COVID-19 Global Trends and Analyses

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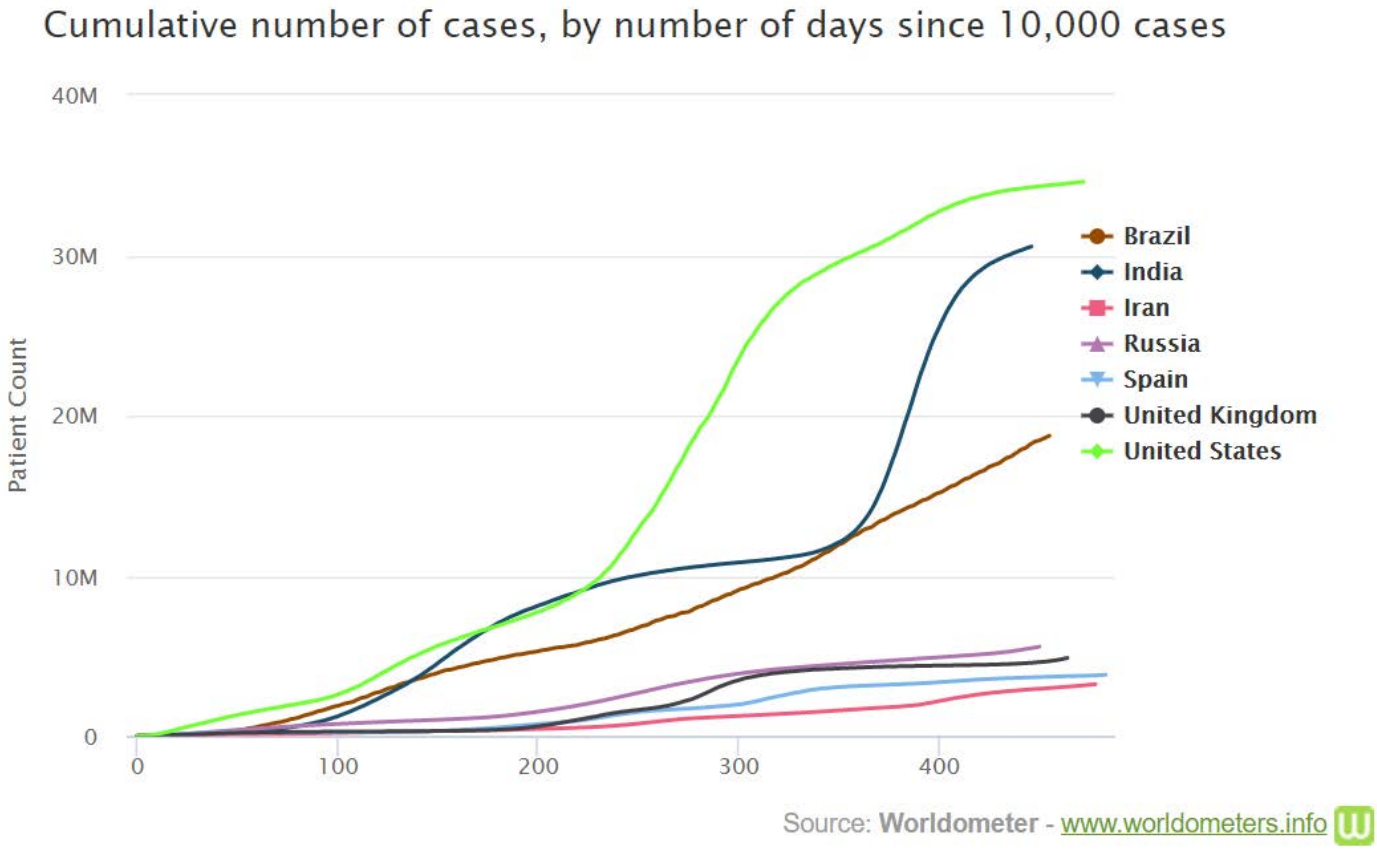
SUMMARY

COVID-19 GLOBAL TRENDS AND ANALYSES | 1 – 30 June 2021

- The **global total** number of reported cases is 184 million and the grim milestone of four million deaths has been reached. The cumulative number of cases is equivalent to 23.5 per 1,000 population.
- The global seven-day rolling average of daily cases has declined from around 828,000 on 29 April to 363,000 on 20 June – a 56 per cent decrease. However, this has increased to 381,000 on 2 July, a 5 per cent jump.
- While lagging behind cases, the seven-day average of daily deaths has decreased from 13,481 on 30 April to 7,682 on 2 July, a 43 per cent decline.
- Almost all **South Asian** countries have reported steep declines in new cases, including India, Pakistan and Nepal, and cases have begun to decline in Sri Lanka. However, the exception is **Afghanistan** where both cases and deaths are increasing rapidly.
- In **SE Asia,** cases continue to surge in Thailand, Myanmar, Malaysia, Vietnam and Cambodia while in decline in Laos and Timor-Leste. The **Philippines** continues to report an average of 5,000 cases a day.
- **Indonesia** is having by far its worst wave since the pandemic began. Since mid-May new daily cases have climbed almost vertically until reaching an all-time high of 22,300 on 2 July. Average daily deaths have also increased from 145 on 18 May to 451 on 2 July. This latest surge has been fuelled by the Delta variant of SARS-CoV-2.
- Reported figures in **Papua New Guinea** have declined to single digit daily cases.
- New daily cases in **Fiji** show no sign of slowing.
- A series of quarantine breaches in Sydney and Brisbane has led to outbreaks and clusters across **Australia**. Sydney's outbreak had reached 277 cases by 4 July. At one point in late June, Sydney, Brisbane, Townsville, Darwin, Alice Springs and Perth were all in lockdown.
- **South Africa** is experiencing a major third wave. The seven-day average of daily cases has increased fivefold from 3,745 on 28 May to 17,703 on 2 July.
- Most other **Southern African** countries are also experiencing second or third waves, including Zambia, Zimbabwe, Mozambique, Botswana, Namibia and Angola.
- Highly vaccinated **Israel** (59.7 per cent fully vaccinated) is reporting an outbreak of the Delta variant, which began in schools. Its seven-day average has increased from 21 on 28 May to 261 on 2 July. Indoor mask wearing has been re-mandated.
- The number of new cases reported in Europe had been declining until mid-June. Since then a number of countries have reported upward trends caused by rapid spread of the Delta variant, especially the UK and Russia but also Portugal and Spain. The UK is reporting an average of 25,000 new cases daily.
- The number of new cases in the **United States** is in steep decline. The current 7-day moving average of 13,678 new cases daily is down 39 per cent from one month ago. The average of daily deaths is 234, down 66 per cent. However, there are concerns that cases are once again rising, predominantly the Delta variant, in states where vaccination rates are low, such as Missouri, Utah, Wyoming and Texas.
- **South America** is once again the most affected region of the world. Brazil, Argentina and Colombia are currently experiencing the most severe waves. **Brazil** has reported more than 18.7 million cases and 524,000 deaths, the second highest in the world after the US. The current 7-day average of new daily cases is more than 52,000.
- **Argentina's** 7-day average has declined from more than 33,000 in early June to just over 19,000 on 3 July. However, **Colombia's** average has reached an all-time high of 30,000 per day.

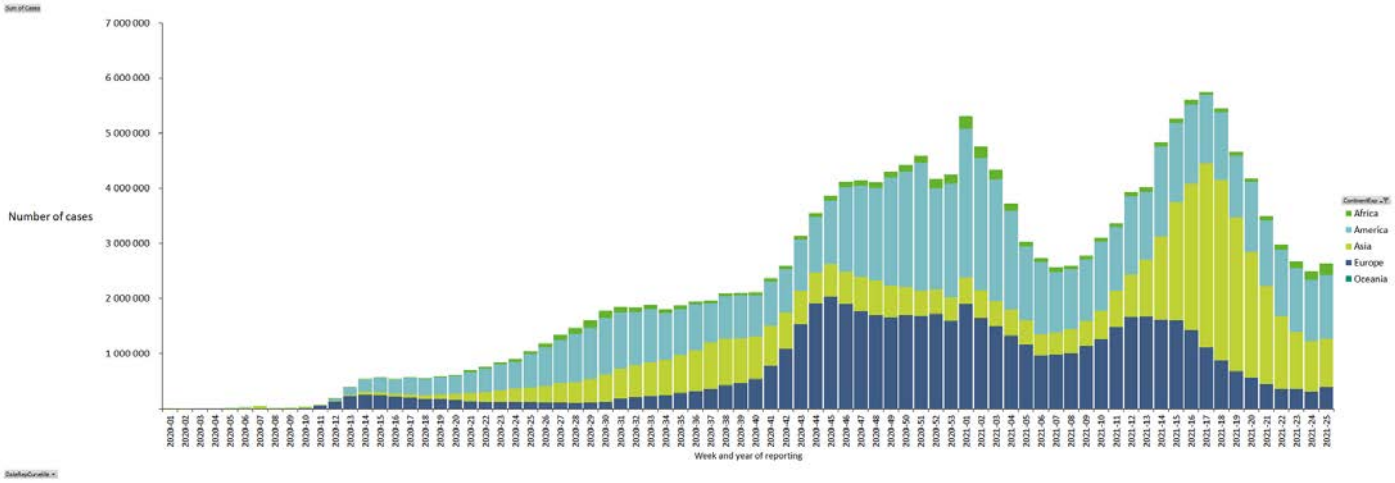
GLOBAL EPIDEMIOLOGY AND TRENDS

The **global total** number of reported cases is 184 million and the grim milestone of four million deaths has been reached. The cumulative number of cases is equivalent to 23.5 per 1,000 population. Cases are low in most European countries except the UK, Russia and Portugal where cases caused by the Delta variant are surging. The steady decline of cases in the US has halted and cases are once again increasing in states with low vaccination coverage, such as Missouri, Utah, Wyoming and Texas. The national seven-day rolling average of new daily cases has increased from around 12,000 on 21 June to 14,000 on 1 July. Cases continue to surge in a number of South American countries. There has been significant improvement in most South Asian countries while many Southeast Asian countries have steadily increasing case numbers.

