# COVID-19 Global Trends and Analyses

## Volume 1:

- Global Epidemiology and Trends
- Science Snapshots

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# SUMMARY

## COVID-19 GLOBAL TRENDS AND ANALYSES | 1 – 31 May 2021


- The **global total** number of reported cases has reached 171 million and 3.6 million deaths.
- The **cumulative number of global cases** is equivalent to 21.8 per 1,000 population. Cases are declining in Europe and North America, while surging in Latin America and Asia, where almost every country is experiencing second, third and fourth waves. However, several Asian countries are now reporting declines in new daily cases, including India, Bangladesh, Pakistan, and Laos.
- The **global seven-day rolling average** of daily cases has **declined** from around 828,000 on 29 April to 508,000 on 29 May – a 39 per cent decrease. While lagging behind cases, the seven-day average of daily deaths has also decreased from 13,481 on 30 April to 11,156 on 29 May.
- The number of new cases in the **United States** is in steep decline. The current seven-day moving average of 22,580 daily new cases is down 37 per cent from 14 days ago. The average of daily deaths is down 12 per cent, and hospitalisations are down 23 per cent.
- After Asia, **South America** remains the second most affected region of the world. Brazil, Argentina and Colombia are currently experiencing the most severe surges. **Central American** countries, such as Costa Rica and the Dominican Republic are also having severe surges.
- The **African continent** has reported 4.8 million cases and 130,000 deaths. South Africa has reported the highest number of cases at 1.6 million, followed by Morocco with 518,000 cases, and Tunisia with 340,000 cases.
- **South Africa** could be entering a third wave. The seven-day average of daily cases has increased fourfold from 879 on 8 April to 3,745 on 28 May. **Egypt and Namibia** are also experiencing third waves.
- In the **Middle East**, the worst affected countries continue to be **Iran and Iraq** although there has been some improvement in both countries in recent weeks. Highly vaccinated **Israel** is reporting very few cases. Its seven-day average has decreased from more than 8,000 in mid-January to just 21 on 28 May. Cases are also declining sharply in **Palestine and Jordan**.
- While **India** is experiencing the largest outbreak of any country in the world during the pandemic, almost every other country in Asia is in the midst of massive surges. In **South Asia,** Sri Lanka, Nepal, Maldives and Bhutan are having severe third waves. Cases are decreasing in Pakistan and Bangladesh. In **Southeast Asia**, Malaysia, Thailand, Vietnam, and Cambodia continue to report high numbers of new cases. It is impossible to know the real situation in **Myanmar**.
- **Japan and South Korea** are having fourth waves while **Taiwan** is experiencing its first significant wave of community cases. **Singapore** is also having a new spike in cases. In Asia, **only China and Brunei** are currently reporting low numbers of cases.
- The situation in **Papua New Guinea (PNG)** remains highly unstable. New cases appeared to decline between 1 April (288 cases/day) and 3 May (61/day). Then due to a backlog of provincial cases being added to the official national figures, the seven-day average went up to a new high of 297 on 14 May. But, there has been a further decline to 72 on 28 May. The country's attack rate of 1.7 per 1,000 is now higher than Australia (1.2). Testing rates in PNG remain extremely low.

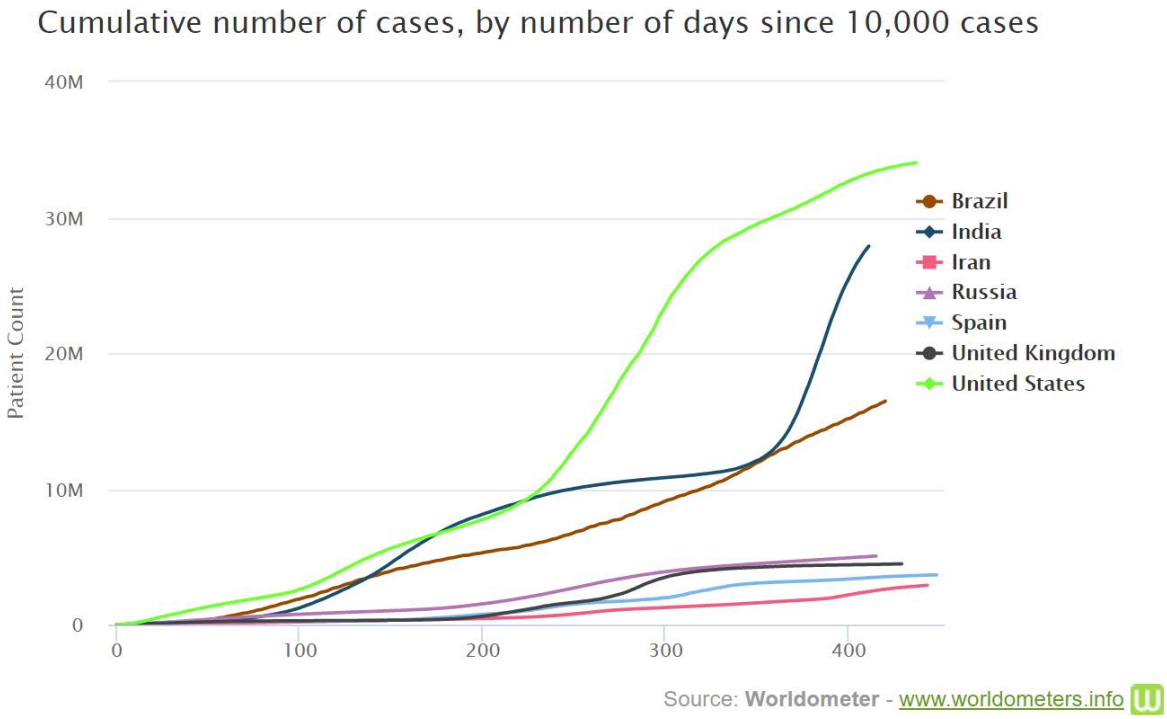
# SUMMARY

## COVID-19 GLOBAL TRENDS AND ANALYSES | 1 – 31 May 2021


- **Timor-Leste** has seen no respite from its first wave of community cases that began in early March. The country has now reported 6,752 cases and 16 deaths. Its seven-day average has been just below 200 daily cases for the past two weeks. The attack rate of 5 per 1,000 is much higher than both PNG and Australia.
- **Australia** had reported more than two weeks and Victoria 87 days without community transmission when two cases were detected in Melbourne on 24 May. Genomic testing revealed that these cases were linked to a man who left hotel quarantine in Adelaide more than two weeks previously and returned to Melbourne where he tested positive. By 31 May there was a cluster of 51 community cases, 15,000 close or casual contacts and more than 200 exposure sites across the city and in regional Victoria. The Victorian Government has imposed a seven-day 'circuit breaker' lockdown across the state.

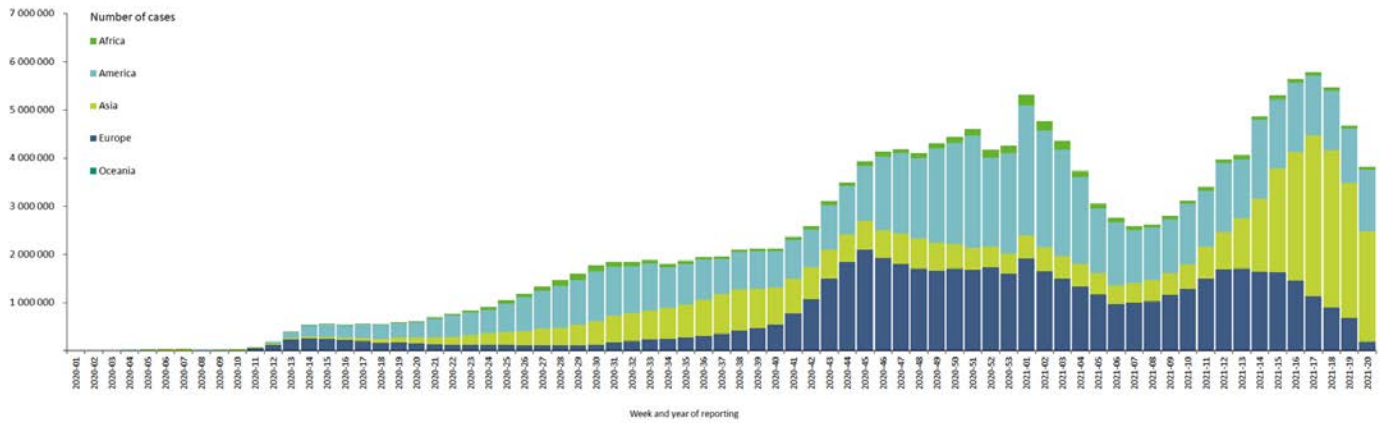
# GLOBAL EPIDEMIOLOGY AND TRENDS

The **global total** number of reported cases is 171 million and 3.6 million deaths. The cumulative number of cases is equivalent to 21.8 per 1,000 population. Cases are declining in Europe and North America, while surging in Latin America and Asia, where almost every country is experiencing second, third and fourth waves. However, several Asian countries are reporting declines in new daily cases, including Bangladesh, Pakistan, and Laos.

