Force Health Protection Branch
NATO MilMed COE
Munich

Update 104
COVID-19
Coronavirus Disease
23 February 2022

info.dhsc@coemed.org

Branch Chief
Phone: +49 89 1249 4003
Branch Admin
Phone: +49 89 1249 4001

GLOBAL
↘
428 436 746
Confirmed cases
389 400 000 recovered
5 908 246 deaths

USA
(7-days incidence 189,3)
↘
78 102 435
confirmed cases
74 860 000 recovered
934 394 death

IND
(7-days incidence 11,7)
↘
42 851 929
confirmed cases
41 430 000 recovered
512 344 deaths

BRA
(7-days incidence 334,1)
↘
28 535 689
confirmed cases
25 660 000 recovered
645 665 deaths

News:

- **WHO:** published a statement on Omicron sublingeage BA.2 from the WHO's Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE) that met on Monday to discuss the latest evidence on the Omicron variant of concern, including its sublineages BA.1 and BA.2. Based on available data of transmission, severity, reinfection, diagnostics, therapeutics and impacts of vaccines, the group reinforced that the BA.2 sublineage should continue to be considered a variant of concern and that it should remain classified as Omicron. The group emphasized that BA.2 should continue to be monitored as a distinct sublineage of Omicron by public health authorities.
- **WHO:** announced the first case of wild poliovirus in Africa in more than five years, in Malawi. "As an imported case from Pakistan, this detection does not affect the African region's wild poliovirus-free certification status," the WHO said (see mor under Other infectious diseases).
- **WHO:** announced the first six countries that will receive the technology needed to produce mRNA vaccines on the African continent. Egypt, Kenya, Nigeria, Senegal, South Africa and Tunisia all applied and have been selected as recipients.
- **ECDC**: published a new data collection on COVID-19 outbreaks in closed settings like long-term care facilities. The aim was to obtain an estimate of relative risk of infection for vaccinated residents and staff members in these settings, by SARS-CoV-2 variant, vaccine product and number of vaccine doses.
- **CDC**: updated their information on the Johnson & Johnson's Janssen COVID-19 Vaccine.
- **CDC**: published a new study on pediatric emergency department visits associated with mental health conditions before and during the COVID-19 pandemic (see picture on the right).
- **CDC**: published a new study on the effectiveness of maternal completion of a 2-dose primary mRNA COVID-19 vaccination series during pregnancy against COVID-19 hospitalization among infants aged <6 months (see picture on the right).

- **Topics:**
- Global situation
- European situation/Vaccination News
- European Situation on Vaccination
- SARS-CoV-2 VOIs and VOCs
- Subject in Focus: Corona SitRep EUROPE LTU-POL-ROU
- Other Infectious Disease Outbreaks
- Summary of information on the individual national Corona restrictions
- Travel Recommendations and other Useful Links

EUROPE
↘
167 518 199
confirmed cases
147 500 000 recovered
1 788 482 deaths

FRA
(7-days incidence 781,0)
↘
22 765 667
confirmed cases
20 750 000 recovered
137 277 deaths

GBR
(7-days incidence 527,6)
↘
18 744 585
confirmed cases
17 470 000 recovered
160 955 deaths

RUS
(7-days incidence 792,3)
↘
15 430 540
confirmed cases
12 390 000 recovered
340 101 deaths

Situation by WHO Region, as of 20 February

Global epidemiological situation overview; WHO as of 20 February 2022

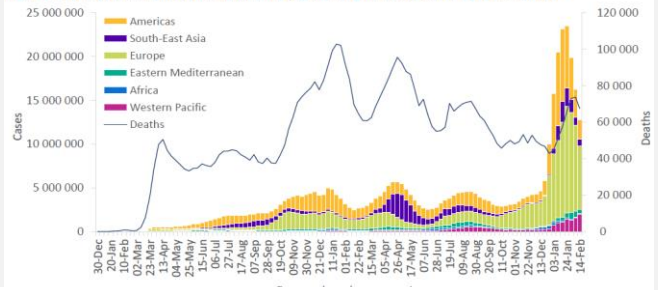
Globally, during the week of 14 through 20 February 2022, the number of new COVID-19 cases decreased by 21% as compared to the previous week. In addition, the number of new deaths showed a decreasing trend (-8%) when compared to the previous week (Figure 1). Across the six WHO regions, over 12 million new cases and over 67 000 new deaths were reported (Table 1). As of 20 February 2022, over 422 million confirmed cases and over 5.8 million deaths have been reported globally.

At the regional level, the Western Pacific Region reported a 29% increase in the number of new weekly cases, while all other regions reported decreases: the Eastern Mediterranean Region (-34%), the Region of the Americas (-29%), the European Region (-26%), the African Region (-22%) and the South-East Asia Region (-17%). The number of new weekly deaths increased in the Western Pacific (+21%) and African (+20%) Regions and decreased in the South-East Asia (-37%), the Regions of Americas (-9%), the European Region (-5%) and the Eastern Mediterranean Region (-4%).

The **highest numbers of new cases** were reported from:

- Russia (1 236 910 new cases; 7% decrease)
- Germany (1 218 465 new cases; 8% decrease),
- Brazil (773 353 new cases; 23% decrease)
- United States of America (746 129 new cases; 39% decrease),
- Repulic of Korea (612 195 new cases; 80% increase),

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 20 February 2022**

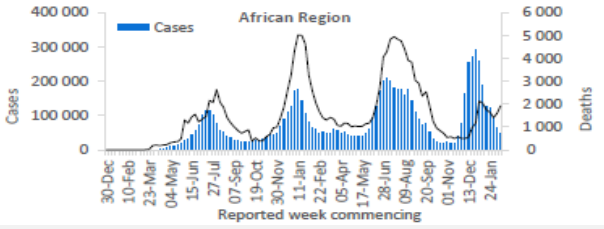


WHO regional overviews Epidemiological week 14-20 February 2022**

African Region

The African Region has reported a continued decrease in the number of cases since the beginning of January 2022, with over 53 000 new cases reported, a 22% decrease as compared to the previous week. However, four countries in the Region (8%) reported an increase of over 20% in cases: Ghana (469 vs 210 new cases; +123%), Equatorial Guinea (17 vs 8 new cases; +112%), Zimbabwe (1925 vs 964 new cases; +99%) and Burkina Faso (40 vs 26 new cases; +53%). The highest numbers of new cases were reported from Réunion (21 707 new cases; 2424.5 new cases per 100 000 population; -29%), South Africa (16 929 new cases; 28.5 new cases per 100 000; -6%), and Algeria (2710 new cases; 6.2 new cases per 100 000; -25%).

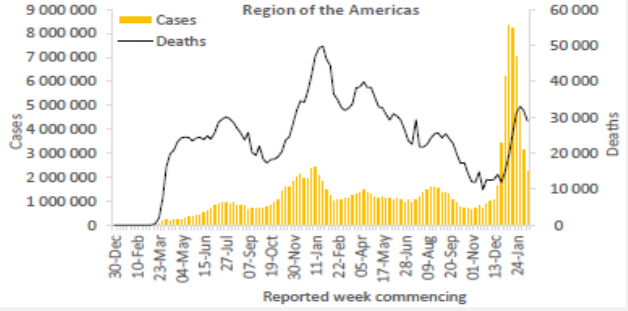
With just over 1900 new deaths reported this week, the Region shows a 20% increase when compared to the previous week. This increase is driven by a backlog of deaths reported by South Africa following an ongoing audit exercise. The highest numbers of new deaths were reported from South Africa (1632 new deaths; 2.8 new deaths per 100 000 population; +40%), Algeria (72 new deaths; <1 new death per 100 000; similar to previous week), and Réunion (38 new deaths; 4.2 new deaths per 100 000; +12%).



Region of the Americas

The Region of the Americas reported over 2.2 million new cases, a 29% decrease as compared to the previous week, a trend that has continued since mid-January. However, three countries have reported increases in new cases of 20% or greater, with the highest proportional increases reported from Mexico (90 422 vs 53 344 new cases; +70%), Nicaragua (85 vs 65 new cases; +31%) and, Saint Lucia (536 vs 419; +28%). The highest numbers of new cases were reported from Brazil (773 353 new cases; 363.8 new cases per 100 000; -23%), the United States of America (746 129 new cases; 225.4 new cases per 100 000; -39%), and Chile (236 312 new cases; 1236.2 new cases per 100 000; -5%).

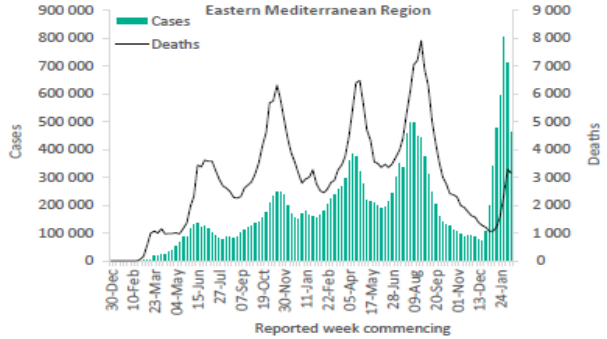
The Region reported just under 29 000 new deaths this week, a 9% increase as compared to the previous week. The highest numbers of new deaths were reported from the United States of America (14 723 new deaths; 4.4 new deaths per 100 000; -6%), Brazil (5877 new deaths; 2.8 new deaths per 100 000; -12%), and Mexico (2221 new deaths; 1.7 new deaths per 100 000; +8%).



Eastern Mediterranean Region

In the Eastern Mediterranean Region, new weekly cases continue to decline for the second consecutive week since the peak reached in early February 2022. Over 466 000 new cases were reported this week, representing a 34% decrease as compared to the previous week. The highest numbers of new cases were reported from the Islamic Republic of Iran (145 032 new cases; 172.7 new cases per 100 000; -39%), Jordan (110 012 new cases; 1078.2 new cases per 100 000; -19%), and Lebanon (30 984 new cases; 453.9 new cases per 100 000; -33%).

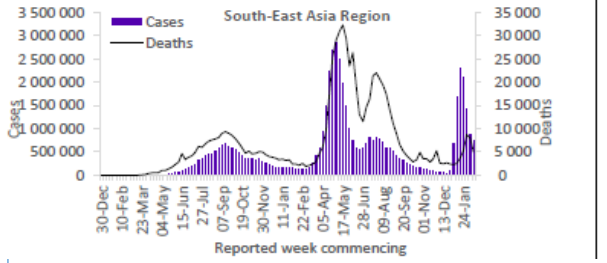
The number of new weekly deaths remains stable when compared to the previous week's figures, with over 3100 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (1228 new deaths; 1.5 new deaths per 100 000; +49%), Egypt (402 new deaths; <1 new death per 100 000; -3%), and Tunisia (310 new deaths; 2.6 new deaths per 100 000; -32%).



South-East Asia Region

A decline in new cases has been observed in the South-East Asia Region since mid-January. Over 762 000 new cases were reported in the Region this week, a 17% decrease as compared to the previous week. Despite the declining trend at the regional level, four countries reported an increase of over a 20% e: Myanmar (18 896 vs 8870 new cases; +113%), Bhutan (2649 vs 1337 new cases; +98%), Indonesia (389 727 vs 291 298 new cases; +34%) and Thailand (118 988 vs 96 326 new cases; +24%). The highest numbers of new cases were reported from Indonesia (142.5 new cases per 100 000), India (191 052 new cases; 13.8 new cases per 100 000; -57%), and Thailand (170.5 new cases per 100 000).

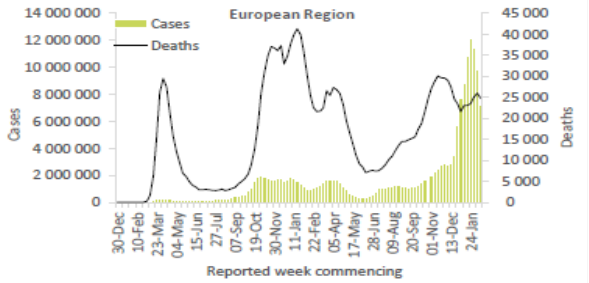
Regionally, the number of new deaths also declined this week with just over 5000 new deaths reported, a 37% decrease as compared to the previous week. The highest numbers of new deaths were reported from India (3238 new deaths; <1 new death per 100 000; -52%), Indonesia (1189 new deaths; <1 new death per 100 000; +91%), and Thailand (188 new deaths; <1 new death per 100 000; +30%).



