Response to Commonwealth Government COVID-19 Response Inquiry

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Overview

We are responding to only one of the Terms of Reference of the COVID-19 Response Inquiry, namely:

Key health response measures (for example across COVID-19 vaccinations and treatments, key medical supplies such as personal protective equipment, quarantine facilities, and public health messaging

We have, collectively and separately, published extensively on COVID-19 in the peer-reviewed academic literature including in: *Sage Open, Journal of Public Health, PLOS Global Health, PLOS ONE, Economic Analysis and Policy*, and *Royal Society Open Science*. A list of these publications is attached.

Our submission is focussed on the effectiveness of lockdown in Australia and other countries as means to reduce the contagion of COVID-19 and is based on peer-reviewed publication by Chu et al.[1] (2023) in *Sage Open* from November 2023 based on data from 2020-22 for three countries: Australia, Canada, and the United Kingdom.

Key Findings for Australia, Canada, and United Kingdom

Many countries mandated social distancing measures during the COVID-19 pandemic of 2020-22 that variously included opening hours restrictions on hospitality and retail, economy-wide lockdowns, and additional international border controls. We analysed whether more restrictive (hereafter, closures) or less restrictive (hereafter, openings) social distancing measures changed the short-term trends in the number of COVID-19 cases, hospitalisations, and ICU patients in Australia, Canada, and the United Kingdom. Our analysis uses a 'before-and-'after' trend analysis (decremental/incremental and growth/decay trends) to compare the trends of epidemic indicators before and after each closure or opening event. Results show that, in general, and for these three countries: (a) closures resulted in reduced trend growth and (b) openings resulted in increased trend growth for the three selected measures of public health.

Our results provide a robust finding, independent of statistical and model assumptions and framing, that mandated lockdowns were effective at controlling the growth in COVID-19 in 2020-21 for the three selected countries. These results are important counter evidence to a narrative that mandatory social distancing measures, including mask wearing, are either ineffective or not required for controlling airborne infectious diseases such as COVID-19.

Findings for Australia

Figure 1 summarises COVID-19 outbreaks in Australia and shows major lockdowns (in black vertical lines) and openings (in purple vertical dashed lines). COVID-19 restrictions in Australia began with a nationwide lockdown in March 2020, with subsequent lockdowns implemented by state governments. The (first) national lockdown was implemented by the federal government, supported by all state and territory governments, as an emergency response to the first outbreak of the disease in Australia. This national lockdown coincided with the closure of the international border to non-citizens.

After the initial outbreak, federal public health restrictions started to ease from late April to May 2020. When a second COVID-19 outbreak emerged in the state of Victoria in July 2020, a lockdown was reinstated in

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[1] L. Chu, R.Q. Grafton. T. Kompas and M-L McLaws. Effects of Closures and Openings on Public Health in the Time of COVID-19: A Cross-Country and Temporal Trend Analysis, Sage Open Volume 13, 4 https://doi.org/10.1177/21582440231207472

Melbourne, the second-largest city in Australia, and quickly upscaled to the entire state. This Victorian lockdown lasted until October 2020, i.e., the second vertical purple line in Figure 2. Subsequently, some short lockdowns were applied by both the New South Wales (NSW) and Victorian governments in response to COVID-19 outbreaks until late June 2021.

The third COVID-19 outbreak in Australia, triggered by the Delta variant, emerged in June 2021 and prompted a return to stringent lockdowns in both states. Beginning in October 2021, when the NSW state vaccination rate reached 70% of 16+ years population, the state government progressively relaxed its public health restrictions. In early December 2021, Australia's international borders were opened to citizens and their relatives, and shortly thereafter to all international visitors.
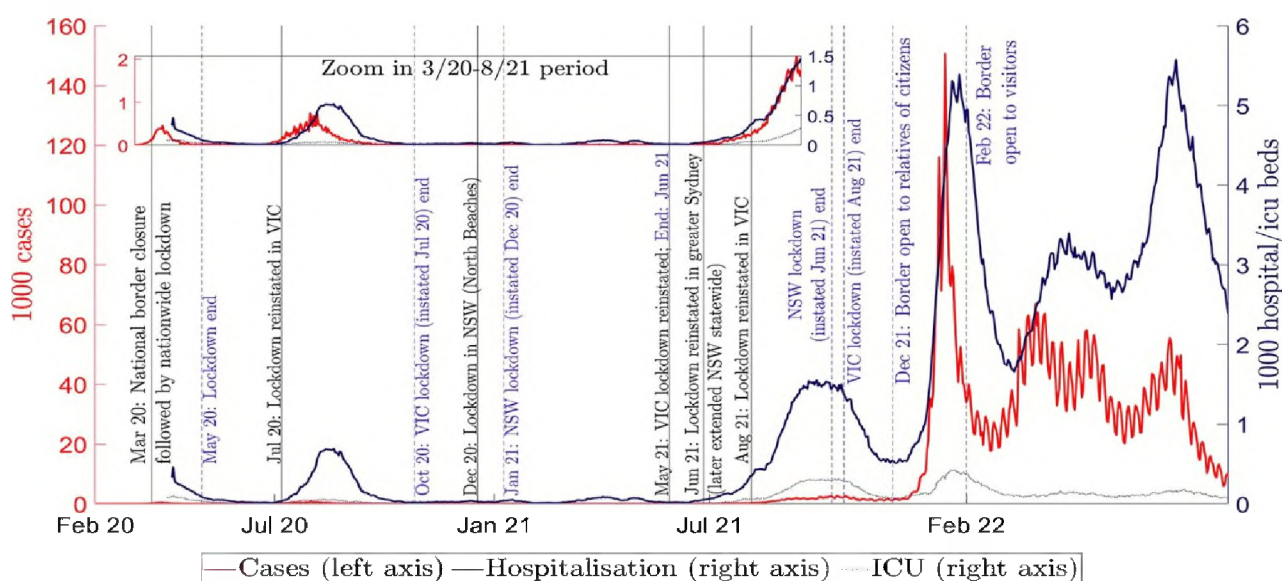
Figure 1. COVID-19 lockdowns and openings in Australia, 2020-2022