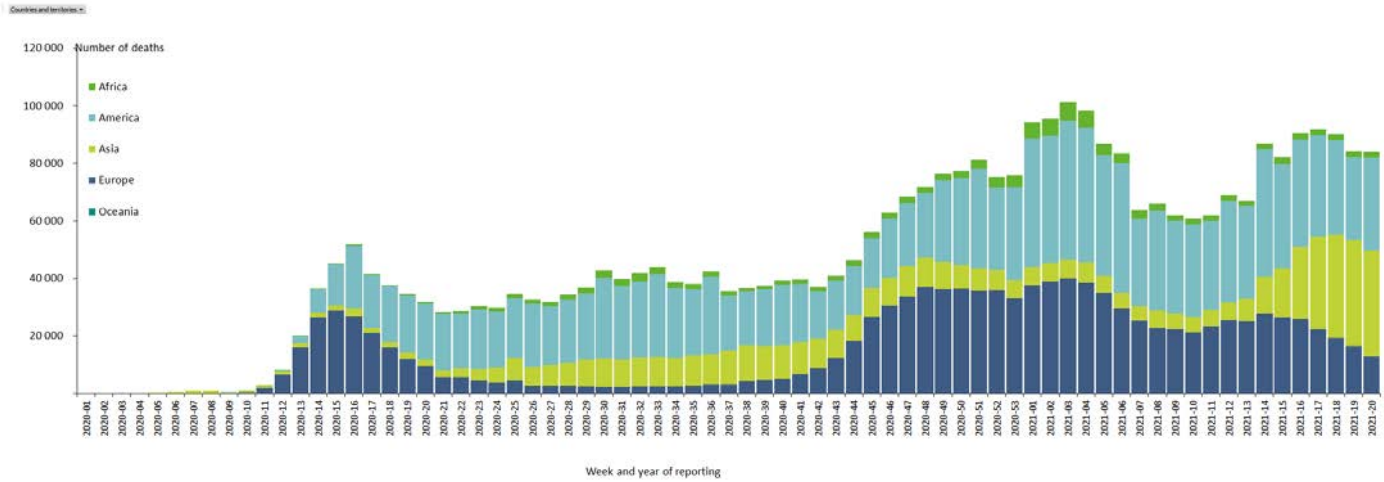



The global seven-day rolling average of daily cases has declined from around 828,000 on 29 April to 508,000 on 29 May – a 39 per cent decrease. While lagging behind cases, the seven-day average of daily deaths has also decreased from 13,481 on 30 April to 11,156 on 29 May. 28 countries have now recorded more than one million cases, the most recent being Sweden (population 10.4 million) and Belgium (11.5 million).

### Distribution of weekly COVID-19 cases worldwide, as of 27 May 2021 (source European CDC)



## Distribution of weekly COVID-19 deaths worldwide, as of 27 May 2021



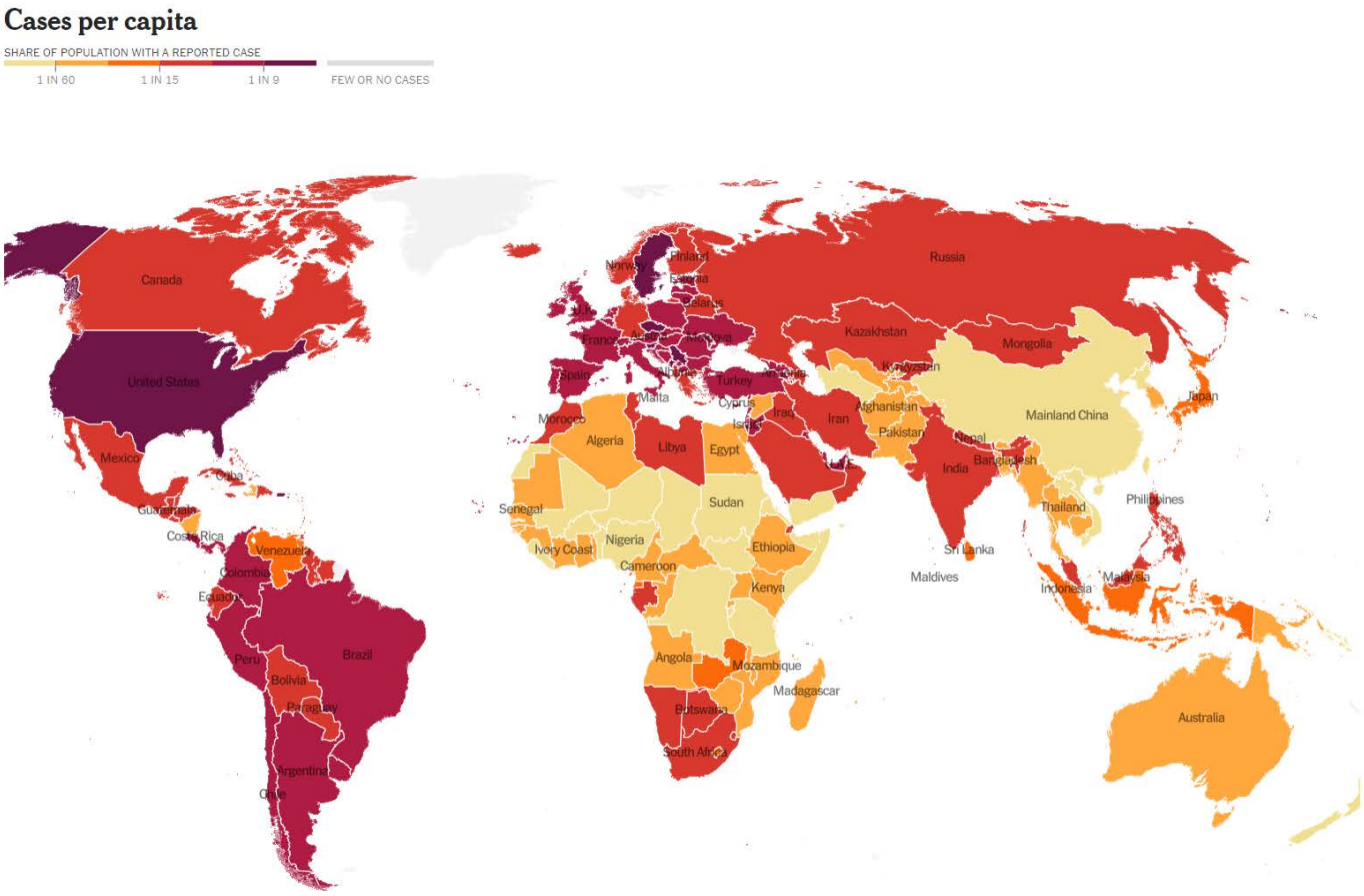

# European Region

- Europe has so far reported **46.3 million cases** (27 per cent of the global total) and just over one million deaths (29 per cent).
- The number of new cases reported in Europe is steeply declining. This is the case for all but three of the 48 countries and territories. The exceptions have prolonged third waves – Russia, reporting around 8,000 cases a day, Greece (2,000 per day) and Belarus (1,000).
- The declines in new cases are most likely to be **due to the restrictions**, including lockdowns, imposed in most European countries rather than vaccination. Only five countries have fully vaccinated at least 20 per cent of their populations – UK (34 per cent), Hungary (31 per cent), Serbia (27 per cent), Iceland (22 per cent) and Denmark (20 per cent). These levels of coverage are not sufficient to provide herd immunity.

### Sweden | European Region

Sweden, with a population of 10.5 million, has now reported more than one million cases of COVID-19. The country's cumulative incidence rate of 104 per 1,000 ranks fifth in Europe behind Montenegro (158), Czech Republic (154), Slovenia (121) and Luxembourg (109).

As can be seen from the map below (on the following page), Sweden's attack rate is comparable to the US and higher than Brazil.




In Europe, America, and elsewhere, politicians ostensibly arguing for individual liberty and economic growth have weighed in against mandates on business restrictions and the wearing of masks. Some scientists have also joined the fray. For example, Sunetra Gupta (co-author of the *Great Barrington Declaration*) favours looser measures in order to preserve civil liberties and to attain herd immunity as a by-product.

Sweden figures in all this because of its largely voluntary approach to quarantining and social distancing. Indeed, for much of 2020, Sweden's strategy was spearheaded not by politicians but by a health official, Anders Tegnell, the state epidemiologist. In advocating for a light-touch approach, he noted in September 2020 that controlled spread of the virus over the population should provide Sweden with greater protection in the second wave compared to its Nordic neighbours, who opted for conventional strategies. Thus, the cost of a high death rate in the first wave would be more than offset by the benefit of a low death rate in the second wave.

If he had been correct, then during the second half of 2020, excess mortality in Sweden—from all causes and not just COVID-19—should have been lower in comparison to that of the other Nordic countries. In fact, no such thing happened. Sweden's cumulative rate of deaths of 1,414 per million is many times higher than Denmark (432), Finland (170) and Norway (143). Sweden has done no better than UK and US for much of the second and third waves of the global pandemic.

Faced with such statistics, Swedish proponents of a hands-off approach sought other explanations for the unexpected surge in cases and deaths. For example, Tegnell claimed in December 2020 that Sweden's immigrants have been driving its higher death rate. Others, too, have misleadingly cited Sweden's relatively high proportion of foreign-born residents to make a case that Sweden did not fare too badly.

However, in the Norrland region, immigrants from outside the EU/EEA/UK constitute 8.2 per cent of its population, not far off the 6.6 per cent share seen in the neighbouring Nordic countries. Yet as of 29 November 2020, Norrland had a COVID-19 death rate that was 4.8 times higher than the average in those Nordic countries. During the second wave, the

discrepancy was starker still: Norrland's COVID-19 death rate was over six times as high as the neighbouring Nordic countries' average. All of which suggests that policy—not demographics—explains the outcome.

