globally, which seems more of a business concern, when we consider that new molecules/products are the cornerstone of high profit business for pharmaceutical companies. Interestingly, the authors never question why this should be the default option to solve all new health problems. Do the authors forget that “new” is not a synonym of “better”, and that adaptation of already available technologies and drugs must also be considered, especially when the situation demands efficiency? The lack of consideration of alternative approaches that could be especially valuable in low-income countries makes the message of this article unbalanced and the conclusions questionable.