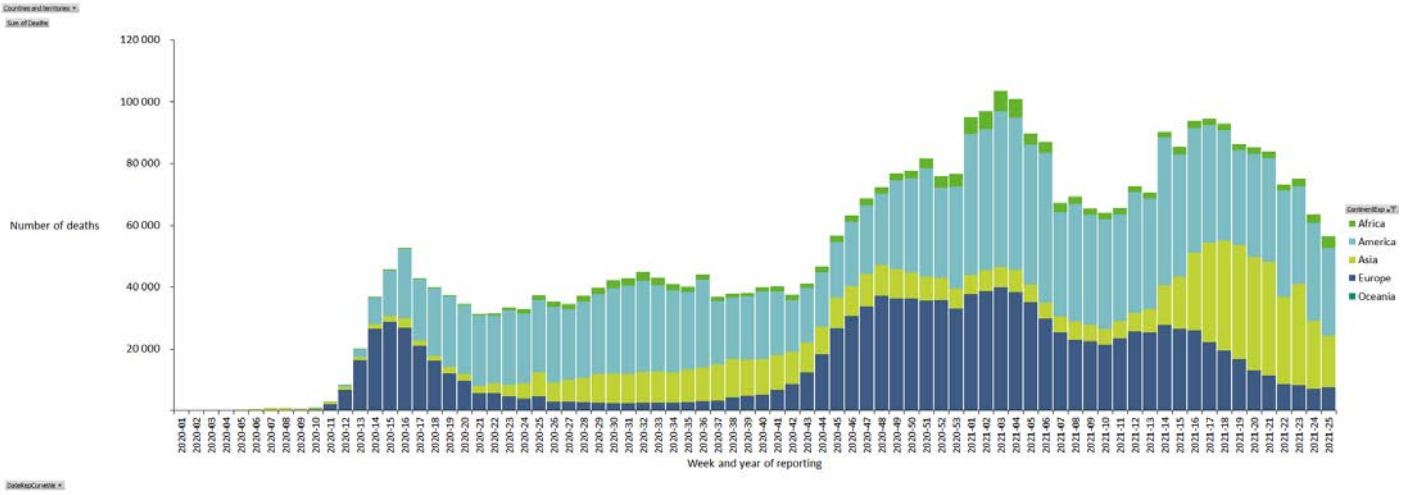


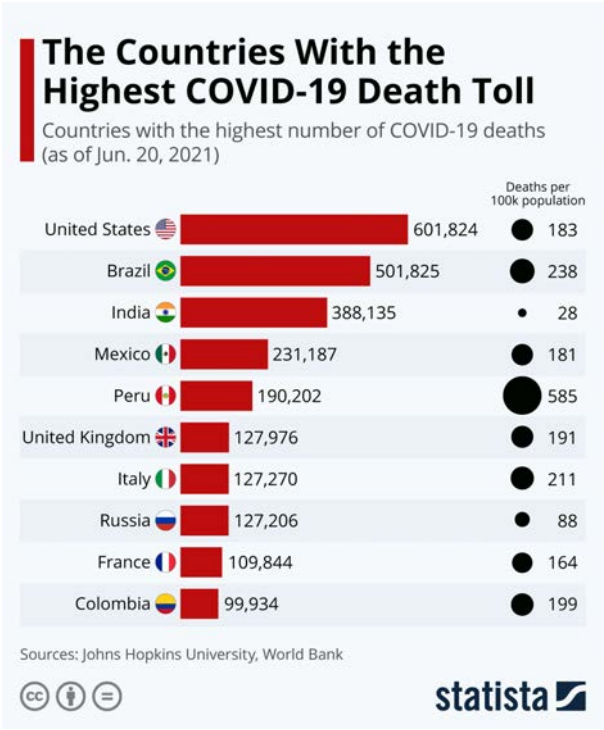
The global seven-day rolling average of daily cases has declined from around 828,000 on 29 April to 363,000 on 20 June – a 56 per cent decrease. However, this has increased to 381,000 on 2 July, a 5 per cent jump. While lagging behind cases, the seven-day average of daily deaths has decreased from 13,481 on 30 April to 7,682 on 2 July, a 43 per cent decline. 28 countries have now recorded more than one million cases, the most recent being Romania (population 19.4 million).

Distribution of weekly COVID-19 cases worldwide, as of 1 July 2021 (source European CDC)



Distribution of weekly COVID-19 deaths worldwide, as of 1 July 2021





Asia-Pacific Region

- Almost all **South Asian** countries have reported steep declines in new cases, including India, Pakistan and Nepal. In Sri Lanka, cases have begun to decline after a large wave that peaked in mid-May. Cases and deaths in **Afghanistan** are increasing rapidly.
- In **SE Asia**, cases continue to surge in Thailand, Myanmar, Malaysia, Vietnam and Cambodia while in decline in Laos and Timor-Leste. The **Philippines** continues to report an average of 5,000 cases a day.
- **Indonesia** is currently facing its worst wave since the pandemic began.
- In **Asian high-income countries,** Taiwan is coming out of a recent surge, South Korea continues to report around 500 cases and in Japan where case numbers were declining there has been an uptick in the past week.
- Reported figures in **Papua New Guinea** have declined to single digit daily cases.
- New daily cases in **Fiji** show no sign of slowing.

7-day moving average of daily new deaths in Afghanistan

Southeast Asia | Asia-Pacific Region

Since March 2021, Thailand, Cambodia, Vietnam, Malaysia, Indonesia, the Philippines, Laos and Timor-Leste have each had major surges in COVID-19 cases. Only Laos and Timor-Leste have returned to low case numbers.

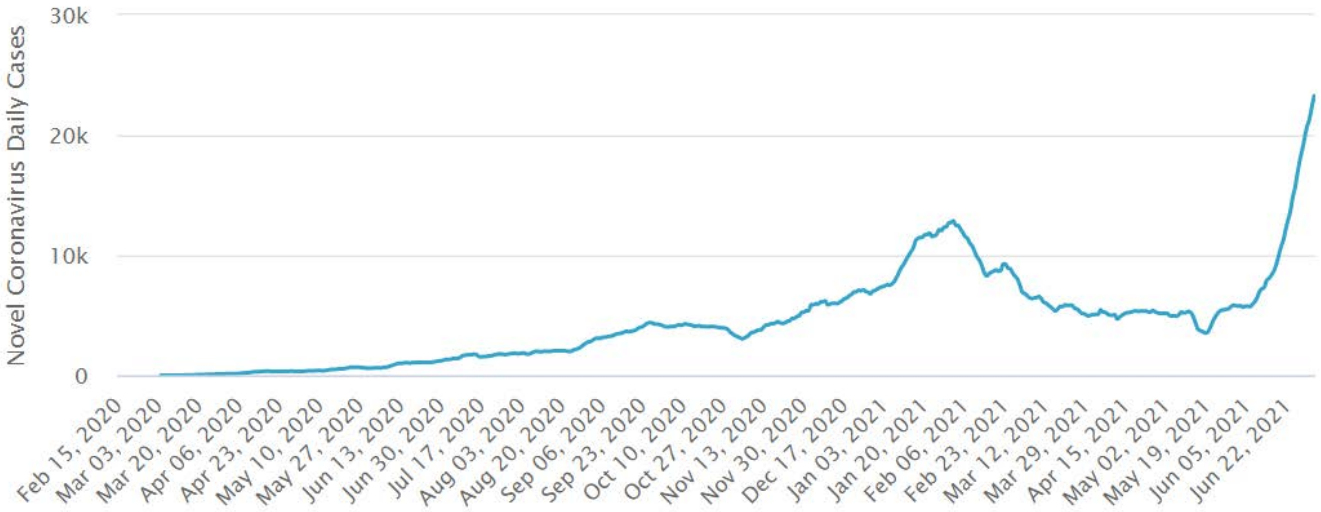
Indonesia has been the most severely affected. The country first reported 1,000 daily cases on 14 June 2020. Since then, cases have increased to more than 5,000 daily cases consistently between 28 November 2020 and 15 May 2021. After a few days below that number, new daily cases have climbed almost vertically until reaching an all-time high of 22,300 on 2 July 2021. Average daily deaths have also increased from 145 on 18 May to 451 on 2 July. This latest surge has been fuelled by the Delta variant of SARS-CoV-2.

