

Dear COVID-19 Response Inquiry Panel,

I appreciate the chance to contribute my insights and personal experiences regarding the Australian Government's handling of the COVID-19 pandemic. As a Research Fellow at Monash University, my academic background and professional experience means that I have some understanding of the background of this matter.

I strongly advocate for the inquiry to focus on the importance of pandemic prevention. Modern societies possess the capabilities to avert the emergence of new pathogens and to detect and eradicate them early on. Considering the immense human and economic toll of pandemics, and the potential for even more severe outbreaks than COVID-19, prioritizing prevention is essential.

The study titled "[*The costs and benefits of primary prevention of zoonotic pandemics*](#)" authored by Bertstein in 2022, presents a compelling economic argument for prioritizing pandemic prevention. This research demonstrates that substantial investments in prevention are not only feasible but also highly beneficial, even under conservative estimates and without factoring in the prospective contributions of emerging technologies.

Consequently, I suggest that the newly established Australian Centre for Disease Control should prioritize measures to thwart the emergence of new pathogens and ensure effective management in case they do surface.

This submission is mainly aligned with the 'preventive health measures' outlined in the third term of reference.

The valuable diagnostic resources and expertise developed during the COVID-19 crisis should be retained and repurposed for broader public health applications, rather than being decommissioned. Utilizing clinical metagenomics and wastewater testing, along with monitoring at airports, cruises, and other points of entry, can greatly enhance the National Notifiable Diseases Surveillance System (NNDSS). This approach not only provides a wealth of data but also ensures regular testing for novel pathogens using metagenomic sequencing. Maintaining this infrastructure in a ready state would facilitate a more rapid expansion of diagnostic capabilities in the event of a future pandemic, a necessity we have experienced first-hand in controlling the spread of infectious diseases. Jaime Yassif, during a testimony at the U.S. House Hearing on "Biosecurity for the Future: Strengthening Deterrence and Detection," emphasized that:

"Sustainably financed systems for early detection and robust response can stop outbreaks at the source before they evolve into global pandemics"

For effective early detection, systems must be consistently funded and safeguarded against budget cuts. Establishing a public health monitoring system that remains functional during normal times and crises is a key strategy.

The inquiry should delve into various diagnostic methods and technological advancements, such as clinical diagnostics, wastewater monitoring, and surveillance at airports, cruises, and other entry points. It's vital to understand the latest developments in metagenomics (both clinical and wastewater), CRISPR-based diagnostics, and enhancements in PCR and LAMP technologies, including multiplexing approaches.

Additionally, the inquiry should review the emerging models on cost-effectiveness, along with potential challenges identified in literature, to inform the development of an early detection system. For instance:

1. [Sharma et al. \(2023\) in "Threat Net: A Metagenomic Surveillance. Health Security"](#) estimate that with a budget of \$400-800 million, there's a 95% probability of detecting a novel respiratory pathogen similar to SARS-CoV-2 after 10 emergency department presentations and 79 infections across the US.
2. [Liu et al.'s pre-print \(2023\)](#) discusses early detection strategies for mitigating COVID-19 and future pandemics, suggesting that hospital monitoring could have detected COVID-19 approximately 1000 cases earlier, and wastewater surveillance could serve as an early warning system for pandemics with lengthy incubation periods.
3. [Wegryzyn et al. \(2022\) in "Early Detection of Severe Acute Respiratory Syndrome Coronavirus 2 Variants Using Traveler-based Genomic Surveillance at 4 US Airports."](#) published in Clinical Infectious Diseases, provided early warning of variant detection, identifying the first Omicron BA.2 and BA.3 cases in North America.
4. [Liang et al. \(2023\) in "Managing the Transition to Widespread Metagenomic Monitoring: Policy Considerations for Future Biosurveillance."](#) outlined policy challenges for a successful sequencing-based public health monitoring system over the coming decades.
5. Research by SecureBio and MIT's Sculpting Evolution group (<https://naobservatory.org/>) on monitoring for exponentially increasing nucleic acid sequences, as pandemic potential viruses also show exponential increases in their nucleic acids.
6. [Ghouneimy et al. \(2023\) in "CRISPR-Based Diagnostics: Challenges and Potential Solutions toward Point-of-Care Applications."](#) explores the costs and potential settings for CRISPR-based diagnostics.

