



Update 126 FHP-Update 23 November 2022



GLOBAL

640 280 307
confirmed cases
627 400 000
recovered
6 627 920 deaths

KOR

7-days incidence
717

HKG

7-days incidence
706

JPN

7-days incidence
566

News:

- **WHO:** is launching a [global scientific process to update the list of priority pathogens](#)—agents that can cause outbreaks or pandemics—to guide global investment, research and development (R&D), especially in vaccines, tests and treatments.
- **WHO :** published an updated [interim guidance for monkeypox vaccination](#).
- **WHO:** WHO has [released a new resource](#) to help guide policy-makers, decision makers, and implementers in designing and overseeing telemedicine implementations.
- **WHO:** released the [first report to capture the implications of COVID-19 for vaccine markets](#). Amongst other points it shows that despite progress in recent decades, global market vaccine dynamics are not fully conducive to the development, supply and access for vital vaccines for public health.
- **ECDC:** published an [interim analysis of COVID-19 vaccine effectiveness in healthcare workers](#). This is part of building infrastructure to allow the regular monitoring of COVID-19 vaccine effectiveness over time, using a multi-country approach that involves studies implemented in different settings.
- **ECDC:** published an executive [summary are based on antimicrobial resistance](#) (AMR) data from invasive isolates in Europe.
- **ECDC:** published the ninth and [final report for the 2021-2022 influenza season](#). As of week 39/2022, 149 372 detections had been reported, resulting from extended late season influenza activity. Of these 149 372 detections, 98% were type A viruses, with A(H3N2) dominating (91%) over A(H1N1)pdm09 (9%), and 2% type B. This represents a large increase (148 096, 117-fold) in detections compared to the 2020-2021 season, on the back of a great increase (1 957 744, 151%) in the number of samples tested.

Topics:

- Global situation: COVID-19 (slide 2 – 4)
- Global Monkeypox outbreak (slide 5)
- 2022 Polio Outbreaks (slide 6 – 7)
- Other infectious diseases (slide 8)
- Ukraine Situation Report (slide 9)
- Force Health Protection Event 2022 (slide 10 – 11)

Disclaimer:

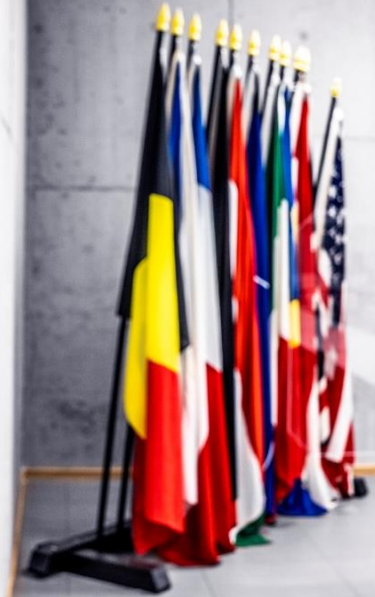
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Force Health Protection Hybrid Event

“Focus on Health Surveillance”



08 to 10 November 2022
in Munich or virtual



EUROPE

256 137 126
confirmed cases
252 100 000
recovered
2 078 239 deaths

GRC

7-days incidence
518

CHE

7-days incidence
486

FRA

7-days incidence
364

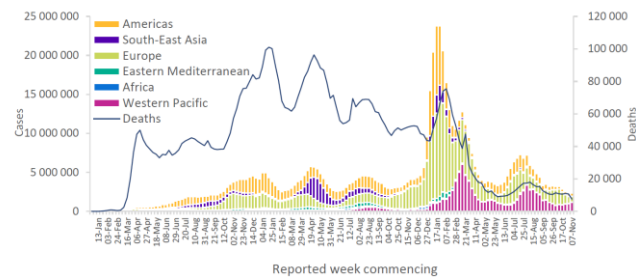
COVID-19 Situation by WHO Region, as of 16 November

Global epidemiological situation overview; WHO as of 16 November 2022

Globally, the number of new weekly cases increased by 2% during the week of 7 to 13 November 2022 as compared to the previous week, with over 2.3 million new cases reported (Figure 1). The true number of incident cases is an underestimate due to a decline in testing globally. The number of new weekly deaths decreased by 30% as compared to the previous week, with over 7400 fatalities reported. As of 13 November 2022, over 632 million confirmed cases and over 6.5 million deaths have been reported globally. At the regional level, the number of newly reported weekly cases decreased across three of the six WHO regions: the European Region (-21%), the Eastern Mediterranean Region (-12%) and the African Region (-8%); while case numbers increased in the Western Pacific Region (+18%), the South-East Asia Region (+15%) and the Region of the Americas (+12%). The number of new weekly deaths decreased across four regions: the African Region (-86%), the South-East Asia Region (-80%), the European Region (-41%) and the Region of the Americas (-10%); while the number of deaths increased in the Western Pacific Region (+14%) and the Eastern Mediterranean Region (+7%).

At the country level, the highest numbers of new weekly cases were reported from Japan (503 766 new cases; +25%), the Republic of Korea (355 990 new cases; +19%), the United States of America (281 955 new cases; +6%), Germany (184 987 new cases; -25%), and China (171 745 new cases; -22%). The highest numbers of new weekly deaths were reported from the United States of America (2323 new deaths; -6%), Japan (552 new deaths; +41%), the Russian Federation (436 new deaths; -10%), China (410 new deaths; -24%), and France (390 new deaths; -10%).

Figure 1. COVID-19 cases reported weekly by WHO Region, and global deaths, as of 13 November 2022**



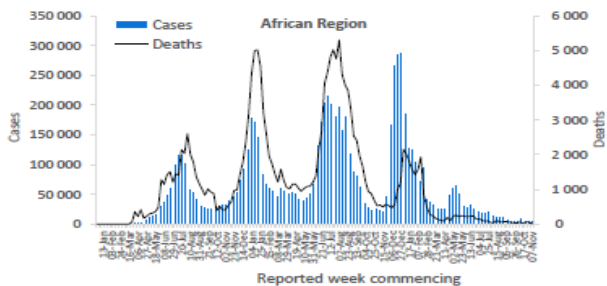
WHO regional overviews:

Epidemiological week 7-13 November 2022

African Region

The African Region reported almost 5900 new cases, an 8% decrease as compared to the previous week. Ten (20%) of the 50 countries for which data are available reported increases in new cases of 20% or greater, with the highest proportional increases observed in Mayotte (76 vs 19 new cases; +300%), Benin (seven vs three new cases; +133%) and Mozambique (44 vs 24 new cases; +83%). The highest numbers of new cases were reported from South Africa (3445 new cases; 5.8 new cases per 100 000 population; +73%), Kenya (700 new cases; 1.3 new cases per 100 000; +18%), and Réunion (509 new cases; 56.9 new cases per 100 000; +32%).

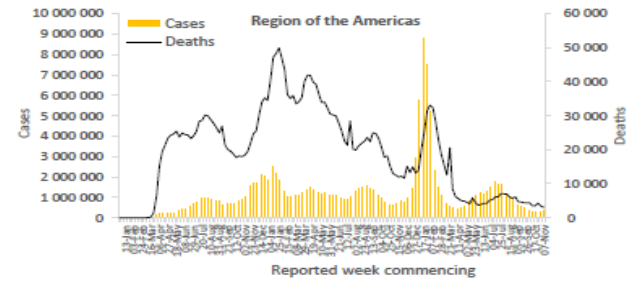
The number of new weekly deaths in the region decreased by 86% as compared to the previous week, with eight new deaths reported. All new deaths were reported from South Africa (eight new deaths; <1 new death per 100 000 population; -85%).



Region of the Americas

The Region of the Americas reported over 418 000 new cases, a 12% increase as compared to the previous week. Seventeen (30%) of the 56 countries for which data are available reported increases in new cases of 20% or greater, with some of the highest proportional increases observed in Guyana (19 vs six new cases; +217%), Paraguay (69 vs 25 new cases; +176%) and Cuba (26 vs 10 new cases; +160%). The highest numbers of new cases were reported from the United States of America (281 955 new cases; 85.2 new cases per 100 000; +6%), Brazil (59 135 new cases; 27.8 new cases per 100 000; +120%), and Chile (46 640 new cases; 244.0 new cases per 100 000; +32%).

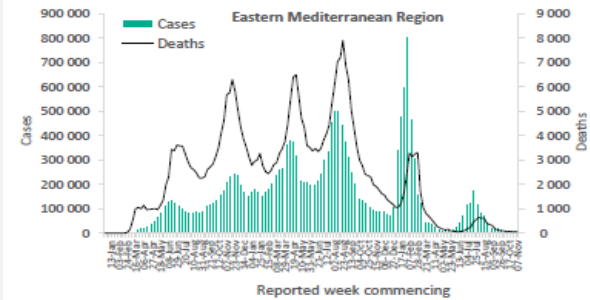
The number of new weekly deaths in the region decreased by 10% as compared to the previous week, with 3051 new deaths reported. The highest numbers of new deaths were reported from the United States of America (2323 new deaths; <1 new death per 100 000; -6%), Brazil (324 new deaths; <1 new death per 100 000; +29%), and Chile (194 new deaths; 1.0 new death per 100 000; +42%).