Indonesia has recorded 2,178,272 cases overall, among the highest number in Asia, and 58,491 deaths. After initially resisting stricter measures, on 3 July the government introduced tighter restrictions on movement and air travel, a ban on restaurant dining and closure of non-essential offices. They will be applied on the most populous island of Java and on the tourist island of Bali.

Hospitals across the densely populated main island of Java are being pushed to the brink. In Jakarta, some emergency wards have been moved to tents erected in hospital car parks to free up isolation rooms, while residents have formed queues to buy oxygen tanks for family members being treated at home. The bed occupancy rate in the city's hospitals hit 93 per cent this week, with hospitals across Java also edging toward full capacity. On 3 July, dozens of coronavirus patients died after the central supply of liquid medical oxygen ran out due to delays from suppliers.

Indonesia has vaccinated 11 per cent of the population with one dose and 5 per cent have been fully vaccinated. The country relies mainly on Sinovac manufactured in China. Doubts about the effectiveness of Sinovac have emerged after reports that at least 10 out of 26 Indonesian doctors who died from COVID-19 in June had been fully vaccinated with Sinovac, prompting health experts to consider whether doctors should receive alternative doses to boost immunity. In Kudus, a town in central Java, more than 500 medical workers have tested positive for COVID-19 over the last two weeks, including one doctor who died. All were fully vaccinated.

7-day moving average of daily new cases in Indonesia



In **Thailand**, after a dip in mid-June, daily new cases are soaring again, fuelled by the recently arrived Delta variant, with the 7-day average of new daily cases reaching almost 5,000 on 2 July. On that day, the country reported 6,200 new cases, an all-time record. Deaths have also been increasing reaching a 7-day average of 46 on 2 July. The government's Centre for COVID-19 Situation Administration said 39 per cent of the new cases reported on 2 July were in Bangkok, 25 per cent in neighbouring provinces and 36 per cent in the other 71 provinces. A Centre Deputy Spokesperson said Bangkok authorities must urgently set up isolation stations to separate infected people in their local communities and add beds for treatment of serious cases.

About 90 per cent of Thailand's more than 271,000 reported coronavirus cases and 95 per cent of the deaths have been recorded during a surge that began in early April. There were 992 deaths in June, more than 15 times Thailand's total for all of 2020.

Only 10 per cent of the population has received one vaccine dose and just 4 per cent are fully vaccinated. The Thai Government has struggled to secure timely and adequate vaccine supplies, and efforts to obtain more have proceeded slowly. So far, Thailand has only used vaccines from AstraZeneca and China's Sinovac and Sinopharm, although the country has agreements to also buy from Pfizer and Johnson & Johnson. A Thai company, Siam BioScience, was supposed to provide the country with 10 million doses a month of the locally produced AstraZeneca vaccine, but that has been cut to 5-6 million doses. The company, owned by Thailand's king, reportedly has had production problems. It also has contracts to provide vaccines to other countries.

Vietnam, a country of 97 million people, has only reported 18,360 cases and 84 deaths. However, 92 per cent of these cases have been reported since the beginning of 2021. The 7-day average of new daily cases has increased from 8 on 25 April (just at the end of the New Year festival) to 478 on 1 July. The majority of cases have been the Delta variant. A new daily high of 713 cases were reported on 1 July. Most of the 713 new cases were in Ho Chi Minh City, the southern economic hub of nine million people, about half of whom the authorities are aiming to test before Tuesday next week. The health ministry unveiled plans to introduce home quarantine for suspected cases, a shift in strategy that has now relied on centralised centres often run by the military. These plans could be replicated nationwide.

Vietnam has provided one dose of vaccine to 3.7 per cent of the population and just 0.2 per cent is fully vaccinated. The government plans to vaccinate 70 to 75 per cent of the 98 million population by the end of this year or early next year. On 4 June, it approved its first Chinese-made vaccine. Sinopharm is the third to be endorsed in Vietnam, alongside the AstraZeneca vaccine and Russia's Sputnik V. The government has not announced any purchases of the vaccine, but unofficial reports indicate that China has pledged to provide Vietnam with 500,000 doses of the Sinopharm vaccine. Vietnam has launched a public fund to finance the country's effort to secure 120 million doses of COVID-19 vaccines by the end of the year. Recently, mobile phone users have received up to three text messages urging them to contribute to a COVID-19 vaccine fund, while civil servants have been encouraged to part with a day's pay.

Australia | Asia-Pacific Region

In late May, a cluster of new cases was identified in Melbourne, Victoria linked to a man who left hotel quarantine in Adelaide, South Australia more than two weeks previously and returned to Melbourne where he tested positive for the Kappa variant of SARS-CoV-2. 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 imposed a seven-day 'circuit breaker' lockdown across the state. This was later extended to two weeks. During this time a separate cluster of 15 cases was detected that were infected with the Delta variant. The source of this cluster remains unknown; however, it is presumed that it was someone in hotel quarantine.

On 16 June, a limousine driver transporting flight crew from Sydney airport in New South Wales (NSW) tested positive; it was later shown that he was infected with the Delta variant. For five consecutive days, two cases were reported but daily numbers began to climb to 30 on 26 June when a partial lockdown was imposed on Greater Sydney. By 3 July, 277 cases had been identified all linked to the original case. In addition, linked cases were identified in Perth, Western Australia, which went into a short lockdown, and Melbourne.

Soon after, a flight crew member who had just left hotel quarantine in Brisbane, Queensland tested positive for the Alpha variant. That led to a cluster of more than 10 cases. There was then another breach in hotel quarantine in Brisbane leading to an infected man travelling to work in a mine in central Australia where he infected some of his workmates. That led to cases in Darwin in Northern Territory, Adelaide, the Sunshine Coast in Queensland and northern NSW. At one point in late June, Sydney, Brisbane, Townsville, Darwin, Alice Springs and Perth were all in lockdown.

All of these outbreaks and lockdowns were caused by breaches in quarantine. Since 1 May, there have been 12 breaches of quarantine, with a rate of one leak per 41 infected travellers going through the system. This compares with a rate of one per 106 before May.

Australian Quarantine Breaches – 1 May to 3 July 2021

State	Breaches	Overseas Cases	1 in X
New South Wales	3	182	1 in 61
Victoria	1	82	1 in 82
Queensland	5	122	1 in 24
Western Australia	2	20	1 in 10
South Australia	1	79	1 in 79
Tasmania	0	0	-
Australian Capital Territory (ACT)	0	0	-
Northern Territory	0	11	-
Australia	**12**	**496**	**1 in 41**

Source: Anthony Macali (@migga)

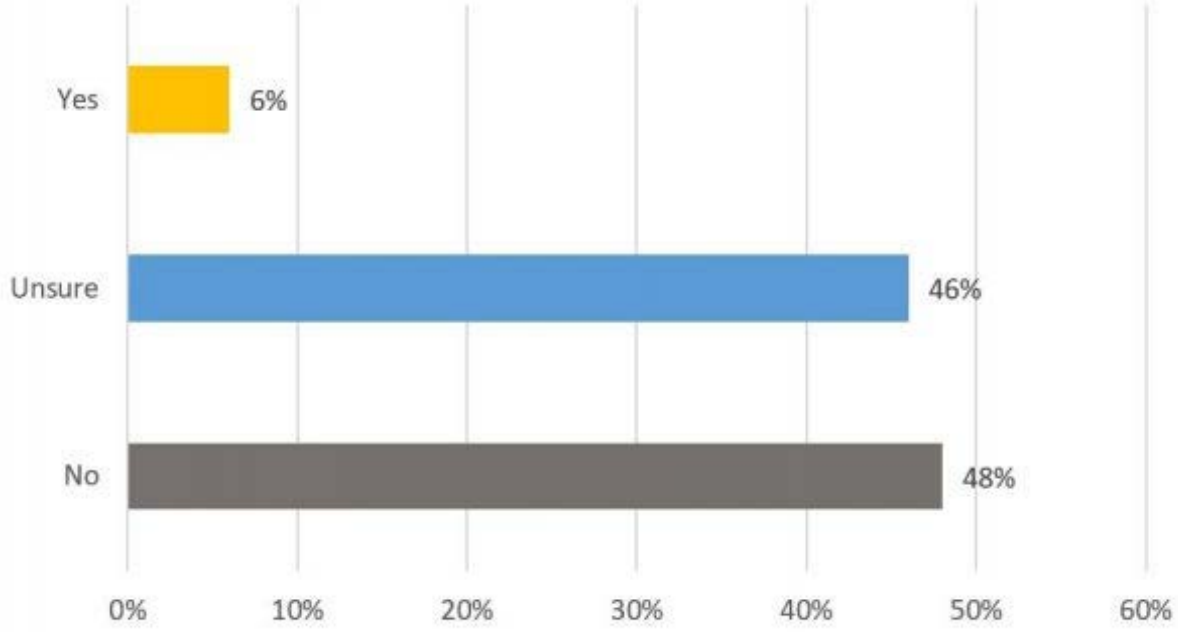
Australia lags behind in its vaccine roll-out with 25 per cent of the population receiving at least one dose and only 6 per cent fully vaccinated. The latter is the lowest among the 38 member countries of the OECD, Organisation for Economic Co-operation and Development.

