Suppression of SARS-CoV-2 after a second wave in Victoria, Australia

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Abstract

Countries around the world are experiencing a second wave of COVID-19 which is proving to be difficult to control. This report describes the combination of physical distancing, mandatory mask wearing, movement restrictions and enhanced test, trace and isolation efforts that can be used to successfully suppress community transmission to zero.

Key words: COVID, restrictions, pandemic

The Australian state of Victoria (population 6.49 million) has successfully suppressed a second wave of COVID-19 through mandatory mask wearing, strict physical distancing and movement restrictions, and enhanced test, trace and isolation efforts. As of December 9th, 2020 there have been a total of 27,993 cases in Australia with 908 deaths. Almost three quarters of these cases and 820 of the deaths have been in Victoria. Here we report how Victoria has been able to suppress SARS-CoV-2 to achieve a goal of no community transmission, with more than 40 days without any reported cases. On November 1, 2020, no cases of COVID-19 were reported in Australia outside of hotel quarantine facilities.

On March 20, Australia closed its borders to arrivals of most non-citizens and soon after instituted mandatory 14 day hotel quarantine for all international arrivals. A first wave of cases was successfully suppressed by physical distancing restrictions, infection control and hygiene measures, underpinned by a strong focus on community engagement and education. By the end of April, the first wave of COVID-19 appeared under control, with approximately 7000 total cases and 100 deaths. In Victoria between April and June, there were small numbers of cases identified, predominantly in international arrivals. June 9th was the last day with zero cases reported in Victoria prior to the second wave. Australia has a universal healthcare system and during the pandemic has offered free COVID testing to all eligible people.

The state of Victoria experienced a second wave of infections starting at the end of June, with more than a doubling of the total number of cases and deaths within a month (Figure 1). Unlike the first wave, which mainly involved returning international travellers, the second wave was driven by community transmission. Genomic testing showed the second wave could be traced back to cases

acquired overseas transmitted from hotel quarantine because at least one secondary case was acquired by another guest in hotel quarantine.

As clusters of cases emerged, the Victorian government modified existing restrictions by initially enhancing limits on movement in local high-risk areas, defined by postcode. The basis for definition of a high-risk area in relation to this initial limitation on movement was related to disease incidence. This localised limitation of movement was not able to prevent further growth in case numbers, as essential workers contributed to spread beyond these areas. All of Metropolitan Melbourne entered stage 3 restrictions on July 7 which included stay at home directions with limited exemptions including for permitted work or education, necessary goods or services, care or other compassionate reasons, exercise and in emergencies. Two weeks after the introduction of stage 3 restrictions, as case numbers continued to climb, mandatory face coverings outside of home were introduced, for all those aged 12 years and over, including when at school.

On August 2, with 621 cases recorded on that day, Melbourne enacted stage 4 restrictions while the remainder of Victoria remained at Stage 3. Schools and childcare settings closed, except for children of essential workers or vulnerable children. Schools were closed as part of the overall strategy for the strictest element of the lockdown to reduce aggregate mobility across the community. Many workplaces, industries and facilities closed, with limited food distribution, supermarkets and pharmacies remaining open - although some construction continued. Only one person per household was allowed to shop for food each day, and people were limited to one hour of exercise within a 5km radius of their place of residence. A curfew was introduced from 8pm until 5am and all restrictions were enforced, with heavy fines for non-compliance. Gatherings were heavily restricted with no private gatherings indoors, except for visits from intimate partners. There were limits on the

number of people who could attend funerals and places of worship were essentially closed. There were strict restrictions on visitors to healthcare settings including residential aged care facilities. This coincided with high numbers of healthcare worker infections and outbreaks in residential aged care facilities. Restaurants and cafes were only permitted to serve take away food. To encourage testing and adherence to control measures, financial relief packages from both federal and state governments were available to assist those adversely affected by quarantine or isolation.

With a fall in incidence, a roadmap to easing restrictions was implemented from September 13, with stay at home restrictions significantly relaxed from October 28. The first step in easing of restrictions allowed the introduction of a social "bubble" to reduce isolation for people who lived alone and easing of the curfew to 9pm to 5am. This was followed by some relaxation of restrictions on outdoor work, including increasing of manufacturing and construction, removal of the curfew and opening up of schools and childcare. The third step of easing saw the 5km limit for movement extended to 25km, return of most industries but a strong message to continue working from home where possible. Recent steps in easing have seen the return to free movement throughout the state, with density quotients, patron caps and opening up of retail, indoor physical recreation and entertainment facilities including cinemas and nightclubs, all with careful hygiene and physical distancing measures in place. An increased size of groups able to dine indoors or visit other households was allowed. Face masks remain mandatory indoors in public.

There are important lessons learnt from overcoming this second wave which is now affecting many countries around the world. The first is that aggressive suppression of community transmission is possible but only with tough restrictions. These restrictions, although necessary to contain the spread of COVID-19, have potential for negative impacts on individuals, the economy and the community. Melbourne's lockdown, however, was only one of a range of measures introduced to contain and overcome the second wave. Restrictions need to be applied widely to ensure that

transmission is controlled, simultaneously with support for financial, emotional and psychological needs. While restrictions need to be proportionate and in place for the shortest possible time, relaxation should be stepwise and cautious. The key triggers for changing restriction levels were epidemiological thresholds developed by the public health team. These thresholds featured two indicators: rolling statewide average of number of new cases per day over 14 days; and the number of cases of unknown source of acquisition over previous 14 days. Modelling was used to identify the risks and potential outcomes of shifting restrictions too quickly. The public health rationale needs to be clearly communicated at all stages, as “restriction fatigue” can creep in.

