COVID-19 Weekly Epidemiological Update

Edition 94, published 1 June 2022

In this edition:

Global overview

Data as of 29 May 2022

Globally, the number of new weekly cases has continued to decline since a peak in January 2022. During the week of 23 until 29 May 2022, over 3.3 million cases were reported, an 11% decrease as compared to the previous week (figure 1). The number of new weekly deaths also continues to decline, with over 9 600 fatalities reported, representing a 3% decrease as compared to the previous week.

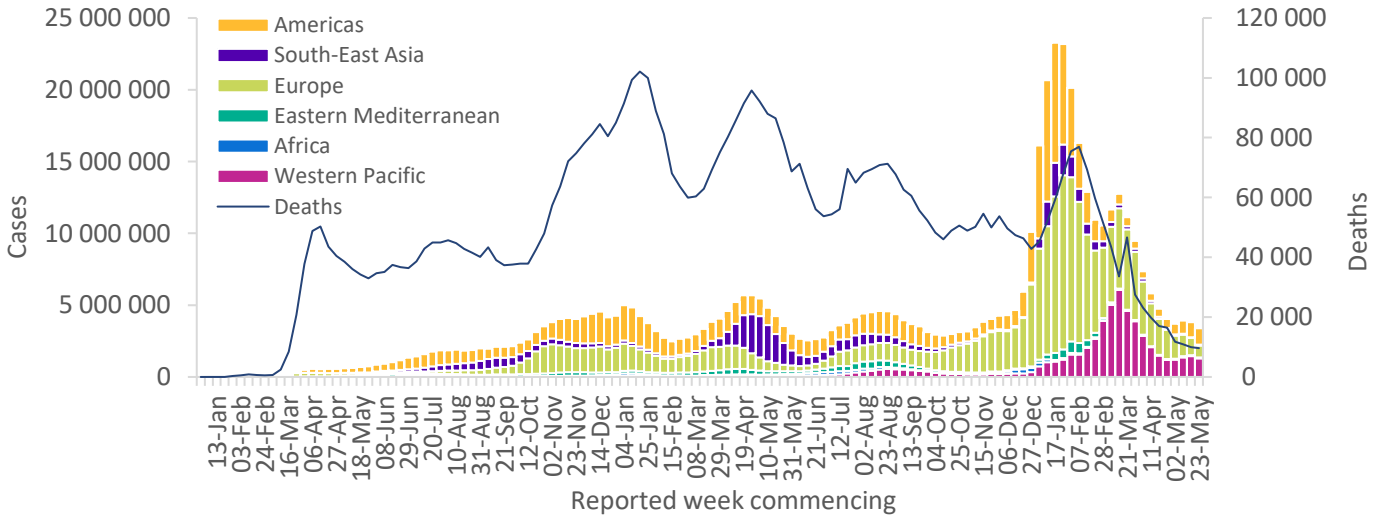
At the regional level, the number of new weekly cases increased in the American Region (+9%) and in the Eastern Mediterranean Region (+1%), while it decreased in the remaining four WHO regions.

The number of new weekly deaths increased in the Western Pacific Region (+18%), in the African Region (+15%), and in the Region of the Americas (+13%), while decreasing trends were observed in the remaining three regions.

As of 29 May 2022, over 526 million confirmed cases and over six million deaths have been reported globally.

These trends should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 29 May 2022**



**See *Annex 1: Data, table, and figure notes*

At the country level, the highest number of new weekly cases were reported from the United States of America (736 298 new cases; +3%), China (576 367 new cases; +6%), Australia (294 128 new cases; -18%), Japan (203 365 new cases; -18%), and Germany (183 844 new cases; -38%).

The highest number of new weekly deaths were reported from the United States of America (2 461 new deaths; +25%), Brazil (826 new deaths; +16%), Italy (624 new deaths; -15%), the Russian Federation (605 new deaths; -11%), and China (578 new deaths; +82%).

Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 29 May 2022**

WHO Region	New cases in last 7 days (%)	Change in new cases in last 7 days *	Cumulative cases (%)	New deaths in last 7 days (%)	Change in new deaths in last 7 days *	Cumulative deaths (%)
Western Pacific	1 299 894 (38%)	-10%	59 958 154 (11%)	1 506 (16%)	18%	230 479 (4%)
Americas	1 139 104 (34%)	9%	157 027 750 (30%)	4 229 (44%)	13%	2 742 377 (44%)
Europe	842 866 (25%)	-30%	220 678 128 (42%)	3 117 (32%)	-22%	2 012 067 (32%)
South-East Asia	50 204 (1%)	-8%	58 122 050 (11%)	457 (5%)	-15%	788 614 (13%)
Africa	34 126 (1%)	-36%	8 988 466 (2%)	242 (3%)	15%	171 434 (3%)
Eastern Mediterranean	17 580 (1%)	1%	21 769 191 (4%)	96 (1%)	-45%	342 813 (5%)
Global	**3 383 774 (100%)**	**-11%**	**526 544 503 (100%)**	**9 647 (100%)**	**-3%**	**6 287 797 (100%)**

**Percent change in the number of newly confirmed cases/deaths in the past seven days, compared to seven days prior*
**See *Annex 1: Data, table, and figure notes*

For the latest data and other updates on COVID-19, please see:

- WHO COVID-19 Dashboard
- WHO COVID-19 Weekly Operational Update and previous editions of the Weekly Epidemiological Update

Figure 2. COVID-19 cases per 100 000 population reported by countries, territories and areas, 23 – 29 May 2022*

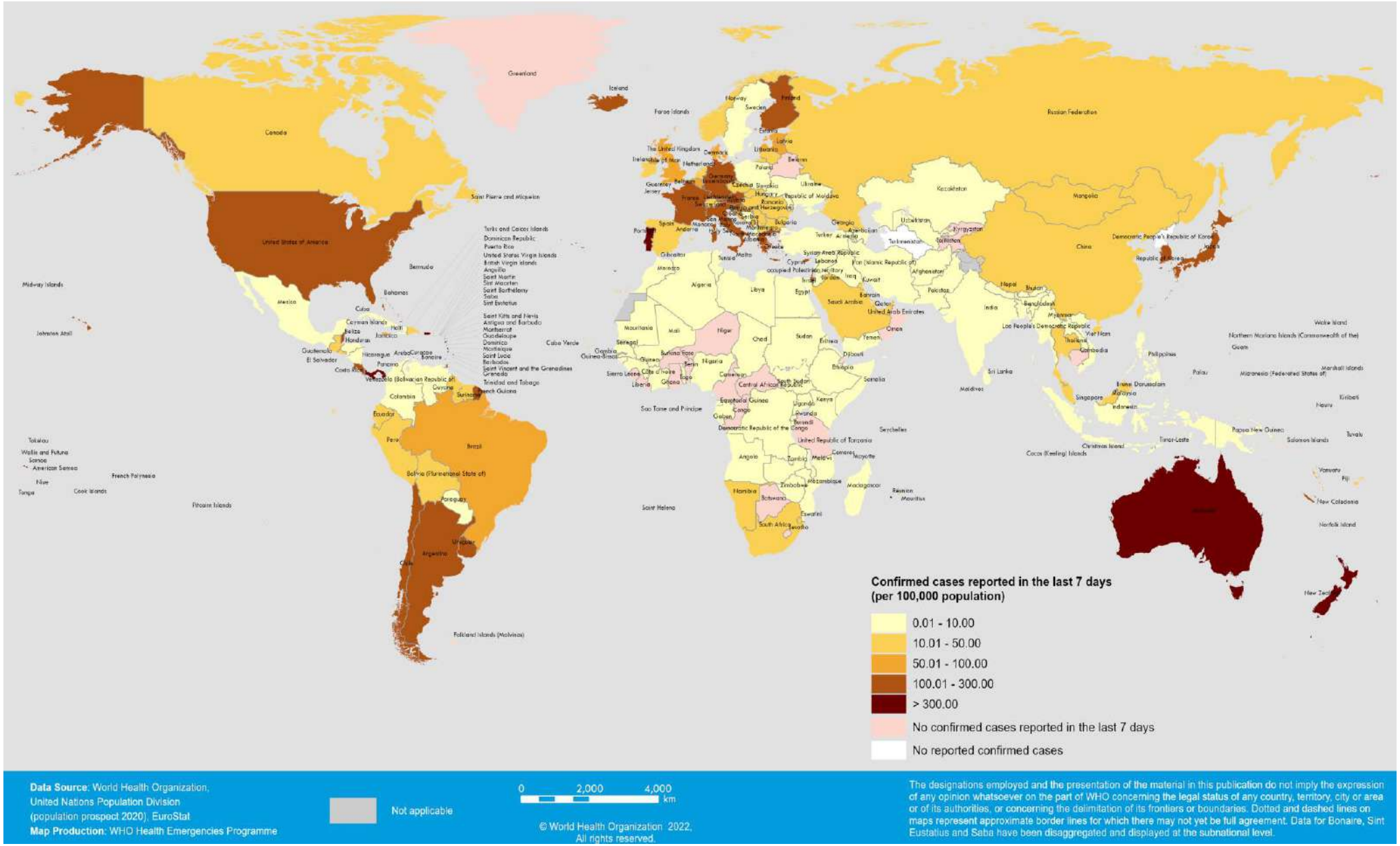


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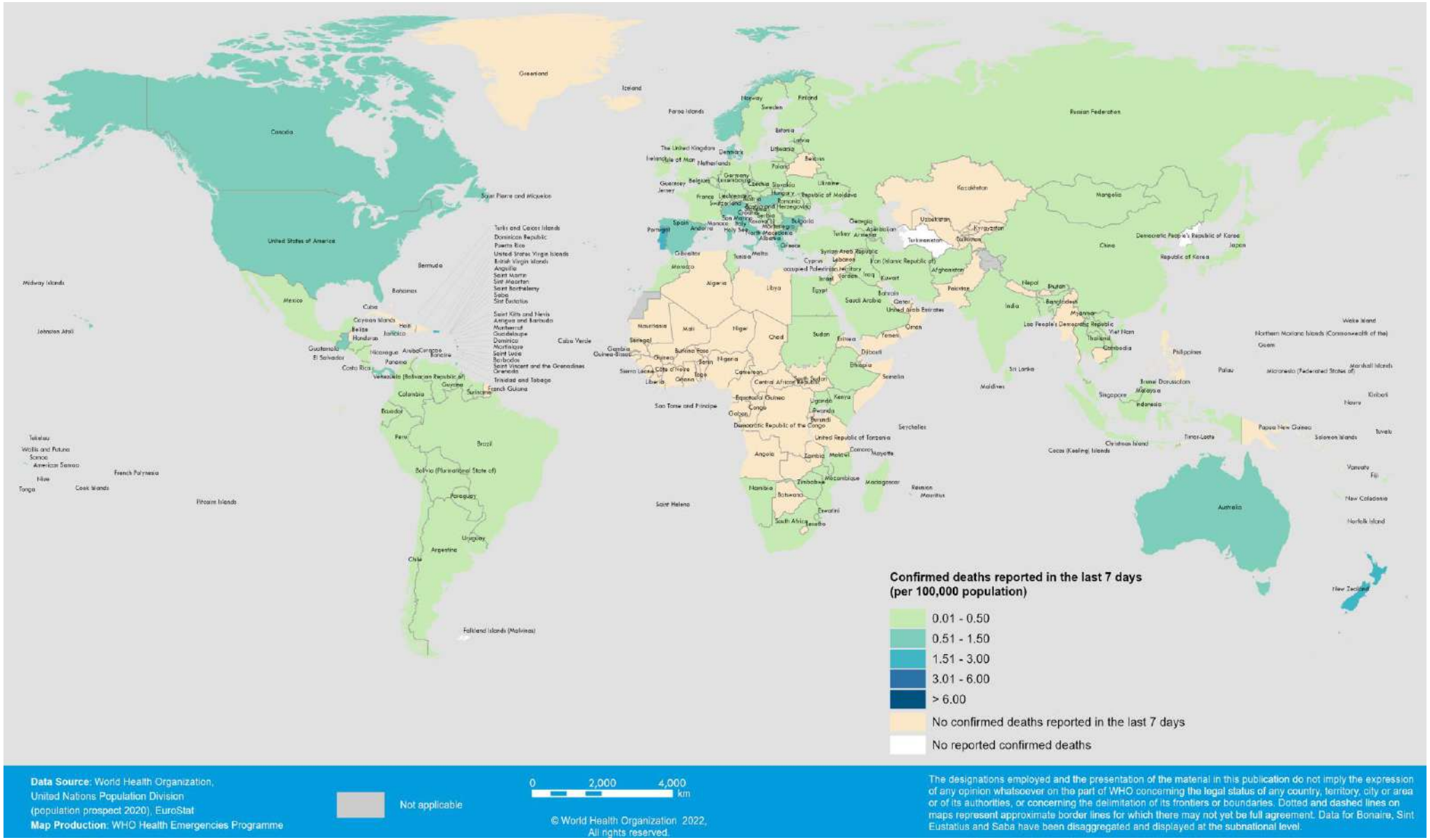
Figure 3. COVID-19 deaths per 100 000 population reported by countries, territories and areas, 23-29 May 2022*



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Special Focus: Update on SARS-CoV-2 variants of interest and variants of concern

WHO, in collaboration with national authorities, institutions and researchers, routinely assesses if variants of SARS-CoV-2 alter transmission or disease characteristics, or impact the effectiveness of vaccines, therapeutics, diagnostics or public health and social measures (PHSM) applied to control disease spread. Potential variants of concern (VOCs), variants of interest (VOIs) or variants under monitoring (VUMs) are regularly assessed based on the risk posed to global public health.
The classifications of variants will be revised as needed to reflect the continuous evolution of circulating variants and their changing epidemiology. Criteria for variant classification, and the lists of currently circulating and previously circulating VOCs, VOIs and VUMs, are available on the WHO Tracking SARS-CoV-2 variants website. National authorities may choose to designate other variants and are strongly encouraged to investigate and report newly emerging variants and their impact.

Geographic spread and prevalence of VOCs

There continues to be a decline in the number of SARS-CoV-2 sequences submitted to GISAID, with 152 476 submitted within the last 30 days. The Omicron VOC remains the dominant variant circulating globally, accounting for nearly all sequences reported. Among the Omicron sublineages, BA.2 is the dominant sublineage, despite declining from 78% to 75% of Omicron sequences submitted in the last 30 days. The BA.1 sublineage has also declined in prevalence from 7% to 4%. Three Omicron sublineages have shown an increasing trend among Omicron sequences submitted in the last 30 days: BA.2.12.1 has risen from 11% to 16%; BA.4 has risen from 2% to 3%; and BA.5 has risen from 1% to 2%. During the same period, the prevalence of BA.3 has declined to <1%.

These trends should be interpreted with due consideration of the limitations of surveillance systems, including differences in sequencing capacity and sampling strategies between countries, as well as changes in sampling and sequencing strategies in multiple countries.

Additional resources

- Tracking SARS-CoV-2 Variants
- COVID-19 new variants: Knowledge gaps and research
- Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health
- Considerations for implementing and adjusting public health and social measures in the context of COVID-19
- VIEW-hub: repository for the most relevant and recent vaccine data
- WHO Statement on Omicron sublineage BA.2

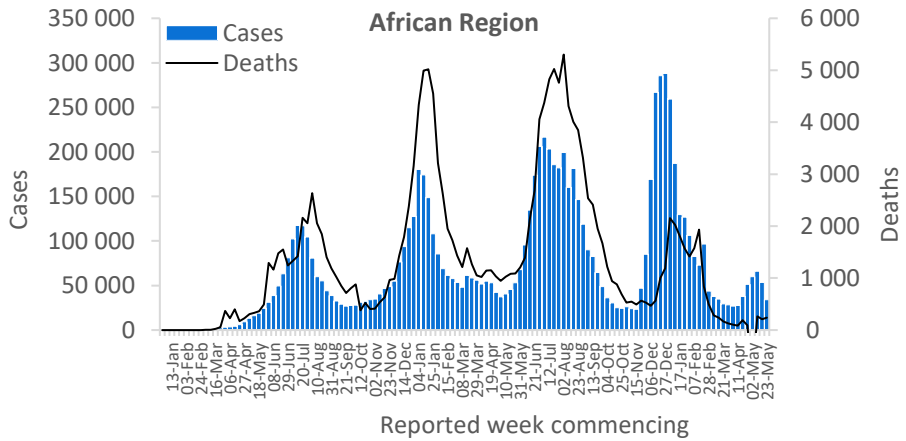
WHO regional overviews:

Epidemiological week 23-29 May 2022**

African Region

After reporting increasing trends for a month, the African Region reported a decline in the number of new weekly cases for the second consecutive week, with over 34 000 new cases, a 36% decrease as compared to the previous week. However, eleven (22%) countries reported an increase in the number of new cases of over 20%, with the greatest proportional increases observed in Angola (234 vs 46 new cases; +409% and included batch reporting), Kenya (464 vs 211 new cases; +120%) and Ethiopia (889 vs 406 new cases; +119%). The highest numbers of new cases were reported from South Africa (25 541 new cases; 43.1 new cases per 100 000 population; -35%), Réunion (3252 new cases; 363.2 new cases per 100 000; -40%), and Ethiopia (889 new cases; <1 new case per 100 000; a +119%).

The number of new weekly deaths increased by 15% as compared to the previous week, with over 200 new deaths reported. The highest numbers of new deaths were reported from South Africa (211 new deaths; <1 new death per 100 000 population; +19%), Réunion (seven new deaths; <1 new death per 100 000; -13%), and Zimbabwe (six new deaths; <1 new deaths per 100 000; -50%).

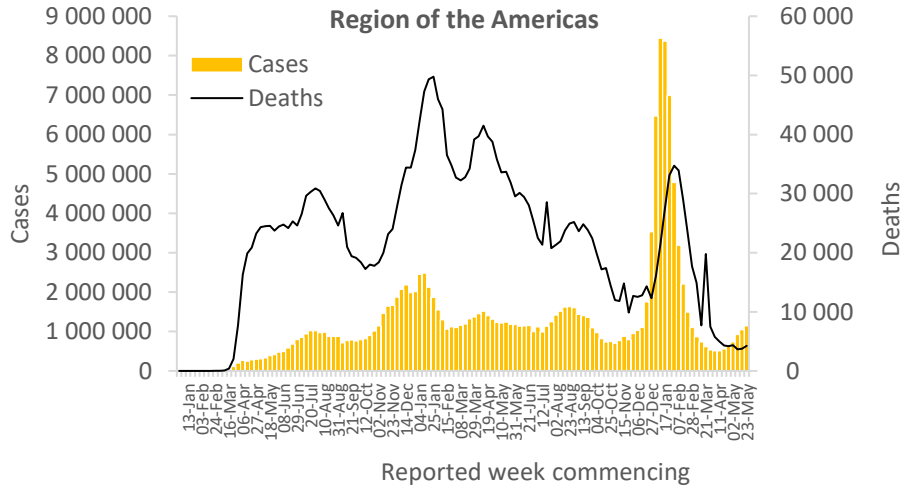


Updates from the African Region

Region of the Americas

The Region of the Americas has continued to report an increasing trend in case incidence since mid-April 2022, with over 1.1 million new weekly cases, a 9% increase as compared to the previous week. Ten (18%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Saba (18 vs 4 new cases; +350%), Dominican Republic (1909 vs 838 new cases; +128%) and Brazil (158 732 vs 97 674 new cases; +63%). The highest number of new cases were reported from the United States of America (736 298 new cases; 222.4 new cases per 100 000; +3%), Brazil (158 732 new cases; 74.7 new cases per 100 000; +63%), and Argentina (51 778 new cases; 114.6 new cases per 100 000; +19%).

The number of new weekly deaths in the Region increased by 13% as compared to the previous week, with over 4200 new deaths reported. The highest numbers of new deaths were reported from the United States of America (2461 new deaths; <1 new death per 100 000; +25%), Brazil (826 new deaths; <1 new death per 100 000; +16%), and Canada (303 new deaths; <1 new death per 100 000; -32%).

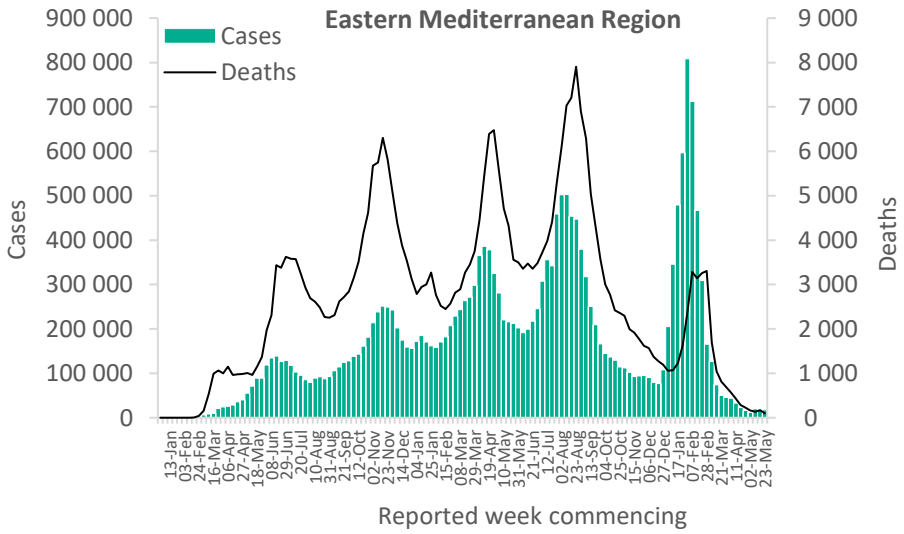


Updates from the Region of the Americas

Eastern Mediterranean Region

The Eastern Mediterranean Region reported over 17 000 new weekly cases, representing a 1% increase as compared to the previous week. Seven (32%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Kuwait (751 vs 105 new cases; +615% and included batch reporting), Sudan (92 vs 34 new cases; +171%) and Morocco (1202 vs 824 new cases; +46%). The highest numbers of new cases were reported from Saudi Arabia (3621 new cases; 10.4 new cases per 100 000; -4%), Bahrain (3187 new cases; 187.3 new cases per 100 000; -16%), and the United Arab Emirates (2603 new cases; 26.3 new cases per 100 000; +13%).

The number of new weekly deaths in the Region decreased by 45% as compared to the previous week, with 96 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (35 new deaths; <1 new death per 100 000; -36%), Saudi Arabia (15 new deaths; <1 new death per 100 000; +7%), and Egypt (14 new deaths; <1 new death per 100 000; -33%).

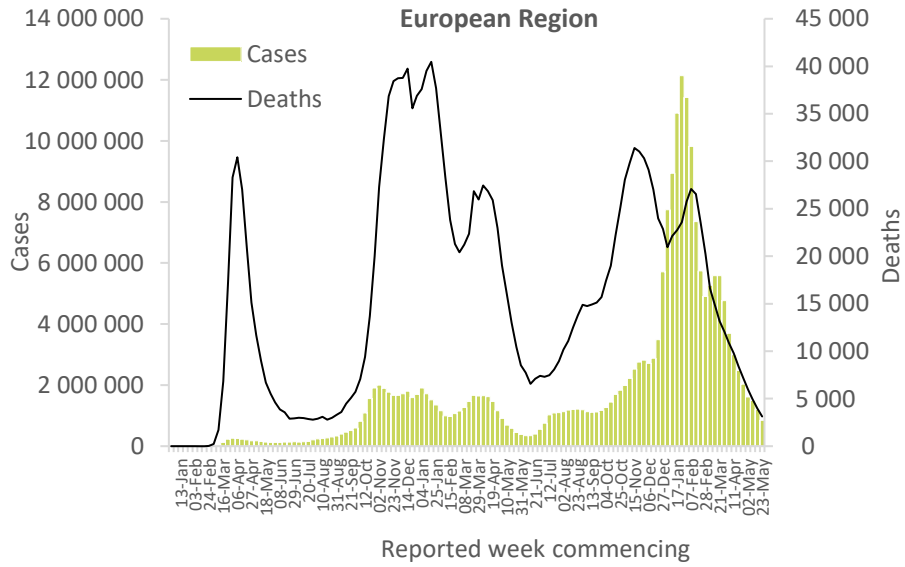


Updates from the Eastern Mediterranean Region

European Region

In the European Region, the number of new cases has continued to decline since mid-March 2022, with over 842 000 new weekly cases, a 30% decrease as compared to the previous week. Three (5%) countries in the Region reported increases in new cases of 20% or greater: Armenia (25 vs 18 new cases; +39%), Denmark (4426 vs 3269 new cases; +35%) and Azerbaijan (49 vs 40 new cases; +23%). The highest numbers of new cases were reported from Germany (183 844 new cases; 221.1 new cases per 100 000; -38%), Portugal (176 910 new cases; 1718.3 new cases per 100 000; -8%), and Italy (144 478 new cases; 242.2 new cases per 100 000; -27%).

Over 3100 new weekly deaths were reported, a 22% decrease as compared to the previous week. The highest numbers of new deaths were reported from Italy (624 new deaths; 1.0 new death per 100 000; -15%), the Russian Federation (605 new deaths; <1 new death per 100 000; -11%), and the United Kingdom (314 new deaths; <1 new death per 100 000; -43%).

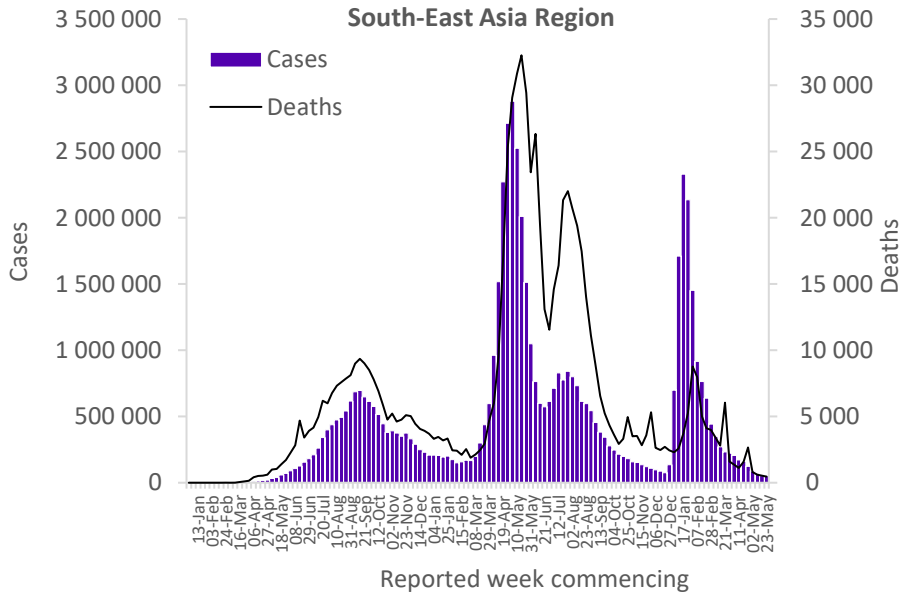


Updates from the European Region

South-East Asia Region

The South-East Asia Region has continued to report decreasing trends in the incidence of weekly cases and deaths since mid-January 2022, with over 50 000 new cases and over 400 new deaths reported this week, decreases of 8% and 15% respectively as compared to the previous week. Two countries showed increases in the number of new cases of 20% or greater: Bhutan (40 vs 4 new cases; +900% but due to batch reporting) and Timor-Leste (17 vs 6 new cases; +183%). The highest numbers of new cases were reported from Thailand (31 154 new cases; 44.6 new cases per 100 000; -17%), India (16 672 new cases; 1.2 new cases per 100 000; +13%), and Indonesia (1825 new cases; <1 new case per 100 000; similar to the previous week's figures).

The highest numbers of new deaths in the Region were reported from Thailand (226 new deaths; <1 new death per 100 000; -18%), India (173 new deaths; <1 new death per 100 000; -13%), and Indonesia (52 new deaths; <1 new death per 100 000; -19%).

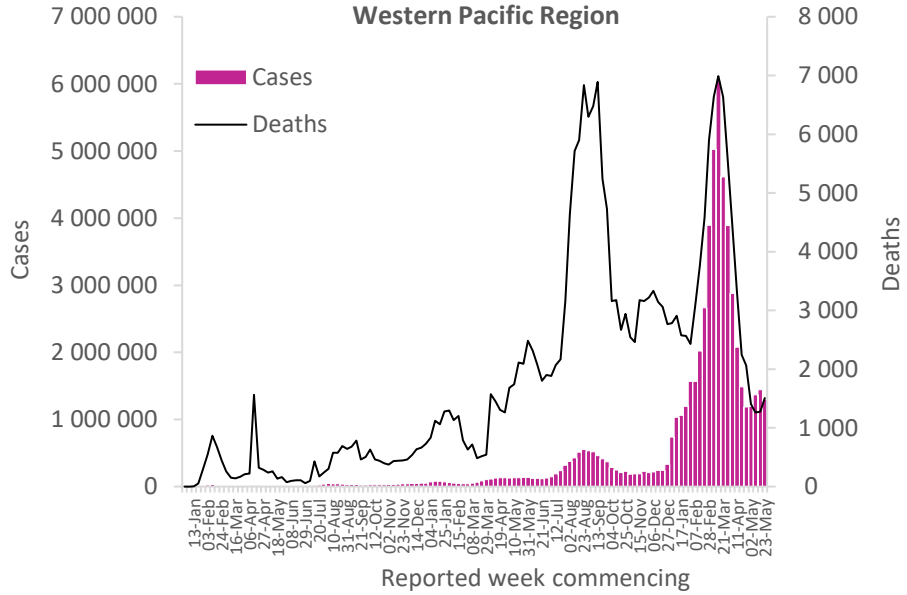


Updates from the South-East Asia Region

Western Pacific Region

After an increasing trend in the number of new weekly cases observed during the last three weeks, the Western Pacific Region reported just under 1.3 million new cases this week, a 10% decrease as compared to the previous week. Two countries reported increases in new cases of 20% or greater: Northern Mariana Islands (Commonwealth of the) (18 vs 10 new cases; +80%) and French Polynesia (53 vs 37 new cases; +43%). The highest numbers of new cases were reported from China (576 367 new cases; 39.2 new cases per 100 000; +6%), Australia (294 128 new cases; 1153.4 new cases per 100 000; -18%), and Japan (203 365 new cases; 160.8 new cases per 100 000; -18%).

The Region reported over 1500 new weekly deaths, representing an 18% increase as compared to the previous week. The highest numbers of new deaths were reported from China (578 new deaths; <1 new death per 100 000; +82%), Australia (347 new deaths; 1.4 new deaths per 100 000; +13%), and Japan (244 new deaths; <1 new death per 100 000; -4%).



Updates from the Western Pacific Region

Annex 1. Data, table, and figure notes

Data presented are based on official laboratory-confirmed COVID-19 cases and deaths reported to WHO by country/territories/areas, largely based upon WHO case definitions and surveillance guidance. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change, and caution must be taken when interpreting these data as several factors influence the counts presented, with variable underestimation of true case and death incidences, and variable delays to reflecting these data at the global level. Case detection, inclusion criteria, testing strategies, reporting practices, and data cut-off and lag times differ between countries/territories/areas. A small number of countries/territories/areas report combined probable and laboratory-confirmed cases. Differences are to be expected between information products published by WHO, national public health authorities, and other sources.

Due to public health authorities conducting data reconciliation exercises that remove large numbers of cases or deaths from their total counts, negative numbers may be displayed in the new cases/deaths columns as appropriate. When additional details become available that allow the subtractions to be suitably apportioned to previous days, graphics will be updated accordingly. A record of historic data adjustment made is available upon request by emailing epi-data-support@who.int. Please specify the countries of interest, time period, and purpose of the request/intended usage. Prior situation reports will not be edited; see covid19.who.int for the most up-to-date data. COVID-19 confirmed cases and deaths reported in the last seven days by countries, territories, and areas, and WHO Region (reported in previous issues) are now available at: https://covid19.who.int/table.

'Countries' may refer to countries, territories, areas or other jurisdictions of similar status. The designations employed, and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Countries, territories, and areas are arranged under the administering WHO region. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions except, the names of proprietary products are distinguished by initial capital letters.

[1] All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999). In the map, the number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.