Eastern Mediterranean Region

The Eastern Mediterranean Region reported over 10 000 new cases, a 12% decrease as compared to the previous week. Five (23%) of the 22 countries for which data are available reported increases in new cases of 20% or greater, with the highest proportional increases observed in Somalia (11 vs six new cases; +83%), Sudan (64 vs 37 new cases; +73%) and Morocco (596 vs 393 new cases; +52%). The highest numbers of new cases were reported from Qatar (2436 new cases; 84.6 new cases per 100 000; -10%), Bahrain (1752 new cases; 103.0 new cases per 100 000; -14%), and the United Arab Emirates (1731 new cases; 17.5 new cases per 100 000; -16%).

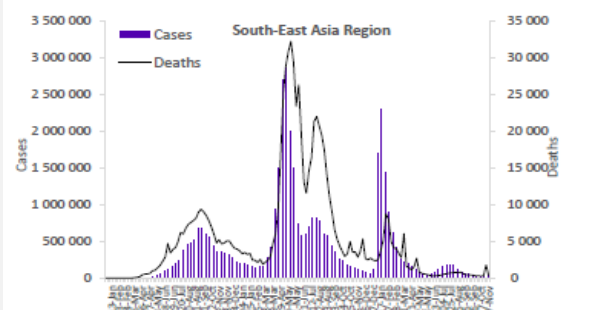
The number of new weekly deaths in the region increased by 7% as compared to the previous week, with 61 new deaths reported. The highest numbers of new deaths were reported from the Islamic Republic of Iran (18 new deaths; <1 new death per 100 000; -14%), Saudi Arabia (15 new deaths; <1 new death per 100 000; +25%), and Sudan (nine new deaths; no deaths reported in the previous week).



South-East Asia Region

The South-East Asia Region reported over 50 000 new cases, a 15% increase as compared to the previous week. Two (20%) of the 10 countries for which data are available reported increases in new cases of 20% or greater, with the highest proportional increases observed in Timor-Leste (nine vs four new cases; +125%) and Indonesia (40 212 vs 30 670 new cases; +31%). The highest numbers of new cases were reported from Indonesia (40 212 new cases; 14.7 new cases per 100 000; +31%), India (5798 new cases; <1 new case per 100 000; -30%), and Thailand (3166 new cases; 4.5 new cases per 100 000; +15%).

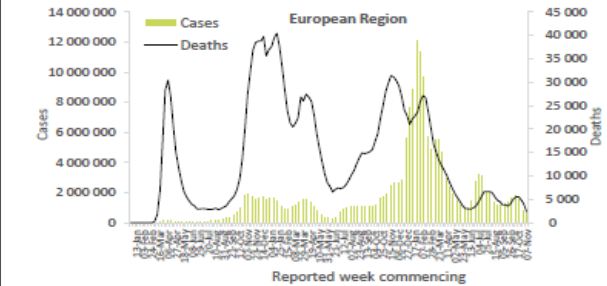
The number of new weekly deaths in the region decreased by 80% as compared to the previous week, with 353 new deaths reported. The highest numbers of new deaths were reported from Indonesia (275 new deaths; <1 new death per 100 000; +19%), Thailand (42 new deaths; <1 new death per 100 000; +5%), and India (31 new deaths; <1 new death per 100 000; -98%).



European Region

The European Region reported just under 697 000 new cases, a 21% decrease as compared to the previous week. Five (8%) of the 61 countries for which data are available reported increases in new cases of 20% or greater, with the highest proportional increases observed in North Macedonia (196 vs 71 new cases; +176%), Andorra (76 vs 53 new cases; +43%) and Monaco (66 vs 50 new cases; +32%). The highest numbers of new cases were reported from Germany (184 987 new cases; 222.4 new cases per 100 000; -25%), France (151 950 new cases; 233.6 new cases per 100 000; -1%), and Italy (126 180 new cases; 211.6 new cases per 100 000; -24%).

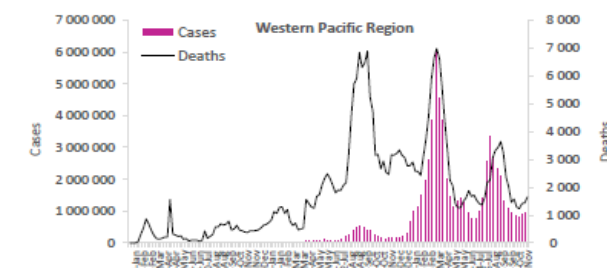
The number of new weekly deaths in the region decreased by 41% as compared to the previous week, with 2341 new deaths reported. The highest numbers of new deaths were reported from the Russian Federation (436 new deaths; <1 new death per 100 000; -10%), France (390 new deaths; <1 new death per 100 000; -10%), and Italy (330 new deaths; <1 new death per 100 000; -40%).



Western Pacific Region

The Western Pacific Region reported over 1.1 million new cases, an 18% increase as compared to the previous week. Ten (29%) of the 34 countries for which data are available reported increases in new cases of 20% or greater, with the highest proportional increases observed in French Polynesia (63 vs six new cases; +950%), Tuvalu (1096 vs 140 new cases; +683%) and New Caledonia (127 vs 44 new cases; +189%). The highest numbers of new cases were reported from Japan (503 766 new cases; 398.3 new cases per 100 000; +25%), the Republic of Korea (355 990 new cases; 694.4 new cases per 100 000; +19%), and China (171 745 new cases; 11.7 new cases per 100 000; -22%).

The number of new weekly deaths in the region increased by 14% as compared to the previous week, with 1643 new deaths reported. The highest numbers of new deaths were reported from Japan (552 new deaths; <1 new death per 100 000; +41%), China (410 new deaths; <1 new death per 100 000; -24%), and the Republic of Korea (291 new deaths; <1 new death per 100 000; +35%).



Global COVID-19 Trends and the Variant Landscape



The Omicron variant continues to be the dominant circulating strain globally, accounting for 99.6% of the SARS-CoV-2 sequences shared through GISAID in the last 30 days (October 7 to November 7, 2022). [1] BA.5 sublineages make up a large proportion of these sequenced samples. While the number of weekly COVID-19 cases and deaths continues to decrease globally since mid-July, select WHO regions are observing increases as of November 6 [Western Pacific: +10% increase in weekly cases, +8% increases in weekly deaths; South-East Asia: +28% increase in weekly cases, +535% increase in weekly deaths]. These regions, including countries from the continents of Asia and Oceania, have detected several emerging variants.

Globally, BA.2 descendants, including BA.2.75*, are increasing in prevalence, accounting for ~9.74% of the sequences sampled for the week of October 31, 2022. [1, 2] Among the BA.5 sublineages, the emerging variants BQ.1 and BA.5 with additional mutations (R346X) are collectively replacing the previously dominant BA.5 sublineages such as BA.5.2 and BA.5.2.1.

Although experimental data described these emerging variants as significantly immune evasive, the impact is yet to be observed in real world severe outcomes, such as increased hospitalizations. Early evidence from France, where BQ.1.1 is dominant as of October 24, suggests that the subvariant has not contributed to an increase in case severity based on the recent decline in hospitalizations and lower peak volumes compared to prior waves. [4, 5, 6] Recent infections and/or vaccination is possibly providing a level of protection against the emerging variant that is limiting its impact. Similar trends can be observed across other countries in Europe and Asia.

Several emerging subvariants are increasing in presence in the United States as of November 5, including BA.4.6, BQ.1, BF.7, BQ.1.1, BA.5.2.6, BA.2.75. [7] This dominant "variant soup" is likely contributing to the upturn in reported cases observed in early-November. Hospitalizations are beginning to increase but remain relatively low, compared to previous waves. [9] The expected trajectory of cases and case severity in countries now experiencing increases in the emerging variants is dependent on specific population factors (recency of infections, vaccination coverage, and waning immunity). Therefore, it is challenging to relate outcomes from France across other countries. However, vaccination continues to provide the safest and most effective protection against severe illness and death from SARS-CoV-2.

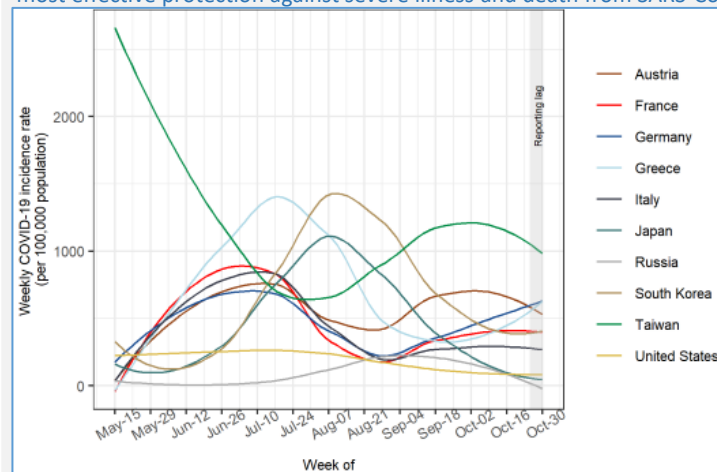


Fig. 1 Outlines the new weekly COVID-19 cases per 100,000 population between the weeks of May 15 and October 30, 2022 for the top 10 countries reporting the highest number of cases in the past 30 days. A locally weighted smoothing (LOESS) curve has been applied to the data.

