GIG CYMRU NHS WALES | Iechyd Cyhoeddus Cymru Public Health Wales

Iechyd Rhyngwladol International Health

International Horizon Scanning and Learning to Inform Wales' COVID-19 Public Health Response and Recovery

Report 29, 10/06/2021

Canolfan Gydweithredol Sefydliad Iechyd y Byd ar Fuddsoddi ar gyfer Iechyd a Llesiant

World Health Organization Collaborating Centre on Investment for Health and Well-being

Overview

The International Horizon Scanning and Learning work stream was initiated as part of the COVID-19 public health response, to support response and recovery measures and planning in Wales.

The learning and intelligence is summarised in regular reports to inform decision-making. These may vary in focus and scope, depending on the evolving COVID-19 situation and public health/policy needs. The reports focus on COVID-19 international evidence, experience, measures, transition and recovery approaches. Evidence is provided to help understand and explore solutions for addressing the on-going and emerging health, wellbeing, social and economic impacts (potential harms and benefits) of COVID-19.

This work is aligned with and feeds into the Welsh Government Office for Science and into Public Health Wales Gold Command. It is part of a wider Public Health Wales' systematic approach to intelligence gathering to inform comprehensive, coherent, inclusive and evidence-informed policy action, which supports the Wellbeing of Future Generations (Wales) Act and the Prosperity for All national strategy towards a healthier, more equal, resilient, prosperous and globally responsible Wales.

Disclaimer: The reports provide high-level summary of emerging evidence from country experience and epidemiology; research papers (peer-reviewed/not); and key organisations' guidance/reports, including sources of information to allow further exploration. The reports do not provide detailed or in-depth data/evidence analysis. Due to the novelty of COVID-19 virus/disease, and the dynamic situation, studies and evidence can be conflicting, inconclusive or depending on country/other context.

In focus this week

- **COVID-19 vaccine uptake across the world**
- **Re-opening policies**
- **Country insight: India**

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At a glance: summary of international learning on COVID-19

"A global pandemic requires a world effort to end it – None of us will be safe until everyone is safe"
Dr Tedros Adhanom Ghebreyesus, Director-General, World Health Organization (WHO)

COVID-19 vaccine uptake across the world

- There are a **number of factors that are consistently reported to have an impact on vaccine uptake globally, including sex, education, ethnicity and income**
- Long term, the **underlying structural factors that generate health inequity should be addressed, combined with actions to address inequity of COVID-19 vaccine uptake** to protect the most vulnerable in society immediately
- **Levels of confidence in the COVID-19 vaccine vary over time and influence uptake**, which should be kept under continuous review, including any booster vaccination plans

More information is summarised on pp.4-8

Re-opening policies

- Most countries have produced a **staged plan to lift infection prevention control measures**, with **social distancing and compulsory mask use lifted last**
- COVID-19 seems likely to stay for the foreseeable future, requiring getting used to a '**new normal' where mask wearing is likely to become a long-term addition** to daily routine
- **Wearing face masks is still recommended** in confined public spaces and crowded outdoor settings, especially by vulnerable people/those with underlying medical conditions
- Decisions on removal of infection prevention control measures must be made **based on the best available data for that country at the time**
- Most countries include the **percentage of population vaccinated** in the suite of factors to consider, prior to lifting restrictions
- **Re-opening policies should not increase inequity**: an assessment of the differential impact on different groups should be considered prior to re-opening to avoid unintended consequences

More information is summarised on pp.9-14

Country insight: India

- India reported a **large second wave** of COVID-19 infections in April 2021 with a **high reinfection rate**, not reported in other countries
- A **new more transmissible variant, called Delta by the WHO,** emerged in India and has since spread globally
- The **rapid spread of the new variant across the globe**, despite stringent lockdowns in many countries, highlights the importance of global health cooperation, solidarity, and consistent evidence-informed measures against COVID-19 within and between countries
- **COVID-19 vaccination rollout should continue to be a high priority** to reduce COVID-19 mortality and morbidity
- The **Delta variant is expected to become the dominant variant in the UK**
- Potential reduction in vaccine effectiveness against symptomatic COVID-19 from the Delta variant requires the **public health impact in the UK to be kept under close review**

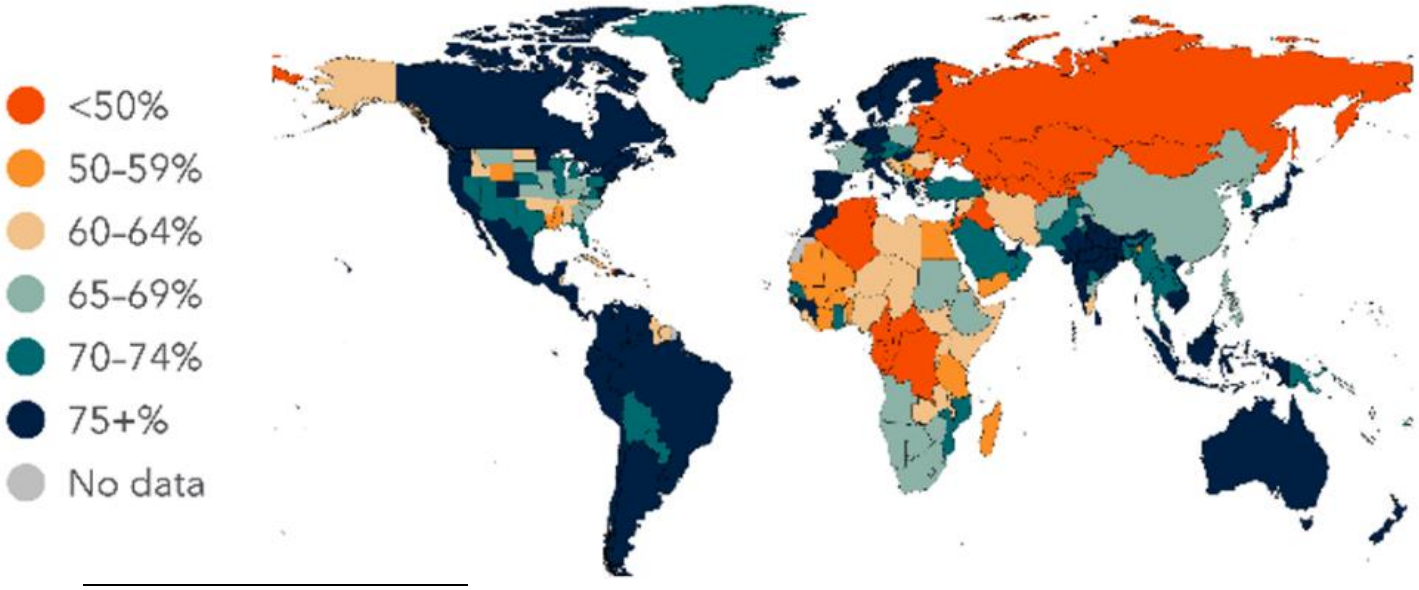
More information is summarised on pp. 15-18

COVID-19 vaccine uptake across the world

Overview: disparities and determinants

- COVID-19 vaccine uptake is an important factor in breaking the link between disease and hospitalisations, and serious illness[1][2]
- Vaccine hesitancy may be a problem in the global effort to control COVID-19 and has the potential to derail the current successes if not managed effectively[1][2]
- Globally, over 70% of people are likely to accept a COVID-19 vaccine, ranging from 29% in Kazakhstan to 95% in Extremadura, Spain *(Figure 1)*[3]
- A systematic review across 33 studies, looking into COVID-19 vaccine acceptance rates worldwide among adults representing the general public, has found the highest uptake rates in Ecuador (97.0%) and China (91.3%); the lowest uptake rates in Kuwait (23.6%); and medium rates in Russia (54.9%), Poland (56.3%), US (56.9%), and France (58.9%)[4]
- Disparities in the COVID-19 vaccine uptake have been predicted and recently observed[5]
- Studies conducted in early 2021 reveal less uptake of vaccines among people from ethnic minority groups compared to other groups[6][7]
- As the pandemic appears to have a disproportionate effect on people from ethnic minorities across multiple countries, such as higher morbidity and mortality, and greater adverse socioeconomic consequences, lower vaccine uptake among these groups could have severe implications[8]
- A historical trend in mistrust and lower vaccine uptake in ethnic minority groups is observed with varied reasons, including: structural or institutional racism, poor experience of public services, especially public health services, etc.[9][10]