A prominent Swedish critic concluded that in a world where data are widely available, evidence-based best practices and not ideology should inform public policy. Framing the discourse in any other way is disingenuous at best and a wilful obfuscation at worst.

## The United States and Canada

- The number of new cases in the **United States** is in steep decline. The country has reported **33.1 million cases** and more than 590,000 deaths. The current 7-day moving average of 22,580 daily new cases is down 37 per cent from 14 days ago. The average of daily deaths is 695, down 12 per cent, and the 27,300 current hospitalisations are down 23 per cent.
- **Canada** has reported 1.4 million cases and more than 250,000 deaths. Cases have been declining since mid-April when the peak 7-day average was 8,767 cases to 3,164 on 28 May.

## Latin America

- After Asia, **South America** remains the second most affected region of the world. Brazil, Argentina and Colombia are currently experiencing the most severe surges. **Brazil** has reported more than 16 million cases and 450,000 deaths. The country has not had distinct waves as the 7-day average of new daily cases has never been less than 25,000 since May 2020. The current average is more than 65,000 daily new cases.
- **Argentina's** 7-day average has surged to more than 33,000, up from 6,000 in early March. Likewise, **Colombia's** average is currently 19,000 up from 3,500 in March.
- **Chile**, which has fully vaccinated 41 per cent of the population, has passed the peak of its third wave but continues to report more than 6,000 cases a day.
- A number of **Central American** countries are also experiencing severe surges, including Costa Rica, Dominican Republic, Honduras, Cuba and Trinidad.

### Costa Rica | Latin America

Costa Rica, with a population of 5.1 million, has reported 314,000 cases and 4,000 deaths. The attack rate of 771 per million is the second highest in Central America, after Belize. The country reported very few cases until late June 2020, when it entered a prolonged wave averaging around 1,000 daily cases until January 2021 when daily cases declined to around 330 in early March. This was followed by a severe second wave reaching a peak of 2,700 daily cases in mid-May. There has been a small decline since then.

The new surge has put huge pressure on overstretched hospitals. This is despite the country having the best health system in Central America. This is widely believed to be due to the fact that Costa Rica abolished its military more than 70 years ago and has invested the savings in health and education. In a region plagued by chronic poverty, violence and political upheaval, it remains an island of political stability, economic prosperity and contentment.

So, why is Costa Rica experiencing this current crisis? Many say that it's because the government has been reluctant to close borders and impose stricter restrictions for fear of further damage to its economy, which is heavily dependent on international tourists. Costa Rica's tourism sector in pre-pandemic 2019 was estimated at about $5 billion, or about 8.5 per cent of country's GDP. The central bank forecasts less than 800,000 foreign tourists visiting Costa Rica during 2021, which would mark a more than 20 per cent decrease from 2020. And last year saw only a third of the international travellers who visited in 2019, or about 1.01 million, which was the fewest in more than two decades.

Authorities have responded by ordering new restrictions on activities and some businesses since the first week of May, but at the same time exempting hotels, beaches and most national parks in the hopes of nudging reluctant travellers. But there are no signs of them returning yet.

Daily new cases in Costa Rica


## African Region

- The African continent has reported 4.8 million cases and 130,000 deaths. South Africa has reported the highest number of cases at 1.6 million, followed by Morocco with 518,000 cases, and Tunisia with 340,000 cases.
- **South Africa** could be entering a third wave. The seven-day average of daily cases has increased fourfold from 879 on 8 April to 3,745 on 28 May.
- **Egypt and Namibia** are experiencing third waves.
- **Angola's** second wave is far worse than its first and has recorded record numbers of daily cases.
- **Zambia and Uganda** are having moderate new spikes in cases.
- Highly vaccinated **Seychelles** continues to report more than 200 cases a day.
- Other African countries are stable, reporting low numbers of new cases.

## Middle East Region

- The worst affected countries continue to be **Iran and Iraq** although there has been some improvement in recent weeks.
- Highly vaccinated **Israel** is reporting very few cases. Its seven-day average has decreased from more than 8,000 in mid-January to just 21 on 28 May.
- Cases are also declining sharply in **Palestine and Jordan**.
- In the **Gulf countries**, highly vaccinated UAE continues to report more than 2,000 cases a day; cases are surging in Bahrain and Kuwait; and cases are low in Saudi Arabia and Qatar.

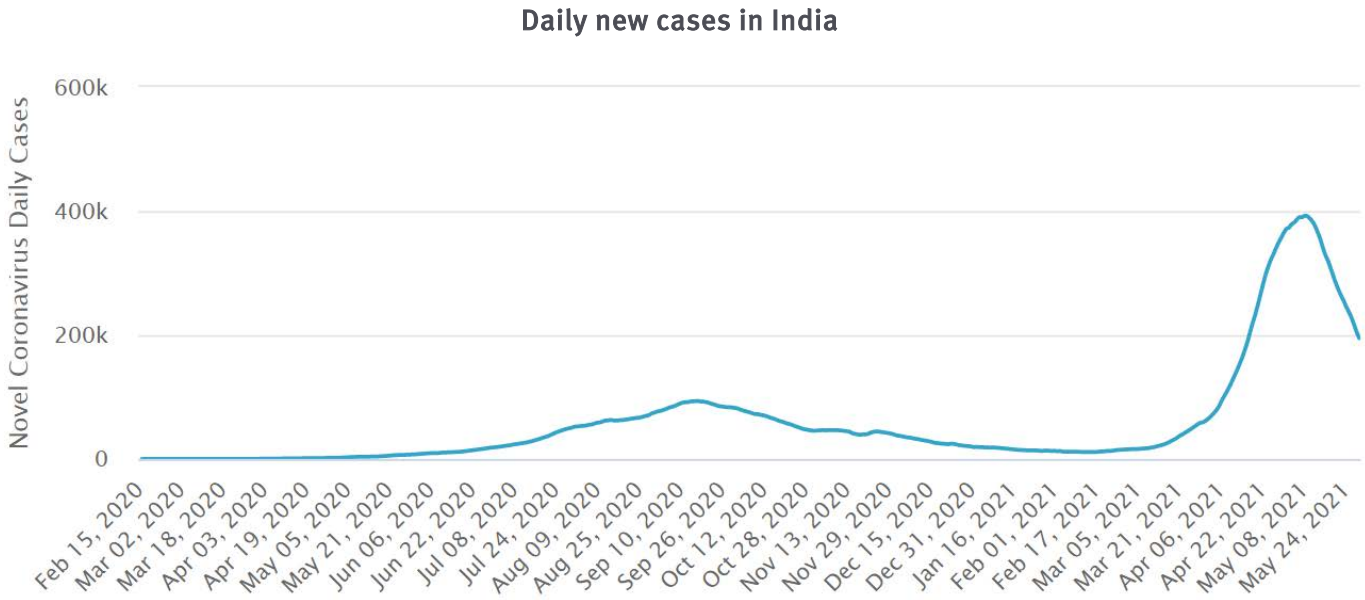
## Asia-Pacific Region

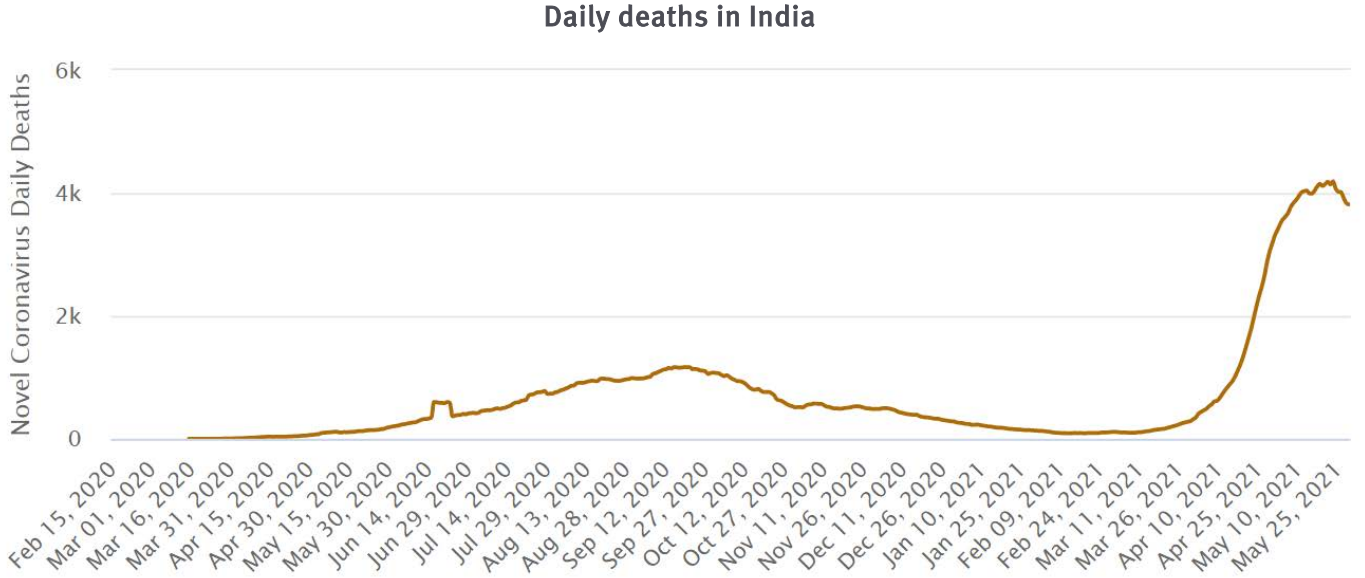
- The Asian region continues to be the epicentre of the current pandemic. Only two countries – China and Brunei – are reporting low numbers of daily cases.
- **India** has passed the peak of its massive second wave. The seven-day moving average has declined from a record high of 392,000 cases on 8 May to 205,000 on 28 May. However, the number of deaths still averages more than 4,000 daily.

