My submission underscores the necessity for Australia to prioritize proactive measures in preventing future pandemics rather than solely focusing on preparedness. As a young Australian, the profound impact of COVID-19 has prompted significant disruptions in my life, affecting aspects such as education and relationships. I perceived a vulnerability within my demographic—both socially and economically—leaving us less resilient in the face of adversities.

While acknowledging the importance of exploring ways the government can enhance support for individuals and communities during future pandemics, it is crucial to recognize that even the most well-managed response can result in devastating consequences. Therefore, the primary objective should be centred around pandemic prevention.

I am aware of the substantial investments made by Australian jurisdictions in hazard reduction for other natural disasters, particularly in response to climate change. However, there seems to be a noticeable absence of similar initiatives aimed at reducing the likelihood of pandemics, despite the evidently higher risk to the average Australian.

In this context, I would like to address several key issues that I believe are pivotal in steering our efforts towards effective pandemic prevention.

I advocate for the establishment of comprehensive codes of practice and standards by the Australian government concerning Indoor Air Quality (IAQ), coupled with the implementation of regulations specifically targeting high-risk spaces. Annually, Australians suffer from illnesses attributed to exposure to airborne pathogens in indoor settings. The elderly and immunocompromised individuals, among the most vulnerable in our community, face heightened risks in such environments. Strengthening controls on IAQ not only bolsters our defense against current and future pandemics but also mitigates adverse health effects stemming from other hazards like indoor smog, toxic materials, non-pandemic respiratory diseases, and other recognized airborne health threats.

Despite Australians spending over 90% of their time indoors, the Australian Department of Climate Change, Energy, the Environment, and Water notes the absence of specific IAQ controls, aside from limited regulations specified by Work Safe Australia. Lacking nationalized standards and codes outlining minimum performance requirements for infection control, there's a concern that the nation may resort to ineffective interventions that offer minimal protection against pathogens.

The introduction of clear and effective codes of practice and standards for IAQ in Australia would establish precise metrics and targets for air quality, aiming to minimize pathogen transmission. Without such metrics and targets, there's a fear that manufacturers and innovators might develop products insufficient in purifying indoor air to levels conducive to reducing pathogen transmission. Establishing evidence-based IAQ standards, informed by the latest scientific research in respiratory disease, air filtration and sanitation, public health, and behavioral science, is crucial to creating the right regulatory environment for effective IAQ interventions available to the Australian public. Additionally, specific requirements should be outlined for high-risk environments, such as aged care facilities, hospitals, healthcare facilities, and other places caring for the immunocompromised, where airborne infections can be potentially life-threatening.

The Lancet COVID-19 Commission Task Force recommends Non-infectious Air Delivery Rates (NADR) as measurable goals for ventilation and filtration targets to protect against infectious disease transmission. Acknowledging ongoing scientific debates on optimal metrics and targets, the Task Force emphasizes the inadequacy of current practices. I

recommend that the Inquiry reviews the Task Force's report to gain insights into setting effective codes and standards for IAQ.

IAQ codes and standards could be defined by the Australian Building Codes Board (ABCB) within the National Construction Code. The ABCB could tap into the expertise of the Australian Commission on Safety and Quality in Health Care, the Australasian Health Infrastructure Alliance (AHIA), and leverage existing IAQ work done by the ABCB. ASHRAE Standard 241, Control of Infectious Aerosols, may also provide valuable insights in formulating these codes and standards.

I firmly believe that clearer codes of practice and standards for IAQ can safeguard all Australians against airborne pathogens in indoor environments. With the right regulatory framework, we can curtail pathogen spread, alleviate the burden on our public health system, and protect the most vulnerable members of our community.

In exchange for cheap meat from factory farms, people are dying of bacterial infections that were trivial to treat a few decades ago and facing escalating rates of pandemics that devastate lives and livelihoods. Simply put, factory farms are pressure cookers in which nature cooks up novel pathogens. According to the UN, there will be an estimated 10 billion people in 2050. Without paradigm shifts in industry or culture, I'm concerned that accelerating demands for meat will only increase and intensify these risks.

Intensive farming practices produce inexpensive meat due to the supposed efficiencies of increasing livestock density. Animals are being packed closer and closer together in factory farms, breathing and defecating on top of each other. This environment is a breeding ground for novel pathogens whose evolution is accelerated by the density of hosts and the abundance of transmission routes. These practices have a negative public health externality in both antimicrobial resistance and pandemic potential viruses. The Inquiry shouldn't stand for industries that profit by endangering people in Australia and around the world.

