GCDC
المركز الخليجي للوقاية من الأمراض ومكافحتها
Gulf Center for Disease Prevention and Control

مجلس الصحة
لدول مجلس التعاون
Gulf Health Council

Monthly Epidemic Intelligence Report

Issue 11

November 2024

Definitions

The below is a list of commonly referred to terms and keywords in the monthly reports.

Gulf Public Health Emergency Network (PHEN)

A group of technical individuals within GCC health authorities, nominated to represent each GCC country. The composition typically includes International Health Regulations Focal Point, Ministry of Health Communicable Disease Directors and National Public Health Laboratory Directors or appointed representatives on their behalf. The Gulf CDC serves as the Network's secretariat with the PHE Department Director chairing the network meetings.

Hazard

A source/incident that has the potential to cause morbidity (including injury) or mortality in an exposed human population.

Signal

An incident/situation involving a hazard that has occurred. Signals are typically news/updates identified through Event-Based Surveillance and Indicator-Based Surveillance, utilizing both official and non-official sources. Signals can be of a disease origin or a CRNE (Chemical, Radiological, Nuclear, or Environmental) origin.

Potential Threat

Any threat that has been confirmed by the PHEN to have the potential to pose a near-future risk to the GCC countries' populations and could be monitored closely by Gulf CDC for 2 weeks.

Event of Regional Interest

Any threat, inside or outside the GCC, that has been identified by the Public Health Emergency Network to pose a certain type of risk for the GCC countries' public health. For these threats, Gulf CDC produces regular risk assessments and recommendations for their control, as well as enhances daily monitoring of it to provide regular situational updates to the GCC countries.

Rapid Risk Assessment

A prompt evaluation of the level of health risk in relation to a verified acute event within a short time frame, mainly for situation update, risk level determination and recommendation to support the GCC countries in risk communication and management.

GULF CDC Risk Scale					
Negligible	Very Low	Low	Moderate	High	Critical

Country names in this report are as per the UN list

Summary of the Month

This monthly report provides an overview of the signals, potential threats, and specifically Events of Regional Interest detected and identified through the Gulf CDC Epidemic Intelligence system during the month of **November 2024** (October 24, 2024 – November 23, 2024).*

80	2	2	3
Disease Signals	CRNE Signals	Potential Threats	Events of Regional Interest

Executive Summary

Disease Signals This month, the epidemic intelligence team at Gulf CDC detected 80 infectious disease signals. Of these, 14% were of malaria, 9% were of poliovirus (different types and mostly vaccine-derived), 8% were of mpox, and 2.5% were signals of animal infections. No signals were detected in the GCC countries.

CRNE Signals 2 CRNE signals with potential public health consequences were identified, including 1 flood in Spain and 1 environmental signal related to poliovirus in Poland.

Potential Threats the Gulf CDC identified 2 potential threats in November: Diphtheria in Nigeria and an undiagnosed illness in India.

Events of Regional Interest the Gulf CDC continued monitoring 3 events of regional in the month of November: Highly Pathogenic Avian Influenza H5N1 globally and Mpox globally and Marburg in Rwanda.