- Cases are still surging in **Nepal** reaching almost 9,000 per day as they are in **Sri Lanka**.
- There are clear declining trends in **Pakistan** and **Bangladesh**.
- In **SE Asia**, cases continue to surge in Thailand, Vietnam and Cambodia while in decline in Laos.
- Both **Indonesia** and the **Philippines** continue to report an average of 5,000 cases a day.
- Cases continue to surge in **Asian high-income countries** – Malaysia, Singapore, Japan, South Korea and Taiwan.
- Cases also continue to rise in **Timor-Leste** reaching 200 per day.
- Officially reported figures in **Papua New Guinea** are highly unstable.

## India | Asia-Pacific Region

India has reported more than 28 million cases and 325,000 deaths. Both figures are considered underestimates. In consultation with more than a dozen experts, The New York Times has analysed case and death counts over time in India, along with the results of large-scale antibody tests, to arrive at several possible estimates for the true scale of devastation in the country. Even in the least dire of these, estimated infections and deaths far exceed official figures. More pessimistic ones show a toll on the order of millions of deaths — the most catastrophic loss anywhere in the world.



Based on this analysis, the most likely scenario is that there have been **539 million infections and 1.6 million deaths** due to COVID-19 in India.

The latest national seroprevalence study in India ended in January, before the current wave, and estimated roughly 26 infections per reported case. This scenario uses a slightly lower figure, in addition to a higher infection fatality rate of 0.3 per cent — in line with what has been estimated in the United States at the end of 2020. In this scenario, the estimated number of deaths in India is **more than five times the official reported count**.

The undercount of cases and deaths in India is most likely pronounced for technical and logistical reasons. Because hospitals are overwhelmed, many COVID-19 deaths occur at home, especially in rural areas, and are omitted from the official count. Laboratories that could confirm the cause of death are equally swamped. Additionally, researchers have found that there are few tests available; often families are unwilling to say that their loved ones have died of COVID-19; and the system for keeping vital records in India is unreliable. Even before COVID-19, about four out of five deaths in India were not medically investigated.

According to official figures, the seven-day rolling average of new daily cases is declining. The average has declined from a record high of 392,000 cases on 8 May to 205,000 on 28 May. However, this mainly reflects a decline in cases in urban hotspots. Active cases in the richest state of Maharashtra and Karnataka, home to the tech hub of Bengaluru, the capital Delhi and the coastal state of Kerala have fallen in the last two weeks. However, the virus is spreading rapidly in rural areas and poorer states such as Bihar. Daily numbers in states including West Bengal, which recently concluded state elections, and the southern states of Andhra Pradesh and Tamil Nadu are also on the rise.

Whilst a national lockdown was not imposed (like in March 2020), states have imposed different levels of restrictions and have been releasing them since late May. The global response has been laudable with donations and support from international governments and communities, noting India's strict laws on foreign aid and donations. India COVID-SOS, for example, has also published important resources for home care. A comment published in the Lancet, by India COVID-SOS has called for specific international actions.

## South Asia | Asia-Pacific Region

Other than India, a number of other countries in the sub-continent have been severely affected by huge surges in cases. Perhaps, the worst affected is neighbouring **Nepal**, which shares a long porous border with India. The country, with a population of 29.6 million, has reported more than 553,000 cases and 7,000 deaths. More than one half of those cases have been reported since mid-April. The seven-day moving average has risen from just 400 daily cases in mid-April to a record peak of just under 9,000 four weeks later. The attack rate of 18.7 per 1,000 is just lower than that of India.

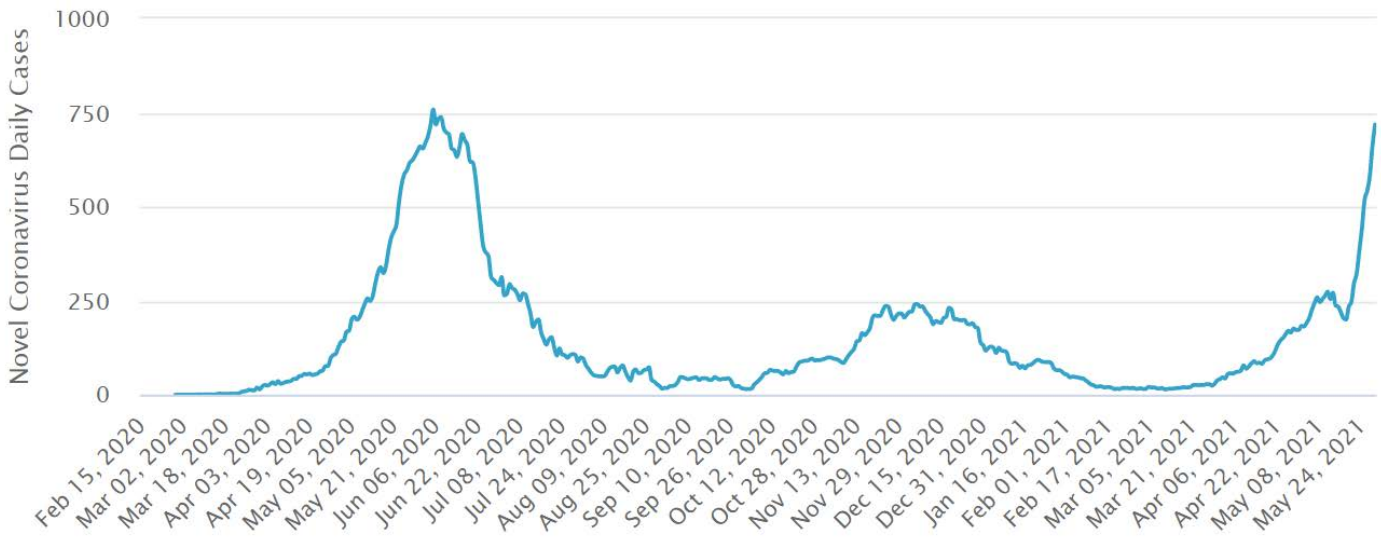
**Sri Lanka** is also experiencing a massive third wave with the seven-day moving average of 3,169 daily cases 3.5 times higher than the peak of its second wave of 901 cases. Inter-provincial travel restrictions are in place across the country until 30 May. Travel is permitted only for essential services and to obtain vaccination during this period. However, doctors have said that this will be ineffective because cases are surging in all provinces. The medics have warned that it will not be long before the hospitals are flooded with patients, completely inundated and the medical staff is stretched way beyond its capacity, resulting in a serious breakdown of health services in the country. They urged the government to impose a 14 day national lockdown. Finally, on 26 May, the government imposed a national seven day lockdown. All inbound international passenger flights are also suspended.

Cases also continue to increase in **Maldives and Bhutan** even though both countries have vaccinated high proportions of their populations.

**Afghanistan** is having a distinct third wave with the seven-day rolling average of 718 daily cases just short of the peak of the first wave in June 2020. Doctors in Afghanistan have expressed fears that the COVID-19 variant first discovered in India could now be spreading quickly in the country. At Kabul's main COVID-19 hospital, where all 100 beds are occupied, doctors said that many critically ill patients had recently returned from India. Up to 10 people die here every day.

The health ministry reported almost 1,000 new COVID-19 infections on 28 May, but actual numbers are likely to be much higher, as many people continue to recover at home without seeking medical care. The country has no capacity to conduct genomic sequencing. The country has only provided one vaccine dose to 1.6 per cent of the population with just 0.3 per cent fully vaccinated.

**Daily new cases in Afghanistan**




On a positive note, cases are declining in **Pakistan and Bangladesh**.

## Mekong Sub-Region | Asia-Pacific Region

The countries of this sub-region largely controlled spread of the coronavirus effectively in 2020, the only exception being Myanmar. Since March 2021, Thailand, Cambodia, Vietnam and Laos have each had major surges in cases.

**Thailand** has been the most severely affected. The current wave reportedly started in Bangkok's nightlife district and then spread across the country during the Thai New Year in April. The country has now reported 150,000 cases and almost 1,000 deaths. Only 1.6 per cent of Thais are fully vaccinated. Health officials are aiming to prioritise distributing vaccine doses in Bangkok during the national drive next month to inoculate at least 70 per cent of residents by July, says the Department of Disease Control.

Like Thailand, **Cambodia** had few cases and no deaths until February 2021. The country has now reported almost 29,000 cases and more than 200 deaths. The current seven-day average is 597 daily cases. Some commentators have pointed to factors that contributed to the country's COVID-19 performance, such as the quick and effective measures put in place by its larger and wealthier neighbours, Thailand and Vietnam, who had been two of the better performers against COVID-19 in the region. In addition, Cambodia's performance benefitted indirectly from its comparatively young population and the substantial international aid it has received. These factors gave Cambodia an edge against the coronavirus, raising doubts about whether its government had actually been responsible for this initial success.