Prevalent Emerging Variant Landscape between October 7 and November 7, 2022. [3]

Lineage (total countries with prior detection)	Proportion of sequences detected	Locations with the greatest prevalence (>10 sequencings)
BF.7 (75)	7.75% (8,159 seq)	Belgium, Luxembourg, Netherlands, Sweden, Denmark, Poland, Czechia, France, Slovenia, Italy
BQ.1 (50)	4.06% (4,275 seq)	Ireland, Iceland, Portugal, Brazil, Brunei, Luxembourg, Belgium, United Kingdom, Dominican Republic, Estonia, Denmark
BA.4.6 (86)	3.56% (3,741 seq)	Dominican Republic, Chile, United States, Canada, Australia, Netherlands, France, Spain, United Kingdom, Sweden
BA.2.75 (61)	3.13% (3,297 seq)	India, Malaysia, Hong Kong, Brunei, Australia, Ireland, Singapore, Switzerland, Indonesia, Turkey
BA.2.3.20 (34)	0.56% (5,92 seq)	Australia, Austria, Netherlands, South Korea, Singapore, Switzerland, Israel, Japan, United States, Denmark
XBB (37)	0.99% (1,043 seq)	India, Singapore, Brunei, Australia, Indonesia, Israel, Austria, United Kingdom, Denmark, United States

Nirmatrelvir (PAXLOVID) and the Risk of Post-Acute Sequelae of COVID-19 (also known as Long COVID)

It has been previously documented that a five-day course of Nirmatrelvir (commercialized as Paxlovid by Pfizer Pharmaceuticals) can reduce the risk of hospitalizations and deaths in COVID-19 patients who are more likely to develop severe illness. More recently, in a non-peer-reviewed study [10], researchers from the US Department of Veterans Affairs (VA) have found that taking the medication may also reduce the risk of developing "long COVID" (post-acute COVID-19 sequelae).

The following were the methods carried out to get to these conclusions:

1. Researchers reviewed electronic health records from more than **56,000 patients** in the VA health system who tested positive for COVID-19 between March and June 2022 and had **at least one risk factor for severe disease**.
2. They compared the health outcomes of 9,000 patients who had taken Paxlovid early in their course of illness, with 47,000 patients who had not (i.e., the control group).
3. In the study, long COVID was defined as developing one or more conditions including heart issues, blood disorders, fatigue, and trouble breathing, within one to three months after testing positive.

The study concluded that compared to the control group, **patients who took Paxlovid were 26% less likely to develop long COVID, had a 48% lower risk of post-acute death, and a 30% lower risk of post-acute hospitalization** between 30 to 90 days after infection. Lastly, according to the study, the benefits of taking Paxlovid didn't just apply to those who were unvaccinated. Patients who were vaccinated or boosted, or had COVID-19 reinfections, had a similar reduction in the risk of developing long COVID.

Key Takeaways

1. While the prevention of infection with SARS-CoV-2 is still the most important strategy to reducing the risk of long COVID, **the only pharmaceutical approach to reducing risk of long COVID supported by research has been vaccination**. This study is the first description of a potential preventive drug. Although this observational study included a large sample size, additional studies, especially in the form of experimental, randomized controlled trials, are required to compare long COVID outcomes in patients who took either Paxlovid or a placebo.
2. Since Paxlovid is presently only approved for individuals at high risk of COVID-19 severe disease, further investigations may be required to explore whether the use of the drug in a lower-risk population can also reduce the risks of acute problems and subsequently reduce the risk of long COVID.
3. The mechanism by which Paxlovid prevents long COVID requires further study, but likely relates to the reduction in viral load and clearance of SARS-CoV-2 to undetectable levels earlier in the illness.

Global COVID-19 Trends and the Variant Landscape



The Resurgence of Respiratory Illnesses in the Context of the COVID-19 Pandemic

Situation Overview:

Early season onset of respiratory illness, particularly those caused by respiratory syncytial virus with historically higher numbers than observed pre-pandemic are being reported in the United States and Canada. **An expected increase in the incidence of seasonal influenza and COVID-19, and the subsequent negative impacts on healthcare delivery will likely result in an overall increased morbidity and mortality in children, the elderly, and individuals with underlying health conditions.**

Background:

Respiratory syncytial virus (RSV) causes acute respiratory tract infections in people of all ages. Signs and symptoms vary with age and health status, and tend to be more severe among premature infants, children under the age of six months and children with weakened immune systems and/or concurrent illnesses.

RSV is the most common cause of lower respiratory tract infection in children <1 year of age globally. The hospitalization rates were highest among children <6 months (0.2 per 100.000) and premature infants <1 year (0.64 per 100.000) from a meta-analysis of global data from 2000-2015. [1] In infants between one month and one year of age, RSV is estimated to cause more deaths than any other single infectious agent, except for malaria.

Respiratory disease trends with a focus on the US and Canada:

Test Positivity % by PCR of RSV in the US

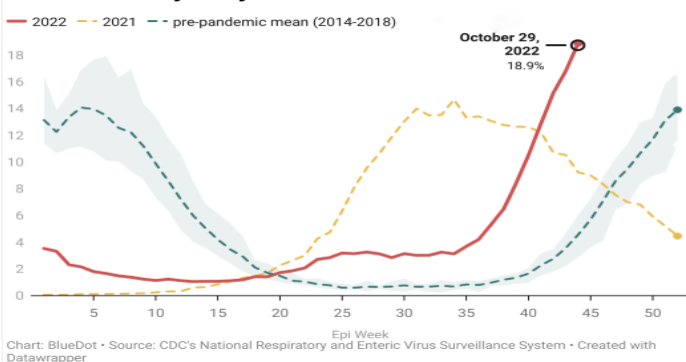


Chart: BlueDot - Source: CDC's National Respiratory and Enteric Virus Surveillance System - Created with Datawrapper

Several regions are observing deviating seasonal patterns since 2020, including Australia [2], Europe [3], and North America [4,5].

Given that Australia's RSV season typically peaks mid-July, observations may be used as a comparison for countries in the northern hemisphere. However, Australia is observing out-of-season increasing detection since June, making such comparisons challenging.[6] There was a significant increase in the number of cases within in the 2-4-year-old group (+83.91% increase compared to 2014-2019 annual average) and increased median age of affected children (2020: 14 months; 2014-2019 avg: 7 months). [7] Compared to previous years before the COVID-19 pandemic (specifically 2018 and 2019), the **US and**

Canada are seeing a markedly early rise in seasonal hospitalizations due to RSV and in test positivity rate, respectively. (Table 1 and Table 2). [7,8]

Age group	Hospitalization rate per 100,000 due to RSV in the United States		
	Mid-October 2018	Mid-October 2019	Mid-October 2022
0 – 6 months	14.8	16.9	99.7
6 – 12 months	3	5.4	52.2
1 – 2 years	3	3.4	28.2
65+ years	0.2	0.2	1.3

Note: Data prior to 2018 for all age groups was not available as hospitalization rates by the RSV-NET was only recorded on people >18 years old.

Epidemiological Week	Positivity rate of RSV tests in Canada		
	2018	2019	2022
Week 41 (Mid-October)	0.67%	0.7%	3.57%
Week 42 (Mid-October)	0.91%	0.77%	4.73%

Source: BlueDot

The weekly test positivity in the United States is significantly higher than the typical level observed at this time of year (+425% vs. 2014-2018 average), and 35% higher than the average peak positivity pre-pandemic. [9] **Rates of RSV-associated hospitalizations are approaching levels comparable to those observed during peak activity that typically occurs in December, yet are expected to continue rising without public health intervention.**[7] Similarly in Canada, percent positivity is markedly elevated for this time of year with 4.7% positivity as of October 22, 2022, compared to 0.77% on October 19, 2019. [8] Currently the province of Quebec is reporting the highest test positivity with 13.08%. **As of November 2, 2022, trends in Ontario indicate that hospitalizations for non-COVID respiratory illnesses among children 0-4 years are almost three times higher than usual for the season, and roughly the same as the peak in activity reported in late December 2020 and 2021.** Similar trends are observed among children between 5-17 years. [10] Children 14 years and above requiring critical care may be diverted to adult intensive care units in the province. [11] Additionally, hospitals across Canada are reporting similar challenges in providing care. [12]

In 2022 in Canada, while cases of **influenza have been increasing** during epidemiological weeks 40 and 41, overall activity is below the seasonal threshold. In contrast in the United States, during week 42 of this year, the test positivity rate for influenza viruses was 6.2%, compared to 2% and 1.5% in week 42 of 2018 and 2019, respectively, which indicates increased activity over pre-pandemic seasons.

Highlights:

- Children have had limited exposure to respiratory pathogens that circulated prior to the pandemic due to the success of non-pharmaceutical pandemic interventions. As a result, **there is a larger susceptible population than would be typical for a single respiratory season prior to the pandemic.** Relaxation of non-pharmacological COVID-19 measures has led to higher exposure to respiratory pathogens than has been experienced over the past two respiratory seasons in North America. The return to usual activities prior to the pandemic, such as the attendance of children in congregate care settings, has likely catalyzed this situation.
- If cases of RSV continue in the current trend, the expected increase in circulation of COVID-19 and influenza will result in **further impacts to healthcare and increases in hospitalizations and deaths.**
- There is no approved vaccine against RSV, although **several vaccine candidates are in late-stage clinical trials [13], some of which have begun the regulatory process with the FDA with earliest decisions expected mid-2023 [14].** The vaccine candidate from Pfizer has demonstrated high efficacy against severe disease in older adults (60+) and newborns. [15, 16] Currently, healthcare providers can use an RSV-specific humanized monoclonal antibody in premature infants and young children with certain heart and lung conditions. However, the benefits of this therapy for RSV infection are uncertain as they have not been evaluated in randomized trials.
- There is emerging scientific evidence of the potential for SARS-CoV-2 to disrupt adaptive immune function following infection [17, 18]. Data available for the province of British Columbia in Canada indicate that a large proportion of children and adolescents were infected with SARS-CoV-2 between September/October 2021 and July/August 2022 (rising from <15% to 70-80%) [19]. **The potential impacts of widespread SARS-CoV-2 infections in children on immunity to other pathogens are not well studied.** However, the literature available for adults indicates a precautionary approach to reducing transmission of SARS-CoV-2 in children would be appropriate while studies should be undertaken to understand the risks.