Pacific Islands | Asia-Pacific Region

Papua New Guinea has reported a total of 17,098 cases and 173 deaths. Daily new cases continue to decline steadily with the 7-day rolling average falling from a high of 297 on 14 May to just 3 on 2 July. PNG's vaccine rollout has been very slow with 0.6 per cent vaccinated at least once and <0.1 per cent fully vaccinated. This is partly explained by supply and logistics constraints, there is also a high level of vaccine hesitancy in large part due to misinformation on social media.

A recent online survey from PNG's *The National* newspaper found that 77 per cent of respondents did not want to be vaccinated. The ANU Crawford School of Public Policy and the School of Business and Public Policy at the University of Papua New Guinea conducted a survey of 281 undergraduates in May 2021. The survey found a lower – but still significant – proportion (48 per cent) not intending to get the vaccine.

Responses to the question "would you like to be vaccinated with the Oxford AstraZeneca vaccine?"



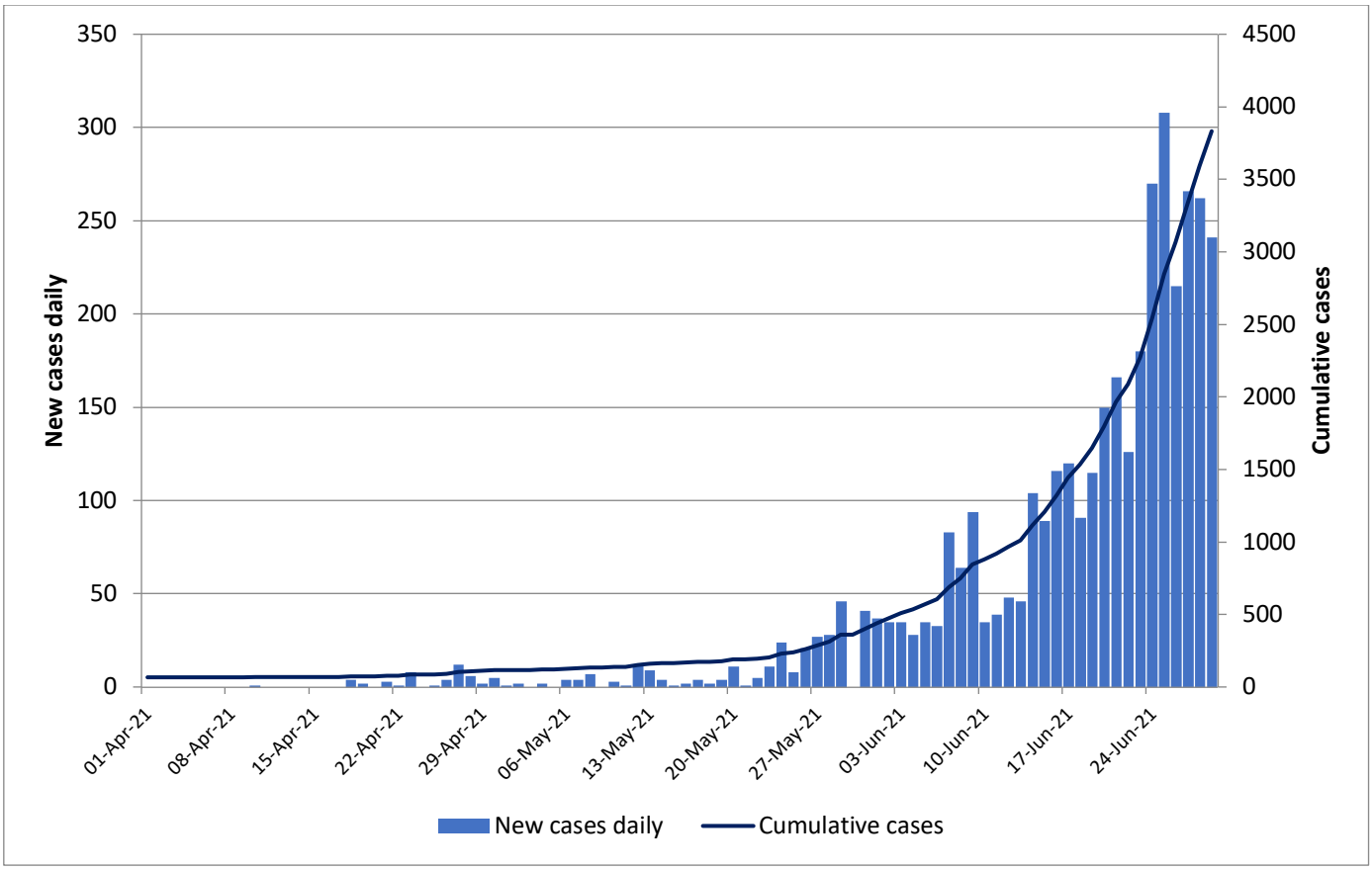
Other Pacific Island Countries and Territories (PICT)

As of 25 June 2021, 11 of the 21 PICTs have reported cases and deaths (Commonwealth of the Northern Marianas (CNMI), Fiji, French Polynesia, Guam, New Caledonia, Papua New Guinea (PNG), Republic of the Marshall Islands (RMI), Samoa, Solomon Islands, Vanuatu and Wallis and Futuna). Among these countries, a total of 30,694 confirmed cases have been reported including 303 deaths. Among all cumulative cases, 62 per cent were in French Polynesia, 26 per cent were in Guam and 9 per cent were in Fiji; however, over the previous 10 weeks, 82 per cent of all newly reported cases in PICTs have been reported in Fiji.

Pacific Island Countries and Territories	Population	Total Cases	Deaths
American Samoa	55,312	0	0
Cook Islands	17,577	0	0
Fiji	889,953	2,848	13
French Polynesia	279,287	18,992	142
Guam	167,294	8,060	139
Kiribati	117,606	0	0
Marshall Islands	58,791	4	0
Micronesia (Federated States of)	113,815	0	0
Nauru	12,581	0	0
New Caledonia	287,800	129	0
Niue	1,619	0	0
Northern Mariana Islands (Commonwealth of the)	57,216	183	2
Palau	18,008	0	0
Pitcairn Islands	40	0	0
Samoa	197,097	1	0
Solomon Islands	669,823	20	0
Tokelau	1,357	0	0
Tonga	104,494	0	0
Tuvalu	11,646	0	0
Vanuatu	299,882	3	0
Wallis and Futuna	11,239	454	7
Total	**3,372,437**	**30,694**	**303**

Fiji Outbreak

Fiji has been experiencing an outbreak of locally acquired cases since April 2021, with the majority of cases in the Central Division. Between 18 April 2021 and 29 June 2021, a total of 3,760 cases and 15 deaths were reported to the World Health Organization.



Several characteristics of the outbreak cause alarm including the daily test positivity and the doubling rate. The Fiji Ministry of Health and Medical Services reports that the daily test positivity rate is 8.3 per cent. According to criteria published by WHO in May 2020, a positive rate of less than 5 per cent is one indicator that the epidemic is under control in a country[1]. The doubling rate, that is the length of time for the number of confirmed cases to double in each country for which we have data, is a metric to indicate where confirmed cases are increasing most rapidly. The doubling rate for Fiji is currently reported to be 9 days (1,468 cases on 18 June to 3,591 cases on 27 June 2021), and is the fastest reported doubling rate globally.

The Fijian Government has restricted movement for essential purposes only and instituted a curfew from 6pm until 4am every day for affected areas. Within these areas, people can move for only three reasons: to source food, obtain medicine and for authorised work. Dr Fong has not recommended a complete lockdown to the Prime Minister and has emphasised the importance of compliance to existing curfews rather than a complete lockdown claiming that a complete lockdown is not feasible due to a poor track record of public compliance to measures. Fiji is also targeting vaccinations, reporting that 46 per cent of adults in Fiji have received one dose, and 6.5 per cent have received the second dose.

