



Infectious disease surveillance and monitoring for animal and human health: summary of notable incidents of public health significance: December 2021

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Incident assessment key

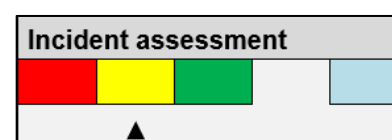
Deteriorating	No change	Improving	Undetermined
Incident is deteriorating with increased implications for public health	Update does not alter current assessment of public health implications	Incident is improving with decreasing implications for public health	Insufficient information available to determine potential public health implications

Notable incidents of public health significance

Coronavirus (COVID-19): Global summary

Incident assessment

No change: Update does not alter current assessment of public health implication.



Event information

By the end of December 2021, the World Health Organization (WHO) had reported over [285 million coronavirus \(COVID-19\) cases](#) and over 5.43 million deaths globally. Overall, there has been a gradual increase in incidence from October until the end of 2021. A total of [8.39 billion vaccine doses](#) had been administered globally as of 20 December 2021. For further insight, please refer to the following reports:

- WHO's global [weekly epidemiological updates](#)
- ECDC's [weekly surveillance summary](#) for European countries
- UKHSA's [national COVID-19 surveillance reports](#)

Updates to note

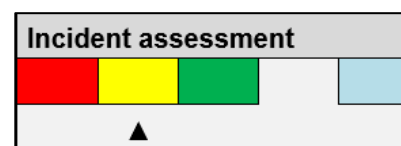
The [Omicron \(B.1.1.529\)](#) variant of concern was first identified in November 2021. Preliminary data suggest that Omicron is associated with a [reduced risk of hospitalisation](#) in comparison to the Delta (B.1.617.2) variant, however, further investigation is needed to understand clinical severity.

A vaccine effectiveness [study](#) using data from a care organisation in South Africa indicated that vaccine effectiveness was 70% against hospitalisation during the Omicron wave, compared to 93% effectiveness in the Delta wave. In other research, in vitro [assays](#) found that a third dose of the BNT1612b2 (Pfizer) vaccine showed 4 times lower neutralisation efficiency against the omicron variant compared to the delta variant.

Hepatitis E, South Sudan, Unity State

Incident assessment

No change: Update does not alter current assessment of public health implication.



Event information

[South Sudan](#) has experienced a higher number of hepatitis E cases in 2021 than in previous years. As of 29 November, 1,143 suspected cases with 5 deaths had been reported in 2021. From 2018 to 2020, there were 564 cases.

The majority of cases in 2021 (778; 68.2%) were reported from the [Bentiu](#) internally displaced person (IDP) camp in Unity State. However, increasingly cases are being reported from outside the camp in the towns of Bentiu and Rubkona, suggesting transmission in the surrounding community. The affected area is also close to the Sudan and Ethiopian borders, and due to the mobility of IDP populations and refugees across these borders, there is a [moderate risk of regional spread](#).

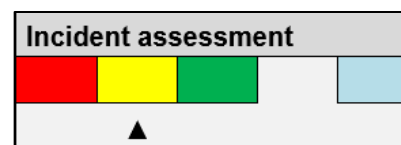
Bentiu IDP camp hosts 107,000 people and has reported hepatitis E cases since 2014. Cases have been above the epidemic threshold since mid-May 2021, leading the Ministry of Health to declare an outbreak in August 2021. The situation is further exacerbated by flooding in Unity State, resulting in deteriorating water and sanitation conditions, additional population displacement and the development of new IDP sites.

A [vaccination campaign](#) has been developed and in December the WHO reported that 57,000 vaccines were in South Sudan and ready to be used. However, the vaccination program was placed on hold following the acute flooding situation.

Wild polio and circulating vaccine derived polio virus, global update: 2021

Incident assessment

No change: Update does not alter current assessment of public health implication.



Event information

Wild polio virus

During December 2021, the Global Polio Eradication Initiative (GPEI) reported one confirmed case of wild polio virus in [Afghanistan](#). Overall, in 2021, 5 cases have been identified globally: 4 cases in Afghanistan and one in Pakistan.