The February 2021 cluster that spawned this new wave has been linked to four Chinese nationals who were caught on CCTV bribing security guards and fleeing quarantine. This spike in COVID-19 cases unfortunately coincided with the country's traditional New Year celebrations (13-15 April). In mid-April, the government started implementing a last-minute lockdown in Phnom Penh and Takhmao city, the capital of Kandal province. The suddenness of the announcement and the lack of clarity in its messaging created chaos.

The country's weak health care system is incapable of keeping up with the exponential growth in COVID-19 cases, as hospitals turn people away. Meanwhile, the Cambodian government appears to be moving as quickly as it can to mitigate the spread of the disease through its vaccination program. As of 30 May, the country had provided at least one dose to 26 per cent of the population and 11 per cent are fully vaccinated. This is the second highest rate in SE Asia after Singapore.

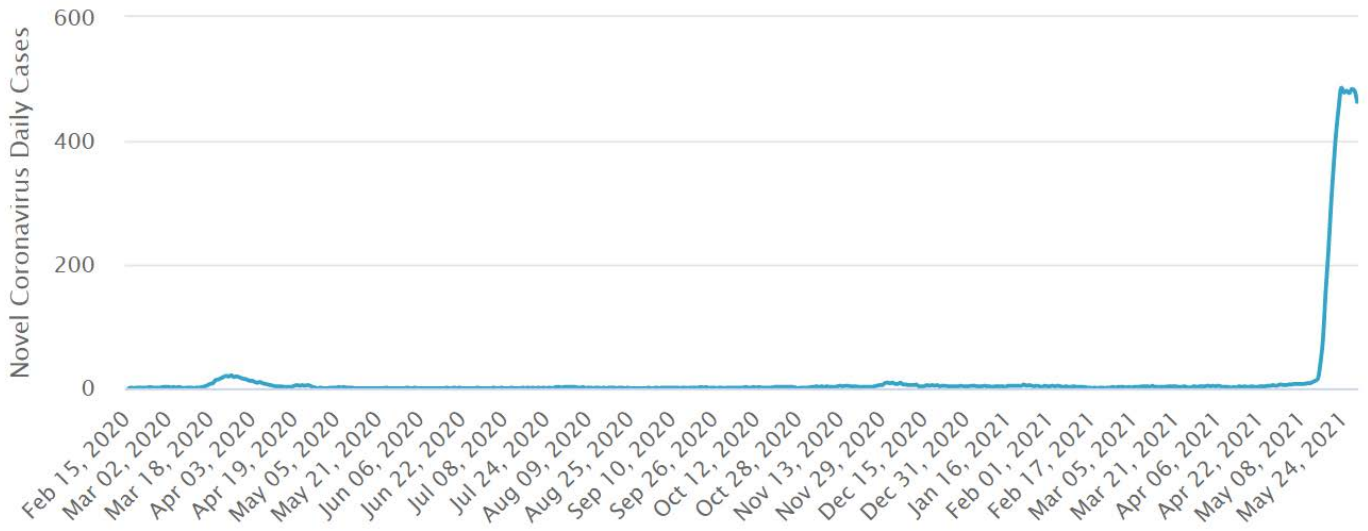
## Taiwan and Singapore | Asia-Pacific Region

Both Singapore and Taiwan had gone more than six months with near zero community transmission. **Taiwan** had no community transmission for 250 consecutive days. However, after a breach in hotel quarantine at Taipei airport in early May, which resulted in 31 infections, new cases have soared to a seven-day average of 484 on 25 May.

Taiwan is lagging badly in its vaccine rollout. Only 1.6 per cent of the population has received one dose. Currently, the elderly, vulnerable people, and essential workers can be vaccinated for free. Publicly-funded vaccinations are also available for certain at-risk groups including medical staff, health and social workers, seniors and other high-risk frontline workers. People not on the priority list had been paying TW$500-600 (AU$23-$27) for an AstraZeneca shot. Those showing symptoms or in at-risk groups are also eligible for free swab tests, while others have to pay anywhere between TW$5,000 to TW$7,000 (AU$230-$320) per test. Since the start of the rollout in March, Taiwan has only received about 700,000 doses for 23 million people from AstraZeneca due to a global shortage.

Despite a vaccine shortage, Taipei has rejected Beijing's offer to send Chinese-made vaccines, with Taiwanese health officials citing their "unproven" efficacy rates and what they've called public distrust. China's Sinopharm has a reported efficacy of 79 per cent and has been given WHO emergency approval, while Sinovac's results have ranged from 50.4 per cent to 83.5 per cent.

**Daily new cases in Taiwan**




The genesis of **Singapore's** outbreak is somewhat different. Several airport workers were infected by travellers arriving from India even though they had received two doses of the Pfizer vaccine. They then dined in a public food court and set off a chain of transmission that led to a city-wide lockdown. The outbreak has been less severe than Taiwan's with the current seven day average of around 35 daily cases. Singapore has the advantage over Taiwan in having provided at least one vaccine dose to 65 percent of the population and has fully vaccinated 28 percent.

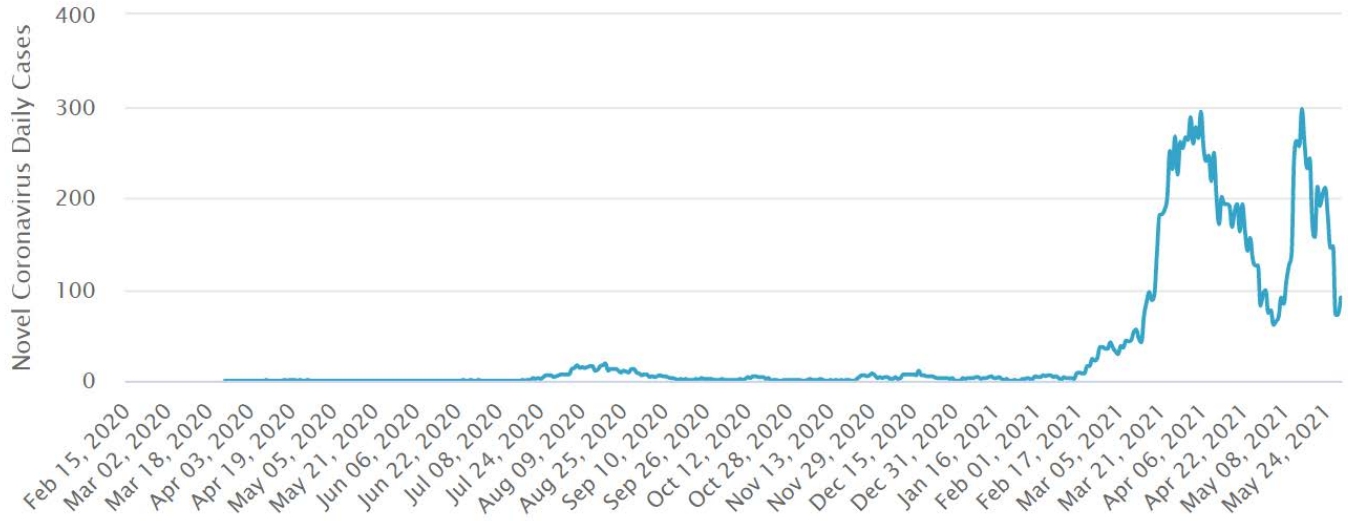
## Papua New Guinea | Asia-Pacific Region

The situation in Papua New Guinea (PNG) remains highly unstable. New cases appeared to decline between 1 April (288 cases/day) and 3 May (61). Then due to a backlog of provincial cases joining the official national figures, the seven-day average went up to a new high of 297 on 14 May. But, there has been a further decline to 72 on 28 May. **The country's attack rate of 1.7 per 1,000 is now higher than Australia (1.2).**

There are concerns that many cases recorded in the provinces are not being reported to the national level. For example, when contacted by the ABC, the Western Highlands Provincial Health Authority said it had recorded 1,135 cases since the pandemic began. Yet on the same day, the national statistics said it had 538 cases. The hospital said it had recorded 19 COVID-19 deaths, but only eight were listed in the national data.

The country has vaccinated less than 0.1 per cent of the population and widespread misinformation on social media has led to a high level of vaccine hesitancy even among health workers.

**Daily new cases in Papua New Guinea**




## Timor-Leste | Asia-Pacific Region

Timor-Leste has seen no respite from its first wave of community cases that began in early March. The country has now reported 6,752 cases and 16 deaths. Its seven-day average has been just below 200 daily cases for the past two weeks. The attack rate of 5 per 1,000 is much higher than both PNG and Australia. The capital Dili has been in lockdown since March and domestic travel has been strictly curtailed. Around 5 per cent of Timorese have received at least one dose of vaccine; however, less than 0.1 per cent has been fully vaccinated.

## Australia | Asia-Pacific Region

Australia had reported more than two weeks and Victoria 87 days without community transmission when two cases were detected on 24 May. Genomic testing revealed that these cases were linked to a man who left hotel quarantine in Adelaide more than two weeks previously and returned to Melbourne where he tested positive. By 31 May there was a cluster of 51 community cases, 15,000 close or casual contacts and more than 200 exposure sites across the city and in regional Victoria. The Victorian government has imposed a seven-day 'circuit breaker' lockdown across the state.