Table 1 summarises the trend analysis for Australia, namely, when there were beneficial changes in epidemic outcomes after lockdowns (in white rows) and when there were detrimental changes after openings (in grey rows). At the national level, Table 1 shows the impact of the international border closure and nation-wide lockdown measures. After Australia closed its international borders and instituted the first lockdown in March 2020, the number of cases continued to increase over the short-term, but the increasing trend was flattened in all considered scenarios, i.e., lower incremental rate and growth rate of epidemic indicators. When the national lockdown ended in early May 2020, the epidemic trends increased, at least in the short-term. When the international border was opened to the relatives of citizens in early December 2021, and to all international travellers in February 2022, the growth in COVID-19 increased relative to the pre-opening trends.

After April 2020, lockdowns in Australia were implemented by state governments. The most important, in terms of duration and stringency, was the Victorian lockdown that began in June 2020 (Grafton et al., 2021)[2]. Our trend analysis indicates this 2020 Victorian lockdown was highly effective at reducing the trend growth in COVID-19 cases. There were also beneficial trend growth changes

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[2] R.Q. Grafton, J. Parslow, T. Kompas, K. Glass and E. Banks (2021) Epidemiological Modelling of the Health and Economic Effects of COVID-19 control in Australia's Second Wave. Journal of Public Health, https://doi.org/10.1007/s10389-021-01611-0

associated with the Northern Beaches of Sydney outbreak in December 2020, another outbreak in Victoria in May 2021, and an additional outbreak in Greater Sydney in June 2021.

Table 1. Openings and Closings in Australia 2020-21

	Positive COVID-19 Cases			COVID-19 Hospitalisations			COVID-19 ICU patients		
	Mean (%)	Trend (%)	Growth (%)	Mean (%)	Trend (%)	Growth (%)	Mean (%)	Trend (%)	Growth (%)
Mar-20: National border closure followed by national closure	14	**100**	**100**	NA	NA	NA	NA	NA	NA
May-20: Closure end	**100**	**100**	**100**	0	**100**	**100**	0	**100**	**100**
Dec-21: Border open to relatives of citizens	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Feb-22: Border open to visitors	0	**100**	**100**	0	0	0	0	0	0
Jun-20: Closure begins in Victoria, starts in Melbourne	0	0	**100**	0	0	0	NA	NA	NA
Oct-20: Victoria closure (began June 20) ends	0	0	0	0	0	0	NA	NA	NA
Dec-20: Closure begins in New South Wales (North Beaches, Sydney)	0	**100**	**100**	NA	NA	NA	NA	NA	NA
Jan-21: New South Wales closure (began Dec 20) ends	0	**86**	**86**	NA	NA	NA	NA	NA	NA
May-21: Closure reinstated in Victoria (May 21)	43	**100**	**100**	NA	NA	NA	NA	NA	NA
Jun-21: Victoria closure (began May 21) ends	0	**100**	**100**	NA	NA	NA	NA	NA	NA
Jun-21: Closure begins New South Wales, starting fin Greater Sydney	0	**86**	**100**	NA	NA	NA	NA	NA	NA
Oct-21: New South Wales closure (began Jun 21) ends	0	**86**	**71**	0	**100**	**100**	0	**100**	**100**
Aug-21: Closure recommences in Victoria	0	0	14	**71**	**57**	**57**	NA	NA	NA
Oct-21: Victoria closure (began Aug 21) ends	0	0	0	0	0	0	0	**100**	**100**

Notes to Table 1.

1. 'Mean' 'Trend' and 'Growth' columns correspond to changes in the average, the linear trend, and the rate of change (growth rate) of epidemic indicators.

2.Numbers above 50% are in bold. NA values indicate inadequate data, for example, missing data or pre-closure numbers were small (all equal to 5 or below) for reliable trend analysis.

3. White (grey) cells represent the fraction of scenarios with beneficial (detrimental) changes after closures (openings), that is, slower increasing/growing (declining) or faster-declining (increasing) trends. If the number of COVID-19 cases, hospitalizations or ICU patients remained small (i.e., equal to or less than 5) during the entire evaluation period, we did not count it as an unwanted change regardless of their trend coefficients.