Figure 1. Percent of adults who would accept or probably accept a COVID-19 vaccine (as of 23/03/2021)



[1] https://www.bmj.com/content/373/bmj.n1138
[2] https://www.ox.ac.uk/news/science-blog/covid-19-vaccine-hesitancy-uk
[3] http://www.healthdata.org/sites/default/files/files/Projects/COVID/2021/1_briefing_Global_4.pdf
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7920465/
[5] https://www.bmj.com/content/372/bmj.n513
[6] https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/29january2021
[7] https://www.rsph.org.uk/about-us/news/new-poll-finds-bame-groups-less-likely-to-want-covid-vaccine.html
[8] https://www.bmj.com/content/372/bmj.m4921?ijkey=b7ca7451dab7383f47879363ec983861630731d5&keytype2=tf_ipsecsha
[9] https://blogs.bmj.com/bmj/2021/04/08/what-is-behind-the-low-covid-19-vaccine-take-up-in-some-ethnic-minorities/
[10] https://scholar.google.com/scholar?q=.+COVID-19+vaccine+deployment%3A+Behaviour%2C+ethics%2C+misinformation+and+policy+strategies.Royal+Society%2C+British+Academy%2C+2020.

– Findings from a systematic review[11] *(Table 1)* focusing on COVID-19 **vaccine hesitancy globally, indicate that key contributing factors include:**
  - ✓ **Age** – generally older generations (55+ and 65+) are more likely to take up vaccination, with lower rates in younger (<25) and middle aged people
  - ✓ **Sex** – most studies found a reduced likelihood for vaccination among females; some studies reported non-significant differences between sexes
  - ✓ **Education** – most studies found education to at least Higher Education level indicated a higher acceptance of vaccination; some studies found a non-significant difference between education levels
  - ✓ **Ethnicity** – most studies found ethnic minorities to be less likely to take up vaccination; some studies found non-significant differences between ethnic groups
  - ✓ **Income** – most studies observed lower uptake among individuals on lower incomes

Table 1: Factors influencing vaccine uptake intention (adapted from Robinson et al, 2021)[11]

Author, Country	Number	Age	Sex	Education	Ethnicity	Income
Edwards[12] (Australia)	3061	55+ more likely to vaccinate	Males more likely to vaccinate	Higher education level more likely to vaccinate	Non-significant	Higher income more likely to vaccinate
Hacquin[13] (France)	4027	64+ more likely to vaccinate	Males more likely to vaccinate	Beyond high school level more likely to vaccinate		
Ward[14] (France)	5018	64+ more likely to vaccinate	Males more likely to vaccinate	Non-significant		Higher income more likely to vaccinate
Murphy[15] (Ireland)	1041	64+ more likely to vaccinate than 35–44 yrs, no other groups	Non-significant	Non-significant	Irish ethnicity more likely to vaccinate than non-Irish	Higher income more likely to vaccinate
Roozenbeek[16] (UK)	1150	Older adults more likely to vaccinate	Non-significant	Non-significant		
Loomba[17] (UK)*	4001	55+ more likely to vaccinate than <25	Males more likely to vaccinate	Higher education level more likely to vaccinate	Whites more likely to vaccinate than Black/Asian & other	Higher income more likely to vaccinate
McAndrew[18] (UK)	1663	Older adults more likely to vaccinate	Non-significant	Non-significant	Non-significant	
Murphy[19] (UK)	2025	65+ more likely to vaccinate	Non-significant	Non-significant	Non-significant	Higher income more likely to vaccinate
Sherman[20] (UK)	1488	Older adults more likely to vaccinate	Non-significant	Non-significant	Non-significant	
Daly[21] (US)*	7547	65+ more likely to vaccinate	Males more likely to vaccinate	Degree level education and above more likely to vaccinate	Whites more likely to vaccinate than African Americans (Black)	Higher income more likely to vaccinate
Carpiano[22] (US)	1000	60+ more likely to vaccinate than 30-59yrs	Males more likely to vaccinate	College level education and above more likely to vaccinate	Whites more likely to vaccinate than African Americans, Hispanic and other	Non-significant
Callaghan[23] (US)	5009	Older adults more likely to vaccinate	Males more likely to vaccinate	Non-significant	Whites more likely to vaccinate than African Americans	Higher income more likely to vaccinate
Loomba[24] (US)*	4000	<25yrs more likely to vaccinate than 25–54	Males more likely to vaccinate	Higher educational level more likely to vaccinate	Whites more likely to vaccinate than African Americans (and other)	Higher income more likely to vaccinate
McAndrew[25] (US)	1198	Non-significant	Males more likely to vaccinate	College education level and above more likely to vaccinate	Whites more likely to vaccinate than African Americans	

[11] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7867398/ ***(Table augmented with additional studies)***
[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7990228/
[13] https://psyarxiv.com/r8h6z/
[14] https://pubmed.ncbi.nlm.nih.gov/33038683/
[15] https://www.nature.com/articles/s41467-020-20226-9
[16] https://royalsocietypublishing.org/doi/10.1098/rsos.201199
[17] https://www.nature.com/articles/s41562-021-01056-1
[18] https://pubmed.ncbi.nlm.nih.gov/33810905/
[19] https://www.nature.com/articles/s41467-020-20226-9
[20] https://www.medrxiv.org/content/10.1101/2020.08.13.20174045v1
[21] https://www.medrxiv.org/content/10.1101/2020.11.27.20239970v1
[22] https://www.medrxiv.org/content/10.1101/2020.09.07.20190058v1
[23] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7834845/
[24] https://www.nature.com/articles/s41562-021-01056-1
[25] https://pubmed.ncbi.nlm.nih.gov/33810905/

Country insight: vaccine uptake in the United States of America (US)[26][27]

- Vaccinations are increasing for both first and second dose with a total of just under 900,000 doses being administered per 1 million of the US population *(Figure 2)*
- Vermont has administered the most doses of COVID-19 vaccine at 127,222 per 100,000 in comparison to Mississippi which has administered the least number of doses at 60,165 per 100,000 population *(Figure 3)*
- COVID-19 vaccine hesitancy rates vary across the country and is overall under 40%, with a few states showing 29 to 32.97% hesitant population, including Wyoming, Kentucky, Montana and Ohio *(Figure 4)*
- Wyoming shows the highest level of estimated vaccine hesitancy, combined with one of the lowest levels of vaccine uptake *(Figures 3 and 4)*

Figure 2: COVID-19 vaccinations per 1 million by first dose, second dose and total doses administered, US, weekly rate, 03/12/2020 - 03/06/2021 (extracted 07/06/2021)[26]