Technical guidance and other resources

- WHO technical guidance
- WHO COVID-19 Dashboard
- WHO Weekly Operational Updates on COVID-19
- WHO COVID-19 case definitions
- COVID-19 Supply Chain Inter-Agency Coordination Cell Weekly Situational Update
- Research and Development
- Open WHO courses on COVID-19 in official UN languages and in additional national languages
- WHO Academy COVID-19 mobile learning app
- The Strategic Preparedness and Response Plan (SPRP) outlining the support the international community can provide to all countries to prepare and respond to the virus
- EPI-WIN: tailored information for individuals, organizations, and communities
- Recommendations and advice for the public: Protect yourself; Questions and answers; Travel advice

COVID-19 Weekly Epidemiological Update

Edition 95, published 8 June 2022

In this edition:

Global overview

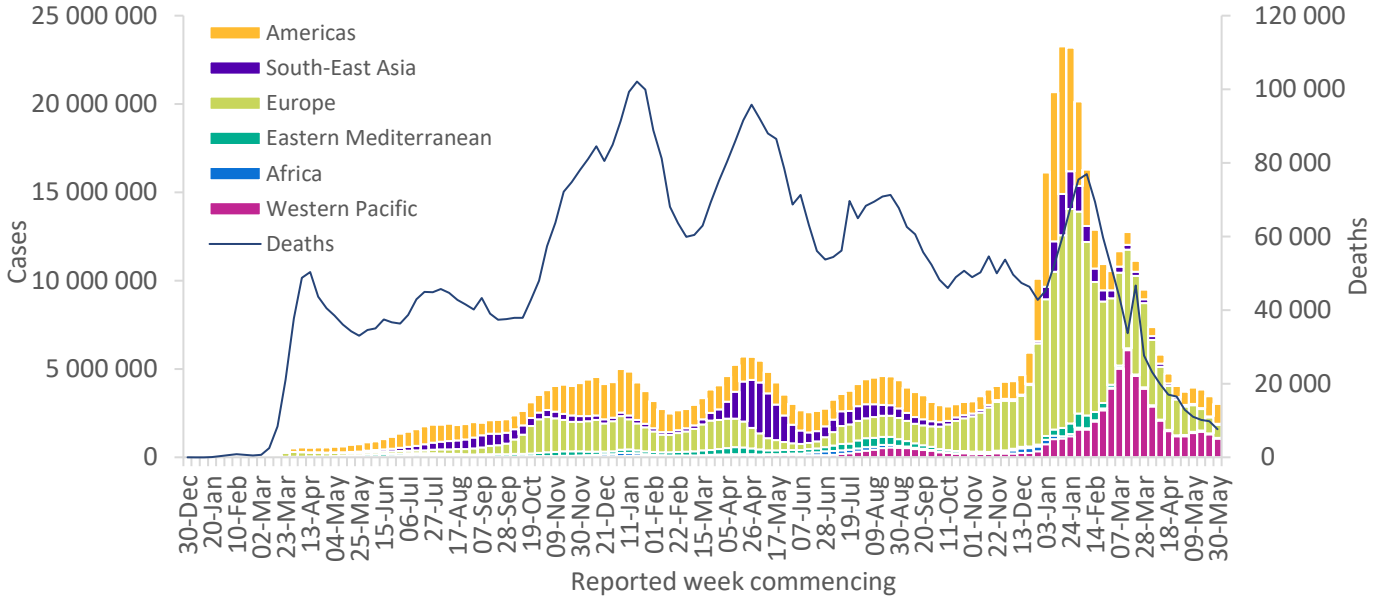
Data as of 5 June 2022

Globally, the number of new weekly cases has continued to decline since the peak in January 2022. During the week of 30 May to 5 June 2022, over three million cases were reported, a 12% decrease as compared to the previous week (figure 1). The number of new weekly deaths also continues to decline, with over 7 600 fatalities reported, representing a 22% decrease as compared to the previous week.

At the regional level, the numbers of new weekly cases increased in the Eastern Mediterranean Region (+19%) and South-East Asia Region (+1%), while they decreased in the other four WHO regions. The number of new weekly deaths increased in the Western Pacific Region (+7%), while decreasing trends were observed in the other five regions.

As of 5 June 2022, over 529 million confirmed cases and over six million deaths have been reported globally. These trends should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 5 June 2022**



**See *Annex 1: Data, table, and figure notes*

At the country level, the highest number of new weekly cases were reported from the United States of America (657 268 new cases; -11%), China (528 432 new cases; -8%), Australia (221 935 new cases; -25%), Brazil (216 334 new cases; +36%), and Germany (215 955 new cases; +16%).

The highest number of new weekly deaths were reported from the United States of America (1 703 new deaths; -33%), China (910 new deaths; +57%), Brazil (652 new deaths; -21%), the Russian Federation (565 new deaths; -7%), and Italy (380 new deaths; -39%).

Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 5 June 2022**

WHO Region	New cases in last 7 days (%)	Change in new cases in last 7 days *	Cumulative cases (%)	New deaths in last 7 days (%)	Change in new deaths in last 7 days *	Cumulative deaths (%)
Americas	1 124 932 (37%)	-1%	158 183 579 (30%)	3 303 (43%)	-23%	2 745 921 (44%)
Western Pacific	1 055 718 (35%)	-19%	61 013 872 (12%)	1 615 (21%)	7%	232 094 (4%)
Europe	744 792 (25%)	-18%	221 509 299 (42%)	2 082 (27%)	-35%	2 015 211 (32%)
South-East Asia	50 811 (2%)	1%	58 172 873 (11%)	350 (5%)	-23%	788 964 (13%)
Africa	26 160 (1%)	-29%	9 017 523 (2%)	211 (3%)	-13%	172 773 (3%)
Eastern Mediterranean	20 965 (1%)	19%	21 790 247 (4%)	83 (1%)	-14%	342 896 (5%)
Global	**3 023 378 (100%)**	**-12%**	**529 688 157 (100%)**	**7 644 (100%)**	**-22%**	**6 297 872 (100%)**

**Percent change in the number of newly confirmed cases/deaths in the past seven days, compared to seven days prior*
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Figure 2. COVID-19 cases per 100 000 population reported by countries, territories and areas, 30 May – 5 June 2022*

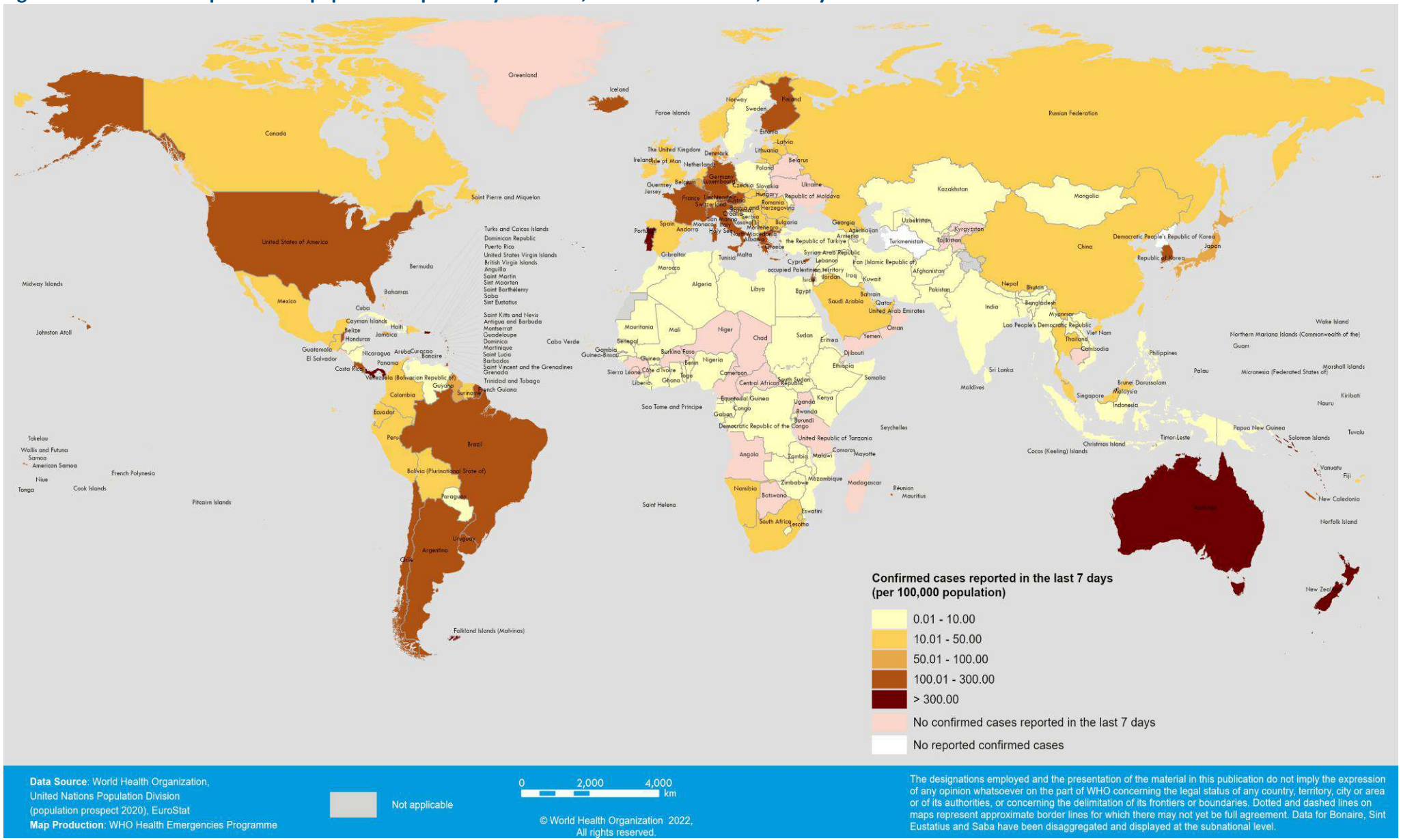

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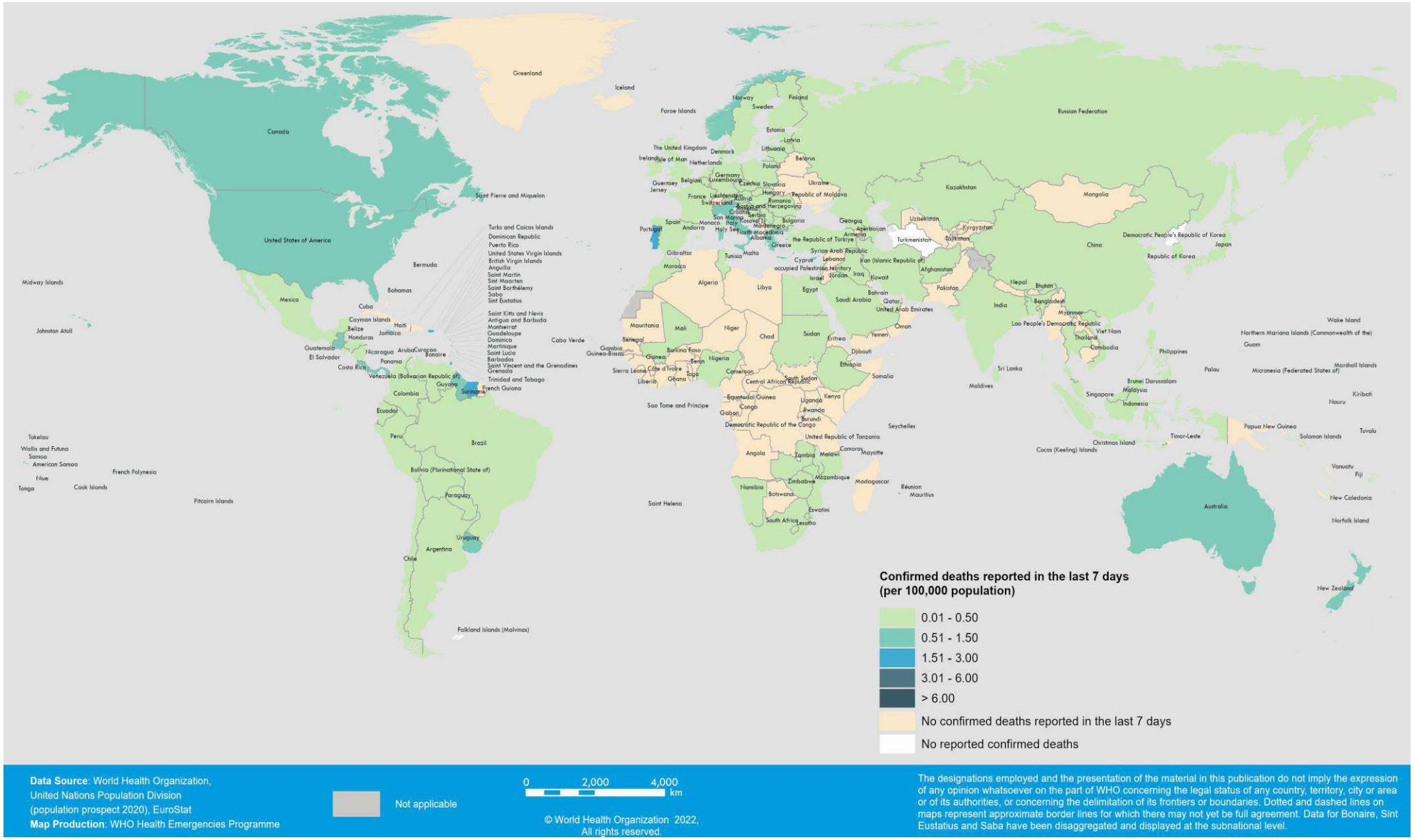
Figure 3. COVID-19 deaths per 100 000 population reported by countries, territories and areas, 30 May – 5 June 2022*



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The classifications of variants will be revised as needed to reflect the continuous evolution of circulating variants and their changing epidemiology. Criteria for variant classification, and the lists of currently circulating and previously circulating VOCs, VOIs and VUMs, are available on the WHO Tracking SARS-CoV-2 variants website. National authorities may choose to designate other variants and are strongly encouraged to investigate and report newly emerging variants and their impact.

Geographic spread and prevalence of VOCs

The Omicron VOC continues to be the dominant variant circulating globally, accounting for nearly all sequences reported to GISAID in the last 30 days. Due to very low circulation among sequences submitted to GISAID in the last three months, Delta is now categorized by WHO as a 'previously circulating VOC,' in the same way that Alpha, Beta and Gamma are categorized. Importantly however, this does not imply that previously circulating VOCs cannot resurge in the future and WHO will continue to monitor using available data.

Among Omicron lineages, as of epidemiological week 20 (15 to 21 May 2022), BA.2 and its descendent lineages (pooled lineages named BA.2.X) are declining but remain dominant, accounting for 44% and 19% respectively (figure 4, Table 2). Several variants with preliminary evidence of a growth advantage over other Omicron lineages show a global prevalence of <1% and are no longer rising, namely BA.2.11, BA.2.13, and BA.2.9.1. These lineages have in common the acquisition of a mutation at the locus S:L452X. Former dominant Omicron lineages BA.1, BA.1.1. BA.1.X and BA.3 sublineages have declined to <1%.

Globally, BA.2.12.1, BA.5, and BA.4 variants are rising in prevalence. As of week 20, BA.2.12.1 (detected in 53 countries) has reached a prevalence of 28%, a prevalence that may be largely attributed to an initial rapid increase in the Region of the Americas. BA.5 (detected in 47 countries) and BA.4 (detected in 42 countries) account for 4% and 2% of circulating variants, respectively. All three variants carry the signature mutation at locus S:L452 that is thought to confer greater transmissibility through higher cell fusogenicity and immune escape characteristics. Accumulating evidence from several countries indicates that there has been no observed increase in severity associated with BA.5 and BA.4.[1] No evidence is available at the current time on disease severity associated with BA.2.12.1.

As for the recombinant variants of SARS-CoV-2 detected in early 2022, including recombinants of known VOCs, a few had characteristics indicative of potential for increased transmissibility; however, this did not translate into a wide spread. The number of SARS-CoV-2 recombinant sequences submitted to GISAID which were being monitored by WHO or which showed an initial rise in the number of sequences reported (XE, XD and XF) continues to decline weekly, now representing <0.1% of sequences submitted during week 20.

Figure 4 Panel A and B: The number and percentage of SARS-CoV-2 sequences, as of 4 June 2022

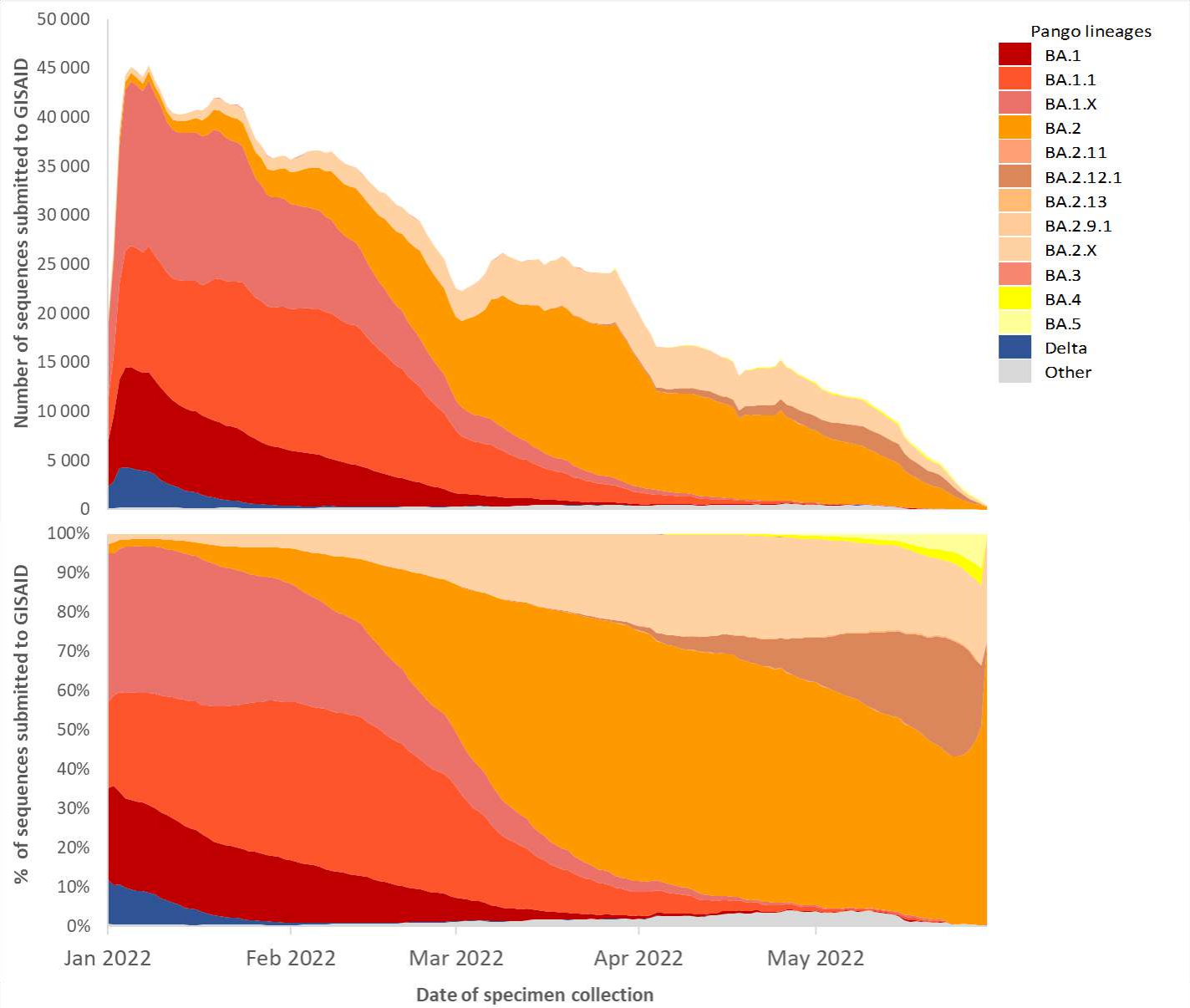


Figure 4 Panel A shows the number and **Panel B** the percentage of all circulating variants since 1 January 2022. Omicron sister-lineages and additional Omicron VOC descendent lineages under further monitoring (VOC-VUM) are shown. BA.1.X and BA.2.X include all BA.1 and BA.2 pooled descendent lineages, except those already shown in the figure above. Source: SARS-CoV-2 sequence data and metadata from GISAID, as of 4 June 2022.

Table 2: Relative proportions of Omicron lineages over the last four weeks by specimen collection date

Lineage	Countries	Sequences[a]	2022-18[b]	2022-19[b]	2022-20[b]	2022-21[b]
BA.1	175	491 224	0.11	0.21	0.20	0.02
BA.1.1	174	959 680	0.53	0.52	0.39	0.13
BA.1.X*	174	889 390	0.17	0.32	0.31	0.02
BA.2	138	1 054 358	53.15	49.60	43.98	49.88
BA.2.11	12	547	0.04	0.05	0.05	0.03
BA.2.12.1	53	68 256	16.78	21.85	27.83	15.62
BA.2.13	34	1 529	0.34	0.44	0.47	0.45
BA.2.9.1	13	649	0.08	0.08	0.14	0.21
BA.2.X*	122	404 797	22.89	21.24	19.25	20.05
BA.3	31	817	0.01	0.01	0.00	0.00
BA.4	42	4 692	1.12	1.25	2.38	4.14
BA.5	47	4 905	1.01	1.87	4.00	8.75
Delta	202	4 338 590	0.01	0.01	0.00	0.02
Other	209	2 675 752	3.75	2.55	0.98	0.70

[a]Data source: sequences and metadata from GISAID

[b]Relative proportions in %

*BA.1.X and BA.2.X include all BA.1 and BA.2 pooled descendent lineages, except those already shown in the table above.

The blue rows indicate the dominant lineages. The grey rows indicate the lineages that are increasing in prevalence.

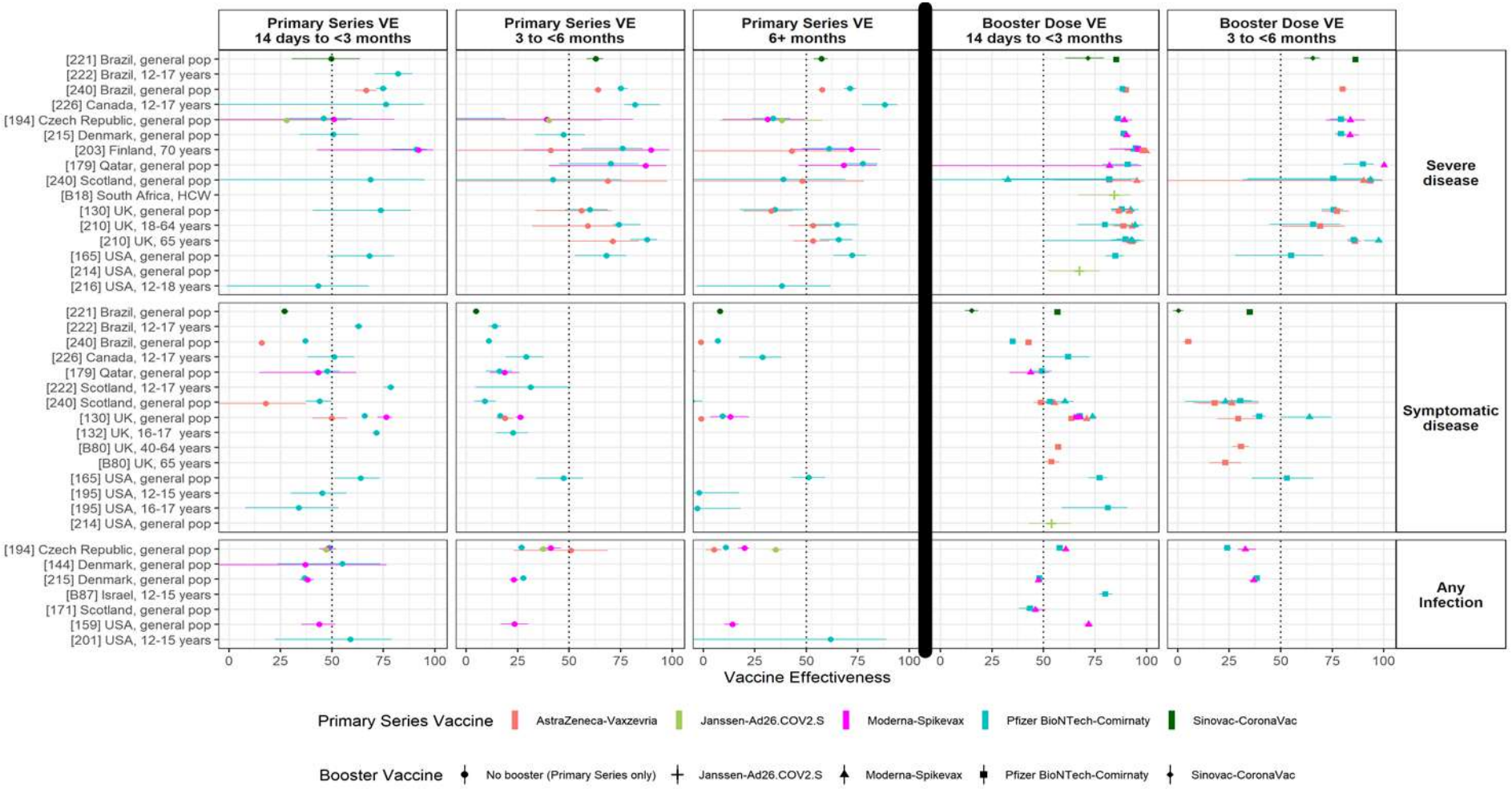
Characteristics of Omicron

Available evidence on the phenotypic impacts of VOCs is reported in previous editions of the COVID-19 Weekly Epidemiological Update. Table 3 summarize the phenotypic characteristics of the Omicron VOC and its sublineages for which evidence is available since the last update on 25 May 2022. Some of these studies have not been peer-reviewed and the findings must, therefore, be interpreted with due consideration of this limitation.

Table 3: Summary of phenotypic characteristics* of the Omicron VOC

Public health domain of impact	Omicron (B.1.1.529)	Omicron sublineages			
		BA.1	BA.2	BA.4	BA.5
Transmissibility	Growth advantage and increased transmissibility compared to Delta (Campbell 2021)[2]	Lower transmissibility compared to BA.2 (Atkulwar 2022)[3]	Increased transmissibility compared to BA.1[3]	No studies on relative transmissibility compared to BA.1 and BA.2	No studies on relative transmissibility compared to BA.1 and BA.2
Disease severity	Overall evidence suggests lower severity despite contrasting evidence. Earlier studies reported lower severity compared to Delta. [1,4–7] However, more recent studies reported similar [8,9] or increased severity[10] compared to Delta.[1,4–7,11 12]	No difference in disease severity compared to BA.2[13]	No difference in disease severity compared to BA.1[13]	Currently available evidence does not suggest a difference in disease severity compared to BA.1 [14]	Currently available evidence does not suggest a difference in disease severity compared to BA.1 [14,15]
Risk of reinfection	Reduced risk of Omicron reinfection if previously infected with a different SARS-CoV-2 variant[16,17]	Reduced risk of reinfection with BA.1 following infection with BA.2[18]	Reduced risk of reinfection with BA.2 following infection with BA.1 [18]	No specific data available	No specific data available
Impact on antibody responses	Reduction in neutralizing activity reported as compared to other VOCs[19–21]	Lower neutralising antibody titers compared to the index virus [20]	Lower neutralising antibody titers compared to the index virus[20]	Lower neutralising antibody titres (7.6-fold) compared to BA.1 [22–24]	Lower neutralising antibody titres (7.5-fold) compared to BA.1 [22,24]
Impacts on diagnostics	PCR assays that include multiple gene targets maintain their accuracy to detect Omicron[25]; S gene target failure/positivity (SGTF) may be a proxy for screening. Limited to no impact on sensitivity of Ag-RDTs observed[26–29]	S gene target failure.	The majority will be S gene target positive (SGTP).	S gene target failure.	S gene target failure.
Impact on treatment	No difference in the effectiveness of antiviral agents (polymerase and protease inhibitors) against the Omicron variant[30]. Conserved neutralizing activity for three broadly neutralizing monoclonal antibodies (sotrovimab, S2X259 and S2H97) and a reduced effectiveness of other monoclonal antibodies[31–34]	Reduced efficacy of casirivimab-imdevimab against BA.1[35]	Reduced neutralising activity of sotrovimab [35], casirivimab and imdevimab against BA.2[36]	Reduced neutralising activity of casirivimab and imdevimab[36]	Reduced neutralising activity of casirivimab and imdevimab[36]
Impact on vaccination	Results of vaccine effectiveness (VE) studies should be interpreted with caution because estimates vary with the type of vaccine administered and the number of doses and scheduling (sequential administration of different vaccines). For further information, **see the section Interpretation of the results of the VE for the Omicron variant**				

Figure 5. Vaccine effectiveness (VE) of primary series and booster vaccination against the Omicron variant of concern



Abbreviations: pop=population; HCW=healthcare workers. Dots represent point estimates of vaccine effectiveness; horizontal lines represent the 95% confidence intervals. Labels along left side of plot indicate reference numbers [], country, and study population. Reference numbers identify the study and link to the summary table of VE effectiveness studies on view-hub.org (Table 1 in summary table); references starting with a 'B' are studies found in the booster VE table only (Table 2 in summary table). Primary series refers to the completion of two doses of vaccines for AstraZeneca-Vaxzevria; Moderna-Spikevax, Pfizer BioNTech-Comirnaty and Sinovac-CoronaVac and one dose of Janssen-Ad26.COV2.S. Severe disease includes severe disease, hospitalization, and pneumonia; symptomatic disease includes disease of any severity level; any infection can include symptomatic and asymptomatic infection. Additional details on the methods for inclusion of the estimates in the plots provided in Annex 3. Note, nine point estimates for the primary series with confidence intervals below 0 are not shown in the Omicron plot: two estimates from reference #144 against infection at 3 to <6 months (Pfizer BioNTech-Comrinaty and Moderna-Spikevax), two estimates from reference #179 against symptomatic disease at 6+ months (Pfizer BioNTech-Comrinaty and Moderna-Spikevax), and five estimates from reference #240 (one AstraZeneca-Vaxzevria estimate at 3 to <6 months; three AstraZeneca-Vaxzevria estimates and one Pfizer BioNTech estimate at 6+ months).

Figure 5 summarizes the impact of Omicron variant on product-specific vaccine effectiveness (VE) over time for both primary series vaccines and booster vaccines. Additional information on vaccine performance against VOCs can also be found in Annex 4. Since the last update, one new study (not yet peer-reviewed) assessing absolute vaccine effectiveness of three doses of Pfizer BioNTech-Comirnaty among children in Israel has been added to the figure.[35] The study found three doses of the vaccine to be 80% effective (95% CI: 76.7-83.1) at preventing Omicron infection among children 12-15 years of age within approximately two months of vaccination with the third dose.

Interpretation of the results of absolute VE for the Omicron variant

To date, 22 studies from 10 countries (Brazil, Canada, Czech Republic, Denmark, Finland, Israel, Qatar, South Africa, the United Kingdom and the United States of America) have assessed the duration of protection of five vaccines against the Omicron variant (six studies assessed VE of primary series vaccination only, four assessed VE of booster vaccination only, and 12 assessed both). Findings from these studies show reduced VE of COVID-19 primary series vaccines against the Omicron variant for all outcomes (*severe disease*, *symptomatic disease*, and *infection*) than has been observed for the other VOCs. Importantly though, VE estimates against the Omicron variant remain higher for *severe disease*, in the majority of studies. Booster vaccination substantially improves VE for all outcomes and for all combinations of schedules with estimates available for both primary series and booster vaccination. VE declines more with time after booster vaccination for symptomatic disease and infection than it does for severe disease; however, studies that assess VE of booster vaccination beyond six months are needed to evaluate the longer duration of protection.

For *severe disease*, within the first three months of primary series vaccination, six of 12 (50%) VE estimates for the mRNA vaccines (Moderna-Spikevax and Pfizer BioNTech-Comirnaty) were ≥70%. Of the two studies available for vector vaccines, one reported a VE of <70% for AstraZeneca-Vaxzevria, and the other reported a VE of <50% for Janssen-Ad26.COV2.S. One study available for inactivated vaccines (Sinovac-CoronaVac) reported a VE equal to 50%. Beyond three months after vaccination, 13 of 28 (46%) VE estimates for the mRNA vaccines were ≥70% while 19 (68%) were ≥50%; one of the 12 (8%) VE estimates for AstraZeneca-Vaxzevria was ≥70% while eight (67%) were ≥50%, but neither of the two estimates for Janssen-Ad26.COV2.S were ≥50%. The two available VE estimates beyond three months of vaccination for Sinovac-CoronaVac were ≥50%.

Booster vaccination improved VE against severe disease in all studies in which it was assessed. There were 33 estimates of an mRNA booster, two estimates a booster dose of Janssen-Ad26.COV2.S, and one estimates a booster dose of Sinovac-CoronaVac. Across the datasets, only one estimate for Pfizer BioNTech-Comrinaty as a booster dose and one for Janssen-Ad26.COV2.S as a booster dose below 70% between 14 days and three months of receipt of a booster dose. At three to six months post mRNA booster, 17 of 20 (85%) estimates showed VE ≥70% (an mRNA vaccine was given as the primary series in 13 of the 20 estimates while AstraZeneca-Vaxzevria and Sinovac-CoronaVac were given as the primary series for six and one of the 20 estimates, respectively).

