

## COVID-19 Country Response Analysis – April No. 5

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This update covers the period April 13 to 24.

### Global trends

- Globally, the number of reported cases has increased by 33% to 2,714,942 cases over the past two weeks.
- The number of new daily cases has been unstable but has risen from around 71,000 per day two weeks ago to around 80,000 on 23 April. More than one-third of new daily cases have been reported from the U.S.
- The number of new daily cases has been steadily declining in Spain (30% decrease in the past 2 weeks), Italy (11%), France (54%) and Germany (41%). However, daily new cases in the US, UK, Belgium and the Netherlands are highly unstable and have not significantly declined over the past two weeks.
- Over the past two weeks, the highest increases in cumulative cases have been in Singapore (344%), Russia (270%), Saudi Arabia (260%), Qatar (226%), Mexico (210%), Peru (202%), Brazil (180%), Turkey (170%), Canada (150%), and the U.S. (140%).
- The cumulative global case-fatality ratio (CFR) is 7%.
- The highest CFRs have been in Belgium (14.9%), France (13.6%), the UK (13.5%), Italy (13.4%), Sweden (12%), the Netherlands (11.6%), and Indonesia (8.3%).
- The lowest CFRs have been in Singapore and Qatar (0.1%), UAE (0.6%), Russia (0.8%) and Saudi Arabia (0.9%).
- The highest rates of testing have been in Iceland (13,214 per 100,000), UAE (7,987), Luxembourg (5,893), Bahrain (5,878), Portugal (2,947), Norway (2,805), Israel (2,776), and Qatar (2,550).
- The lowest rates of testing among countries with more than 5,000 cases are in Indonesia (22 per 100,000), India (36), Mexico (38), Pakistan (56), and the Philippines (66).

### Australian trends

- The cumulative number of cases has increased by 10% over the past two weeks.
- The number of new daily cases has been less than 50 every day since 12 April.
- Australia has tested 470,000 people (1,830 per 100,000) for a positivity rate of 1.4%, compared with 24% in the UK and 19% in the US.
- Since 14 April, most cases have been acquired through local transmission (known and unknown).
- The CFR is 1.1%.

### Pathway to ease restrictions: the evidence

Australia, along with a number of other countries and states within the United States, have announced plans to relax restrictions currently in place to reduce coronavirus transmission in the coming weeks. Most have established clear criteria to guide a phased relaxation of restrictions. With some variations, these criteria include:

- Sustained reduction in reported cases (e.g., in the U.S. for 14 consecutive days);
- Expanded testing capacity and contact tracing;
- Strengthened capacity to effectively treat a spike in COVID-19 patients; and
- Adequate preparedness to respond to new clusters of cases.

In California, Washington and Oregon, there are additional criteria<sup>1</sup>:

- Being able to protect California's most vulnerable populations, including seniors, homeless individuals and those with compromised immunity;
- Working with research hospitals and other research partners to pursue therapies for the virus; and
- Making sure businesses, schools, and other public spaces can continue physical distancing.

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<sup>1</sup> <https://www.abc10.com/article/news/health/coronavirus/governor-newsom-to-give-better-timeline-to-reopen-california-ease-stay-at-home-restrictions/103-529c7b70-200f-470c-8ed1-33c15c66cd69>



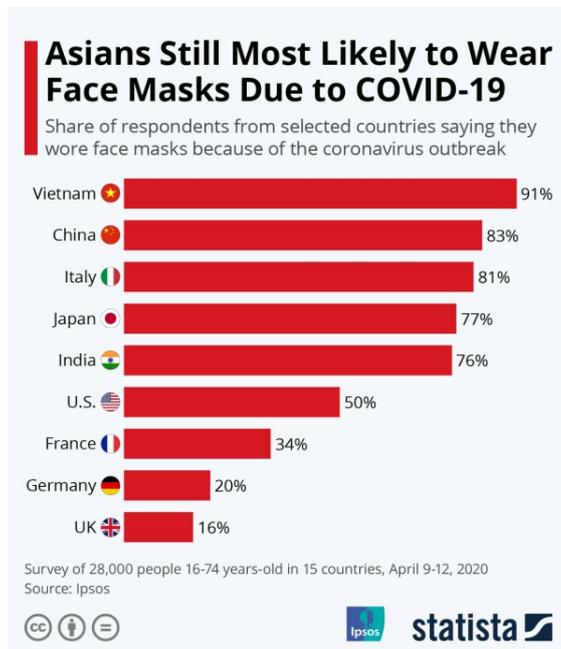
## What restrictions are being relaxed (or planned to relax) in other countries?