European Region

The European Region reported a further decline this week with over 7.2 million new cases, a 26% decrease as compared to the previous week. This is the third consecutive week of a decline in the number of new cases since the Region observed a peak at the end of January. Only one country – Iceland - reported a greater than 20% increase this week (17 293 vs 13 333 new cases; +30%). The highest numbers of new cases were reported from the Russian Federation (1 236 910 new cases; 847.6 new cases per 100 000; -7%), Germany (1 218 465 new cases; 1465.1 new cases per 100 000; -8%), and Turkey (599 596 new cases; 710.9 new cases per 100 000; -12%).

This week, over 24 000 new deaths were reported in the Region, a 5% decrease as compared to the previous week. The highest numbers of new deaths were reported from the Russian Federation (5252 new deaths; 3.6 new deaths per 100 000; +9%), Italy (2024 new deaths; 3.4 new deaths per 100 000; -11%), and Turkey (1922 new deaths; 2.3 new deaths per 100 000; +11%).

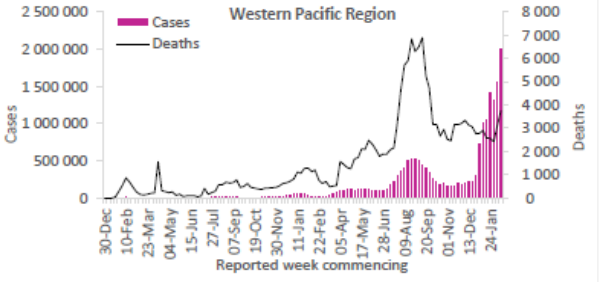


Updates from the European Region

Western Pacific Region

The Western Pacific Region reported a sharp increase (29%) in new weekly cases as compared to the previous week, with over two million new cases. More than a third (11/28; 39%) of the countries in the Region reported an increase of 20% or greater in the past week. The most substantial increases were observed in New Zealand (10 361 vs 2792 new cases; +271%), China (26 329 vs 7571 new cases; +248%) and Brunei Darussalam (10 934 vs 4175 new cases; +162%). The highest numbers of new cases were reported from the Republic of Korea (612 195 new cases; 1194.1 new cases per 100 000; +80%), Japan (579 928 new cases; 458.5 new cases per 100 000; -7%), and Viet Nam (255 812 new cases; 262.8 new cases per 100 000; +63%).

Over 3700 new deaths were reported in the Region this week, a 21% increase as compared to the previous week. The highest numbers of new deaths were reported from Japan (1434 new deaths; 1.1 new deaths per 100 000; +52%), the Philippines (677 new deaths; <1 new death per 100 000; -5%), and Viet Nam (561 new deaths; <1 new death per 100 000; -7%).



Source: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---22-february-2022

1. https://www.ctvnews.ca/health/coronavirus/hong-kong-reports-1-347-new-covid-19-cases-as-health-care-system-overwhelmed-1.5779571
2. https://www.ha.org.hk/haho/ho/cc/ha_situation_and_confirm_en.pdf
3. https://www.nytimes.com/2022/02/16/world/asia/hong-kong-covid-omicron-wave.html
4. https://www.scmp.com/news/hong-kong/health-environment/article/3167346/coronavirus-hong-kong-senior-beijing-official
5. https://www.scmp.com/news/hong-kong/health-environment/article/3167462/coronavirus-hong-kong-government-considering
6. https://www.covidvaccine.gov.hk/en/
7. https://ourworldindata.org/covid-vaccinations?country=HKG

Global Situation

bluedot

Overview of COVID-19 in Hong Kong

Disease Activity: The seven-day rolling average daily number of new cases **has surged from 15 on January 16 to 1,878 as of February 16**. Similarly, the 14-day test positivity rate has increased from 0.016% on January 16 to 0.064% as of February 9. After five months of no COVID-19 related deaths, **approximately 25 new deaths were recorded between February 12 and February 17**. Despite officials having COVID-19 cases relatively under control throughout the pandemic, **recent spikes in the fifth wave and associated strain on the healthcare system are attributed to the community spread of the Omicron variant**.[1]

Hospital Occupancy – The current COVID-19 wave has rapidly overwhelmed the healthcare system. According to the Hospital Authority, as of February 11, hospital beds for COVID-19 patients have reached 90% occupancy, while isolation facilities are reaching capacity limits.[1, 2]

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Public Measures – **Current spikes in cases have strained Hong Kong's 'dynamic zero-COVID' strategy to suppress all COVID-19 outbreaks that occur.** Despite rising cases, government officials have stated there are currently no plans to place the city in lockdown. Restrictions that remain in place include limiting social gatherings to two individuals, restaurant closures by 6 p.m., and mask-wearing. Working from home is recommended for individuals who are able to. Due to the shortage of isolation beds for COVID-19 patients, government officials are shortening the quarantine period of infected residents and staff working in elderly residential care homes.[1] Government officials are also working with mainland China and have developed task forces in an effort to increase testing capacity and develop temporary isolation facilities.[3, 4] Hong Kong received the first batch of additional testing supplies from mainland China on February 17. Officials are also considering a citywide universal testing campaign.[5]

Vaccination Coverage – As of February 18, among Hong Kong's approximately 7.5 million population, **76% (5,751,859) have received at least one dose of a COVID-19 vaccine, 67% (5,078,872) have two doses, and 18% (1,404,970) have received booster shots**.[6] Vaccination coverage among the most vulnerable age groups remains low. Media reports highlight that, as of February 16, only about 56% of seniors aged 70 and older have received at least one dose of a COVID-19 vaccine.[3] Approximately 14% of individuals aged three to 11 have received the first dose of a COVID-19 vaccine.[5] Health officials have noted that children aged three and up would be eligible to receive vaccinations from February 15, 2022.[1] Hong Kong began its vaccination campaign in February 2021, and two vaccines are currently being administered, including Comirnaty (Pfizer-BioNTech) and CoronaVac (Sinovac).[7]

Opening borders = more migration in Latin America

Nearly two years after COVID-19 shut down most land crossings in South America, several countries have announced the reopening of borders. Ecuador said its international crossing with Peru was expected to open on 18 February, while Peru has already opened its Amazon border with Brazil, which serves as an alternative route for many migrants from Venezuela, Cuba, and Haiti heading southward. The government in Lima said it was also coordinating with Bolivia and Chile to open those borders too. Colombia, which has continued to allow access to its territory for citizens of neighbouring countries for humanitarian reasons during the pandemic, is expected to reopen crossings to all traffic on 1 March. Amid growing poverty (Latin America is forecast to see the slowest economic growth globally in 2022), as well as ongoing violence and political instability in countries like Colombia, Cuba, Haiti, and Venezuela), these border reopenings are expected to further propel migration, including record numbers of children. As well as higher death rates along dangerous routes, the pandemic has also seen rising xenophobia in some countries. Meanwhile, in Chile, there are growing tensions in the northern town of Colchane. Migrants there are in a state of limbo, unable to really enter Chile nor return to Bolivia.

Source: The New Humanitarian

Virus tests Pacific nations, but some are better prepared

Solomon Islands' health system is buckling under the weight of its first COVID-19 outbreak – one of several Pacific Island nations struggling after largely keeping the virus at bay. Two years into the pandemic, Solomon Islands is seeing what countless other countries faced in early outbreaks: congested isolation centres, testing shortages, and transmission rates that have "overwhelmed" its health system. "Our health system cannot cater for all persons tested positive or showing symptoms," a government press release stated. Across the Pacific, remote nations like Kiribati, Samoa, Tonga, and Palau are also seeing their first major outbreaks – long distances and closed borders no longer an airtight barrier. But vaccination status also varies. Countries like Samoa and Tonga have relatively high rates, and haven't recorded any confirmed COVID-19 deaths. In Solomon Islands, only 11 percent of the population are fully vaccinated. Among its 68 recorded deaths, most have been unvaccinated people, the government said. This reflects a clear vaccination divide in the Pacific, according to forecasts by the Lowy Institute, a Sydney-based think tank: Some Pacific nations are world leaders, but others are lagging behind due to a combination of misinformation and weak health systems. At its current rate, Solomon Islands won't be fully vaccinated until 2026 at least, according to the forecasts.

Source: The New Humanitarian

Notes from the Field: **Outbreak of COVID-19 Among a Highly Vaccinated Population Aboard a U.S. Navy Ship After a Port Visit — Reykjavik, Iceland, July 2021**

On July 27, 2021, a fully vaccinated crew member on a U.S. Navy ship who had been symptomatic with cough and congestion for 4 days received a positive test result for SARS-CoV-2. The ship had approximately 350 personnel on board; COVID-19 vaccination rate was >98%.

Masking and physical distancing mandates on the ship were relaxed while at sea but were immediately reimplemented upon identification of the crew member's positive test result. During the deployment, personnel had permission to go ashore only during the Iceland port visit and only if they were fully vaccinated.

After identification of the initial case, all ship personnel were notified to report if they had any COVID-19–like signs or symptoms, resulting in diagnoses of an additional 11 COVID-19 cases that day. The ship immediately instituted prevention measures, including mask use, physical distancing, increased cleaning, isolation of the 12 initial patients, testing of 69 close contacts, and testing and quarantine of six unvaccinated persons (two of whom were also close contacts). On July 28 and 29, six additional cases were identified through testing. Further analysis determined 17 of the 18 specimens were Delta variant AY.9 lineage; 16 of the 17 were identical.

The 18 infected persons were removed from the ship on July 31 to reduce the ship's health care requirements and to prevent further transmission. Four additional cases of COVID-19 were identified during August 1–7 (including three diagnosed aboard the ship and one postdeployment) with onset July 28–August 5.

The overall attack rate was 6.3%.

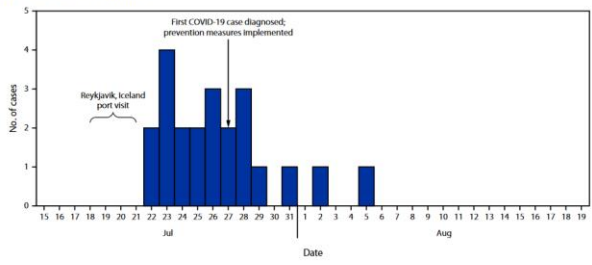
Among the 22 infected personnel identified, all were fully vaccinated, and all were symptomatic.

What are the implications for public health practice?

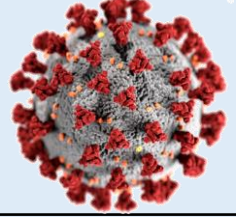
Vaccination, in combination with other prevention strategies, resulted in a much lower attack rate of COVID-19 than seen in the early months of the pandemic.

Source:
https://www.cdc.gov/mmwr/volumes/71/wr/mm7107a5.htm?s_cid=mm7107a5_x

FIGURE. Date of symptom onset or specimen collection* for COVID-19 cases identified during an outbreak on a U.S. Navy ship (N = 22) — Reykjavik, Iceland, July–August 2021†



* Whichever occurred earlier; for all but one case, symptom onset preceded specimen collection.
† Prevention measures included mask use, physical distancing, increased cleaning, canvassing for mild symptoms, and increased testing.