VE estimates against *symptomatic disease* and *infection* within the first three months of primary series vaccination tended to be lower than against severe disease, and VE decreased more substantially over time. For *symptomatic disease* within the first three months of primary series vaccination, three of 13 (23%) VE estimates for the mRNA vaccines were ≥70% and seven (54%) were ≥50%; none of the three available VE estimates for AstraZeneca-Vaxzevria nor the single estimate for Sinovac-CoronaVac) were above 50%. Beyond three months after vaccination, one of the 29 (3%) VE estimates were ≥50% (21 estimates evaluated mRNA vaccines, six evaluated AstraZeneca-Vaxzevria, and two evaluated Sinovac-CoronaVac). Booster with an mRNA vaccination after completion of a primary series of an

mRNA vaccine, AstraZeneca-Vaxzevria, or Sinovac-CoronaVac, improved VE against *symptomatic disease* with four of 20 (20%) VE estimates ≥70% and 15 (75%) estimates ≥50% between 14 days and three months post booster. However, booster dose protection declined with time since vaccination with only two of twelve (17%) available estimates indicating a VE of ≥50% at three to six months following receipt of an mRNA booster dose. Neither the single estimate for a booster dose of AstraZeneca-Vaxzevria nor the single estimate for a booster dose of Sinovac-CoronaVac three to six months post vaccination was above 50%. VE against *infection* showed a similar pattern as that against *symptomatic disease*.

Additional resources

- Tracking SARS-CoV-2 Variants
- COVID-19 new variants: Knowledge gaps and research
- Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health
- Considerations for implementing and adjusting public health and social measures in the context of COVID-19
- VIEW-hub: repository for the most relevant and recent vaccine data
- WHO Statement on Omicron sublineage BA.2

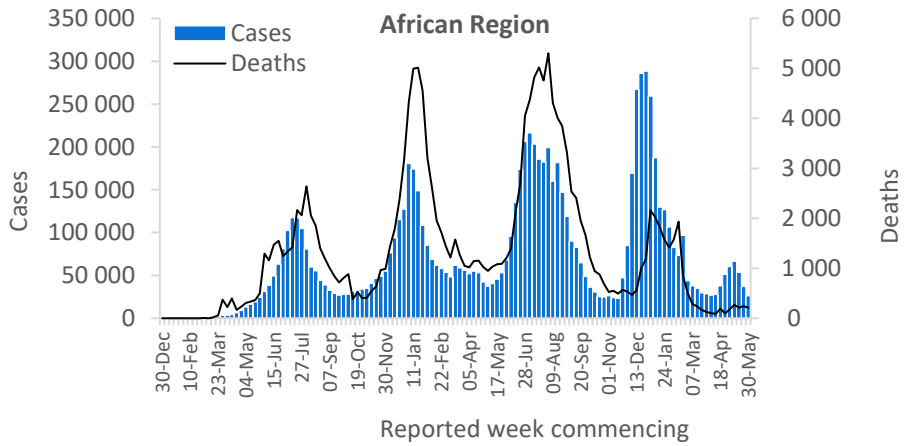
WHO regional overviews:

Epidemiological week 30 May – 5 June 2022**

African Region

After reporting increasing trends for a month, the African Region has reported a decline in the number of new weekly cases for the third consecutive week, with over 26 000 new cases, a 29% decrease as compared to the previous week. However, eleven (22%) countries reported an increase in the number of new cases of over 20%, with the greatest proportional increases observed in Ghana (352 vs 73 new cases; +382%), Eritrea (10 vs three new cases; +233%) and Ethiopia (2483 vs 889 new cases; +179%). The highest numbers of new cases were reported from South Africa (14 885 new cases; 25.1 new cases per 100 000; -42%), Ethiopia (2483 new cases; 2.2 new cases per 100 000; +179%), and Réunion (2046 new cases; 228.5 new cases per 100 000; -37%).

The number of new weekly deaths in the Region decreased by 13% as compared to the previous week, with over 200 new deaths reported. The highest numbers of new deaths were reported from South Africa (171 new deaths; <1 new death per 100 000 population; -19%), Zimbabwe (10 new deaths; <1 new death per 100 000; +67%), and Réunion (seven new deaths; <1 new death per 100 000; similar to the previous week's figures).

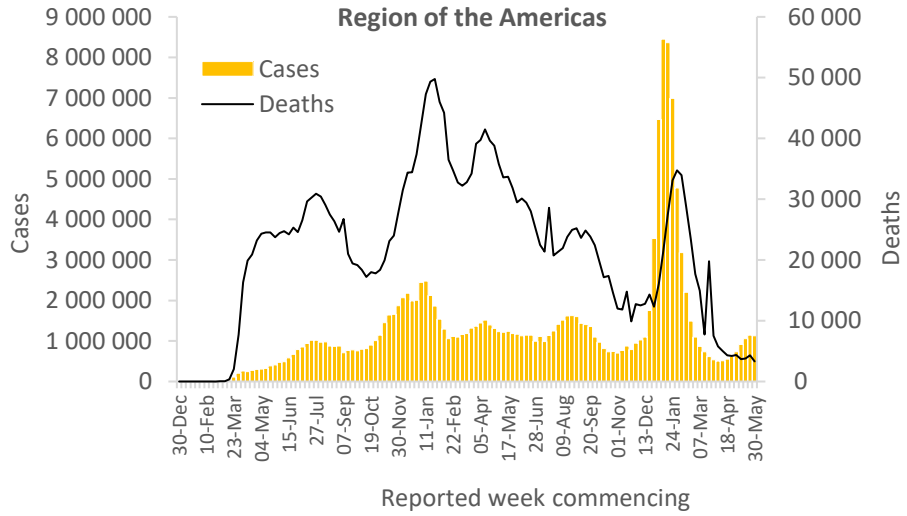


Updates from the African Region

Region of the Americas

Following an increasing trend since mid-April 2022, the Region of the Americas has reported a decrease in case incidence. Over 1.1 million new weekly cases were reported, a 1% decrease as compared to the previous week. However, sixteen (29%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Ecuador (7215 vs 2400 new cases; +201%), Haiti (74 vs 29 new cases; +155%) and Guyana (627 vs 347 new cases; +81%). The highest numbers of new cases were reported from the United States of America (657 268 new cases; 198.6 new cases per 100 000; -11%), Brazil (216 334 new cases; 101.8 new cases per 100 000; +36%), and Chile (55 211 new cases; 288.8 new cases per 100 000; +16%).

The number of new weekly deaths in the Region increased by 23% as compared to the previous week, with over 3300 new deaths reported. The highest numbers of new deaths were reported from the United States of America (1703 new deaths; <1 new death per 100 000; -33%), Brazil (652 new deaths; <1 new death per 100 000; -21%), and Canada (304 new deaths; <1 new death per 100 000; similar to the previous week's figures).

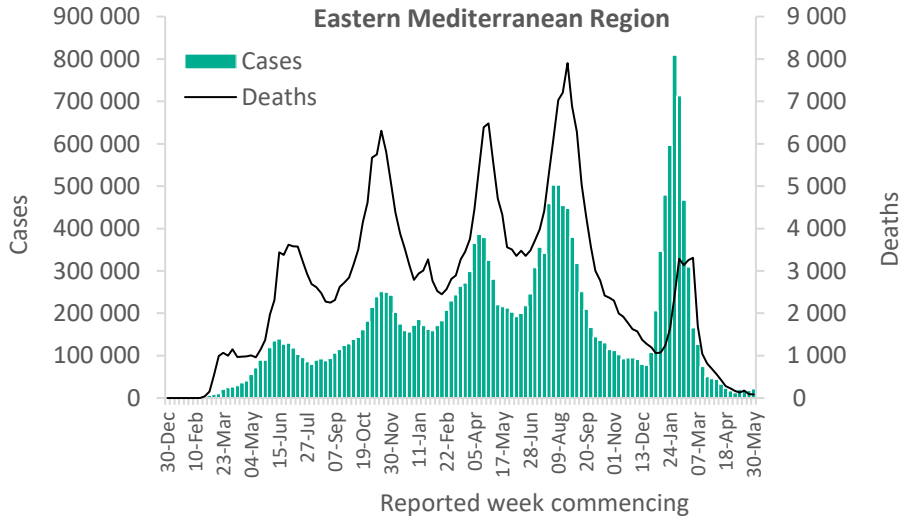


Updates from the Region of the Americas

Eastern Mediterranean Region

The Eastern Mediterranean Region reported just under 21 000 new weekly cases, representing a 19% increase as compared to the previous week. Six (27%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Somalia (30 vs 14 new cases; +114%), Morocco (2188 vs 1202 new cases; +82%) and Bahrain (4806 vs 3187 new cases; +28%). The highest numbers of new cases were reported from Saudi Arabia (4545 new cases; 13.1 new cases per 100 000; +26%), Bahrain (4086 new cases; 240.1 new cases per 100 000; +28%), and the United Arab Emirates (3269 new cases; 33.1 new cases per 100 000; +26%).

The number of new weekly deaths in the Region decreased by 14% as compared to the previous week, with over 80 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (22 new deaths; <1 new death per 100 000; -37%), Egypt (14 new deaths; <1 new death per 100 000; similar to the previous week's figures), and Saudi Arabia (12 new deaths; <1 new death per 100 000; -20%).

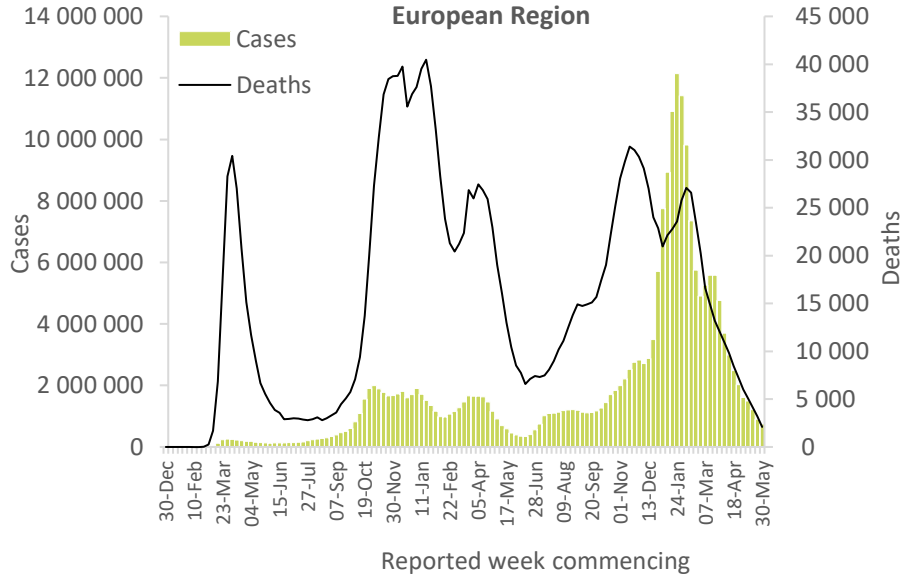


Updates from the Eastern Mediterranean Region

European Region

In the European Region, the number of new cases has continued to decline since mid-March 2022, with over 744 000 new weekly cases, an 18% decrease as compared to the previous week. Six (10%) countries in the Region reported increases in new cases of 20% or greater: Monaco (132 vs 59 new cases; +124%), Uzbekistan (113 vs 81 new cases; +40%) and Luxembourg (1559 vs 1181 new cases; +32%). The highest numbers of new cases were reported from Germany (215 955 new cases; 259.7 new cases per 100 000; +16%), France (128 198 new cases; 197.1 new cases per 100 000; +13%), and Portugal (120 711 new cases; 1172.4 new cases per 100 000; -31%).

Over 2000 new weekly deaths were reported, a 35% decrease as compared to the previous week. The highest numbers of new deaths were reported from the Russian Federation (565 new deaths; <1 new death per 100 000; -7%), Italy (380 new deaths; <1 new death per 100 000; -39%), and France (272 new deaths; <1 new death per 100 000; -7%).



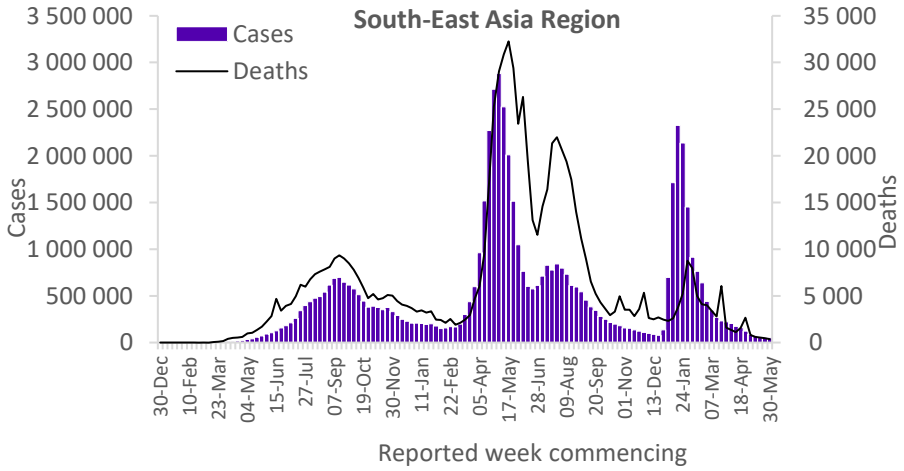
Updates from the European Region

South-East Asia Region

After a decreasing trend in the number of new weekly cases observed since mid-January 2022, the South-East Asia Region reported over 50 000 new cases this week, representing a 1% increase as compared to the previous week. Three (30%) countries showed increases in the number of new cases of 20% or greater: India (23 774 vs 16 672 new cases; +43%), Indonesia (2385 vs 1825 new cases; +31%), and Nepal (72 vs 59 new cases; +22%). The highest numbers of new cases were reported from Thailand (24 145 new cases; 34.6 new cases per 100 000; -23%), India (23 774 new cases; 1.7 new cases per 100 000; +42), and Indonesia (2385 new cases; <1 new case per 100 000; +31%).

The Region reported 350 deaths, a decrease of 23% as compared to the previous week. The highest numbers of new deaths were reported from Thailand (199 new deaths; <1 new death per 100 000; -12%), India (106 new deaths; <1 new death per 100 000; -39%), and Indonesia (41 new deaths; <1 new death per 100 000; -21%).

Reports of an outbreak of COVID-19 reported in the Democratic People's Republic of Korea continue through official media on 12 May 2022; however, at present, no confirmed cases or deaths have been reported to WHO.

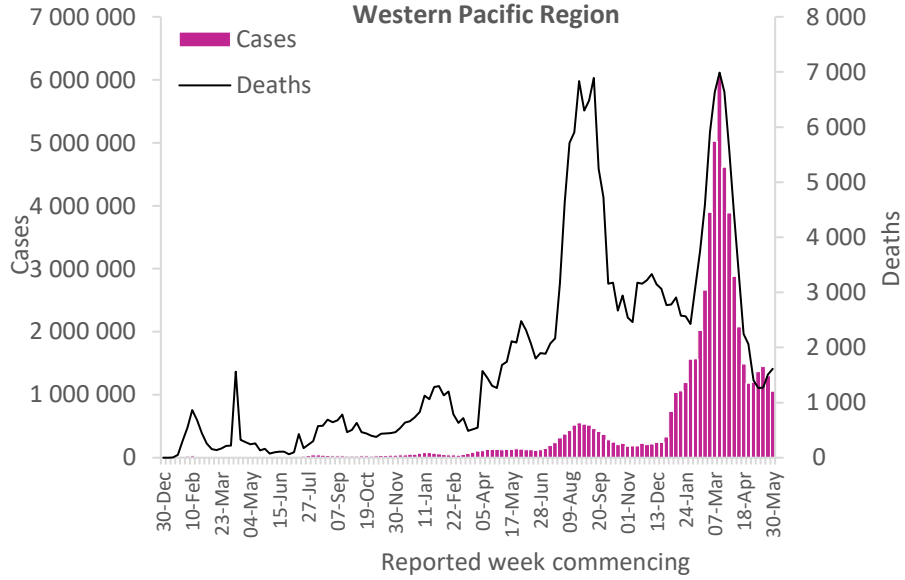


Updates from the South-East Asia Region

Western Pacific Region

With over one million new weekly cases reported, the Western Pacific Region shows a decreasing trend for the second consecutive week (-19% as compared to the previous week). Six (18%) countries reported increases in new cases of 20% or greater, with the largest proportional increases observed in Papua New Guinea (205 vs 31 new cases; +561%), Vanuatu (1174 vs 205 new cases; +473%) and Tonga (254 vs 94 new cases; +170%). The highest numbers of new cases were reported from China (528 432 new cases; 35.9 new cases per 100 000; -8%), Australia (221 935 new cases; 870.3 new cases per 100 000; -25%), and Japan (122 241 new cases; 96.7 new cases per 100 000; -40%).

The Region reported over 1600 new weekly deaths, representing a 7% increase as compared to the previous week. The highest numbers of new deaths were reported from China (910 new deaths; <1 new death per 100 000; +57%), Australia (288 new deaths; <1 new death per 100 000; -17%), and Japan (199 new deaths; <1 new death per 100 000; -18%).



Updates from the Western Pacific Region

Summary of the COVID-19 Monthly Operational Update

The Monthly operational Update is a report provided by the COVID-19 Strategic Preparedness and Response Plan (SPRP) monitoring and evaluation team which aims to update on the ongoing global progress against the COVID-19 SPRP 2021 framework.

In this edition, highlights of country-level actions and WHO support to countries include:

- WHO, Government of Japan, and Governments of the Marshall Islands, Federated States of Micronesia and Palau partner to enhance COVID-19 preparedness and response
- WHO/Europe mission to Tajikistan to support the Ministry of Health and Social Protection of the Population of the Republic of Tajikistan with clinical management of COVID-19
- Expansion of South Sudan's COVID-19 vaccination to remote regions
- Eastern Mediterranean Region publishes its COVID-19 Strategic Preparedness and Response Plan for 2022
- Region of the Americas establishes a high-level commission on mental health and COVID-19
- Integrating SARS-CoV-2 into influenza sentinel surveillance- field experience in Togo
- Engaging with Parliamentarians in Nepal to strengthen Risk Communications and Community Engagement (RCCE)
- Technical and targeted multi-sectoral support to manage COVID-19 waste in the African Region
- Shipment of rapid antigen tests to Iraq
- Nigeria holds first national Training of Trainers (ToT) workshop on infodemic management
- COVID-19 Vaccine Delivery Partnership supports countries to scale-up vaccination strategies
- WHO plays advisory role to International Olympic Committee for Beijing 2022 Winter Olympic and Paralympic Games
- Act-A Health Systems Response Connector (HSRC) supports Member States to translate COVID-19 tools into national interventions
- Progress update on the utilization of OpenWHO training platform

Annex 1. Data, table, and figure notes

Data presented are based on official laboratory-confirmed COVID-19 cases and deaths reported to WHO by country/territories/areas, largely based upon WHO case definitions and surveillance guidance. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change, and caution must be taken when interpreting these data as several factors influence the counts presented, with variable underestimation of true case and death incidences, and variable delays to reflecting these data at the global level. Case detection, inclusion criteria, testing strategies, reporting practices, and data cut-off and lag times differ between countries/territories/areas. A small number of countries/territories/areas report combined probable and laboratory-confirmed cases. Differences are to be expected between information products published by WHO, national public health authorities, and other sources.

Due to public health authorities conducting data reconciliation exercises that remove large numbers of cases or deaths from their total counts, negative numbers may be displayed in the new cases/deaths columns as appropriate. When additional details become available that allow the subtractions to be suitably apportioned to previous days, graphics will be updated accordingly. A record of historic data adjustment made is available upon request by emailing epi-data-support@who.int. Please specify the countries of interest, time period, and purpose of the request/intended usage. Prior situation reports will not be edited; see covid19.who.int for the most up-to-date data. COVID-19 confirmed cases and deaths reported in the last seven days by countries, territories, and areas, and WHO Region (reported in previous issues) are now available at: https://covid19.who.int/table.

'Countries' may refer to countries, territories, areas or other jurisdictions of similar status. The designations employed, and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Countries, territories, and areas are arranged under the administering WHO region. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions except, the names of proprietary products are distinguished by initial capital letters.

[1] All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999). In the map, the number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.

[2] Since 21 May, data for COVID-19 cases and deaths in Northern Ireland was no longer included in the United Kingdom updates (see here for the official announcement).

Annex 2. Additional notes on VOC impacts on vaccines

- Reductions in VE do not necessarily mean loss of protection, as indicated by the absolute VE estimate. For example, a 10-percentage point reduction in VE against symptomatic disease for mRNA vaccines would still mean high vaccine effectiveness of ~85%. Likewise, vaccines have shown higher VE against severe disease; thus, small reductions in VE against severe disease due to VOCs may still mean substantial protection.
- Table 3 summarizes the impact of VOCs on COVID-19 vaccine performance in the absence of waning, and, therefore, does not include studies that only assess VE greater than four months post final dose.
- Studies reporting VOC-specific VE estimates for full vaccination (≥7 days post final dose) are assessed against a comparator VE estimate for that vaccine product to determine level of reduction in VE. For symptomatic disease, VOC VE is compared against phase three RCT results from non-VOC settings. For severe disease and infection, due to instability or lack of phase three RCT estimates, VOC VE is compared to non-VOC VE estimates from the same study when available (or to Alpha VE from same study when assessing Beta, Gamma, or Delta); with an exception for AstraZeneca-Vaxzevria for infection (when a phase three estimate of VE against infection due to non-VOC is available and used as comparator). In some instances, a study may be included for severe disease or infection outcome even without a comparator if a very high VE estimate is reported against a VOC (i.e., >90%).
- It is also important to note that studies vary in population, outcome definitions, study design and other methodological considerations, which may in part explain differences when comparing VE estimates for a product between different studies. In addition, the reductions summarized in the table represent VE point estimates and do not represent the uncertainty intervals around these estimates which vary substantially across studies. The reductions in VE noted should be interpreted with these limitations in mind.
- Neutralization studies that use samples collected >seven days and <six months after complete vaccination and that use an ancestral strain as the reference are included in Table 3.

Annex 3. Methods for Figure 5

- VE studies included in the plot were identified from an ongoing systematic review of COVID-19 vaccine effectiveness studies. All studies were cohort or test-negative studies. Methods for the systematic review and inclusion/exclusion criteria are available on view-hub.org. The studies were conducted during a period when Omicron was the predominant circulating variant. Only studies providing VE estimates of individual vaccines are included in the plot (studies assessing combined VE of more than one vaccine are excluded). In addition, for the primary series VE, only studies providing VE estimates for discrete time intervals since vaccination, which evaluate changes in VE over time, are included.

- For the primary series VE, estimates are only included in the plot for studies that report absolute VE for more than one time period for an individual vaccine. Thirteen studies of VE against Omicron provided only a single cumulative VE estimate for an individual vaccine, which due to varying lengths of time since vaccination are difficult to interpret due to the marked waning of VE over time with Omicron.

Annex 4. Summary of Primary Series Vaccine Performance against Variants of Concern *(VE data as of 28 May 2022; Neutralization data as of 2 June 2022)*

	WHO Emergency Use Listing (EUL) Qualified Vaccines[+]									Vaccines without WHO EUL[+]	
	AstraZeneca-Vaxzevria/SII - Covishield	Beijing CNBG-BBIBP-CorV	Bharat-Covaxin	Cansino - Convidecia	Janssen-Ad26.COV 2.S	Moderna-mRNA-1273	Novavax-Nuvaxovid/SII - Covavax	Pfizer BioNTech-Comirnaty	Sinovac-CoronaVac	Anhui ZL-Recombinant	Gamaleya-Sputnik V
Alpha, Beta, Gamma											
Summary of VE*	*see update from 11 January 2022 for details of vaccine performance against Alpha, Beta, and Gamma variants of concern*										
Delta											
Summary of VE*	*see update from 27 April 2022 for details of vaccine performance against Delta variant of concern*										
Omicron[38]											
Summary of VE*	Reduced protection against infection and symptomatic disease; possible reduced protection against for severe disease but limited evidence										
- Severe disease	-	-	-	-	-	↓to↓↓/↓↓↓$_2$	-	↓↓to↓↓↓$_5$	-	-	-
- Symptomatic disease	↓↓↓$_1$	-	-	-	-	↓↓/↓↓↓$_2$	-	↓↓↓$_3$	-	-	-
- Infection	↓↓↓$_1$	-	-	-	-	↓↓↓$_3$	-	↓↓↓$_3$	-	-	-
Neutralization	↓↓↓$_7$	↓to↓↓$_4$	↓↓$_1$	-	↓to↓↓↓$_4$	↓↓↓$_{18}$	-	↓↓↓$_{46}$	↓↓to↓↓↓$_5$	-	↓↓$_1$

VE refers to vaccine effectiveness and vaccine efficacy. *Summary of VE: indicates the general conclusions but only for the vaccines evaluated against the specific variant. Arrows generalize the magnitude of reduction in VE or neutralization: "↔" <10 percentage point (pp) reduction in VE, or VE >90% with no comparator, or that there was a <2-fold reduction in neutralization; "↓" 10 to <20 pp reduction in VE, or 2 to <5-fold reduction in neutralization; "↓↓" 20 to <30 pp reduction in VE, or 5 to <10-fold reduction in neutralization; "↓↓↓" ≥30 pp reduction in VE, or ≥10-fold reduction in neutralization. When more than one neutralization study is available, the interquartile range (25th and 75th percentiles) of fold-reductions across all studies for specific vaccine/variant was used. "Moderna-mRNA-1273/Pfizer BioNTech-Comirnaty" indicates that both vaccines were evaluated together in study. The number of studies is shown as subscripts: vaccine effectiveness and neutralization studies informing this table can be found on the VIEW-hub Resources Library. References indicated by superscripts next to VOC name in column 1 are vaccine efficacy results from randomized controlled trials informing this table.

Technical guidance and other resources

- WHO technical guidance
- WHO COVID-19 Dashboard
- WHO Weekly Operational Updates on COVID-19
- WHO COVID-19 case definitions
- COVID-19 Supply Chain Inter-Agency Coordination Cell Weekly Situational Update
- Research and Development
- Open WHO courses on COVID-19 in official UN languages and in additional national languages
- WHO Academy COVID-19 mobile learning app
- The Strategic Preparedness and Response Plan (SPRP) outlining the support the international community can provide to all countries to prepare and respond to the virus
- EPI-WIN: tailored information for individuals, organizations, and communities
- Recommendations and advice for the public: Protect yourself; Questions and answers; Travel advice

References

1. Wolter N, Jassat W, Walaza S, et al. *Early Assessment of the Clinical Severity of the SARS-CoV-2 Omicron Variant in South Africa*. Infectious Diseases (except HIV/AIDS); 2021. doi:10.1101/2021.12.21.21268116

2. Campbell F, Archer B, Laurenson-Schafer H, et al. Increased transmissibility and global spread of SARS-CoV-2 variants of concern as at June 2021. *Eurosurveillance*. 2021;26(24):2100509.

3. Atkulwar A, Rehman A, Imaan Y, Baig M. Atkulwar 2022_Analyses of OMicron genomes from India reveal BA.2 as a more transmissible variant.pdf. Published online 2022. doi:https://doi.org/10.1101/2022.04.25.22274272

4. Ferguson N, Ghani A, Hinsley W, Volz E. *Report 50: Hospitalisation Risk for Omicron Cases in England*. Imperial College London; 2021. Accessed December 23, 2021. https://www.imperial.ac.uk/media/imperial-college/medicine/mrc-gida/2021-12-22-COVID19-Report-50.pdf

5. Ulloa AC, Buchan SA, Daneman N, Brown KA. Estimates of SARS-CoV-2 Omicron Variant Severity in Ontario, Canada. *JAMA*. Published online February 17, 2022. doi:10.1001/jama.2022.2274

6. Lewnard JA, Hong VX, Patel MM, Kahn R, Lipsitch M, Tartof SY. *Clinical Outcomes among Patients Infected with Omicron (B.1.1.529) SARS-CoV-2 Variant in Southern California*. Epidemiology; 2022. doi:10.1101/2022.01.11.22269045

7. Nyberg T, Twohig KA, Harris RJ, et al. Risk of hospital admission for patients with SARS-CoV-2 variant B.1.1.7: cohort analysis. *BMJ*. 2021;373:n1412. doi:10.1136/bmj.n1412

8. Gunadi, Hakim MS, Wibawa H, et al. *Comparative Analysis of the Outcomes of COVID-19 between Patients Infected with SARS-CoV-2 Omicron and Delta Variants: A Retrospective Cohort Study*. Public and Global Health; 2022. doi:10.1101/2022.04.30.22274532

9. Strasser Z, Hadavand A, Murphy S, Estiri H. *SARS-CoV-2 Omicron Variant Is as Deadly as Previous Waves After Adjusting for Vaccinations, Demographics, and Comorbidities*. In Review; 2022. doi:10.21203/rs.3.rs-1601788/v1

10. Grint DJ, Wing K, Gibbs HP, et al. *Accident and Emergency (AE) Attendance in England Following Infection with SARS-CoV-2 Omicron or Delta*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.05.03.22274602

11. Wang Z, Schmidt F, Weisblum Y, et al. mRNA vaccine-elicited antibodies to SARS-CoV-2 and circulating variants. *Nature*. Published online February 2021. https://www.ncbi.nlm.nih.gov/pubmed/33567448

12. Nyberg T, Ferguson NM, Nash SG, et al. Comparative analysis of the risks of hospitalisation and death associated with SARS-CoV-2 omicron (B.1.1.529) and delta (B.1.617.2) variants in England: a cohort study. *The Lancet*. 2022;399(10332):1303-1312. doi:10.1016/S0140-6736(22)00462-7

13. Wolter N, Jassat W, DATCOV-Gen author group, von Gottberg A, Cohen C. *Clinical Severity of Omicron Sub-Lineage BA.2 Compared to BA.1 in South Africa*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.17.22271030

14. Chang CC, Vlad G, Vasilescu ER, et al. *Previous SARS-CoV-2 Infection or a Third Dose of Vaccine Elicited Cross-Variant Neutralizing Antibodies in Vaccinated Solid Organ Transplant Recipients*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.13.22273829

15. Carazo S, Skowronski DM, Brisson M, et al. *Protection against Omicron Re-Infection Conferred by Prior Heterologous SARS-CoV-2 Infection, with and without MRNA Vaccination*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.29.22274455

16. Chemaitelly H, Ayoub HH, Coyle P, et al. *Protection of Omicron Sub-Lineage Infection against Reinfection with Another Omicron Sub-Lineage*. Epidemiology; 2022. doi:10.1101/2022.02.24.22271440

17. Bowen JE, Sprouse KR, Walls AC, et al. *Omicron BA.1 and BA.2 Neutralizing Activity Elicited by a Comprehensive Panel of Human Vaccines*. Immunology; 2022. doi:10.1101/2022.03.15.484542

18. Iketani S, Liu L, Guo Y, Liu L, Huang Y, Wang M. Antibody Evasion Properties of SARS-CoV-2 Omicron Sublineages. :12.

19. Yu J, Collier A ris Y, Rowe M, et al. *Comparable Neutralization of the SARS-CoV-2 Omicron BA.1 and BA.2 Variants*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.06.22270533

20. Khan K, Karim F, Ganga Y, et al. *Omicron Sub-Lineages BA.4/BA.5 Escape BA.1 Infection Elicited Neutralizing Immunity*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.29.22274477

21. Hachmann NP, Miller J, Collier A ris Y, et al. *Neutralization Escape by the SARS-CoV-2 Omicron Variants BA.2.12.1 and BA.4/BA.5*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.05.16.22275151

22. Cao Y, Yisimayi A, Jian F, et al. *BA.2.12.1, BA.4 and BA.5 Escape Antibodies Elicited by Omicron Infection*. Immunology; 2022. doi:10.1101/2022.04.30.489997

23. Metzger CM, Lienhard R, Seth-Smith HM. PCR performance in the SARS-CoV-2 Omicron variant of concern? *Swiss Med Wkly*. 2021;151(49-50). doi:10.4414/smw.2021.w30120

24. Drain PK, Bemer M, Morton JF, et al. *Accuracy of Rapid Antigen Testing across SARS-CoV-2 Variants*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.03.21.22272279

25. Soni A, Herbert C, Filippaios A, et al. *Comparison of Rapid Antigen Tests' Performance between Delta (B.1.61.7; AY.X) and Omicron (B.1.1.529; BA1) Variants of SARS-CoV-2: Secondary Analysis from a Serial Home Self-Testing Study*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.27.22271090

26. Bayart JL, Degosserie J, Favresse J, et al. Analytical Sensitivity of Six SARS-CoV-2 Rapid Antigen Tests for Omicron versus Delta Variant. Published online 2022:9.