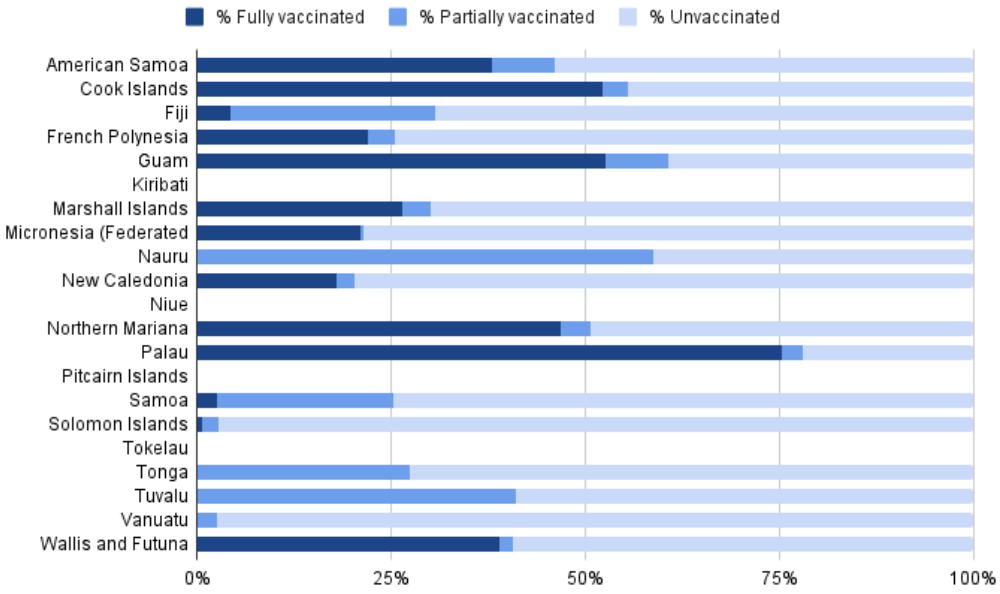
1 Public health criteria to adjust public health and social measures in the context of COVID-19, 12 May, 2020

Current Point of Entry Measures

Fiji	International passenger air travel in and out of Fiji has been suspended as of 22 April 2021 until further notice.
French Polynesia	Negative PCR test within 3 days of departure and antigen or PCR test upon arrival. Testing on day 4 and 8 during mandatory 10-day quarantine. Fully vaccinated individuals may be exempt from quarantine, depending on duration of stay in country of origin.
Guam	Negative PCR test no more than 72 hours prior to arrival or documentation of recovery from COVID-19. 7-10 day quarantine, location and duration dependent on traveller classification and test results. Individuals fully vaccinated (FDA or WHO EUL), previously infected, or travelling from certain countries may be exempt from quarantine.
Republic of the Marshall Islands	Total suspension of international travellers until 30 June 2021.
New Caledonia	Negative PCR test within 72 hours prior to departure. All arrivals required to undergo 14-day quarantine in an approved facility, testing during last day of quarantine. Travellers who have been fully vaccinated with 2 doses of mRNA vaccine, 1 mRNA + 1 AZ, or 1 mRNA + previous infection may undergo a 7-day quarantine period.
Commonwealth of the Northern Mariana Islands	Testing required on arrival and day 5 of quarantine, which is required in a designated facility for minimum of 5-7 days. Vaccinated individuals and those travelling from certain jurisdictions may be exempt from some testing and quarantine requirements.
Palau	Negative PCR result within 3 days of departure. Proof of COVID-19 vaccination (WHO or US FDA authorised) with final dose received 14+ days prior to arrival. Exemptions for children under 12 years.
Samoa	Commencing 1 August 2021, travellers including crew are required to be fully vaccinated before entry into Samoa - legitimate vaccine certificate is required for boarding. Negative PCR within 72 hours, medical exam within 120 hours, and antibody test within 5 days of departure. Quarantine to be determined based on vaccine type and country of origin.
Solomon Islands	2 or 3 pre-flight tests (depending on country of origin – high / low risk). Testing at point of entry and 14 or 21 days of mandatory, facility-based quarantine (depending on country of origin).
Vanuatu	Negative PCR within 72 hours before departure to Vanuatu. Health screen on arrival, mandatory facility-based quarantine for 14 full days (15 nights), testing on days 5 and 11 (plus day 1 for arrivals from high-risk areas).
Wallis and Futuna	Negative PCR within 72 hours from departure. 14-day quarantine may be required.

Vaccination across PICTs

WHO WRPO reported that as of 30 June 2021, 1,133,930 COVID-19 vaccination doses have been distributed in PICTs (excluding PNG) and 381,461 individuals are considered fully vaccinated. Among countries with available data, vaccination coverage (as a per cent of the total population) is highest in the American-affiliated states of Palau (75% fully vaccinated), Guam (53%), Northern Mariana Islands (47%), and American Samoa (39%). In addition, 53 per cent of the population of Cook Islands (associated with New Zealand) is fully vaccinated.



African Region

- The African continent has reported 5,394,709 million cases (a 12% increase since last month) and 141,000 deaths (8.5% increase). South Africa has reported the highest number of cases at 1.9 million, followed by Morocco with 529,000 cases, and Tunisia with 403,000 cases.
- **South Africa** is experiencing a major third wave. The seven-day average of daily cases has increased fivefold from 3,745 on 28 May to 17,703 on 2 July.
- Most other **Southern African** countries are also experiencing second or third waves, including Zambia, Zimbabwe, Mozambique, Botswana, Namibia and Angola.
- In Central Africa, **Uganda and DRC** are also having second waves linked to the Delta variant.
- Highly vaccinated **Seychelles** continues to report more than 200 cases a day.

Uganda | African Region

Uganda has reported 82,852 cases and 1,111 deaths. The testing rate is 28.5 per 1,000. Uganda is experiencing a major second wave; the 7-day average increased from 47 on 1 May to 1,467 on 14 June but has since declined to 789 on 2 July. The sharp uptick of cases, believed to be fuelled by different variants – including Delta – circulating in the country, has surprised public and private hospitals, and many have struggled to meet the constant demand for care. The Mandela National Stadium is now a temporary hospital for COVID-19 patients, and although the government says it is meant for patients with mild to moderate cases, deaths have occurred there.

The second wave in Uganda has hit the young hard, with those aged between 30 and 39 the worst affected, according to the Ministry of Health. Those aged 20-29 have recorded the second-highest number of positive cases. Only 1.8 per cent of the 42 million people living in Uganda having been vaccinated so far. Uganda has nearly depleted the 964,000 AstraZeneca shots it received from COVAX, the vaccine-sharing initiative for low and middle-income countries. Additional shipments of COVAX vaccines that were expected in May have yet to arrive.

Middle East Region

- The worst affected countries continue to be **Iran and Iraq** with recent upticks in new cases during the past two weeks.
- Highly vaccinated **Israel** (59.7% fully vaccinated) is reporting an outbreak of the Delta variant, which began in schools. Its seven-day average has increased from 21 on 28 May to 261 on 2 July. Indoor mask wearing has been re-mandated.
- Cases are declining sharply in **Palestine and Jordan**.
- In the **Gulf countries**, highly vaccinated UAE (70% fully vaccinated) continues to report around 2,000 cases a day; however, cases have dropped to low levels in Bahrain (58% fully vaccinated).

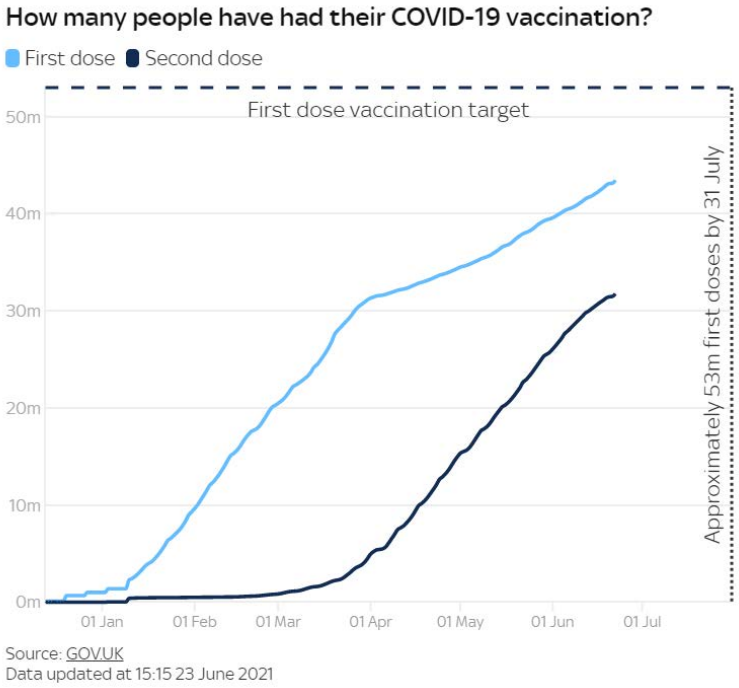
European Region

- Europe has so far reported **54,714,915 cases**; the five countries reporting most cases are France (5,770,021), Russia (5,472,941), Turkey (5,409,027), United Kingdom (4,732,434) and Italy (4,258,069). There have been 1,166,120 deaths; the five countries reporting most deaths are Russia (133,893), United Kingdom (128,100), Italy (127,472), France (110,997) and Germany (90,762).
- The number of new cases reported in Europe had been declining until mid-June. Since then, a number of countries have reported upward trends, especially the UK and Russia but also Portugal and Spain.
- Several countries have fully vaccinated more than 50 per cent of their populations – Malta (65%), Iceland (62%), UK (50%), and Hungary (50%) – but most have fully vaccinated around 30 to 35 per cent. These levels of coverage are not yet sufficient to provide herd immunity.