In Europe, a number of countries have begun to ease restrictions, including Germany, Austria, Spain, Italy, Norway, Denmark and the Czech Republic.

**However, most of these restrictions were never implemented in Australia.** They include reopening clothing shops, hardware stores, hairdressers, bookshops, bike stores, car dealerships, small repair shops, schools and kindergartens, all contingent on a capacity to maintain safe physical distancing.

The Czech Republic has gone one step further and will reopen gyms and fitness centres (but with showers and change rooms closed). Pubs, wine bars, coffee shops, and restaurants will be allowed to reopen on 25 April, but with strict restrictions: they can only have outdoor seating and provide service through a hatch.

Austria, Czech Republic, Italy and Spain have mandated the use of face masks when outside the home. New York City has also mandated wearing masks outside. Note that the UK has the lowest rate of wearing masks (16%).



In the U.S., there are large variations between the 50 states. Some Southern states have announced the imminent relaxation of a number of measures and plan to reopen massage and tattoo parlours, gyms, beaches and, next week in Georgia, restaurants and bars. These states have been heavily criticised as they have not yet achieved the criteria of sustained reduction in cases and expanded testing. Georgia has one of the lowest cumulative testing rates at 913 per 100,000 compared with the national rate of 1307 per 100,000.

Three consortiums of states – on the West and East Coasts and in the Midwest have announced the coordinated, phased restrictions based on the criteria listed above for California, Washington and Oregon. While the consortia have agreed on criteria, none have published timelines for the lifting of specific restrictions.

The most common definitive action has been to lift restrictions on elective surgery although this has not been possible in heavily affected states like New York, New Jersey, Louisiana and Michigan. Some states, such as Minnesota, have reopened outdoor recreational businesses, including golf courses, bait shops, public and private marinas and outdoor shooting ranges.

## What is the optimal testing rate?

There are no gold standards for testing rates. WHO recommends conducting enough tests that no more than 10% are positive. Researchers at the Harvard Global Health Institute estimate the United States will need to perform at least 500,000 coronavirus tests per day in order to successfully reopen the economy<sup>2</sup>. This equates to 152 per 100,000 population compared with the current 150,000 tests per day, or 45 per 100,000. The report stated that this was the minimum required to implement an effective test, trace and isolate strategy.

However, the Harvard recommendation is based on the high current test positivity rate in the U.S. of close to 20%. In Australia, by contrast, the positivity rate is just 1.5%. So, it is difficult to find evidence for a specific rate of testing here. On 22 April, 12,569 people were tested in Australia, which is a rate of 50 per 100,000.

Rather than aiming for a certain per capita testing rate, it may make more sense in Australia to prioritise who is tested. There are different reasons to prioritise different groups. For example, older adults and people with chronic illnesses have a higher likelihood of developing severe conditions if they get COVID-19. First responders, health workers, teachers and others who have close contact with large numbers of people also have a high chance of getting and spreading the disease. People living in close quarters such as nursing homes or prisons also run a high risk of infection.

The other approach that needs to be considered is doing random population surveys to detect the true COVID-19 infection rate in the community. Given the low attack rate in Australia, the sample size for such surveys may need to be high, perhaps of the order of 10,000 to achieve narrow confidence intervals. These surveys could either test throat swabs for the virus or blood for antibodies (once there are reliable antibody tests available).

## Should schools be open: the evidence?

In response to the COVID-19 pandemic, 107 countries had implemented national school closures by 18 March, 2020. It is unknown whether school measures are effective in coronavirus outbreaks (eg, due to severe acute respiratory syndrome [SARS], Middle East respiratory syndrome, or COVID-19). School closures were deployed rapidly across mainland China and Hong Kong for COVID-19. However, there are no data on the relative contribution of school closures to transmission control.

