Global updates on COVID-19 and other diseases

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1.0 COVID-19 and related issues

1.1 The World Health Organization updates

During the four-week (28-day) reporting period from 6 January to 2 February 2025, the weekly SARS-CoV-2 polymerase chain reaction (PCR) test positivity percentage detected by the integrated sentinel and systematic virological surveillance within the Global Influenza Surveillance and Response System (GISRS) changed from 7.3 to 5.0%. An average of 69,900 specimens across 103 countries were tested for SARS-CoV-2 each week during this period.[1]

Twenty-three (10%) countries reported COVID-19 deaths, and 83 (35%) countries reported COVID-19 cases globally; there was a 16% decrease in reported cases, with the total estimated at > 147,000, while a 28% increase or approximately 4,500 new deaths, were reported. From countries that are consistently reporting, new hospitalisations and intensive care unit (ICU) admissions decreased by 40% and 31%, respectively (or a total of > 16,700 new hospitalisations and 700 ICU admissions, respectively).[1,2]

The WHO continues to monitor several SARS-CoV-2 variants, including one variant of interest (VOI) JN.1, and 7 variants under monitoring (VUMs). In week 5 of 2025:[2]

- JN.1 VOI accounted for 16.3% of sequences,

- The most prevalent VUM, XEC, showed a decrease in prevalence, 42.7% of sequences.
- LP.8.1 and LB.1 are the only tracked variants currently growing in prevalence, accounting 13.9% and 1.2%, respectively, of sequences.
- All other remaining VUMs are declining in prevalence.

Wastewater surveillance from around 30 countries from 5 WHO regions estimated the circulation of the SARS-CoV-2 virus to be approximately 2 to 19 times higher than counts of identified and reported cases.[1]

1.2 Long-COVID, findings from a Spanish study

A survey-based study conducted in Spain has estimated that 23% of adult COVID-19 survivors develop long-COVID (LC), with 56% of them, or 13% of those infected, still experiencing symptoms at 2 years. The evaluation was based on 2,764 COVID-19 participants from a population-based cohort established before the pandemic. They were followed up in 2020, 2021, and 2023 for concentrations of immunoglobulin (Ig) G antibodies against the SARS-CoV-2 virus and clinical, vaccination, sociodemographic, and lifestyle factors. Of this total, 647 LC patients were compared with 2,117 infected controls without long-term symptoms.

The results are simplified as follows (paraphrased):[3]

- From 2021 to 2023, 23% of participants developed LC symptoms, and 56% of those infected in 2021 reported symptoms for 2 years.
- Three subtypes were identified:
    - Mild neuromuscular (51.6%),
    - Mild respiratory (20.6%), and
    - Severe multi-organ (27.8%), which carries the highest risk of persistent symptoms associated with persistent long-COVID (relative risk, RR, 1.61).
- The most common long-COVID symptoms were neurologic (63%), muscular (39%), respiratory (28%), and psychological and psychiatric (21%).
- The risk was higher among females, those < 50 years old, people of low socioeconomic status, severe COVID-19 infection, elevated pre-vaccination IgG levels, obesity, and prior chronic disease, especially asthma/chronic obstructive pulmonary disease and mental health conditions. A lower risk was associated with pre-infection vaccination, infection after Omicron became the dominant variant, which could be due to milder infections or a greater general immunity to the virus, higher physical activity levels, and sleeping 6 - 8 hours daily.

- Vaccination during the 3 months post-infection was found to be protective against long-COVID.

Despite considerable advancements in comprehending the disease, these research findings highlight that the COVID-19 pandemic continues to have a profound effect on the overall quality of life.[4]

1.3 COVID-19 and loss of lives, Europe

From 2020 to 2022, the COVID-19 pandemic led to the loss of nearly 17 million years of life among 289 million adults (≥ 35 years old) across 18 European countries. Had the pandemic not occurred, about 50% of these lives would likely have been lived without disability. This estimate was made using modelling studies based on multiple data sources: the numbers and rates of deaths related to COVID-19 and deaths from other causes were first quantified. Then, the proportion of loss of life expectancy and years lived with and without disability that could have been avoided if the pandemic had not happened was then estimated.[5,6]

The most loss was observed in 2021, where an estimated 7.1 million lives were lost. Of the total estimated person-years-of life (PYLL) lost, between 69-79% were due to COVID-19 deaths, while the remaining were due to non-COVID deaths. These numbers declined after 2021, following the introduction of COVID-19 vaccines. However, PYLL related to other causes of death continued to rise from 2020 to 2022 in most countries. Lower-income countries had higher PYLL per capita and a greater proportion of disability-free PYLL from 2020 to 2022, with comparable patterns for life expectancy.

These estimates illustrate the long-term effects of the COVID-19 pandemic, which extend beyond SARS-CoV-2 deaths. While vaccinations prevented direct loss of lives from COVID-19, the continued loss of lives from other causes highlights the broader consequences of the pandemic, including disruptions in healthcare services. The COVID-19 pandemic intensified socioeconomic inequities in premature death among countries and widened sex differences in life expectancy.