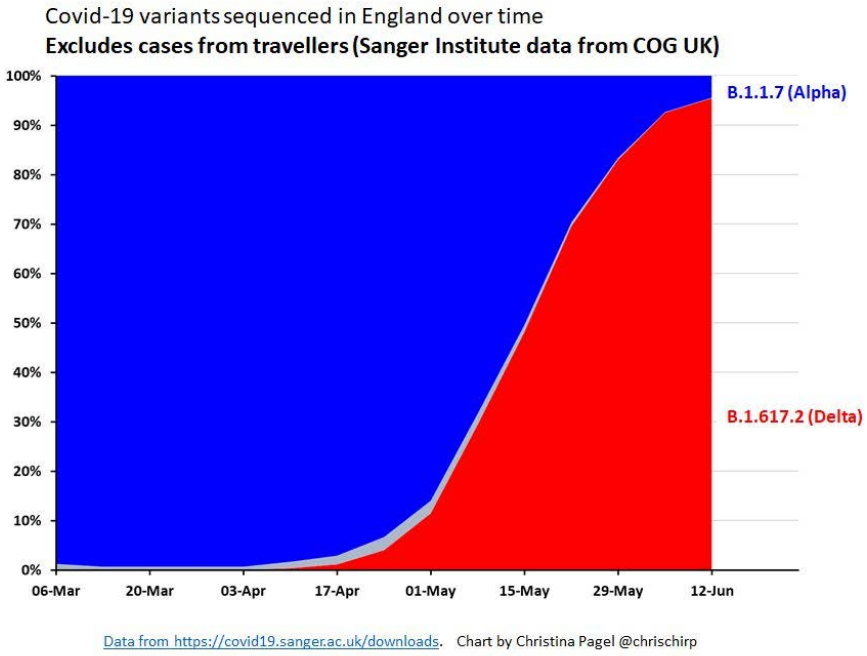
United Kingdom | European Region

The UK has reported a total of 4.8 million cases among a population of approximately 66.5 million people. On 1 July 2021, they reported 27,989 new cases, which was the highest amount since late January. Toward the end of 2020, the UK introduced widespread vaccinations. From April to June 2021, the UK had drastically reduced daily new cases to under 3,000 a day, a remarkable decrease from their third wave peak of 60,000 in mid-January 2021.

The vaccination effort in the UK has been immense, with the country ranking 5th in total vaccine doses per 100 people (among countries with a population of at least 1 million). There are 113 total vaccine doses per 100 people, with 44 million individuals who have had their first vaccine dose. This represents more than 80 per cent of their adult population with 32 million people that have received their second dose. The minister for vaccines, Nadhim Zahawi, has estimated that the vaccination rollout has saved more than 14,000 lives and has prevented 44,500 hospital admissions in England. Currently, the four vaccines approved for use by medical regulators are the Pfizer, Astra Zeneca, Moderna and Janssen (which is due to arrive later this year).

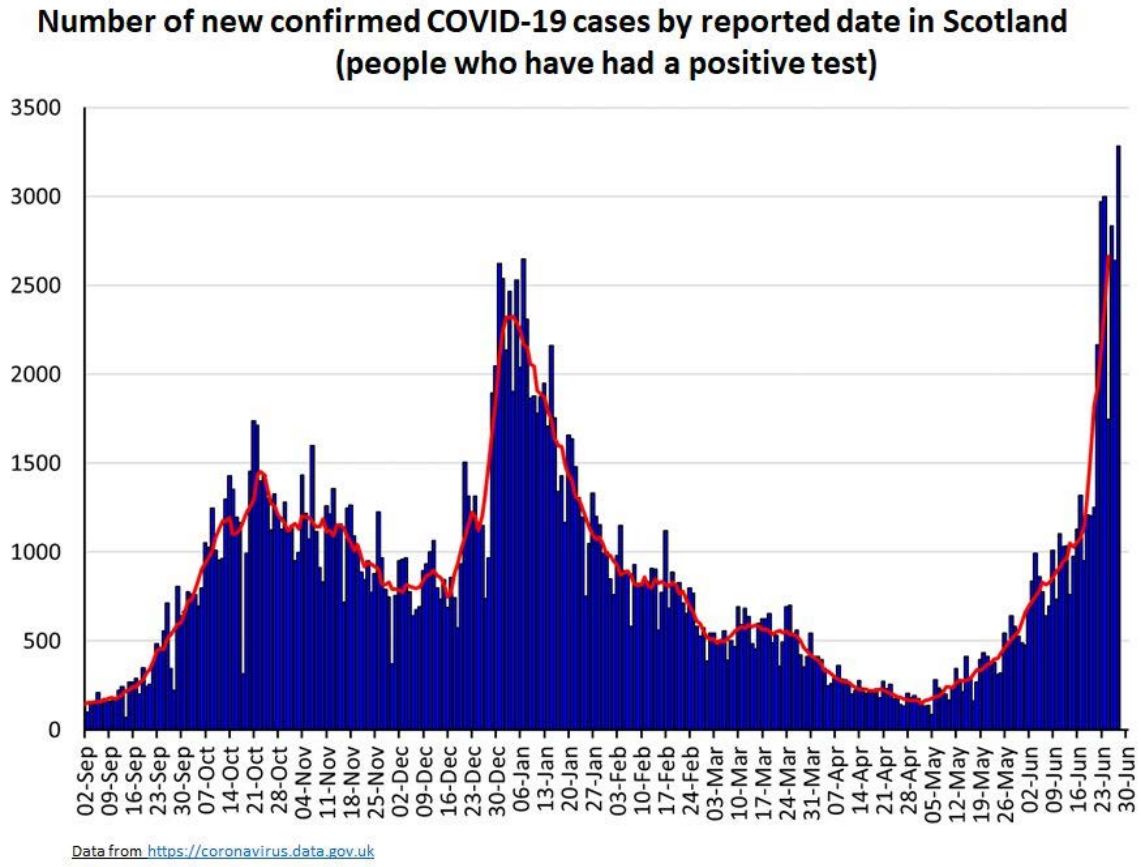


Although the vaccine rollout in the UK has been widespread, efforts to reduce the impact of COVID-19 have been hampered by the introduction and dominance of the Delta variant. Since mid-April 2021, the Delta variant has become the dominant variant in the region, to the point where over 90 per cent of variants sequenced in the UK are the Delta strain. It has just taken over 8 weeks to overtake the previous dominant variant, Alpha. Thankfully, although infection with Delta has shown a higher risk of hospital admission, it appears as though two doses of the vaccine have granted 90 per cent protection against hospitalisation.



Reasons for the increase in Delta in the UK include its introduction during a colder season, and the fact that it entered the country during a period of progressively easing restrictions. Although there is high concern around the spread of Delta, the latest wave has seen the age distribution of cases shift to younger people relative to previous waves. To combat the spread of the variant, the UK Government has delayed its 'Freedom Day', which marks the date in which the remaining COVID-19 restrictions are removed, to 19 July.

In Scotland, confirmed cases have skyrocketed past their previous peak as week-on-week cases have more than doubled. Positivity rates are over 10 per cent, although hospital and ICU occupancy have yet to match the previous wave.



The long-term consequences of the disastrous waves of infection that the UK faced last year are slowly becoming clearer, following the release of a report by the Office for National Statistics. In this report, statisticians found that an estimated 1.1 million people in private households had reported experiencing persistent COVID-19 symptoms that lasted longer than 4 weeks. In 674,000 of these individuals, the COVID-19 symptoms were enough to adversely affect their day-to-day activities.

The United States and Canada

- The number of new cases in the **United States** is in steep decline. The country has reported **34.6 million cases** and more than 621,000 deaths. The current 7-day moving average of 13,678 new cases daily is down 39 per cent from one month ago. The average of daily deaths is 234, down 66 per cent. However, there are concerns that cases are once again rising, predominantly the Delta variant, in states where vaccination rates are low, such as Missouri, Utah, Wyoming and Texas.
- **Canada** has reported 1.42 million cases and more than 26,000 deaths. Cases have been declining since mid-April when the peak 7-day average was 8,767 cases to 556 on 2 July. Canada has provided at least one dose of vaccine to 69 per cent of the population and 34 per cent are fully vaccinated.

Latin America

- **South America** is once again the most affected region of the world. Brazil, Argentina and Colombia are currently experiencing the most severe waves. **Brazil** has reported more than 18.7 million cases and 524,000 deaths, the second highest in the world after the US. 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 52,000 daily new cases.
- **Argentina's** 7-day average has declined from more than 33,000 in early June to just over 19,000 on 3 July. However, **Colombia's** average has reached an all-time high of 30,000 per day.
- **Chile**, which has fully vaccinated 56 per cent of the population, has passed the peak of its third wave but continues to report more than 3,000 cases a day.

Peru | Latin America

Peru has almost tripled its official COVID-19 death toll to 180,764, following a government review, making it the country with the worst death rate per capita, according to Johns Hopkins University data. Its cumulative death toll of 5.8 per 1,000 compares with 3.0 in Hungary, 2.5 in Brazil, 2.1 in Italy and Argentine, and 1.9 in the US and UK. Peru has been among the hardest-hit Latin American countries during the COVID-19 pandemic. Its hospitals have been overcrowded and demand for oxygen has been outstripping availability.

Peru's updated numbers are in line with so-called excess death figures, which researchers have used in Peru and other countries to measure possible undercounting during the pandemic. Excess deaths measure the total number of deaths over a period of time and compare it with the same period before the pandemic.