27. Bekliz M, Perez-Rodriguez F, Puhach O, et al. *Sensitivity of SARS-CoV-2 Antigen-Detecting Rapid Tests for Omicron Variant*. Infectious Diseases (except HIV/AIDS); 2021. doi:10.1101/2021.12.18.21268018

28. Takashita E, Kinoshita N, Yamayoshi S, et al. Efficacy of Antiviral Agents against the SARS-CoV-2 Omicron Subvariant BA.2. *N Engl J Med*. Published online March 9, 2022:NEJMc2201933. doi:10.1056/NEJMc2201933

29. Planas D, Saunders N, Maes P, et al. *Considerable Escape of SARS-CoV-2 Variant Omicron to Antibody Neutralization*. Immunology; 2021. doi:10.1101/2021.12.14.472630

30. VanBlargan LA, Errico JM, Halfmann PJ, et al. *An Infectious SARS-CoV-2 B.1.1.529 Omicron Virus Escapes Neutralization by Several Therapeutic Monoclonal Antibodies*. Microbiology; 2021. doi:10.1101/2021.12.15.472828

31. Cameroni E, Saliba C, Bowen JE. Broadly neutralizing antibodies overcome SARS-CoV-2 Omicron antigenic shift. Published December 14, 2021. Accessed December 23, 2021. https://www.biorxiv.org/content/10.1101/2021.12.12.472269v1

32. Roche. Ronapreve does not retain neutralising activity against the Omicron variant. Published 2021. Accessed December 17, 2021. https://www.roche.com/dam/jcr:dfe6dcb4-d787-45d6-9b1d-ffc17d667e4c/2021216_Roche%20statement%20on%20Ronapreve%20Omicron.pdf

33. World Health Organization. Therapeutics and COVID-19: Living guideline. Accessed December 17, 2021. https://www.who.int/publications/i/item/WHO-2019-nCoV-therapeutics-2021.4

34. Yamasoba D, Kosugi Y, Kimura I, et al. *Sensitivity of Novel SARS-CoV-2 Omicron Subvariants, BA.2.11, BA.2.12.1, BA.4 and BA.5 to Therapeutic Monoclonal Antibodies*. Microbiology; 2022. doi:10.1101/2022.05.03.490409

35. Amir O, Goldberg Y, Mandel M, et al. *Initial Protection against Omicron in Children and Adolescents by BNT162b2*. Epidemiology; 2022. doi:10.1101/2022.05.22.22275323

36. Ella R, Reddy S, Blackwelder W, et al. Efficacy, safety, and lot to lot immunogenicity of an inactivated SARS-CoV-2 vaccine (BBV152): a, double-blind, randomised, controlled phase 3 trial. Published online July 2, 2021:2021.06.30.21259439. doi:10.1101/2021.06.30.21259439

COVID-19 Weekly Epidemiological Update

Edition 96, published 15 June 2022

In this edition:

Global overview

Data as of 12 June 2022

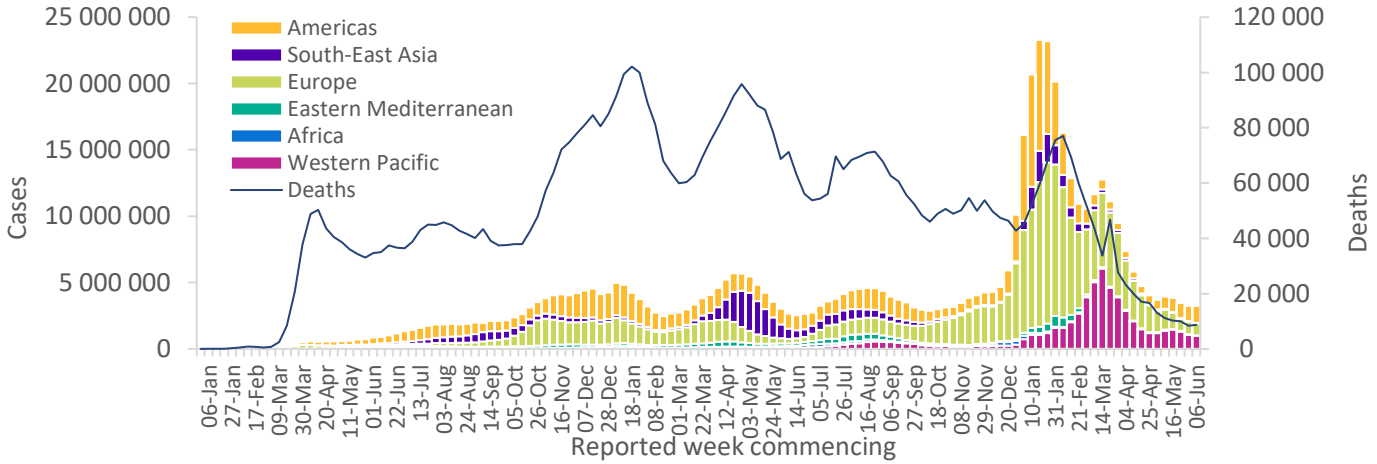
Globally, the number of new weekly cases has continued to decline since a peak in January 2022. During the week of 6 until 12 June 2022, over 3.2 million cases were reported, similar to the number reported during the previous week (figure 1).
After five weeks of decline, the number of new weekly deaths has risen again, with over 8700 fatalities reported, a 4% increase as compared to the previous week.

At the regional level, the number of new weekly cases increased in the Eastern Mediterranean Region (+58%), in the South-East Asia Region (+33%) and in the Region of the Americas (+13%), while it decreased in the other three WHO regions.
The number of new weekly deaths increased in the Region of the Americas (+21%) and Western Pacific Region (+17%), while decreasing trends were observed in the other four regions.

As of 12 June 2022, over 533 million confirmed cases and over 6.3 million deaths have been reported globally.

These trends should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 12 June 2022**



**See *Annex 1: Data, table, and figure notes*

At the country level, the highest number of new weekly cases were reported from the United States of America (743 723 new cases; +13%), China (501 146 new cases; -5%), Germany (281 706 new cases; +16%), Brazil (279 862 new cases; +29%), and Australia (194 158 new cases; -13%).

The highest number of new weekly deaths were reported from the United States of America (2367 new deaths; +32%), China (1201 new deaths; +32%), Brazil (989 new deaths; +52%), the Russian Federation (500 new deaths; -12%), and Italy (443 new deaths; +17%).

Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 12 June 2022**

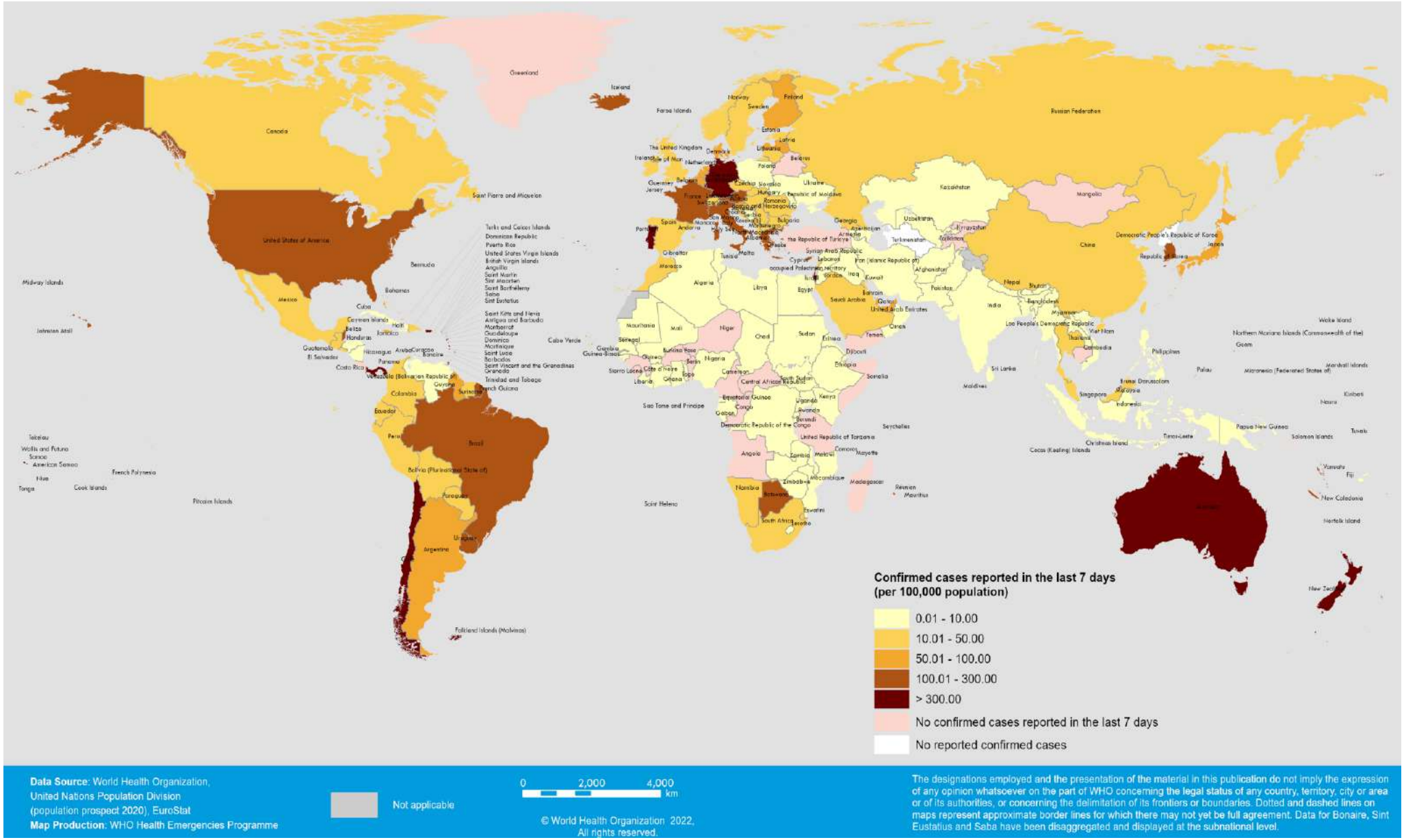
WHO Region	New cases in last 7 days (%)	Change in new cases in last 7 days *	Cumulative cases (%)	New deaths in last 7 days (%)	Change in new deaths in last 7 days *	Cumulative deaths (%)
Americas	1 278 169 (39%)	13%	159 473 940 (30%)	4 105 (47%)	21%	2 750 430 (44%)
Western Pacific	970 940 (30%)	-8%	61 985 866 (12%)	1 882 (22%)	17%	233 976 (4%)
Europe	873 103 (27%)	-8%	222 587 925 (42%)	2 208 (25%)	-18%	2 018 528 (32%)
South-East Asia	67 795 (2%)	33%	58 240 686 (11%)	261 (3%)	-25%	789 225 (13%)
Eastern Mediterranean	33 329 (1%)	58%	21 823 732 (4%)	62 (1%)	-32%	342 966 (5%)
Africa	27 097 (1%)	-7%	9 047 715 (2%)	219 (3%)	-11%	173 028 (3%)
Global	**3 250 433 (100%)**	**<1%**	**533 160 628 (100%)**	**8 737 (100%)**	**4%**	**6 308 166 (100%)**

**Percent change in the number of newly confirmed cases/deaths in the past seven days, compared to seven days prior*
**See *Annex 1: Data, table, and figure notes*

For the latest data and other updates on COVID-19, please see:

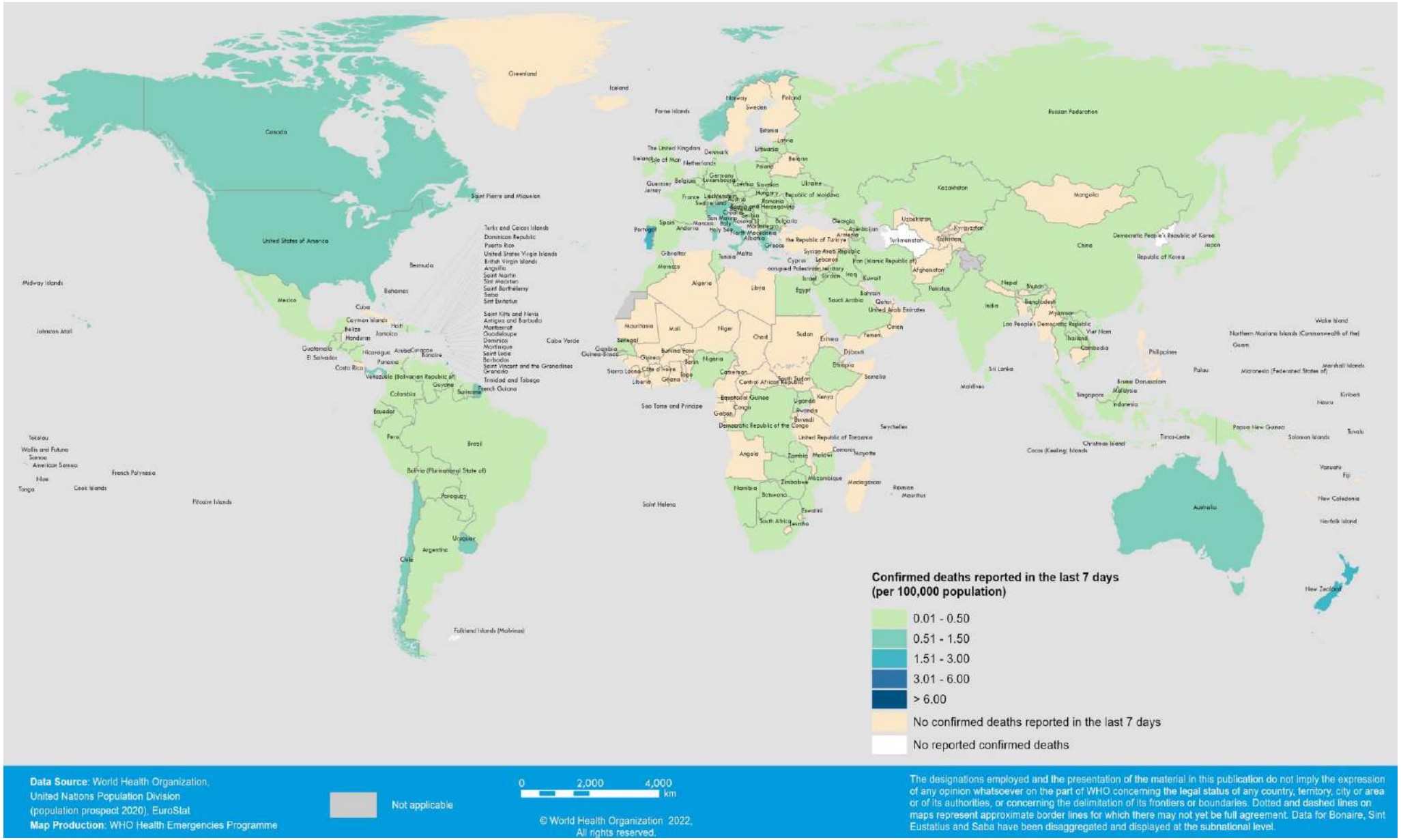
- WHO COVID-19 Dashboard
- WHO COVID-19 Weekly Operational Update and previous editions of the Weekly Epidemiological Update
- WHO COVID-19 detailed surveillance data dashboard

Figure 2. COVID-19 cases per 100 000 population reported by countries, territories and areas, 6 – 12 June 2022*



**See *Annex 1: Data, table, and figure notes*

Figure 3. COVID-19 deaths per 100 000 population reported by countries, territories and areas, 6-12 June 2022*



**See *Annex 1: Data, table, and figure notes*

Special Focus: Update on SARS-CoV-2 variants of interest and variants of concern

WHO, in collaboration with national authorities, institutions and researchers, routinely assesses if variants of SARS-CoV-2 alter transmission or disease characteristics, or impact the effectiveness of vaccines, therapeutics, diagnostics or public health and social measures (PHSM) applied to control disease spread. Potential variants of concern (VOCs), variants of interest (VOIs) or variants under monitoring (VUMs) are regularly assessed based on the risk posed to global public health.

The classifications of variants will be revised as needed to reflect the continuous evolution of circulating variants and their changing epidemiology. Criteria for variant classification, and the lists of currently circulating and previously circulating VOCs, VOIs and VUMs, are available on the WHO Tracking SARS-CoV-2 variants website. National authorities may choose to designate other variants and are strongly encouraged to investigate and report newly emerging variants and their impact.

Geographic spread and prevalence of VOCs

Within the last 30 days (13 May to 12 June 2022), 169 940 SARS-CoV-2 sequences were submitted to GISAID. There continues to be a substantial decline in the number of SARS-CoV-2 submissions to GISAID, as compared to the number of sequences submitted during the month of January 2022, when 1 248 906 sequences were submitted to GISAID. The Omicron VOC remains the dominant variant circulating globally, accounting for 97% of sequences reported. Among Omicron lineages submitted to GISAID, BA.2 represents 39%, while BA.2.12.1 represents 28%, BA.5 represents 6%, and BA.4 represents 3%. For epidemiological week 20 (15 to 21 May 2022) and week 21 (22 to 28 May 2022), there was a 4% decline in the number of BA.2 sequences, while there were increases of 4%, 3%, and 2% in BA.5, BA.2.12.1, and BA.4 sequences respectively.

These trends should be interpreted with due consideration of the limitations of surveillance systems, including differences in sequencing capacity and sampling strategies between countries, as well as changes in sampling and sequencing strategies in multiple countries.

Additional resources

- Tracking SARS-CoV-2 Variants
- COVID-19 new variants: Knowledge gaps and research
- Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health
- Considerations for implementing and adjusting public health and social measures in the context of COVID-19
- VIEW-hub: repository for the most relevant and recent vaccine data
- WHO Statement on Omicron sublineage BA.2

Special Focus: WHO Mass Gatherings Global Event Database Analysis

Mass Gatherings (MGs) are events characterized by the concentration of people at a specific location for a specific purpose over a set period of time (WHO, 2015). As such, if inadequately planned and/or managed, mass gatherings have the potential to strain the response resources of the host country or community, also working as amplifiers of disease outbreaks. During the COVID-19 pandemic, the threshold for identifying such events as mass gatherings lowered significantly, as even smaller events and gatherings posed a risk to increased spread of the virus.

Since the beginning of the pandemic, WHO continues to recommend that the decision-making process related to holding, modifying, postponing or cancelling gatherings of any size in the context of the COVID-19 pandemic should rely on a risk-based approach. Such risk assessment exercises should be tailored to the characteristics of the event under consideration and be repeated at regular intervals, throughout the planning period as well as during the gathering, stopping only after the event has ended when local systems have returned to normal. Following such an approach enables a factual and dynamic appraisal of the overall risk associated with the event and its implications, and a timely adaptation of the response[i].

Recognized as a best practice for mass gatherings, public health authorities and event organizers are invited to apply WHO's recommended risk-based approach to decision-making for mass gatherings, tailoring it to the event under consideration.

WHO Mass Gatherings Global Event Database

In January 2020, WHO and its Collaborating Centre for Global Health Security – the Johns Hopkins Bloomberg School of Public Health (JHU) – developed a WHO Mass Gatherings Global Event Database to monitor the impact of the COVID-19 pandemic on mass gathering planning.
Hosts of mass gatherings, as well as all partners involved, are encouraged to enter information on events into an online form (example data shown) that feeds into the global database and is regularly reviewed and updated by JHU. Between January 2020 and 7 June 2022, the database featured over 5000 mass gatherings, of which 58% have applied WHO's risk-based approach in their decision-making process.

Mass Gatherings Indicators of risk-based approach implementation:

The database has been used to inform WHO's COVID-19 Strategic Preparedness and Response Plan (SPRP) and its associated mass gatherings country-based and event-based indicator(s) on a weekly and monthly basis, as described below (see Table 2).
Since the beginning of the COVID-19 pandemic, the use of risk-based approaches to mass gatherings has increased substantially. As of 7 June 2022, 174 out of 196 (88.7%) countries worldwide, including 90.2% (165/183) of Member States and 75% (9/13) of non-Member States, reported having a mass gathering event being affected by COVID-19 (cancelled, postponed, suspended, otherwise modified or re-opened in post-crisis scenario, i.e. their regular format) as a result of using a risk-based approach to decide if or how a mass gathering should be held.

[i] https://apps.who.int/iris/handle/10665/332235

The mass gatherings event-level SPRP indicator has remained relatively stable for the last six months at 68%-70% and as of 7 June 2022, 68.5% of events reported having been affected by COVID-19 (Table 2).

Table 2. Mass Gatherings country and event-level SPRP monitoring indicators

Indicator	*Description*	*Percentage*	*Number*
Country-level SPRP indicator	*Percentage of countries that reported having at least one mass gathering event affected by COVID-19 (cancelled, postponed, suspended, otherwise modified or re-opened in post crisis scenario) as a result of a risk assessment exercise/risk-based approach.*	***88.7%***	*174 out of 196 countries*
Event-level SPRP indicator	*Percentage of events that were affected by COVID-19 (cancelled, postponed, suspended, otherwise modified or re-opened in post crisis scenario) as a result of a risk assessment exercise/risk-based approach.*	***68.5 %***	*2967 out of 4329 events*

The breakdown of the mass gatherings country-level SPRP indicator on the use of a risk assessment/risk-based approach for those affected by COVID-19 mass gathering events (88.7% in total) by WHO region and Member States status is described below (see Table 3).

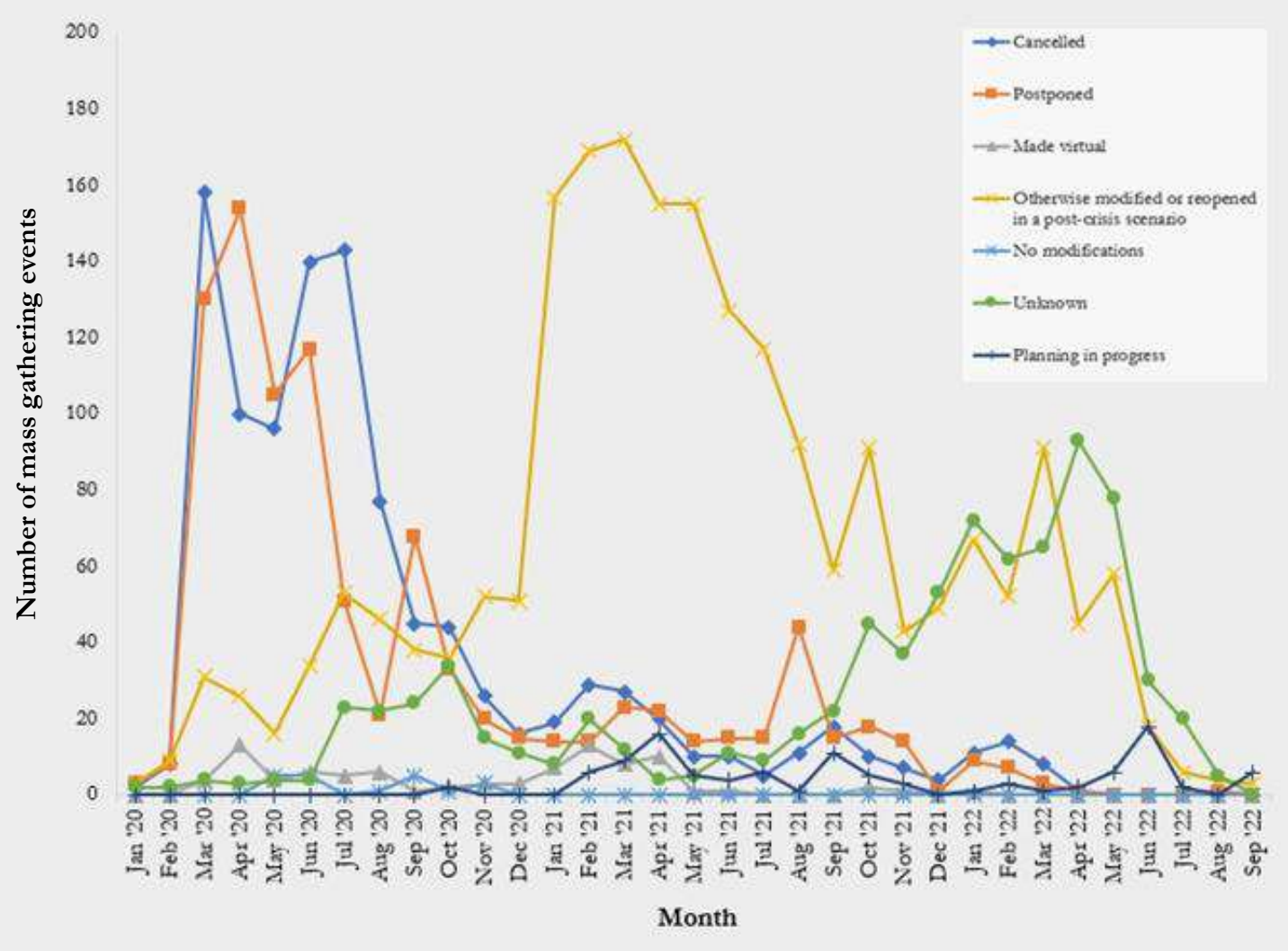
Table 3. Breakdown of the mass gatherings country-level SPRP indicator by WHO Region

WHO Region	Member-States percentage (N)	Non-Member States percentage (N)	WHO Region percentage (N)
Africa	86.7% (39)	100% (1)	87.0% (40)
Americas	87.1% (27)	100% (1)	77.8% (28)
Eastern Mediterranean	81.8% (18)	-	81.8% (18)
Europe	98.1% (53)	100% (2)	98.2% (55)
South-East Asia	81.8% (9)	-	81.8% (9)
Western Pacific	95.0% (19)	100% (5)	96% (24)
Total	90.2% (165 out of 183)	75.0% (9 out of 13)	88.7% (174 out of 196)

Monitoring of mass gathering events status

Monitored modifications to mass gatherings include cancellation, postponement, made virtual, otherwise modified or reopened in post-crisis scenario, held with no modifications, with unknown status, and planning in progress. Data collection for each calendar year includes all events that are happening through the end of December of the current year in order to forecast potential situations of concern. Events that have not yet occurred are recorded as “Planning in progress.” Events for which no data could be found on the event status are recorded as “Unknown”. Figure 4 (below) provides a temporal analysis of decisions made to mass gatherings by host authorities throughout the COVID-19 pandemic.

Figure 4. Monitoring of the mass gathering events status using the WHO Mass Gatherings Global Event Database, 2020- 2022



The majority of mass gatherings were postponed or cancelled in early to mid-2020, most likely as a default measure, but the majority of mass gatherings in late 2020 to 2021 were held in a modified format (i.e. online or hybrid format) as organizers began to embrace the risk-based approach process. The trend also generally follows the decline in mass gatherings coinciding with peaks in incidence of Delta and Omicron VOCs, respectively. The drop in recorded mass gatherings in the database during the latter half of 2022 is likely more attributable to ongoing data collection efforts rather than a true representation of the number of events being held during that time period. However, the proportional rise in events not reporting their status, as compared to reporting modifications or postponements, is being observed. More work is needed to convey the continued risks of SARS-CoV-2 transmission to mass gathering event organizers to encourage the ongoing use and reporting of a risk assessment/risk-based approach (RA/RBA).

Mass gatherings that indicated using a RA/RBA were most often reported to be otherwise modified rather than cancelled or postponed (see Table 4). Fifty-two percent of events (1581 out of 3045) that indicated the use of RA/RBA reported a modification to the event. However, there are still gaps in the data where it could not be determined

whether event organizers used a RA/RBA to make decisions about their events. Over 40% (2134 out of 5244) of all recorded events have not reported whether a RA/RBA was used.

The continuous process of cataloguing and analyzing global mass gatherings demonstrates its value and practicality for the WHO SPRP during the COVID-19 pandemic. Knowing where and when mass gatherings will occur can inform resource mobilization efforts and public health operational response during COVID-19 and other outbreaks.

Additionally, the decision to modify, postpone, or cancel a mass gathering often depends on financial and other considerations alongside health and safety concerns. Applying the risk assessment/risk-based approach can facilitate the delivery of a safe and successful event that, in turn, may yield important psychosocial benefits for participants and spectators and generate revenues for host countries and organizers. However, it is also clear that applying a set of precautionary measures also requires significant levels of human and financial resources. Event organizers, therefore, must account for these factors when planning gatherings of all sizes.

Table 4. Breakdown of usage of a risk assessment for recorded mass gathering events globally (n=5244) as of 7 June 2022

Use of risk assessment	Status of mass gatherings							
	Cancelled	Postponed	Made virtual	Otherwise modified	No modifications	Unknown	Planning in progress	Total
Yes	801 (15.27%)	523 (9.97%)	89 (1.70%)	1581 (30.15%)	4 (0.08%)	16 (0.31%)	31 (0.59%)	3045 (58.07%)
No	34 (0.65%)	7 (0.13%)	0 (0.00%)	19 (0.36%)	3 (0.06%)	2 (0.04%)	0 (0.00%)	65 (1.24%)
Not reported	249 (4.75%)	440 (8.39%)	2 (0.04%)	553 (10.55%)	13 (0.25%)	800 (15.26%)	77 (1.47%)	2134 (40.69%)
Total	1084 (20.67%)	970 (18.50%)	91 (1.74%)	2153 (41.06%)	20 (0.38%)	818 (15.60%)	108 (2.06%)	5244 (100.00%)

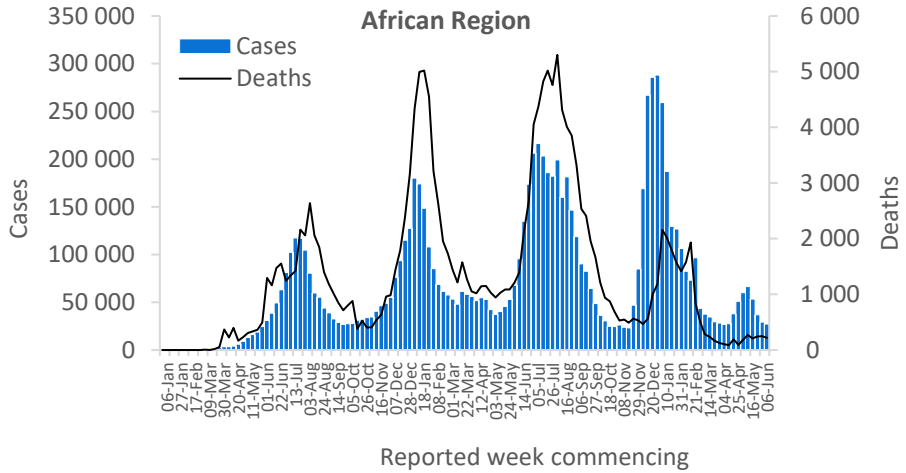
WHO regional overviews:

Epidemiological week 6-12 June 2022**

African Region

The African Region reported a decline in the number of new weekly cases for the third consecutive week, with over 27 000 new cases, a 7% decrease as compared to the previous week. However, 13 (27%) countries reported an increase in the number of new cases of 20% or greater, with some of the greatest proportional increases seen in Malawi (89 vs 37 new cases; +141%), Uganda (572 vs 267 new cases; +114%) and Cabo Verde (540 vs 266 new cases; +103%). The countries that reported the highest numbers of new cases were South Africa (10 550 new cases; 17.8 new cases per 100 000 population; -29%), Ethiopia (3829 new cases; 3.3 new cases per 100 000; +54%), and Réunion (1924 new cases; 214.9 new cases per 100 000; -6%)

The number of new weekly deaths in the Region decreased by 11% as compared to the previous week, with over 200 new deaths reported. The highest numbers of new deaths were reported from South Africa (164 new deaths; <1 new death per 100 000 population; -4%), Réunion (12 new deaths; 1.3 new deaths per 100 000; +71%), and Zimbabwe (11 new deaths; <1 new deaths per 100 000; +10%).

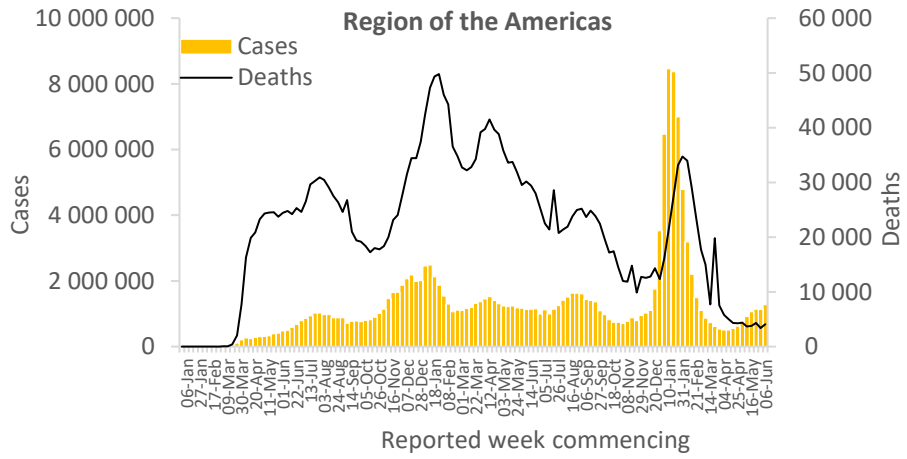


Updates from the African Region

Region of the Americas

The Region of the Americas has continued to report increases in case incidence since mid-April 2022, with over 1.2 million new weekly cases, a 13% increase as compared to the previous week. Seventeen (30%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Saint Martin (74 vs 38 new cases; +95%), the British Virgin Islands (137 vs 75 new cases; +83%) and Bolivia (Plurinational State of) (2002 vs 1250 new cases; +60%). The highest number of new cases were reported from the United States of America (743 723 new cases; 224.7 new cases per 100 000; +13%), Brazil (279 862 new cases; 131.7 new cases per 100 000; +29%), and Chile (69 174 new cases; 361.9 new cases per 100 000; +25%).