1.4 Vaccine protection and doses

Results from a study based on the analysis of 5 Swedish registries from January 2021 to February 2022 found that the risk of LC or post-COVID condition (PCC) was much lower for vaccinated than unvaccinated participants in the year after infection. This includes pre-Omicron and Omicron periods. A summary of the findings is as follows (paraphrased):[7]

- Of the 331,042 participants, 2,546 (0.7%) had LC at any point, and 852 of those 33% had the condition for ≥ 1 year.
- The incidence of LC was 0.4% for unvaccinated adults, 0.3% for one vaccine dose, and 0.1% for two or three.
- The adjusted risk ratio for LC in vaccinated versus unvaccinated participants was 0.81 for one dose, 0.42 for two doses, and 0.37 for three. Over 66% of the doses were of the Pfizer/BioNTech vaccine.

Severe COVID-19 disease is associated with an increased risk of LC/PCC. COVID-19 vaccines protect against severe disease, reducing the risk of persistent LC/PCC. This reinforces the need to get adequate protection against the disease and the long-term effects of SARS-CoV-2 infection.

1.5 Novel coronaviruses, findings

1.5.1 Alpha-coronavirus, South Korea

The outcome of a retrospective study conducted in South Korea was the discovery of a novel human coronavirus (HCoV) genetically different from existing human coronaviruses, including the SARS-CoV-2 virus that causes COVID-19.[8]

The novel virus belongs to the alpha-coronavirus (α-CoV) family and was detected in a 103-day-old infant with pneumonia symptoms and liver function abnormalities. In contrast, the virus that causes COVID-19 primarily causes pneumonia.

To determine the cause of the outbreak, > 800 wild Korean dormice, collected from 2018 to 2022, were examined for viral infections; 16 (1.8%) animals collected in Gangwon and Jeju provinces were infected with the novel α-CoV, which showed a high genetic similarity of 93.0 to 96.8% to the virus found in infants.

The research indicated the likelihood of dormice being the source of the virus; however, the route of infection remains unclear.

1.5.2 New merbecovirus from bats, China

A newly discovered coronavirus from bats, HKU-CoV lineage 2 or HKU5-CoV-2, was found to carry the same human receptor, angiotensin-converting enzyme 2 (ACE2), as the SARS-CoV-2 virus, the cause of the COVID-19 pandemic. The new virus belongs to the merbecovirus group, which also includes the virus that causes Middle East Respiratory Syndrome (MERS).[9]

Laboratory studies based on structural and functional analysis indicated that the HKU-CoV-2 has a better adaptation to human ACE2 than another branch HKU5-CoV group, namely lineage 1 or the HKU-CoV-1 virus. However, it was found that the virus did not enter infect human cells as effectively as the SARS-CoV-2 virus.

As bat merbecoviruses, which are phylogenetically related to MERS-CoV, pose a high risk of spillover to humans, either through direct transmission or facilitated by intermediate hosts, investigations are ongoing to determine the risk of HKU-CoV-5 spilling over to humans.[10]

1.6 Looking back 5 years

It has been 5 years since the World Health Organization (WHO) declared COVID-19 a global pandemic on 11 March 2020.[11] As of 23 March 2025, 777,684,506 cases and 7,092,720 deaths have been reported to the WHO since the beginning of the pandemic.[12,13]

Even though the COVID-19 outbreak no longer constitutes a Public Health Emergency of International Concern (PHEIC) – it was declared over on 5 May 2023 – the effects of the pandemic are still felt: ongoing health and socio-economic impact, and the continued threat of the disease among vulnerable populations.[14,15]

Assessments are ongoing about the mitigation measures taken, what worked and what did not, including lockdowns and closures, masking and vaccinations, treatment and the development of (new) therapeutic tools, personal freedom and politics. It also highlighted logistical nightmares, and questions access/equality and equity. The origins of the outbreak remain debatable. [14,16–19]

Vaccinations remain a key tool to prevent severe disease. However, tracking vaccine uptake and boosters is a difficult task as reporting mandates have been reduced globally, as with tracking the SARS-CoV-2 virus.[20] Monitoring the virus is important as it continues to evolve – a chance meeting with an unexpected variant could cost us more lives. COVID-19 still kills, and the virus still changes.[14,15]

Other reflections that are “begging for action” include (paraphrased and summarised): [21]

- Pandemics are the ultimate geopolitical destabiliser: conflicts created while the world was preoccupied with the pandemic need addressing.

- Prevention needs fiscal space too: long-term prevention strategies must advocate for financial flexibility to enable the necessary investments related to health.
- Outbreaks need swift action: the lesson from COVID-19 and the ongoing H5 avian influenza (in the US) tells governments that comprehensive action and adequate support are required rather than a piecemeal strategy, and inconsistent reporting and staffing.
- Remembrance supports action: remembering the pandemic helps confront denialism and helps spur action (in remembering weathering the pandemic).
- Finding hope in chaos: There is once again the threat of diseases amid uncertainty. Building capacities and forging alliances can help countries not lose sight of the practical and the possible.

While much of the world is still in the midst of a crisis response, the shift to prevention must be underway. Collective action and support across borders and communities are key to preventing any outbreak.