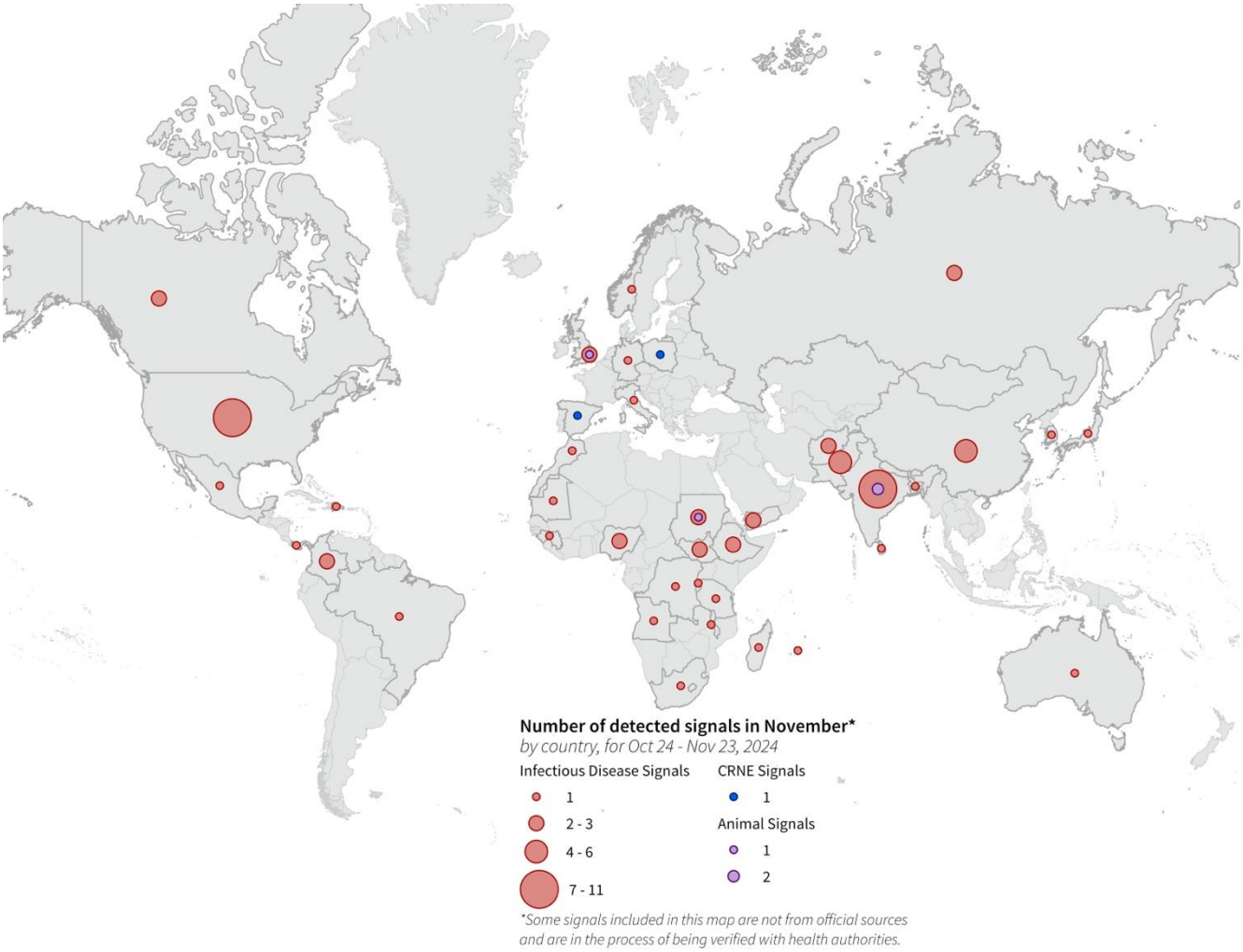
* Monthly reports cover data from the 24th of the previous month to the 23rd of the reported month, ensuring there is no gap in reported data.

The details of the detected signals and identified threats are shared weekly with the GCC Member States' technical representatives in the Gulf Public Health Emergency Network (PHEN) (available on this link) and are presented and discussed in weekly roundtable discussions. These are often verified through secondary research or communication with regional and international partners. In consultation with the PHEN members, a potential threat is escalated to an Event of Regional Interest based on its anticipated potential for causing a public health emergency in the GCC region.

Signals

The Gulf CDC monitors the globe for daily, weekly, and monthly disease signals. Based on Gulf CDC analysis, certain signals may be designated as threats and/or events of regional concern, depending on their risk level, impact, and likelihood. As outbreaks evolve, new diseases may be added to this list. Some diseases may also be removed if the risk they pose reduces below our threshold.

Potential threats are identified based on several considerations such as high connectivity between reporting country and the GCC countries, level of transmissibility of pathogens, vulnerability degree of GCC populations to the identified hazard, capacity levels of GCC health systems to respond to the identified hazard.



- Number of detected signals and potential threats by the Gulf CDC from October 24 to November 23, 2024

Highlights of Signals Identified in November 2024

- **Poliovirus in Pakistan:** There is an ongoing alarm for the spread of poliovirus[1], with the total of cases rising to 55 after poliovirus type 1 (WPV1)[2] was detected in several districts, as of 23 November.
  - A nationwide anti-polio vaccine campaign was launched on 28 October.
  - Cases have been reported in Balochistan (26), Khyber Pakhtunkhwa (14), Sinh (13), Punjab (1), and Islamabad (1).
  - Sewage samples have been tested and are signalling sustained virus circulation in Loralai. Currently, there are 204 positive environmental samples across 71 districts in Pakistan[3].
  - In 2023, the country only reported 6 polio cases, which was 70% less than the total cases reported in 2022[4].
- **Poliovirus in Afghanistan:** As of 01 November, 23 cases of WPV1 have been reported [5].
- **Chikungunya and Malaria in India:** Delhi, India has been reporting their highest rates of chikungunya and malaria this year compared to the last 5 years[6].
  - As of 9 November, 728 cases of malaria and 172 cases of chikungunya were reported in Delhi. Comparisons of cases to previous years can be seen below:

Year	Chikungunya	Malaria
2020	111	228
2021	89	167
2022	48	263
2023	65	426
2024	**172**	**728**

  - Other regions, such as Shahdara South zone have also reported high cases of chikungunya (87 cases).
- **Coxsackie virus in Russia**: 9 regions[7] (including Moscow, St. Petersburg, Krasnodar Krai and Tatarstan) in Russia have been reporting outbreaks of Coxsackie virus, as of 15 November.
  - Many reports of symptoms have been originating from school-aged children. It is believed that the virus has been brought to Russia via tourists returning from Turkey.
  - In one kindergarten class in Vladimir, more than 20 children[8] were infected after coming into contact with a sick child.
- **Mycoplasma pneumonia globally:** Japan, US, and Canada[9] are raising concerns regarding surges of cases due to "walking pneumonia".
  - Japan is currently experiencing the "worst outbreak" seen in more than 20 years, reporting nearly 6,000 cases in the country this year, as of 05 November. This is more than 10 times the number of cases reported last year. 20-30 % of infections are resistant to antibiotics.
  - In October, the US reported a rise in mycoplasma pneumonia infections in young children in the late spring, but case counts have remained high since then.
  - In the UK, between October 2023 and March 2024, there were 2592 detections, compared to 364 in the winter of 2022-2023.