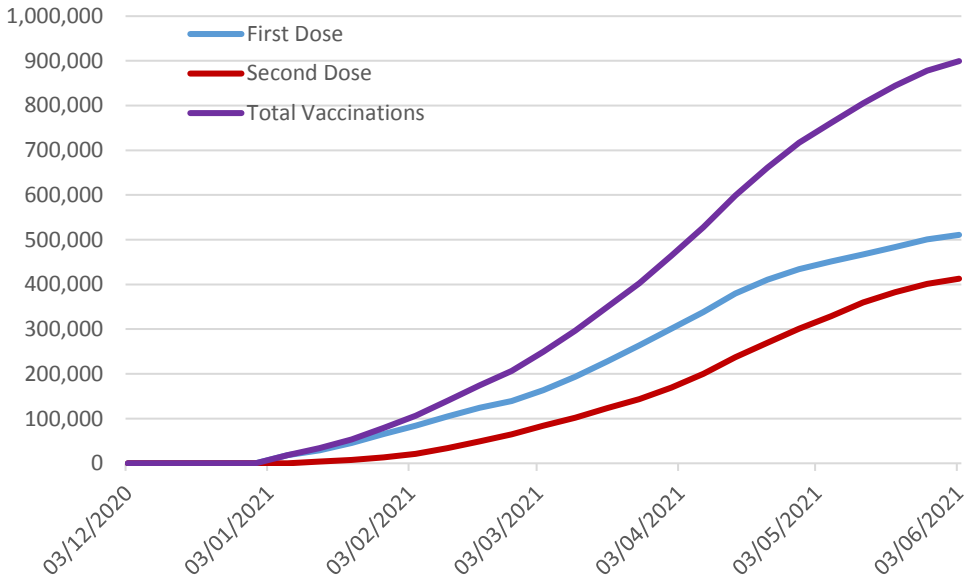
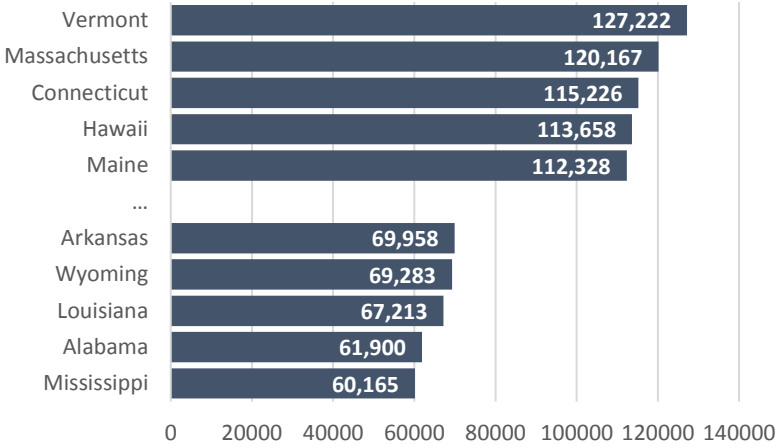
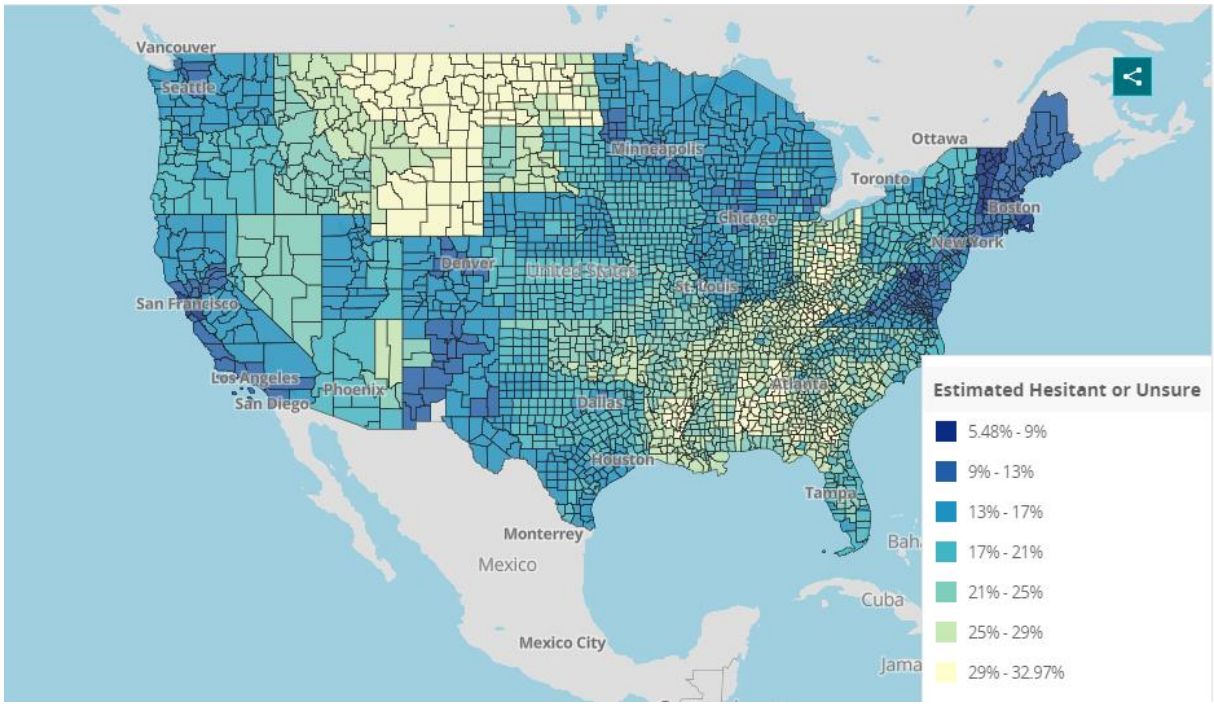


Figure 3: COVID-19 vaccinations administered per 100 thousand by state, US, until 06/06/2021 (extracted 07/06/2021)[27]



[26] https://ourworldindata.org/coronavirus-data-explorer
[27] https://covid.cdc.gov/covid-data-tracker/#vaccinations

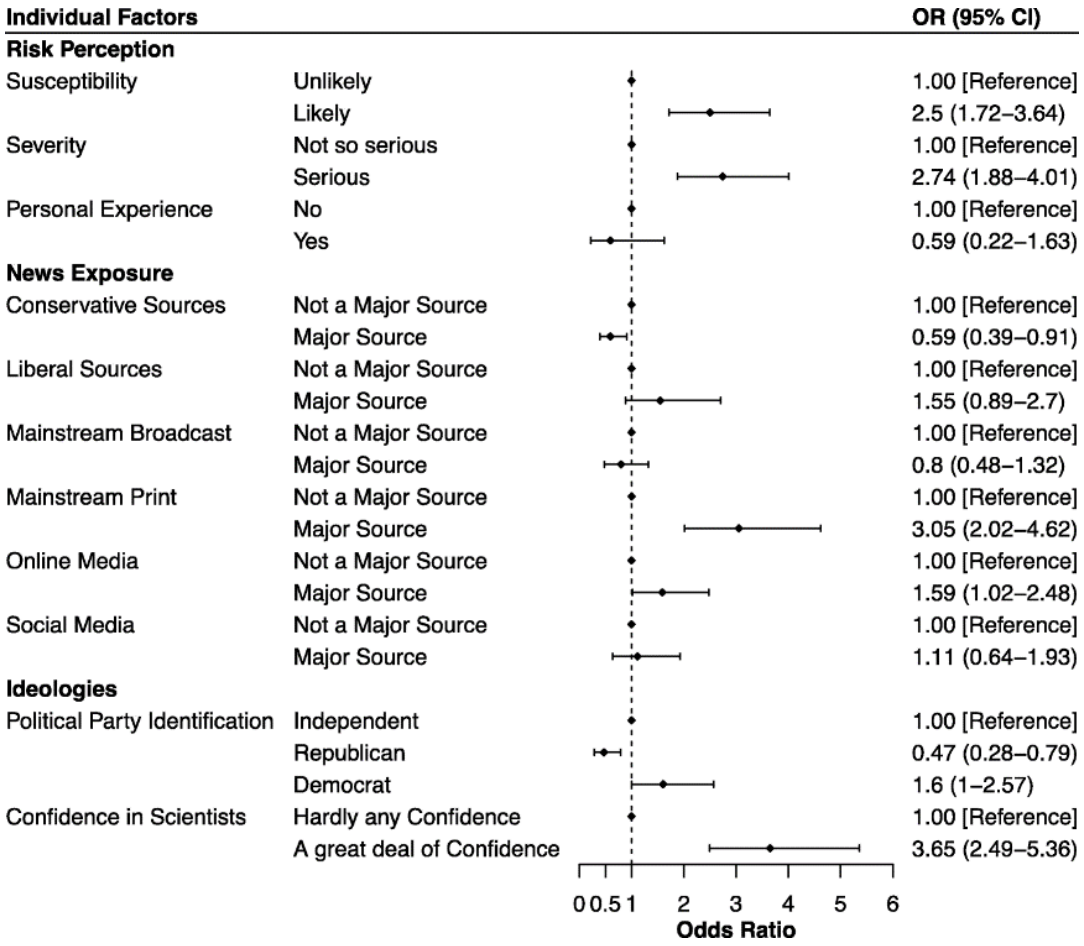
Figure 4: Estimated COVID-19 vaccine hesitancy by state/county, US, until 17/05/2021 (extracted 24/05/2021)[28]