Key Takeaway:

- Contrary to COVID-19, RSV causes more severe acute symptoms in children compared to other age groups.**
- While there is no approved vaccine against RSV, promotion and approaches to increase vaccine coverage for seasonal influenza and COVID-19 will help to alleviate strain on hospital systems.**
- Finally, further study into the effects of the novel SARS-CoV-2 virus on the immune system in children are warranted to understand what the impacts of previous SARS-CoV-2 infections may be on immunity to other pathogens in this population.

Global Monkeypox Outbreak 2022



According to the World Health Organization (WHO), there have been **80,221 laboratory-confirmed cases and 52 deaths** attributed to monkeypox between **January 1 and November 16, 2022**. A total of **1,132 new cases** were reported during the week of November 7 to November 13, which is a **16% decrease** compared to the previous week. The top five countries reporting the largest number of cases for the week of November 7 are Brazil, the United States (U.S.), Colombia, Mexico, and Peru. Out of the 110 countries reporting cases to the WHO, **64 countries have not reported new cases in the past 21 days**. Eighteen countries are reporting increases in weekly new cases, with the largest increases reported in Bolivia, Italy, Ireland, Brazil, and Spain. **Deaths attributed to monkeypox have been reported across 15 countries**, with the largest number reported by Brazil.

Of the countries that provided detailed demographic data, the current monkeypox outbreak continues to **affect males disproportionately** (96.9%; 44,742/46,184). Additionally, **1.2%** (560/49,901) **of cases are reported to be aged 0-17** and **0.3%** (149/49,901) **of cases were aged 0-4**. Notably, the American Region continues to report the majority (74%) of monkeypox cases in children in the global outbreak. [1]

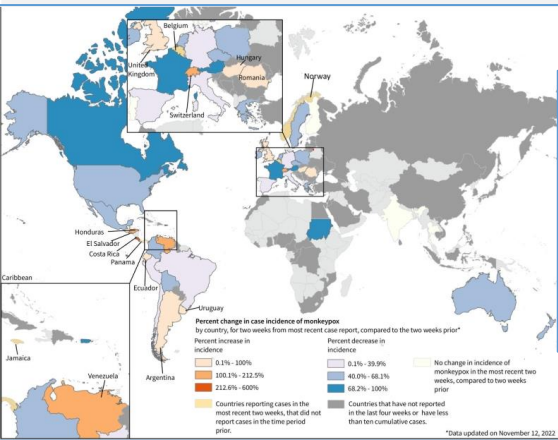
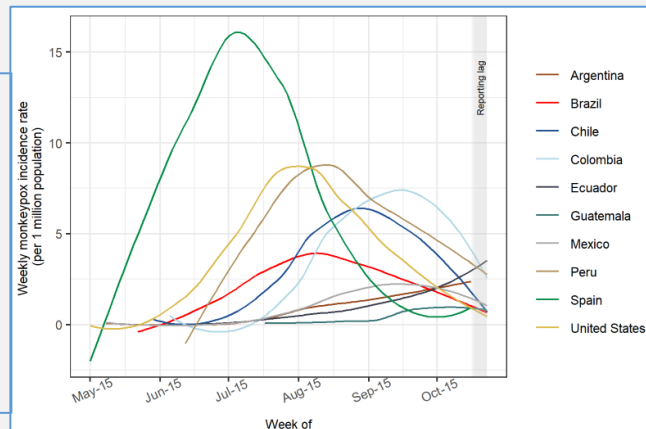


Fig. 1 outlines the percent change in the number of new monkeypox cases (incidence) reported in the 2 weeks from the most recent case report, by country, compared to the previous two weeks. Countries reporting an increase in cases have been labelled. The presented data should be interpreted with caution as recent data may be influenced by reporting lags, and due to variability in scale, access and timeliness of testing and reporting among countries.

Fig. 2 shows the weekly monkeypox incidence rate per one million population between the weeks of May 15 and November 12, for the top 10 countries reporting the highest number of cases in the most recent four epidemiological week. A locally weighted smoothing curve has been applied to the data, which may result in values less than zero. The presented data should be interpreted with caution as recent data may be influenced by reporting lags, access, type, and timeliness of testing among countries.



Monkeypox cases in children and adolescents in the United States

A study published by the Centers of Disease Control and Prevention on November 4, 2022 outlines the **epidemiologic and clinical features of children and adolescents aged <18 years diagnosed with monkeypox in the United States**. [2] A

- Monkeypox in children and adolescents <18 years remains rare in the U.S. Therefore, data is limited in this age group.
- During the May 17 – September 24, 2022 reporting period, there were a total of 25,308 infections reported in the U.S.
 - Cases were mainly in adult gay, bisexual, and other men who have sex with men.
 - 83 of the total cases were in children and adolescents <18 years (0.3% of reported cases).

Results from the Study

A brief breakdown of the infections and routes of exposure in this age group:

- **55 cases in the 13-17 years age range** (89% in males, the most presumed exposure route for 66% of cases was male-to-male sexual contact with an infected individual)
- **28 cases in the 0-12 years age range** (64% in males, almost all exposure was a result of direct skin-to-skin contact with an adult with monkeypox who was caring for the child in a household setting)

A breakdown of the race/ethnicity of infections in this age group:

- **The majority of cases were reported in non-Hispanic Black or African American individuals (47%)**
- Second highest ethnicity reported was Hispanic or Latino (35%)

Clinical features:

- **100% of infected cases presented with rash**
- The second and third most common features were malaise (36%) and fever (35%).
- Among children aged 0-12 years: lesions were commonly found on the trunk, and no children presented with anogenital lesions.
- Among adolescents aged 13-17 years: lesions were commonly found on the trunk and genitals.

Overall in this age group, **11% of the cases were hospitalized**; however, none required admittance to an intensive care unit or died. No reported cases during this timeframe were attributed to sexual abuse.

There were 10 instances where a child or adolescent attended a childcare facility or school while symptomatic; no instance of secondary transmission in these settings was identified.

Key Takeaways

1. **The risk of children and adolescents getting infected with the monkeypox virus remains low.**
2. Monkeypox can also spread through close, personal, and often through skin-to-skin contact.
3. Exposure routes differed between younger children and adolescents:
 - Younger children (0-12 years) acquired infection after skin-to-skin contact with household members with monkeypox.
 - Adolescents (13-17 years) acquired infection most frequently through male-to-male sexual contact.
4. Rash is the most common monkeypox symptom, thus children and adolescents with a rash may require ruling out monkeypox along with chickenpox, herpes, allergic skin rashes and hand, foot, and mouth disease.
5. There is a need for **strengthened vaccination efforts and education** around preventive measures and sexual health.
6. Ensuring **equitable access** to monkeypox vaccination, testing and treatment is a critical public health priority.

2022 Polio Outbreaks: Circulating Vaccine-Derived Poliovirus type 2 Outbreaks in Non-Endemic Countries; Part 1



Currently, there are two major ongoing polio outbreaks globally – one involving wildtype poliovirus 1 (WP1), and one involving circulating vaccine-derived poliovirus 2 (cVDPV2). This report is part 1 of 2 reports and will primarily focus on the countries reporting cVDPV2 outbreaks, while part 2 (to follow) will focus on countries reporting WP1 outbreaks.

Cases of cVDPV2 make up over 80% of all cVDPV cases globally, and hence, the ongoing multi-region cVDPV2 outbreak will be the focus of this report; however, a brief situational overview is provided below for ongoing cVDPV1 and cVDPV3 outbreaks:

Multi-region outbreaks of cVDPV1: African region¹

- In 2022, cases of cVDPV1 have been reported in the Democratic Republic of Congo (DRC), Malawi, Mozambique, and Madagascar. The DRC, Madagascar, and Mozambique all have estimated national vaccine coverages of less than 80% in 2021, while Malawi reported a coverage of 89%.² All four countries continue using OPV.

- As of November 1, 2022, the DRC had reported 36 cases of cVDPV1 in 2022, Madagascar had reported 10 cases, Mozambique had reported 13 cases, while Malawi had reported 3 cases (Figure 1). The continuing spread of cVDPV1 within Africa represents a major setback to the global polio eradication effort.

Single-region outbreak of cVDPV3: Israel and Palestine³

- On March 6, 2022, health authorities in Israel confirmed the first case of cVDPV3 since 1989 in a four-year-old child in Jerusalem. Genome sequencing indicated links to cVDPV3 strains detected in environmental samples in Israel and Palestine between September 2021 and January 2022, indicating ongoing outbreaks of cVDPV3 in both regions. As of April 15, six additional children had been identified as asymptomatic positive cases.
- cVDPV3 has not been reported anywhere else in the world this year, and positive cases or environmental samples have not been reported in Israel or Palestine since April 2022. Given Israel's strong surveillance system and detection of asymptomatic cases as well as high polio vaccine coverage estimates in Israel (98%) and in Palestine (95%), it is possible that circulation of cVDPV3 has been interrupted.