Potential Threats

Undiagnosed Illness

India

This threat is being monitored closely by Gulf CDC.

Situational Highlights

- A village in Rajasthan, India, has experienced 17 deaths within a month (September 2024), leading to concerns of a potential epidemic.
- The cause of these deaths, predominantly among children, is uncertain [10].
- Sixteen of the deaths occurred after treatment from unqualified practitioners. The district health department is investigating the matter.
- While the undiagnosed illness in Rajasthan has not been confirmed, authorities have stated that the deaths may have occurred due to seasonal diseases, so a link between the Chandipura virus outbreak from earlier in the year and this undiagnosed illness may exist.
    - Between early June and mid-August 2024, the Ministry of Health and family Welfare of India reported 245 cases of acute encephalitis, including 82 deaths in the states of Gujarat and Rajasthan.
    - Of those reported, Chandipura virus (CHPV)[11] was confirmed in 64 cases through immunoglobulin M enzyme-linked immunosorbent assay or reverse transcription polymerase chain reaction. This is the largest CHPV outbreak reported in India in the last 20 years

Diphtheria

Nigeria

This threat is being monitored closely by Gulf CDC.

Key Stats

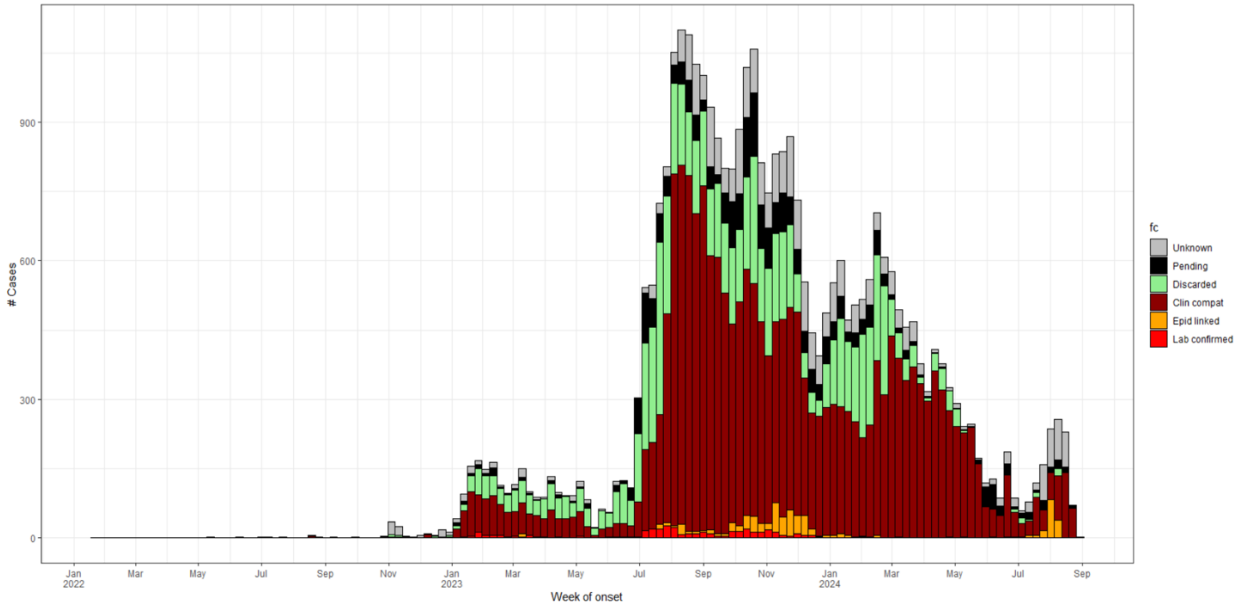
1,200 deaths
Due to the diphtheria outbreak (since May 2023)

38,000 suspected cases
of diphtheria since May 2023

Situational Highlights

- Since the onset of the diphtheria outbreak in Nigeria[12] in May 2023, there have been 38,000 suspected cases, 23,000 confirmed cases and 1,200 deaths.
- According to a 2023 report by the WHO, only 57% of Nigeria's population has received the pentavalent vaccine, which protects against diphtheria alongside tetanus, pertussis, hepatitis B and haemophilus influenza type B.
- According to the most recently available diphtheria situation report (5 September 2024) published by the Nigeria CDC[13], there has been a recent upsurge in cases in recent weeks, after falling to their lowest numbers in June and July 2024 since then onset of the outbreak in May 2023.