2.0 Tuberculosis

World Health Organization: World Tuberculosis Day

Tuberculosis (TB) continues to devastate millions globally, inflicting severe health, social, and economic consequences. World Tuberculosis Day, observed annually on 24 March, amplifies the urgency of ending TB – the world's deadliest infectious disease that has been responsible for > 1 million deaths annually, bringing devastating impacts on families and communities. This year's theme, ***Yes! We Can End TB: Commit, Invest, Deliver***, is a bold call for hope, urgency, and accountability. [22]

Global efforts to combat TB have saved an estimated 79 million lives since 2000. However, the drastic and abrupt cuts in global health funding happening now are threatening to reverse these gains, with the highest-burden countries in the WHO African Region facing the greatest impact, followed by countries in the WHO South-East Asian and Western Pacific Regions. Rising drug resistance, especially across Europe and the ongoing conflicts across the Middle East, Africa and Eastern Europe, further exacerbate the situation for the most vulnerable, with breakdowns seen in:

- Human resource shortages, undermining service delivery.
- Severely disrupted diagnostic services, delaying detection and treatment.
- The collapse of data and surveillance systems, compromising disease tracking and management, and

- Community engagement efforts, including active case finding, screening, and contact tracing deteriorating, leading to delayed diagnoses and increased transmission risks.

The WHO's Director-General and Civil Society Task Force on Tuberculosis issued a decisive statement which outlined 5 critical priorities:[23]

- Addressing TB service disruptions urgently, ensuring responses match the crisis's scale.
- Securing sustainable domestic funding, guaranteeing uninterrupted and equitable access to TB prevention and care.
- Safeguarding essential TB services, including access to life-saving drugs, diagnostics, treatment and social protections, alongside cross-sector collaboration.
- Establishing or revitalising national collaboration platforms, fostering alliances among civil society, non-governmental organisations (NGOs), donors, and professional societies to tackle challenges.
- Enhancing monitoring and early warning systems to assess real-time impact and detect disruptions early.

A new technical guidance on TB and lung health was released, outlining critical actions across the care continuum, focusing on prevention, early detection of TB and comorbidities, optimised management at first contact and improved patient follow-up. It also promotes better use of existing health systems, addressing shared risk factors such as overcrowding, tobacco, undernutrition and environmental pollutants.

Tackling TB together with other communicable diseases, along with non-communicable diseases, including lung conditions and disabilities, will help improve health outcomes.

3.0 Rabies

3.1 Sarawak

Eleven (11) new rabies cases have been detected in March 2025 by the Sarawak Veterinary Diagnostic Laboratory, with multiple bite incidents involving stray and free-roaming pet dogs across Kuching, Padawan, and Bau districts.[24]

The following details the animal rabies-positive cases detected by the Sarawak Veterinary Services Department (DVSS) within the specified period:[25–28]

- 3-7 March 2025: Four (4) animal rabies-positive cases in Kuching, involving stray dogs (bite cases) at Jalan Bau Lama, Kampung Nyabut, and Kampung Surih Stapok, and a free-roaming pet (bite case) at Lorong 1, Pekan Paku.
- 10-14 March 2025: Three (3) animal rabies-positive cases in Kuching, including a dog at Lorong 2E, Jalan Stephen Yong, and free-roaming pets (bite cases) at Lorong 15, Jalan Semaba Batu 5, Jalan Penrissen, Padawan, and Jalan Sebuku, Buso, Bau.
- 17-21 March 2025: Three (3) new rabies cases in Sarawak. Two cases involved stray dogs in Taman Hillside, Matang Sungai Tengah, and a premise in Batu Kawah New Township (MJC). One case involved a free-roaming pet in Kampung Sejijak, Batu Kawa.

Pet owners within a 1 km radius of the areas mentioned are required to vaccinate their pets. The DVSS, local councils and the Immune Belt Enforcement Team (IBET) continue to facilitate this by providing rabies vaccination, dog licensing and microchipping exercises for free. Pet neutering (subsidised) is encouraged to control the animal population. The public was reminded that failure to comply with licensing and anti-animal dumping by-laws is punishable by law. They were also reminded to immediately seek medical attention if bitten.[24]

As of 29 March 2025, Health Department data indicates that the cumulative number of human rabies cases in Sarawak since July 2017 remains at 83, with 76 fatalities. So far, no human deaths have been reported in 2025.[24]

3.2 The US,

3.2.1 Other mammals

Maryland and North Carolina reported cases of rabies in raccoons which had encounters with pet dogs.[29,30] A domestic goat, which had received rabies vaccination, was also infected from exposure to an infected raccoon.[31] In Virginia, rabies was reported in a skunk and raccoons.[32]

3.2.2 Death, transplanted infected organ

Officials have confirmed that a Michigan resident died from rabies after receiving a kidney transplant from an infected donor. The transplant took place in December 2024, and the patient passed away in January 2025. The Michigan Department of Health and Human Services determined that the rabies virus was transmitted through the transplanted kidney. Authorities noted that while potential organ donors are screened for various infections, rabies testing is not routine due to its rarity and the time required for testing.[33–35]

3.3 The Philippines

The Department of Health (DOH) reported a 39% decline in rabies cases nationwide, with 55 human death cases recorded from 1 January to 1 March 2025, compared to 90 in the same period last year. DOH data from 2024 showed 426 rabies cases, of which 193 (45%) were transmitted through the saliva of domestic pets. Among the 2024 cases involving domestic pets, 41% were unvaccinated, and 56% had an undetermined vaccination status.[36,37]