Our preparedness and response to the next pandemic will largely depend on our ability to detect and understand new pathogens swiftly. The significance of this is reflected in every aspect of the terms of reference. Therefore, investing in pathogen-agnostic early detection systems now is crucial to stay ahead of future pandemics. Given the pivotal role of PCR diagnostics in controlling case numbers before widespread vaccine adoption, it would be almost negligent not to enhance our diagnostic capabilities in anticipation of the next pandemic. I recommend that the Inquiry urge the new CDC to investigate the advantages of a pathogen-agnostic early detection system, considering both its immediate public health benefits and its potential as a long-term early warning system for pandemics.

Continuing from our previous discussion on enhancing diagnostic capabilities and early detection systems, I additionally recommend the Inquiry turn its attention to supporting industry amidst labor shortages, as outlined in Terms of Reference 5. A crucial resource for this consideration is the paper by Gopal et al from the Geneva Centre for Security Policy, titled "[Securing Civilisation Against Catastrophic Pandemics](#)."

This paper commences by examining the escalating risks of pandemics, particularly those that might be engineered, and introduces a critical differentiation between "stealth" and "wildfire" pandemics. This distinction has profound implications for our policy-making approach. A key point raised in the paper is the vulnerability of critical infrastructure during a pandemic more severe than COVID-19. The potential absence or inability of essential workers, due to illness or unwillingness to risk exposure, could lead to a swift breakdown of our interconnected society. The ensuing secondary effects, like the failure of electricity and other essential services, could have far greater impact than the direct consequences of the virus itself.

In this context, when considering support for industry, the primary objective should be ensuring the functionality of essential services during a more severe future pandemic. If critical infrastructure collapses, other measures such as financial or community support may become moot or unfeasible.

A notable recommendation from Gopal et al is the development of “pandemic-proof personal protective equipment” (P4E). This equipment is vital for key workers in sectors like food, water, power, and law enforcement, providing them with the assurance that they can work safely without risking their own health or that of their families. The paper outlines specific requirements for such protective gear.

Furthermore, the paper delves into identifying essential workers, preparing the workforce and supply chains, and exploring social and technological strategies to mitigate the spread of future pandemics.

I suggest that the inquiry thoroughly review “Securing Civilisation Against Catastrophic Pandemics” and consider it a foundational element for further recommendations. Our foremost priority should be to implement measures that eliminate the possibility of worst-case scenarios. Only then can we effectively address other aspects of the terms of reference, confident in our ability to avert societal collapse.

Building on the crucial insights from "Securing Civilisation Against Catastrophic Pandemics," we understand the importance of being prepared for the most severe scenarios. History has shown us that major public health triumphs result from innovative individuals introducing new ideas and perspectives to health challenges. With the expansion of public health's scope, its capacity to enhance life expectancy and quality of life has also grown significantly.

The core aim of this inquiry's terms of reference is to improve our future responses. In light of the potentially catastrophic nature of future pandemics, prioritizing pandemic prevention is imperative, as is keeping essential services running if such a calamity is to again come to pass. This not only involves acknowledging the possibility of pandemics emerging in novel ways but also requires open-mindedness about emerging technologies and unexpected topics. These are the areas that hold immense potential in shaping a healthier future.

Therefore, the focus should be on embracing innovation and anticipating the unexpected. By doing so, we can develop a public health system that is not just reactive but proactive in preventing crises, thereby ensuring the safety and well-being of future generations.

Sincerely,
Ariel Zeleznikow-Johnston
Research Fellow, Monash University