European Situation

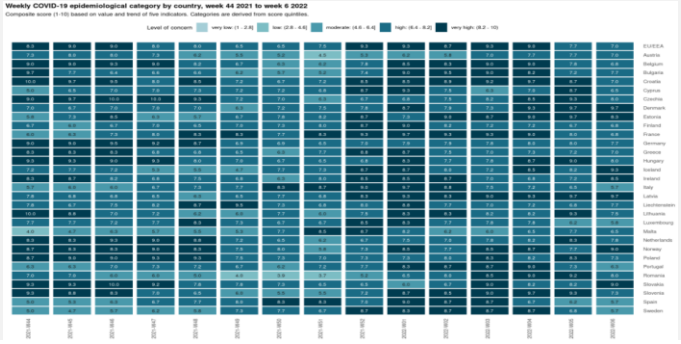
Vaccination News

ECDC COVID-19 country overviews report Week 06, as of 18 February 2022

At the end of week 6 2022 (week ending Sunday, 13 February), the overall epidemiological situation in the EU/EEA was characterised by a very high overall case notification rate, although this has been decreasing for two weeks. This decrease has largely been driven by a fall in rates among those under 50 years, where the rates have fallen from very high levels. Case rates among older age groups appear to have stabilised for the EU/EEA overall. However, 15 countries reported increasing trends compared to the previous week among people aged 65 years and above, which may lead to increases in severe disease in the coming weeks. The overall EU/EEA death rate remained elevated but stable. Case notification rates are forecast to decrease over the next two weeks, hospital admissions to remain stable and death rates to increase. An epidemiological situation of high or very high concern was observed in 25 EU/EEA Member States. While considerable differences remain between countries, the overall picture appears to be improving, with 12 countries moving to a lower category compared to last week and fewer classified as of very high concern. The Omicron variant of concern is now dominant in all EU/EEA countries. Interpretation of trends in surveillance data is challenging at present due to the rapidly changing and diverse testing strategies within EU/EEA countries. The overall COVID-19 case notification rate for the EU/EEA was 2 962 per 100 000 population (3 586 the previous week). This rate has been decreasing for two weeks. The 14-day COVID-19 death rate (54.7 deaths per million population, compared with 54.8 deaths the previous week) has been stable for 12 weeks. Of 27 countries with data on hospital or ICU admissions or occupancy up to week 6, 14 reported an increasing trend in at least one of these indicators compared to the previous week. ECDC's assessment of each country's epidemiological situation is based on a composite score for the absolute value and trend of five weekly COVID-19 epidemiological indicators. As shown below, for week 6, seven countries (Denmark, Estonia, Iceland, Ireland, Latvia, Norway and Slovakia) were categorised as of very high concern, 18 countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Finland, France, Germany, Greece, Hungary, Liechtenstein, Lithuania, Malta, the Netherlands, Poland, Romania and Slovenia) as of high concern and five countries (Italy, Luxembourg, Portugal, Spain and Sweden) as of moderate concern. Compared with the previous week, four countries (Iceland, Ireland, Norway and Slovakia) moved to a higher category, 12 countries (Croatia, Cyprus, Czechia, Hungary, Italy, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovenia and Sweden) moved to a lower category and 14 countries stayed in the same category. Forecasts of cases, hospital admissions and deaths from the European COVID-19 Forecast Hub provide predictions for weeks 7 and 8. Compared with the current week, decreasing trends in cases, stable trends in hospital admissions, and increasing trends in deaths are forecast in the EU/EEA by the end of week 8. By the end of week 6, the cumulative uptake of the primary course of COVID-19 vaccination in the EU/EEA was 82.2% (country range: 34.7–94.4%) among adults aged 18 years and older and 71.0% (country range: 29.1–85.4%) in the total population. The cumulative uptake of a booster/additional dose was 58.5% (country range: 10.2–84.8%) among adults aged 18 years and older and 48.3% (country range: 8.4–67.1%) in the total population.

The estimated distribution (median and range of values from 23 countries for weeks 4 to 5, 24 January – 6 February 2022) of variants of concern (VOCs) was 98.0% (50.4–100.0%) for B.1.1.529 (Omicron) and 1.5% (0.0–49.6%) for B.1.617.2 (Delta).

During the same period, B.1.1.529 (Omicron) was the dominant variant (accounting for >50% of sequenced viruses) in all of the 23 EU/EEA countries with adequate sequencing volume. A description of the epidemiology of 360 436 reported Omicron cases is available in the virus variants summary and variants sections.



A total of 10 countries accounted for **67.1%** of all vaccinations administered globally as of February 10. The top five countries/territories with the highest number of cumulative people fully vaccinated per 100,000 population are **Gibraltar** (120,930), **United Arab Emirates** (93,840), **Brunei Darussalam** (91,360), **Portugal** (91,220), and **Chile** (88,600). Conversely, the top five countries with the lowest number of cumulative people fully vaccinated per 100,000 population are **Burundi** (60), the **Democratic Republic of the Congo** (230), **Chad** (800), **Haiti** (810), and **Yemen** (1,180).

Vaccine Administration

According to data collected by Our World in Data, more than 10.4 billion COVID-19 vaccine doses have been administered in 184 countries. As of February 14, the WHO's COVAX program has shipped 1.1 billion doses to 144 eligible countries. Based on data from Our World in Data, in Figure 1A we present a map with the percentage of population fully vaccinated per country/territory; in Figure 1B, we present a map with the total number of vaccine doses administered per country/territory, for those with reported data. In Figure 1C, we present a map with the percentage of population vaccinated with a booster dose per country/territory.

Figure 1A

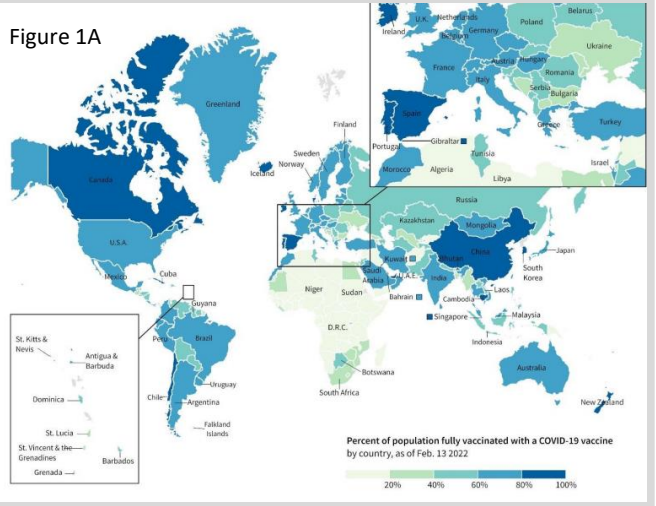


Figure 1B

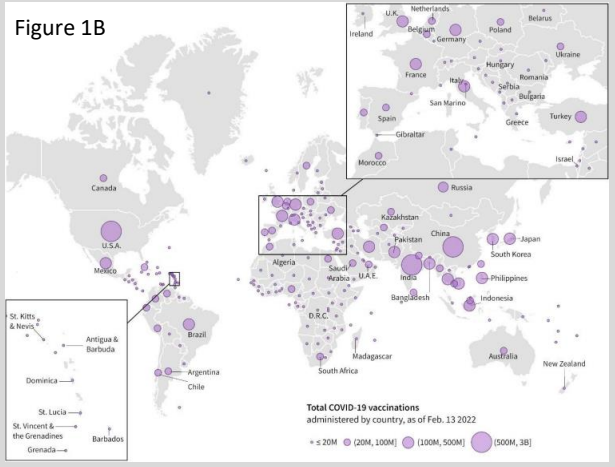
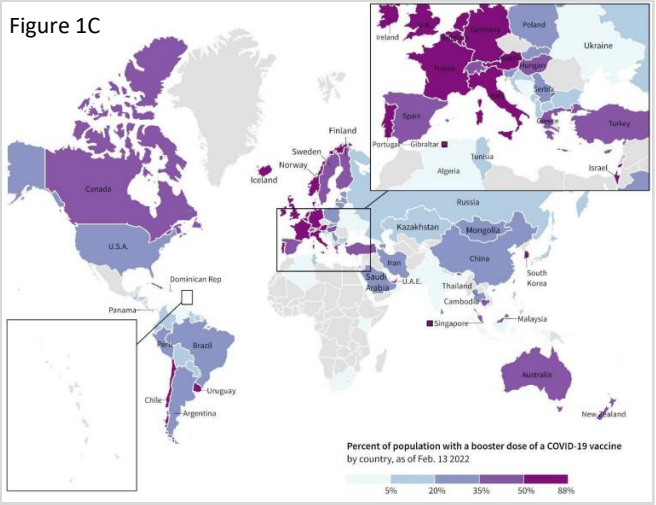
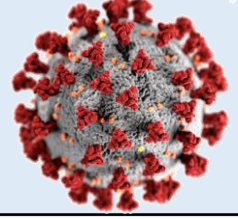


Figure 1C



Source: https://mcusercontent.com/ab84a833923e562d0999bf440/files/837db5ba-3fa2-06c2-d604-9941ae9205fb/BlueDot_VaccineAdministration31.pdf



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Vaccination News

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Spotlight on Second Generation Vaccines

Current market-approved vaccines are all administered intramuscularly and are known to induce high systemic immune response. However, these vaccines do not induce high levels of antiviral immune memory at sites of infection, such as in the respiratory mucosa, which are important for preventing respiratory tract infections. With new variants of SARS-CoV-2 emerging globally, vaccine effectiveness for preventing infection has been decreasing, although vaccine effectiveness against severe disease remains high and long-lasting against new variants. Recently, there has been increasing research into new approaches to administer vaccines that may also be effective against transmission of SARS-CoV-2. Including other approaches in the current vaccination rollout may help in reducing overall global transmission and rate of infections.

What are some advantages of alternative approaches to intramuscular vaccines (i.e., intranasal vaccines)?

One example of an alternative approach to the vaccines in current use are intranasal vaccines. Whereas intramuscular vaccines do not induce high levels of antiviral immune memory at sites of infection, current market-approved vaccines are all administered intramuscularly and are known to induce high immune response in memory B-cells (for long-term immunity) as well as circulating T-cells. However, these vaccines do not induce high levels of antiviral immune memory at sites of infection, such as the tissue resident memory T-cells in respiratory mucosa, which are important for preventing respiratory tract infections.[1] Intramuscular vaccines depend on priming the immune system to recognize pathogens in circulation. However, **a vaccine administered intranasally may enhance immune response on mucosal surfaces as well such as the throat and the nose – common sites of SARS-CoV-2 infection.** Additionally, intranasal vaccines produce high levels of IgA antibodies (commonly found and serves as a first line of defense in the nasopharynx) that can survive longer on mucosal surfaces. These vaccines may be able to coat the entire airway with antibodies that may wane more slowly. A preprint study on IgA antibodies suggested that a long-lasting IgA response may be the key to preventing infection[2] , further highlighting the advantages of intranasal vaccines. Intranasal vaccines also have socioeconomic advantages, especially in low- and middle-income countries. Since these vaccines would not require administration by healthcare professionals or in a sterile environment, they may help in immunizing populations more quickly in areas with low resources. They may also function as alternatives for individuals who might not prefer needles, particularly children.[3]

As of the end of January 2022, 12 intranasal vaccines are currently in different stages of clinical trials, nine of which are based on viral vector vaccines. Results of some preclinical studies have shown promising results so far which have been summarized in a published review article.3 One study indicated that a single dose of an intranasal vaccine has been able to induce systemic and local immunity in mice and nonhuman primates (such as rhesus macaque).[4] Studies also indicated that immunization via the intranasal route increased the resident memory T-cells in lung tissue, eliciting a robust protective mucosal immunity, and preventing infection in the upper and lower respiratory tracts.[5] Another study found that nasal shedding of SARS-CoV-2 was reduced in hamsters and rhesus macaques that were immunized with an intranasal vaccine.[6] Research on intranasal vaccines is ongoing and there are several outstanding questions yet to be answered about this alternative approach to vaccine delivery for COVID-19. However, preclinical studies published so far have shown favourable results on the advantages of intranasal vaccines that may help reduce transmission of SARS-CoV-2 on a global scale and protect against continued evolution of the virus and new variants.

What are additional vaccine targets to augment broad long-lasting immunity?