3.4 India

Health authorities in Karnataka have documented a substantial rise in dog bite incidents in 2025, with 66,459 cases and 8 rabies fatalities recorded so far since January 2025 – a 47% increase in incidence from those reported in 2024.[38]

3.5 Thailand

As of 12 March 2025, the Department of Disease Control (DDC) reported two rabies deaths, one each in Chonburi (eastern Thailand) and Si Sa Ket (northeastern Thailand) provinces, this year. Both fatalities were preventable as the individuals had been bitten by dogs but did not seek necessary medical treatment, including post-exposure vaccination.[39]

The Maha Sarakham Livestock Development Office declared Tambon Na Kha in Wapi Pathum district (northeastern Thailand) a rabies control zone after a cow died from the disease. The declaration restricted the movement of animals, including dogs, cats, and livestock, out of the designated zone without official authorisation for a month (28 February to 29 March 2025).[40]

3.6 Viet Nam

As of 26 March 2025, 6 rabies cases, including two deaths in Long Thanh District, have been reported. To combat this, a mass dog and cat vaccination campaign, funded privately, will take place from 30 March to 24 April. Local authorities are tasked with ensuring its effective implementation and public education on animal diseases.[41]

3.7 Indonesia

As of 7 March 2025, Indonesia has reported 13,453 cases of rabies, which have led to 25 deaths. A substantial portion of the country, specifically 26 out of 38 provinces, is recognised as areas where rabies is consistently present (endemic).[42]

4.0 African swine flu (ASF)

4.1 Malaysia

As of 26 March 2025, out of 115 farms investigated, including one illegal operation, 57 tested positive for African Swine Flu (ASF). As a result, approximately 76,000 infected pigs from 57 farms in the Kuala Langat and Sepang districts were disposed of by the Department of Veterinary Services (DVS). Additionally, DVS Selangor seized 68 live pigs and > 9,400 kilograms of pig carcasses for violations related to animal movement.[43]

4.2 India

Mizoram state (northeast India) is battling an outbreak of ASF, which has resurfaced after an 80-day gap. Lawngtlai district, bordering Myanmar and Bangladesh, has been badly affected, with 260 pig deaths. Mamit district, adjacent to Tripura (northeast India) and Bangladesh, reported 30 deaths across multiple localities.[44]

4.3 The Philippines

As of March 14, the Philippines is experiencing a decrease in ASF cases, with the Department of Agriculture (DA) reporting 39 active cases across 27 municipalities and 7 regions, with the Province of Bohol (Central Visayas) being the most affected. This is a notable improvement from the 66 cases reported in late February 2025 and a substantial drop from the peak of 500 in 2024. This improvement is linked to increased biosecurity measures and the ongoing ASF vaccination program. According to the DA, initial results show the vaccine's effectiveness, with 28,000 doses administered across 29 farms. While new cases in Sta. Maria in the Province of Laguna (Luzon) are being investigated, the DA remains focused on areas with previous high outbreaks and expanding its ASF control strategies.[45]

4.4 VietNam, vaccine

The Bureau of Animal Industry (BAI), is prioritising the commercial release of an ASF vaccine by April 2025. Officials have emphasised the need to have the vaccine readily available to the market, building on the encouraging results observed from the government's initial 160,000-dose rollout, currently being used in 29 ASF hotspot farms with a 17.46% utilisation rate. The initiative has shown promising results, with only 51 deaths reported among vaccinated pigs.[46,47]

4.5 Bhutan

On 15 March 2025, a new ASF outbreak was reported by the Bhutan Ministry of Agriculture and Livestock in Wangdue Phodrang District. The outbreak affected a farm of 77 pigs in Nyalakha Village, Rubesa Gewog. In a worrying development, ASF was also detected in pork samples from multiple meat shops.[48]

4.6 South Korea

On 16 March 2025, an outbreak of ASF was confirmed at a pig farm in Yangju City, Gyeonggi-do, South Korea, housing 6,000 pigs. This is the third instance of ASF reported on domestic pig farms in the country this year. The outbreak was discovered after the farm owner reported the deaths of 44 pigs on the morning of the same day (16 March 2025). Authorities have responded by restricting access to the farm and culling the pigs to prevent further spread.[49,50]

4.7 Germany

African Swine Fever has resurfaced in the Märkisch Oderland district of Brandenburg. The disease was confirmed in a wild boar found dead near Kienitz in early March 2025, within the high-risk zone bordering Poland. Consequently, a restricted zone II, which had been lifted last year following 12 months without new cases, is being reinstated around the location of the discovery.[51]

4.8 Serbia

An outbreak has been detected in wild boars at two forest locations. In Plavna, it resulted in the deaths of two wild boars, and in Vlaska, one case was confirmed.[52]

4.9 Nepal

Officials from the Veterinary Hospital and Animal Services Expert Center reported positive ASF cases in 22 Bangur pigs (an ancient Indian breed of domestic pig) that died on farms in Gorkha Municipality-6 and 7 via rapid tests. [53] The infection has been present in the area since the beginning of February 2025. By 9 March 2025, Bagmati Province had recorded 200 pigs affected by the virus within the Hetauda Sub-metropolitan City of Makawanpur District. These cases were spread across multiple wards (the smallest unit of local government).[54]