SNAPSHOTS | DIAGNOSIS, EPIDEMIOLOGY AND OUTCOMES

Need to improve the spread of respiratory viruses in Australian hospitals

In a pre-print article in the *MJA*, the authors argue that current approaches in Australia to limiting transmission of respiratory viruses including COVID-19 are not good enough. The overrepresentation of healthcare workers among those acquiring SARS-CoV-2 infection in workplace settings is a clear testament to this with adjusted hazard ratios of HR 3·40.

Australia has been slow to appreciate and to study the extent of transmission of respiratory viruses in healthcare facilities or to implement appropriate infection control practices in these settings. For example, the Australian guidelines for the prevention and control of infection in healthcare settings, which were revised in 2021, recommend contact and droplet precautions for respiratory viruses, together with a weak recommendation to place these patients in a single room. Airborne precautions were only recommended for patients with infections where transmission is known to occur by the airborne route (aerosols), such as tuberculosis.

In contrast, a WHO-commissioned meta-analysis of data on transmission of coronaviruses, including SARS-COV-2, showed that N95 respirators provide 96 per cent protection versus surgical masks 67 per cent. Eye guards provided further protection.

The authors propose revising the existing approach to the control of transmission of respiratory viruses, including:

1. The application of both contact and airborne precautions, including eye protection, in managing all patients with suspected COVID-19 or influenza-like illness (regardless of whether so-called "aerosol-generating procedures" are being performed).
2. Health workers involved in care of patients with influenza-like illness should be trained in correct donning and doffing of personal protective equipment.
3. Fit testing should be provided annually for health workers.
4. Healthcare facilities need to ensure there is access to sufficient single rooms to effectively manage patients with respiratory viral infections.
5. Building and engineering controls in healthcare settings, including ventilation and air conditioning, should be optimised to minimise the risk of airborne transmission within facilities.

Updated infection control guidelines in Australia

The Infection Control Expert Group (ICEG) and National COVID-19 Clinical Evidence Taskforce have jointly agreed on updated recommendations to protect healthcare workers from COVID-19 infection, which were published on 10 June.

This includes advice on when to use face (surgical) masks, P2/N95 respirators and eye protection. Their recommendations are based on the combined experience and expertise of the members involved – and relates to healthcare workers in all settings, **including hotel quarantine**. ICEG has followed the emerging evidence and now recognises the potential for transmission of SARS-CoV-2 via aerosols in specific circumstances.

In these most recent guidelines ICEG does not specify which kind of PPE should be used in which healthcare settings. Rather, it states that "PPE is a critical part of infection prevention and control. However, organisations should consider

it as the last line of defence within a broader 'Hierarchy of Controls' framework, which includes minimisation of risk through the implementation of administrative and engineering controls and other interventions in combination with appropriate PPE." Regarding respiratory and surgical masks, the recommendations include the following:

1. Healthcare workers who wear P2/N95 respirators should complete fit testing before first use, and perform a fit (seal) check properly each time they are used. In situations where fit testing has not yet been carried out, and a P2/N95 respirator is recommended for use, a fit checked P2/N95 respirator is preferred to a surgical mask.
2. All healthcare workers providing direct patient care or working within the patient/client/resident zone for individuals with suspected or confirmed COVID-19 should have access to P2/N95 respirators.
3. For healthcare workers providing direct patient care or working within the patient/client/resident zone for individuals with suspected or confirmed COVID-19, the choice between P2/N95 respirator or surgical mask should be based on an assessment of risk of transmission.
4. Assessment of risk of transmission of COVID-19 to healthcare workers should include consideration of: the individual patient/client/resident's pre-existing likelihood of COVID-19; patient/client/resident factors; and the physical location of care.

Assessment of SARS-CoV-2 reinfection one year after primary infection in Lombardy, Italy

Italian researchers investigated the incidence of SARS-CoV-2 primary infection and reinfection among individuals who, during the first wave of the pandemic in Italy (February to July 2020), underwent diagnostic reverse-transcriptase–polymerase chain reaction (PCR). Symptomatic and asymptomatic patients of any age, who were recruited in several screening and contact-tracing programs, were included. The findings have been published in *JAMA*.

During the follow-up (mean 280 days) five reinfections (0.31 per cent) were confirmed in the cohort of 1,579 positive patients. Only one was hospitalised, and four patients had a close relationship with health facilities. Of 13,496 persons who initially were not infected with SARS-CoV-2, 528 (3.9 per cent) subsequently developed a primary infection.

The study results suggest that **reinfections are rare events** and patients who have recovered from COVID-19 have a lower risk of reinfection. Natural immunity to SARS-CoV-2 appears to confer a **protective effect for at least a year**, which is similar to the protection reported in recent vaccine studies. However, the observation ended before SARS-CoV-2 variants began to spread, and it is unknown how well natural immunity to the wild-type virus will protect against variants.

Update on monoclonal antibody cocktails

Four commercial monoclonal antibody cocktails are considered here – Regeneron/Roche, Eli Lilly, Glaxo Smith Kline (GSK) and AstraZeneca.

1. In April 2021, **Regeneron** announced that Phase 3a/b trials found its single-dose monoclonal antibody cocktail was effective in both preventing COVID-19 infections and halting the disease's progression in asymptomatic patients. REGEN-COV (casirivimab with imdevimab) is a cocktail of two monoclonal antibodies designed to block infectivity of SARS-CoV-2. Both the IIIa prevention trial and the 3b treatment trial testing REGEN-COV were jointly run with the National Institutes of Health (NIH).

   The double-blind, placebo-controlled Phase 3a **prevention trial** enrolled 1,505 uninfected people, who lived in the same household as a person who tested positive within four days, showed that REGEN-COV 1,200 mg administered subcutaneously decreased the risk of symptomatic infections by 81 per cent in people who were not infected when they started the trial.

   The Phase 3b **treatment trial** enrolled 204 individuals without any COVID-19 symptoms who tested positive but did not have anti-virus antibodies at baseline, and were randomised to receive either one dose of REGEN-COV

(1,200 mg) or placebo. REGEN-COV reduced the overall risk of progressing to symptomatic COVID-19 by 31 per cent (primary endpoint), and by 76 per cent after the third day. The trial also showed that REGEN-COV reduced symptom duration (by 45 per cent) and markedly decreased viral load levels (by more than 90 per cent). Hospitalisations were reduced by 100 per cent.

2. In Phase 3 trial data released in March, **Eli Lilly's** bamlanivimab-etesevimab combination reduced the risk of hospitalisation and death by 87 per cent versus placebo. Investigators tested a combination of 700 mg of bamlanivimab and 1400 mg of etesevimab in a trial comprising 769 patients in total. The US FDA has authorised use of the drug in these doses for "high risk individuals" early in the progression of their disease. Patients over 65, or those under 65 but who are overweight or have multiple health problems, qualify as high-risk for treatment with the drug.
3. **AstraZeneca's** trial results, released on 15 June, showed that their antibody cocktail was only 33 per cent effective at preventing symptomatic COVID-19 in people who had been exposed to the virus. The trial of 1,121 adult volunteers looked at whether the long-acting antibody combination could protect people who had recently been in contact with the SARS-CoV-2 virus in places like aged care homes. The study, conducted in the US and UK, showed that 23 volunteers who got the AZD7442 cocktail developed symptomatic COVID-19 following exposure to the virus, compared with 17 cases in the placebo group. Twice as many participants got the antibody, but the difference between the two groups wasn't considered statistically significant. The cocktail was well tolerated by participants.
4. On 27 May, the US FDA granted emergency use authorisation to **GlaxoSmithKline** (GSK) and Vir Biotechnology for sotrovimab, a single-dose monoclonal antibody, for mild-to-moderate COVID-19 in adults and children 12 years of age and older weighing at least 40 kilograms. The EUA was granted base on interim data from the Phase III COMET-ICE (COVID-19 Monoclonal antibody Efficacy Trial – Intent to Care Early) trial in high-risk adult outpatients. The data showed an 85 per cent drop in hospitalization for more than 24 hours or death in patients receiving sotrovimab compared to placebo.
5. The Australian TGA granted a provisional determination to GSK Australia in relation to the monoclonal antibody treatment, sotrovimab (GSK4182136) on 14 April 2021. The TGA has now received GSK's application for provisional registration and is evaluating the preliminary data for sotrovimab. **This is the only monoclonal antibody treatment being considered by the TGA.**

Screening for SARS-CoV-2 by RT-PCR: Saliva or nasopharyngeal swab?

A rapid review and meta-analysis published on 10 June in *PLoS One* compared saliva and nasopharyngeal/oropharyngeal samples for the detection of SARS-CoV-2 through a meta-analysis searching in PubMed up to 29 December 2020.

Out of 50 eligible studies, meta-analysis showed high concordance, 92.5 per cent across studies and pooled sensitivities of 86.5 per cent and 92.0 per cent from saliva and nasopharyngeal/oropharyngeal swabs respectively. Heterogeneity across studies was 72.0 per cent for saliva and 85.0 per cent for nasopharyngeal/oropharyngeal swabs. The meta-analysis strongly suggests that **saliva could be used for frequent testing** of COVID-19 patients and mass screening of populations.

Underlying medical conditions associated with severe COVID-19 illness among children

This cross-sectional study, published in *JAMA*, included patients aged 18 years and younger with COVID-19 or B97.29 (other coronavirus) during an emergency department or inpatient encounter from March 2020 through January 2021. Data were collected from more than 800 US hospitals.