The number of new weekly deaths in the Region increased by 21% as compared to the previous week, with over 4100 new deaths reported. The highest numbers of new deaths were reported from the United States of America (2367 new deaths; <1 new death per 100 000; +32%), Brazil (989 new deaths; <1 new death per 100 000; +52%), and Canada (199 new deaths; <1 new death per 100 000; -35%).

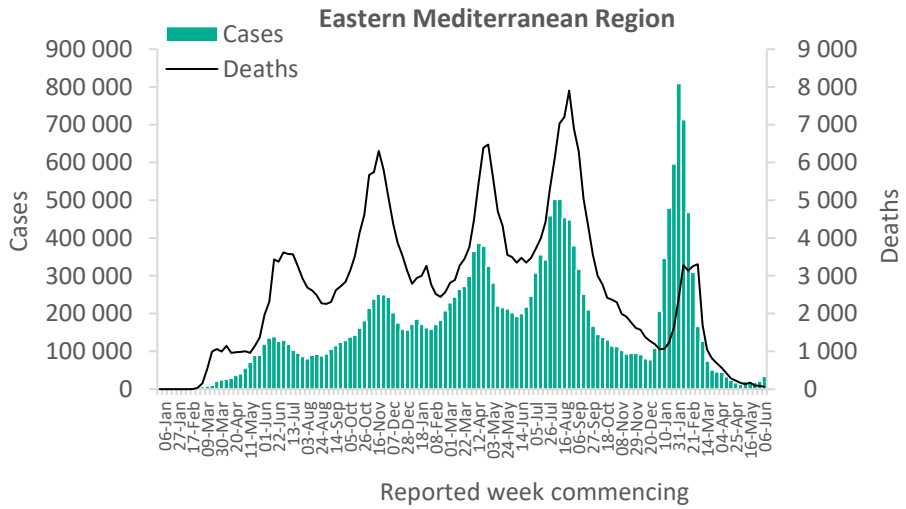


Updates from the Region of the Americas

Eastern Mediterranean Region

The Eastern Mediterranean Region reported over 33 000 new weekly cases, representing a 58% increase as compared to the previous week. Twelve (55%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Morocco (5184 vs 2188 new cases; +137), Kuwait (1701 vs 851 new cases; +100%) and the United Arab Emirates (5909 vs 3269 new cases; +81%). The highest numbers of new cases were reported from Bahrain (6551 new cases; 385.0 new cases per 100 000; +60%), Saudi Arabia (6149 new cases; 17.7 new cases per 100 000; +35%), and the United Arab Emirates (5909 new cases; 59.7 new cases per 100 000; +81%).

The number of new weekly deaths in the Region decreased by 32% as compared to the previous week, with 62 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (21 new deaths; <1 new death per 100 000; -5%), Saudi Arabia (15 new deaths; <1 new death per 100 000; +25%), and Lebanon (eight new deaths; <1 new death per 100 000; -11%).

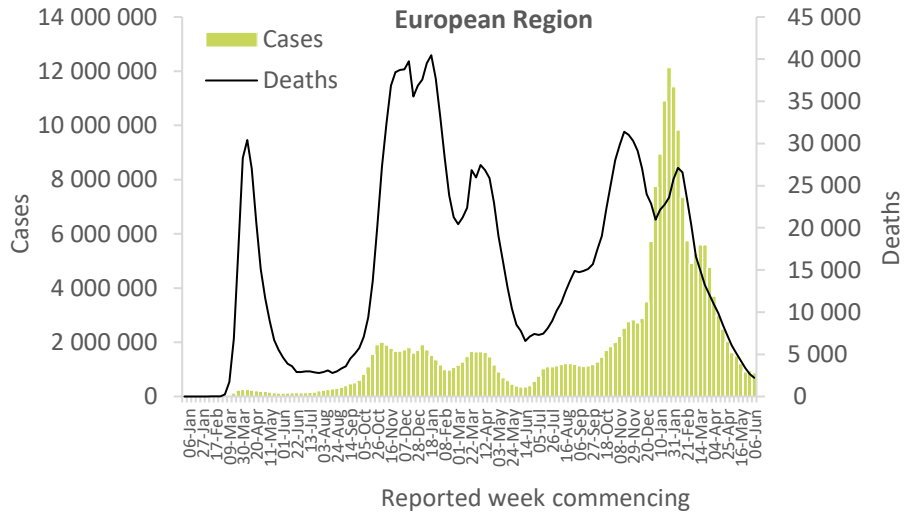


Updates from the Eastern Mediterranean Region

European Region

After decreases in the number of new weekly cases observed since mid-March 2022, the European Region reported over 873 000 new cases this week, an 8% increase compared to the previous week. Twenty-one (34%) countries in the Region reported increases in new cases of 20% or greater, with some of the greatest proportional increases observed in the Republic of Moldova (227 vs 34 new cases; +568%), Jersey (308 vs 167 new cases; +84%) and Israel (29 248 vs 16 476 new cases; +78%). The highest numbers of new cases were reported from Germany (281 706 new cases; 338.7 new cases per 100 000; +16%), Italy (143 614 new cases; 240.8 new cases per 100 000; +23%), and France (136 360 new cases; 209.7 new cases per 100 000; -2%).

Over 2200 new weekly deaths were reported, an 18% decrease as compared to the previous week. The highest numbers of new deaths were reported from the Russian Federation (500 new deaths; <1 new death per 100 000; -12%), Italy (443 new deaths; <1 new death per 100 000; +17%), and France (240 new deaths; <1 new death per 100 000; -26%).



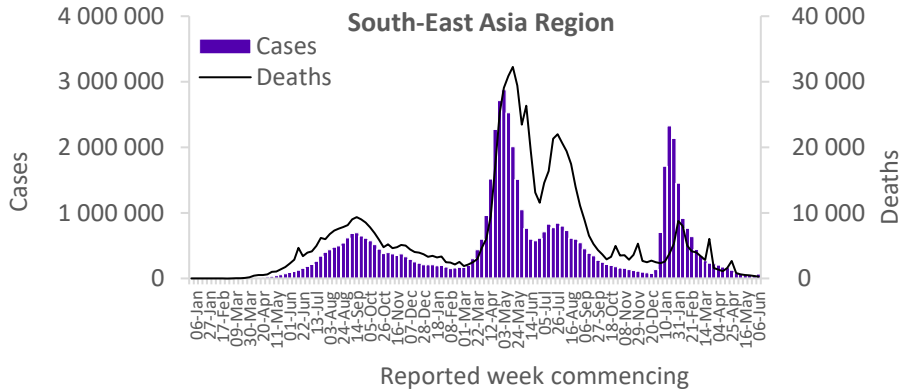
Updates from the European Region

South-East Asia Region

After the declining trend in new cases observed since mid-January 2022, the South-East Asia Region reported over 67 000 new cases, a 33% increase compared to the previous week. Five (50%) countries showed increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Bangladesh (492 vs 216 new cases; +128%), India (45 200 vs 23 774 new cases; +90%) and Indonesia (3688 vs 2385 new cases; +55%). The highest numbers of new cases were reported from India (45 200 new cases; 3.3 new cases per 100 000; +90%), Thailand (18 070 new cases; 25.9 new cases per 100 000; -25%), and Indonesia (3688 new cases; 1.3 new cases per 100 000; +55%).

The number of new weekly deaths in the Region decreased by 25% as compared to the previous week, with over 200 new deaths reported. The highest numbers of new deaths were reported from Thailand (163 new deaths; <1 new death per 100 000; -18%), India (69 new deaths; <1 new death per 100 000; -35%), and Indonesia (28 new deaths; <1 new death per 100 000; -32%).

Reports of an outbreak of COVID-19 reported in the Democratic People's Republic of Korea continue through official media on 12 May 2022; however, at present, no confirmed cases or deaths have been reported to WHO.

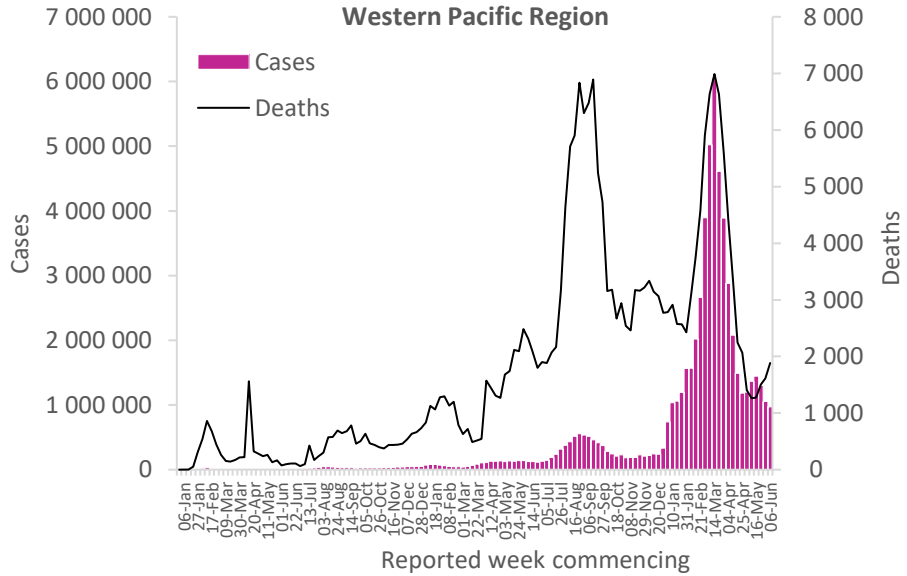


Updates from the South-East Asia Region

Western Pacific Region

With just under 971 000 new cases reported last week, the Western Pacific Region continues the decreasing trend observed for the third consecutive week. This represents an 8% decline in new cases as compared to the previous week. Six (18%) countries reported increases in new cases of 20% or greater, with the largest proportional increases observed in Guam (688 vs 126 new cases; +446%), French Polynesia (160 vs 35 new cases; +357%) and Palau (80 vs 45 new cases; +78%). The highest numbers of new cases were reported from China (501 146 new cases; 34.1 new cases per 100 000; -5%), Australia (194 158 new cases; 761.4 new cases per 100 000; -13%), and Japan (125 577 new cases; 99.3 new cases per 100 000; +3%).

The Region reported over 1800 new weekly deaths, representing a 17% increase as compared to the previous week. The highest numbers of new deaths were reported from China (1201 new deaths; <1 new death per 100 000; +32%), Australia (295 new deaths; 1.2 new deaths per 100 000; +2%), and Japan (144 new deaths; <1 new death per 100 000; -28%).



Updates from the Western Pacific Region

Annex 1. Data, table, and figure notes

Data presented are based on official laboratory-confirmed COVID-19 cases and deaths reported to WHO by country/territories/areas, largely based upon WHO case definitions and surveillance guidance. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change, and caution must be taken when interpreting these data as several factors influence the counts presented, with variable underestimation of true case and death incidences, and variable delays to reflecting these data at the global level. Case detection, inclusion criteria, testing strategies, reporting practices, and data cut-off and lag times differ between countries/territories/areas. A small number of countries/territories/areas report combined probable and laboratory-confirmed cases. Differences are to be expected between information products published by WHO, national public health authorities, and other sources.

Due to public health authorities conducting data reconciliation exercises that remove large numbers of cases or deaths from their total counts, negative numbers may be displayed in the new cases/deaths columns as appropriate. When additional details become available that allow the subtractions to be suitably apportioned to previous days, graphics will be updated accordingly. A record of historic data adjustment made is available upon request by emailing epi-data-support@who.int. Please specify the countries of interest, time period, and purpose of the request/intended usage. Prior situation reports will not be edited; see covid19.who.int for the most up-to-date data. COVID-19 confirmed cases and deaths reported in the last seven days by countries, territories, and areas, and WHO Region (reported in previous issues) are now available at: https://covid19.who.int/table.

'Countries' may refer to countries, territories, areas or other jurisdictions of similar status. The designations employed, and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Countries, territories, and areas are arranged under the administering WHO region. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions except, the names of proprietary products are distinguished by initial capital letters.

[1] All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999). In the map, the number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.
[2] Since 21 May, data for COVID-19 cases and deaths in Northern Ireland was no longer included in the United Kingdom updates (see here for the official announcement).

Technical guidance and other resources

- WHO technical guidance
- WHO COVID-19 Dashboard
- WHO Weekly Operational Updates on COVID-19
- WHO COVID-19 case definitions
- COVID-19 Supply Chain Inter-Agency Coordination Cell Weekly Situational Update
- Research and Development
- Open WHO courses on COVID-19 in official UN languages and in additional national languages
- WHO Academy COVID-19 mobile learning app
- The Strategic Preparedness and Response Plan (SPRP) outlining the support the international community can provide to all countries to prepare and respond to the virus
- EPI-WIN: tailored information for individuals, organizations, and communities
- Recommendations and advice for the public: Protect yourself; Questions and answers; Travel advice

COVID-19 Weekly Epidemiological Update

Edition 97, published 22 June 2022

In this edition:

Global overview

Data as of 19 June 2022

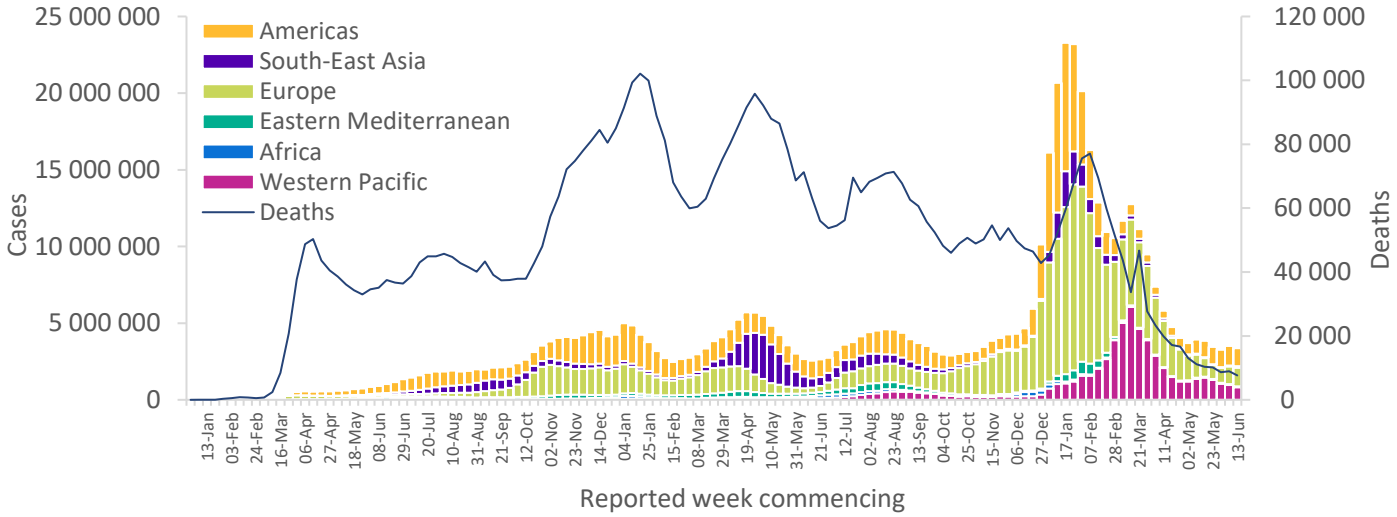
Globally, the number of new weekly cases has continued to decline since the peak in January 2022. During the week of 13 until 19 June 2022, over 3.3 million cases were reported, a 4% decrease as compared to the previous week (figure 1). The number of new weekly deaths declined by 16% as compared to the previous week, with over 7500 fatalities reported.

At the regional level, the number of new weekly cases increased in the South-East Asia Region (+46%), the Eastern Mediterranean Region (+45%), and the European Region (+6%), while it decreased in the other three WHO regions. The number of new weekly deaths increased in the South-East Asia Region (+4%), while decreasing trends were observed in the other five regions.

As of 19 June 2022, over 536 million confirmed cases and over 6.3 million deaths have been reported globally.

These trends should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

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



**See *Annex 1: Data, table, and figure notes*

At the country level, the highest number of new weekly cases were reported from the United States of America (652 217 new cases; -12%), China (406 401 new cases; -19%), Germany (356 414 new cases; +10%), Brazil (256 034 new cases; -9%), and France (253 322 new cases; +33%). The highest number of new weekly deaths were reported from the United States of America (1 858 new deaths; -13%), China (1 044 new deaths; -13%), Brazil (956 new deaths; -3%), the Russian Federation (443 new deaths; -11%), and Italy (338 new deaths; -24%).

Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 19 June 2022**

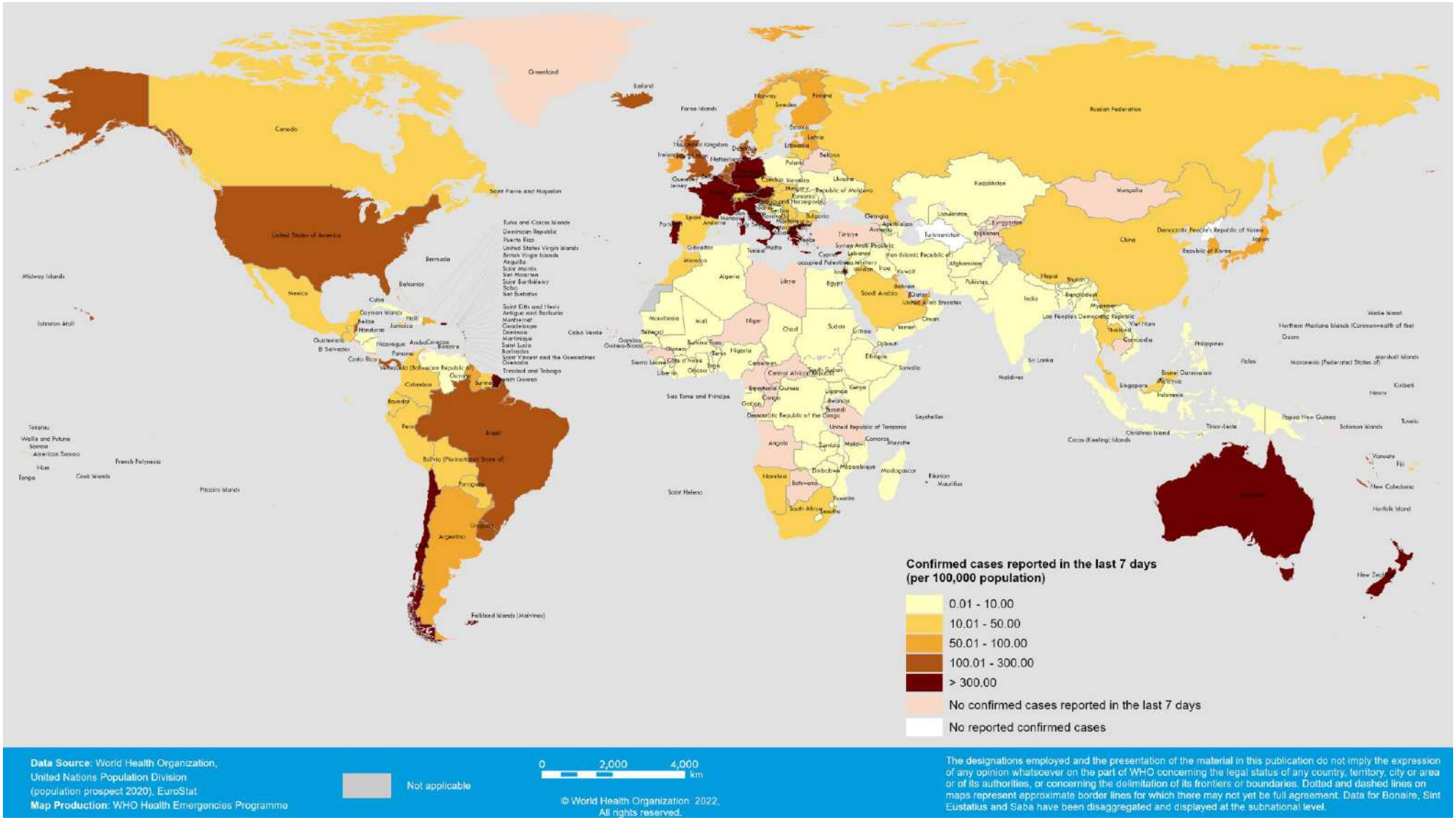
WHO Region	New cases in last 7 days (%)	Change in new cases in last 7 days *	Cumulative cases (%)	New deaths in last 7 days (%)	Change in new deaths in last 7 days *	Cumulative deaths (%)
Europe	1 201 047 (36%)	6%	224 069 651 (42%)	1 985 (26%)	-26%	2 021 567 (32%)
Americas	1 169 388 (35%)	-9%	160 675 014 (30%)	3 437 (45%)	-11%	2 754 328 (44%)
Western Pacific	820 228 (24%)	-16%	62 806 589 (12%)	1 667 (22%)	-11%	235 643 (4%)
South-East Asia	99 237 (3%)	46%	58 339 959 (11%)	273 (4%)	4%	789 500 (12%)
Eastern Mediterranean	48 257 (1%)	45%	21 872 148 (4%)	61 (1%)	-2%	343 395 (5%)
Africa	22 296 (1%)	-21%	9 074 845 (2%)	169 (2%)	-24%	173 207 (3%)
Global	**3 360 453 (100%)**	**-4%**	**536 838 970 (100%)**	**7 592 (100%)**	**-16%**	**6 317 653 (100%)**

**Percent change in the number of newly confirmed cases/deaths in the past seven days, compared to seven days prior*
**See *Annex 1: Data, table, and figure notes*

For the latest data and other updates on COVID-19, please see:

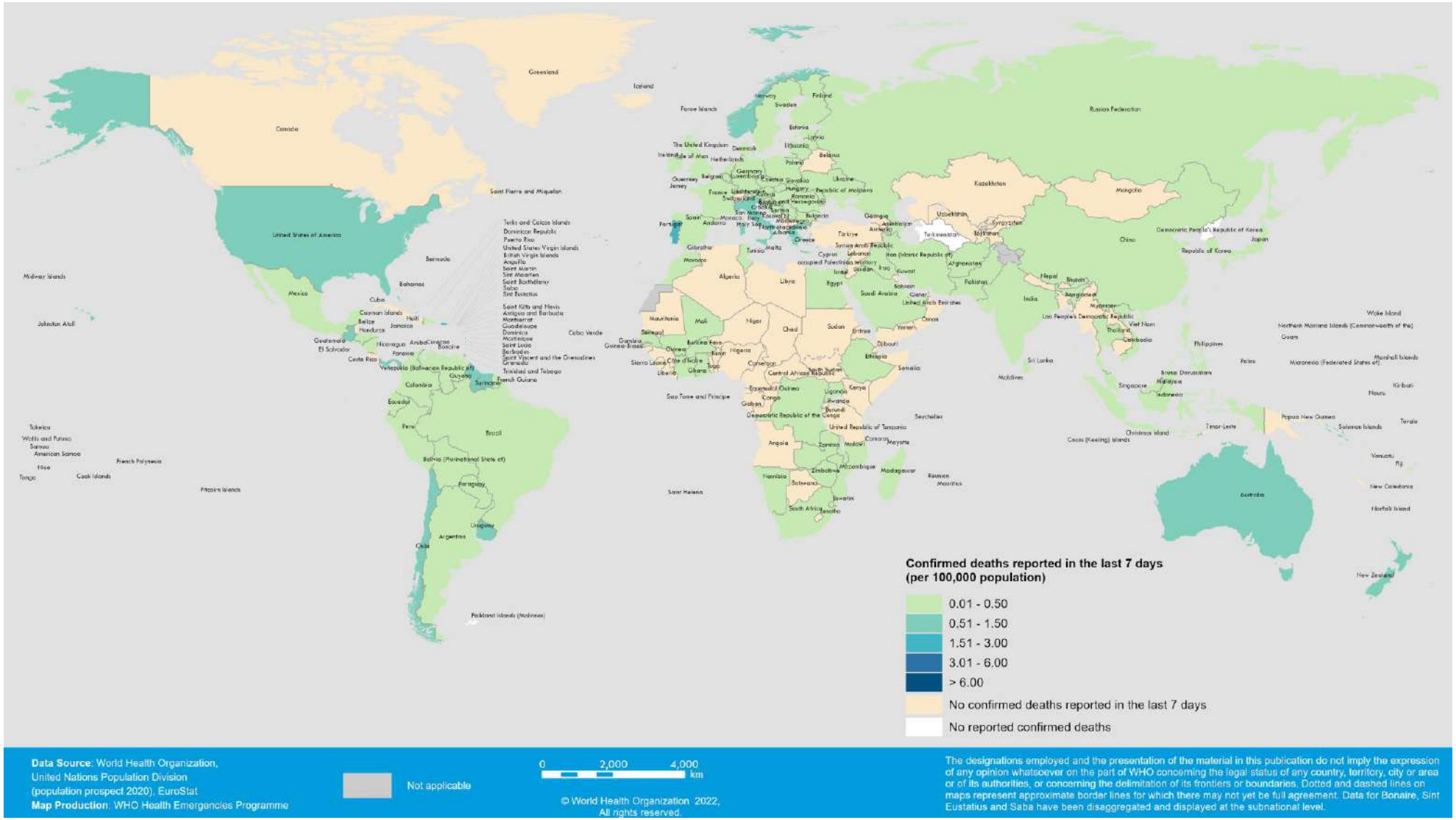
- WHO COVID-19 Dashboard
- WHO COVID-19 Weekly Operational Update and previous editions of the Weekly Epidemiological Update
- WHO COVID-19 detailed surveillance data dashboard

Figure 2. COVID-19 cases per 100 000 population reported by countries, territories and areas, 13 – 19 June 2022*



**See *Annex 1: Data, table, and figure notes*

Figure 3. COVID-19 deaths per 100 000 population reported by countries, territories and areas, 13-19 June 2022*



**See *Annex 1: Data, table, and figure notes*

Special Focus: Update on SARS-CoV-2 variants of interest and variants of concern

WHO, in collaboration with national authorities, institutions and researchers, routinely assesses if variants of SARS-CoV-2 alter transmission or disease characteristics, or impact the effectiveness of vaccines, therapeutics, diagnostics or public health and social measures (PHSM) applied to control disease spread. Potential variants of concern (VOCs), variants of interest (VOIs) or variants under monitoring (VUMs) are regularly assessed based on the risk posed to global public health.

The classifications of variants will be revised as needed to reflect the continuous evolution of circulating variants and their changing epidemiology. Criteria for variant classification, and the lists of currently circulating and previously circulating VOCs, VOIs and VUMs, are available on the WHO Tracking SARS-CoV-2 variants website. National authorities may choose to designate other variants and are strongly encouraged to investigate and report newly emerging variants and their impact.[1]

Geographic spread and prevalence of VOCs

The Omicron VOC continues to be the dominant variant circulating globally, accounting for nearly all sequences reported to GISAID between 17 May and 17 June 2022. Among Omicron lineages, as of epidemiological week 23 (6 to 12 June 2022), the proportions of BA.2 and its descendent lineages (pooled lineages named BA.2.X) are declining but nonetheless remain dominant, accounting for 36% and 12% respectively (Table 2).

Globally, BA.5 and BA.4 lineages continue to rise in prevalence and have been detected in 62 and 58 countries respectively. BA.2.12.1, which has now been detected in 69 countries, has decreased in prevalence since the previous week. As of week 23, the prevalence of BA.5 is 25% (from previous week 16%), BA.4 is 9% (from previous week 16%) and BA.2.12.1 is 17% (from previous week 31%). BA.4 and BA.5 have a constellation of genetic mutations that differ from BA.2, including a shared mutation at S:L452 which has been associated with higher transmissibility. The rise in prevalence of BA.4 and BA.5 has coincided with a rise in cases in several WHO regions. In some countries, the rise in cases has also led to a surge in hospitalizations and ICU admissions; however, the current evidence available does not indicate a change in severity associated with any of the three Omicron descendent lineages BA.2.12.1, BA.4 and BA.5.

Based on sequence data submitted to GISAID, variant circulation and dynamics differ by country. Multiple countries report co-circulation of BA.2.12.1, BA.4 and BA.5. The prevalence of VOC-LUMs BA.2.9.1, BA.2.11 and BA.2.13 (all carrying the S:L452 mutation) is <1%. .

Figure 5 Panel A and B: The number and percentage of SARS-CoV-2 sequences, as of 20 June 2022

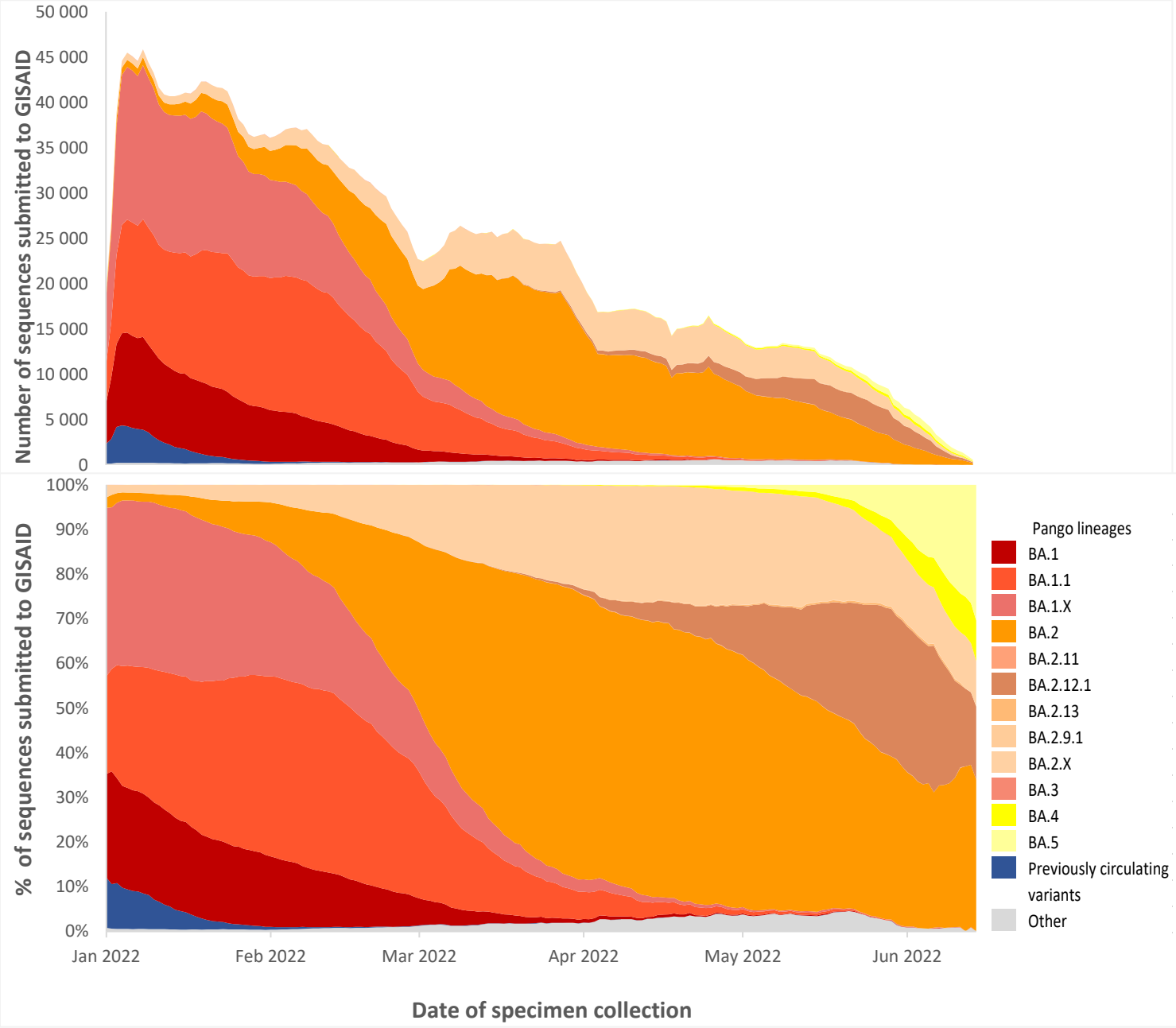


Figure 4 Panel A shows the number and **Panel B** the percentage of all circulating variants since 1 January 2022. Omicron sister-lineages and additional Omicron VOC descendent lineages under further monitoring (VOC-VUM) are shown. BA.1.X and BA.2.X include all BA.1 and BA.2 pooled descendent lineages, except those already shown in the figure above. Source: SARS-CoV-2 sequence data and metadata from GISAID, as of 20 June 2022.