5.0 Avian/zoonotic influenza

5.1 Highly pathogenic avian influenza H5N1

5.1.1 Mammals

5.1.1.1 The UK, first reported case in sheep

A case of H5N1 was confirmed in a domestic sheep in Yorkshire. The infection was identified during routine surveillance at a farm where captive birds had already been detected with highly pathogenic avian influenza (HPAI). The affected sheep, an ewe, exhibited mastitis but showed no other clinical symptoms. Laboratory tests confirmed the presence of H5 antibodies in the blood, and the virus was also detected in its milk via PCR testing. As a precautionary measure, all infected birds and the ewe were culled to prevent further spread. Subsequent testing of the remaining flock of sheep returned negative results, suggesting no further transmission occurred within the herd.[55]

This case was included in a broader government report on avian influenza findings in captive mammals. The document also references a previous outbreak in March 2023, where ten South American bush dogs (*Speothos venaticus*) tested positive for H5N1 at a zoological facility in England. These animals were part of a breeding program and were tested following an unusual mortality event in November 2022, in which ten of fifteen animals died within nine days. At the time, influenza of avian origin was not initially suspected, but postmortem examinations later confirmed the presence of the virus.

Investigators found no clear evidence of mammal-to-mammal transmission, and it is believed that the bush dogs were exposed to the virus through contact with infected wild birds.[56]

5.1.1.The US, first reported case in rats

The United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) has confirmed ongoing detections of HPAI H5N1 in mammals. HPAI has been detected in wild birds, commercial and backyard poultry, dairy cattle, cats [57], and now rats. [58] These detections are significant because they indicate that the virus can occasionally cross into non-avian hosts. The agency is continually updating its dataset as new cases emerge. Notably, the virus has now been found in rats, raising concerns about their potential role in transmission, particularly in urban environments where they may come into contact with infected birds or farm animals.[59] These developments highlight the ongoing challenges posed by HPAI, with surveillance and biosecurity measures remaining critical in controlling its spread.

5.1.1.3 The US, dairy cattle (economic impact of H5N1 on dairy production)

The spread of highly pathogenic avian influenza (HPAI) H5N1 in dairy cattle has caused economic losses due to sustained declines in milk production and extensive herd transmission. To mitigate the impact, the US Department of Agriculture (USDA) launched compensation and monitoring programs, while the Food and Drug Administration (FDA) expanded testing to assess pasteurisation effectiveness. These measures aim to protect the dairy industry from financial and biosecurity risks.[60]

5.1.1.4 The expanding threat of H5N1 in mammals and what is next?

The growing list of mammal species infected with H5N1 is a cause for concern. Recent reports indicate that more than 48 mammal species across multiple continents have been naturally infected, including terrestrial, semiaquatic, and marine mammals. The primary mode of transmission appears to be direct contact with infected birds or their carcasses, but there are concerns about possible mammal-to-mammal transmission, particularly in densely populated settings like farms or wildlife colonies. [61]

Can serological testing uncover hidden exposure? It can be a valuable tool for identifying past exposure to H5N1, such as tests to detect antibodies against the virus. However, there are several challenges: [62]

- No commercial serology test: Current H5N1 serological testing is conducted mainly for public health investigations, not for routine diagnostics.
- Complex interpretation: Cross-reactivity with other influenza strains and pre-existing immunity complicate the results, with the likelihood of false negatives if antibody levels decline over time.
- Need for widespread testing: H5N1 is likely to spread to more species than officially recorded, and broad serological surveys could provide critical insights into its true reach.

5.1.2 Birds

5.1.2.1 Canada, wild geese

Canada confirmed the detection of the HPAI H5N1 in goose carcasses collected from Prince Edward Island. The presence of the H5N1 D1.1 genotype was confirmed in 6 out of 7 samples tested at the National Centre For Foreign Animal Disease (NCFAD) laboratory in Winnipeg, Manitoba – Canada's only World Organisation for Animal Health (WOAH) Reference Laboratory for HPAI and low-pathogenic avian influenza (LPAI) – in mid-March 2025.[63]

5.1.2.2 Hong Kong, non-poultry including wild birds

Hong Kong's final report confirms the resolution of a recurring HPAI H5N1 outbreak in wild birds as of 19 March 2025. The virus was first detected on 6 November 2024, in an environmental sample at Mai Po Nature Reserve, followed by confirmations in a dead Eurasian Wigeon and another environmental sample. The source remains unknown, but authorities implemented intensive surveillance, disinfection, and monitoring of poultry farms. No further cases were detected after December 2024, leading to the outbreak's official closure.[64]

5.1.2.3 Japan, update/follow-up

Japan continues to deal with widespread outbreaks of HPAI, which have significantly impacted the poultry industry. As of early 2025, there have been 50 confirmed outbreaks across 14 prefectures, leading to the culling of approximately 9.27 million birds. This situation has contributed to a sharp increase in egg prices, which have risen by 10% since the beginning of the year and are now 60% higher than the average for the same period in previous years.[65]