Epi-curve of confirmed diphtheria cases in Nigeria, epi-week 19 2022 – epi-week 35 2024[13]



- Kano state accounts for the largest proportion of cases (75%), and 22.6% of confirmed cases were in fully vaccinated individuals.

Events of Regional Interest

Highly Pathogenic Avian Influenza H5N1

Globally

Negligible	Very Low	Low	Moderate	High	Critical

Gulf CDC Risk Assessment of this Event – 6 August 2024

- **Risk Question:** What is the likelihood of HPAI H5N1 human-to-human transmission occurring in the GCC countries and what is the impact of that transmission?
- **Impact:** Moderate. Despite the global unavailability of specific antiviral drugs for HPAI H5N1, case management capacities of the GCC countries for influenza infections are generally high.
- **Likelihood:** Unlikely. The likelihood of HPAI H5N1 importation to the GCC countries from the United States is unlikely given the low number of cases. Further, there is no evidence of human-to-human transmission at this time.

Please refer to the Gulf CDC Rapid Risk Assessment: Highly Pathogenic Avian Influenza H5N1 from 6 August 2024 further details.

Why is this Notable?

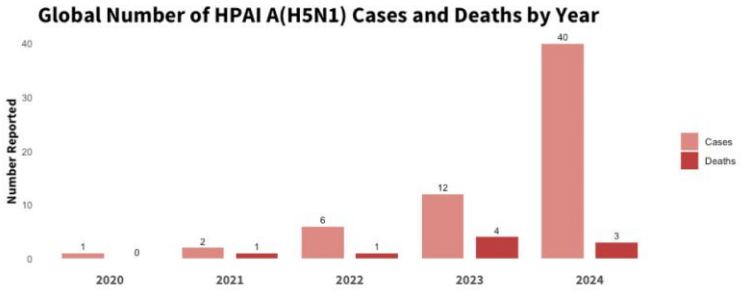
The Gulf CDC EI team escalated the Avian Influenza H5N1 outbreaks in the United States to an event of regional interest on 3 August 2024. The Gulf CDC has detected new signals of Highly Pathogenic Avian Influenza H5N1 (HPAI H5N1) infections caused by contact with infected cattle in multiple states within the United States of America.

Key Stats

55 cases
of HPAI H5N1 in Humans in the US in 2024

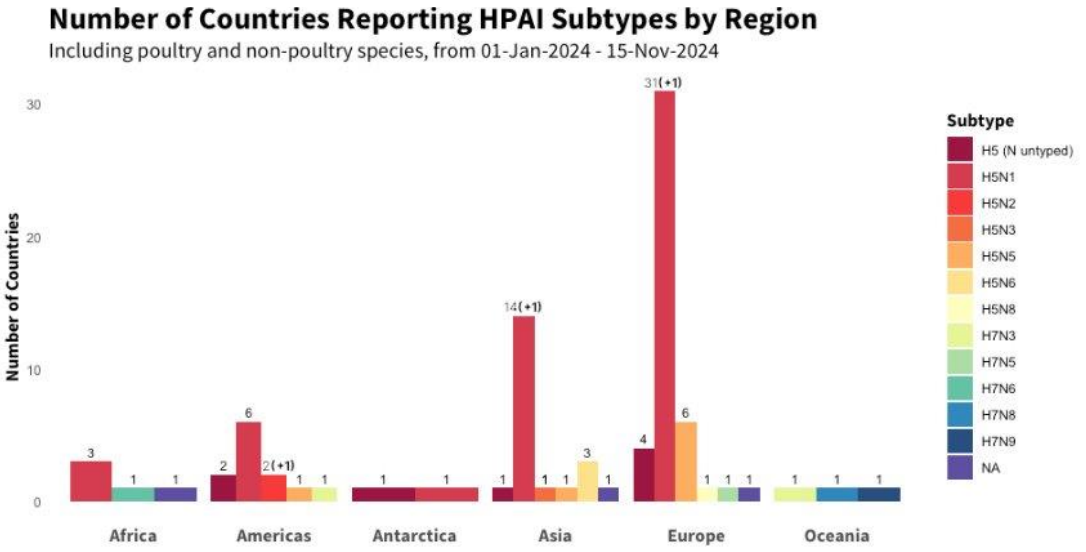
75 cases
of HPAI H5N1 in Humans Globally in 2024