Multi-region outbreaks of cVDPV2: African region, London (UK), New York state (USA), and Israel

- African region⁴:** On July 8, a case of AFP caused by cVDPV2 was reported in **Algeria**. The strain was genetically linked to strains circulating in Nigeria and was classified as an international importation event with a known source. Additionally, the detection of cVDPV2 in **Benin, Ghana, Togo, and Côte d'Ivoire** have been reported to be due to international spread from **Nigeria**.⁵ In total, 15 countries in Africa have reported cases of cVDPV2 in 2022 (Figure 1).
- Cases and environmental samples of cVDPV2 have been reported in several countries globally (Figure 1). The UK, USA, and Israel are the only affected countries that do not administer the OPV containing the type 2 serotype, indicating importation of polio into these regions.

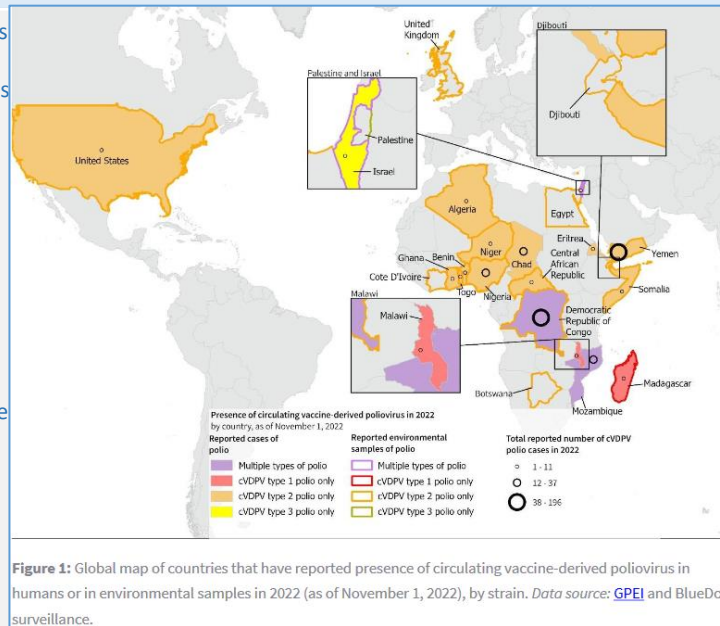


Figure 1: Global map of countries that have reported presence of circulating vaccine-derived poliovirus in humans or in environmental samples in 2022 (as of November 1, 2022), by strain. Data source: GPEI and BlueDot surveillance.

- London, UK⁶:** On June 26, 2022, evidence of community transmission of cVDPV2 emerged for the first time since the UK was declared polio-free in 2003. Whole genomic sequencing of samples collected in north and east London between February and June 2022 indicated that mutations were occurring, which confirmed circulation in the community. As of November 15, 2022, no cases of paralytic polio have been reported in the country.
- New York State, USA⁷:** On July 21, 2022, health authorities in Rockland County, New York state confirmed a human case of cVDPV2. The affected individual was an unvaccinated young adult who presented with symptoms of paralysis a month prior and did not have any international travel history. Sequencing conducted on wastewater samples collected earlier in June were linked to the cVDPV2 strain from the human case, supporting that the affected individual acquired the disease from the community.
 - Throughout July, August, and September, cVDPV2 was detected in wastewater samples across five other neighbouring counties in New York state, including Sullivan, Orange, Nassau, Kings, and Queens counties, indicating ongoing circulation and widening geographic spread.⁸
- Israel⁹:** On August 18, 2022, official information indicated that wastewater samples in Jerusalem and Bnei Brak areas tested positive for cVDPV2. Genomic sequencing indicated that the strains found in New York state were greater than 99% genetically similar to cVDPV2-positive environmental samples identified in Israel and London, providing evidence of the spread of polio between the UK, US, and Israel.¹⁰

Reasons for Concern

- The switch to using the bivalent OPV that does not include the type 2 strain was expected to decrease the incidence of cVDPV2; however, there has been a gap in intestinal mucosal immunity to the type 2 strain in young children since the withdrawal, leading to an overall global increase in the number of cVDPV2 cases.
- The origin of the cVDPV2 outbreaks in New York State, London, and Israel remains unknown, however, it is likely that cases were imported into the affected communities by individuals who were exposed to cVDPV in another country. The UK and USA stopped the use of OPV in 2004 and 2000, respectively.^{11, 12} Israel uses both OPV and IPV, but the OPV administered does not include the type 2 strain, indicating that the origin of this outbreak is in another unidentified country. Polio has now been detected in countries that previously eradicated the disease. This is likely due to a combination of suboptimal vaccination coverage during the COVID-19 pandemic, vaccine hesitancy, and spread by infected travellers although the exact links have not been determined.
- While USA's national vaccine coverage estimate is high (93.4%), there is substantial heterogeneity in coverage across states and counties. The risk of polio spread is increased for sub-populations in regions where coverage may be lower than the national or statewide average. The case of AFP reported in New York State in 2022 was from Rockland County, which has one of the lowest polio vaccine coverage estimates in the state (60.3%). Twenty-six other counties in New York State reported a county-wide polio vaccine coverage estimate of less than 80%, out of which three have already reported cVDPV2-positive wastewater samples, indicating ongoing community transmission of the virus in the state.¹³
- It is likely that there is ongoing community transmission of the virus in the UK as well. The first cVDPV2-positive wastewater environmental samples in the UK were collected in February 2022, and positive samples have continually been reported throughout 2022.
- It has been previously reported that high-income countries were associated with significantly greater odds of reporting cVDPV cases, likely due to more robust public health surveillance systems in place.¹⁴ Hence, the detection of cVDPV2 in high-income countries such as the UK and USA can imply that cases of polio may be occurring in low- and middle- income countries that are going undetected.

2022 Polio Outbreaks: Circulating Vaccine-Derived Poliovirus type 2 Outbreaks in Non-Endemic Countries, Part 2



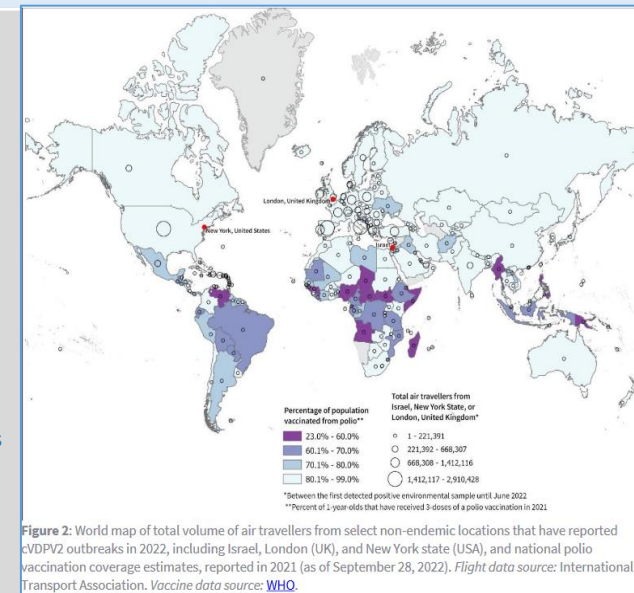
Outlook for cVDPV2

Countries that are most connected to locations reporting the presence of cVDPV may be at highest risk of polio importation, among which locations that also have lower vaccine coverage may be more susceptible to paralytic polio.

- Israel, London, and New York state are locations that have reported the presence of cVDPV in 2022 and are highly connected to the rest of the world via air travel, drawing large numbers of travellers. Among all international air travel reported by IATA (the International Air Transport Association) from January to June 2022, the USA and the UK were the top two most internationally connected countries globally. Approximately 9.6% and 8.3% of all international air travellers originated from the USA and the UK, respectively, while Israel accounted for 0.8% of all international air passengers during the same time period. Hence, countries most connected to these locations are at high risk of importation of polio through air travel.
- In comparison, all countries in Africa reporting the presence of cVDPV accounted for a total of approximately 2.0% of all international air passengers during the same time period, with each country individually accounting for less than 0.2% of the total global air travel, except for Egypt.
- Globally, 54 countries have an estimated vaccine coverage below 80% (threshold defined by the WHO). Most of these countries are in Africa, South America, and Southeast Asia. Several countries in Africa have reported cases of cVDPV and the re-emergence of wildtype polio in 2022, and have some of the lowest immunization estimates, indicating that these countries are likely at highest risk for the regional spread of polio.
- African countries reporting a vaccine coverage estimate of less than 80% that share a land border with countries reporting the presence of cVDPV may be most susceptible to paralytic polio due to importation of the virus through ground travel. These countries include: Angola (43% vaccine coverage estimate), Guinea (48%), South Sudan (50%), Eswatini (61%), Liberia (64%), Mauritania (66%), Ethiopia (68%), Cameroon (70%), Tanzania (70%), Mali (72%), Libya (73%), and Congo-Brazzaville (75%).
- As a proactive approach to identify locations at highest risk of importation and spread via air travel, BlueDot conducted two analyses to examine: (1) International spread of polio; (2) Domestic spread of polio within the USA from New York State, both through air travel data.

International spread of polio from Israel, London (UK), and New York state (USA) (non-endemic locations of interest)

- To assess locations that may be at highest importation risk of cVDPV and risk of paralytic polio, BlueDot examined national vaccine coverages and outbound air travel volumes from the three locations of interest between February and June 2022 for the UK, and between April and June 2022 for the USA and Israel, which accounts for the timeframe when samples were first detected (Figure 2).
- The top three countries that are most connected to London, New York State, and Israel are: Spain, Italy, and the USA (Table 1). Though these countries have a high national vaccine coverage estimate, there can be considerable variability in coverage across countries, and any communities with suboptimal coverage are at risk. As observed in Israel, the USA, and UK, having a high national vaccination coverage does not preclude the importation risk and spread of cVDPV.
- Mexico may be more susceptible to paralytic polio due to being among the top 25 countries most connected to countries reporting cVDPV and having a suboptimal vaccine coverage (under 80%).