Table 2: Relative proportions of SARS CoV-2 variants over the last four weeks by specimen collection date

			Last 4 weeks by collection date (%)			
Lineage	**Countries**	**Sequences[a]**	**2022-20**	**2022-21**	**2022-22**	**2022-23**
BA.1	178	494 314	0.13	0.04	0.04	0.05
BA.1.1	177	968 541	0.30	0.16	0.07	0.05
BA.1.X*	175	895 060	0.23	0.06	0.06	0.04
BA.2	146	1 137 826	41.42	36.51	32.53	36.40
BA.2.11	15	627	0.06	0.04	0.03	0.03
BA.2.12.1	69	118 126	27.02	33.04	30.57	17.20
BA.2.13	36	2 305	0.42	0.50	0.48	0.35
BA.2.9.1	13	699	0.07	0.05	0.03	0.08
BA.2.X*	133	452 477	20.26	15.59	13.16	11.60
BA.3	33	830	0.00	0.01	0.00	
BA.4	58	10 778	2.11	3.73	6.27	8.62
BA.5	62	18 556	3.57	7.91	16.11	24.78
Delta[#]	202	4 344 425	0.01	0.01	0.01	
Other	210	2 687 902	4.39	2.35	0.64	0.80

[a] Data source: sequences and metadata from GISAID.
[b] Relative proportions in %.
* BA.1.X and BA.2.X include all BA.1 and BA.2 pooled descendent lineages, except those already shown in the table above.
[#]Previously circulating VOC
The blue rows indicate the dominant lineages. The darker grey rows indicate the lineages that are increasing in prevalence, light grey indicate the lineage with decreasing prevalence since last week.

Characteristics of Omicron

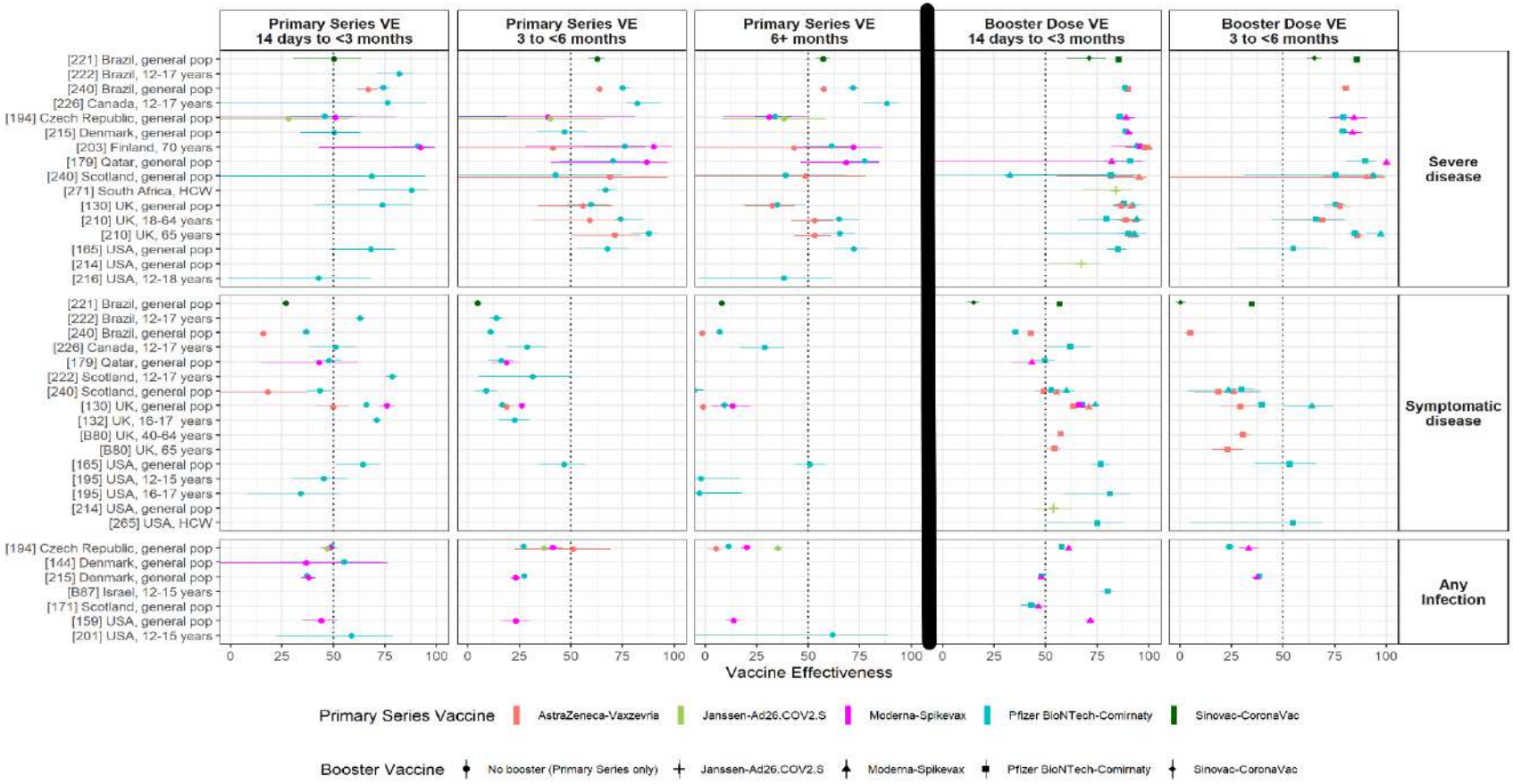
Available evidence on the phenotypic impacts of VOCs is reported in previous editions of the COVID-19 Weekly Epidemiological Update. Table 2 summarizes the phenotypic characteristics of the Omicron VOC and its sublineages for which evidence is available since the last update on 8 June 2022. Some of these studies have not been peer-reviewed and the findings must, therefore, be interpreted with due consideration of this limitation.

Table 2: Summary of phenotypic characteristics* of the Omicron VOC

Public health domain of impact	Omicron (B.1.1.529)	Omicron sublineages			
		BA.1	BA.2	BA.4	BA.5
Transmissibility	Growth advantage and increased transmissibility compared to Delta [i]	Lower transmissibility compared to BA.2 [2]	Increased transmissibility compared to BA.1[2]	Growth advantage compared to BA.2 [3]	Growth advantage over BA.2 [3]
Disease severity	Overall evidence suggests lower severity despite contrasting evidence. Earlier studies reported lower severity compared to Delta. [4–8] However, more recent studies in different settings reported similar [9,10] or increased severity[11] compared to Delta.[4–8,12 13]	No difference in disease severity compared to BA.2[14]	No difference in disease severity compared to BA.1[14]	Currently available evidence does not suggest a difference in disease severity compared to BA.1 [15]	Currently available evidence does not suggest a difference in disease severity compared to BA.1 [16,17]
Risk of reinfection	Reduced risk of Omicron reinfection among individuals previously infected with a different SARS-CoV-2 variant compared to naïve individuals[18,19]	Reduced risk of reinfection with BA.1 following infection with BA.2[20]	Reduced risk of reinfection with BA.2 following infection with BA.1 [20]	No specific data available	No specific data available
Impact on antibody responses	Reduction in neutralizing activity reported as compared to other VOCs[21–23]	Lower neutralising antibody titers compared to the index virus [22]	Lower neutralising antibody titers compared to the index virus[22]	Lower neutralising antibody titres (7.6-fold) compared to BA.1 [24–26]	Lower neutralising antibody titres (7.5-fold) compared to BA.1 [24,26]
Impacts on diagnostics	PCR assays that include multiple gene targets maintain their accuracy to detect Omicron[27]; S gene target failure/positivity (SGTF) may be a proxy for screening. Limited to no impact on sensitivity of Ag-RDTs observed[28–31]	S gene target failure.	The majority will be S gene target positive (SGTP).	S gene target failure.	S gene target failure.
Impact on treatment	No difference in the effectiveness of antiviral agents (polymerase and protease inhibitors) against the Omicron variant[32]. Conserved neutralizing activity for three broadly neutralizing monoclonal antibodies (sotrovimab, S2X259 and S2H97) and a reduced effectiveness of other monoclonal antibodies[33–36]	Reduced efficacy of casirivimab-imdevimab against BA.1[37]	Reduced neutralising activity of sotrovimab [37], casirivimab and imdevimab against BA.2[38]	Reduced neutralising activity of casirivimab and imdevimab[38]	Reduced neutralising activity of casirivimab and imdevimab[38]
Impact on vaccination	Results of vaccine effectiveness (VE) studies should be interpreted with caution because estimates vary with the type of vaccine administered and the number of doses and scheduling (sequential administration of different vaccines). For further information, **see the section Interpretation of the results of the VE for the Omicron variant**				

[i] Similar methodology used as Reference [1]

Figure 6. Vaccine effectiveness (VE) of primary series and booster vaccination against the Omicron variant of concern



Abbreviations: pop=population; HCW=healthcare workers. Dots represent point estimates of vaccine effectiveness; horizontal lines represent the 95% confidence intervals. Labels along left side of plot indicate reference numbers , country, and study population. Reference numbers identify the study and link to the summary table of VE effectiveness studies on view-hub.org (Table 1 in summary table); references starting with a 'B' are studies found in the booster VE table only (Table 2 in summary table). Primary series refers to the completion of two doses of vaccines for AstraZeneca-Vaxzevria; Moderna-Spikevax, Pfizer BioNTech-Comirnaty and Sinovac-CoronaVac and one dose of Janssen-Ad26.COV2.S. Severe disease includes severe disease, hospitalization, and pneumonia; symptomatic disease includes disease of any severity level; any infection can include symptomatic and asymptomatic infection. Additional details on the methods for inclusion of the estimates in the plots provided in Annex 3. Note, nine point estimates for the primary series with confidence intervals below 0 are not shown in the Omicron plot: two estimates from reference #144 against infection at 3 to <6 months (Pfizer BioNTech-Comrinaty and Moderna-Spikevax), two estimates from reference #179 against symptomatic disease at 6+ months (Pfizer BioNTech-Comrinaty and Moderna-Spikevax), and five estimates from reference #240 (one AstraZeneca-Vaxzevria estimate at 3 to <6 months; three AstraZeneca-Vaxzevria estimates and one Pfizer BioNTech estimate at 6+ months).

Figure 6 summarizes the impact of the Omicron variant on product-specific vaccine effectiveness (VE) over time for both primary series vaccines and booster vaccines. Additional information on vaccine performance against VOCs can also be found in Annex 4. Since the last update, one new study assessing absolute vaccine effectiveness of three doses of Pfizer BioNTech-Comirnaty among healthcare workers in the United States of America has been added to the figure.[39] In addition, a study evaluating VE of two doses of Janssen-Ad26.COV2.S against hospitalization among healthcare workers in South Africa that had been previously included in the figure has now been published. The study has provided additional VE estimates for two doses of Pfizer-BioNTech-Comirnaty, which have been added to the figure.[40]

Interpretation of the results of absolute VE for the Omicron variant

To date, 23 studies from ten countries (Brazil, Canada, Czech Republic, Denmark, Finland, Israel, Qatar, South Africa, the United Kingdom and the United States of America) have assessed the duration of protection of five vaccines against the Omicron variant (six studies assessed VE of primary series vaccination only, three assessed VE of booster vaccination only, and 14 assessed both). Findings from these studies show reduced VE of COVID-19 primary series vaccines against the Omicron variant for all outcomes (*severe disease*, *symptomatic disease*, and *infection*) than has been observed for the other four VOCs. Importantly though, VE estimates against the Omicron variant remain higher for *severe disease* than the other outcomes, in the majority of studies. Booster vaccination substantially improves VE for all outcomes and for all combinations of schedules with estimates available for both primary series and booster vaccination. VE declines more with time after booster vaccination for symptomatic disease and infection than it does for severe disease; however, studies that assess VE of booster vaccination beyond six months are needed to evaluate longer duration of protection.

For *severe disease*, within the first three months of primary series vaccination, seven of 13 (54%) VE estimates for the mRNA vaccines (Moderna-Spikevax and Pfizer BioNTech-Comirnaty) were ≥70%. Of the two studies available for vector vaccines, one reported a VE of <70% for AstraZeneca-Vaxzevria, and the other reported a VE of <50% for Janssen-Ad26.COV2.S. One study was available for inactivated vaccines (Sinovac-CoronaVac), reporting a VE of 50%. Beyond three months after vaccination, thirteen of 29 (45%) VE estimates for the mRNA vaccines were ≥70% while 20 (69%) were ≥50%; one of the 12 (8%) VE estimates for AstraZeneca-Vaxzevria was ≥70% while eight (67%) were ≥50%; neither of the two estimates for the other vector-based vaccine, Janssen-Ad26.COV2.S, were ≥50%. The two available VE estimates beyond three months of vaccination for Sinovac-CoronaVac were ≥50%.

Booster vaccination improved VE against *severe disease* in all studies in which it was assessed. There were 33 estimates evaluated an mRNA booster, two estimates for a booster dose of Janssen-Ad26.COV2.S, and one estimate for a booster dose of Sinovac-CoronaVac. Across the datasets, only one estimate for a booster dose of Pfizer BioNTech-Comirnaty and one estimate for a booster dose of Janssen-Ad26.COV2.S were below 70% between 14 days and three months of receipt of a booster dose. At three to six months post mRNA booster, 17 of 20 (85%) estimates showed VE ≥70% (an mRNA vaccine was given as the primary series in 13 of the 20 estimates while AstraZeneca-Vaxzevria and Sinovac-CoronaVac were given as the primary series for six and one of the twenty estimates, respectively).

VE estimates against *symptomatic disease* and *infection* within the first three months of primary series vaccination were lower than against severe disease, and VE decreased more substantially over time. For *symptomatic disease* within the first three months of primary series vaccination, three of 13 (23%) VE estimates for the mRNA vaccines were ≥70% and seven (54%) were ≥50%; none of the three VE estimates for AstraZeneca-Vaxzevria nor the single estimate for Sinovac (CoronaVac) were above 50%. Beyond three months after vaccination, one of the 29 (3%) VE

estimates were ≥50% (21 estimates evaluated mRNA vaccines, six evaluated AstraZeneca-Vaxzevria, and two evaluated Sinovac-CoronaVac). mRNA booster vaccination after completion of a primary series of an mRNA vaccine, AstraZeneca-Vaxzevria, or Sinovac-CoronaVac, improved VE against *symptomatic disease,* with five of 21 (24%) VE estimates ≥70% and 16 (76%) estimates ≥50% between 14 days and three months post booster. However, booster dose protection declined with time since vaccination with only two of 13 (15%) available estimates indicating a VE of ≥50% at three to six months following receipt of an mRNA booster dose. Neither the single estimate for a booster dose of AstraZeneca-Vaxzevria nor the single estimate for a booster dose of Sinovac-CoronaVac three to six months post vaccination was above 50%. VE against *infection* showed a similar pattern as that against *symptomatic disease*.

Additional resources

- Tracking SARS-CoV-2 Variants
- COVID-19 new variants: Knowledge gaps and research
- Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health
- Considerations for implementing and adjusting public health and social measures in the context of COVID-19
- VIEW-hub: repository for the most relevant and recent vaccine data
- WHO Statement on Omicron sublineage BA.2

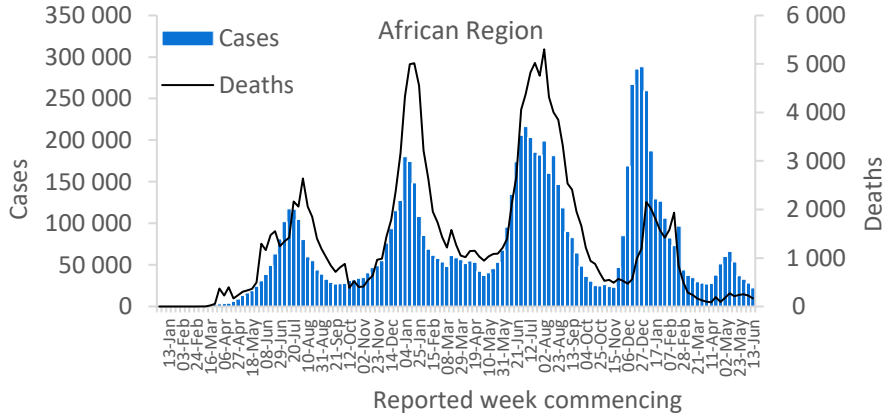
WHO regional overviews:

Epidemiological week 13-19 June 2022**

African Region

The African Region reported 22 000 new cases, a 21% decrease as compared to the previous week. Eleven (22%) countries reported an increase in the number of new cases of 20% or greater, with some of the greatest proportional increases seen in Senegal (51 vs 17 new cases; +200%), South Sudan (36 vs 18 new cases; +100%) and Mozambique (758 vs 392 new cases; +93%). The countries that reported the highest numbers of new cases were South Africa (7978 new cases; 13.5 new cases per 100 000 population; -24%), Ethiopia (3488 new cases; 3.0 new cases per 100 000; -9%), and Kenya (2370 new cases; 4.4 new cases per 100 000; +83%).

The number of new weekly deaths in the Region decreased by 24% as compared to the previous week, with over 150 new deaths reported. The highest numbers of new deaths were reported from South Africa (121 new deaths; <1 new death per 100 000 population; -26%), Uganda (eight new deaths; <1 new death per 100 000; +167%), and Zimbabwe (eight new deaths; <1 new deaths per 100 000; -27%).

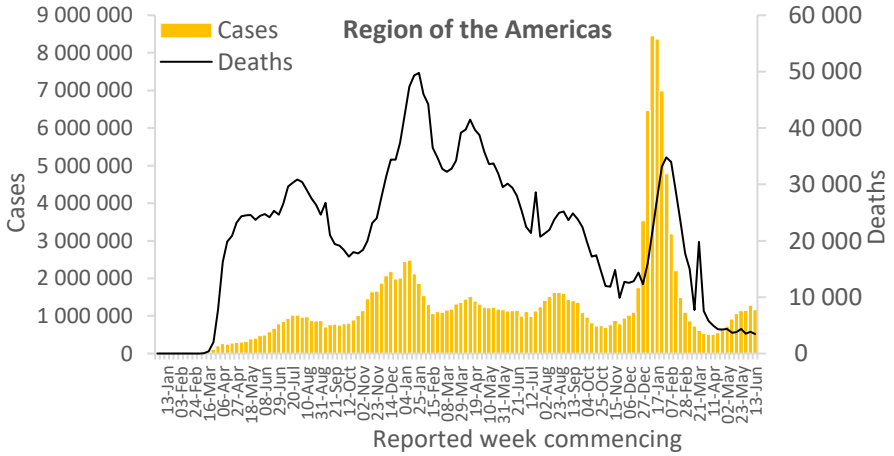


Updates from the African Region

Region of the Americas

After reporting increases in the number of new weekly cases observed since mid-April 2022, the Region of the Americas reported over 1.1 million new cases, a 9% decrease as compared to the previous week. However, fourteen (25%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Turks and Caicos Islands (29 vs 12 new cases; +142%), Saint Kitts and Nevis (73 vs 39 new cases; +87%) and Paraguay (1384 vs 776 new cases; +78%). The highest numbers of new cases were reported from the United States of America (652 217 new cases; 197.0 new cases per 100 000; -12%), Brazil (256 034 new cases; 120.5 new cases per 100 000; -9%), and Chile (73 455 new cases; 384.3 new cases per 100 000; +6%).

The number of new weekly deaths in the Region decreased by 11% as compared to the previous week, with over 3400 new deaths reported. The highest numbers of new deaths were reported from the United States of America (1858 new deaths; <1 new death per 100 000; -13%), Brazil (956 new deaths; <1 new death per 100 000; -3%), and Chile (150 new deaths; <1 new death per 100 000; +24%).

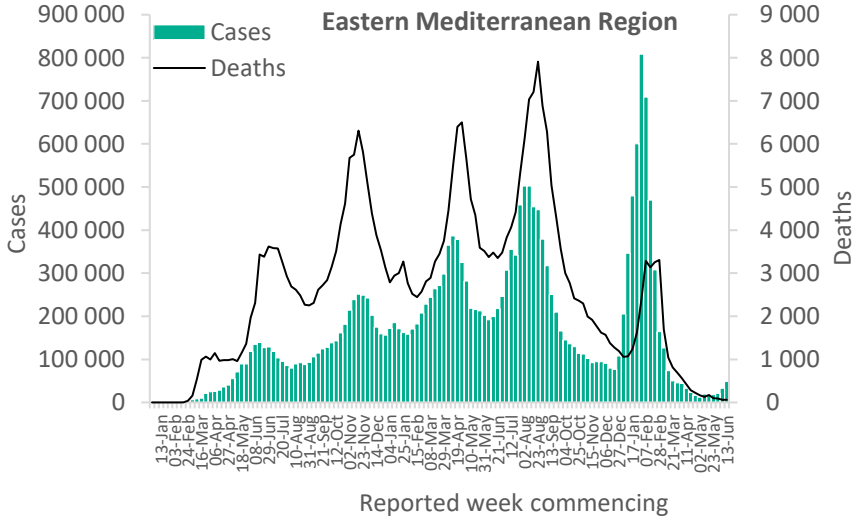


Updates from the Region of the Americas

Eastern Mediterranean Region

The Eastern Mediterranean Region reported over 48 000 new weekly cases, representing a 45% increase as compared to the previous week. Fourteen (63%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Iraq (2210 vs 1080 new cases; +105), Morocco (9628 vs 5184 new cases; +86%) and Oman (327 vs 194 new cases; +69%). The highest numbers of new cases were reported from the United Arab Emirates (9651 new cases; 97.6 new cases per 100 000; +63%), Morocco (9628 new cases; 26.1 new cases per 100 000; +86%), and Bahrain (9227 new cases; 542.3 new cases per 100 000; +41%).

The number of new weekly deaths in the Region decreased by 2% as compared to the previous week, with 61 new deaths reported. The highest numbers of new deaths were reported from Saudi Arabia (15 new deaths; <1 new death per 100 000; similar to the previous week's figures), the Islamic Republic of Iran (14 new deaths; <1 new death per 100 000; -33%), and Tunisia (seven new deaths; <1 new death per 100 000; similar to the previous week's figure).

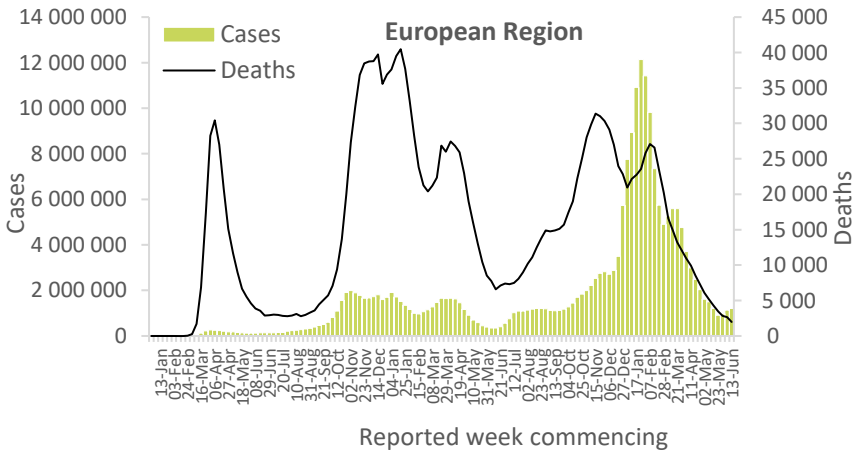


Updates from the Eastern Mediterranean Region

European Region

After reporting decreases in the number of new weekly cases since mid-March 2022, a slight increase has been reported in the last two weeks in the European Region, with over 1.2 million new cases reported this week, a 6% increase compared to the previous week. Twenty-one (34%) countries in the Region reported increases in new cases of 20% or greater, with the greatest proportional increases observed in the Isle of Man (570 vs 153 new cases; +272%), Uzbekistan (370 vs 140 new cases; +164%) and Kosovo[1] (93 vs 37 new cases; +151%). The highest numbers of new cases were reported from Germany (356 414 new cases; 428.6 new cases per 100 000; +10%), France (253 322 new cases; 389.5 new cases per 100 000; +33%), and Italy (210 840 new cases; 353.5 new cases per 100 000; +47%).

With just under 2000 new weekly deaths, a 26% decrease as compared to the previous week, the Region reports a decreasing trend since early February 2022. The highest numbers of new deaths were reported from the Russian Federation (443 new deaths; <1 new death per 100 000; -11%), Italy (338 new deaths; <1 new death per 100 000; -24%), and France (272 new deaths; <1 new death per 100 000; +6%).

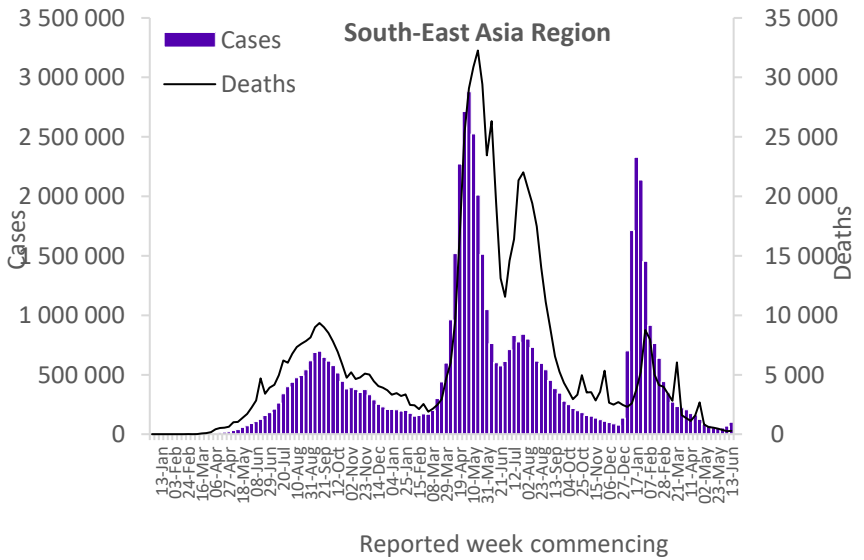


Updates from the European Region

South-East Asia Region

After the declining trend in new cases observed since mid-January 2022, the Region has reported an increase in the last three weeks, with over 99 000 new cases reported this week, a 46% increase as compared to the previous week. Six (60%) countries showed increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Bangladesh (2212 vs 492 new cases; +350%), Maldives (369 vs 160 new cases; +131%) and Indonesia (7587 vs 3688 new cases; +106%). The highest numbers of new cases were reported from India (74 675 new cases; 5.4 new cases per 100 000; +65%), Thailand (14 181 new cases; 20.3 new cases per 100 000; -22%), and Indonesia (2.8 new cases per 100 000).

The number of new weekly deaths increased by 4% as compared to the previous week, with over 273 new deaths reported. The highest numbers of new deaths were reported from Thailand (133 new deaths; <1 new death per 100 000; -18%), India (94 new deaths; <1 new death per 100 000; +36%), and Indonesia (44 new deaths; <1 new death per 100 000; +57%).

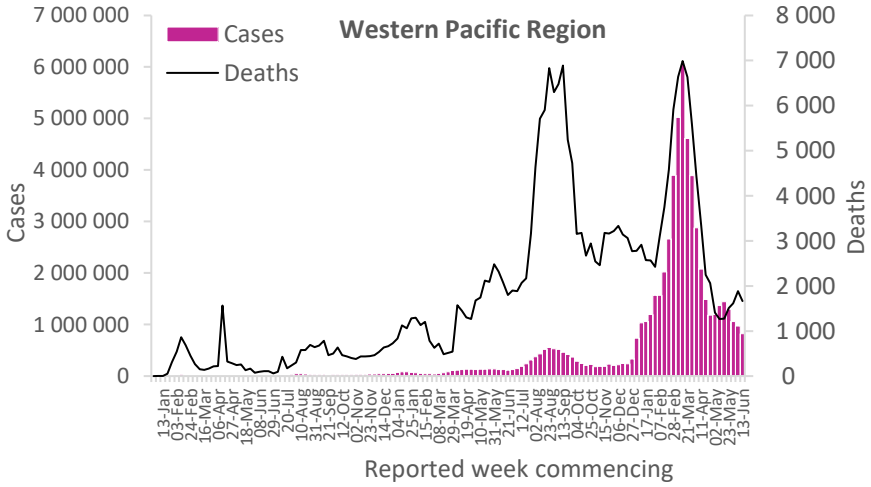


Updates from the South-East Asia Region[3]

Western Pacific Region

With over 820 000 new cases reported last week, the Western Pacific Region continues the decreasing trend that has been observed for the past month . This represents a 16% decline in new cases as compared to the previous week. Seven (21%) countries reported increases in new cases of 20% or greater, with the largest proportional increases observed in Fiji (163 vs 41 new cases; +298%), Northern Mariana Islands (Commonwealth of the) (79 vs 37 new cases; +114%) and the Philippines (2738 vs 1587 new cases; +73%). The highest numbers of new cases were reported from China (406 401 new cases; 27.6 new cases per 100 000; -19%), Australia (181 980 new cases; 713.7 new cases per 100 000; -6%), and Japan (91 491 new cases; 72.3 new cases per 100 000; -27%).

The Region reported over 1600 new weekly deaths, representing a 11% decrease as compared to the previous week. The highest numbers of new deaths were reported from China (1044 new deaths; <1 new death per 100 000; -13%), Australia (311 new deaths; 1.2 new deaths per 100 000; +5%), and Japan (144 new deaths; <1 new death per 100 000; similar to the previous week's figures).



Updates from the Western Pacific Region

Summary of the COVID-19 Monthly Operational Update

The Monthly operational Update is a report provided by the COVID-19 Strategic Preparedness and Response Plan (SPRP) monitoring and evaluation team which aims to update on the ongoing global progress against the COVID-19 SPRP 2021 framework.

In this edition of the COVID-19 Monthly Operational Update, highlights of country-level actions and WHO support to countries include:

- WHO Country Office and Ministry of Health Türkiye lead the development of a national genomic surveillance strategy: 24–26 June 2022 in Izmir, Türkiye
- The United Republic of Tanzania hosts the first simulation exercise in East Africa since the onset of the COVID-19 pandemic, to improve readiness to health emergencies at points of entry
- Empowering indigenous women as 'agents of change': WHO supports Ecuador to engage community stakeholders as part of its COVID-19 response strategy
- 15 tonnes of lifesaving COVID-19 supplies arrive in Samoa
- The Syrian Arab Republic's coastal areas takes COVID-19 vaccination campaign to a new level
- Myanmar: learning from COVID-19 to prepare for influenza
- WHO/Europe carried out an Intra-Action Review in Azerbaijan, identifying challenges and best practices from the response to COVID-19
- PAHO/WHO supports the Plurinational State of Bolivia to introduce and expand oxygen therapy for COVID-19 patients
- Strengthening Yemen's response to COVID-19 and the delivery of essential health services
- Preparing for future outbreaks with free online courses on 28 diseases through OpenWHO
- "The Story of Coronavirus": an animated video to understand COVID-19 transmission
- WHO Scientific Advisory Group for the Origins of Novel Pathogens (SAGO) released its first preliminary report
- WHO holds a global consultation entitled "Crafting the Mosaic": Resilient surveillance systems for respiratory viruses of pandemic potential
- Global Lead Coordinator for COVID-19 Vaccine Delivery Partnership visits Malawi
- Updated WHO guidance and publications

Annex 1. Data, table, and figure notes

Data presented are based on official laboratory-confirmed COVID-19 cases and deaths reported to WHO by country/territories/areas, largely based upon WHO case definitions and surveillance guidance. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change, and caution must be taken when interpreting these data as several factors influence the counts presented, with variable underestimation of true case and death incidences, and variable delays to reflecting these data at the global level. Case detection, inclusion criteria, testing strategies, reporting practices, and data cut-off and lag times differ between countries/territories/areas. A small number of countries/territories/areas report combined probable and laboratory-confirmed cases. Differences are to be expected between information products published by WHO, national public health authorities, and other sources.

Due to public health authorities conducting data reconciliation exercises that remove large numbers of cases or deaths from their total counts, negative numbers may be displayed in the new cases/deaths columns as appropriate. When additional details become available that allow the subtractions to be suitably apportioned to previous days, graphics will be updated accordingly. A record of historic data adjustment made is available upon request by emailing epi-data-support@who.int. Please specify the countries of interest, time period, and purpose of the request/intended usage. Prior situation reports will not be edited; see covid19.who.int for the most up-to-date data. COVID-19 confirmed cases and deaths reported in the last seven days by countries, territories, and areas, and WHO Region (reported in previous issues) are now available at: https://covid19.who.int/table.

'Countries' may refer to countries, territories, areas or other jurisdictions of similar status. The designations employed, and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Countries, territories, and areas are arranged under the administering WHO region. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions except, the names of proprietary products are distinguished by initial capital letters.