- Reasons for vaccine hesitancy have varied over time, with some of the top reasons identified through a survey prior to vaccine roll-out, including:[29]
  - ✓ Concern about the side effects and safety of vaccine (23.4%)
  - ✓ Concern that the vaccine is being developed too quickly (21.6 %)
  - ✓ Plan to wait and see if it is safe and may get it later (18%)
  - ✓ Do not trust the government (9.8%)
  - ✓ There is currently a lack of published research to identify hesitancy around second dose of the vaccine roll-out
- Factors such as ethnicity, sex, and aligning to conservative politics has had an impact on vaccine uptake, shown by studies published prior to the vaccine roll out *(Figure 5)*
- Evidence is emerging for disparities in vaccine hesitancy between different ethnicities:
  - ✓ African Americans report lower COVID-19 vaccination intention[30][31][32]
  - ✓ Asian and African Americans report being less likely to seek vaccination than White and Hispanic Americans[34]
- A survey[35], conducted before vaccine roll-out among 1012 adults looking at the likelihood of vaccine acceptance for oneself and under one's care (such as children), according to factors such as risk perception, news exposure, and ideologies, has suggested:
  - ✓ 68% and 65% agreed to get the vaccine for themselves and people under their care, respectively
  - ✓ risk perceptions (severity of and susceptibility to COVID-19), confidence in science and major mainstream print news exposure were significantly associated with vaccine uptake

[28] https://covid.cdc.gov/covid-data-tracker/#vaccinations
[29] https://www.cdc.gov/mmwr/volumes/70/wr/mm7006e3.htm#T2_down
[30] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7596314/
[31] https://www.sciencedirect.com/science/article/pii/S0033350621000834?via%3Dihub
[32] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7834845/
[33] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-10862-1
[34] https://www.sciencedirect.com/science/article/pii/S0264410X21000141?via%3Dihub
[35] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-10862-1#:~:text=Conclusions,affecting%20COVID%2D19%20vaccine%20uptake

Figure 5. Individual factors of the likelihood (Odds Ratio=OR) of vaccinating oneself[36] (OR=1 means no difference/same likelihood; R>1 means more likely; R<1 means less likely)



Country insight: vaccine uptake in the United Kingdom (UK)

- Evidence from the UK[37][38] shows that COVID-19 vaccine hesitancy is higher in:
  - ✓ Individuals from ethnic minority backgrounds, such as among Black and Pakistani / Bangladeshi ethnic groups[39]
  - ✓ Those with lower levels of education
  - ✓ Those with a lower annual income (less than £16,000 a year)
  - ✓ Individuals with poor knowledge of COVID-19
  - ✓ Individuals with poor compliance with government COVID-19 guidelines
- Evidence from England[40] shows lower vaccine uptake among the following groups:
  - ✓ Ethnic minorities
  - ✓ People living in areas of higher deprivation
  - ✓ Those with severe mental illness
  - ✓ Learning disabilities
- These findings have informed policy in the UK and access to vaccines for these specific groups has been promoted to improve health equity and vaccine uptake

[36] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-10862-1#:~:text=Conclusions,affecting%20COVID%2D19%20vaccine%20uptake
[37] https://www.thelancet.com/action/showPdf?pii=S2666-7762%2820%2930012-0
[38] https://www.sciencedirect.com/science/article/pii/S0264410X20313219?via%3Dihub
[39] https://www.medrxiv.org/content/10.1101/2020.12.27.20248899v1
[40] https://www.medrxiv.org/content/10.1101/2021.01.25.21250356v2

Re-opening policies

Overview

- COVID-19 seems likely to stay for the foreseeable future, requiring getting used to a '**new normal' where mask wearing** is likely to be a long-term addition to the daily routine[41]
- **Wearing face coverings/masks is still recommended** in confined public spaces, such as supermarkets, public transport and crowded outdoor settings, especially by those who are vulnerable or have underlying medical conditions[42]
- Predictions suggest that the global percentage of people adopting the use of face masks will be around 53% by September 2021: 67% for India; 19% for the US; 9% for Israel; and 7% for the UK *(defined as percentage of the population who say they always wear a face mask in public)*[43]
- Several countries have outlined the possibility of ending measures such as social distancing and wearing masks, and a **step-wise approach** *(Table 2)*

Table 2. Country overview: steps to ease COVID-19 restrictions

Country/Province	Steps to ease COVID-19 policies
Finland[44]	- From June 2021, social distancing measures are to be removed for outdoor events - A review of the continued use of masks and remote working are due to be made in June and (if required) August 2021, respectively
Netherlands[45]	- Six steps towards complete removal of COVID-19 measures, with 'Step 6' including the removal of social distancing and mask requirements - The Netherlands moved to 'Step 2' on the 19th May 2021
Portugal[46]	- Four phases up to 30th May 2021; venues allowed to re-open with reduced capacity, mask use still required
Switzerland[47]	- Bars and restaurants reopened at the end of May 2021 - Restrictions remain on gatherings and events, quarantine no longer required for vaccinated individuals - Vaccine certificate system to be introduced at the end of June 2021
South Korea[48]	- Masks will no longer be required outdoors from July 2021 for those having had at least one dose of the vaccine
Canada	
Alberta[49]	- Three step plan towards easing of restrictions - 'Stage 3' will result in lifting of all restrictions, and will begin two weeks after >70% of residents aged 12+ have received a single dose of the vaccine (expected to be by the end of June 2021)
British Columbia[50]	- Removal of indoor mask requirement and normal social contact can resume from 7th September 2021
Ontario[51]	- Three step process, with 'Step 3' retaining limits on indoor and outdoor gatherings as well as capacity limits for retail (social distancing to still be in effect)
Quebec[52]	- 'Reduced requirements' for masks and social distancing for fully vaccinated individuals from the end of August, with no date yet provided for complete removal of restrictions
Saskatchewan[53]	- 'Step 2' of reopening plans to commence 20th June, with restrictions on indoor hospitality capacity being lifted but mask mandate and limits on size of gatherings to remain

[41] https://www.sciencedirect.com/science/article/pii/S1359029421000017
[42] https://www.ecdc.europa.eu/sites/default/files/documents/covid-19-face-masks-community-first-update.pdf
[43] https://covid19.healthdata.org/global
[44] https://valtioneuvosto.fi/en/information-on-coronavirus/lifting-of-restrictions
[45] https://www.government.nl/topics/coronavirus-covid-19/plan-to-reopen-society
[46] https://covid19estamoson.gov.pt/#
[47] https://www.bag.admin.ch/bag/en/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/massnahmen-des-bundes.html
[48] https://www.reuters.com/world/asia-pacific/south-koreans-no-longer-need-masks-outdoors-if-vaccinated-against-covid-19-2021-05-26/
[49] https://www.alberta.ca/coronavirus-info-for-albertans.aspx
[50] https://www2.gov.bc.ca/gov/content/covid-19/info/restart
[51] https://www.ontario.ca/page/reopening-ontario
[52] https://www.quebec.ca/en/health/health-issues/a-z/2019-coronavirus/reopening-plan
[53] https://www.saskatchewan.ca/government/news-and-media/2021/may/04/reopening-roadmap-a-gradual-measured-approach-to-easing-public-health-measures