Domestic spread of polio in the USA from New York state

- To assess states that may be at highest risk of importation and subsequent severe consequences of spread (i.e., paralytic polio cases) in the USA, BlueDot examined state-wide vaccine coverages and domestic outbound air travel volumes from New York state from April and June 2022, which accounts for the timeframe when samples were first detected (Figure 3).
- Florida and California are the two most connected states to New York state by air. Despite the state-wide polio vaccine coverage exceeding 93%, there may be regions with populations that are under-immunized that remain susceptible. Traveller volumes and vaccine coverage estimates for the top 25 states most connected to New York state via air are provided in Appendix 3.
- States surrounding New York, as well as the neighbouring province of Ontario in Canada, may also be at an increased risk of importation of polio, though they have an estimated vaccine coverage of over 90% (Pennsylvania (95.4%), New Jersey (94.3%), Connecticut, Massachusetts (95.6%), New Hampshire (90.8%), Vermont (93.7%), and Ontario (91.0%)). [15, 16](#)

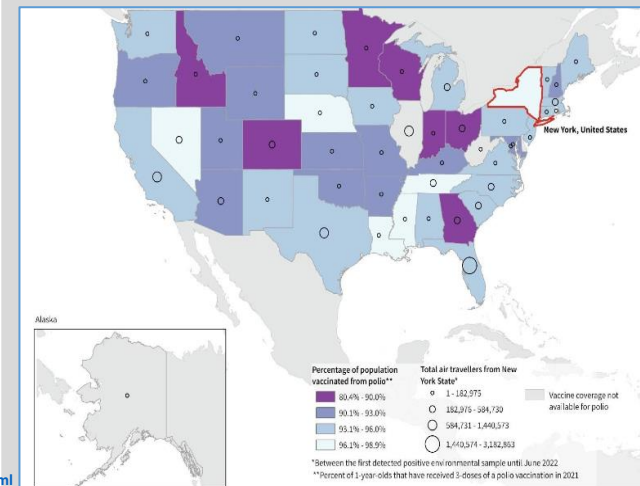


Figure 3: Map of the USA showing total volume of air travellers from New York state to all other states, and statewide polio vaccination coverage estimates, reported in 2021 (as of September 28, 2022). Flight data source: International Air Transport Association. Vaccine data source: US Center for Disease Control and Prevention

	Inactivated polio vaccine (IPV)	Oral polio vaccine (OPV)	Disadvantages
Description	<ul style="list-style-type: none"> IPV contains inactivated (killed) virus strains of all three poliovirus serotypes The vaccine produces antibodies against all three serotypes, and these antibodies prevent the spread of the virus to the central nervous system and protect against paralysis, in case of infection Administered via injection 	<ul style="list-style-type: none"> OPV contains live-attenuated (weakened) form of the virus, which is able to replicate in the body, inducing a mucosal immune response in the intestines The vaccine can either contain one serotype, a combination of two, or all three different serotypes Administered via oral droplets 	<ul style="list-style-type: none"> Low levels of gut/intestinal immunity Cannot prevent WPV reinfection or replication in an infected person, which can lead to shedding in the stool Requires supplies for injections and skilled workers to administer Expensive when compared to OPV
Effectiveness	<ul style="list-style-type: none"> Two doses of IPV are 90% or more effective against paralytic polio; three doses are 99 to 100% effective 	<ul style="list-style-type: none"> According to various studies carried out globally, vaccine effectiveness for 3 doses of OPV against paralytic polio was found to lie between 72 to 98% 	<ul style="list-style-type: none"> The weakened virus can undergo genetic changes in the body during replication and result in rare cases of vaccine-associated paralytic poliomyelitis (VAPP), which presents much like the wildtype virus and can cause paralysis but cannot be spread to others Virus in the vaccine can mutate over time as it circulates to become virulent, leading to vaccine-derived poliovirus (VDPV) in under-vaccinated communities
Advantages	<ul style="list-style-type: none"> Strong humoral immunity (circulating antibodies in blood) and cell-mediated immunity (T cells) Prevents paralytic disease No risk of vaccine-associated paralytic polio (VAPP) or secondary transmission of the vaccine-derived poliovirus (VDPV) 	<ul style="list-style-type: none"> Strong humoral and gut/intestinal immunity Easy administration of drops, possible to conduct pulse vaccination campaigns and vaccinate many children in a small amount of time Can interrupt the chain of transmission in outbreaks/epidemics Inexpensive when compared to IPV 	<p>Key differences between IPV and OPV</p> <p>Sources:</p> <p>https://polioeradication.org/polio-today/polio-prevention/the-vaccines/</p> <p>https://apps.who.int/iris/bitstream/handle/10665/357167/WER9725-eng-fre.pdf</p> <p>https://www.cdc.gov/vaccines/vpd/polio/hcp/effectiveness-duration-protection.html</p> <p>https://www.who.int/docs/default-source/biologicals/vaccine-quality/polio-grad</p>

Other Infectious Disease Outbreaks/ Conflicts



Ebola in Uganda; Follow Up

SUBLOCATIONS AFFECTED: : Central Region (Kampala Capital City, Kassanda, Mityana District, Mubende District, Wakiso District), Eastern Region (Jinja District), Western Region (Bunyangabu District, Kagadi District, Kyegegwa District)

The Ministry of Health of Uganda announced a case of Ebolavirus disease (EVD) in the Buyengo sub-county, Jinja district in the Eastern region of Uganda, approximately 70km from Kampala. This is the first confirmed case in the Eastern Region of the country. The statement indicated that the individual was a 45-year-old male who died on November 10 and was linked to a probable case, his brother, who died on November 3.

The man identified as a probable case (the brother of the confirmed case) began experiencing symptoms ten days before passing after being in contact with a known cluster of cases in the Rubaga division (Kampala). The Ministry of Health did not clarify if the probable case was accounted for as a reported EVD case.

Schools will be closing on November 25, two weeks ahead of a scheduled school break, due to 23 cases and eight deaths among students in five schools in Kampala, Wakiso District (near Kampala), and Mubende District. Further information reported by WHO on November 10 stated that the initial six children from three different schools in Kampala tested positive for EVD on October 26. They were all contacts of a confirmed case. As of November 10, 276 individuals have been identified as contacts of a confirmed case in Kampala.

Furthermore, the lockdown imposed in Mubende and Kassanda was extended for another 21 days beyond its original end date of November 5. The number of patients in the Ebola Treatment Units was not disclosed in the last two official reports.

Since the outbreak began in September, a total of 163 cases (141 confirmed and 22 probable) and 77 deaths (55 confirmed and 22 probable) have been officially reported in Uganda as of November 16. There were 5 new confirmed cases this week (the same number of new confirmed cases as last week). Some health experts fear the actual tally could be higher still up. To date 11 Nov, there have been 18 cases and six deaths reported in Health care Workers.

The two westernmost districts (Kigadi and Bunyangabu) have surpassed over 2 incubation periods (49 and 45 days, respectively) without reporting an additional case. As of November 16, the number of contacts being followed has decreased to 764 individuals currently under monitoring from 1,086 individuals as of November 10.

CONCERN LEVEL: HIGH.

Source: [Twitter](#), [News](#); [Reliefweb](#); [WHO](#)

Poliomyelitis in Democratic Republic of the Congo; Follow Up

In a follow-up on the poliomyelitis outbreak in the Democratic Republic of the Congo (DRC), there has been updated information indicating that the environmental samples initially reported as belonging to the wild-poliovirus type are circulating vaccine-derived poliovirus (cVDPV). There is no further information about the source of infection for the individuals who presented with paralysis and died in the Haut-Lomani region (where environmental samples were confirmed positive).

After confirmation that there are no wild-poliovirus samples detected in the DRC, this event is considered to no longer be of concern since wild-poliovirus has been ruled out. The DRC has been affected by ongoing outbreaks of cVDPV-2 and cVDPV-1 since early 2018.

CONCERN LEVEL: No Concern

Source: [ProMed](#)

Poliomyelitis in Indonesia

SUBLOCATIONS AFFECTED: Nanggroe Aceh Darussalam Province (Mane)

A case of poliomyelitis has been detected in the Mane district, Pidie Recency, on the Sumatran Island province of Aceh, Indonesia. According to news media, the local government has declared an outbreak status following the confirmation of poliomyelitis in a child who presented with paralysis. The 7-year-old child reported symptoms of fever, pain, and weakness in the limbs. There are no further details about the affected individual, including their history of immunizations or travel. Additionally, the poliovirus type (i.e., wild poliovirus or circulating vaccine-derived poliovirus) is not specified. The initial response by health authorities is underway including a field investigation.