Key Factors of Concern for Avian Influenza H5N1

Disease severity	Avian Influenza H5N1 with a severe pathogen severity level. The mortality rate for this infection can be as high as 60%. Infection is mainly through contact with infected poultry, however there are growing concerns that this virus could mutate and cause more efficient person-to-person transmission.
Trends from previous outbreaks	In 2023, there were 12 reported human infection cases of H5N1 across 4 countries (Cambodia, China, Chile, United Kingdom). In years prior, there have been small numbers of sporadic reported human infection cases of H5N1 across several countries. 
Healthcare capacity	All GCC countries have set up infectious disease programs or services for zoonosis, but strategic plans and programs need improvement to control and prevent the spread of avian influenza. There are limited systems in place for ensuring regular collaboration and coordination between the Health and Agricultural sectors. This may lead to the infected individual seeking healthcare at a later stage of the infection, risking further complications and severe symptoms. While recent clades of the H5N1 virus have not been detected in the GCC countries, the connectivity to other countries through agricultural trade and bird migration increases the likelihood of importation of the virus, and the possibility of spillover to humans (particularly those in close contact with poultry). *Please refer to the Gulf CDC Rapid Risk Assessment on Avian Influenza H5N1 (6 August 2024) for further details.* In November 2024, the Gulf CDC and GCC Member states conducted a regional simulation exercise, using H5N1 as the scenario to develop the Public Health Emergencies Response Coordination Plan and identify areas of cooperation, communication channels, and potential gaps.
Connectivity to the Gulf Region	While the United States is highly connected via air travel to the Gulf Region, the low number of cases in humans and the lack of evidence thus far regarding human-to-human transmission makes the likelihood of importation 0%.

Situational Highlights for Avian Influenza H5N1

- **Since the start of 2024, there have been 75 human cases of HPAI H5N1 reported across 6 countries.**
  - To date, there have been 55 human cases reported in the United States, and 16 in Cambodia. The remaining 4 countries (Australia, Canada, China and Vietnam) have each reported 1 case. The United States and Canada were the only two countries to report new human cases of HPAI H5N1 in November 2024.
    - On 13 November the Public Health Agency of Canada[14] announced Canada's first locally acquired H5N1 infection in a human in British Columbia. Genomic sequencing suggests that the H5N1 virus is closely related to those circulating in poultry in British Columbia, it is of the 2.3.4.4b clade and the D.1.1 genotype.
    - Between 28 October and 17 November, 17 new cases in humans were reported in the United States[15].
      - California reported 10 human cases, all due to infected dairy cattle exposure whereas 6 cases reported in Washington and 1 case in Oregon that were related to infected poultry exposure.
      - This was Oregon's first human case with poultry exposure.
      - Of all known cases, the majority have occurred in California (29) as a result of cattle exposure (28).
      - There have been 4 reported cases that had exposure to either dairy cattle or poultry that were negative after confirmatory testing was conducted at the CDC.
- **New and ongoing outbreaks in animal populations continue to be reported globally.**
  - As of 22 November 2024, HPAI (H5N1) has been reported in dairy herds in 15 states in the United States with 616 affected herds [15]. Two states continue to report detections in livestock herds in the last 30 days.
  - Several poultry outbreaks have been reported in the last 30 days, including 10 commercial outbreaks (Arizona, California, Oregon, and Utah), and 14 non-commercial outbreaks (California, Colorado, Montana, Oregon, Pennsylvania, and Washington).
  - As per WOAH-World Animal Health Information System (WAHIS) [16], HPAI events were reported in 74 countries globally between 1 January 2024 and 15 November 2024. The chart below outlines the number of countries reporting HPAI events per continent. Most of the events were dominated by HPAI H5N1 and were reported as recurrence of eradicated disease.



Number of countries reporting HPAI evens among animals per continent (1 January - 15 November 2024), Source: WOHA

- **Recent findings:**
  - A phylogenic analysis[17] of the mass outbreak of H5N1 clade 2.3.4.4b in southern elephant seals at Península Valdés, Argentina, in October 2023 and re-emphasizes the likely occurrence of mammal-to-mammal transmission and sporadic mammal-to-bird spillovers. The Argentina marine mammal viruses contain several mutations that are possibly associated with increased virulence, transmission, or adaption; some of which have been consistently reported in marine mammals' outbreaks of other countries.
  - Researchers evaluated spatial and epidemiological characteristics of human infections[18] with H5N1, H5N6, H9N2, and H7N9 avian influenza viruses in China from 2011 to March 2024 using boosted regression tree models. H5N1 and H5N6 cases were concentrated in Eastern and Southwest China, while H9N2 and H7N9 infection were more widely distributed. The number of live poultry markets was an important predictor of human infections of H5N1, H5N6, and H9N2 (largest contribution to H9N2), whereas irrigation coverage was a significant contributor to H7N9 infections. Other assessed factors include human or pig density, precipitation, temperature, and wetland coverage.

Mpox

Globally

Negligible	Very Low	Low	Moderate	High	Critical

Gulf CDC Risk Assessment of this Event – 14 August 2024

- **Risk Question:** What is the likelihood of importing a mpox clade 1b case into the GCC causing an occurrence of subsequent cases in the GCC in the next 3 months?
- **Impact:** Moderate, With the low transmission potential of the virus in the Gulf communities, and the high national capacities established for mpox prevention and control, the level of potential impact of mpox has been characterized as moderate.
- **Likelihood:** Likely, as there is a large volume of travelers to the Gulf from countries reporting mpox Clade 1b cases, it is likely that unlinked cases/clusters to be detected within the next 3 months.

Why is this Notable?

The Gulf CDC EI team escalated the global mpox to an event of regional interest on 14 August 2024 due to an increase in the expected incidence of epidemic activity. Furthermore, On 14-Aug-2024, the WHO declared mpox as a public health emergency of international concern (PHEIC) for the second time.