Country insight: easing restrictions in the US

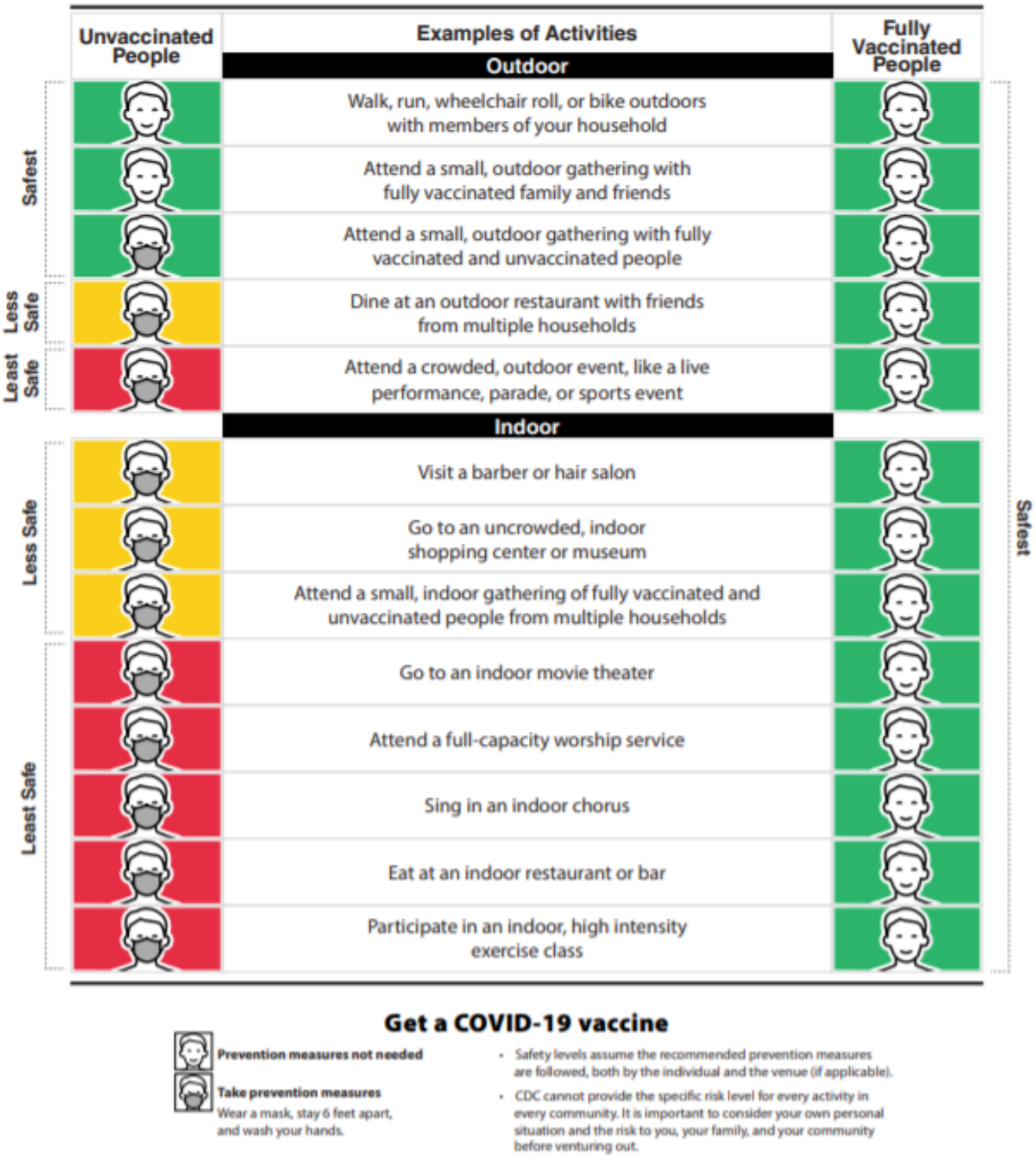
- As of 13th May 2021, fully vaccinated people are no longer required to wear a mask or physically distance in any setting, except where required by federal, state, local, tribal, or territorial laws, rules, and regulations, including local business and workplace guidance[54] *(Figure 6)*
- Several states have laid out specific plans regarding the use of face masks *(Table 3)*
- Fully vaccinated people can refrain from testing following a known exposure unless they are residents or employees of a correctional or detention facility or a homeless shelter
- Wearing a face mask will continue to be a requirement at airports, aboard commercial flights and on other public transport across the country until at least 13th September 2021[55]
- Most states are 'open' or have plans to open as of 27th May 2021 *(Figure 7 and 8).*
- Face coverings in educational settings (e.g. schools) are recommended at least through the end of the school year, as while children are less likely to suffer severe COVID-19, they are not without risk and can readily transmit the virus [5657]
- A recent study, including 169 elementary schools in Georgia, US, suggest[58]:
  - ✓ In schools that require masks, transmission of COVID-19 was lower by 37% than in schools where masks were optional
  - ✓ Improved ventilation slowed virus transmission
  - ✓ To increase, not decrease, the use of masks and ventilation in schools
  - ✓ The American Federation of Teachers and the National Education Association, have urged states in the US to keep their mask requirements at least through to the end of this academic year.

Table 3. Plans regarding use of face masks across several states in the US

State	Reopening date (2021)	Notes
California[59]	**15th June**	- Use of masks mandate to remain after full re-opening of economy - Unvaccinated individuals will be allowed to attend large events as long as they wear a mask
Michigan[6061]	**1st July**	- Six phases, with 'post-pandemic' phase featuring minimal to no limitations on personal and social activities, while businesses will have some lasting safety requirements - Face mask and gatherings restrictions due to be lifted on 1st July 2021
Oregon[62]	**No date provided**	- Business restrictions and limitations on gatherings to be removed after >70% of residents aged 16+ have received a single vaccine dose - Mask requirement to remain for those who are unvaccinated, while large venues in 'low risk' counties (case rate less than 50 per 100k population) can increase capacity in 'vaccinated sections'
Vermont[63]	**4th July**	- All restrictions to become recommendations after July 4th2021, or once >80% of residents aged 12+ have received a single dose of vaccine - Masks are currently required indoors for unvaccinated individuals
Washington[64]	**30th June**	- 'Phase 3' in implementation from 18th May to 30th June 2021, featuring reduced capacity across most events, activities and venues

[54] https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html
[55] https://www.tsa.gov/news/press/releases/2021/04/30/tsa-extends-face-mask-requirement-airports-and-throughout
[56] Coronavirus disease 2019 (COVID-19) Factsheet (cdc.gov)
[57] https://www.reuters.com/world/us/covid-19-mask-mandates-latest-flashpoint-us-schools-2021-05-25/
[58] https://www.cdc.gov/mmwr/volumes/70/wr/mm7021e1.htm
[59] https://www.gov.ca.gov/2021/04/06/governor-newsom-outlines-the-states-next-step-in-the-covid-19-pandemic-recovery-moving-beyond-the-blueprint/
[60] https://www.michamber.com/news/governor-whitmer-outlines-reopening-strategy/
[61] https://content.govdelivery.com/attachments/MIEOG/2020/05/07/file_attachments/1446147/Governor%20Whitmer%27s%20MI%20Safe%20Start%20Plan.pdf
[62] https://coronavirus.oregon.gov/Pages/living-with-covid-19.aspx#countystatus
[63] https://www.vermont.gov/vermont-forward#gsc.tab=0
[64] https://coronavirus.wa.gov/what-you-need-know/safe-start

Figure 6: US guidelines for vaccinated and unvaccinated people, the Centres for Disease Control and Prevention (CDC) [65]



[65] https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html

Figure 7. US re-opening status and plans by state, as of 27th May 2021[66]

