To Whom It May Concern,

Thank you for the opportunity to have my views about the Government's COVID-19 inquiry heard. My name is Bradley Tjandra, I am an actuary who saw the impact of the COVID-19 pandemic in terms of both human lives and economic impacts in my professional and personal life.

More than any other global catastrophic risk, we can prevent novel pathogens and identify and eliminate them if they do. Given the cost of pandemics on Australia – and that pandemics worse than COVID-19 are possible – prevention should be our top priority. This is why I believe the inquiry should put a special focus on pandemic prevention.

The paper "The costs and benefits of primary prevention of zoonotic pandemics"[1] (Bertstein 2022) outlines the economic benefits of pandemic prevention. Even with conservative assumptions, and without accounting for the potential benefits of emerging technologies, there is strong justification for investing in pandemic prevention.

Considering this, the new Australian "Centre for Disease Control" should be focussed on preventing novel pathogens from emerging and being able to control them if they do.

My submission goes primarily to 'preventive health measures' in terms of reference 3.

Research tells us that the likelihood of zoonotic pandemics is greater than we think and on the rise[2]. Land use change, travel and trade, and climate change are known drivers of the emergence of novel pathogens[3]. While we can't stop all these things, the Inquiry should recommend practical interventions that reduce their risk domestically as well as international approaches that encourage others to do the same.

1. **Land use** change is a known driver of disease spillover from animals to humans[4]. E.g., the spillover of the Hendra virus into horses and humans in Queensland was partially attributable to increased nutritional stress and fragmentation of flying fox habitats vaused by urbanisation[5].
2. **Travel and trade** can contribute to the spread of disease. There are concerns that activities like the movement of live animals through legal (live animal exports) and illegal (smuggling) trade may propagate spillover risks at each point. Coronaviruses carried by pangolins confiscated from the illegal wildlife trade in Vietnam have been found to originate in Yunnan and Guangxi, China. These are the provinces in which bats have been found to carry SARS-related coronavirus most similar to SARS-CoV-2.
3. **Climate change** will increase the spillover risks from anthropogenic land use. At least 10,000 virus species have the ability to infect humans but, at present, the vast majority are circulating silently in wild mammals. Changes in climate and land use will lead to opportunities for viral sharing among previously geographically isolated species. By 2070, it is expected that there will be 300,000 novel animal pair encounters globally. In other words,

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[1] The costs and benefits of primary prevention of zoonotic pandemics - PMC (nih.gov)
[2] Intensity and frequency of extreme novel epidemics - PubMed (nih.gov)
[3] The Need to Prioritize Prevention of Viral Spillover in the Anthropopandemicene: A Message to Global Health Researchers and Policymakers
[4] Land use-induced spillover: a call to action to safeguard environmental, animal, and human health - PubMed (nih.gov)
[5] The emergence of Hendra virus from flying foxes (Pteropus spp.)

climate change will double the opportunities for one of the estimated 10,000 viruses in wildlife to move between species[6].

In all three of these cases, it's open to the Inquiry to recommend that Australia, including through national and jurisdictional biosecurity strategies, include practical interventions and programs to treat both the underlying trend and the risks it creates.

Further, while I understand that assisting foreign governments is not in the terms of reference of this Inquiry, international policies to support Australians at home are in scope. In that context, the Inquiry should consider recommendations that leverage Australian international leadership to pursue global pandemic prevention that keeps Australians safe wherever they are.

Given our special relationship with the Asia-Pacific, regional capacity building can be a key contribution to global public health. At least 4 out of 9 pandemics that have occurred since 1900 originated from Asia, due to high population density and proximity of animals to the population[7]. Good work is already being done by the Indo-Pacific Centre for Health Security[8]. Given the growing importance of this work, the Inquiry should consider making recommendations about how it could be appropriately expanded and focused on pandemic prevention. This might include investments into projects relevant to mitigating risks due to land use change, trade and travel, and climate change, as well as thinking about how innovative approaches to pandemic prevention recommended by this Inquiry could be spread in our region.

We can also build further our record of international leadership. Australia is a member of the International Experts Group of Biosafety and Biosecurity Regulators. Australia also advocates for chemical and biological weapons security and non-proliferation, including through the formation of the Australia Group to harmonise export controls for chemical and biological weapons[9]. We could build on this track record and help keep Australians safe by:

Acting on the recommendation of Global Health Security Index's 2021 report on Advancing Collective Action and Accountability Amid Global Crisis by regularly reporting to the World Organisation for Animal Health (OIE) on incidence of human cases of zoonotic disease. This is a critical global norm and we should help establish it.

Recommending that the Foreign Minister consider including in free trade agreements that relate to animals and animal products something akin to a "national treatment" obligation that requires the other trading partner to meet or exceed the standards and practices to prevent zoonoses. Through this mechanism, Australia could adopt best practices domestically, and then encourage our trading partners to adopt similar practices - ultimately making Australia and the world safer.

Preventing future pandemics should pair efforts at stopping pathogens from emerging, with ensuring we have the plans and technologies to rapidly combat them if they do.

Taking 17 November as the date of first human SARS-COV-2 infection, there were 44 days between first infection and first response (31 December 2019), 54 days between first infection and genome publication (10 January 2020), and 67 days between first infection and the lockdown of Wuhan (23 January 2020). For SARS-CoV-2, this was enough time to spread across the world. Modelling shows

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[6] Climate change increases cross-species viral transmission risk

[7] A visual history of pandemics | World Economic Forum (weforum.org)

[8] Homepage | indopacifichealthsecurity.dfat.gov.au

[9] The Australia Group — The Australia Group (dfat.gov.au)

that if Wuhan had locked down one (16 Jan), two (9 Jan) or three weeks (2 Jan) earlier, cases of COVID-19 in Wuhan could have been reduced by 66%, 86% or 95% respectively.

Despite this failure, we know that success is possible. We can stop an outbreak from turning into a pandemic if we can quickly enact the right response. During the first year of COVID-19, both Taiwan and New Zealand achieved 100 consecutive days free of community transmission. This was largely due to an understanding of the seriousness of SARS-CoV-2 while case numbers were low. The 2002-2004 SARS, ebola, and many other examples also demonstrate that containment is possible.

I think everyone in the world would wish that Wuhan had the capability to detect a novel pathogen outbreak, disseminate information, and respond in a timely manner. Early detection and action could have lead to containment rather than a pandemic – saving millions of lives and trillions of dollars.

However, in Australia, we are in no position to criticise China. We also don't have early detection capacity and we don't have plans to contain novel pathogens at jurisdictional or national levels. When a novel pathogen emerges here, we are also unlikely to be able to identify it and act early enough to prevent it from spreading beyond our shores.

We can build such systems now and get ahead of the next pandemic.

This Inquiry should recommend that the CDC write a white paper proposing options for a national system for the early detection of pathogens, including setting out the costs and benefits of such a system, and put it to the government before the end of 2024. The white paper should explore a mix of proven techniques and emerging technologies - including metagenomics. The goal should be an enduring system that can protect the lives and livelihoods of Australians from the next pandemic.

I think pandemics are one of the most important issues of our time, and expert assessments that the risk of pandemics is increasing are alarming. I think this inquiry should carefully consider how future pandemics could start and ensure it makes specific recommendations to reduce their likelihood. This should include the known mechanisms that have been with humans since time immemorial, such as zoonoses, as well as more recent risks, such as lab leaks, and emerging threats, such as engineered pathogens.

Warm regards,

Bradley Tjandra