CONCERN LEVEL: Medium Concern

Source: [MediaNews](#)

Violence against aid workers; Yemen

Humanitarian access in Yemen remains challenging; most access incidents are driven by bureaucratic impediments, mainly movement delays. The third quarter of 2022 witnessed a significant increase in incidents that impacted the safety and security of aid workers compared with the second quarter. Over the same period, humanitarian partners reported 673 access incidents in 103 districts in 19 governorates across Yemen, affecting 5.8 million people. Almost three-quarters (73.6 per cent) of the reported incidents pertained to bureaucratic constraints imposed by the authorities, including restrictions on the movement of humanitarian workers and commodities within Yemen. These include interferences in humanitarian operations, travel permit denials or delays, and cancellations of missions and field travel activities. Violence against humanitarian personnel assets and facilities continues to be a major concern for humanitarian partners in Yemen, mainly in GoY-controlled areas. The third quarter witnessed a decrease of 42.1 per cent in the frequency of such incidents, with 33 reported compared with 57 incidents in the second quarter of 2022.

Source: [OCHA](#)

Influenza Europe

Weeks 45/2022 (07 November - 13 November 2022)

- Germany, Kazakhstan, Malta and Portugal reported widespread influenza activity and/or at least medium intensity.
- The percentage of all sentinel primary care specimens from patients presenting with ILI or ARI symptoms that tested positive for an influenza virus was 13% which is higher than the previous week (8%) and above the epidemic threshold set at 10%.
- The start of the influenza epidemic at the Regional level is usually defined as two consecutive weeks in which $\geq 10\%$ of patients in sentinel primary care settings tested positive for influenza virus infection
- Germany, Georgia, Kazakhstan, Portugal and United Kingdom (Scotland) reported seasonal influenza activity above 10% positivity in sentinel primary care.
- Both influenza type A and type B viruses were detected among all monitoring systems, with influenza A(H3) viruses being dominant in sentinel surveillance while similar numbers of A(H1)pdm09 and A(H3) viruses were detected in non-sentinel surveillance.
- Hospitalized cases with confirmed influenza virus infection were reported from other wards (1 type A virus) and SARI surveillance (31 type B viruses, of which 28 were from Kazakhstan, and 8 type A viruses), but only one was reported from an ICU ward. When comparing the different influenza type distributions by system, it is important to consider that different sets of countries are reporting to each system.

Source: [Flu Net Europe](#)

Ukraine – Escalation of Attacks Across the Country

Flash Update No. 6 (16 November 2022)

Highlights

- Continuing attacks on energy infrastructure are leading to a major energy crisis in the country, with repeated cuts and power outages, including in the capital Kyiv.
- Over 165,000 people in villages retaken by Ukraine, including the city of Kherson, face dire humanitarian situation due to extensive damages and destruction of infrastructure.
- The priority of the humanitarians remains timely and critical assistance to recently retaken areas of Ukraine and addressing challenges related to winter and power cuts.
- During last four weeks, humanitarians sent at least seven convoys to support the people in retaken areas of Kharkivska and Khersonska oblast, including the city of Kherson.

General security and humanitarian situation

Almost nine months into the full-scale war, hostilities and attacks persist across Ukraine, particularly in the east and south of the country, damaging critical civilian infrastructure – especially energy – and increasing the urgent needs of millions of people. Over the past weeks, waves of attacks on energy infrastructure have forced the country to adopt emergency power outages in all Ukrainian regions. Millions are facing constant power cuts, and the lack of energy is also affecting water pumping, adding to the previous challenges faced by millions of people to access clean water or run their heating systems at home. On 15 November, for example, a new wave of missile attacks – the largest on energy infrastructure since the start of the war, according to the Ministry of Energy – left millions of people in Ukraine without electricity, water or heating. This came at a critical time when the temperature is dropping below zero, raising concerns about a serious humanitarian crisis during the harsh Ukrainian winter if people are unable to heat their homes. The attacks on Ukraine’s energy infrastructure came just a few days after the Government recovered control of the city of Kherson and dozens of other towns and villages in this southern region of the country, which had been taken by Russian forces in the first weeks of the war in early March. The security situation in this part of the country remains highly volatile, with fighting and attacks reported across the new frontline and some of the areas which remain outside the control of the Ukrainian Government. Civilian infrastructure is being devastated, adding to an already complex situation on the ground. In Kherson city, for example, people have not had water and electricity for over two weeks, while markets are running low on food, most shops are empty, pharmacies and health facilities have no medicines, and people can only rely on locally produced

fruits and vegetables, according to humanitarians who visited the city over the last days. Khersonska oblast Military Administration urged residents of the city and other recently retaken areas to evacuate to safer regions of Ukraine, informing that the levels of destruction and limited access to essential services will make it nearly impossible for the Government to ensure people in these areas can meet their basic needs. In other parts of the oblast recently retaken by Ukrainian forces, including Novovorontsovska, Novooleksandrivka, Velyka Oleksandrivka and Vysokopillia, humanitarians have reported a dire situation, as people face similar challenges as in Kherson city. Local authorities report that a large part of the infrastructure of the retaken areas has been damaged, including up to 70 per cent in Novovoskresenske village, where new attacks were recorded on 8 November. Local authorities also report very limited functional social services, with pressing needs in various humanitarian sectors.

Health Needs

- Some 14.5 million people in Ukraine are estimated to need health assistance.
- According to the [WHO Health Needs Assessment](#), almost one in five people in Ukraine has been unable to obtain the medicine they need since the war started. In areas experiencing active hostilities and areas beyond the control of the Government of Ukraine, this increases to one in three people. The major barriers to accessing health care are the cost of care, time constraints, and limited transport availability.
- According to the International Organization for Migration (IOM) [Area Baseline Assessment](#), 33 per cent of internally displaced people are in need of medicines and health services. This need is most acute in the east of the country.
- Nearly 44 per cent of older displaced people seeking shelter and safety in Lvivska oblast had issues accessing medical facilities, and 81 per cent had difficulties accessing medicines, according to the [HelpAge survey](#) on humanitarian needs of older women and men among those internally displaced. The survey revealed that 96 per cent of people interviewed (76 per cent women) have at least one chronic disease, 73 per cent of older people have limited mobility, while 7 per cent of older people are entirely immobile and need constant support.

Health Gaps

- According to the [WHO Surveillance System for Attacks on Health Care](#), there were 631 attacks on health care in Ukraine – resulting in 100 deaths and 129 injuries – between 24 February and 25 October.

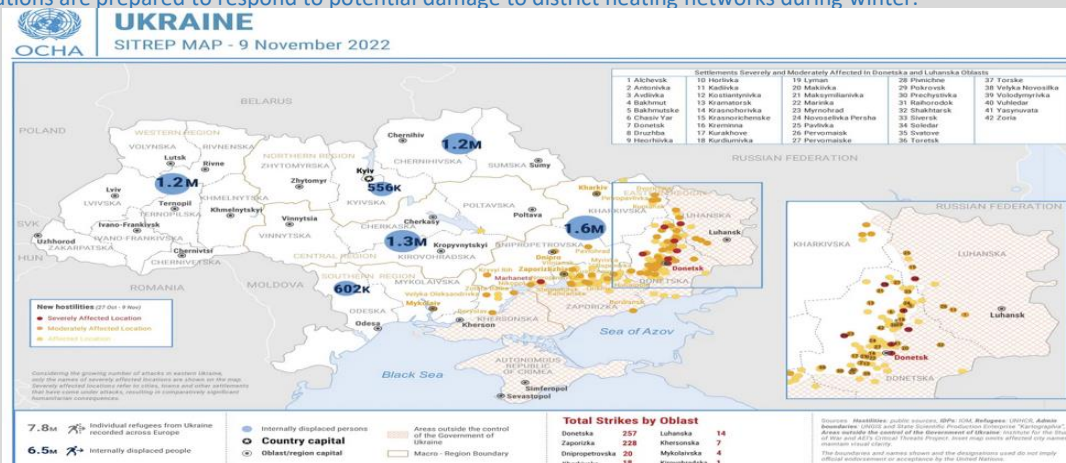
Water, Sanitation and Hygiene (WASH) Needs

- Up to 16 million people in Ukraine need water, sanitation and hygiene assistance. These include communities living in areas where water and waste-water infrastructure has been damaged, energy supply disrupted, and internally displaced people in collective centres and host communities.
- As a consequence of the impact on services, there is an elevated risk of WASH-related diseases in affected areas.

Water, Sanitation and Hygiene (WASH) Gaps

- A limited number of partners with contingency supplies and/or funds for rapid interventions – notably generators, pipe fittings and household water treatment – limits assistance in areas recently retaken by the Government.
- More sustainable approaches must be found for water-scarce settlements near the frontline and in retaken areas.
- Few organizations are prepared to respond to potential damage to district heating networks during winter.

KEY FIGURES



Source: [Reliefweb](#)

Abstracts from the Force Health Protection Event 2022 (1)

Paul Ioudovski

Affiliation: Directorate of Force Health Protection, Canadian Forces Health Services Headquarters, Department of National Defence, Ottawa, Ontario, Canada

Title: Expanding the use of the Canadian Armed Forces deployment health surveillance system to a large scale exercise: Exercise INTREPID BEAR/MAPLE RESOLVE 2022

Abstract:

Background: The Disease and Injury Surveillance System (DISS) is an automated electronic coding tool that captures diagnostic information entered by health services personnel on medical visits in deployed settings. The Canadian Armed Forces (CAF) employed the DISS during two major training exercises in Wainwright, Alberta, Canada in 2022; Ex-INTREPID BEAR (Ex-IB) (12-Apr/04-May) and Ex-MAPLE RESOLVE (Ex-MR) (05-May/08-Jun), to monitor for injury and disease increases of concern, inform injury prevention measures, and maintain operational readiness.