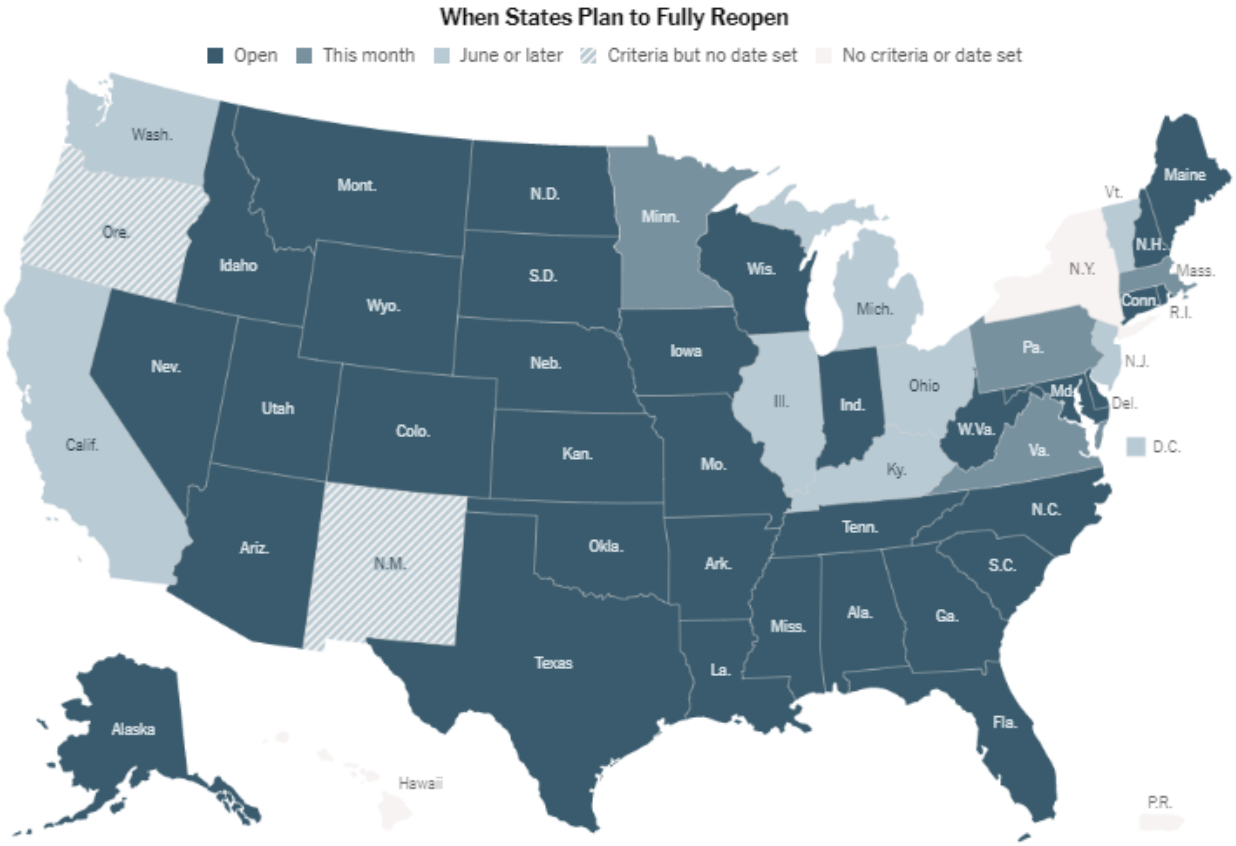


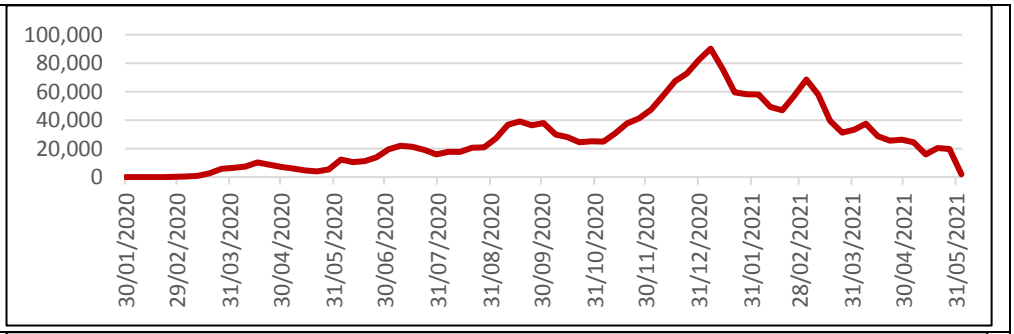
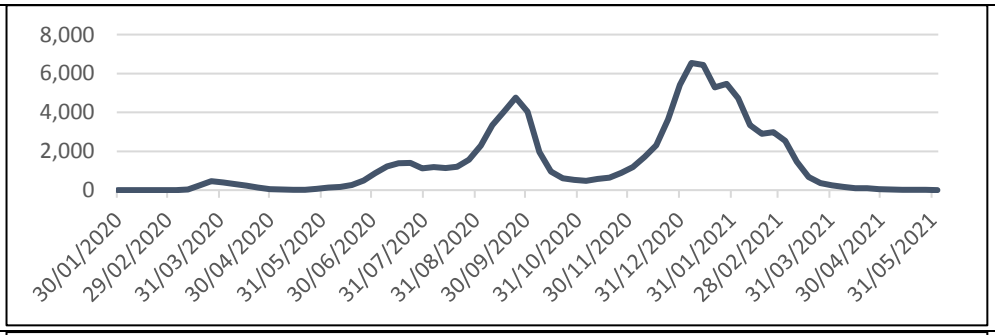
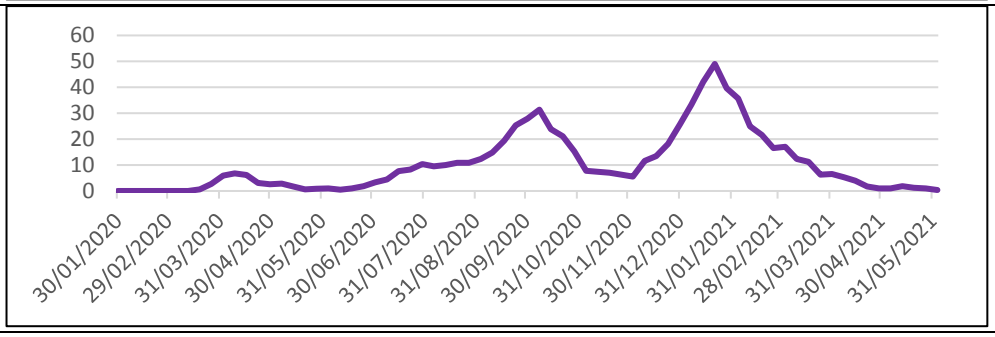
Figure 8. US mask mandate status by state, May 2021[66]

[66] https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html

Country insight: easing restrictions in Israel

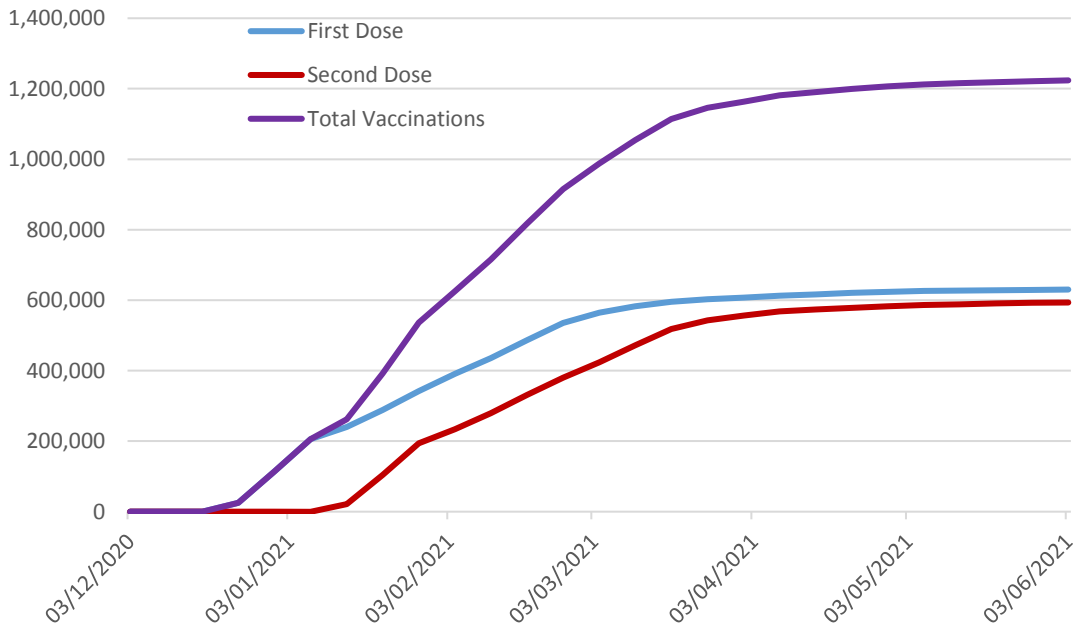
- Israel has introduced a **traffic light model for regional restrictions**, updated weekly, rather than imposing a national lockdown, to minimise outbreaks
- **Data from each region is analysed** to determine measures, focusing on[67]:
  - ✓ Number of new cases in the area
  - ✓ Percentage of positive results and infection rates
- There has been a downward trend in relation to the rates of tests, cases, and deaths in the recent weeks *(Table 4)*
- Downward case/death trends can be due to declining infection rate, as well as other factors, such as lower testing rates and geo-political context
- In May 2021 more than 60% of the population have been fully vaccinated and the Government has announced a number of changes to national restrictions[68]
- In May 2021, the Ministry of Health announced its intentions to begin preparing to vaccinate children aged 12-16 after adult vaccinations have proved successful[69]
- Following the vaccine roll-out data, the number of doses administered has plateaued since April 2021 onwards, with 1,220,000 doses administered per 1 million population *(Figure 9)*

Table 4: COVID-19 tests, cases, and deaths per 1 million, weekly rate, 30/01/2020-03/06/2021 (extracted 07/06/2021)[70]