Currently approved vaccines target the spike protein on the SARS-CoV-2 virus used for entering host cells. However, changes in the viral spike protein (due to selective pressure) of emerging variants can make new SARSCoV-2 variants capable of evading our vaccine-derived immunity. This has been seen with the circulating Omicron variant citing a significant reduction in T-cell response against the spike protein in some individuals.[7] Thus, other targets are being considered for longer-lasting immunity, as including additional immune targets in future vaccines will allow for robust and diversified protection to counter emerging variants. A published study[8] by researchers at the Imperial College London suggests memory T-cells (a type of white blood cell that is part of the human immune system) produced after a previous non-COVID-19 human endemic coronavirus (hCoV)[8]. infection are “cross-reactive” as they may elicit an immune response against viral proteins of SARS-CoV-2. Such immune responses are possible due to similar genetic structures shared among SARS-CoV-2 and other coronaviruses. Among 52 recent household contacts of lab-confirmed COVID-19 cases, PCR testing was performed on days four and seven post-exposure to determine whether the household contact was infected. Results indicated that the household contacts who did not develop COVID-19 had higher frequencies of specific cross-reactive T-cells at baseline (suggesting a memory immune response from endemic coronaviruses) than PCR-positive contacts. At day 28, the infected household contacts had increasing detection of specific cross-reactive T-cells.

Interestingly, those who did not test positive demonstrated a decline in these crossreactive T-cells, suggesting the migration of these cells was an active response against the recent exposure. The potential cross-recognition of T-cells developed by an individual after non-COVID-19 coronavirus and SARSCoV-2 infection indicates key viral target proteins (e.g., nucleocapsid or ORF1 proteins), in addition to the spike protein, that may enhance COVID-19 vaccine effectiveness. While T-cell recognition is more robust against these mutations than antigen-derived immunity, there can be reductions in reactivity with new variants.[9]

Vaccine Research Updates

Company	Vaccine Candidate	Updates
Moderna/National Institute of Health	Spikevax (mRNA-1273)	In a press release on January 26, Moderna announced that six months after a booster dose of Spikevax, Omicron variant neutralization experienced a 6.3-fold decline from the peak titres recorded 29 days after receiving the booster vaccine. This was in comparison to the SARS-CoV-2 ancestral strain which declined 2.3-fold over the same period of time. Furthermore, Moderna indicated that the first participant has been dosed in their Phase 2 study evaluating the immunogenicity, safety, and reactogenicity of the Omicron variant-specific booster, mRNA-1273.529.
AstraZeneca/University of Oxford	AZD2816	On February 10, AstraZeneca announced that they will no longer be pursing the investigation of vaccine candidate AZD2816, a COVID-19 vaccine which was specific to the Beta variant. The decision was reached after finding no meaningful difference between the immunogenicity of the AZD2816 vaccine and the first-generation vaccine, Vaxzevria.
Johnson & Johnson/Janssen	Janssen (Ad26.COV2.S)	On February 9, Johnson & Johnson published the results of their primary Phase 3 efficacy analysis of the Janssen vaccine. Researchers found that a single dose of the vaccine was 56.3% effective against moderate to severe disease 14 days after vaccination. Vaccination effectiveness dropped to 52.9% after four weeks. However, they noted that protection varied by variant, and the Delta and Omicron variants were not included in this analysis.
Israel Institute for Biological Research	BriLife	The BriLife vaccine differs from mRNA vaccines as it is a live, viral vector vaccine whereby the spike protein of SARS-CoV-2 has been added to a benign virus. At the end of January, researchers from the Israel Institute for Biological Research found that the BriLife vaccine produced a neutralizing antibody level against the Omicron variant which was approximately a third of the antibody level found to be produced against the ancestral strain of SARSCoV-2. Furthermore, they detected evidence that the vaccine’s live viral vector spontaneously acquired mutations found on the Omicron variant. They believe this will allow the vaccine to evolve and provide immunity against future variants.
Novavax	Covovax/Nuvaxovid (NVX-CoV2373)	On February 3, Novavax reported that they are developing an Omicron-specific vaccine. This followed the announcement in December 2021, where it was found that a booster was recommended to restore protection against the Omicron variant.
Baqiyatallah University of Medical Sciences	Noora	On February 9, researchers announced that the Phase 3 trial of vaccine candidate, Noora, was complete and awaiting emergency use authorization in Iran. Results of the Phase 2 and 3 trials have not been published. However, initial results indicated that the recombinant protein vaccine can provide strong protection against the Omicron variant and that no serious side effects were observed.
Erciyes University	Turkovac	According to media sources, on January 25, researchers provided limited information indicating that Turkovac can provide protection against the Alpha and Delta variants. Results from the Phase 3 clinical trial have not made public, as such, there is little information available to indicate the safety and efficacy of the vaccine.

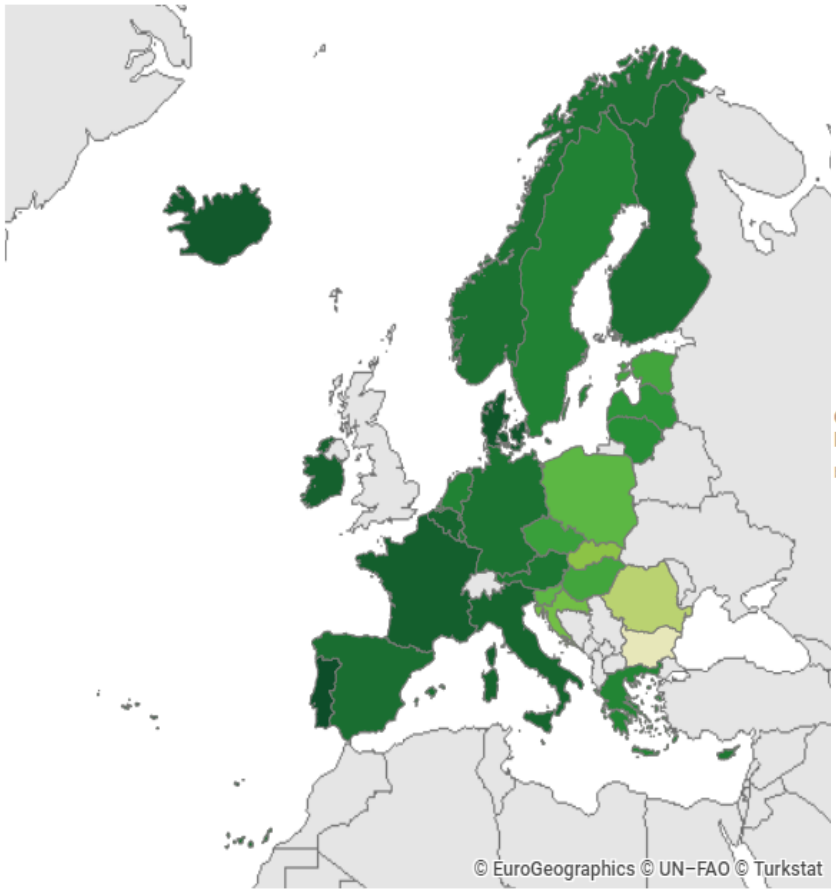
European Situation on Vaccination

Source: https://qap.ecdc.europa.eu/public/extensions/COVID-19/vaccine-tracker.html#uptake-tab

Total doses distributed to EU/EEA countries 1,104,474,516 | 872,327,303

Indicator: Uptake of the primary course

Cumulative uptake (%) of the primary course in the total population in EU/EEA countries as of 2022-02-21

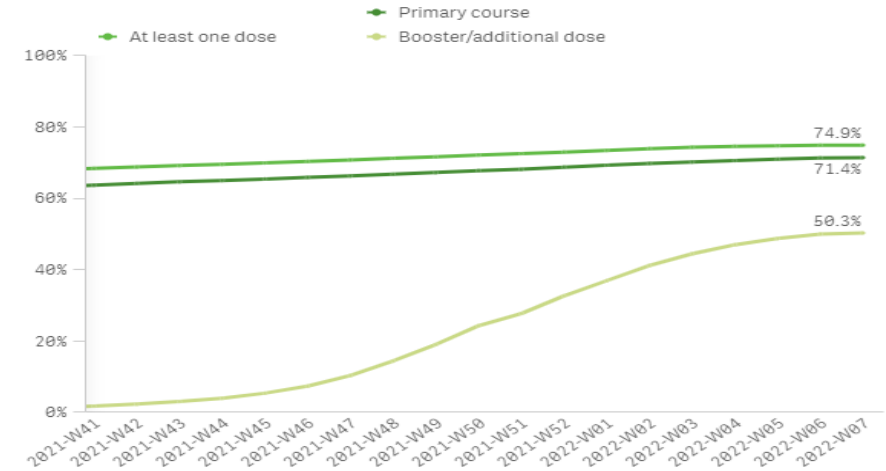


Uptake of the primary course (%)

29.2% 85.4%

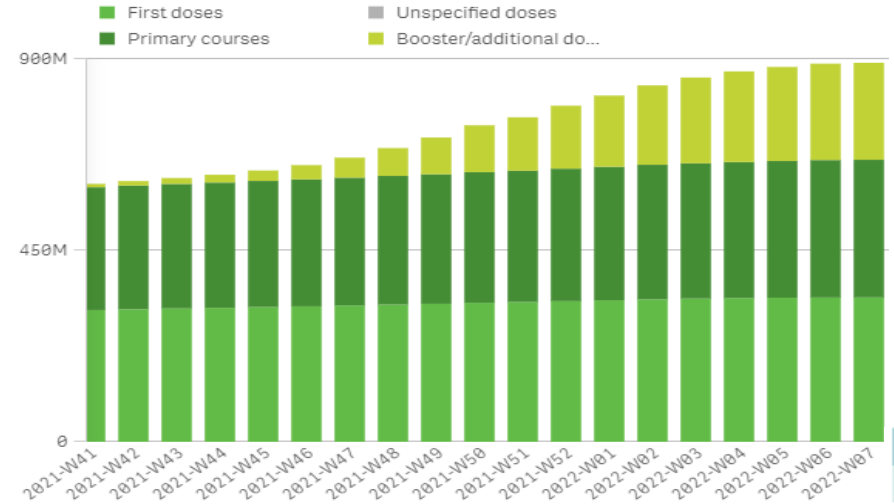
Cumulative vaccine uptake (%) in the total population in EU/EEA countries as of 2022-02-21

by reporting week (data for the current week are preliminary)



Cumulative number of vaccine doses administered to the total population in EU/EEA countries as of 2022-02-21

by reporting week (data for current week are preliminary)



Cumulative uptake (%) of the primary course by age group in EU/EEA countries as of 2022-02-21

Country	60+ years	50-59 years	25-49 years	18-24 years	<18 years
Austria	92.8%	82.9%	76.9%	75.1%	29.5%
Belgium	94.2%	91.4%	85.0%	82.8%	35.7%
Bulgaria	37.5%	38.4%	32.2%	27.3%	2.0%
Croatia	77.3%	69.7%	57.6%	44.1%	4.1%
Cyprus	94.3%	88.1%	84.7%	71.3%	18.7%
Czechia	85.8%	78.1%	65.3%	68.7%	19.1%
Denmark	99.8%	94.2%	85.6%	82.8%	42.7%
Estonia	78.5%	74.6%	68.0%	71.3%	18.7%
Finland	95.2%	88.1%	82.6%	77.8%	28.0%
France	93.1%	93.7%	90.0%	93.1%	27.1%
Germany	89.7%	-	-	-	-
Greece	88.8%	82.4%	74.9%	69.9%	20.3%
Hungary	81.6%	75.3%	65.0%	52.5%	23.0%
Iceland	100.0%	92.5%	87.5%	86.2%	41.5%
Ireland	100.0%	99.3%	88.8%	86.8%	30.8%
Italy	91.7%	86.4%	80.1%	85.9%	37.0%
Latvia	75.8%	78.5%	76.5%	79.0%	19.6%
Liechtenstein	-	-	-	-	1.7%
Lithuania	78.7%	79.1%	79.6%	74.5%	16.2%
Luxembourg	91.3%	87.7%	78.4%	74.0%	30.2%
Malta	99.2%	88.9%	93.3%	85.3%	41.5%
Netherlands	-	-	-	-	21.6%
Norway	99.3%	95.4%	86.2%	85.4%	11.6%
Poland	76.4%	67.9%	60.0%	55.4%	21.7%
Portugal	100.0%	94.8%	89.4%	87.4%	34.1%
Romania	46.3%	56.4%	49.6%	48.9%	6.7%
Slovakia	72.8%	61.4%	52.5%	51.8%	10.2%
Slovenia	84.3%	70.0%	56.8%	58.0%	10.4%
Spain	98.4%	89.2%	77.5%	72.8%	29.6%
Sweden	96.1%	91.2%	80.4%	76.8%	11.6%