The Lancet recently published a review of the evidence by a team led by the London-based UCL Institute of Child Health<sup>3</sup>. The authors undertook a systematic review by searching three electronic databases to identify what is known about the effectiveness of school closures and other school social distancing practices during coronavirus outbreaks. They included 16 of 616 identified articles.

The evidence for the effectiveness of school closures and other school social distancing measures comes almost entirely from influenza outbreaks, for which transmission of the virus tends to be driven by children. A 2018 review of 10 studies found that school closure reduced the peak of the related outbreak by a mean of 29.7% and delayed the peak by a median of 11 days<sup>4</sup>.

There are several theoretical reasons why school closures might be less effective in COVID-19 than in influenza outbreaks. Children contribute more to influenza transmission than do adults, with low levels of immunity and high levels of

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<sup>2</sup> <https://www.thecrimson.com/article/2020/4/22/harvard-coronavirus-hghi-daily-tests/>

<sup>3</sup> School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. Russell M Viner, Simon J Russell, Helen Croker, Jessica Packer, Joseph Ward, Claire Stansfield, Oliver Mytton, Chris Bonell, Robert Booy. *Lancet Child Adolesc Health* 2020. Published Online April 6, 2020. [https://doi.org/10.1016/S2352-4642\(20\)30095-X](https://doi.org/10.1016/S2352-4642(20)30095-X)

<sup>4</sup> Bin Nafisah S, Alamery AH, Al Nafesa A, Aleid B, Brazanji NA. School closure during novel influenza: a systematic review. *J Infect Public Health* 2018; **11**: 657–61.



transmission due to symptomatic disease<sup>5</sup>. However, in the COVID-19 pandemic thus far, children appear to form a much lower proportion of cases than expected from their population, although evidence for this is mixed and some data suggest that children might be as likely to be infected as adults but largely remain asymptomatic or have a mild form of the disease<sup>6</sup>. In Hubei province in China, only 2.4% of more than 70,000 cases were in children and adolescents under 19 years of age<sup>7</sup>. Emerging epidemiological data suggest little evidence of transmission of COVID-19 through schools in China, although this might reflect closure of schools during most of the outbreak.

Data from the SARS outbreak in mainland China, Hong Kong, and Singapore included in the systematic review suggest that school transmission played no substantial role in the outbreak, and that school closures and other activities such as school temperature monitoring did not contribute to control of infection transmission. Modelling studies of SARS produced conflicting results. Modelling studies from the COVID-19 pandemic support the use of national school closure as part of a package of social distancing measures. Yet, the only study to examine school closures as a separate intervention warned that the impact was relatively marginal, given the reasonable assumptions that household and community contacts would rise as a consequence<sup>8</sup>.

As of April 3, 2020, Taiwan had been recognised to have effectively minimised spread of COVID-19, but with national policies that avoided widespread planned school closures and instead mandated initially local class closures, and subsequently local temporary school closures, based on low thresholds for infected cases within individual schools<sup>9</sup>.

These findings pose a dilemma for policy makers seeking measures to protect populations. School closure presents an apparently common-sense method of dramatically reducing spread of disease and the evidence from previous influenza outbreaks appears compelling. However, policy makers need to be aware of the equivocal evidence when proposing or implementing national or regional school closures for COVID-19, given the very high costs of lengthy school closures during pandemics.

**The US CDC's guidance on school closures<sup>10</sup> is relevant and applicable to Australia:**

- There is a role for school closure in response to school-based cases of COVID-19 for decontamination and contact tracing (few days of closure), in response to significant absenteeism of staff and students (short to medium length, i.e. 2-4 weeks of closure), or as part of a larger community mitigation strategy for jurisdictions with substantial community spread (medium to long length, i.e. 4-8 weeks or more of closure).
- Available modelling data indicate that early, short to medium closures do not impact the epi curve of COVID-19 or available health care measures (e.g., hospitalisations). There may be some impact of much longer closures (8 weeks, 20 weeks) limiting further community spread, but that modelling also shows that other mitigation efforts (e.g., handwashing, home isolation) have more impact on both spread of disease and health care measures. In other countries, those places who closed schools (e.g., Hong Kong) have not had more success in reducing spread than those that did not (e.g., South Korea).