Methods: All CAF health encounters were entered into the DISS. Data included visit type, primary diagnosis, disposition, and duty restrictions. Personal identifiers were not captured. Descriptive statistics were used to characterize disease and injury trends by Global Burden of Diseases (GBD) categories and by diagnoses, as well as their subsequent operational impact.

Results: 1005 clinical visits were recorded (n=778 first-time visits, n=227 follow-up visits; Ex-IB=17.2 clinical visits per 100 personnel, Ex-MR=13.1 clinical visits per 100 personnel). An increase in acute respiratory tract infections (RTIs) visits was identified during the first week of Ex-IB followed by a rapid decline during the start of Ex-MR. By GBD categories, Respiratory Infections was the most common reason for first visits in Ex-IB (47.8%) and Non-musculoskeletal Injuries/Poisoning (48.1%) was the most common for Ex-MR. By diagnosis, COVID-19 related visits were the most frequent reason for first visits (n=68) during Ex-IB and back/lumbar pain during Ex-MR (n=19). There were a total of 295 injury-related first-time visits across Ex-IB/MR. Back/lumbar pain was the main injury-related diagnosis for Ex-IB (n=19/152) whereas corneal abrasion was the most common injury-related visit for Ex-MR (n=10/143). For Ex-IB and Ex-MR, there were 0.10 and 0.18 duty days lost per person, respectively. Musculoskeletal Injuries/Disorders GBD category contributed the highest number of total days lost (n=328 days). 61.8% of all clinical visits resulted in a return to active duty disposition.

Discussion: The DISS enabled the tracking and reporting on the key health issues affecting personnel on exercise. Injuries were highly prevalent, presenting opportunities for injury reduction on future exercises. Injuries can affect employability, deployability, and impact training objectives. As well, the early identification of an increase in acute RTIs allowed for early intervention to mitigate spread. The simplicity of the DISS facilitated health personnel's compliance with data entry, allowing fulsome data collection despite the hectic pace on exercise. The expansion of the use of the DISS beyond deployments can aid in early injury and disease detection to optimize training effectiveness.

Robert Alexander Hawes

Affiliation: Senior Epidemiologist, Directorate of Force Health Protection, Canadian Forces Health Services Group, Canadian Armed Forces

Title: Population-based prediction of injury and disease in combat zones: lessons learned from Canadian Armed Forces surveillance data in Afghanistan

Abstract:

Background: Military health surveillance systems provide a unique platform to study the determinants of injury and disease in a modern theatre of war. Using sophisticated data linkage and analysis techniques, we conducted a population-based study of the determinants of medical attrition, and the operational impact on an entire deployed combat force.

Methods: The sampling frame included 30,319 CAF personnel deployed during the Canadian combat mission (Operation Athena) in Kandahar, Afghanistan between 2006 and 2011, identified using administrative and pay information. To define the full spectrum of injury and disease events in theatre, five medical databases were linked using the CAF unique service number. These databases represented i) Role 2 Enhanced specialist visits (DHSO), ii) Role 3 trauma admissions and procedures (US-DODTR), iii) Role 4 emergency medical evacuations (STRAT-AE), iv) computer-assisted equipment analysis and wound profiling (CASPEAN), and v) CAF autopsy reviews. The mechanism, severity and outcome of each injury or disease event was coded as a return to duty (RTD), medical evacuation, or death. Multistate survival models were used to compute the incidence and hazard of serious injury or disease events, and the median time to medical attrition based on gender, rank, and operational role in theatre.

Results: From a cohort comprising 17,785 person-years (py) of observation, we recorded 1,850 casualties including 784 repatriations/evacuations and 147 deaths. The majority of injuries were caused by IEDs (32.7/1000py) with a mean of 9.8 distinct injury sites of either of mild (62%) or critical (22%) severity. Non-combat injuries (28.9/1,000), serious disease (22.8/1000py) and mental health conditions (8.5/1000py) were significant contributors to in-theatre attrition. Overall, the risk of medical attrition was calculated to be 0.6% at 90 days, and 1.4% at 180 days, but substantially higher for infantry (1.8%; 3.9%) and reconnaissance (2.0%; 3.9%) personnel. The adjusted hazard rate (AHR) for an IED injury was more than nine times greater among reconnaissance (AHR=9.5) and combat engineering (AHR=9.4) personnel and nearly six times greater among infantry (AHR=5.6) compared to support personnel. Male gender was associated with a 4-fold increase in the adjusted risk of suffering an injury from IED, whereas females were 2.5 times more likely to suffer a non-combat injury.

Discussion: The use of predictive modelling to forecast the survival rate of a deployed force has implications for primary health care, injury prevention and strategic planning. We discuss the opportunities for allied NATO nations to coordinate and communicate predictive modelling strategies in theatre.

Abstracts from the Force Health Protection Event 2022 (2)

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Title: Dental consults: The primary reason for first-time visits in Op IMPACT Erbil Role-2 medical facility

Abstract

Background: In 2016, the Canadian Armed Forces (CAF) Disease and Injury Surveillance System (DISS) was implemented in a Role-2 medical setting located in Erbil, Iraq as part of Operation IMPACT. This facility provided health services to CAF members, coalition forces and military personnel from “other” nations. The medical facility capabilities included resuscitation and surgery, intensive care unit, intermediate-care ward, diagnostic imaging, laboratory services, and dental care. The purpose of this report is to describe the most frequent reasons for health visits during a 26 month period in a Role-2 setting.

Methods: The DISS is a web-based application that captures health diagnostic information on all health related visits in deployed settings. This report covered the surveillance period between November 2016 to December 2018. Health encounters were entered in the DISS by trained Medical Technicians. Our study population included all patients that attended the health facility during this time period. The primary diagnosis/reason was captured for each visit. Descriptive statistical analyses were carried out. All diagnoses were grouped using a modified version of the Global Burden of Disease (GBD) categories.

Results: There were 3388 visits in total, of which 78.1% (n=2646) were first-time visits. CAF personnel accounted for 11.2% (n=381) of first-time visits whereas 66.9% (n=2265) of first-time visits corresponded to coalition forces and “other” demographic groups. For all groups, dental diagnoses/reasons were the leading GBD category for first-time visits (57.6%; n=1524) followed by musculoskeletal (MSK) injuries (11.6%; n=308), and non-MSK injury categories (7.8%; n=207). The remaining 17 GBD categories accounted for 22.9% (n=607) of diagnoses/reasons for first-time visits. Within the dental category, coalition forces accounted for 75.1% (n=1145), CAF personnel for 15.4% (n=234), and “other” demographic groups for 9.5% (n=145) of all first-time visits.

Discussion: It was surprising to find dental related consults as the leading reason for first-time visits in a Role-2 facility and not trauma or injuries. Although this was a Role-2 medical setting, most reasons of visit fell within the realm of a Role-1 treatment facility. Reasons why dental conditions were the primary reason of visit were not within the scope of this study. However we postulate that having a dental care facility onsite, possibly different pre-deployment screening standards, and differences in length of the tour among the different forces, might have influenced the results. These findings could contribute to future resource planning of CAF Role-2 medical settings and to further customizing pre-deployment training of health personnel.

Lieutenant-Commander Ernie Ebert

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Title: Adverse Events Following Immunization with COVID-19 vaccines: Passive surveillance in the Canadian Armed Forces

Abstract

Background: Booster doses of COVID-19 vaccines were offered to most CAF members as a recommended, voluntary vaccine, starting on 03 December 2021. Only mRNA vaccines were authorized by Health Canada as a booster dose against COVID-19. Adverse Event Following Immunization (AEFI) reporting is a Standard within CAF Health Services, which aligns with the Public Health Agency of Canada’s (PHAC) guidance on AEFI reporting. Specifically, serious (life-threatening, resulting in hospitalization, fatal outcome, etc.) and unexpected (inconsistent with the Product Monograph) AEFIs should be reported.

Methods: Passive surveillance of AEFIs, using AEFI report forms from the PHAC, was conducted. All CAF Health Services clinicians and immunizers were reminded of their requirement to report AEFIs to CAF Directorate of FHP.

Results: In the first 4 months following the recommendation for a booster dose, there were a total of at least 155 reported cases of delayed hypersensitivity/urticaria following immunization with a Moderna Spikevax 3rd dose. This led to a rapid internal investigation into potential causes for these AEFIs, based on vaccine administration data. Regular updates were provided to senior medical authorities and lead immunizers across CAF’s medical clinics, in Canada and around the world.

Collaboration with civilian colleagues, who are their jurisdiction’s subject matter experts on AEFIs led to identification of some additional reports of delayed hypersensitivity/urticaria.

The Canadian product monograph was updated on 14 July 2022 adding this AEFI as a post-market adverse reaction.

Discussion: The early identification of delayed hypersensitivity/urticaria following booster doses of mRNA vaccines was made possible by a passive surveillance system employed by the CAF Health Services. This allowed the CAF Directorate of FHP to investigate this AEFI internally, rapidly developing briefings and guidance for senior leadership, in parallel with messaging for our front-line health care providers, in order to support vaccine confidence for CAF members. The harmonized approach to AEFI with that of PHAC made data sharing among our Canadian civilian counterparts smooth and effective. Although only around 0.2% of the Canadian population serve in the CAF, our passive surveillance system had a real impact upon post-market vaccine safety surveillance at a national level, as evidenced by the revision to the Product Monograph for Moderna Spikevax on 14 July 2022 acknowledging this AEFI. As of 12 September 2022, over 46,000 eligible CAF members (~66%) have voluntarily received at least 1 additional dose of COVID-19 vaccine.