SARS-CoV-2 Variant of Concern: Update on BA.2 Pango lineage of Omicron

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Pre-Print Study RE: Virological Characteristics of SARS-CoV-2 Omicron BA.2 Variant

- A recent pre-print study conducted by researchers in Japan has provided some evidence for the virological characteristics of the SARS-CoV-2 Omicron BA.2 subvariant.
- The Omicron variant was first reported in November 2021. The sub-lineages BA.1, BA.2, and BA.3 are designated as Omicron, the most recent SARS-CoV-2 variant of concern.
- The initial sub-lineage, BA.1, quickly spread worldwide.
- In January 2022, an increase in BA.2 was reported and quickly became the dominant sub-lineage of Omicron in some countries (e.g., Denmark). However, little remains known about BA.2 virological characteristics including its transmissibility and the effectiveness of vaccines against BA.2.
- The results of this pre-print study present evidence that the reproduction number (the average number of infected persons resulting from contact with a single infected person) of BA.2 is 1.4-fold higher than BA.1.
- Evidence in hamsters suggests that BA.2 is more pathogenic (capacity to cause disease) than BA.1.
- Results from animal studies suggest that BA.2 is resistant to BA.1-induced immunity.
- Additionally, the antigenicity (capacity of the virus to bind to antibody molecules) for BA.2 is reported to be different from BA.1.
- Overall, the study authors concluded that the virological characteristics of BA.2 are different compared to BA.1 and that the risk of BA.2 on global health is potentially higher than that of BA.1.[1]
- There remains limited evidence as to whether vaccination against COVID-19 is more, or less, effective against BA.2 compared to BA.1.
- A COVID-19 vaccine surveillance report published by the UK Health Security Agency on February 3, 2022, reported that vaccine effectiveness against symptomatic disease in humans was similar for BA.1 and BA.2 sub-lineages of Omicron (analysis combined all vaccines). However, as mentioned in the initial animal pre-print study above, BA.2 may be more resistant to BA.1-induced immunity.[2]

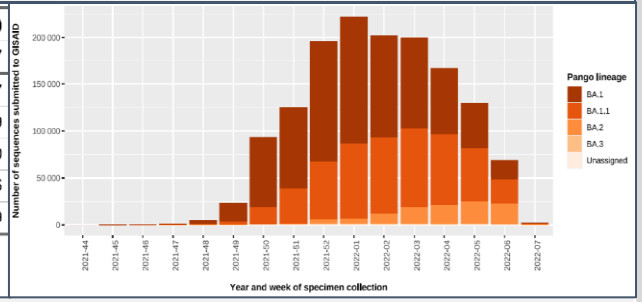
Source: 1. https://global.us16.list manage.com/track/click?u=ab84a833923e562d0999bf440&id=800a2da59a&e=7c8941661d
2. https://global.us16.list-manage.com/track/click?u=ab84a833923e562d0999bf440&id=a8f031593b&e=7c8941661d

Global distribution and relative proportion of Omicron lineages for sequences submitted to GISAID presented by week of specimen collection (Figure 1 and 2)

				Overall (%)	Last 4 weeks by collection date (%)			
Lineage	Countries	Sequences[a]	SGTF[b]	Total	2022-04	2022-05	2022-06	2022-07
BA.1	151	831 022	96.42	55.89	42.18	37.04	30.21	26.67
BA.1.1	139	539 618	95.66	36.29	45.25	43.93	37.41	36.49
BA.2	85	110 905	0.10	7.46	12.23	18.56	31.91	35.80
BA.3	19	422	99.05	0.03	0.04	0.02	0.02	0.05
Unassigned	56	4 834	17.81	0.33	0.31	0.45	0.46	0.99

[a]Data source: sequences and metadata from GISAID

[b]Percentage of sequences with Spike H 69-70 deletion associated with S gene target failure



Is an infection with Omicron protective against subsequent infections?

What are the advantages of getting vaccinated or receiving booster dose over infection-acquired immunity?

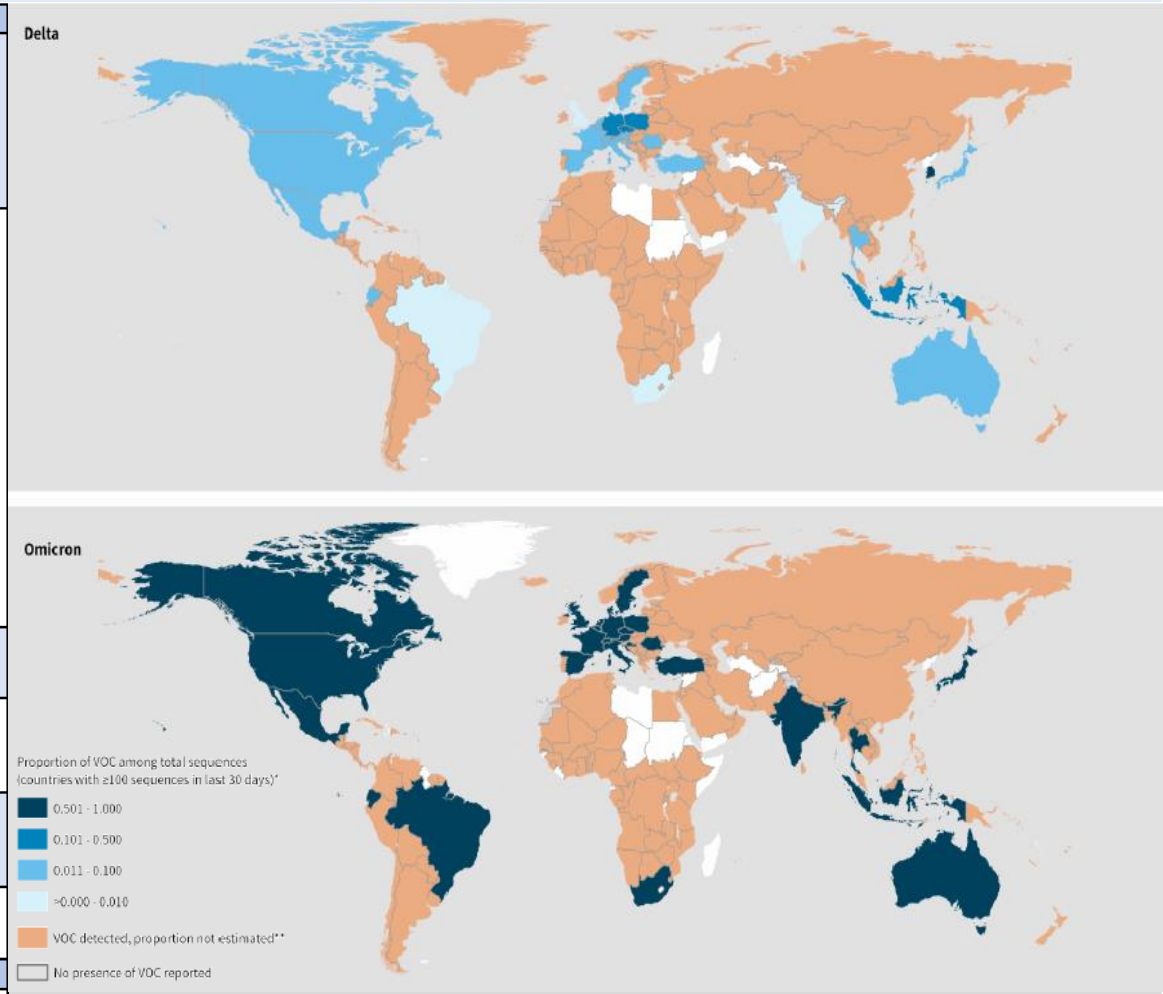
In a study[10] completed by the Oregon Health & Science University (OHSU), it was found that fully vaccinated individuals (i.e., those that completed a primary series) who experienced a breakthrough infection, or individuals who experienced infection of SARS-CoV-2, prior to becoming fully vaccinated, had equal levels of enhanced immunity. They defined "hybrid immunity" as individuals who were previously infected with COVID-19 and then received two doses of a COVID-19 vaccine following infection, and "breakthrough immunity" as individuals who received two doses of a COVID-19 vaccine, and then experienced a SARS-CoV-2 infection. The study also found that **the quality and level of the neutralizing antibodies were higher in individuals with hybrid and breakthrough immunity than individuals who received only two-doses of a COVID-19 vaccine or were infected without vaccination.** Additionally, those with hybrid or breakthrough immunity had better immune responses to neutralizing a wider range of variants of concern (VOCs), including Omicron, compared to those with just two doses of a vaccine. The researchers at OSHU concluded that **although fully vaccinated individuals who experienced a SARS-CoV-2 infection displayed high results in the potency and range of neutralizing antibodies, individuals who solely relied on infection-acquired immunity showed short-lived protection against COVID-19.** This finding should be caveated with results from a preliminary laboratory study suggesting that breakthrough Delta/Omicron infections are strongly linked to enhanced protection against severe disease, where more severe infections provided greater antibody-derived immunity. [11]

Another pre-print study[12] found that **unvaccinated individuals who were previously infected with prior variants (e.g., Alpha, Beta, or Delta) and were subsequently infected with the Omicron variant showed little neutralizing antibodies to the Omicron variant. Additionally, those who are fully vaccinated (without a booster dose) and subsequently infected with Omicron had high neutralizing antibodies; however, they were lower or more short-lived against Omicron compared to other VOCs.** Infection with Omicron following a second dose of vaccination may allow for an enhanced immune response for circulating VOCs, but this likely varies based on the individuals' pre-existing comorbidities, severity of disease, time since full vaccination, and the possibility of a more severe, immune-evading VOC emerging. However, a pre-print from South Africa[13] suggests that fully vaccinated individuals infected with Omicron experience higher levels of antibody neutralization against Omicron, and other VOCs such as Delta, Beta, and other variants such as C.1.2, and the wild-type variant. **Individuals who were infected with Omicron but were not vaccinated showed high levels of antibody neutralization to Omicron, but not to other VOCs.**

It has been well established that two doses of a COVID-19 vaccine can provide protection against severe disease, which appears to be upheld against the Omicron VOC. **While a breakthrough infection with Omicron can provide additional immunity against subsequent infections, it may be short-lived due to individual immune response. Importantly, unvaccinated individuals who recover from an Omicron infection may have limited protection against future infections,** while infection without vaccination runs the risk of severe disease and damage to the body's immune system, respiratory system, and other organ systems. In conclusion, although individuals who are fully vaccinated and have experienced an Omicron infection have a more enhanced immune response compared to those who are not vaccinated, or have not had an infection, booster doses are preferred over natural infection. Booster doses can elicit a strong immune response[14], and do not run the risk of severe disease or transmission compared to a natural infection.