Additionally, the most recent reports confirm that one of the largest outbreaks occurred in Yachiyo, Ibaraki Prefecture, where approximately 1.1 million egg-laying hens were culled. This marked the first recorded outbreak in Ibaraki and the 16th nationwide.[65]

5.1.2.4 Togo

Togo has reported three outbreaks of HPAI H5N1, leading to the culling of > 6,500 poultry across three locations: Adjengré, Anyron Kopé, and Kouloumdé. The virus was confirmed in farms from these locations, affecting egg-laying hens, broiler chickens and local breeds. Authorities have enforced strict control measures, including culling, disinfection, and a one-month ban on poultry markets within a 3 km radius of the outbreaks. The government has assured farmers of compensation for losses and emphasised vigilance to curb further spread.[66]

5.1.3 Human cases

5.1.3.1 The US

Recent H5N1 human cases in the US include infections in Ohio, Wyoming, and Nevada, primarily linked to exposure to infected poultry or dairy cattle. The Ohio case involved a hospitalised patient with severe illness, carrying the D1.3 genotype (was introduced to North America in 2022, common in birds), who later recovered.[67] Despite these genetic changes, the Centers for Disease Control and Prevention (CDC) confirms that H5N1 remains susceptible to flu antivirals like oseltamivir, though resistance monitoring continues. No mutations affecting antiviral treatments or vaccines have been detected.[68]

5.1.3.2 Cambodia

The WHO Avian Influenza Weekly Update (21 March 2025) highlights Cambodia's third human case this year, involving a 3.5-year-old boy from Kratie, Cambodia, who has been confirmed with H5N1.[69] He was hospitalised in critical condition after exposure to sick and dead poultry, which his family had consumed. Two of the three cases reported from Cambodia in 2025 have been fatal. Authorities are investigating the source and monitoring contacts to prevent further spread. Since 2003, Cambodia has reported 75 human cases of H5N1, with 45 deaths.[70]

5.1.4 Research updates

5.1.4.1 India, first report of 2.3.4.4b clade

A recent study published in Virology (May 2025) highlights the first clade 2.3.4.4b H5N1 avian influenza detection in India. The virus was identified in Kerala following outbreaks among poultry and wild birds in 2024. Genetic analysis revealed novel reassortment between H5N1 and low-pathogenic (LPAI) H3N8 viruses. Despite high mortality in birds, surveillance found no human infections among exposed individuals. These findings stress the need for enhanced monitoring of avian influenza at the human-animal interface to prevent potential spillovers. [71]

5.1.4.2 The US

5.1.4.2.1 Viral pathogenicity study

Recent research comparing the current bovine H5N1 strain from US dairy cattle to an older H5N1 strain from a wild bird in Mongolia (2005) has revealed concerning findings. Experiments conducted on human lung cells and mice showed that the bovine strain had superior growth and faster replication in human lung cells. In mice, the bovine H5N1 strain demonstrated greater pathogenicity, causing rapid lung damage, brain infection (high virus levels in the brain), and increased mortality across multiple infection routes. These findings indicate that the cattle-derived strain is more aggressive than earlier H5N1 variants, reinforcing the need for enhanced surveillance and precautionary measures to mitigate potential public health risks.[72]

5.1.4.2.2 Antiviral treatment

This study in mice tested antiviral treatments for the H5N1 in dairy cattle and other animals for public health and pandemic preparedness. It found that the FDA-approved antiviral baloxavir was more effective than oseltamivir in improving survival and reducing virus spread after exposure to H5N1-contaminated cow milk through the nose and eyes. These findings highlight the potential of baloxavir as a better treatment option for severe H5N1 infections.[73]

5.1.4.2.3 Impact on production and transmission

A recent study on the H5N1 avian influenza outbreak in dairy cattle revealed significant impacts on milk production, economic losses, and virus transmission. In a large Ohio herd, affected cows experienced a sustained drop in milk output, with an average loss of 900 kg per cow over 60 days, leading to an estimated financial loss of USD950 per cow and a total herd loss of USD737,500.[74] Nearly 90% of cows tested had antibodies against H5N1, indicating widespread asymptomatic transmission. Additionally, multiparous cows (those that have given birth multiple times) were more susceptible to clinical disease than first-lactation cows, suggesting that repeated exposure during milking may increase infection risk. These findings emphasize the need for strict monitoring and biosecurity measures to control the spread of H5N1 in dairy farms and minimise economic damage.[75]

5.1.4.2.4 Immune imprinting and vaccination responses

Research on H5N1 antibody responses in individuals born between 1927 and 2016 revealed that older adults exhibited higher levels of antibodies to both historical and recent H5N1 strains, likely due to immune imprinting from earlier exposure to other group 1 influenza viruses such as H1N1 and H2N2. On the contrary, young children, who had limited exposure to seasonal influenza viruses, had low levels of H5-specific antibodies.[76]

The study also assessed antibody responses in 100 individuals before and after vaccination with the A/Vietnam/1203/2004 H5N1 vaccine. Both younger and older individuals developed antibodies to the vaccine strain and a contemporary H5N1 clade, with younger children showing higher seroconversion rates due to their lower pre-vaccination antibody levels. These results suggest that younger individuals may benefit more from vaccination in the event of an H5N1 pandemic.[76]