Among 43,465 patients with COVID-19 aged 18 years or younger, **28.7 per cent had underlying medical conditions**. The most common diagnosed conditions were asthma, neurodevelopmental disorders, anxiety and fear-related disorders, depressive disorders, and obesity. The strongest **risk factors for hospitalisation were type 1 diabetes and obesity**, and the strongest risk factors for severe COVID-19 illness were type 1 diabetes, and cardiac and circulatory congenital anomalies. Prematurity was a risk factor for severe COVID-19 illness among children younger than 2 years. Chronic and complex chronic disease histories were risk factors for hospitalisation, as well as for severe COVID-19 illness.

Risk factors for death among 120,804 hospitalised patients with confirmed COVID-19 in São Paulo, Brazil

São Paulo is a state in Brazil with one of the highest numbers of confirmed and severe cases of COVID-19, with an incidence of 294 hospitalisations per 100,000 inhabitants. Authors of a paper published in the American Journal of Tropical Medicine and Hygiene report the clinical characteristics and outcomes of 120,804 hospitalised patients with confirmed COVID-19 from 26 February to 10 October, 2020, in São Paulo. Characteristics of patients who died and survived were compared using a survival analysis. The median age was 60 years and 56.1 per cent were men. **Most hospitalised patients (66.1 per cent) reported one or more comorbidities**, 34.5 per cent of hospitalised patients were admitted to intensive care units, and 27.4 per cent died. Men (hazard ratio [HR], 1.22), elderly individuals (HR, 3.85), and patients with chronic conditions including hypertension (HR, 1.05), chronic lung disease (HR, 1.38), diabetes mellitus (HR, 1.14), and chronic neurological disease (HR, 1.48) were at higher risk for death from COVID-19.

Clinical characteristics and risk factors for death among hospitalised children and adolescents with COVID-19 in Brazil: an analysis of a nationwide database

The authors of a paper published in *The Lancet Child and Adolescent Health* did an analysis of all patients younger than 20 years who had RT-PCR-confirmed COVID-19 and were registered in the nationwide surveillance database of patients admitted to hospital with severe acute respiratory disease in Brazil, between 16 February 2020, and 9 January 2021. The primary outcome was time to recovery (discharge) or in-hospital death.

Of the 82,055 patients younger than 20 years reported during the study period, 11,613 had available data showing laboratory-confirmed SARS-CoV-2 infection and were included in the sample. **Among these patients, 886 (7.6 per cent) died in hospital (at a median 6 days after hospital admission)**, 10,041 (86.5 per cent) patients were discharged from the hospital, 369 (3.2 per cent) were in hospital at the time of analysis, and 317 (2.7 per cent) were missing information on outcome. The estimated probability of death was 4.8 per cent during the first 10 days after hospital admission, 6.7 per cent during the first 20 days, and 8.1 per cent at the end of follow-up.

Multivariate survival analysis showed that risk of death was increased in infants younger than 2 years (hazard ratio 2.36) or adolescents aged 12–19 years (2.23) relative to children aged 2–11 years; those of Indigenous ethnicity (3.36) relative to those of White ethnicity; those living in the Northeast region (2.06) or North region (1.55) relative to those in the Southeast region; and those with one (2.96), two (4.96), or three or more (7.28) pre-existing medical conditions relative to those with none.

Scientists begin to unravel the mysteries of the coronavirus and brains

In the coronavirus pandemic's early days, neuropathologists were reluctant to open skulls during autopsies for fear of viral transmission to staff. However, over time as the COVID-19 caseload increased, scientists in the US and Germany examined the brains of deceased patients. Neurological symptoms were reported in many acute cases and in patients with 'long COVID'. Patients reported visual and auditory disturbances, vertigo and tingling sensations, among other perplexing symptoms. Some lost their sense of smell, or their vision became distorted. Weeks or months after the initial onset of symptoms, some complain even after a mild bout of the coronavirus of persistent "brain fog".

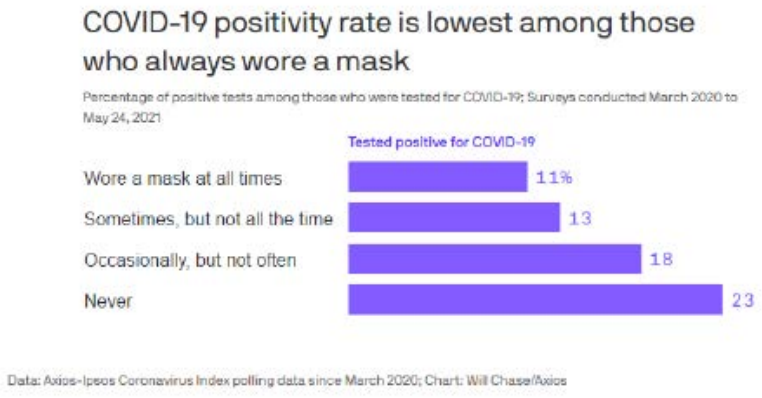
The virus can get very close to the brain as it infects cells in the upper part of the nasal cavity. Experiments have shown that the coronavirus can infiltrate neurons and other brain cells, though this has yet to be seen in vivo. Studies in the US and in Germany did not find viral proteins in brain autopsies. In the brains of individuals who died due to COVID-19, two types of problems were clear. First were infarctions, dead tissue surrounding blocked blood vessels, found in the brain's grey matter. The second issue, appearing in the brainstem, cerebellum and other areas, involved swarms of immune cells. Those enlarged cells often converged around dead or dying neurons. Autoantibodies have been found in post-mortem brains and the cerebrospinal fluid of COVID-19 patients.

In summary, **there is still no clear consensus on how the coronavirus affects the brain in both mild and severe acute coronavirus infections** and whether brain pathology is a factor in 'long COVID'. Scientists are working on follow-up studies examining the brains of patients who had COVID-19 and recovered but later died.

COVID-19 positivity rate is lowest among those who always wore a mask

Exclusive polling data from the Axios-Ipsos Coronavirus Index, which has conducted serial surveys (n ~ 1200) in the US since March 2020, shows that the respondents who reported never wearing masks were twice as likely to test positive for COVID-19 as those who said they wore masks all the time. Just 11 per cent of people who reported always wearing masks outside the home tested positive for COVID-19 — compared to 23 per cent of those who said they never wore masks.

- That's even though people who wore masks all the time were tested more regularly than those who didn't.
- 30 per cent of people who wore masks at all times reported getting tested for COVID-19, compared to 23 per cent who wore masks sometimes, 20 per cent of those who wore them occasionally but not often and 12 per cent of those who never wore them.



The pattern was similar for physical distancing. Just 10 per cent of people who said they kept a 1.5 metre distance from other people at all times tested positive for COVID-19, compared to 26 per cent of people who said they never did.

- 12 per cent of people who said they sometimes kept a 1.5 metre distance tested positive, as did 20 per cent of those who said they physically distanced occasionally but not often.
- There was less variation in testing rates in this group: 26 per cent of people who always physically distanced got tested for COVID-19, compared to 27 per cent of people who did so sometimes, 28 per cent of those who did so occasionally but not often, and 23 per cent of those who never did.

In Thailand and around the world, dogs are being trained to sniff out the coronavirus in people. So far, the results have been impressive

Preliminary studies, conducted in multiple countries, suggest that the detection rate by sniffer dogs trained to detect people infected with SARS-CoV-2 may surpass that of the rapid antigen testing often used in airports and other public places. The hope is that dogs can be deployed in crowded public spaces, like stadiums or transportation hubs, to identify people carrying the virus. Their skills are being developed in Thailand, UAE, France, Britain, Chile, **Australia** (University of Adelaide), Belgium and Germany, among other countries. They have patrolled airports in Finland, Lebanon and the United Arab Emirates, and private companies have used them at American sporting events.

As a group, the six dogs being trained in Thailand accurately detected the virus 96.2 per cent of the time in controlled settings, according to Chulalongkorn University researchers. Studies in Germany and the United Arab Emirates had lower but still impressive results. An intake of air through their sensitive snouts is enough to identify within a second the volatile organic compound or cocktail of compounds that are produced when a person with COVID-19 sheds damaged cells, researchers say.

Dogs are able to identify asymptomatic individuals because the infected lungs and trachea produce a trademark scent that can be recognised. Dogs need fewer molecules to sniff out COVID-19 than are required for PCR testing, Thai researchers have said. Within a couple months of training, at about 600 sniffs per day, the Thai dogs were sitting obediently whenever they sensed the cellular by-products of COVID-19 on cotton balls, which researchers placed at nose height on a carousel-like contraption.

The Bangkok-based dogs are now screening sweat samples from Thais who cannot easily reach testing sites, such as the elderly or the bedridden. The dogs' minders are working to set up a program with the city's prisons, where thousands of inmates have been diagnosed with COVID-19. There are still many questions about using dogs to detect the virus. What do vaccinated people smell like? How easy will it be to train a large pack of COVID-sniffing dogs around the world? What if people being tested by a canine nose aren't that sweaty? What if a dog gets COVID-19 and loses its sense of smell?

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