Summary of current evidence on the Omicron variant of concern

Domain	Indicator	Main results
Epidemiology	Impact on disease incidence	- Omicron continues to spread globally and has been identified in most countries in all six WHO regions. - Globally, during the week of 14 through 20 February 2022, the number of new COVID-19 cases decreased by 21% as compared to the previous week. The number of new deaths also showed a decreasing trend (8%). At the regional level, the Western Pacific Region reported a 29% increase in the number of new weekly cases while all other regions reported decreases. - It is important to note that these trends may be due, in part, to an overall decrease in testing as some countries may have changed their testing and sequencing policies during the presented period.
	Impact on transmission	- An analysis based on the methods used by Campbell et al [1], and that focused on countries with sufficient sequence data uploaded to GISAID as of 18 February, found a growth rate advantage of Omicron over Delta in all countries. - This translated to a pooled mean transmission advantage (i.e., relative difference in effective reproduction numbers) of 77% (95% CI: 66% – 95%) across epidemiological contexts, under the assumption of an unchanged generation time (i.e. the duration between the moment a person gets infected to the moment they infect another person). The generation time of Omicron has been found to be shorter as compared to Delta, which suggests the transmission advantage may be lower than estimated above; for a 20% shorter generation time, the estimated pooled mean transmission advantage of Omicron over Delta is 66% (95% CI: 60% – 82%). - The same analysis demonstrates a growth rate advantage of the Omicron Pango lineage BA.2 over the Pango lineage BA.1, with a pooled mean transmission advantage of 63% (95% CI: 47% – 77%), under the assumption of an unchanged generation time. - Higher secondary attack rates were reported for Omicron compared to Delta: 13.6% (95% CI: 13.1%-14.1%) vs 10.1% (95% CI: 10.0%-10.2%) in the United Kingdom,[2] and 31% vs. 21% in Denmark.[3] - Researchers in China, Hong Kong SAR[4] found that Omicron had a higher tropism for the bronchi tissue compared to lungs. In the United Kingdom,[5] Omicron was found to infect the upper respiratory tract more rapidly than Delta, yielding about 100-fold higher titres. - Two studies conducted in South Africa [6,7] reported evasion from vaccine-induced and infection-induced immunity by Omicron. This could also be a contributing factor to the higher growth rates of Omicron compared to Delta.
Immune response	Impact on disease severity	Following analyses of patterns in recent medical consultations and hospitalizations, Omicron was consistently found to be associated with less severe disease compared to Delta across studies conducted in the United Kingdom,[8] the United States of America,[9,10] Canada[11] and South Africa.[12]
	Impact on reinfection	Preliminary data on Omicron in individuals previously infected with SARS-CoV-2 since the start of the pandemic showed an increase in the number of reinfections in Denmark[13] and Israel.[14] A higher risk (RR = 3.3; 95%CI: 2.8 – 3.8) of reinfection with Omicron compared to other SARS-CoV-2 variants was reported across the United Kingdom, with an even higher risk (RR = 5.4; 95%CI: 4.9 – 6.0) when reported only from England. [15]
	Impact on vaccination	Results of vaccine effectiveness (VE) studies are difficult to interpret, and estimates vary with the type of vaccine administered and the number of doses and scheduling (sequential administration of different vaccines). Studies conducted in the United Kingdom and the United States of America reported 60% – 75% vaccine effectiveness against symptomatic infection with Omicron.[16] See more details in the section below.
	Impact on antibody responses and cellular immunity	An analysis of neutralization data from 23 laboratories found a 20-fold reduction in neutralization associated with the Omicron variant in unvaccinated, previously infected individuals or individuals who had received two vaccine doses, while sera from vaccinated individuals with previous infection or individuals who had received three vaccine doses showed a seven-fold reduction.[17] This reduced
Domain	**Indicator**	**Main results**
		humoral response could be associated with an increased risk of reinfection. Conversely, studies on cellular immunity showed well preserved responses (70% – 80% of CD4+ and CD8+ responses) that could be associated with a decreased risk of severe disease.[18–22]
Diagnostic tools	Impact on PCR assays	Apart from the BA.2 lineage, all Omicron descendent variants have the 69-70 deletion responsible for S-gene target failure. Evaluation of PCR tests for SARS-CoV-2 that include multiple gene targets revealed limited impact of the Omicron variant on the diagnostic test accuracy of these assays.[23,24]
	Impact on Rapid Diagnostic tests	Preliminary data showed contradictory results, with some indicating that Ag-RDTs have similar sensitivity to Omicron as to the wild-type virus or other VOCs, while other studies found a difference. This variability in test performance was also found in more recent studies.[25,26]
Impact on treatment	Impact on antivirals	Preliminary data from several research projects showed no difference in the effectiveness of antiviral agents against Omicron.[27–29]
	Impact on biologicals	Studies on the effectiveness of monoclonal antibodies for treating patients with Omicron reported conserved neutralizing activity for three broadly neutralizing monoclonal antibodies (sotrovimab, S2X259 and S2H97) and a reduction in effectiveness of other monoclonal antibodies (**Planas 2021, VanBlargan 2021, Cameroni 2021, Wilhelm 2021, Roche 2021**).[30–34]
	Other treatment options	It is anticipated that other therapeutics for the clinical management of severe and critical COVID-19 patients (e.g. Interleukin-6 receptor blockers and corticosteroids, will maintain their effectiveness.



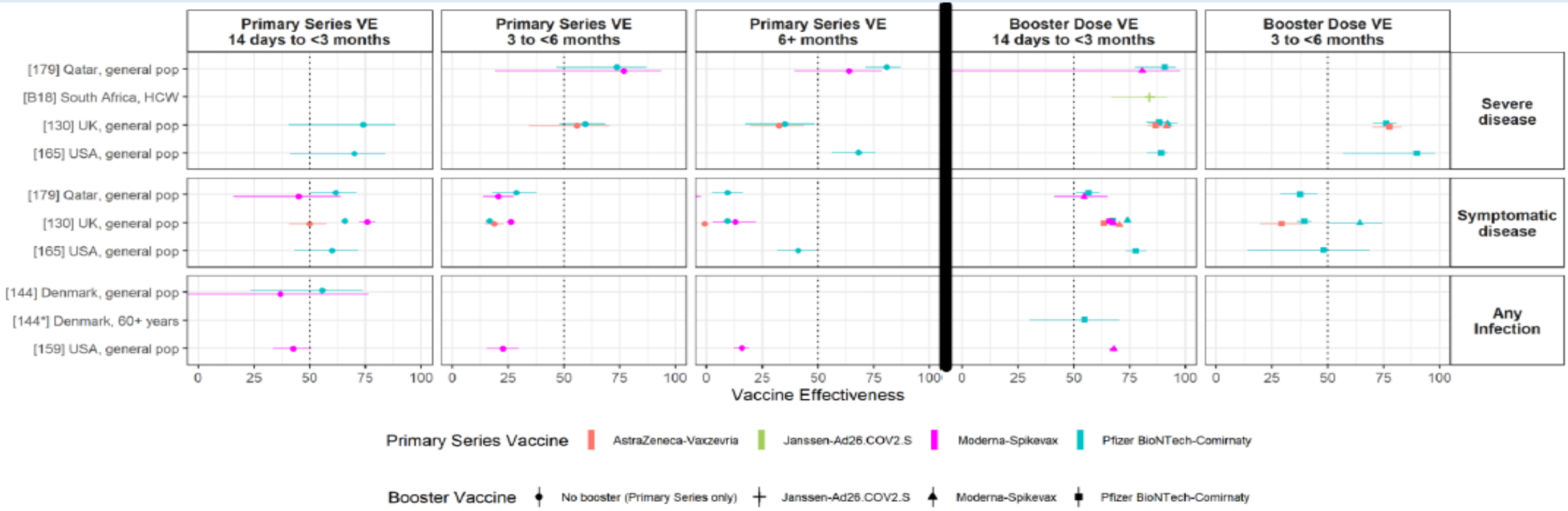
Prevalence of variants of concern (VOCs) Delta and Omicron in the last 30 days, data as of 22 February 2022

World Health Organization

https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---22-february-2022

SARS-CoV-2 Variant of Concern:

Vaccine effectiveness of primary series and booster vaccination against the Omicron variant of concern



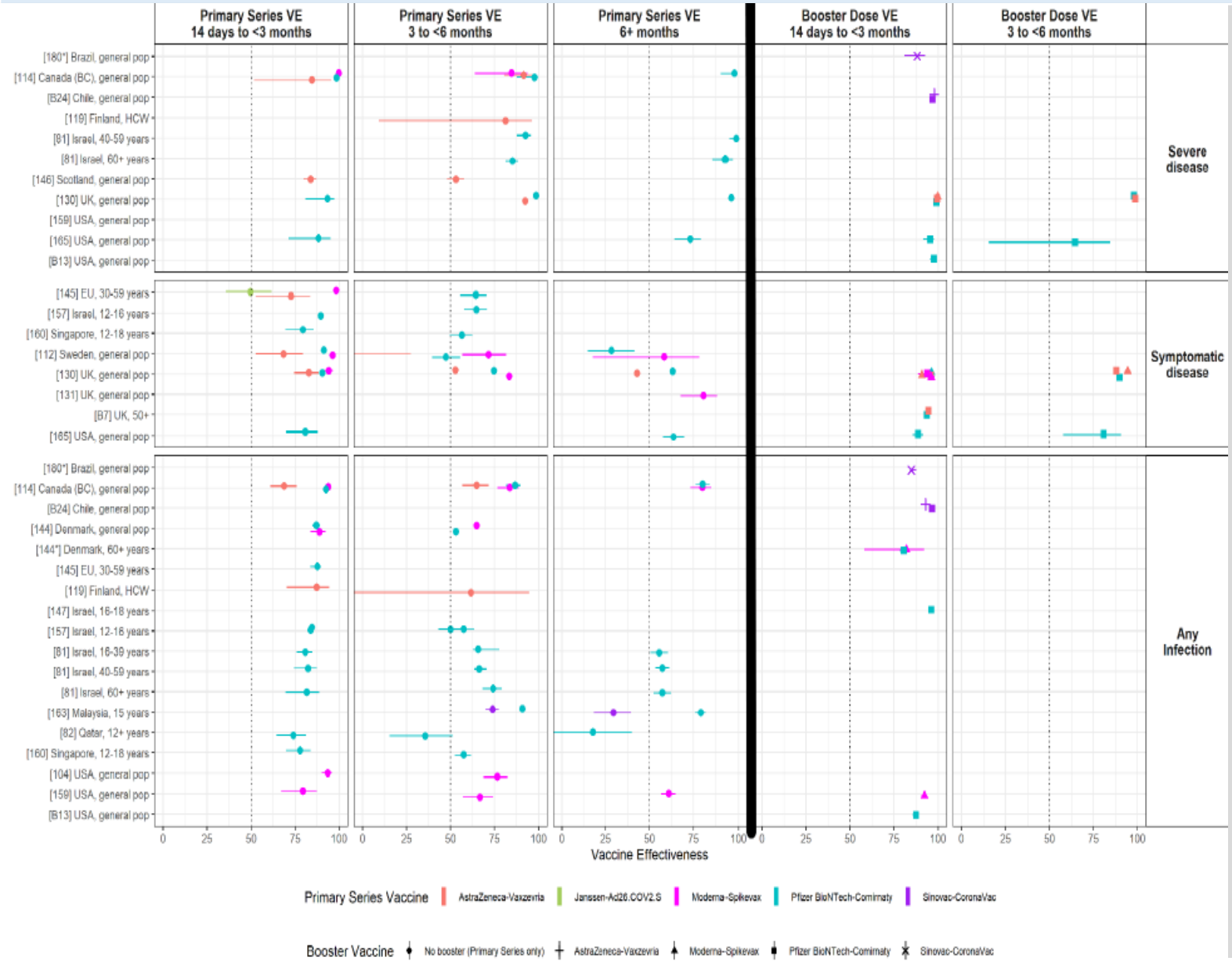
The Figures summarize the impact of Delta and Omicron variants, respectively, on product-specific vaccine effectiveness (VE) over time for both primary series vaccines and booster vaccines. Since the last update, one new study (pre-print) from Qatar has evaluated primary series and booster dose VE of Pfizer BioNTech-Comirnaty and Moderna-Spikevax vaccines against symptomatic and severe disease due to Omicron; and one new peer-reviewed study from Brazil has assessed VE of three doses of Sinovac-CoronaVac against infection and severe disease in the context of Delta. The methods for including estimates in the plot are described below.