5.1.4.2.5 The unpredictable behaviour and growing risks

The H5N1 virus has shown unpredictable behaviour in recent years, with lower-than-expected human fatality rates, possibly due to differences in transmission routes and prior immunity in certain populations. Wild birds may act as asymptomatic reservoirs, spreading the virus to domestic birds and increasing outbreak risks. [77]

The latest *New England Journal of Medicine (NEJM)* report highlights the ongoing H5N1 outbreak in the US, with detections in poultry farms, wild birds, and some mammals, raising concerns about potential human transmission. While human cases remain rare, experts stress the need for vigilance, enhanced surveillance, and updated influenza vaccines to address emerging strains. Authorities emphasise strict biosecurity measures, public awareness, and rapid reporting to mitigate risks.[78]

5.2 H7N9

The US, first outbreak

In March 2025, the US reported its first outbreak of the H7N9 avian influenza virus on a poultry farm in Noxubee County, Mississippi, the first since 2017.[79] The outbreak occurred at a commercial broiler breeder chicken farm, which housed > 47,000 chickens. All birds were euthanised to prevent further spread of the virus. To date, the H7N9 strain has a significant human mortality rate, with 616 deaths among 1,568 infections worldwide since its initial detection in China in 2013. However, WHO notes that this virus does not easily transmit between humans.[80]

6.0 Other diseases/current outbreaks

6.1 Ebola Sudan Outbreak, Uganda

6.1.1 Situation Update

The Africa Centres for Disease Control and Prevention (Africa CDC) announced a second illness cluster in Uganda's Ebola Sudan outbreak on 7 March 2025. A total of 14 cases have been reported, including 12 confirmed cases and two probable cases (due to a lack of testing) since the declaration of the outbreak in Uganda on 30 January 2025. The cases were reported from 6 Ugandan districts, including Jinja, Kampala, Kyegegwa, Mbale, Ntoroko, and Wakiso. Four deaths (two confirmed and two probable) have been reported with a case fatality ratio of 29%. Eight confirmed cases received care at treatment centres in the capital, Kampala, and in Mbale, and were discharged on 18 February 2025. The latest update also reported 192 new contacts, who are currently under follow-up in Kampala, Ntoroko, and Wakiso. Meanwhile, 299 previously listed contacts have completed the 21-day follow-up period. [81,82]

6.1.2 Epidemiology in Uganda

Sudan virus disease (SVD) is a dangerous disease that shares the same virus family as Ebola disease. The causative pathogen is Sudan virus (SUDV), can result in a high case fatality rate (CFR, 41-70% in previous outbreaks). The incubation period ranges from 2 to 21 days, with a typical duration of 7 to 11 days. The disease is characterised by an acute onset of fever with non-specific symptoms and signs, followed several days later by nausea, vomiting, diarrhoea, and occasional rash. Person-to-person transmission occurs by direct contact with blood, bodily fluids, organs, or contaminated surfaces and materials. The risk of infection begins at the onset of clinical signs and increases with the severity of the disease. [82]

SUDV is enzootic and persists in animal reservoirs in the region. Uganda has reported 5 SVD outbreaks (first in 2000, one in 2011, two in 2012, and one in 2022), making the current outbreak its sixth SVD outbreak in the country. The Ministry of Health (MoH) has performed whole-genome sequencing on the sample of the first confirmed case, and the results indicate that the outbreak is most likely the result of a spillover event.[82]

While Africa CDC claimed that there are no direct epidemiological links between the first and second cluster, the genetic sequencing shows the same SUDV strain is involved, which rules out a new jump from animals and suggests that undetected transmission is highly likely. Community deaths, burial tradition, care of patients in health facilities, and traditional healers with limited protection and preventive measures entail a high risk of unscrutinised transmission chains.[81,82]

6.1.3 Surveillance and Contact Tracing

SVD alert levels among the affected community and the health facilities have been low. The MoH is implementing heightened public health measures to enhance surveillance efforts and community awareness.[82] The are as follows:

- The MoH ramps up alert management with the support of WHO and other partners, including the establishment of an alert desk with toll-free numbers to detect and verify alerts nationwide.
- The search for active cases in and around the affected communities associated with the case movement has been intensified. Specific teams have been assigned to conduct detailed case investigations around all cases to intercept the chains of transmission, conduct contact tracing of positive cases and provide daily follow-up.
- The MoH, supported by WHO, established a mortality surveillance system to investigate and test non-trauma-related deaths within the affected districts.
- To prevent the geographical spread, the MoH is conducting exit screening for SVD signs and symptoms at 13 high-volume points of entry (POE) in Uganda, including Entebbe International Airport.