Key Stats

7 Clade Ib exported cases
Outside the African continent

55,000+
Reported suspected cases in African countries in 2024

Key Factors of Concern for Mpox

Disease severity	Severe complications of mpox may include secondary bacterial infections, pneumonia, sepsis, and encephalitis; immunocompromised individuals are particularly susceptible to severe infections. Mpox is divided into two distinct clades, clade I and Clade II, with Clade II being further divided into the Clade IIa and Clade IIb subclades. Clade I is predominantly found in central Africa around the Congo basin while Clade Ia is found in West Africa. Clade IIb however, was able to spread and cause outbreaks globally in 2022.

	Clade I has been shown to cause more severe disease than clade II, with case fatality rates (CFRs) of approximately 10% and 1% respectively.
Trends from previous outbreaks	Although ongoing human-to-human transmission of mpox in the DRC has been documented since the 1970s, there are still gaps in knowledge of all the dynamics involved. Initially, infections happened within minor domestic or local clusters, believed to be predominantly caused by the transmission from animals to humans, as sexual transmission of the MPXV clade I was not officially reported until April 2023. Most cases in the multi-country outbreak (non-endemic) in 2022 were Clade II, lineage B.1, and its descendants, while the current outbreaks in several countries in Africa (DRC, Uganda, Kenya, Rwanda, Burundi) are primarily Clade I.
Healthcare capacity	In 2024, the majority (96%) of mpox cases have been reported from the DRC and Burundi. The current outbreak in the DRC (started in 2023) is due to mpox clade I with at least one new strain of clade I, proposed as clade Ib, and around 70% of cases reported in children under 15. However, within the DRC, testing in rural areas is limited and just 24% of the clinically compatible (reported as suspected) cases in the country have been tested in 2024. Of those tested, the positivity is approximately 65% at the national level. Surveillance and response capacity have been strengthened within the DRC by government initiatives with the aid of institutions such as the WHO, particularly in the most affected provinces such as South Kivu. Risk communication has also been updated and increased to inform the population about the risks and precautions to take to avoid acquiring Mpox. The Interim Medical Countermeasures Network (i-MCM-Net) [19] that the Gulf CDC participates in, established an access and allocation mechanism for the mpox response. As of 27 September 2024, 2.7 million MBA-BN, 3 million LC16 and 50,000 ACAM2000 vaccines had been pledged by both public and private donors.
Connectivity to the Gulf Region	Of the 5 African countries that have reported cases of mpox Clade 1b, the GCC has the highest connectivity with Kenya. To get an estimated of volume of travelers for October 2024, the following passenger volumes were recorded between African countries that have reported cases of mpox Clade Ib, historical passenger volumes including both direct and indirect passengers for November 2023 are presented below[20]:

	Burundi	DRC	Kenya	Rwanda	Uganda
UAE	657	2,664	14,388	2,111	14,321
Bahrain	-	10	298	17	83
Saudi Arabia	170	238	4,478	101	977
Oman	50	46	638	51	106
Qatar	26	45	2,588	708	839
Kuwait	6	65	357	10	134

Connections between the above-mentioned countries and the region are primarily counted based on airline data. Other routes of entry and illegal migration might contribute to the importation likelihood.

Situational Highlights for Mpox

The WHO has announced that Mpox will continue as a public health emergency of international concern (PHEIC), citing a resurgence in cases and the virus's ongoing geographic spread. The PHEIC initially declared in August, was reaffirmed following a meeting of the WHO Emergency Committee

- **New countries reporting mpox cases in 2024:** The United Kingdom, United States, Angola and Canada reported their first Mpox Clade Ib cases between 30 October and 23 November 2024.
    - **United Kingdom:** On 30 October, the UK Health Security Agency (UKHSA)[21] reported a single confirmed human case of mpox Clade Ib. By 6 November, the UKHSA confirmed 3 additional cases of mpox Clade Ib among household contacts of the index case.
        - This marks the third confirmed detection of Clade I in Europe with previous cases reported in Sweden (one case) and Germany (one case).
        - The first case was detected in London and the individual has been transferred to the Royal Free Hospital High Consequence Infectious Disease unit. The subsequent two cases are under specialized care at Guy's and St Thomas' NHS Foundation Trust in London.
        - The individual recently travelled to countries in Africa that have been reporting community transmission of Clade Ib but the specific countries visited have not been reported.
        - The UKHSA has stated that the risk to the public remains low; however, close monitoring of the situation continues, and the risk assessment is subject to change. Officials are working to trace close contacts and reduce the risk of any potential spread. Extensive preparations have been made across healthcare facilities to ensure readiness for potential further cases.
    - **United States:** On 16 November, the California Department of Public Health[22] reported a single confirmed human case of mpox Clade I among a traveler, marking the first confirmed detection of mpox Clade I in the United States.
        - The case was identified through laboratory testing in an individual who recently traveled to an unspecified location in Africa. The case is reported to be related to the ongoing outbreak of mpox Clade I in Central and Eastern Africa.
        - The affected individual received health care in San Mateo County. Further details regarding the individual's symptoms, demographics, and travel details were not provided.
        - The individual is isolating and recovering at home. Close contacts have been contacted by public health workers, but there is no concern or evidence that mpox Clade I is currently spreading between individuals in California or the United States.
        - Mpox specimens from the affected individual are being sent to the CDC for further laboratory testing.
    - **Canada:** On 23 November, the Manitoba Health, Seniors and Long-Term Care department[23] confirmed the first human case of mpox clade Ib in the province, marking the first detection of this strain in Canada.