Circulating vaccine derived polio virus (cVDPV)

During December 2021, one acute flaccid paralysis (AFP) case of cVDPV type 1 (cVDPV1) was reported in [Madagascar](#). Overall, in 2021, 14 cases have been reported: 11 in Madagascar and 3 in Yemen.

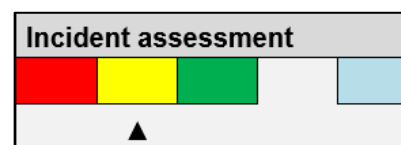
As of 28 December, 566 AFP cases of cVDPV type 2 (cVDPV2) have been reported in 2021, across 20 countries, with 385 cases (68%) reported from [Nigeria](#). In comparison, in 2020, a total of 1,079 AFP cases of cVDPV2 were reported across 24 countries, with a much lower number reported from Nigeria (8 cases). The substantial increase in cVDPV2 cases in Nigeria has been attributed to disruption to vaccination campaigns caused by COVID-19, as well as ongoing conflicts and challenges accessing populations which have not received polio vaccinations for prolonged periods.

Cases of cVDPV2 continue to be identified in [Yemen](#), following the first reported cases in November 2021. As of 28 December, [6 cases](#) have been reported by GPEI. More than [12.4 million polio vaccines](#) were delivered to Yemen at the end of December 2021, with the aim of vaccinating 10 million children under 10 years old.

Yellow fever, Africa

Incident assessment

No change: Update does not alter current assessment of public health implication.



Event information

During 2021, 9 countries in the [WHO African Region](#) have reported confirmed cases of yellow fever: Cameroon, Chad, Central African Republic, Côte d'Ivoire, the Democratic Republic of the Congo (DRC), Ghana, Niger, Nigeria, and Republic of Congo. A further 6 countries have reported probable cases: Benin, Burkina Faso, Gabon, Mali, Togo, and Uganda.

In total, 300 probable and 88 confirmed cases of yellow fever were reported from 1 January until 20 December 2021. There were 66 deaths, equating to an overall case fatality rate among probable cases of 22%, however, this varies widely between countries.

In [Ghana](#), a yellow fever outbreak was declared in October, which is mainly affecting nomadic communities in the Savannah Region. As of 20 December, [386 suspected](#), 90 probable and 21 confirmed cases were reported, with 11 deaths.

Vaccination coverage in the affected regions remains lower than the 80% threshold required to provide herd immunity. In [2020](#), the WHO and United Nations Children's Fund (UNICEF) estimated overall yellow fever vaccination coverage in the African region to be 44%. Furthermore, [WHO](#) highlight that certain areas may be affected by delays in investigations of suspected cases due to insecurity or under-served communities (for example, nomadic communities in Ghana).

Other incidents of interest

Avian influenza A(H5N6), China

In December 2021, 6 cases of avian influenza A(H5N6) were reported in mainland China, bringing the total number of cases reported so far in 2021 to 31.

On [8 December](#), a female resident of Sichuan Province who had exposure to poultry was reported to have died.

On [11 December](#), a case was reported in a male resident of Guangdong Province, who kept poultry at home.

On [15 December](#), 4 cases were reported, of which 3 were residents of Hunan and one was resident of Guangxi. All 4 cases had exposure to poultry.

From 2014 to date, a total of 57 human cases have been reported from mainland China.

Cholera

Cholera continues to be reported in the [DRC](#), with 10,029 suspected cases and 179 deaths (case fatality rate of 1.8%) reported between 1 January and 12 December 2021. The highest [incidence](#) is found in the south-east of the country, including the provinces of Tanganyika, Haut-Lomami, Sud-Kivu and Haut-Katanga. The case fatality rate overall in the country is currently higher than the WHO standard of less than 1% and a [vaccination campaign](#) was launched in December that will target over 2 million people.