Political engagement is also important. In Victoria, daily media conferences (live streamed) were held by the state Premier, usually accompanied by the Chief Health Officer, facilitating direct communication to the public unfiltered by the media. Preparedness in high-risk settings such as aged care and high-density public housing is crucial to avoid uncontrolled transmission or prolonged lockdown for some of the most vulnerable people in society. This should be combined with minimising risk factors in sectors recognised as amplifying environments such as abattoirs and food distribution centres.

We have also learnt that disadvantage can affect transmission in many ways, through high risk workplaces, crowded households, poor health literacy, casual employment, and culturally and linguistically diverse populations. This requires active preparedness, a broad government response and locally-led, genuine community engagement. Engaging with community representatives and working together to develop and share key messages and to understand barriers and enablers about testing and self-isolation is essential. This community engagement is key to gaining the trust of COVID positive individuals in order to rapidly and effectively identify and quarantine their close

contacts. The provision of funded quarantine options outside of crowded homes and high-density settings helps reduce ongoing household transmission. Government support for individuals in casualised work, or with poor job security is recommended. This workforce is often extremely mobile and may struggle to self-isolate due to financial pressures, especially if asymptomatic or with minimal symptoms.

Test, trace and isolate needs to be immediately responsive, scalable and able to adapt to evolving challenges in a culturally sensitive way. Between January 22nd and December 9th 2020, 3,651,779 COVID-19 tests were performed in Victoria with 0.6% positive results. High testing rates were achieved by public messaging, maximising access to testing sites and ensuring no out of pocket expenses for people to be tested and compensation eligible people to isolate while awaiting test results. The Victorian response was successful as it was able to embrace change and learn from previous experiences across the outbreak. Such evolution led to improved turnaround times for pathology test results and expedited contact tracing efforts, both important components.

Finally, with transmission under control and potentially eliminated, a road map to COVID normal is in place and under constant review. This roadmap needs to be carefully considered, proportionate, cognisant of health, psychological and economic needs of the community, and sufficiently cautious to avoid a third wave. A continuous appraisal of emergent or changing risk profiles in Victoria will be critical until there is a successful vaccine campaign.

Footnote-

Postcode restrictions: stay at home restrictions for 10 (then 12) areas defined by postcode

Stage 3 Metropolitan Melbourne: stay at home restrictions for metropolitan Melbourne with limited reasons to leave home

Mandatory masks: face coverings mandatory outside the home and in all workplaces

Stage 4 restrictions statewide: stay at home restrictions with limited reasons to leave home, curfew and movement limited to 5km from home, work limited to permitted industries only

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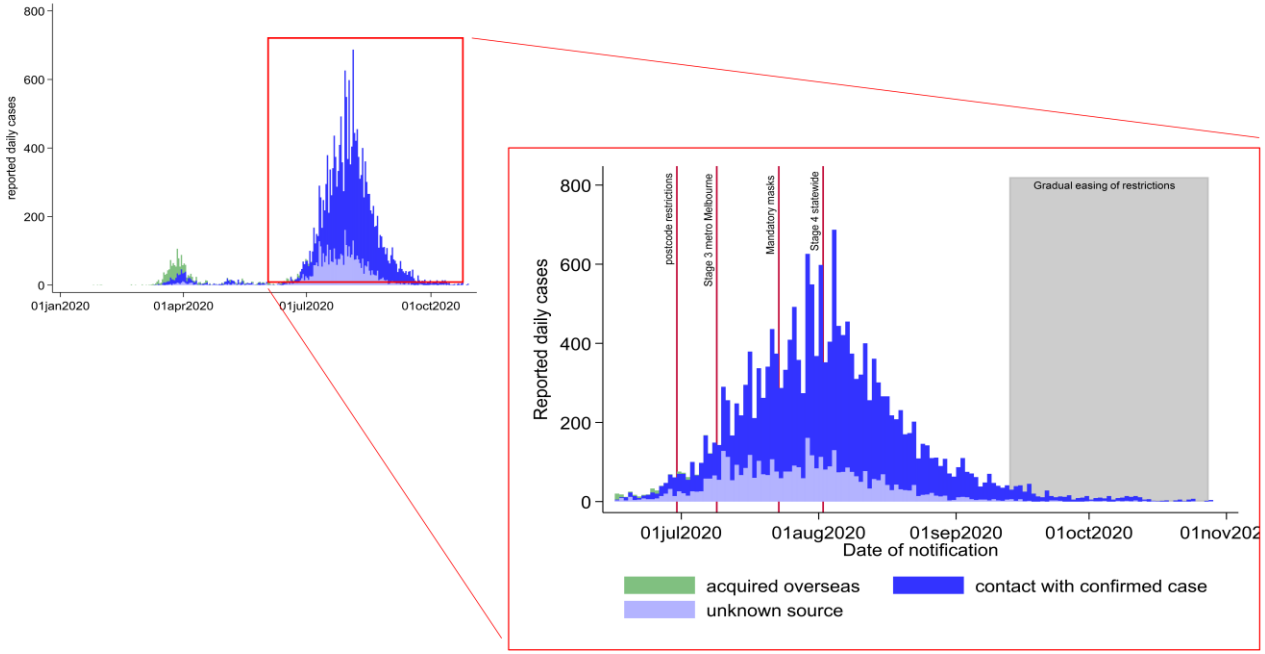
Figure 1: Epidemic curve of COVID-19 in Victoria with restriction levels

Figure 1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200
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01apr2020
01jul2020
01oct2020
Reported daily cases
postcode restrictions
Stage 3 metro Melbourne
Mandatory masks
Stage 4 statewide
Gradual easing of restrictions
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01aug2020
01sep2020
01oct2020
01nov202
Date of notification
acquired overseas
contact with confirmed case
unknown source