This outbreak has highlighted the frequent leaks in the hotel quarantine system – 17 separate leaks since November 2020 and 1 in 108 infected returned travellers leading to a leak.

# BREACHES

27 Oct 2020 to 13 May 2021

| STATE | BREACHES | CASES | 1 in X |
|---|---|---|---|
| NSW | 8 | 912 | 1 in 114 |
| VIC | 3 | 141 | 1 in 47 |
| QLD | 3 | 390 | 1 in 130 |
| WA | 3 | 238 | 1 in 79 |
| SA | 2 | 212 | 1 in 106 |
| TAS | 0 | 4 | - |
| ACT | 0 | 10 | - |
| NT | 0 | 136 | - |
| AUS | 19 | 2,043 | 1 in 108 |

Source: Anthony Macali (@migga)

This in turn reflects very different policies and practices in place in each state and territory, especially in the area of ventilation and the use of appropriate personal protection equipment, such as masks. While Victoria requires all quarantine hotel staff in open areas of hotels to wear N95 masks, the following is the current guidance by the NSW Health Department.

TABLE 2: PPE SELECTION GUIDE FOR QUARANTINE HOTEL STAFF AND VISITORS

| Staff category | Context | Hand Hygiene | Disposable Gloves | Fluid Resistant or Isolation Gown | Surgical Mask | P2/N95 Respirator | Eye Protection |
|---|---|---|---|---|---|---|---|
| **Clinical staff** e.g. nurses doctors | Screening Swab Rounds (Swabber and Assistant) | ✓ | ✓ doff after every guest | ✓ doff in each floor before entering lift | ✗ | ✓ | ✓ |
| | Passenger Room entry e.g. welfare checks, room change, escorting guest | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| | Face-to-face with unwell guest (within1.5m) | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | Pre-discharge asymptomatic screening | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| | Medication delivery (no F2F) | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ |
| | Saliva screening | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ |

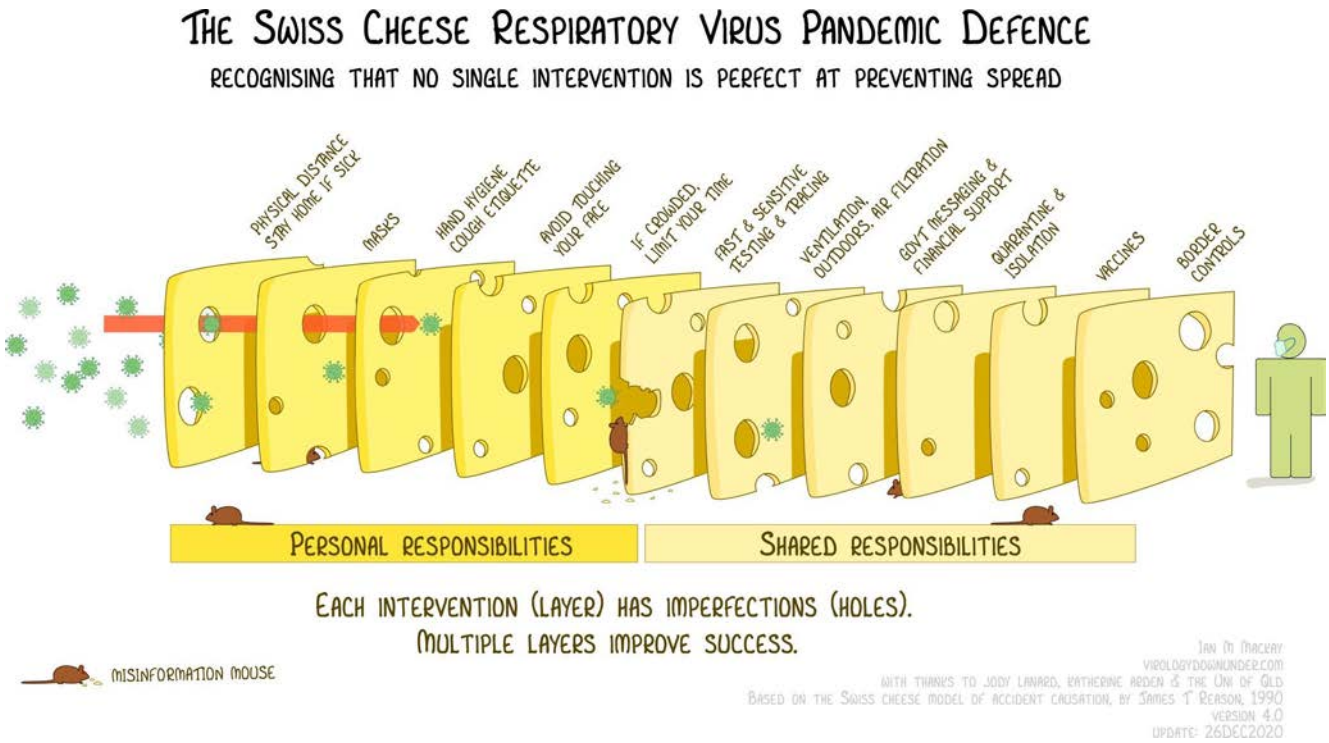
Australia has so far provided at least one dose to 15 per cent of the population, ranking #81 in the world as of 30 May. Only two states report the proportion fully vaccinated – NSW (1.8 per cent) and Victoria (1.3 per cent). However, the pace of vaccinations is picking up rapidly, especially in Victoria. Nationwide, vaccinations have leapt to 617,000 doses a week, based on the seven-day moving average.

In Victoria, an outbreak of COVID-19 cases in Melbourne is expected to further boost vaccinations, which achieved a record 23,600 doses on 28 May. This is the highest one-day figure recorded in any state since the campaign began.

In NSW, daily vaccinations have almost tripled since the state opened its first mass vaccination hub on 10 May, from roughly 3,500 to 9,900 on May 24, based on the seven-day moving average.

So far, 4,229,000 doses of COVID-19 vaccine have been delivered across Australia. At the current pace of roughly 617,000 doses a week, we can expect to reach the 40 million doses needed **to fully vaccinate Australia's adult population in mid-July 2022**.

The current Victorian outbreak reminds us that responses to all epidemic diseases require a multi-pronged approach. At this stage of the pandemic in Australia the priorities must be more effective quarantine measures, expanding vaccination and maintaining solid capacity to test, trace and isolate. The so-called Swiss cheese analogy is worth revisiting.




## Pacific Islands | Asia-Pacific Region

As of 25 May 2021, 10 of the 21 Pacific Island Countries and Territories (PICTs), excluding PNG, have reported cases and deaths (Commonwealth of the Northern Marianas Islands (CNMI), Fiji, French Polynesia, Guam, New Caledonia, Republic of the Marshall Islands (RMI), Samoa, Solomon Islands, Vanuatu, and Wallis and Futuna). Among these countries, a total of 27,768 confirmed cases have been reported including 293 deaths. Among the cases, 67 per cent were in French Polynesia and 28 per cent were in Guam. Large-scale community transmission is currently reported in French Polynesia. Localised community transmission is also currently reported in Guam. The transmission scenario in Fiji has not been widespread; most recent cases appear to be linked to clusters however some community transmission may be emerging. Eleven PICTs have reported zero cases (American Samoa, Cook Islands, Kiribati, Federated States of Micronesia, Nauru, Niue, Palau, Pitcairn Islands, Tokelau, Tonga and Tuvalu).

### Vanuatu

On 11 April 2021, a deceased person was found on the beach near Port Vila and was later confirmed to be SARS-CoV-2 positive. The person had been reported as missing on 11 April from a cargo ship that was temporarily located in Port Vila harbour. The cause of death was not determined. Testing of the 12 other crew members confirmed 11 cases of COVID-19 of which 3 reported mild symptoms of COVID-19; 1 person tested negative. The vessel exited Vanuatu on 21 April 2021. The 11 cases and the one deceased person constitute 12 cases on an international conveyance and were not added to Vanuatu's case count.