[Nigeria](#) has reported 109,189 suspected cholera cases and 3,604 deaths (case fatality rate of 3.3%) in 2021, as of 19 December. In the most recent reporting week (ending 19 December) the states of Borno (42), Nasarawa (40) and Adamawa (21) account for 75% (103 of 137) of suspected cases. The [WHO](#) has donated health intervention materials to the Adamawa State Government to support the response.

Crimean-Congo haemorrhagic fever (CCHF), Iraq

In December, an outbreak of CCHF was reported in [Iraq](#). Between April and November 2021, there were 45 suspected cases, of which 15 were confirmed, with 9 associated deaths. CCHF is endemic in Iraq, with most cases being reported in the summer.

Dengue, Pakistan

[Pakistan](#) reported 48,906 dengue cases and 183 deaths (case fatality ratio of 0.4%) between 1 January and 25 November (latest available data). Dengue is endemic in Pakistan, which reports seasonal surges of cases and circulation of the 4 different serotypes (DENV-1, DENV-2, DENV-3 and DENV-4) in the country. Due to the nature of recurrent dengue transmission in the

country, there may be an increased risk of re-infection and therefore potentially more serious complications.

Ebola virus disease (EVD), DRC

On 16 December 2021, the EVD outbreak in the Béni Health Zone, North Kivu Province, [DRC](#) was declared over, 42 days after the second negative test from the last confirmed case. The outbreak was initially declared on 8 October and was the 13th outbreak in the country. During the outbreak, a total of 8 confirmed (6 deaths) and 3 probable (3 deaths) cases were reported from 3 health areas of the Béni health zone. Over 1,800 people were vaccinated during a campaign that was launched just 5 days after the declaration of the [outbreak](#).

Hantavirus

During December 2021, media reported cases of hantavirus in [Chile](#) and [Argentina](#), although the strain of hantavirus was not specified. In Chile, 3 cases (including one death) were reported in the Maule region. In Argentina, one fatal case was identified in La Plata, in the province of Buenos Aires.

Hepatitis E, Chad

A Hepatitis E outbreak was declared in Sategui health area, in the Tandjile region of [Chad](#) in November 2021. Between 01 October and 30 November (latest available data), there were 385 suspected cases and 2 deaths. Chad has been affected by flooding since June 2021 and Hepatitis E is endemic. The Tangjile region previously had large outbreaks in 2017 and 2018.

Lassa fever, Nigeria

Lassa fever cases continue to be reported in [Nigeria](#), where it is endemic. During 2021, there were 4,654 suspected and 510 confirmed cases of Lassa fever (case fatality rate of 20.0%). Confirmed cases increased in the last two weeks of December 2021, where cases approximately tripled compared to the previous two weeks. Overall, case numbers in 2021 were lower than in 2020 (6,732 suspected, 1,181 confirmed cases and 244 deaths; case fatality rate of 20.7%).

Meningitis, DRC

The meningitis epidemic in Tshopo Province, [DRC](#), which began in September 2021, was declared over in December 2021. In total, 2,662 cases and 205 deaths were reported. During the response, more than [160,000](#) people were vaccinated. Tshopo Province lies on the [African meningitis belt](#) (an area recognised as being at particularly high risk of meningitis epidemics).

Middle East respiratory syndrome (MERS), Saudi Arabia

In December 2021, the Ministry of Health of [Saudi Arabia](#) retrospectively reported 4 cases of MERS.

On [31 October](#), there was a fatal case reported in a 50-year-old male in Hafer Albatin city, Hafer Albatin Governorate. The case reported contact with camels.

On [8 November](#), there was a case in a 45-year-old male in Riyadh city, Riyadh Region. The case did not report contact with camels and has recovered.

On [12 December](#), there was a fatal case reported in a 79-year-old male in Riyadh city, Riyadh Region. The case did not report contact with camels.

On [29 December](#), there was a case in a 49-year-old in Turabah city, Taif Governorate. The case did not report contact with camels.

