

Dear COVID-19 Inquiry Panel,

Thank you for the opportunity to make a submission regarding Australia's COVID-19 response. I have recently graduated from Medical school [REDACTED] and will shortly commence working as a junior doctor. I became a doctor because I wanted to be there to support people in their most vulnerable times, and be able to improve the health of the Australian population.

Throughout my degree, the world saw the dark consequences of a global pandemic, and this impacted my own education significantly, as well as the health and safety of many people I met through working in the COVID-19 Vaccination Clinics.

I was excited to see Australia announce the creation of a Centre for Disease Control, and this seems like the next logical step in the wake of COVID-19.

Throughout my course, our public health lecturers taught us the old proverb: "prevention is better than the cure". This seems especially true in pandemics. Pike et al in "The Origin and Prevention of Pandemics" show that the "wait-and-respond approach is not sufficient and that the development of systems to prevent pandemics before they are established should be considered imperative to human health."

My submission is focused on a couple of key issues, but my overall view is that pandemic prevention should be a key priority of the CDC and that we should not simply concede that pandemics are inevitable.

Nature can produce pathogens that are extremely infectious (eg measles: estimated R0 of 15-20) Nature can also produce pathogens that are extremely fatal (eg rabies: almost 100% death rate) Nature, however, is not known to produce pathogens that have both high transmissibility and high mortality.

Humans, driven by various motivations, could be on the verge of creating pathogens with both these features – risking pandemics much worse than COVID-19. Past events unfortunately indicate that humans have indeed resorted to biological weapons to harm others. The convergence of open science leading to the publication of dangerous knowledge, as well as the democratisation of synthetic biology, and AI-assisted research might mean that a small group of nefarious actors could cause catastrophic harm.

The Unabomber, Theodore Kaczynski, and the Aum Shinrikyo cult both engaged in terrorism motivated by bringing the end of civilisation. If active in the year 2023, it is conceivable that COVID-19 would have inspired them to seek to engineer a pandemic pathogen. An Aum Shinrikyo member who had a virology PhD attempted to make the anthrax pathogen more lethal. Similarly, the Unabomber was a mathematics prodigy and professor, who could leverage emerging technologies to further his goals.

Preventing the next pandemic requires making sure that highly skilled bad actors never have the capability to engineer a novel pathogen. However, a variety of trends are making this a realistic possibility. Open science norms – while typically essential to modern science – sometimes allow the publication of dangerous material. While the scientists who published the genomic sequences of the smallpox virus perhaps didn't foresee a future where the synthesised DNA was readily available, that information cannot be “unpublished”. I recommend that the inquiry read “Information Hazards in Biotechnology” (2018) by Lewis et al for a deeper understanding of this risk and more examples, including Mousepox and Botulinum toxin H.

Public commentary has focused on the possible origins of COVID-19, including whether it was a “lab leak”. Regardless of the specifics of COVID-19 specifically, I've been shocked to learn about the high rate of safety incidents at labs handling dangerous pathogens. A publication from Manheim and Lewis found that from 1975-2016 there were 71 reported high-risk human-caused pathogen exposure events – as well as evidence of underreporting.¹ A lab leak also likely began the 1977 flu pandemic.

Given pandemics can cost millions of lives, it seems clear that safety standards (or adherence to standards) fall far short of what is appropriate. While I'm firmly in favour of science, and think that science is a force for good in fighting pandemics, it has to be done responsibly.

As an outsider, there is little transparency about how physical containment facilities in Australia are regulated. The Office of the Gene Technology Regulator seems to focus mostly on GMOs and provides little information about its functions regarding physical containment facilities.

To the extent that information is available, OGTR's 2022-23 annual report is proud that it certified a record 132 physical containment facilities last year, meaning that there are now 1,874 “high-level” facilities operating in Australia. It also reports that it only conducted 49 inspections in the same period, including no inspections of the highest-level PC4 facilities.

Reviewing older reports, no PC4 facilities were inspected in 2021-22 either, and only 1 inspection occurred in 2020-21. Despite only conducting 49 inspections in 2022-23, 26 certified physical containment facilities were found to be non-compliant. In this context, the report noted that OGTR takes a “cooperative approach” to compliance and that no culpability was found in any of these cases.

In addition to seeming shortcomings in oversight, the guidelines themselves are troubling. The rules for PC4 facilities were last updated in 2007 and reference standards like AS1324.1 on air filters and AS/NZS 2243.3 on lab safety, which don't appear to have been updated since 2001 and 2002 respectively. AS1324.1 specifically has been criticised by the HVAC industry for being based on inaccurate research from the 1950s and has now been superseded by ISO 16890.

¹ David Manheim and Gregory Lewis, 'High-Risk Human-Caused Pathogen Exposure Events from 1975-2016' (2022) 10 F1000Research 752.

This is not necessarily a criticism of OGTR. OGTR only has 51 employees and has wide-ranging regulatory functions apart from these topics.

Overall, this snapshot paints a grim picture of the state of regulation in Australia, and one that I think falls far short of public expectations about how seriously these issues would be taken. Before reading into this, I would have guessed that PC4 facilities comply with cutting-edge global standards that account for emerging technology, and would each be inspected several times per year.

I think the Inquiry should also task the new CDC with responsibility for tracking the risk that a bad actor could create a pathogen with pandemic potential, and ensuring that safeguards remain one step ahead of that risk.

I think that this Inquiry should recommend a thorough review of biosafety – including the suitability of requirements, degree of adherence, and adequacy of oversight – for all research that involves human or animal pathogens. The review should include a risk assessment that takes into account the potentially catastrophic global consequences of errors, and ensures that our approach to mitigation is proportionate to that risk.

Since ancient times, the scope of public health has been increasing. Contemporaries would have thought that lenses in microscopes, the design of sewers, citrus on ships or a hundred other things had little to do with public health. However, expanding the scope of public health to include emerging issues and new technologies has directly led to substantially better outcomes.

This inquiry is a chance to put new and emerging topics at the forefront of how we think about pandemics. Whether it's harnessing the benefits of metagenomic sequencing or addressing the risks of AI – I think it's essential that this Inquiry look to the risks and opportunities of the future.

Thank you for your consideration.
Sarah Winthrop

Citations:

[Revisiting Aum Shinrikyo: New Insights into the Most Extensive Non-State Biological Weapons Program to Date](#)

[The Words of a Killer How the Unabomber's writings helped lead investigators to his door 25 years ago](#)

[Information Hazards in Biotechnology - Lewis - 2019 - Risk Analysis - Wiley Online Library](#)

[OGTR Annual Report 2022-23](#)

[Australian Government Department of Health and Aged Care, Office of the Gene Technology Regulator Annual Report 2021-22 \(ogtr.gov.au\)](#)

[Guidelines for the certification of physical containment facilities | Office of the Gene Technology Regulator \(ogtr.gov.au\)](#)

[Bringing the Australian air filter standard up to speed - HVAC&R News \(hvacrnews.com.au\)](#)