Tests per 1 million	
Cases per 1 million	
Deaths per 1 million	

[67] https://corona.health.gov.il/en/local-councils-traffic-light-model/
[68] https://datadashboard.health.gov.il/COVID-19/general
[69] https://www.gov.il/en/departments/news/11052021-01
[70] https://ourworldindata.org/coronavirus-data-explorer

Figure 9: COVID-19 vaccinations per 1 million, weekly rate, 03/12/2020-27/05/2021, (extracted 01/06/2021)[71]



Re-opening strategy

- Israel has used a 'green pass' incentive to reopen non-essential businesses, including social and cultural venues - any resident who is fully vaccinated or has recovered from COVID-19 is eligible to obtain a pass, allowing them to use 'green pass approved' facilities
- Initially each pass lasted six months, however due to the high vaccination uptake this policy has since been superseded
- At the end of May 2021, the Government announced that restrictions will expire, resulting in the green pass no longer being required[72]
- The European Union has added Israel to the list of countries that member states can begin to lift travel restrictions, due to the vaccination success and reduced case numbers[73]
- Israel has remained cautious about lifting travel restrictions and have issued travel warnings to residents regarding international travel[74]
- As case rate continues to decrease, residents can now be outdoors without wearing a face mask, but regulations are still in place for outdoor gatherings and indoor mask wearing[75]
- Another relaxed restriction has been an increase in the number of participants allowed at events, both indoors to a maximum of 50; and outdoors to a maximum of 500[76]

[71] https://ourworldindata.org/coronavirus-data-explorer
[72] https://www.gov.il/en/departments/news/23052021-02
[73] https://www.consilium.europa.eu/en/press/press-releases/2021/05/06/travel-restrictions-council-adds-israel-to-the-list-of-countries-for-which-member-states-should-gradually-lift-restrictions-on-non-essential-travel/
[74] https://www.gov.il/en/departments/news/28052021-01
[75] https://www.gov.il/en/departments/news/17042021-01
[76] https://www.gov.il/en/departments/news/04052021-01

Country insight: India

Second wave of COVID-19: epidemiology, factors and impact[77][78]

- A major second wave of COVID-19 have emerged in early April 2021, with an average of 300,000 new cases and 2,000 deaths reported daily by the end of April; and **test positivity increasing dramatically** from 2% in March to 22% in May 2021
- **Testing, cases and deaths have rapidly increased**, with a dip in the most recent week, which might be due to incomplete data and requires further verification *(Table 5)*
- **Multiple factors** have been considered as drivers of the rapid surge in case and death rates within a very short period, including:
  - ✓ **The emergence of a new COVID-19 variant of concern (VOC)** with increased transmissibility has been considered a key factor
  - ✓ **Increased testing** as a result of the new VOC
  - ✓ **A high re-infection rate** of 4.5%, suggested by a study of 1300 people who tested positive, published in March 2021[79]
  - ✓ Media reports have blamed **lax social distancing and mask wearing**, alongside **large scale events**
  - ✓ **Struggling to vaccinate the population** of 1.36 billion, despite having one of the largest pharmaceutical manufacturing capacities in the world for vaccines
  - ✓ **Spread in rural areas where people travel long distances** to get to the nearest health facility, delaying treatment. For example, in the state of Punjab, health records show that over 80% of patients have severe symptoms once they arrive, because of delays caused by travel
- The **availability of government hospital and intensive care unit (ICU) beds is limited** in comparison to the Organisation for Economic Co-operation and Development (OECD) countries, with 0.51 hospital and 0.025 ICU government beds per 1000 population, and a further 0.85 hospital and 0.04 ICU private beds per 1000 population[80]
- There is a **considerable shortage of medical professionals** with 8.57 doctors per 10,000 population and a doctor/patient ratio less than the WHO guideline of 1/1000[81]
- **Lack of genomic sequencing capacity** is hindering efforts to monitor the spread of new variants, as less than 1% of positive samples have been sequenced, compared to 4% in the US and 8% in the UK
- **Economic analysts** believe that COVID-19 **restrictions this year have disrupted the economy less than the lockdown introduced last year**, as businesses and consumers have adapted. If restrictions remain at their current level for the three months from April to June, economic activity is expected to be 2.9% smaller than it was in the previous three months[82]
- There has been **a rapid increase in the number of people being given their first dose of the COVID-19 vaccine**, with the total number of doses administered per 1 million population around 160,000 in June 2021 *(Figure 10)*

[77] Why is India having a covid-19 surge? | The BMJ
[78] v1_covered.pdf (researchsquare.com)
[79] SARS-CoV-2 re-infection: development of an epidemiological definition from India - PubMed (nih.gov)
[80] https://www.oecd.org/coronavirus/en/data-insights/intensive-care-beds-capacity
[81] https://www.mdpi.com/2071-1050/13/6/3415/pdf
[82] Tracking the economic impact of India's second covid wave | The Economist

Table 5. COVID-19 tests, cases and deaths per 1 million, weekly rate, 30/01/2020-03/06/2021 (extracted 07/06/2021)[83]

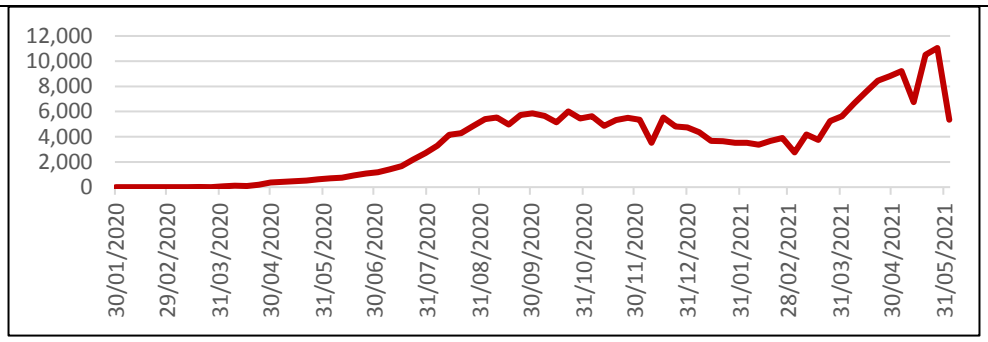
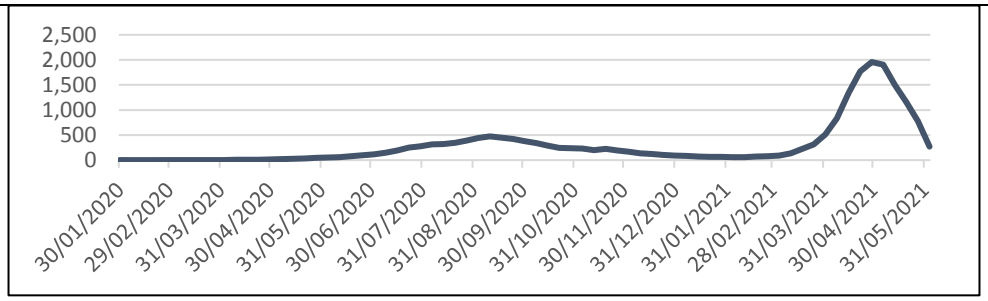
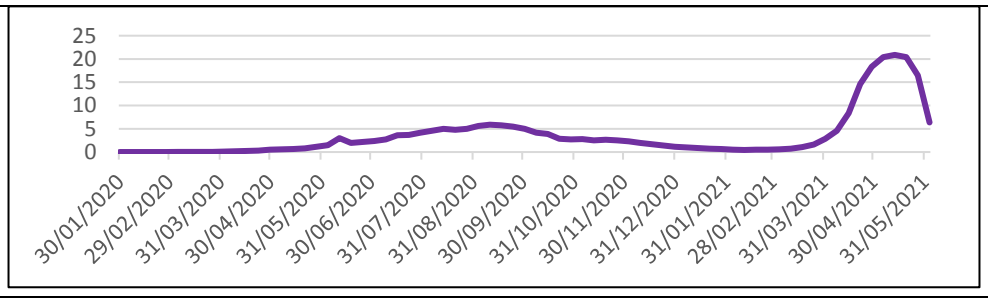
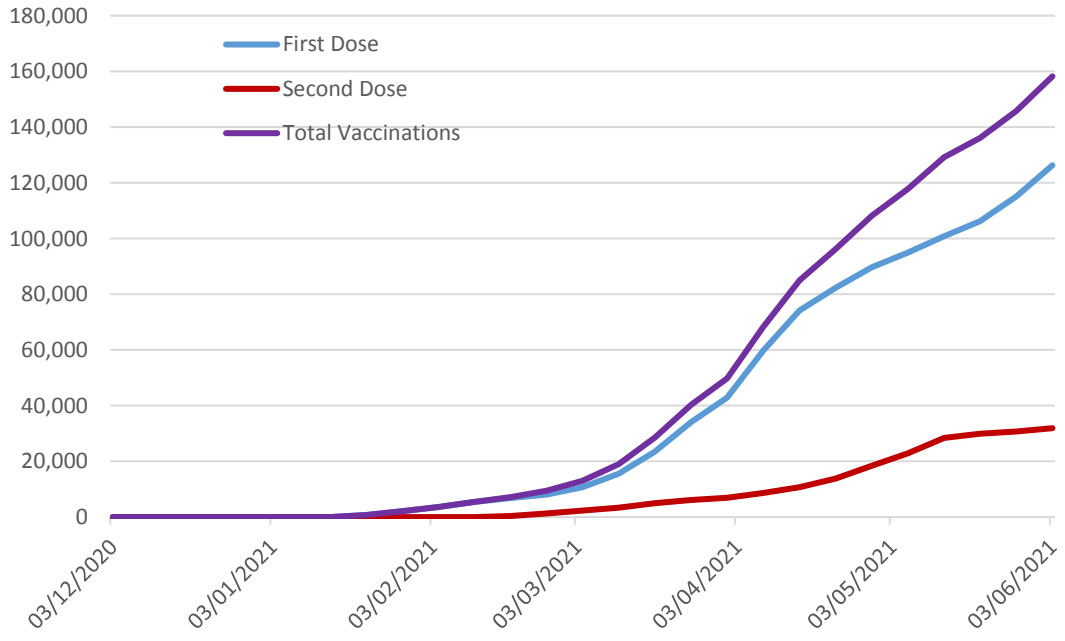
Tests per 1 million	
Cases per 1 million	
Deaths per 1 million	