Globally in 2021, there were 19 cases of MERS reported. Of these cases, 17 were in Saudi Arabia and 2 in the United Arab Emirates.

Monkeypox

On 9 December, an outbreak of monkeypox was declared in Tunda health district, Maniema province, [DRC](#), following disease confirmation at the National Institute of Biomedical Research. The first suspected cases had been reported in early October 2021. As of 12 December, 196 cases and 24 deaths have been reported in Tunda health district. Ongoing strikes among healthcare workers may disrupt response activities. In total during [2021](#), 2,898 cases of monkeypox including 81 deaths have been reported in the DRC, as of 12 December. This compares to 6,257 suspected cases and 229 deaths reported in 2020.

In [Nigeria](#), 98 suspected cases of monkeypox were reported in 2021, of which 34 were confirmed cases with no deaths. 2021 saw an increase in confirmed cases in comparison to 2020 (8 confirmed cases). Since September 2017, a total of 512 suspected monkeypox cases have been reported in the country.

Powassan virus, United States of America (USA)

In December 2021, a case of Powassan virus disease was detected in a resident of Lisbon area, Ohio, [USA](#). This is the first time that a case has been detected in Ohio State. Powassan virus is transmitted by ticks and cases in the USA mainly occur in the northeast and Great Lakes regions. The number of cases reported has been increasing in recent years. Between 2010 and 2019, [181 cases](#) and 21 deaths were reported in the USA.

Plague, DRC

In Ituri province, [DRC](#), 130 suspected plague cases and 14 deaths have been reported in 2021, as of 12 December. This is comparatively fewer cases than in 2020, when 461 suspected cases and 31 deaths were reported in the province.

Zika virus, India

In December, media reported a case of Zika virus in Delhi, [India](#). The case was admitted to hospital in November and has since recovered. In [2021](#), cases of Zika have also been reported in the states of Uttar Pradesh (147), Kerala (83) and Maharashtra (1). No deaths have been reported.

Publications of interest

Avian influenza A

A [study](#) that sequenced avian influenza viruses isolated from whooper swans at stop-over sites along their migratory routes and wintering grounds during 2020 found that swans were an indicator species responsible for the transborder spread of influenza A(H5N8) into central China; a subtype that can also infect humans and poses a potential public health risk.

Chikungunya

Currently, there is no approved no approved vaccines or therapies. A phase 1 human clinical [trial](#) of the first mRNA-encoded monoclonal antibody showed in vivo expression and detectable ex vivo neutralizing activity against Chikungunya virus.

Despite there being no reports of chikungunya cases between 2011 and 2018 in Myanmar, a [seroprevalence survey](#) found that the overall seropositivity rate during this time in 1,544 serum samples was 34.5%, and at its highest in 2018 (37.3%). In 2019, Myanmar reported a chikungunya outbreak.

COVID-19

During the first four weeks of the Omicron-dominated fourth wave in [Gauteng](#) province of South Africa, patients admitted to hospital were 73% less likely to develop severe disease than patients admitted during the delta-dominated third wave.

A [research group](#) has suggested that the Omicron variant may have transmitted from humans to mice, accumulated mutations that promote adaption to mouse hosts, before making the species jump back into humans.

A national cohort study in the USA examined the risks associated with [COVID-19 infection during pregnancy](#), finding that prenatal infection was associated with adverse pregnancy outcomes. 3.4% of pregnant women with documented SARS-CoV-2 infection required admission to intensive care.

Dengue

Yunnan, Guangdong and Fujian provinces were high-risk areas for dengue outbreaks between 2013 and 2016, with outbreaks occurring almost annually. Examination of [viral phylogenies](#) suggested that dengue strains are periodically introduced into China, primarily from Southeast Asia.

EVD

A [study](#) reporting the characteristics of EVD cases in the DRC between July 2018 and May 2020 found that 16.6% of cases were nosocomial infections. Half of the health facilities found to have a case of EVD were privately owned. The authors conclude that nurses and traditional healers should be encouraged to engage with infection prevention and control training.