[1] All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999). In the map, the number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.
[2] Since 21 May, data for COVID-19 cases and deaths in Northern Ireland was no longer included in the United Kingdom updates (see here for the official announcement).
[3] Updates of an outbreak of COVID-19 reported in the Democratic People's Republic of Korea continue through official media since 12 May 2022; however, at present, no confirmed cases or deaths have been reported to WHO.

Annex 2. Additional notes on VOC impacts on vaccines

- Reductions in VE do not necessarily mean loss of protection, as indicated by the absolute VE estimate. For example, a 10-percentage point reduction in VE against symptomatic disease for mRNA vaccines would still mean high vaccine effectiveness of ~85%. Likewise, vaccines have shown higher VE against severe disease; thus, small reductions in VE against severe disease due to VOCs may still mean substantial protection.
- Table 3 summarizes the impact of VOCs on COVID-19 vaccine performance in the absence of waning, and, therefore, does not include studies that only assess VE greater than 4 months post final dose.
- Studies reporting VOC-specific VE estimates for full vaccination (≥7 days post final dose) are assessed against a comparator VE estimate for that vaccine product to determine level of reduction in VE. For symptomatic disease, VOC VE is compared against phase 3 RCT results from non-VOC settings. For severe disease and infection, due to instability or lack of phase 3 RCT estimates, VOC VE is compared to non-VOC VE estimates from the same study when available (or to Alpha VE from same study when assessing Beta, Gamma, or Delta); with an exception for AstraZeneca-Vaxzevria for infection (when a phase 3 estimate of VE against infection due to non-VOC is available and used as comparator). In some instances, a study may be included for severe disease or infection outcome even without a comparator if a very high VE estimate is reported against a VOC (i.e., >90%).
- It is also important to note that studies vary in population, outcome definitions, study design and other methodological considerations, which may in part explain differences when comparing VE estimates for a product between different studies. In addition, the reductions summarized in the table represent VE point estimates and do not represent the uncertainty intervals around these estimates which vary substantially across studies. The reductions in VE noted should be interpreted with these limitations in mind.
- Neutralization studies that use samples collected >7 days and < 6 months after complete vaccination and that use an ancestral strain as the reference are included in the Table 3.

Annex 3. Methods for Figure 6

• VE studies included in the plot were identified from an ongoing systematic review of COVID-19 vaccine effectiveness studies. All studies were cohort or test-negative studies. Methods for the systematic review and inclusion/exclusion criteria are available on view-hub.org. The studies were conducted during a period when Omicron was the predominant circulating variant. Only studies providing VE estimates of individual vaccines are included in the plot (studies assessing combined VE of more than one vaccine are excluded). In addition, for the primary series VE, only studies providing VE estimates for discrete time intervals since vaccination, which evaluate changes in VE over time, are included.

• For the primary series VE, estimates are only included in the plot for studies that report absolute VE for more than one time period for an individual vaccine. Thirteen studies of VE against Omicron provided only a single cumulative VE estimate for an individual vaccine, which due to varying lengths of time since vaccination are difficult to interpret due to the marked waning of VE over time with omicron.

Annex 4. Summary of Primary Series Vaccine Performance against Variants of Concern

(VE data as of 16 June 2022; Neutralization data as of 15 June 2022)

	WHO Emergency Use Listing (EUL) Qualified Vaccines[+]									Vaccines without WHO EUL[+]	
	AstraZeneca-Vaxzevria/SII - Covishield	Beijing CNBG-BBIBP-CorV	Bharat-Covaxin	Cansino - Convidecia	Janssen-Ad26.COV 2.S	Moderna-mRNA-1273	Novavax-Nuvaxovid/SII - Covavax	Pfizer BioNTech-Comirnaty	Sinovac-CoronaVac	Anhui ZL-Recombinant	Gamaleya-Sputnik V
Alpha, Beta, Gamma											
Summary of VE*	*see update from 11 January 2022 for details of vaccine performance against Alpha, Beta, and Gamma variants of concern*										
Delta											
Summary of VE*	*see update from 27 April 2022 for details of vaccine performance against Delta variant of concern*										
Omicron											
Summary of VE*	Reduced protection against infection and symptomatic disease; possible reduced protection against for severe disease but limited evidence										
- Severe disease	-	-	-	-	-	↓to↓↓/↓↓↓ [2]	-	↓↓ to ↓↓↓ [5]	-	-	-
- Symptomatic disease	↓↓↓ [1]	-	-	-	-	↓↓/↓↓↓ [2]	-	↓↓↓ [3]	-	-	-
- Infection	↓↓↓ [1]	-	-	-	-	↓↓↓ [3]	-	↓↓↓ [3]	-	-	-
Neutralization	↓↓↓ [7]	↓to↓↓ [4]	↓↓ [1]	-	↓to ↓↓↓ [4]	↓↓↓ [18]	-	↓↓↓ [47]	↓↓to↓↓↓ [5]	-	↓↓ [1]

VE refers to vaccine effectiveness and vaccine efficacy. *Summary of VE: indicates the general conclusions but only for the vaccines evaluated against the specific variant. Arrows generalize the magnitude of reduction in VE or neutralization: "↔" <10 percentage point (pp) reduction in VE, or VE >90% with no comparator, or that there was a <2-fold reduction in neutralization; "↓" 10 to <20 pp reduction in VE, or 2 to <5-fold reduction in neutralization; "↓↓" 20 to <30 pp reduction in VE, or 5 to <10-fold reduction in neutralization; "↓↓↓" ≥30 pp reduction in VE, or ≥10-fold reduction in neutralization. When more than one neutralization study is available, the interquartile range (25th and 75th percentiles) of fold-reductions across all studies for specific vaccine/variant was used. "Moderna-mRNA-1273/Pfizer BioNTech-Comirnaty" indicates that both vaccines were evaluated together in study. The number of studies is shown as subscripts: vaccine effectiveness and neutralization studies informing this table can be found on the VIEW-hub Resources Library . References indicated by superscripts next to VOC name in column 1 are vaccine efficacy results from randomized controlled trials informing this table.

Technical guidance and other resources

- WHO technical guidance
- WHO COVID-19 Dashboard
- WHO Weekly Operational Updates on COVID-19
- WHO COVID-19 case definitions
- COVID-19 Supply Chain Inter-Agency Coordination Cell Weekly Situational Update
- Research and Development
- Open WHO courses on COVID-19 in official UN languages and in additional national languages
- WHO Academy COVID-19 mobile learning app
- The Strategic Preparedness and Response Plan (SPRP) outlining the support the international community can provide to all countries to prepare and respond to the virus
- EPI-WIN: tailored information for individuals, organizations, and communities
- Recommendations and advice for the public: Protect yourself; Questions and answers; Travel advice

References

1. Campbell F, Archer B, Laurenson-Schafer H, et al. Increased transmissibility and global spread of SARS-CoV-2 variants of concern as at June 2021. *Eurosurveillance*. 2021;26(24):2100509.

2. Atkulwar A, Rehman A, Imaan Y, Baig M. Atkulwar 2022_Analyses of OMicron genomes from India reveal BA.2 as a more transmissible variant.pdf. Published online 2022. doi:https://doi.org/10.1101/2022.04.25.22274272

3. SARS-CoV-2 variants of concern and variants under investigation in England. Technical briefing 42. Published online May 20, 2022. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077180/Technical-Briefing-42-20May2022.pdf

4. Ferguson N, Ghani A, Hinsley W, Volz E. *Report 50: Hospitalisation Risk for Omicron Cases in England*. Imperial College London; 2021. Accessed December 23, 2021. https://www.imperial.ac.uk/media/imperial-college/medicine/mrc-gida/2021-12-22-COVID19-Report-50.pdf

5. Ulloa AC, Buchan SA, Daneman N, Brown KA. Estimates of SARS-CoV-2 Omicron Variant Severity in Ontario, Canada. *JAMA*. Published online February 17, 2022. doi:10.1001/jama.2022.2274

6. Lewnard JA, Hong VX, Patel MM, Kahn R, Lipsitch M, Tartof SY. *Clinical Outcomes among Patients Infected with Omicron (B.1.1.529) SARS-CoV-2 Variant in Southern California*. Epidemiology; 2022. doi:10.1101/2022.01.11.22269045

7. Nyberg T, Twohig KA, Harris RJ, et al. Risk of hospital admission for patients with SARS-CoV-2 variant B.1.1.7: cohort analysis. *BMJ*. 2021;373:n1412. doi:10.1136/bmj.n1412

8. Wolter N, Jassat W, Walaza S, et al. *Early Assessment of the Clinical Severity of the SARS-CoV-2 Omicron Variant in South Africa*. Infectious Diseases (except HIV/AIDS); 2021. doi:10.1101/2021.12.21.21268116

9. Gunadi, Hakim MS, Wibawa H, et al. *Comparative Analysis of the Outcomes of COVID-19 between Patients Infected with SARS-CoV-2 Omicron and Delta Variants: A Retrospective Cohort Study*. Public and Global Health; 2022. doi:10.1101/2022.04.30.22274532

10. Strasser Z, Hadavand A, Murphy S, Estiri H. *SARS-CoV-2 Omicron Variant Is as Deadly as Previous Waves After Adjusting for Vaccinations, Demographics, and Comorbidities*. In Review; 2022. doi:10.21203/rs.3.rs-1601788/v1

11. Grint DJ, Wing K, Gibbs HP, et al. *Accident and Emergency (AE) Attendance in England Following Infection with SARS-CoV-2 Omicron or Delta*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.05.03.22274602

12. Wang Z, Schmidt F, Weisblum Y, et al. mRNA vaccine-elicited antibodies to SARS-CoV-2 and circulating variants. *Nature*. Published online February 2021. https://www.ncbi.nlm.nih.gov/pubmed/33567448

13. Nyberg T, Ferguson NM, Nash SG, et al. Comparative analysis of the risks of hospitalisation and death associated with SARS-CoV-2 omicron (B.1.1.529) and delta (B.1.617.2) variants in England: a cohort study. *The Lancet*. 2022;399(10332):1303-1312. doi:10.1016/S0140-6736(22)00462-7

14. Wolter N, Jassat W, DATCOV-Gen author group, von Gottberg A, Cohen C. *Clinical Severity of Omicron Sub-Lineage BA.2 Compared to BA.1 in South Africa*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.17.22271030

15. COVID-19 Hospital Surveillance ; Update: Week 23, 2022. https://www.nicd.ac.za/wp-content/uploads/2022/06/NICD-COVID-19-Weekly-Sentinel-Hospital-Surveillnace-update-Week-23-2022.pdf

16. National Institute for Communicable Diseases. COVID-19 Hospital Surveillance Update: week 12 2022. Published online 2022. Accessed April 5, 2022. https://www.nicd.ac.za/wp-content/uploads/2022/03/NICD-COVID-19-Weekly-Sentinel-Hospital-Surveillnace-update-Week-12-2022.pdf

17. Relatório de Monitorização da Situação Epidemiológica da COVID-19 Monitoring of COVID-19. https://www.dgs.pt/em-destaque/relatorio-de-monitorizacao-da-situacao-epidemiologica-da-covid-19-n-12-pdf.aspx

18. Chang CC, Vlad G, Vasilescu ER, et al. *Previous SARS-CoV-2 Infection or a Third Dose of Vaccine Elicited Cross-Variant Neutralizing Antibodies in Vaccinated Solid Organ Transplant Recipients*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.13.22273829

19. Carazo S, Skowronski DM, Brisson M, et al. *Protection against Omicron Re-Infection Conferred by Prior Heterologous SARS-CoV-2 Infection, with and without MRNA Vaccination*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.29.22274455

20. Chemaitelly H, Ayoub HH, Coyle P, et al. *Protection of Omicron Sub-Lineage Infection against Reinfection with Another Omicron Sub-Lineage*. Epidemiology; 2022. doi:10.1101/2022.02.24.22271440

21. Bowen JE, Sprouse KR, Walls AC, et al. *Omicron BA.1 and BA.2 Neutralizing Activity Elicited by a Comprehensive Panel of Human Vaccines*. Immunology; 2022. doi:10.1101/2022.03.15.484542

22. Iketani S, Liu L, Guo Y, Liu L, Huang Y, Wang M. Antibody Evasion Properties of SARS-CoV-2 Omicron Sublineages. :12.

23. Yu J, Collier A ris Y, Rowe M, et al. *Comparable Neutralization of the SARS-CoV-2 Omicron BA.1 and BA.2 Variants*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.06.22270533

24. Khan K, Karim F, Ganga Y, et al. *Omicron Sub-Lineages BA.4/BA.5 Escape BA.1 Infection Elicited Neutralizing Immunity*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.04.29.22274477

25. Hachmann NP, Miller J, Collier A ris Y, et al. *Neutralization Escape by the SARS-CoV-2 Omicron Variants BA.2.12.1 and BA.4/BA.5*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.05.16.22275151

26. Cao Y, Yisimayi A, Jian F, et al. *BA.2.12.1, BA.4 and BA.5 Escape Antibodies Elicited by Omicron Infection*. Immunology; 2022. doi:10.1101/2022.04.30.489997

27. Metzger CM, Lienhard R, Seth-Smith HM. PCR performance in the SARS-CoV-2 Omicron variant of concern? *Swiss Med Wkly*. 2021;151(49-50). doi:10.4414/smw.2021.w30120

28. Drain PK, Bemer M, Morton JF, et al. *Accuracy of Rapid Antigen Testing across SARS-CoV-2 Variants*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.03.21.22272279

29. Soni A, Herbert C, Filippaios A, et al. *Comparison of Rapid Antigen Tests' Performance between Delta (B.1.61.7; AY.X) and Omicron (B.1.1.529; BA1) Variants of SARS-CoV-2: Secondary Analysis from a Serial Home Self-Testing Study*. Infectious Diseases (except HIV/AIDS); 2022. doi:10.1101/2022.02.27.22271090

30. Bayart JL, Degosserie J, Favresse J, et al. Analytical Sensitivity of Six SARS-CoV-2 Rapid Antigen Tests for Omicron versus Delta Variant. Published online 2022:9.

31. Bekliz M, Perez-Rodriguez F, Puhach O, et al. *Sensitivity of SARS-CoV-2 Antigen-Detecting Rapid Tests for Omicron Variant*. Infectious Diseases (except HIV/AIDS); 2021. doi:10.1101/2021.12.18.21268018

32. Takashita E, Kinoshita N, Yamayoshi S, et al. Efficacy of Antiviral Agents against the SARS-CoV-2 Omicron Subvariant BA.2. *N Engl J Med*. Published online March 9, 2022:NEJMc2201933. doi:10.1056/NEJMc2201933

33. Planas D, Saunders N, Maes P, et al. *Considerable Escape of SARS-CoV-2 Variant Omicron to Antibody Neutralization*. Immunology; 2021. doi:10.1101/2021.12.14.472630

34. VanBlargan LA, Errico JM, Halfmann PJ, et al. *An Infectious SARS-CoV-2 B.1.1.529 Omicron Virus Escapes Neutralization by Several Therapeutic Monoclonal Antibodies*. Microbiology; 2021. doi:10.1101/2021.12.15.472828

35. Cameroni E, Saliba C, Bowen JE. Broadly neutralizing antibodies overcome SARS-CoV-2 Omicron antigenic shift. Published December 14, 2021. Accessed December 23, 2021. https://www.biorxiv.org/content/10.1101/2021.12.12.472269v1

36. Roche. Ronapreve does not retain neutralising activity against the Omicron variant. Published 2021. Accessed December 17, 2021. https://www.roche.com/dam/jcr:dfe6dcb4-d787-45d6-9b1d-ffc17d667e4c/2021216_Roche%20statement%20on%20Ronapreve%20Omicron.pdf

37. World Health Organization. Therapeutics and COVID-19: Living guideline. Accessed December 17, 2021. https://www.who.int/publications/i/item/WHO-2019-nCoV-therapeutics-2021.4

38. Yamasoba D, Kosugi Y, Kimura I, et al. *Sensitivity of Novel SARS-CoV-2 Omicron Subvariants, BA.2.11, BA.2.12.1, BA.4 and BA.5 to Therapeutic Monoclonal Antibodies*. Microbiology; 2022. doi:10.1101/2022.05.03.490409

39. RICHTERMAN A, BEHRMAN A, BRENNAN PJ, O'DONNELL JA, SNIDER CK, CHAIYACHATI KH. Durability of SARS-CoV-2 mRNA Booster Vaccine Protection Against Omicron Among Health Care

Workers with a Vaccine Mandate. *Clinical Infectious Diseases*. Published online June 6, 2022:ciac454. doi:10.1093/cid/ciac454

40. Gray G, Collie S, Goga A, et al. Effectiveness of Ad26.COV2.S and BNT162b2 Vaccines against Omicron Variant in South Africa. *N Engl J Med*. 2022;386(23):2243-2245. doi:10.1056/NEJMc2202061

COVID-19 Weekly Epidemiological Update

Edition 98, published 29 June 2022

In this edition:

Global overview

Data as of 26 June 2022

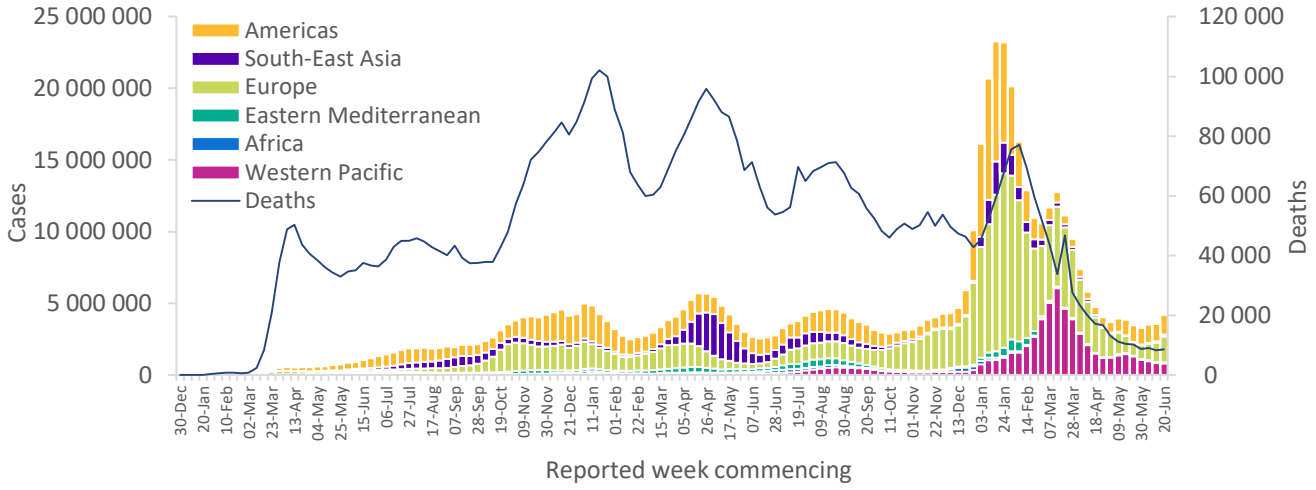
Globally, the number of weekly cases has increased for the third consecutive week, after a declining trend since the last peak in March 2022. During the week of 20 to 26 June 2022, over 4.1 million new cases were reported, an 18% increase as compared to the previous week (Figure 1). The number of new weekly deaths remained similar to that of the previous week, with over 8500 fatalities reported.

At the regional level, the number of new weekly cases increased in the Eastern Mediterranean Region (+47%), the European Region (+33%), the South-East Asia Region (+32%), and the Region of the Americas (+14%), while it decreased in the African Region (-39%) and the Western Pacific Region (-3%). The number of new weekly deaths increased in the Eastern Mediterranean Region (+22%), the South-East Asia Region (+15%), and the Region of the Americas (+11%), while decreases were observed in the Western Pacific Region (-6%), the European Region (-5%) and the African Region (-1%).

As of 26 June 2022, over 541 million confirmed cases and over 6.3 million deaths have been reported globally.

These trends should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 26 June 2022**



**See *Annex 1: Data, table, and figure notes*

At the country level, the highest numbers of new weekly cases were reported from the United States of America (701 855 new cases; +5%), Germany (504 655 new cases; +23%), Brazil (349 791 new cases; +37%), Italy (340 012 new cases; +61%), and China (333 926 new cases; -18%).

The highest numbers of new weekly deaths were reported from the United States of America (1997 new deaths; -2%), Brazil (1313 new deaths; +37%), China (925 new deaths; -11%), the Russian Federation (429 new deaths; -3%), and Italy (355 new deaths; +5%).

Table 1. Newly reported and cumulative COVID-19 confirmed cases and deaths, by WHO Region, as of 26 June 2022**

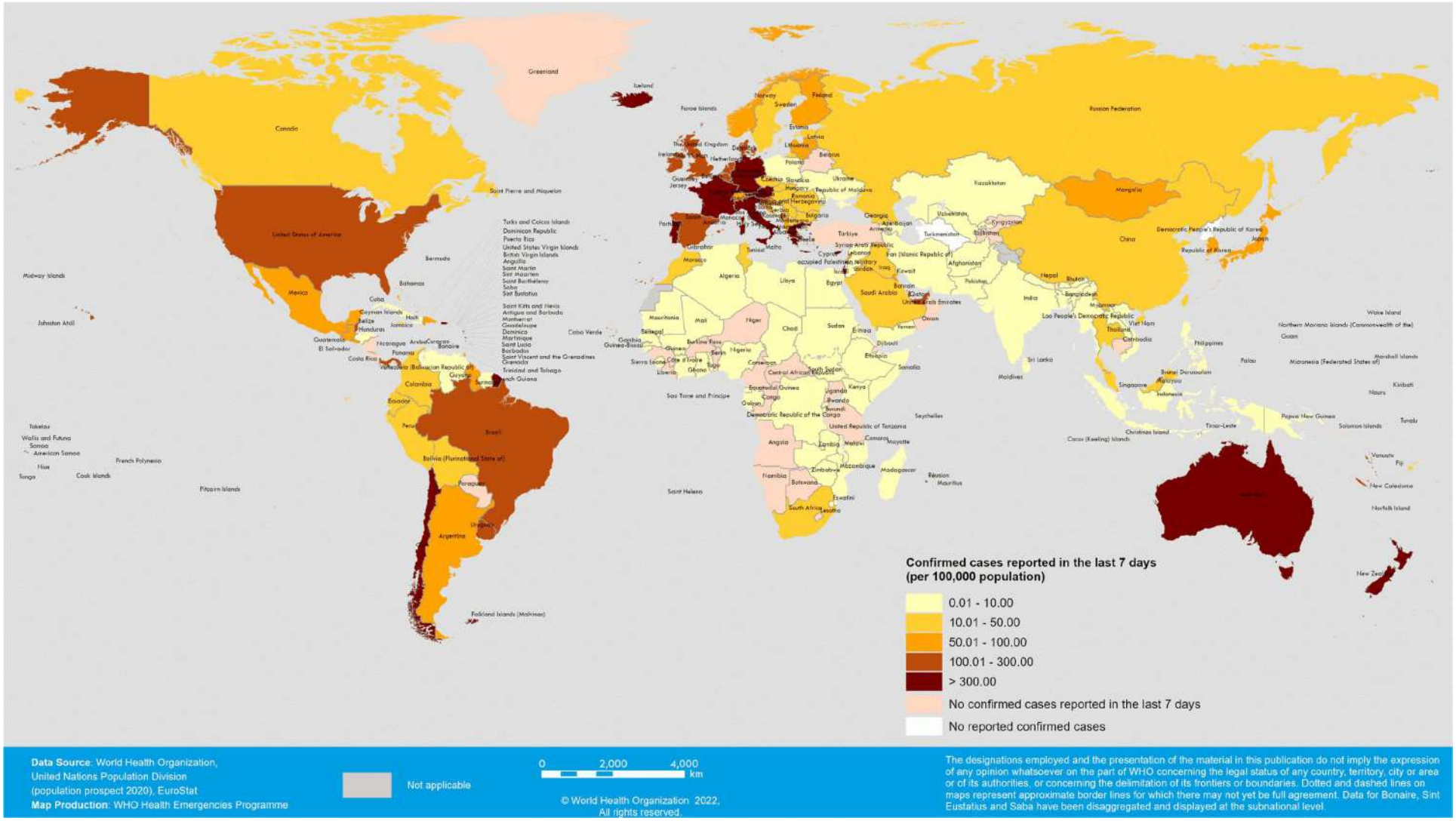
WHO Region	New cases in last 7 days (%)	Change in new cases in last 7 days *	Cumulative cases (%)	New deaths in last 7 days (%)	Change in new deaths in last 7 days *	Cumulative deaths (%)
Europe	1 796 850 (43%)	33%	226 115 754 (42%)	2 259 (26%)	-5%	2 024 722 (32%)
Americas	1 360 367 (33%)	14%	162 064 197 (30%)	4 127 (48%)	11%	2 758 857 (44%)
Western Pacific	799 391 (19%)	-3%	63 605 980 (12%)	1 566 (18%)	-6%	237 209 (4%)
South-East Asia	131 014 (3%)	32%	58 471 132 (11%)	314 (4%)	15%	789 814 (12%)
Eastern Mediterranean	74 016 (2%)	47%	21 948 319 (4%)	83 (1%)	22%	343 485 (5%)
Africa	20 579 (<1%)	-39%	9 107 669 (2%)	203 (2%)	-1%	173 447 (3%)
Global	**4 182 217 (100%)**	**18%**	**541 313 815 (100%)**	**8 552 (100%)**	**3%**	**6 327 547 (100%)**

**Percent change in the number of newly confirmed cases/deaths in the past seven days, compared to seven days prior*
**See *Annex 1: Data, table, and figure notes*

For the latest data and other updates on COVID-19, please see:

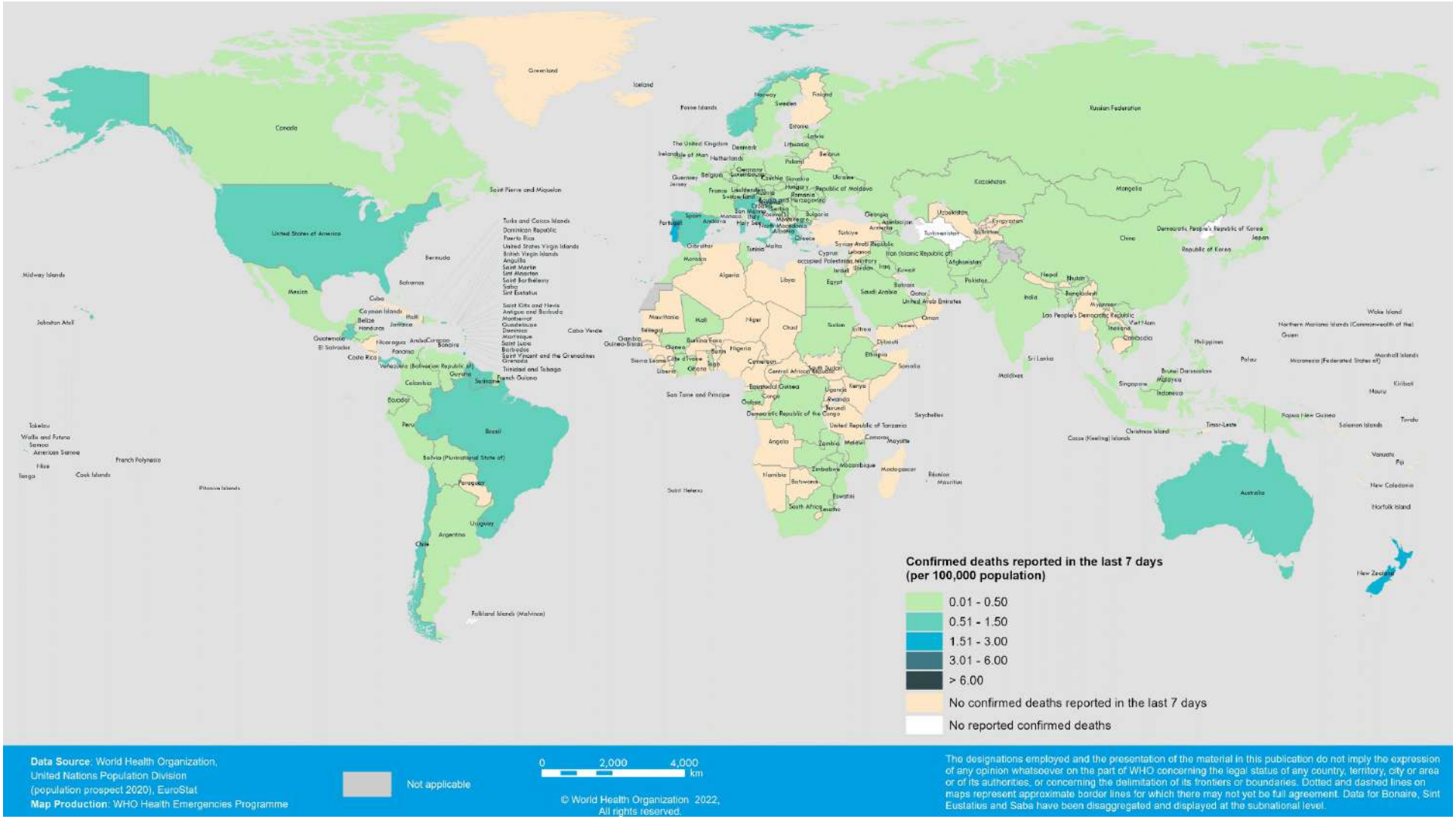
- WHO COVID-19 Dashboard
- WHO COVID-19 Weekly Operational Update and previous editions of the Weekly Epidemiological Update
- WHO COVID-19 detailed surveillance data dashboard

Figure 2. COVID-19 cases per 100 000 population reported by countries, territories and areas, 20 – 26 June 2022*



**See *Annex 1: Data, table, and figure notes*

Figure 3. COVID-19 deaths per 100 000 population reported by countries, territories and areas, 20-26 June 2022*



**See *Annex 1: Data, table, and figure notes*

Special Focus: Update on SARS-CoV-2 variants of interest and variants of concern

WHO, in collaboration with national authorities, institutions and researchers, routinely assesses if variants of SARS-CoV-2 alter transmission or disease characteristics, or impact the effectiveness of vaccines, therapeutics, diagnostics or public health and social measures (PHSM) applied to control disease spread. Potential variants of concern (VOCs), variants of interest (VOIs) or variants under monitoring (VUMs) are regularly assessed based on the risk posed to global public health.

The classifications of variants will be revised as needed to reflect the continuous evolution of circulating variants and their changing epidemiology. Criteria for variant classification, and the lists of currently circulating and previously circulating VOCs, VOIs and VUMs, are available on the WHO Tracking SARS-CoV-2 variants website. National authorities may choose to designate other variants and are strongly encouraged to investigate and report newly emerging variants and their impact.

Geographic spread and prevalence of VOCs

There continues to be a decline in the number of SARS-CoV-2 sequences submitted to GISAID, as compared to January 2022 when 1 248 906 sequences were submitted. From 27 May to 27 June 2022, 146 183 SARS-CoV-2 sequences were submitted to GISAID. Among these sequences, the Omicron VOC remains the dominant variant circulating globally, accounting for 94% of sequences reported in the past 30 days. Among Omicron sequences, as of epidemiological week 24 (13 to 19 June 2022) BA.2 represents 25%, while BA.2.12.1 represents 11%, BA.4 represents 12%, and BA.5 represents 43%. Comparing the proportion of Omicron sequences submitted during epidemiological weeks 23 (6 to 12 June) and 24, BA.2 declined from 30% to 25%, BA.2.12.1 declined from 18% to 11%, while BA.4 increased from 9% to 12% and BA.5 increased from 28% to 43%.

These trends should be interpreted with due consideration of the limitations of surveillance systems, including differences in sequencing capacity and sampling strategies between countries, as well as changes in sampling and sequencing strategies in multiple countries.

Additional resources

- Tracking SARS-CoV-2 Variants
- COVID-19 new variants: Knowledge gaps and research
- Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health
- Considerations for implementing and adjusting public health and social measures in the context of COVID-19
- VIEW-hub: repository for the most relevant and recent vaccine data
- WHO Statement on Omicron sublineage BA.2

Special Focus: Relative vaccine effectiveness

Vaccine effectiveness (VE) is a measure of how well vaccines work in the real world. Most VE studies compare the risk of a clinical outcome among vaccinated persons to the risk among unvaccinated persons, referred to as absolute VE (aVE).