- The individual, who recently returned from travel to an affected region, was assessed, diagnosed, and is currently isolating.
- Specimens tested at the National Microbiology Laboratory confirmed the presence of clade Ib mpox virus.
- A public health investigation, including contact tracing, is underway to identify and mitigate potential transmission risks.

- **Angola:** On 16 November, the Ministry of Health[24] confirmed the first case of mpox in Angola. The affected individual is a woman of Congolese nationality and is in isolation at the specialized Center for the Treatment of Endemic and Pandemic Diseases.
  - Genomic sequencing data has not yet been released.

- **Cumulative cases in Africa:** According to the Africa CDC [25], as of 18 November, there have been 55,413 suspected cases, 12,162 confirmed cases, and 1,142 deaths of mpox in Africa in 2024.
  - **Uganda:** as of 28 October, Uganda has reported a notable rise in the number of cases of the ongoing mpox outbreak. Official information[26] indicates that most of the cases are associated with clade Ib, and it displays distinct outbreak dynamics compared to neighbouring countries.
    - The current outbreak has affected Uganda's male population disproportionately, with 63% of cases occurring in men. Additionally, only 12.5% of cases are in children under 15, a contrast to demographic patterns observed in the DRC, the epicentre of the outbreak.

Cumulative cases (2024) by African country reporting mpox cases[27]

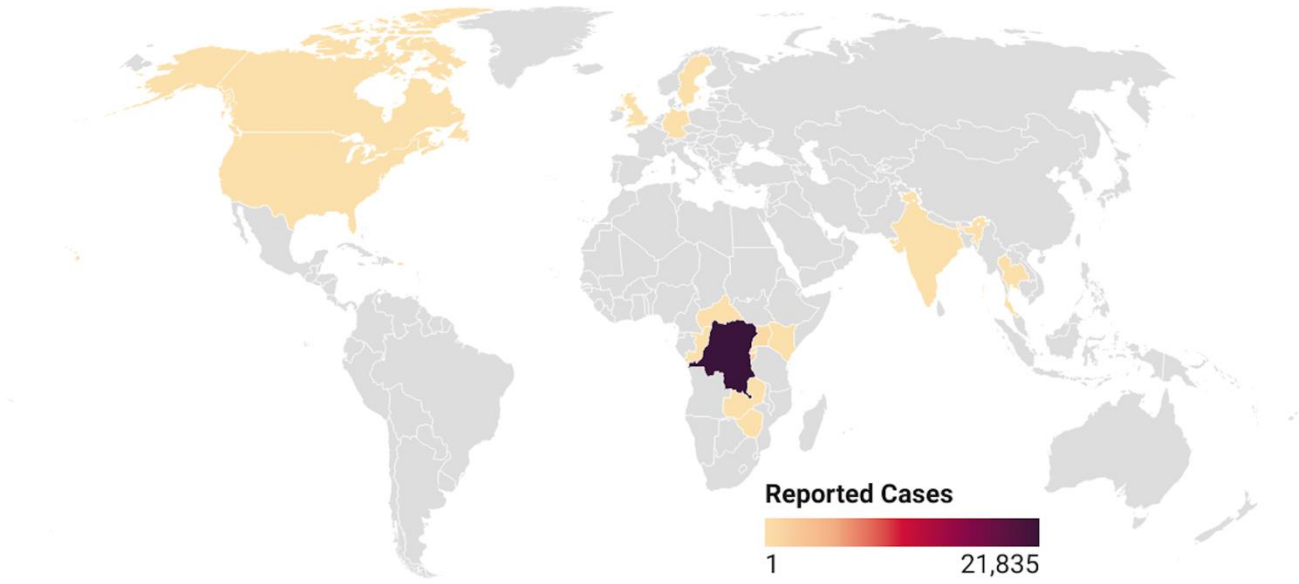
Country	Confirmed	Deaths
Angola	1	0
Burundi*	2,050	1
Cameroon	9	2
Central African Republic	79	2
Congo	22	0
Côte d'Ivoire	97	1
Democratic Republic of the Congo*	9,513	1,138
Gabon	2	0
Ghana	2	0
Guinea	1	0
Kenya*	17	1
Liberia	42	0
Mauritius	1	0
Morocco	3	0
Nigeria	143	0
Rwanda*	37	0
South Africa	25	3
Uganda*	549	1
Zambia	1	0
Zimbabwe	2	0

**Country has confirmed at least one case of mpox clade Ib.*

- **Vaccination updates:** according to the WHO, more than 50,000 people[28] have been vaccinated against mpox in DRC and Rwanda. A large vaccination campaign targeting Kinshasa, the capital city of the DRC, began on 5 November.