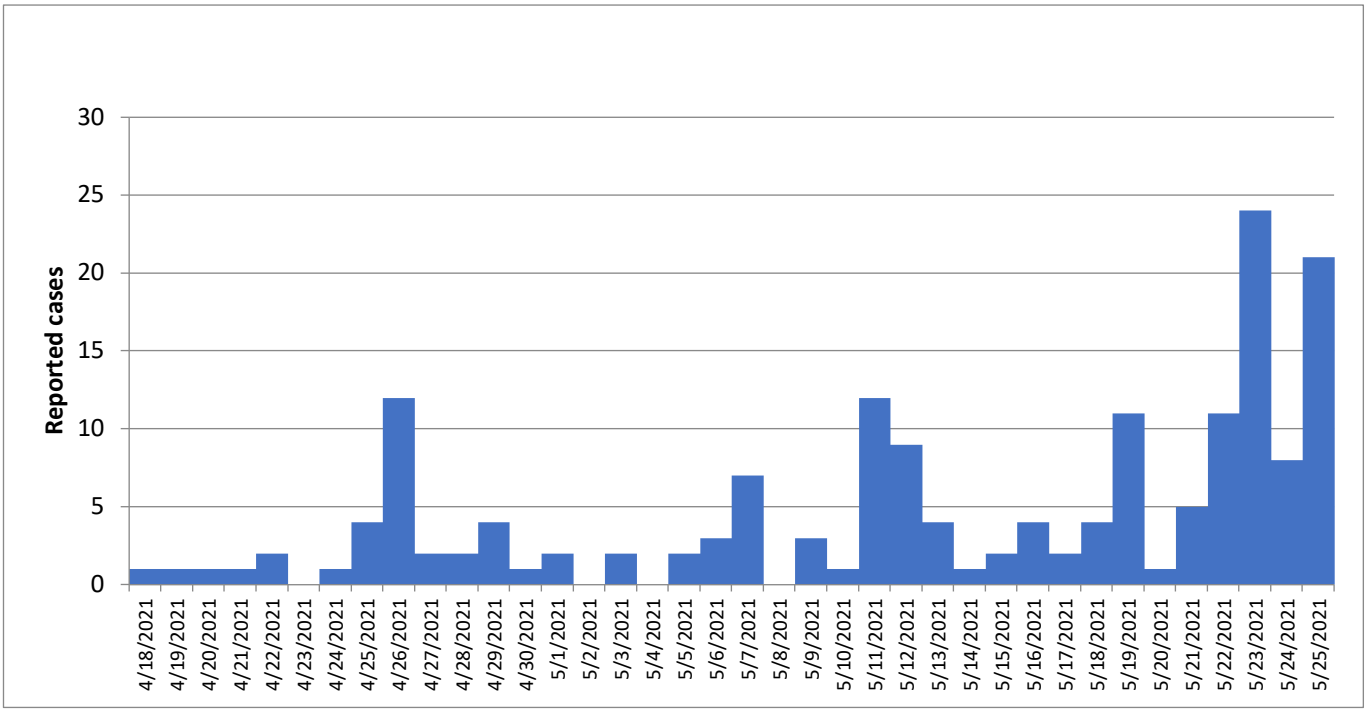
### Kiribati

On 21 May 2021, Kiribati reported that two confirmed cases had been identified on board a fishing vessel in port in South Tarawa, which had previously visited PNG. The cases and other crew remain on board the ship and have not disembarked in Kiribati. Both cases were reported as cases on board an international conveyance. Kiribati has not recorded a case of COVID-19 during the pandemic.

### Fiji Outbreak

On 18 April 2021, Fiji reported its first locally acquired case for the first time in over 12 months. Between 18 April and 26 May 2021, a total of 171 locally acquired cases were reported in Fiji. All confirmed cases are located on the main island of Viti Levu. Several clusters have been identified across the island including cases associated with a funeral, a rugby match, the Fiji Centre for Disease Control, a supermarket, and a hospital. Two deaths among locally acquired cases have been reported this year. Several containment zones have been established, and Fiji has implemented several periods of lockdown to aid contact tracing efforts.

**Epicurve of locally acquired cases in Fiji from 18 April 2021**



# SNAPSHOTS | DIAGNOSIS, EPIDEMIOLOGY AND OUTCOMES

## Independent review of the global COVID-19 response

The report released 12 May by the Independent Panel for Pandemic Preparedness and Response "COVID-19: Make it the Last Pandemic" called for urgent global action to end the pandemic and to establish high-level mechanisms to prepare for, and hopefully prevent, a future pandemic. Its recommendations are based on a comprehensive analysis of the response to the COVID-19 pandemic and the lack of preparedness for such an event.

The World Health Organization (WHO) is criticised for its tardy actions during the first months of 2020; for example, its slowness to warn the world that the novel coronavirus was transmitted person-to-person after it first received information on the spread of the virus in Wuhan, China, in early January. In addition, the report singles out the delay in the declaration of a Public Health Emergency of International Concern (PHEIC). WHO was also censured for opposing international travel restrictions that, if implemented earlier, might have slowed the international spread of the virus, which by the time the PHEIC was declared had caused infections in 18 countries outside China.

The Panel found that WHO was constrained by the international framework that governs the response to emerging infectious diseases and pandemics. That framework is the International Health Regulations (IHR), drafted in 2005 in response to the SARS and H5N1 pandemics and endorsed by member nations in 2007. The IHR imposed new requirements that must be met before the WHO Director-General could act on emergencies, rather than enabling WHO to act immediately and independently. Moreover, the IHR (2005) prohibit international travel restrictions based on a public health emergency.

The report describes February 2020 as a "lost month", referring to the time between the declaration of a PHEIC and the WHO statement on March 11 that characterised COVID-19 as a pandemic. The Panel found that only a few countries set in motion comprehensive and coordinated COVID-19 protection and response measures. Effective and high-level coordinating bodies were critical to a country's ability to adapt to changing information. Of the 28 country responses analysed in depth by the Panel, those adopting aggressive containment included China, New Zealand, South Korea, Singapore, Thailand and Vietnam. Australia was not included in the analysis.

## WHO and US CDC update their guidance on airborne transmission

More than 13 months after WHO declared a pandemic, the agency has formally recognised that the virus is airborne. A scientific brief on the WHO's website, updated on 30 April, reads: "The virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols." In addition to spreading at "short-range", the update states that the virus can spread "in poorly ventilated and/or crowded indoor settings, where people tend to spend longer periods of time". "This is because aerosols remain suspended in the air or travel farther than one metre (long-range)."

The change in WHO's stance came just a week after researchers urged recognition that COVID-19 is predominantly spread through airborne transmission in a paper published in *The Lancet*.

On 7 May, the **US CDC** updated a science brief to reflect current knowledge about SARS-CoV-2 transmission. The brief

begins by saying that modes of SARS-CoV-2 transmission are now categorised as inhalation of virus, deposition of virus on exposed mucous membranes, and touching mucous membranes with soiled hands contaminated with virus.

The brief goes on to say that people release respiratory fluids during exhalation (e.g., quiet breathing, speaking, singing, exercise, coughing, sneezing) in the form of droplets across a spectrum of sizes. These droplets carry virus and transmit infection.

- The largest droplets settle out of the air rapidly, within seconds to minutes.
- The smallest very fine droplets and aerosol particles formed when these fine droplets rapidly dry are small enough that they can remain suspended in the air for minutes to hours.

Infectious exposures to respiratory fluids carrying SARS-CoV-2 occur in three principal ways (not mutually exclusive):

1. Inhalation of air carrying very small fine droplets and aerosol particles that contain infectious virus. Risk of transmission is greatest within three to six feet (0.9m to 1.8m) of an infectious source where the concentration of these very fine droplets and particles is greatest.
2. Deposition of virus carried in exhaled droplets and particles onto exposed mucous membranes (i.e., "splashes and sprays", such as being coughed on). Risk of transmission is likewise greatest close to an infectious source where the concentration of these exhaled droplets and particles is greatest.
3. Touching mucous membranes with hands soiled by exhaled respiratory fluids containing virus or from touching inanimate surfaces contaminated with virus.

The changes in advice provided by two of the world's peak public health bodies have important implications for **Australia**. The peak advisory body the Infection Control Expert Group (ICEG) has acknowledged that airborne transmission does occur but it is uncommon. As a result, recommendations for personal protective equipment for healthcare and quarantine workers do not include the provision of respiratory N95 or P2 masks.

ICEG is currently reviewing recommendations developed recently by the National COVID-19 Clinical Evidence Taskforce Infection Prevention & Control Panel.

## A paradigm shift to combat indoor respiratory infections

Queensland University of Technology air-quality expert, Professor Lidia Morawska, is leading an international call for a 'paradigm shift' in combating airborne pathogens such as COVID-19, demanding universal recognition that infections can be prevented by improving indoor ventilation systems.

In a paper in *Science*, Professor Morawska and 40 co-authors from 14 countries, call for a shift in standards in ventilation requirements equal in scale to the transformation in the 19th century when cities started organising clean water supplies and centralised sewage systems. The international group of air quality researchers recommend that WHO extend indoor air quality guidelines to include airborne pathogens and to recognise the need to control hazards of airborne transmission of respiratory infections. Mandated building ventilation standards need to include higher airflow, filtration and disinfection rates, and monitors that allow the public to observe the quality of air around them.

In an interview with *Science Daily*, Professor Morawska said response efforts to combat airborne viruses were too weak because airborne infections were harder to trace than food or waterborne outbreaks. "We've provided strong evidence that airborne transmission spreads infections, so there should be international ventilation standards that control pathogens," she said.

Ventilation systems should be demand-controlled to adjust for different room occupancies, and differing activities and breathing rates, such as exercising in a gym versus sitting in a movie theatre. She also postulated wide-ranging benefits. "The benefits are beyond infectious disease transmission. Improved indoor air quality may reduce workplace absenteeism, 'sick building syndrome' and allergic reactions. The reduction in productivity losses alone may cover the cost of any ventilation changes."

## COVID-19 has likely caused twice as many deaths globally than reported

The WHO has said that 6 to 8 million people may have died of COVID-19 so far. In its annual World Health Statistics report, they estimated total deaths from the COVID-19 pandemic in 2020 were at least 3 million, or 1.2 million more than officially reported.

WHO officially estimates that around 3.5 million people have died directly as a result of the COVID-19 pandemic as of 23 May 2021. “This number would truly be two to three times higher. So I think safely about 6 to 8 million deaths could be an estimate on a cautionary note,” said Samira Asma, WHO's Assistant Director-General in its data and analytics division, at a virtual press briefing. WHO data analyst William Msemburi said this estimate included both unreported COVID-19 deaths, as well as indirect deaths due to the lack of hospital capacity and restrictions on movements, among other factors.