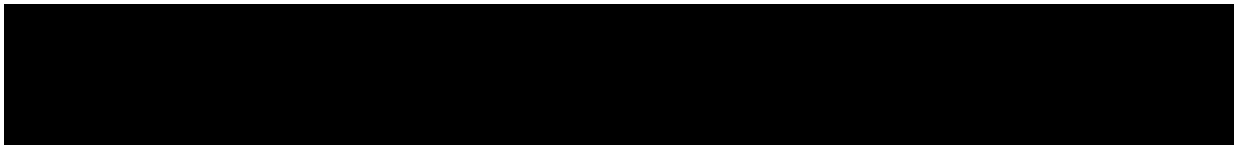
Antibiotics are fed to animals to reduce bacterial infections and boost growth – 70% of antibiotics produced globally are used in livestock, and estimates project that Australia will see a 16% increase in antibiotic usage in farming over the decade to 2030. This overuse is a driver of antibiotic-resistant infections globally. In 2020, antimicrobial resistance was attributed to 1,031 deaths, $439 million in costs of premature death and the loss of 27,705 quality-adjusted life years in Australia (). I understand that the Australian Government has worked with industry so that its "livestock and seafood industries [have] … little to no resistance to antimicrobials", and these steps should be lauded. However, this same approach to ensuring intensive animal farming doesn't risk human lives needs to be expanded to include viruses - they key cause of pandemics.

Viruses with pandemic potential often originate in wildlife but can cross the species barrier and pose a catastrophic risk to Humans. Wildlife are natural hosts for viruses that can persist without causing significant harm to the animals. Occasionally, these viruses can spill over from wildlife to livestock in farms. In these farms, the viruses encounter new environments and species, providing opportunities for genetic recombination and adaptation. This process can enhance the virus's ability to infect and transmit among different hosts, including humans. The proximity of wildlife, livestock, and humans in certain settings, such as live animal markets, live exports, abattoirs or factory farms, increases the likelihood of interspecies transmission events, potentially leading to the emergence of novel and more transmissible viruses with pandemic potential.

We now know that the 2009 H1N1 flu pandemic which caused an estimated 284,000 excess deaths originated first in swine farms in central Mexico. This quote taken from peer reviewed paper “Origins of the 2009 H1N1 influenza pandemic in swine in Mexico”:

“ This highlights the critical role that animal trading plays in bringing together diverse viruses from different continents, which can then combine and generate new pandemic viruses.“

Australia needs to drastically decrease the pathogen transmission risks from high animal densities in live legal or illegal animal trade, live animal exports and factory farming. Australia’s biosecurity strategies need to require the industry to take practical steps to reduce these risks. Where the risks remain too great or the prevention of pathogen transmission is too costly, Australia has a duty to end these practices to avert pandemics and our slow death from antimicrobial resistance. The late epidemiologist Professor Mary-Louise McLaws, an expert in infectious disease control and a frequent voice during the COVID-19 pandemic, said on Channel 10’s The Project:



I think Australia can and needs to do better than Professor McLaws’ prediction.

In conclusion, the imperative to strengthen regulations for biosafety, particularly in laboratory settings, is a paramount consideration supported by public expectations. The insights from Gopal et al's analysis in "Securing Civilisation Against Catastrophic Pandemics" underscore the prevailing risk of dangerous pathogens leaking from labs, emphasizing the need for robust regulatory frameworks.

The inquiry should not overlook the concerning disparity in biosafety regulations in Australia, evident in infrequent updates for PC4 facilities and minimal inspections in recent years. This laxity contributes to a perception among Australians that biosafety is not taken seriously, warranting an urgent independent review of PC3 and PC4 facilities. This review should comprehensively assess risks, regulatory adequacy, compliance, oversight effectiveness, and explore measures to enhance public trust and international collaboration.

Turning attention to pandemic preparedness, the momentum gained in diagnostic and wastewater infrastructure during the COVID-19 response should not be dismantled but strategically redirected for ongoing public health benefits. This proactive pivot can be achieved by incorporating clinical metagenomics, wastewater testing, and regular testing at entry points into routine surveillance efforts, thereby contributing to the National Notifiable Diseases Surveillance System.

As the inquiry delves into the complexities of diagnostic technologies and early detection systems, it is crucial to acquaint itself with diverse sampling types and emerging technologies such as metagenomics, CRISPR-based diagnostics, and PCR/LAMP advancements. Comprehensive familiarity with cost-effectiveness models and potential obstacles will guide the formulation of an efficient early detection system.

The pressing need to invest in pathogen-agnostic detection systems is apparent, and the inquiry should direct the new CDC to explore the benefits of such systems for immediate public health advantages and their potential as an early warning system against future pandemics. Recognizing the pivotal role of quick and accurate pathogen detection, this proactive approach will contribute significantly to the overarching goal of safeguarding public health in the face of emerging infectious threats.