Interpretation of the results of VE for the Delta variant

Six studies of VE for the Omicron variant show lower protection of the primary series COVID-19 vaccines for all outcomes (*severe disease*, *symptomatic disease*, and *infection*) than has been observed previously for other VOCs. Importantly, VE estimates against the Omicron variant remains highest for *severe disease*, while they are lower for s*ymptomatic disease and infection.* Booster vaccination substantially improves VE for all outcomes for all products for which there are data. More data are needed to characterize the duration of the VE following a booster dose. VE estimates for the Pfizer BioNTech-Comirnaty vaccine against *severe disease* due to the Omicron variant within the first three months following the primary series (without a booster dose) range from 70 to 74% and decrease over time since vaccination, with VE estimates of 60-74% between three and six months, and 35-80% at six months or more. In three to six months versus six months or longer, VE estimates for the AstraZeneca-Vaxzevria vaccine against *severe disease* reduced from 56% to 33%, with relatively wide confidence intervals (see Figure above for details). Early VE estimates (measured from 14 days up to three months after vaccination) of the primary series against *symptomatic disease* are generally lower than those for *severe disease*, though they remain at or above 50% for AstraZeneca-Vaxzevria, Moderna-Spikevax, and Pfizer BioNTech-Comirnaty vaccines, except for one study that reported VE of 45% (95% CI: 16-64%) for Moderna-Spikevax. VE against *infection* at 14 days up to three months after the primary series was lower, ranging from 37 to 55%. All available estimates against both *symptomatic disease* and *infection* measured three or more months after completion of the primary series indicate VE estimates of less than 50% for the three vaccines. A booster dose increases VE estimates against *severe disease* to above 75% for all vaccines for which data are available, with this effect maintained up to six months after the booster dose. A booster dose increased VE estimates against *symptomatic disease* in the first three months following vaccination substantially, by at least 37 percentage points across all studied vaccines, with VE ranging from 55% to 78%. However, VE decreased to 29-64% at three to six months. Limited evidence is available for VE against *infection* due to the Omicron variant following a booster dose, with only one study showing a VE of 68% within the first three months of a booster dose of Moderna-Spikevax.

SARS-CoV-2 Variant of Concern:

Vaccine effectiveness of primary series and booster vaccination against the Delta variant of concern



Interpretation of the results of VE for the Delta variant

Most of the evidence to date indicates that effectiveness of the mRNA vaccines (Pfizer BioNTech-Comirnaty and Moderna-Spikevax) remains high against *severe disease* associated with Delta variant infection at six or more months after the primary series, with three of four studies reporting VE estimates of >90% and one study reporting a VE of 74% at six months or more. Three studies report high VE (>80%) of the AstraZeneca-Vaxzevria vaccine three to six months following the primary series, while one study reports a lower VE (54%), compared to the first three months (84%).

VE estimates against *symptomatic disease* and *infection* range from 73 to 96% following the primary series of one of the two mRNA vaccine from 14 days up to three months after vaccination and 68-88% following the primary series of the AstraZeneca-Vaxzevria vaccine during the same time period. There is, however, consistent evidence of decreasing VE against *symptomatic disease* and *infection* over time following the primary series for all of the vaccines for which data are available. Despite this, most of the evidence still shows VE estimates of >50% (59-80%) at six months or more following mRNA vaccine, with four estimates falling below 50%. Three of the four studies evaluating the AstraZeneca-Vaxzevria vaccine also showed a VE >50% (54-65%) at three to six months, though in one of these studies the VE decreased to 43% at six or more months following the primary series. A single study of Sinovac-CoronaVac (an inactivated vaccine) conducted in Malaysia reported a VE against *infection* of 74% three to six months following the primary series, which decreased to 30% beyond six months.

Receipt of a booster dose of mRNA, vector-based and inactivated vaccines for which there are data available resulted in a VE of ≥79% for *all outcomes* within the first three months. At three to six months following the booster dose, the VE of a Pfizer BioNTech-Comirnaty booster following Pfizer BioNTech-Comirnaty or AstraZeneca-Vaxzevria primary series remained >95% against *severe disease* in a single study conducted in the United Kingdom, but decreased from 95% to 65% with Pfizer BioNTech-Comirnaty primary series and booster in a single study conducted in the United States of America. In the same two studies, the VE against *symptomatic disease* at three months or more following a booster dose with an mRNA vaccine was >75% after a primary series of either the AstraZeneca-Vaxzevria or the Pfizer BioNTech-Comirnaty vaccines.

Source: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---22-february-2022

In cooperation with Bundeswehr HQ of Military Medicine

Subject in Focus:

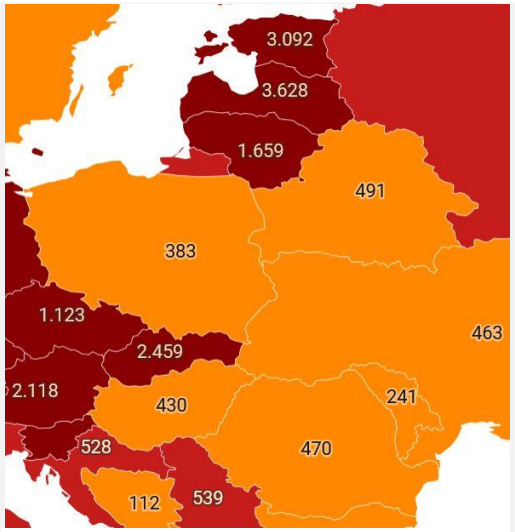
Corona SitRep EUROPE

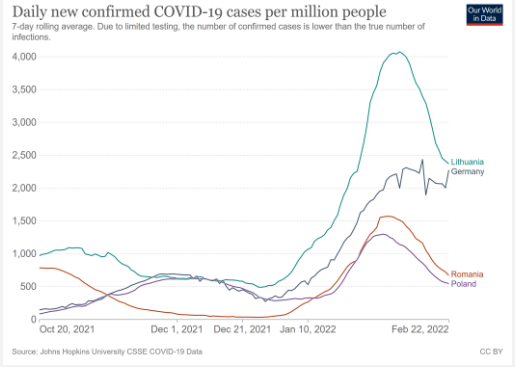
Lithuania — Poland — Romania

THE CORONA SITUATION ON NATO'S EASTERN FLANK In light of the already executed or forthcoming NATO deployments to the eastern flank of the military union (so-called multinational NATO battle groups), it is worthwhile to take a closer look at the corona situation in existing or planned host nations in eastern Europe. These are, in particular, LTU and POL, where NATO battle groups have been stationed for a couple of years already as well as more recently, ROU.

High incidence rates in the Baltics due to Omicron

Since the beginning of January 2022 LTU has, like EST and LVA, been gripped by a violent corona wave that was due to the Omicron variant. The resulting, high incidence rates (LTU currently has a 7-day incidence of 1,659, see map on the right and table) constitute a significant burden on these three small nations. Nonetheless, due to a strong decrease in the incidence rate since about mid-February (see diagram on the right) as well as a reproduction rate below 1 (see table), the LTU government has recently decided to loosen or even entirely lift the countermeasures imposed to battle the pandemic. However, due to the still very high incidence rates, the German Auswärtiges Amt (Ministry of Foreign Affairs) has been listing LTU as a so-called „high risk area" since the 3rd of October 2021, thus still advising against any non-essential, touristic travel to the Baltic nation. Meanwhile, health experts from LTU believe that the current reduction in the amount of daily new cases is not a consequence of a successful vaccination campaign (LTU currently has a vaccination rate of 69%, see table) nor of other countermeasures, but primarily a consequence of the fact that during the last wave (caused by the Delta variant) and the current wave (Omicron), a large part of the LTU populace must have come into contact with the virus, thus leading to a natural subsiding of the rate of infections country-wide. However, such an approach obviously does come at a price, as the example from SWE has shown.





	LTU	POL	ROU	DEU
Inhabitants	2.8 M	37.9 M	19.3 M	83.2 M
Infections/d	6 K	19 K	16 K	209 K
Total number of infections	872 K	5.6 M	2.7 M	13.9 M
7-day incidence	1,659	383	470	1,279
Deaths/d	26	324	215	299
Total deaths	8 K	110 K	63 K	122 K
Reproduction rate	0.8	0.7	0.7	1.1
Vaccination rate	69%	59%	42%	75%
Fatality rate	1%	2%	2.3%	0.9%

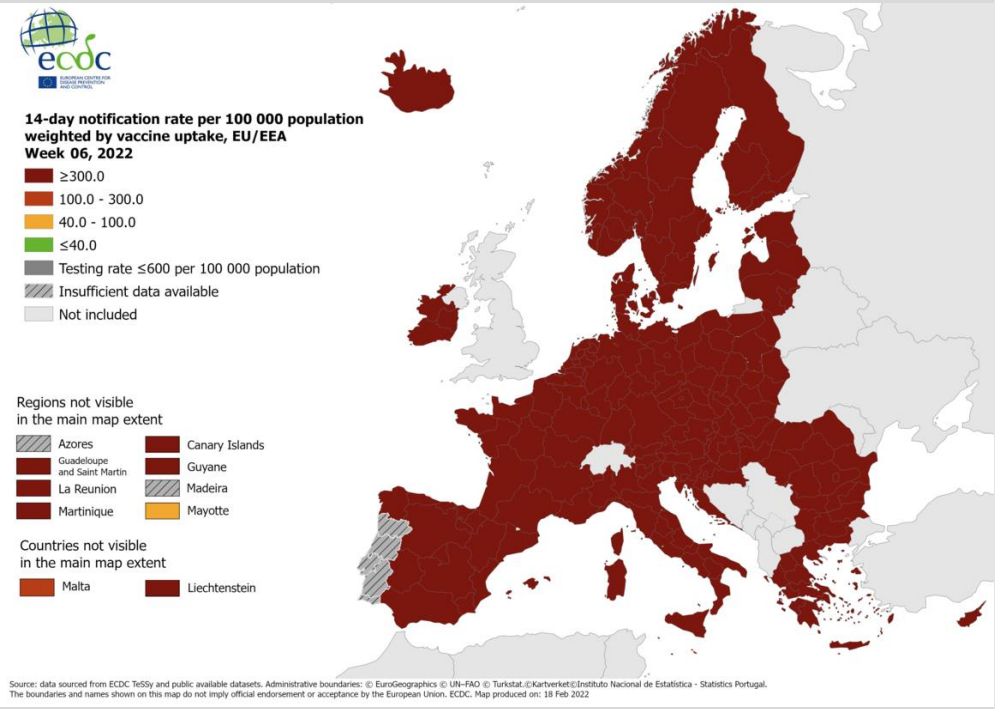
https://www.corona-in-zahlen.de/weltweit/
https://covid19.who.int/
https://www.auswaertiges-amt.de/de/ReiseUndSicherheit/

Omicron strikes Poland, too

In analogy to the wave of infections caused by the Omicron variant in other European countries, POL has also been gripped by this wave since January (see diagram above). However, the number of infections has reached a peak and is currently sinking—the POL health minister was recently quoted with "the beginning of the end"—and the POL government has consequently announced on the 23rd of February 2022 to lift the majority of restrictions country-wide by the 1st of March 2022. Exempted from this decree will presumably be the requirement to wear a mask in certain situations („confined spaces") as well as quarantine and isolation measures following a confirmed infection. However, in light of the still relatively high number of infections, the German Ministry of Foreign Affairs has labeled POL as a „high risk area" as well. What aggravates the current situation is a relatively low vaccination rate among the POL populace: less than two thirds are fully vaccinated. This circumstance, apart from a partially overwhelmed health system, is presumably one important reason for the relatively high fatality rate (see table). The statements recently made by the POL government indicate the willingness to accept this „collateral damage".