Figure 10. COVID-19 vaccinations per 1 million, weekly rate, 03/12/2020-03/06/2021 (extracted 07/06/2021)[83]



[83] https://ourworldindata.org/coronavirus-data-explorer

Variants of Concern

Spread and impact B.1.617 variant

- The **new COVID-19 variant, B.1.617 lineage** was detected in India in October 2020 and is considered as one of the key factors for the second wave, contributing to 63.6% of COVID-19 infections in April 2021[84]
- Preliminary modelling by WHO has suggested that the B.1.617 variant has a higher growth rate than other circulating variants in India, suggesting potential higher transmissibility[85]
- In just a few weeks, the B.1.617 variant has become the dominant strain across India and has spread to about 40 nations, including the UK, Fiji and Singapore[86]
- Clear evidence is available for several variants (mutations) of the B.1.617 lineage, indicating a significant impact on transmissibility, severity and/or immunity response that is likely to have an effect on the epidemiological situation in the European Union and European Economic Area (EU/EEA)[87]

Spread and impact of B.1.617 variant in the UK

- The UK has seen a rapid increase in the new 'Indian' variant, lineages B.1.617.1 and, to a greater extent, B.1.617.2, associated with travel to India and community transmission[87]
- On the 6th May 2021, the UK designated **lineage B.1.617.2 as a VOC**[88]**,** named as a **Delta variant** by the WHO recently *(Table 6)*[89]
- Latest estimates show that **more than half, and potentially as much as three quarters, of all new cases in the UK** are of the B.1.617 variant[90]

Delta variant and vaccine effectiveness

- **National vaccine effectiveness monitoring in the UK** (as of 22nd May 2021) shows a **reduction in vaccine effectiveness against symptomatic infection after one vaccination dose for B.1.617.2** compared to B.1.1.7 (Alpha/UK variant)[91]:
  - ✓ Current data suggest there is an absolute reduction of approximately 20% after 1 dose
  - ✓ Based on neutralisation data, vaccines are expected to remain effective against severe disease, although monitoring continues
- **Vaccination data** from (5th April - 16th May 2021) shows that:[92]
  - ✓ **Two doses of the COVID-19 Pfizer and AstraZeneca vaccine are highly effective** against B.1.617.2
  - ✓ Two doses of the Pfizer vaccine are 88% effective against symptomatic disease from the Delta (B.1.617.2) variant two weeks after the second dose, compared to 93% effectiveness against the Alpha (B.1.1.7) variant
  - ✓ Two doses of the AstraZeneca vaccine are 60% effective against symptomatic disease from the Delta variant, compared to 66% effectiveness against the Alpha variant
  - ✓ Both vaccines are 33% effective against symptomatic disease from the Delta variant three weeks after the first dose, compared to around 50% effectiveness against the Alpha variant

[84] v1_covered.pdf (researchsquare.com)
[85] https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210427_weekly_epi_update_37.pdf?sfvrsn=a1ab459c_5&download=true
[86] https://www.nature.com/articles/d41586-021-01274-7
[87] https://www.ecdc.europa.eu/en/covid-19/variants-concern
[88] https://www.ecdc.europa.eu/en/publications-data/threat-assessment-emergence-sars-cov-2-b1617-variants
[89] https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/
[90] Health and Social Care Secretary's statement on coronavirus (COVID-19): 27 May 2021 - GOV.UK (www.gov.uk)
[91] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/988613/22_May_2021_Risk_assessment_for_SARS-CoV-2_variant_VOC-21APR-02__B.1.617.2.pdf
[92] https://www.gov.uk/government/news/vaccines-highly-effective-against-b-1-617-2-variant-after-2-doses

Recommendations to address VOC

- **Targeted genomic surveillance and antigenic characterisation** of COVID-19 variants should be enhanced to better understand and inform public health implications[93]:
  - ✓ Further characterisation of these lineages is needed to allow a full assessment of their potential public health implications
  - ✓ Greater understanding of the risks related to B.1.617 lineages is needed before any modification of current non-pharmaceutical measures can be considered
  - ✓ COVID-19 vaccination roll-out should continue to be a high priority to reduce COVID-19 transmission and mortality, as has recently been documented in Israel and the UK
- The WHO are encouraging national and local authorities to continue **strengthening existing public health and social measures, and infection prevention and control activities**[94]
- Authorities are also encouraged to **strengthen surveillance and sequencing capacities and apply a systematic approach** to provide a representative indication of the extent of transmission of variants based on the local context, and to detect unusual events

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*Labelling VOC

- A COVID-19 variant is considered **a Variant of Interest (VOI)** if, compared to a reference isolate, its genome has mutations with established or suspected implications, and either:
  - ✓ has been identified to cause community transmission/multiple COVID-19 cases/clusters, or has been detected in multiple countries; OR
  - ✓ is otherwise assessed to be a VOI by WHO in consultation with the WHO COVID-19 Virus Evolution Working Group
- A COVID-19 variant that meets the definition of a VOI and, through a comparative assessment, has been demonstrated to be associated with one or more of the following changes at a degree of global public health significance, is **a VOC**:
  - ✓ Increase in transmissibility or detrimental change in COVID-19 epidemiology; or
  - ✓ Increase in virulence or change in clinical disease presentation; or
  - ✓ Decrease in effectiveness of public health and social measures or available diagnostics, vaccines, therapeutics
- The WHO has suggested a **simple non-stigmatising labelling for the VOC** *(Table 6)*

Table 6. VOC labels suggested by WHO[95]

WHO label	Lineage	Earliest documented samples	Date of designation
Alpha	B.1.1.7	United Kingdom, Sep-2020	18-Dec-2020
Beta	B.1.351	South Africa, May-2020	18-Dec-2020
Gamma	P.1	Brazil, Nov-2020	11-Jan-2021
Delta	B.1.617.2	India, Oct-2020	VOI: 4-Apr-2021 VOC: 11-May-2021

[93] https://www.ecdc.europa.eu/en/publications-data/threat-assessment-emergence-sars-cov-2-b1617-variants
[94] https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210427_weekly_epi_update_37.pdf?sfvrsn=a1ab459c_5&download=true
[95] https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/

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