- **Research updates:** Preliminary genomic data analysis[29] released in late October (yet to be peer reviewed), highlighted that the Clade Ia strain for mpox is likely spreading from person-to-person, adding complexity to controlling the mpox outbreak in Central Africa. The DRC has seen a significant surge in infections linked to this strain, raising concerns among health officials and researchers.

Countries reporting cases of Mpox Clade I, 01 January – 23 November 2024



Countries reporting cases of Mpox Clade I (1 January – 23 November 2024)

Marburg

Rwanda

Negligible	Very Low	Low	Moderate	High	Critical

Gulf CDC Risk Assessment of this Event – 01 October 2024

- **Risk Question:** What is the risk of one case of Marburg virus being imported into the GCC Region from Rwanda in the upcoming month, in terms of the likelihood and impact of the importation?
- **Impact:** Minor, given that GCC countries have high reported capacities for detecting and responding to epidemic-prone diseases.
- **Likelihood:** Unlikely, due to the current scale of the outbreak, and the limited direct travel links to the GCC region.

Why is this Notable?

The Gulf CDC EI team escalated the Marburg outbreak in Rwanda to an event of regional interest on 29 September 2024 due to the Marburg outbreak reported by the Rwandan Ministry of Health on 17 September.

Key Stats

66 cases
Total reported in Rwanda

0 new cases
Reported since 30 October.

Key Factors of Concern for Marburg

Disease severity	Marburg virus disease[30] (MVD) is a severe and often fatal human illness. Marburg virus, along with the Ebola virus, is part of the Filoviridae family, that can cause severe haemorrhagic fever in humans. The case fatality ratio can be as high as 88% but can be much lower with timely diagnosis and appropriate patient care.
Trends from previous outbreaks	There have been 14 previously documented Marburg outbreaks (1967-2022). The 2005 outbreak in Angola and the 1998-2000 outbreak in the Democratic Republic of the Congo remain the most expansive and deadly of these (154 cases, 128 deaths and 252 cases, 227 deaths respectively). Most other outbreaks were smaller and better contained, with 1-5 reported cases. The most recent outbreak occurred in 2023 in Equatorial Guinea and Tanzania, with 40 and 9 respective total reported cases. *Please refer to the Gulf CDC Rapid Risk Assessment on Marburg (1 October 2024) for further details.*
Healthcare capacity	In recent years, Rwanda has invested in its healthcare capacity to handle infectious diseases, particularly through partnerships and infrastructure development. The country has established a strong disease surveillance system[30], bolstered by collaborations with international organizations like the CDC, WHO, and CEPI. Rwanda's biomedical capabilities include early pathogen detection at airports and a biosecurity infrastructure designed to respond rapidly to outbreaks such as Marburg virus, Ebola, and COVID-19. Additionally, the government is constructing a center of excellence for highly infectious diseases[31], aimed at enhancing the country's ability to manage outbreaks effectively. Public health initiatives, such as the Field Epidemiology Training Program (FETP)[32], have also trained local professionals to investigate and respond to emerging health threats.
Connectivity to the Gulf Region	The GCC countries have limited connectivity with Rwanda. To get an estimated of volume of travelers for October 2024, the following passenger volumes were historical passenger volumes including both direct and indirect passengers for November 2023 are presented below[20]:

	Rwanda
UAE	2,111
Bahrain	17
Saudi Arabia	101
Oman	51
Qatar	708
Kuwait	10

Connections between the above-mentioned countries and the region are primarily counted based on airline data. Other routes of entry and illegal migration might contribute to the importation likelihood.

Situational Highlights for Marburg

- **Marburg in Rwanda:** there have been no new cases[33] of Marburg reported since 30 October 2024.
  - As of 19 November, there have been 66 cases and 15 associated deaths.
    - 80% of cases were among healthcare workers who contracted the virus while providing emergency care.
  - On 8 November, Rwanda discharged the last patient, marking the start of the mandatory 42-day countdown required to declare the end of the outbreak.
  - On 22 November, the Rwandan Ministry of Health[34] updated that that there had been 21 days without a new case and the treatment center had closed. Additionally, the statement said that all contacts had completed the follow-up period, and routine surveillance and follow-up of recovered MVD cases continues.
  - The swift response curtailed community transmission, containing the virus largely within two major hospitals in Kigali and among the family of an early patient.
  - The Ministry of Health, in collaboration with WHO, is maintaining enhanced surveillance, involving nearly 60,000 community healthcare workers to ensure active case finding and testing of suspected cases.
    - Measures include active monitoring, infection prevention, and rapid response deployment, which have significantly controlled the spread and reduced case numbers.
- The Gulf CDC continued to monitor this event until 2 incubation periods had passed since the last confirmed case was on the 30 October 2024.

Acknowledgements

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