Romania is suffering from another deadly wave

During last year's autumn, ROU (and BGR) were gripped by a particularly violent corona wave caused by the Delta variant. Due to a high pressure on its already feable health system and a particularly low vaccination rate (see table), ROU experienced one of the highest fatality rates in Europe. During the present corona wave—caused by the Omicron variant—ROU is equally affected and even higher infection rates are being reported. However, the rate of infections is currently dropping and the ROU government is therefore planning to loosen or even lift most of the countermeasures presumably by the end of March. But, as are LTU and POL, ROU is still among the list of „high risk areas" published by the German Ministry of Foreign Affairs. Non-essential, touristic travel to ROU is therefore currently advised against.



https://www.ecdc.europa.eu/en/covid-19/situation-updates/weekly-maps-coordinated-restriction-free-movement
https://koronastop.lrv.lt/en/
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https://www.politico.eu/article/poland-medical-panel-quits-protest-government-inaction-coronavirus/
https://stirioficiale.ro/informatii
https://www.reuters.com/world/europe/romania-daily-covid-19-cases-new-record-high-2022-02-01/

Other Infectious Disease Outbreaks

bluedot

Wild Poliovirus Type-1

Malawi; Lilongwe city – On February 17, 2022 health authorities in Malawi declared an outbreak of wild poliovirus type-1 (WPV-1) after laboratory confirmation of a case in a young child in the capital Lilongwe. This is the first case of WPV-1 in Africa in more than five years. The last case of wild poliovirus in Africa was identified in northern Nigeria in 2016. Genome sequencing has indicated that the confirmed WPV-1 strain detected in Malawi is linked to the one that has been circulating in Sindh Province, Pakistan. Although there are limited details, the WHO has indicated that as an imported case from Pakistan, this detection does not currently affect the WHO African Region's wild poliovirus-free certification status officially marked in August 2020. However, this event underscores once more that there might be a larger outbreak ongoing in Pakistan due to the appearance of an imported case. Although there was only one confirmed case of WPV-1 in Pakistan in 2021, there were 231 confirmed in 2020. An investigation is underway to conduct further surveillance in Malawi and neighbouring countries, including environmental samples and highlights the possibility of risk in the region. A vaccination campaign in Malawi has also begun. Wild poliovirus remains only endemic in Afghanistan and Pakistan, and globally there were only five cases in 2021. WHO is supporting the Malawi health authorities to carry out a risk assessment and outbreak response, including supplemental immunization. Surveillance of the disease is also being ramped up in neighbouring countries. This event is noteworthy as the re-emergence of wild poliovirus has been highlighted as a potential threat amid all mass vaccination disruptions since the beginning of the COVID-19 pandemic. Further, the detection of a wild polio case re-emphasizes that as long as wild polio remains endemic anywhere in the world, many countries remain at risk of importation and spread of the virus. On November 23, 2021, the Emergency Committee under the International Health Regulations (2005) (IHR) agreed that the risk of international spread of poliovirus remains a Public Health Emergency of International Concern (PHEIC) and that there are significant risks despite apparent progress made in the two remaining countries with endemic wild poliovirus. It is critical that all countries strengthen surveillance for acute flaccid paralysis cases to rapidly detect any new virus importation and facilitate a rapid response, in particular those with relatively low vaccination coverage and high connectivity to polio-affected regions.
BlueDot's Initial Assessment: This event represents a major threat to Malawi and surrounding countries. Previously controlled diseases can re-emerge due to importation events from endemic regions and reduction in the gains on vaccine-preventable diseases as a result of the COVID-19 pandemic.

Source: WHO - https://www.afro.who.int/news/malawi-declares-polio-outbreak

Unknown illness

Angola - Previously, 20 deaths in children due to an unknown illness were reported in Cabinda, Angola. In a follow-up, news reports note the deaths among children aged zero to five are possibly due to malaria and anemia. Health officials are still investigating the situation; however, they have reported that 78 children in the region were diagnosed with malaria using rapid malaria tests. According to the WHO Malaria Report (2020), malaria is endemic in the region and is a leading cause of death among children under five. However, due to the under-surveillance of malaria, there is likely an underestimation of the country's true number of malaria cases.

Source: NewsMedia - https://www.macaubusiness.com/angola-unknown-disease-kills-20-children-in-one-village-in-under-a-month/
WHO - https://reliefweb.int/report/world/world-malaria-report-2020

Varicella (source: - http://www.focus-news.net/news/)

Bulgaria; Varna - Cases of varicella (chickenpox) have been reported in Bulgaria in 2022. The cases have been reported in Varna in the eastern region of the country for the period of February 11-17. Further details regarding the cases were not reported. In Bulgaria, varicella vaccination is neither mandatory nor publicly funded and coverage is low. A lack of availability of the varicella vaccine may also contribute to the number of reported cases in the country. This event is noteworthy because disruptions in immunization campaigns during the COVID-19 pandemic can cause a resurgence of vaccine-preventable diseases.

Typhoid

USA - An imported case of typhoid has been reported in the United States in 2022. The affected individual is a 39-year-old man with a recent history of travel to an unspecified location in Mexico. Typhoid fever is endemic in Southeast Asia and the Indian subcontinent but is also present in areas of Africa, Central and South America, and Western Pacific countries with poor water and sewage sanitation. In the United States each year, about 350 people are diagnosed with typhoid fever, however, the US CDC indicates that this is just an estimate as these cases do not include people who do not seek medical care, who are not tested for the disease, or whose disease is not reported. CDC estimates that typhoid fever affects at least 5,700 people in the country every year. Most people diagnosed in the United States have travelled to places where the diseases are most common. This event is noteworthy as it highlights the importance for physicians to consider typhoid in differential diagnosis when treating patients with travel history and nonspecific symptoms. This is of concern with increasing significance of drug resistant strains.

Source: NewsMedia - https://polioeradication.org/polio-today/polio-now/this-week/?bdId=2022-02-09

Measels

Pakistan – Suspected cases and measles-related deaths have been reported in Dadu district, within Sindh province, southeastern Pakistan. According to media reports, health authorities have deployed a clinical team into the affected area to confirm that measles is the cause among all the deceased. In addition, reports indicate that there has been an ongoing measles outbreak since December 2021 and that although a routine mass immunization campaign was delivered, entire villages had refused to have their children vaccinated. This event is noteworthy and raises once more how the COVID-19 pandemic has slowed immunization gains on vaccine-preventable diseases such as measles, which can be deadly among malnourished populations or for those with limited access to care. Throughout 2021, Pakistan had already reported at least four times more cases of measles compared to the previous year (2020). In addition, while 127 deaths were confirmed, estimates suggest that as many as 800 children or more may have died in the country due to measles in 2021. Health and government officials are urging parents to ensure children are vaccinated against measles and rubella.

USA - Health officials confirmed a case of measles in an infant in Snohomish County, Washington state. The affected infant is suspected of contracting the disease while recently travelling with family in South Asia and was diagnosed on February 21. Health officials also stated that based on the potential dates of exposure, symptoms might develop as late as March 12. Authorities have informed the public of potential exposure locations with the confirmed case and are implementing appropriate control measures.

Source: NewsMedia - https://tribune.com.pk/story/2344699/25-children-die-of-measles-within-a-week-in-sindh
https://www.kiro7.com/news/local/officials-confirm-measles-case-snohomish-county-infant/WERQR3US5VDCJDJH6BWUQI4JS4/

Influenza (Source: https://flunewseurope.org/)

Europe - Week 6/2022 (07 February – 13 February 2022)

- Albania, Estonia, Norway, Republic of Moldova and Slovakia reported widespread geographic influenza activity and/or at least medium influenza intensity.
- 6% of all sentinel primary care specimens from patients presenting with ILI or ARI symptoms tested positive for an influenza virus.
- Six countries reported seasonal influenza activity at or above 10% positivity in sentinel primary care: Serbia (70%), Hungary (34%), France (28%), Luxembourg (11%), Republic of Moldova (11%) and Sweden (10%).
- Both influenza type A and type B viruses were detected, with A(H3) viruses being dominant across all monitoring systems.
- Hospitalized cases with confirmed influenza virus infection were reported from intensive care units (4 type A viruses and 1 type B virus), other wards (10 type A viruses) and SARI surveillance (6 type A viruses).

Source: https://covid19.trackvaccines.org/ as of 20.01.2022

Summary of information on the individual national Corona restrictions

The icons are linked to the respective information. Please click on the icons for information.

NATO Member State (click on country for official COVID-19 information)	Approved vaccines										
	Comirnaty	Spikevax	Janssen	Vaxzevria	Nuvaxovid	Sputnik V	CoronaVac	Covishield	Convidecia	Covilo	Turkovac
Albania	x			x		x	x				
Belgium	x	x	x	x	x						
Bulgaria	x	x	x	x	x						
Canada	x	x	x	x				x			
Croatia	x	x	x	x	x						
Czech Republic	x	x	x	x	x						
Denmark	x	x	x		x						
Estonia	x	x	x	x	x						
France	x	x	x	x	x						
Germany	x	x	x	x	x						
Great Britain	x	x	x	x							
Greece	x	x	x	x	x						
Hungary	x	x	x	x	x	x		x	x	x	
Italy	x	x	x	x	x						
Iceland	x	x	x	x	x						

EMA Authorized

EMA & FDA Authorized

Source: https://covid19.trackvaccines.org/ as of 20.01.2022

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	Comirnaty	Spikevax	Janssen	Vaxzevria	Nuvaxovid	Sputnik V	CoronaVac	Covishield	Convidecia	Covilo	Turkovac
Latvia	x	x	x	x	x						
Lithuania	x	x	x	x	x						
Luxembourg	x	x	x	x	x						
Montenegro				x		x				x	
Netherland	x	x	x	x	x						
North Macedonia	x			x		x				x	
Norway	x	x	x		x						
Poland	x	x	x	x	x						
Portugal	x	x	x	x	x						
Romania	x	x	x	x	x						
Slovakia	x	x	x	x	x						
Slovenia	x	x	x	x	x						
Spain	x	x	x	x	x						
Turkey	x					x	x				x
USA	x	x	x								

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Travel Recommendations and other Useful Links

Travel Recommendations

Many countries have halted some or all international travel since the onset of the COVID-19 pandemic but now have re-open travel some already closed public-travel again. This document outlines key considerations for national health authorities when considering or implementing the gradual return to international travel operations.
The decision-making process should be multisectoral and ensure coordination of the measures implemented by national and international transport authorities and other relevant sectors and be aligned with the overall national strategies for adjusting public health and social measures.
Travel has been shown to facilitate the spread of COVID-19 from affected to unaffected areas. Travel and trade restrictions during a public health event of international concern (PHEIC) are regulated under the International Health Regulations (IHR), part III.
The majority of measures taken by WHO Member States relate to the denial of entry of passengers from countries experiencing outbreaks, followed by flight suspensions, visa restrictions, border closures, and quarantine measures. Currently there are exceptions foreseen for travellers with an essential function or need.

Information on COVID-19 testing and quarantine of air travellers in the EU and the US you can find following the link:

- **https://www.ecdc.europa.eu/en/publications-data/guidelines-covid-19-testing-and-quarantine-airtravellers**
- **https://www.cdc.gov/coronavirus/2019-ncov/travelers/how-level-is-determined.html**

More information about traveling worldwide:

- National regulation regarding travel restrictions, flight operation and screening for single countries you will find **here** (US) and **here** (EU).
- Official IATA travel restrictions. You will find **here**.

More information about traveling in the EU

- by the ***European Commission*** you will find here:
https://www.consilium.europa.eu/en/policies/coronavirus/covid-19-travel-and-transport/

- The ***ECDC*** publishes a map of EU Member States, broken down by regions, which show the risk levels across the regions in Europe using a traffic light system. Find it **here**.

As a general rule, information on new measures will be published 24 hours before they come into effect.

All information should also be made available on **Re-open EU**, which should contain a cross-reference to the map published regularly by the European Centre for Disease Prevention and Control.

Useful links

ECDC:

- All info about the COVID-19 pandemic; (situation updates, latest news and reports, risk assessments etc.)
- COVID-19 Vaccine tracker
- SARS-CoV-2 variants dashboard for EU
- Latest Risk assessment on COVID-19 , 15 Feb 2021
- All “guidance's and technical reports” can be found under “All COVID-19 outputs” on this page here

WHO:

- Epi-WIN webinars and updates
- Status of “COVID-19 Vaccines within WHO EUL/PQ evaluation process” and the “Draft landscape and tracker of COVID-19 candidate vaccines”
- Weekly Epidemiological and operational updates
- COVID-19 new variants: Knowledge gaps and research
- COVID-19 Dashboard
- Vaccines explained
- Tracking SARS-CoV-2 variants
- Science in 5: WHO’s series on science and COVID-19
- Quick links

CDC:

- COVID Data Tracker and weekly review
- What´s new and Updated
- Guidance for COVID-19

References:

- European Centre for Disease Prevention and Control www.ecdc.europe.eu
- World Health Organization WHO; www.who.int
- Centres for Disease Control and Prevention CDC; www.cdc.gov
- European Commission; https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/travel-and-transportation-during-coronavirus-pandemic_en
- Our World in Data; https://ourworldindata.org/coronavirus
- Morgenpost; https://interaktiv.morgenpost.de/corona-virus-karte-infektionen-deutschland-weltweit/
- BlueDot; https://bluedot.global/