My submission emphasises the importance of Australia adopting a new strategy which pivots towards proactive pandemic prevention rather than remaining in a reactive mode of preparation.

In terms of my personal experience as a university student throughout COVID-19, I felt it impacted my education and employment opportunities hugely. I spent the majority of my time indoors with little real social interaction, and the opportunities available to me decreased hugely – for example, I was unable to go on a planned international university exchange during this period and many employers I was interested in working for were accepting much lower numbers for internships, or not at all. I was also unable to visit my elderly grandparents who lived overseas, which is important to me.

I know I am not the only young person who went through this - I noticed my close friends experiencing the same hardships.

The government's efforts should not just be limited to managing the fallout of a pandemic but should primarily focus on preventing one. Despite significant investments in mitigating other natural disasters, especially in light of climate change, there seems to be a lack of parallel action towards reducing pandemic risks. This is concerning,

This perspective informs the remainder of my submission.

Indoor Air Quality and emerging technology

In my view, the Australian government should establish practical and clear regulations and standards to govern Indoor Air Quality (IAQ), with an emphasis on areas of high risk. Exposure to indoor airborne pathogens annually compromises the health of Australians, posing a particular threat to the most vulnerable among us, including the elderly and those with weakened immune systems. Improving IAQ controls would not only shield us from existing and future pandemics but also mitigate health issues associated with other hazards, such as non-pandemic respiratory diseases.

Even though Australians spending approximately 90% of their time in indoor environments, the Australian Department of Climate Change, Energy, the Environment and Water points out that the country lacks comprehensive IAQ controls, aside from limited regulation by Work Safe Australia. In the absence of nationwide standards and codes outlining minimum performance requirements for infection control, my concern is that we may resort to inadequate interventions that offer minimal protection against pathogens.

By instituting clear and effective IAQ Australia standards and practices, we would establish measurable air quality objectives aimed at minimising pathogen transmission. Without such targets, my fear is that manufacturers and innovators may produce products that fall short in purifying indoor air to levels necessary for reducing pathogen transmission. IAQ standards, informed by the most current scientific research in respiratory diseases, air filtration and sanitation, public health, and behavioural science, would foster a regulatory environment conducive to effective IAQ interventions for the Australian public. Further, explicit requirements should be included for high-risk settings where airborne infections could pose life-threatening risks, such as aged care homes, hospitals, healthcare facilities, and other centres caring for the immunocompromised.

The Lancet COVID-19 Commission Task Force has proposed Non-infectious Air Delivery Rates (NADR) – meaning we now have measurable ventilation and filtration targets to protect against infectious disease transmission. While the Task Force acknowledges ongoing debates around the optimal metrics and targets, there is consensus that current

practices are inadequate. I urge the Inquiry to review this report for a deeper understanding of the factors involved in setting effective IAQ codes and standards.

The Australian Building Codes Board (ABCB) could potentially formulate these IAQ codes and standards within the National Construction Code. The ABCB could leverage the expertise of the Australian Commission on Safety and Quality in Health Care and the Australasian Health Infrastructure Alliance (AHIA) and build upon the existing IAQ work conducted by the ABCB. ASHRAE Standard 241, Control of Infectious Aerosols, could also contribute to the development of these codes and standards.

Implementing clear IAQ codes of practice and standards will help protect Australians from airborne pathogens in indoor settings. With a suitable regulatory environment, we can curb pathogen spread, ease the strain on our public health system, and safeguard our most vulnerable community members.

Improving laboratory safety

There discussions about the origins of COVID-19 has drawn attention to the safety of BSL-3 and BSL-4 labs. This includes the safety of Australia's Physical Containment Level 3 and 4 (PC3 and PC4) facilities. This issue is within the scope of the inquiry – it pertains to the overarching goal of improving Australia's resilience for future pandemics and considering what role the Commonwealth has to play as a regulator.

I understand there are a spectrum of views among experts about the safety of current lab practices. This difference of opinion largely arises depending on whether one views it from the angle of a specific institution or from a global standpoint. Given that pandemics do not discriminate, a global outlook when evaluating our risk tolerance seems vital. Historical instances such as the last smallpox death resulting from a lab leak in 1978, SARS virus escaping labs multiple times in the early 2000s, and a US military lab inadvertently sending out live anthrax spores samples to 192 labs across eight nations in 2015, make it evident that lab leaks are a real concern.

The Office of Gene Technology Regulator (OGTR) is responsible for issuing guidelines for certifying different categories of physical containment facilities in Australia. the last time these guidelines for PC4 facilities were updated was way back in 2007 – over a decade and a half ago. The obsolete nature of these regulations results in various issues. For instance, clause 32 provides criteria for the HEPA filtration of exhausts from PC4 facilities. However the 2007 guidelines reference AS 1324.1 and AS 1324.2 from 2001 and 1996 respectively. AS 1324.1 is based on EN779 from 1993. In Europe, EN779 was superseded by ISO16890 in 2016. This update was crucial as it was found that the EN779 (and therefore AS 1324.1) greatly overestimated the efficiency of PM2.5 filtration in some cases by not considering electrostatic charge.

This indicates that since at least 2016, we have been aware that the filtration of exhausts from PC4 facilities might be only half as efficient as intended, but the OGTR has seemingly made no move to mitigate this risk.

This risk is further amplified by the fact that the OGTR's annual reports show no inspections of PC4 facilities were conducted in the 2022-23 or 2021-22 reporting years and only a single inspection was carried out in 2020-21.

I present this critique not with any animosity towards the OGTR. With a workforce of around 50, the OGTR has multiple responsibilities and overseeing PC3 and PC4 facilities is not its main function.

It’s alarming that a cursory review of the regulations and oversight of these facilities in Australia demonstrates what appears to be serious deficiencies in the standards that I would expect for such important work. At the very least, considering the importance of public trust, I believe that the Inquiry should advocate for an independent review of the current regulatory and oversight systems, the safety of these facilities, and the public's expectations of their safety to assure there isn't a genuine risk of a future pandemic stemming from a lab leak. If those experts who believe there is no cause for concern are correct, an independent review of this nature could help clarify to the public why that is so.

Concluding statement

I believe that pandemics represent one of the most significant challenges we face in the current era, and the expert opinion that the threat of pandemics is on the rise is deeply concerning. It's crucial that this investigation thoroughly explores potential origins of future pandemics and provides explicit suggestions to mitigate their occurrence. This should encompass not only traditional sources of disease, like zoonotic transmission, but also more modern risks such as laboratory accidents.