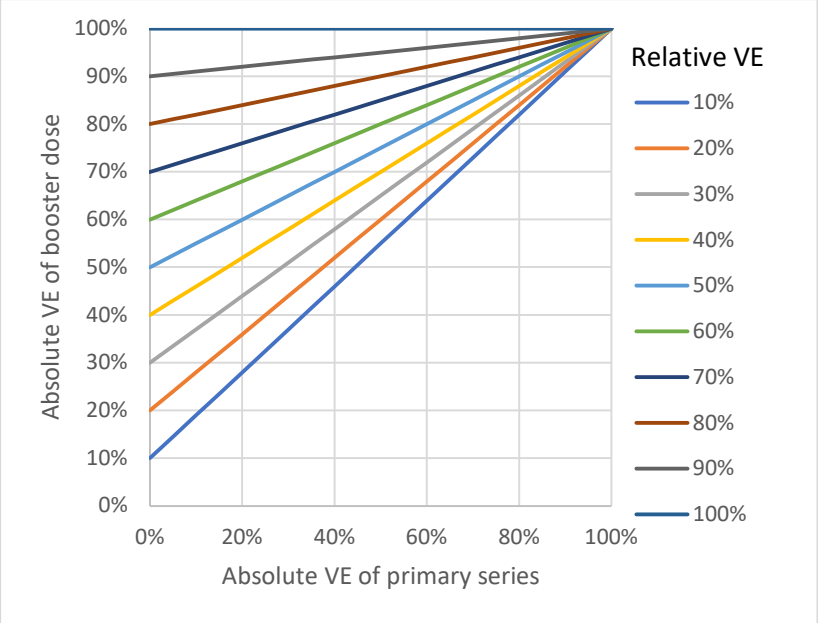
$$aVE = 1 - \frac{risk\ among\ vaccinated}{risk\ among\ unvaccinated}\ x\ 100\%$$

However, as vaccine coverage reaches a high rate (e.g., >90%), the unvaccinated population can become quite different from the vaccinated population in terms of SARS-CoV-2 exposure and/or disease risk, leading to a bias in the aVE results. To help mitigate this bias and compare more similar risk groups, one can compare vaccine effectiveness within the group of vaccinated individuals alone, specifically comparing by the number of doses received. For example, one can compare recipients of one booster dose to recipients of only the primary series, or compare recipients of two booster doses to recipients of one booster dose or the primary series, and so on. This type of comparison is called a relative VE (rVE) and has been done for several vaccines, such as those for influenza.[1] For COVID-19 vaccines, rVE has been reported in studies from multiple countries including Israel, Brazil and Canada.[2-4]

The relationship between absolute and relative VE can be expressed in the following mathematical terms (using boosted versus primary series as an example), which is demonstrated in Figure 4.

$$rVE = \frac{aVE_{boosted} - aVE_{primary\ series}}{1 - aVE_{primary\ series}}\ x\ 100\%$$

Figure 4. Relationship between absolute vaccine effectiveness to relative vaccine effectiveness[a]

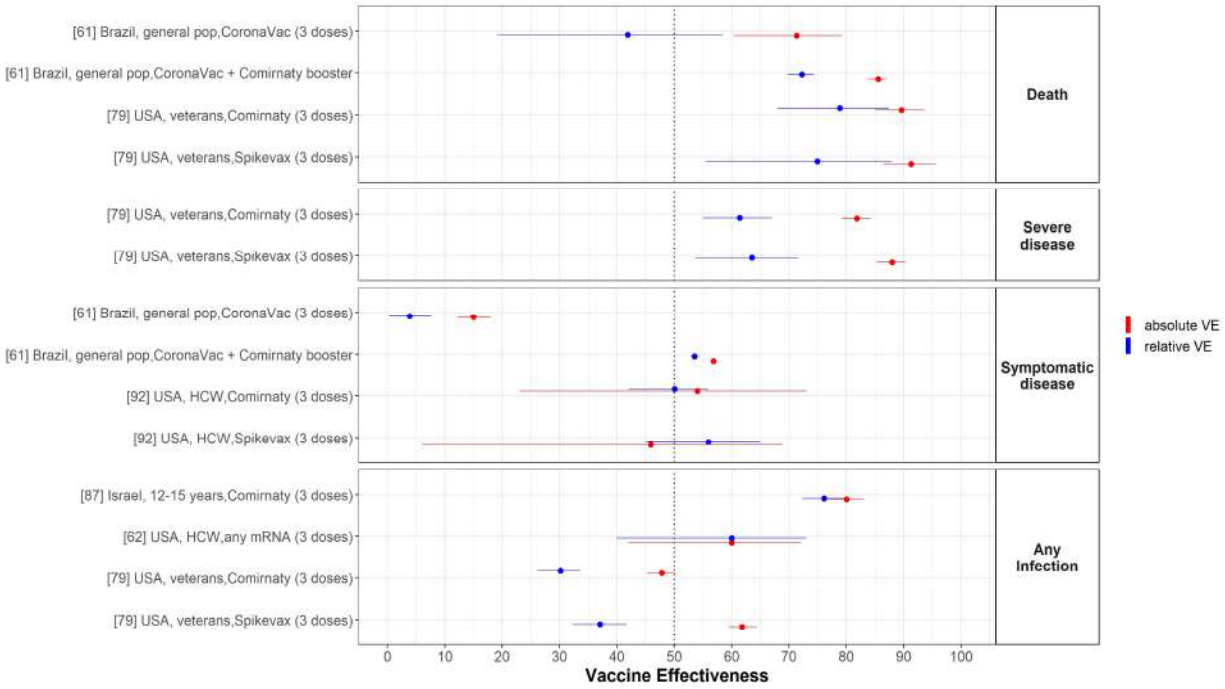


[a]The figure can be applied to any relative VE comparison (i.e., three doses versus two doses; four versus two doses etc.). In this figure, booster dose versus primary series have been used as an example.

At low aVE of the primary series (whereby primary series recipients are compared to unvaccinated persons), the rVE of the booster dose (whereby booster dose recipients are compared to primary series recipients) approximates the aVE of the booster dose (whereby booster dose recipients are compared to unvaccinated persons). However, at high aVE of the primary series, the rVE of the booster dose can vary quite dramatically while the incremental gain in aVE of the booster dose is small.

For example, if the aVE of the primary series is 90%, and the rVE of the booster dose is 50%, then the aVE of the booster dose is 95%. This rVE of 50% makes it appear like a significant increase in protection, but the gain in absolute VE is only 5%. Meanwhile, if the aVE of the primary series is 0%, and rVE of the booster dose is 50%, then the aVE of the booster dose is 50%. The true aVE of the booster dose should always be higher than the rVE, but by how much will depend on the true aVE of the primary series, which is determined by a variety of factors. However, in real-world VE studies, this is not always the case due to issues such as confounding bias (e.g. due to behavioral differences, history of a prior SARS-CoV-2 infection) and uncertainty of the estimates.

Figure 5. Absolute and relative vaccine effectiveness of the first booster dose against Omicron VOC[a]



[a] Labels on y-axis indicate: [reference number], country, population, vaccine. Reference numbers refer to study numbers in Table 2 of the *COVID-19 Vaccine Effectiveness Results Summary Table* found at https://view-hub.org/resources.

A few studies have evaluated both the aVE and the rVE of the booster dose. The results of these evaluations are summarized in Figure 5. Because persons in the comparison group potentially have some vaccine-induced immunity, the rVE is lower or equal to the aVE of the booster dose. If investigators do not provide the aVE of the booster dose, then one cannot calculate it from the rVE alone. One would need both the rVE and the aVE of the primary series at the same time in the same population to calculate the aVE of the booster dose.

The rVE provides a way to quantify the additional preventive benefit of a booster dose versus a primary series. The rVE must be interpreted with the understanding that the comparison group has potentially some residual protection

from the vaccine. Interpreting the rVE requires knowing the population and vaccine being evaluated, the timing of the last dose, the clinical outcome, and the epidemiologic situation, including the circulating SARS-CoV-2 variants. Because these are context and time-specific, one cannot use an aVE of the primary series from one study to calculate the aVE of a booster dose in another study. Furthermore, the rVE of a given vaccine cannot be compared across studies as rVE is dependent on aVE, signifying that averted events can vary widely from study to study.[5]

Second booster dose VE

To date, nine studies have assessed the rVE against the Omicron VOC over time of a second booster vaccine dose relative to either the first booster dose or the primary series. In five studies evaluating the protection of mRNA boosters against COVID-19 *severe disease* (hospitalization, ICU admission, and/or death), the rVE of a second mRNA booster dose compared to the first booster dose ranged from 40% to 86.5% (Table 2). The follow-up time was limited in all studies. Only one study was able to calculate the absolute and relative VE of a second booster dose against severe disease, finding an aVE of the second booster dose of 86%, an aVE of the first booster dose of 77%, and an rVE of 40%.[2] Also presented is the absolute risk reduction to show the impact of the addition of a second booster dose.

Table 2. Studies evaluating the relative vaccine effectiveness (VE) against SARS-CoV-2-specific outcomes of the second booster dose (data as of 27 June 2022)

				Infection with SARS-CoV2	Severe Disease/Mortality with COVID-19			
Study	**Country**	**Population studied**	**Vaccine Evaluated**	**Relative VE against Infection (95% CI)**	**Relative VE against Severe disease (95% CI)**	**Rate among comparator group**	**Rate among 2nd booster dose recipients**	**Rate difference**
Cohen et al [6]	Israel	HCWs	Pfizer-BioNTech-Comirnaty	44% (37-50%) ≥7 days after second booster dose versus ≥4 months after first[t] booster dose				
Regev-Yochay et al[7]	Israel	HCWs	Pfizer-BioNTech-Comirnaty	30% (-9 to55%) ≥7 days after second booster dose versus ≥4 months after first booster dose				
			Moderna-Spikevax	11% (-43 to 44%) ≥7 days after second booster dose versus ≥4 months after first booster dose				
Amir et al[4]	Israel	≥60 years	Pfizer-BioNTech-Comirnaty		89% (87-91%) 0-2 months after second booster dose versus ≥4 months after primary series.	11.6 (10.6-12.9) / 100 000 person days at risk	1.3 (1.1-1.4) / 100 000 person days at risk	10.3 cases / 100 000 person days at risk
Arbel et al[8]	Israel	≥60 years	Pfizer-BioNTech-Comirnaty		78% (72-83%) ≥7 days after second booster dose versus ≥4 months after first booster dose (mortality)	99.2 / 100 000 persons at risk	28 / 100 000 persons at risk	71.2 / 100 000 persons at risk*

Bar-On et al[9]	Israel	≥60 years	Pfizer-BioNTech-Comirnaty	52% (50-52%) 15-21 days after second booster dose versus ≥4 months after first booster dose	66% (57-72%) 15-21 days after second booster dose versus ≥4 months after first booster dose	5.5 (5.2-5.9) / 100 000 person days at risk	2.3 (1.9-2.8) / 100 000 person days at risk	3.2 (2.7-3.7) / 100 000 person days at risk
				9% (0-17%) 50-56 days after second booster dose versus ≥4 months after first booster dose	77% (62-86%) 36-42 days after second booster dose versus ≥4 months after first booster dose	5.5 (5.2-5.9) / 100 000 person days at risk	1.3 (0.8- 2.2) / 100 000 person days at risk	4.2 (3.4–4.9) / 100 000 person-days at risk
Magen et al [10]	Israel	≥60 years	Pfizer-BioNTech-Comirnaty	52% (49-54%) 14-30 days after second booster dose versus ≥4 months after first booster dose	64% (48-77%) 14-30 days after second booster dose versus ≥4 months after first booster dose	85.2 / 100 000 persons	30.4 / 100 000 persons	54.8 (34.7–75.9) / 100 000 persons
Gazit et al [11]	Israel	≥60 years	Pfizer-BioNTech-Comirnaty	65.1% (63-67.1% 14-20 days after second booster dose versus ≥4 months after first booster dose	77.5% (69.7-83.2%) 7-27 days after second booster dose versus ≥4 months after first booster dose			
				22% (4.9-36.1%) 63-69 days after second booster dose versus ≥4 months after first booster dose	86.5% (63.4-95%) 49-69 days after second booster dose versus ≥4 months after first booster dose			
Muhsen et al[12]	Israel	Residents of LTCFs	Pfizer-BioNTech-Comirnaty	34% (30%-37%) ≥7 days after second booster dose versus ≥4 months after first booster dose	67% (57%-75%) against severe hospitalization and 72% (54%-83%) against death ≥7 days after second booster			

					dose versus ≥4 months after first booster dose			
Grewal et al[2]	Canada	≥60 years living in LTCFs	Pfizer-BioNTech-Comirnaty Moderna-Spikevax	19% (12-26%) ≥7 days after second booster dose versus ≥84 days after first booster dose	40% (24-52%) ≥7 days after second booster dose versus ≥84 days after first booster dose			

HCW = healthcare workers
LTCF = long-term care facilities
*Unadjusted rates

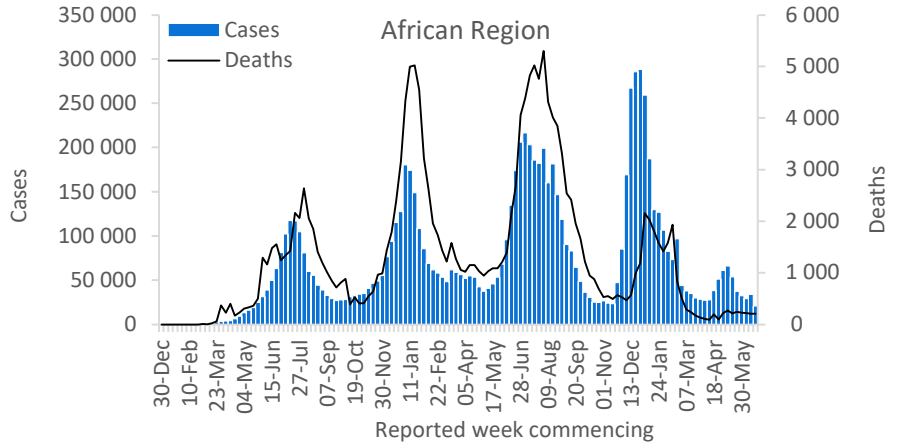
WHO regional overviews:

Epidemiological week 20-26 June 2022**

African Region

The African Region reported a decline in the number of new weekly cases, with over 20 000 new cases reported, a 39% decrease as compared to the previous week. Fourteen (29%) countries reported an increase in the number of new cases of 20% or greater, with some of the greatest proportional increases seen in Equatorial Guinea (44 vs six new cases; +633%), Gabon (82 vs 31 new cases; +165%) and the Seychelles (184 vs 88 new cases; +109%). The countries that reported the highest numbers of new cases were South Africa (6843 new cases; 11.5 new cases per 100 000 population; -14%), Ethiopia (3092 new cases; 2.7 new cases per 100 000; -40%), and Kenya (2859 new cases; 5.3 new cases per 100 000; +21%).

The number of new weekly deaths in the Region was similar as compared to the previous week, with over 200 new deaths reported. The highest numbers of new deaths were reported from South Africa (133 new deaths; <1 new death per 100 000 population; +10%), Democratic Republic of the Congo (17 new deaths; <1 new death per 100 000; +325%), and Zimbabwe (15 new deaths; <1 new death per 100 000; +15%).

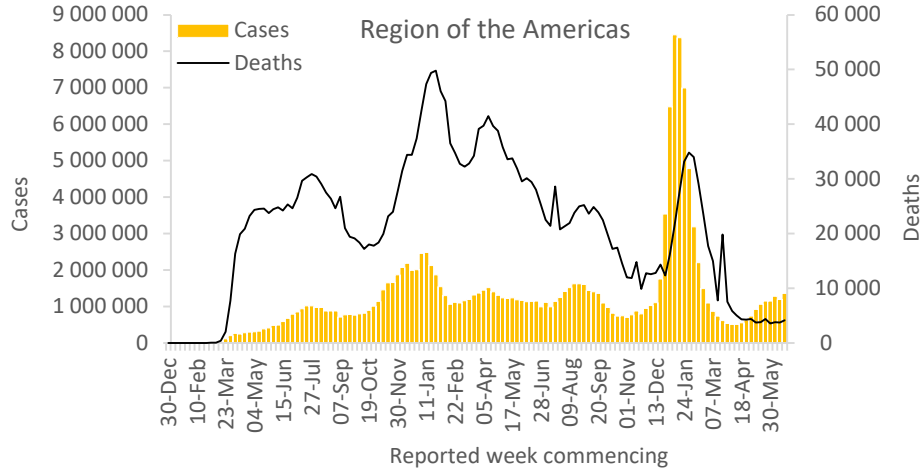


Updates from the African Region

Region of the Americas

The Region of the Americas reported an increase in the number of new weekly cases, with over 1.3 million new weekly cases, a 14% increase as compared to the previous week. Sixteen (29%) countries reported increases in the number of new cases of 20% or greater, with some of the greatest proportional increases observed in Canada (15 051 vs 6515 new cases; +131%), the Falkland Islands (Malvinas) (51 vs 23 new cases; +122%) and Bolivia (Plurinational State of) (5485 vs 2617 new cases; +110%). The highest numbers of new cases were reported from the United States of America (701 855 new cases; 212.0 new cases per 100 000; +5%), Brazil (349 791 new cases; 164.6 new cases per 100 000; +37%), and Mexico (76 407 new cases; 59.3 new cases per 100 000; +47%).

The number of new weekly deaths in the Region increased by 11% as compared to the previous week, with over 4100 new deaths reported. The highest numbers of new deaths were reported from the United States of America (1997 new deaths; <1 new death per 100 000; -2%), Brazil (1313 new deaths; <1 new death per 100 000; +37%), and Chile (159 new deaths; <1 new death per 100 000; +6%).

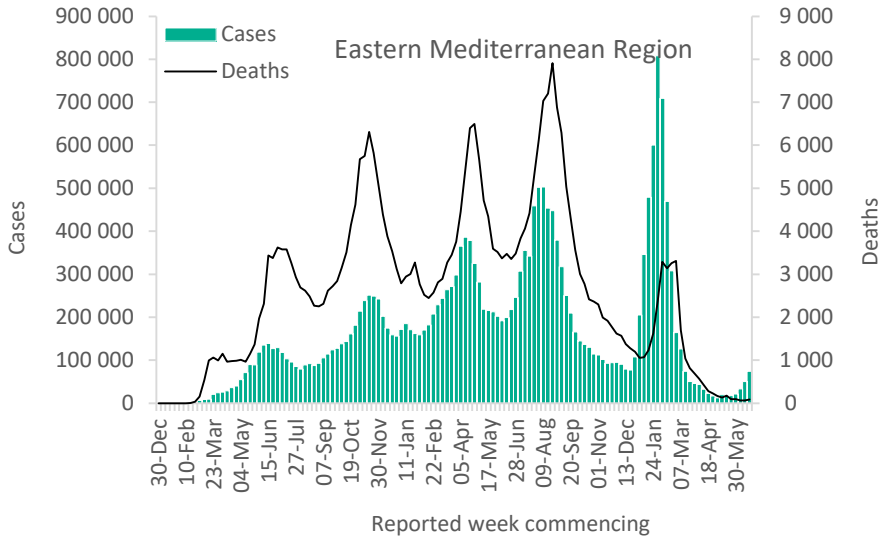


Updates from the Region of the Americas

Eastern Mediterranean Region

The Eastern Mediterranean Region reported over 74 000 new weekly cases, representing a 47% increase as compared to the previous week. Ten (45%) countries reported increases in the number of new cases of 20% or greater, with the greatest proportional increases observed in Iraq (6237 vs 2210 new cases; +182), Tunisia (2277 vs 886 new cases; +157%), and Pakistan (1652 vs 718 new cases; +130%). The highest numbers of new cases were reported from Morocco (17 729 new cases; 48.0 new cases per 100 000; +84%), Bahrain (12 740 new cases; 748.7 new cases per 100 000; +38%), and the United Arab Emirates (11 139 new cases; 112.6 new cases per 100 000; +15%).

The number of new weekly deaths in the Region increased by 22% as compared to the previous week, with 83 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (20 new deaths; <1 new death per 100 000; +43%), Tunisia (15 new deaths; <1 new death per 100 000; +114%), and Saudi Arabia (13 new deaths; <1 new death per 100 000; -13%).

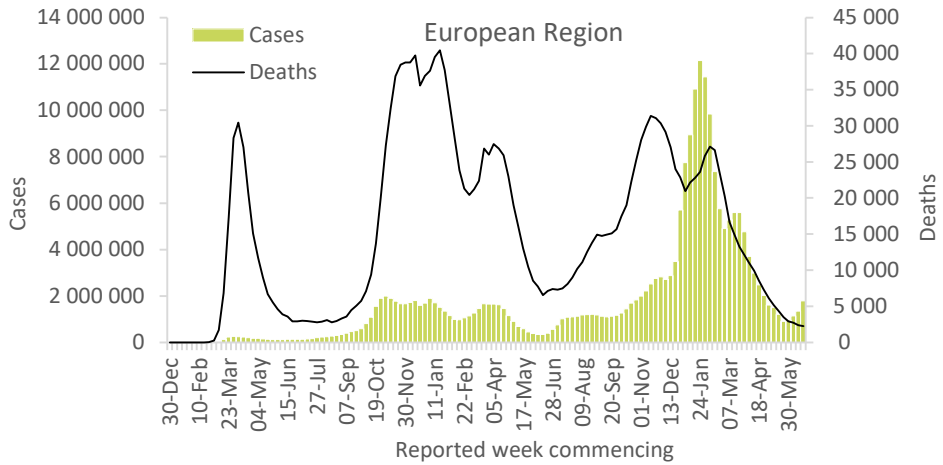


Updates from the Eastern Mediterranean Region

European Region

After reporting decreases in the number of new weekly cases since mid-March 2022, an increase has been reported for the third consecutive week in the European Region, with over 1.8 million new cases reported, a 33% increase compared to the previous week. Thirty-three (54%) countries in the Region reported increases in new cases of 20% or greater, with the greatest proportional increases observed in Romania (2609 vs 341 new cases; +665%), Spain (118 421 vs 18 757 new cases; +531%) and Kazakhstan (299 vs 112 new cases; +167%). The highest numbers of new cases were reported from Germany (504 655 new cases; 606.8 new cases per 100 000; +23%), Italy (340 012 new cases; 570.1 new cases per 100 000; +61%), and France (331 843 new cases; 510.2 new cases per 100 000; +37%).

Over 2200 new weekly 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 (429 new deaths; <1 new death per 100 000; -3%), Italy (355 new deaths; <1 new death per 100 000; a +5%), and Spain (317 new deaths; <1 new death per 100 000; +45%).

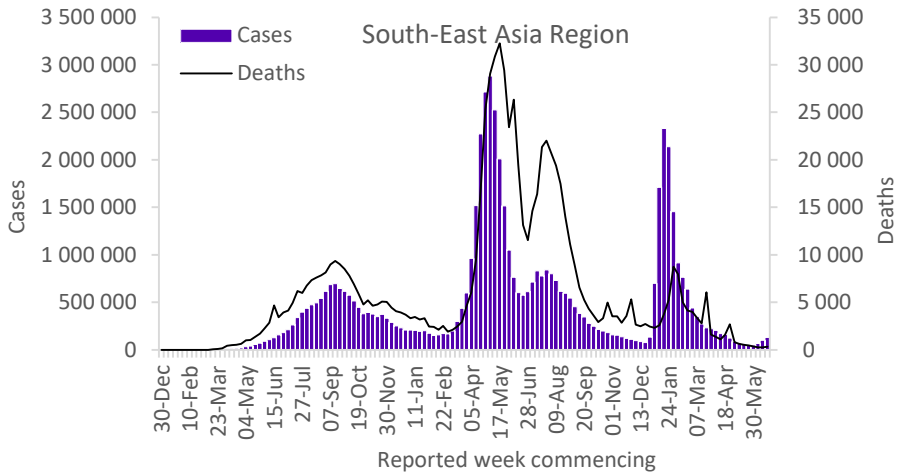


Updates from the European Region

South-East Asia Region

After the declining trend in new cases observed since mid-January 2022, the South-East Asia Region has reported increases over the last four weeks, with over 131 000 new cases reported, a 32% increase as compared to the previous week. Eight of ten countries (80%) for which data are available showed increases in the number of new cases of 20% or greater, with some of the greatest proportional increases observed in Bangladesh (8846 vs 2212 new cases; +300%), the Maldives (1043 vs 528 new cases; +98%) and Sri Lanka (83 vs 47 new cases; +77%). The highest numbers of new cases were reported from India (93 281 new cases; 6.8 new cases per 100 000; +25%), Thailand (15 111 new cases; 21.6 new cases per 100 000; +7%), and Indonesia (12 376 new cases; 4.5 new cases per 100 000; +63%).

The number of new weekly deaths in the Region increased by 15% as compared to the previous week, with over 300 new deaths reported. The highest numbers of new deaths were reported from India (144 new deaths; <1 new death per 100 000; +53%), Thailand (125 new deaths; <1 new death per 100 000; -6%), and Indonesia (30 new deaths; <1 new death per 100 000; -32%).

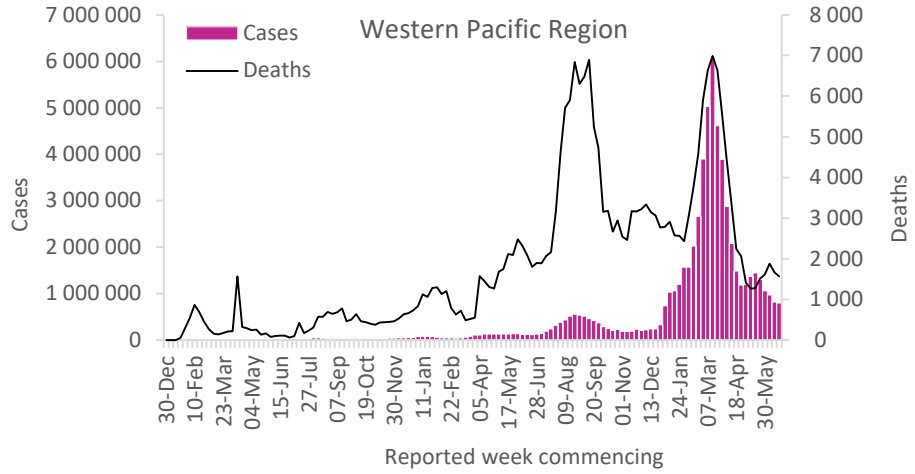


Updates from the South-East Asia Region

Western Pacific Region

The Western Pacific Region continues the decreasing trend observed since mid-May 2022, with over 799 000 new cases reported last week, which is similar to the number of new cases reported during the previous week. Twelve (36%) countries reported increases in new cases of 20% or greater, with some of the largest proportional increases observed in Samoa (346 vs 75 new cases; +361%), French Polynesia (102 vs 60 new cases; +70%) and the Philippines (4376 vs 2738 new cases; +60%). The highest numbers of new cases were reported from China (333 926 new cases; 22.7 new cases per 100 000; -18%), Australia (196 360 new cases; 770.0 new cases per 100 000; +8%), and Japan (109 520 new cases; 86.6 new cases per 100 000; +20%).

The Region reported over 1500 new weekly deaths, representing a 6% decrease as compared to the previous week. The highest numbers of new deaths were reported from China (925 new deaths; <1 new death per 100 000; -11%), Australia (331 new deaths; 1.3 new deaths per 100 000; +6%), and the Republic of Korea (87 new deaths; <1 new death per 100 000; +43%).



Updates from the Western Pacific Region

Annex 1. Data, table, and figure notes

Data presented are based on official laboratory-confirmed COVID-19 cases and deaths reported to WHO by country/territories/areas, largely based upon WHO case definitions and surveillance guidance. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change, and caution must be taken when interpreting these data as several factors influence the counts presented, with variable underestimation of true case and death incidences, and variable delays to reflecting these data at the global level. Case detection, inclusion criteria, testing strategies, reporting practices, and data cut-off and lag times differ between countries/territories/areas. A small number of countries/territories/areas report combined probable and laboratory-confirmed cases. Differences are to be expected between information products published by WHO, national public health authorities, and other sources.

Due to public health authorities conducting data reconciliation exercises that remove large numbers of cases or deaths from their total counts, negative numbers may be displayed in the new cases/deaths columns as appropriate. When additional details become available that allow the subtractions to be suitably apportioned to previous days, graphics will be updated accordingly. A record of historic data adjustment made is available upon request by emailing epi-data-support@who.int. Please specify the countries of interest, time period, and purpose of the request/intended usage. Prior situation reports will not be edited; see covid19.who.int for the most up-to-date data. COVID-19 confirmed cases and deaths reported in the last seven days by countries, territories, and areas, and WHO Region (reported in previous issues) are now available at: https://covid19.who.int/table.

'Countries' may refer to countries, territories, areas or other jurisdictions of similar status. The designations employed, and the presentation of these materials do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Countries, territories, and areas are arranged under the administering WHO region. The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions except, the names of proprietary products are distinguished by initial capital letters.

[1] All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999). In the map, the number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.
[2] Since 21 May 2022, data for COVID-19 cases and deaths in Northern Ireland was no longer included in the United Kingdom updates.
[3] Updates of an outbreak of COVID-19 reported in the Democratic People's Republic of Korea continue through official media since 12 May 2022; however, at present, no confirmed cases or deaths have been reported to WHO.

References for Special Focus on relative vaccine effectiveness

1. Lee JKH, Lam GKL, Shin T, et al. Efficacy and effectiveness of high-dose versus standard-dose influenza vaccination for older adults: a systematic review and meta-analysis. Expert Rev Vaccines 2018;17(5):435-443. DOI: 10.1080/14760584.2018.1471989.
2. Grewal R, Kitchen SA, Nguyen L, et al. Effectiveness of a Fourth Dose of COVID-19 Vaccine among Long-Term Care Residents in Ontario, Canada: Test-Negative Design Study. medRxiv 2022:2022.04.15.22273846. DOI: 10.1101/2022.04.15.22273846.
3. Marra AR, Miraglia JL, Malheiros DT, et al. Effectiveness of heterologous COVID-19 vaccine booster dosing in Brazilian healthcare workers, 2021. Clin Infect Dis 2022. DOI: 10.1093/cid/ciac430.

4. Amir O, Goldberg Y, Mandel M, et al. Protection against omicron severe disease 0-7 months after BNT162b2 booster. medRxiv 2022:2022.05.04.22274647. DOI: 10.1101/2022.05.04.22274647.
5. Lewis NM, Chung JR, Uyeki TM, Grohskopf L, Ferdinands JM, Patel MM. Interpretation of Relative Efficacy and Effectiveness for Influenza Vaccines. Clin Infect Dis 2021. DOI: 10.1093/cid/ciab1016.
6. Cohen MJ, Oster Y, Moses AE, Spitzer A, Benenson S, Group tI-htvW. Effectiveness of the BNT162b vaccine fourth dose in reducing SARS-CoV-2 infection among healthcare workers in Israel, a multi-center cohort study. medRxiv 2022:2022.04.11.22273327. DOI: 10.1101/2022.04.11.22273327.
7. Regev-Yochay G, Gonen T, Gilboa M, et al. Efficacy of a Fourth Dose of Covid-19 mRNA Vaccine against Omicron. N Engl J Med 2022;386(14):1377-1380. DOI: 10.1056/NEJMc2202542.
8. Arbel R, Sergienko R, Friger M, et al. Effectiveness of a second BNT162b2 booster vaccine against hospitalization and death from COVID-19 in adults aged over 60 years. Nat Med 2022. DOI: 10.1038/s41591-022-01832-0.
9. Bar-On YM, Goldberg Y, Mandel M, et al. Protection by a Fourth Dose of BNT162b2 against Omicron in Israel. N Engl J Med 2022;386(18):1712-1720. DOI: 10.1056/NEJMoa2201570.
10. Magen O, Waxman JG, Makov-Assif M, et al. Fourth Dose of BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Setting. N Engl J Med 2022;386(17):1603-1614. DOI: 10.1056/NEJMoa2201688.
11. Gazit S, Saciuk Y, Perez G, Peretz A, Pitzer VE, Patalon T. Short term, relative effectiveness of four doses versus three doses of BNT162b2 vaccine in people aged 60 years and older in Israel: retrospective, test negative, case-control study. BMJ 2022;377:e071113. DOI: 10.1136/bmj-2022-071113.
12. Muhsen K, Maimon N, Mizrahi AY, et al. Association of Receipt of the Fourth BNT162b2 Dose With Omicron Infection and COVID-19 Hospitalizations Among Residents of Long-term Care Facilities. JAMA Intern Med. 2022 Jun 23. DOI: 10.1001/jamainternmed.2022.2658.

Technical guidance and other resources

- WHO technical guidance
- WHO COVID-19 Dashboard
- WHO Weekly Operational Updates on COVID-19
- WHO COVID-19 case definitions
- COVID-19 Supply Chain Inter-Agency Coordination Cell Weekly Situational Update
- Research and Development
- Open WHO courses on COVID-19 in official UN languages and in additional national languages
- WHO Academy COVID-19 mobile learning app
- The Strategic Preparedness and Response Plan (SPRP) outlining the support the international community can provide to all countries to prepare and respond to the virus
- EPI-WIN: tailored information for individuals, organizations, and communities
- Recommendations and advice for the public: Protect yourself; Questions and answers; Travel advice