The WHO did not give a breakdown of the figures, referred to by the agency as “excess mortality”.

## Effects of the SARS-CoV-2 pandemic on maternal and perinatal outcomes

The authors of a study published in The Lancet Global Health did a systematic review and meta-analysis of studies on the effects of the pandemic on maternal, foetal, and neonatal outcomes. They searched MEDLINE and Embase in accordance with PRISMA guidelines, from 1 January 2020 to 8 January 2021, for case-control studies, cohort studies, and brief reports comparing maternal and perinatal mortality, maternal morbidity, pregnancy complications, and intrapartum and neonatal outcomes before and during the pandemic.

The search identified 3,592 citations, of which 40 studies were included. They identified significant **increases in stillbirth** (pooled odds ratio 1:28, increase of 28 per cent) **and maternal death** (pooled odds ratio 1:37, increase of 37 per cent) during versus before the pandemic. Preterm births before 37 weeks' gestation were not significantly changed overall but were decreased in high-income countries.

Mean Edinburgh Postnatal Depression Scale scores were higher, indicating **poorer mental health**, during versus before the pandemic (pooled mean difference 0:42). Surgically managed ectopic pregnancies were increased during the pandemic (OR 5:81).

No overall significant effects were identified for other outcomes included in the quantitative analysis: maternal gestational diabetes; hypertensive disorders of pregnancy; iatrogenic preterm birth; labour induction; modes of delivery (spontaneous vaginal delivery, caesarean section, or instrumental delivery); post-partum haemorrhage; neonatal death; low birthweight (‹2500 g); neonatal intensive care unit admission; or Apgar score less than 7 at 5 min.

In summary, global maternal and foetal outcomes have worsened during the COVID-19 pandemic, with an increase in maternal deaths, stillbirth, ruptured ectopic pregnancies, and maternal depression. Some outcomes show considerable disparity between high-resource and low-resource settings. There is an urgent need to prioritise safe, accessible, and equitable maternity care within the strategic response to this pandemic and in future health crises.

## Neutralising antibody levels are highly predictive of immune protection from symptomatic SARS-CoV-2 infection

Published in *Nature Medicine*, Australian researchers analysed the relationship between in vitro neutralisation levels and the observed protection from SARS-CoV-2 infection using data from seven current vaccines and from convalescent cohorts. They estimated the neutralisation level for 50 per cent protection against detectable SARS-CoV-2 infection to be 20.2 per cent of the mean convalescent level. The estimated neutralisation level required for 50 per cent protection from severe infection was significantly lower (3 per cent of the mean convalescent level).

Modelling of the decay of the neutralisation titre over the first 250 days after immunisation predicts that a significant loss in protection from SARS-CoV-2 infection will occur, although protection from severe disease should be largely retained. Neutralisation titres against some variants of concern are reduced compared with the vaccine strain, and their model predicts the relationship between neutralisation and efficacy against viral variants.

In summary, they show that neutralisation level is highly predictive of immune protection and provides an evidence-based model of SARS-CoV-2 immune protection that will assist in developing vaccine strategies to control the future trajectory of the pandemic.

## Global prevalence of mental health issues during the COVID-19 pandemic

Published in *Nature scientific reports*, researchers searched electronic databases, preprint databases, grey literature, and unpublished studies from 1 January 2020 to 16 June 2020 (updated on 11 July 2020), with no language restrictions. Observational studies using validated measurement tools and reporting data on mental health issues among the general population were screened to identify all relevant studies. They included information from 32 different countries and 398,771 participants.

The pooled prevalence of mental health issues amid the COVID-19 pandemic varied widely across countries and regions and was higher than previous reports before the COVID-19 outbreak began. The global prevalence estimate was 28.0 per cent for depression; 26.9 per cent for anxiety; 24.1 per cent for post-traumatic stress symptoms; 36.5 per cent for stress; 50.0 per cent for psychological distress; and 27.6 per cent for sleep problems. Data are limited for other aspects of mental health issues.

The findings highlight the disparities between countries in terms of the poverty impacts of COVID-19, preparedness of countries to respond, and economic vulnerabilities that impact the prevalence of mental health problems. Research on the social and economic burden is needed to better manage mental health problems during and after epidemics or pandemics.

## High incidence of mucormycosis (black fungal infection) in India during the pandemic

India has reported more than 8,800 cases of deadly “black fungus” in a growing epidemic of the disease. The normally rare infection, called mucormycosis, has a mortality rate of 50 per cent, with some only saved by removing an eye. But in recent months, India has seen thousands of cases affecting recovered and recovering COVID-19 patients. Some experts say there is a link with the steroids used to treat COVID-19. Diabetics are at particular risk. The onset of symptoms is commonly between 12 and 18 days after recovery from acute COVID-19 disease.

Mucormycosis, formerly known as zygomycosis, is a very rare disease caused by the many fungi that belong to the fungal family ‘Mucorales’. Fungi in this family are usually found in the environment (for example, in soil) and often associated with decaying organic material, such as fruit and vegetables. The member of this family which most often causes infection in humans is called Rhizopus oryzae.

Mucorales are considered opportunistic fungi, meaning they usually infect people with an impaired immune system, or with damaged tissue. Use of drugs which suppress the immune system, such as corticosteroids can lead to impaired immune function, as can a range of other immunocompromising conditions, like cancer or transplants. Damaged tissue can occur after trauma or surgery.

Mucormycosis can manifest in the lungs, but the nose and sinuses are the most common site of mucormycosis infection. From there it can spread to the eyes, potentially causing blindness, or the brain, causing headache or seizures. It can also affect the skin. Life-threatening wound infections have been seen after injuries sustained during natural disasters or on battle fields where wounds have been contaminated by soil and water.

Of all mucormycosis cases published in scientific journals globally between 2000 and 2017, diabetes was seen in 40 per cent of cases. A recent summary of COVID-19-associated mucormycosis showed 94 per cent of patients had diabetes, and it was poorly controlled in 67 per cent of cases.

The western states of Gujarat and Maharashtra have reported more than half of the reported cases. At least 15 more states have reported between eight and 900 cases. Following the rise in cases, India's 29 states have been told to declare the disease an epidemic. One study by four Indian doctors has looked at more than 100 cases of COVID-19 patients who had contracted mucormycosis. It found 79 of them were men, and 83 had diabetes. Another study of 45 patients in two Mumbai hospitals found that all were diabetics or diagnosed with diabetes on admission. They all had very steep blood sugar levels.

Treating physicians say that amphotericin B or 'ampho-B' is an anti-fungal intravenous injection which has to be administered every day for up to eight weeks to patients diagnosed with mucormycosis. There are two forms of the drug available: standard amphotericin B deoxycholate and liposomal amphotericin.

## The latest coronavirus comes from dogs

A newly identified coronavirus may not pose a serious threat to humans but the finding highlights the need to monitor animal viruses more proactively.

Scientists have discovered a new canine coronavirus in a child who was hospitalised with pneumonia in Malaysia in 2018. If the virus is confirmed to be a human pathogen, it would be the eighth coronavirus, and the first canine coronavirus, known to cause disease in humans. The study does not prove that the pneumonia was caused by the virus, which may not be capable of spreading between people. But the finding, which was published in the journal *Clinical Infectious Diseases,* highlights the need to more proactively search for viruses that could jump from animals into humans.

Seven coronaviruses are currently known to infect humans. In addition to SARS-CoV-2, the virus that causes COVID-19, there are coronaviruses that cause SARS, MERS and the common cold. Many of these viruses are believed to have originated in bats, but can jump from bats to humans, either directly or after a stopover in another animal host. Scientists have known for decades that coronaviruses can cause disease in dogs, but until now there has been no evidence that canine coronaviruses can infect people.

There is no evidence that dogs transmit SARS-CoV-2 to humans, although both cats and dogs can catch it.

The researchers used a variation of the gold-standard PCR test commonly used to diagnose COVID-19, to analyse some old patient specimens. The samples were nasopharyngeal swabs taken from 301 people who had been hospitalised with pneumonia in Sarawak, Malaysia, in 2017 and 2018. In eight of the specimens, they detected what seemed like a novel coronavirus, similar to those known to infect dogs. These specimens were primarily from children who lived in settings or areas in which contact with domestic and wild animals was common.

Samples were sent to researchers at Ohio State University for further investigation. Using a slightly less sensitive screening technique, they confirmed that two of the eight samples did appear to contain a novel canine coronavirus. Moreover, one of those samples proved capable of causing damage to canine cells. They assembled the complete genome of the virus from this sample. Its genome closely matched that of other known canine coronaviruses. The virus seemed to be a combination of two previously identified canine coronaviruses, and also contained fragments of both a cat coronavirus and a pig coronavirus.

It also had an unusual genetic mutation, a deletion in what is commonly known as the N gene, which codes for an important structural protein. This deletion has not been documented in other canine coronaviruses. Although much more research is needed, one possibility is that the mutation may help animal coronaviruses to adapt to human hosts.

It is too soon to say whether this virus poses a risk to humans. Researchers have not yet proved that this virus is the cause of the pneumonia that sent patients to the hospital. And they have not yet studied whether people who may contract the virus from animals can spread it to other people. One possibility is that coronaviruses may be spreading between humans and other species, including dogs, far more frequently than has been known.

# BURNET INSTITUTE

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