Guinea worm

The presence of Guinea worm (*Dracunculus medinensis*) in domestic dogs (*Canis familiaris*) presents an obstacle to eradication of the disease. [Researchers](#) in Chad found that disease in dogs was associated with consumption of fish, facilitated by seasonal fisheries, thus highlighting a novel Guinea worm transmission pathway.

Human Borna disease virus 1 (BoDV-1)

A [study](#) from Germany reported 3 cases of encephalitis due to BoDV-1 infection which were identified in 2021. All the cases were residents of areas known to be endemic for animal Borna disease, although there had been no human cases previously reported in the areas.

Leishmaniasis

An 11-year [survey](#) (2004-2014) found that Tarim hares (*Lepus yarkandensis*) are a likely animal reservoir for desert type zoonotic visceral leishmaniasis in China. Visceral leishmaniasis has largely been successfully controlled in China, except in some western regions. This study provides insight into the continued infection of sand-flies in areas without active infections in dogs or humans.

Malaria

The WHO's [World Malaria Report](#), published in December 2021, showed an increase in malaria cases and deaths in 2020 compared to previous years (241 million cases and 627,000 deaths in 2020, compared to 227 million cases and 558,000 deaths in 2019). Disruptions to services (for example, distribution of insecticide-treated mosquito nets) due to the COVID-19 pandemic are estimated to have resulted in an additional 47,000 malaria deaths globally in 2020.

Measles

An analysis of the measles surveillance programme in [Syria](#) between 2015 and 2019 found that there were 30,241 clinically suspected cases of measles, compared to 3,194 cases reported in the entire decade before conflicts in the country began. The measles epidemics of 2017 and 2018 accounted for 71% of total cases across 2015 and 2019. Syria has low vaccination rates and limited access to care.

MERS

An epidemiological [study](#) of MERS in Saudi Arabia between January 2019 and October 2020 identified 299 cases. A lower percentage of cases were reported in healthcare workers (11.9%) than in previous studies (19.1 to 25.0%), possibly due to infection prevention and control measures introduced due to the COVID-19 pandemic.

Poliomyelitis

During September 2021, an imported [case](#) of vaccine-derived poliovirus type 2 (cVDPV2) from Senegal was detected in Spain. The WHO European Region was declared polio-free in 2002, but it is essential to maintain and strengthen poliovirus surveillance systems for early detection of potential cases.

Zika virus

A single dose of chimeric dengue-2/Zika [vaccine](#) candidate demonstrated protection against Zika virus challenge in mice and rhesus macaques. There is currently no approved vaccine for Zika virus.

Other publications of interest

[Research](#) demonstrated the impact of the COVID-19 pandemic on routine immunisations. During 2020, there was a decline in the number of diphtheria–pertussis–tetanus-containing vaccine (DTP3) and first dose of measles-containing vaccine (MCV1) administration globally. Reaching their lowest in April 2020, when 33% fewer doses of DTP2 were administered globally, recovery of vaccinations began in June 2020 and continued until late 2020.

Acute flaccid myelitis is a distinct polio-like syndrome of AFP which was first classified in the United States in 2012. Australia reviewed 915 [cases](#) of AFP between 2000 and 2018 and reclassified 37 cases as acute flaccid myelitis. Nonpolio enteroviruses were detected in 33% of AFM cases with stool sample testing.

Bats are considered to act as reservoirs of Ebola and Marburg viruses, but only display subclinical effects from infection. [Researchers](#) studied the immune response of Egyptian rousette bats (*Rousettus aegyptiacus*) to Ebola and Marburg virus infections and found a robust anti-inflammatory state signified by macrophages in the M2 state and an active T cell response. The responsive genes were found to be evolutionary divergent, providing some understanding of the differences in filovirus infections between bats and humans.

Novel agents, rare pathogens and disorders

Nothing to report.

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Published: January 2022

UKHSA publications gateway number: GOV-11222

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