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<sup>5</sup> Wallinga J, Teunis P, Kretzschmar M. Using data on social contacts to estimate age-specific transmission parameters for respiratory spread infectious agents. *Am J Epidemiol* 2006; **164**: 936–44.

<sup>6</sup> Shen K, Yang Y, Wang T, et al. Diagnosis, treatment, and prevention of 2019 novel coronavirus infection in children: experts' consensus statement. *World J Pediatr* 2020; published online February 7. DOI:10.1007/s12519-020-00343-7.

<sup>7</sup> Zunyou Wu and Jennifer M. McGoogan. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China. Summary of a Report of 72 314 Cases. *JAMA*. 2020;323(13):1239-1242. doi:10.1001/jama.2020.2648. February 24, 2020.

<sup>8</sup> Ferguson NM, Laydon D, Nedjati-Gilani G, et al. Report 9: impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. London: Imperial College, 2020.

<sup>9</sup> Wang CJ, Ng CY, Brook RH. Response to COVID-19 in Taiwan: big data analytics, new technology, and proactive testing. *JAMA* 2020; published online March 3. DOI:10.1001/jama.2020.3151.

<sup>10</sup> <https://www.cdc.gov/coronavirus/2019-ncov/downloads/considerations-for-school-closure.pdf>





## Asymptomatic and pre-symptomatic disease – a key barrier

- The proportion of the asymptomatic population that is infected with the SARS-Cov-2 virus is an important public health indicator that would help guide policies on lifting distancing measures
- At this stage, there is not a lot of information globally about the proportion of infected people that are asymptomatic. This is largely due to strict testing criteria that focus on symptomatic cases and inadequate testing kits to conduct population prevalence surveys. For example, in New York State, 669,982 people have been tested of whom 262,268 have tested positive for the coronavirus<sup>11</sup>. This extremely high positivity rate of 39% indicates that testing has been skewed towards symptomatic individuals.
- A study published in Nature reported temporal patterns of viral shedding in 94 Chinese patients with laboratory-confirmed COVID-19 and modeled COVID-19 infectiousness profiles from a separate sample of 77 infector–infectee transmission pairs<sup>12</sup>. They observed the highest viral load in throat swabs at the time of symptom onset, and inferred that infectiousness peaked on or before symptom onset. They estimated that 44% (95% confidence interval, 25–69%) of secondary cases were infected during the index cases' pre-symptomatic stage, in settings with substantial household clustering, active case finding and quarantine outside the home.
- Based mainly on other data from China, so far, pre-symptomatic is a much more common category than asymptomatic. About 75% of people who tested positive in provinces other than Hubei without showing symptoms turn out to be pre-symptomatic, displaying coughing, fatigue, fever and other signs of COVID-19 in a later follow-up examination<sup>13</sup>.
- A study in a nursing home in Washington State found that 56% of those who tested positive were asymptomatic (or pre-symptomatic) on the day of testing<sup>14</sup>.
- A small antibody study in Germany of 1,000 residents of a heavily impacted municipality found that 14% of the sample had been infected, much higher than would have been predicted from reported cases.
- A similar study of 3,000 residents of New York City also found that 14% of the sample had been infected with the virus.
- Two antibody studies have been conducted in California – one in Santa Clara county and one in Los Angeles county. Both found the prevalence of antibody to be far higher than would be expected based on reported cases. However, neither study has been peer-reviewed and there have been many criticisms of the studies<sup>15</sup>.

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<sup>11</sup> <https://covidtracking.com/data> 22 April 2020

<sup>12</sup> <https://www.nature.com/articles/s41591-020-0869-5>

<sup>13</sup> [https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-press-conference-full-01apr2020-final.pdf?sfvrsn=573dc140\\_2](https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-press-conference-full-01apr2020-final.pdf?sfvrsn=573dc140_2)

<sup>14</sup> MMWR 3 April 2020. April 2020. [https://www.cdc.gov/mmwr/volumes/69/wr/mm6913e1.htm?s\\_cid=mm6913e1\\_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6913e1.htm?s_cid=mm6913e1_w)

<sup>15</sup> <https://www.buzzfeednews.com/article/stephaniemlee/coronavirus-antibody-test-santa-clara-los-angeles-stanford>