6.1.4 Therapeutics Trial

The WHO initiated an independent review process for prioritising candidate medical countermeasures and designing clinical trials after the first Ebola Sudan outbreak in

2020. Multiple candidate vaccines and therapeutics are at various stages of development, and one vaccine and two therapeutics are currently available in Uganda, undergoing randomised clinical trial protocols.[82]

Ring vaccination trial: Researchers from Makerere University in Uganda and the Uganda Virus Research Institute (UVRI), supported by the WHO, launched the vaccination trial four days after the outbreak was announced on 30 January 2025. The trial follows the ring vaccination model, in which the primary and secondary contacts of confirmed cases are administered the vaccine. This strategy aims to establish a protective barrier and break chains of transmission. As of 7 March 2025, 264 contacts have been vaccinated.[81,82]

Therapeutics: No licensed therapeutics are available to effectively address the current and future Ebola outbreaks caused by SUDV. A monoclonal antibody (supplied by MappBio, California, the US) and an antiviral (remdesivir, supplied by Gilead, California, the US) were recommended. The therapeutics trial will begin as soon as the national authorities approve.[82]

6.2 Marburg, ends

On 13 March 2025, the Ministry of Health of the United Republic of Tanzania announced the end of the Marburg virus disease (MVD) outbreak, following two consecutive incubation periods of 42 days since the last MVD-confirmed patient died on 28 January 2025. The deceased was given a safe and dignified burial. No new confirmed cases have been reported since then.

The outbreak was declared on 20 January 2025. Ten cases have been reported during the outbreak, including two confirmed and 8 probable cases. All 10 cases were from Biharamulo District in the Kagera Region. The case fatality ratio is 100% (all deaths), including 8 who died before the confirmation of the outbreak (thus classified as probable cases). Additionally, 272 contacts listed for monitoring completed their 21-day follow-up as of 10 February 2025.

This event is the second MVD outbreak declared in the country in the past three years. Both outbreaks occurred in the same region of Kagera, located at the border with Rwanda and Uganda. Late health-seeking behaviour of the affected community increases the risk of further transmission.

Despite the end of the outbreak, the risk of re-emergence of MVD remains. The presence of the animal reservoir in the country may lead to a new spillover event. The WHO advises the maintenance of early case detection and care capacities beyond the outbreak. This helps sustain a quicker response in the event of re-emergence, facilitates continuous risk communication, and promotes community awareness. Individual awareness of infection risk factors and protective measures is an effective way to minimise human transmission. [83]

6.3 Mpox

6.3.1 Global overview[1]

A total of 3,191 new confirmed mpox cases were reported globally in February 2025, a 18.2% decline from January 2025. The African Region remains the most affected area, at 88.2%, followed by the European Region at 6.0% and the Americas Region at 3.2%. All WHO regions reported a decrease in cases, ranging from a 12% to a 50% decrement, except for the Eastern Mediterranean Region, which reported a 50% increase in February 2025 compared to the preceding month. Notably, trend comparisons between regions may be prone to disparities in diagnostic response and disease surveillance reporting capacity.

The decreasing trend in the African Region, especially in the DRC, should be interpreted cautiously, as it may be due to a lower testing rate and case confirmation rather than a genuine decline. The observed decline could be due to both the disruption of response activities in the insecure eastern DRC region and resource constraints resulting from the freeze on U.S. foreign aid that supported sample transportation.[84]

6.3.2 Region-specific report

6.3.2.1 African Countries

Clade Ia mpox virus (MPXV) infection is predominant in the Democratic Republic of Congo (DRC) and sporadically found in the Republic of Congo. This clade typically spills over to human populations through zoonotic exposure and thus has limited human-to-human transmission.

Clade Ib MPXV is spreading predominantly in the DRC, with community transmission also reported in Uganda (2nd), Burundi (3rd), and 5 other countries. The current virus

[1] Data on the epidemiological situation for mpox in Africa were as of 16 March 2025. The global mpox surveillance data were as of 28 February 2025.

strain, first detected in South Kivu, DRC in 2023, is being transmitted exclusively through human-to-human contact. The transmission pattern of clade Ib MPXV had evolved from an initial sexual transmission circle to one involving household transmission. This leads to increased cases among children, and a bimodal distribution peaked at young children and young adult populations.

Four African countries — Côte d'Ivoire, Ghana, Guinea, and Liberia — reported human cases of mpox due to **clade IIa** MPXV since 2024, which had been rarely detected in past decades and had been almost exclusively found in animals. Most individual cases lack an apparent epidemiological link. Genomic sequencing analysis and the continuous rise of cases suggest repeated zoonotic spillover followed by limited secondary transmission. This clade remains the least described MPXV strain in scientific literature.

Côte d'Ivoire, Ghana, and Liberia also experienced transmission of **clade IIb** MPXV, marking them as the first countries to have co-circulation of clade IIa and clade IIb strains.[84]

Uganda

Uganda reported the highest number of laboratory-confirmed cases in Africa within a 6-week period up to 16 March 2025. All cases in the country are linked to clade Ib MPXV. Many cases reported outside of Africa have a travel link to Uganda in the days or weeks preceding the onset of their symptoms.[84]

6.3.2.2 Non-African Countries

Fifteen countries reported **clade Ib** MPXV since the outbreak, and none have sustained community transmission or death associated with the disease.

Most mpox outbreaks in other parts of the world are due to **clade IIb** MPXV, which began in 2022. The main population at risk continue to be men who have sex with men (MSM), contacted primarily through unsafe sexual behaviour. [84]

6.3.3 Countries with first report of Clade Ib MPXV

Brazil: Brazil notified WHO of the first confirmed mpox case due to clade Ib MPXV on 7 March 2025. The affected female has no recent history of travel, and her infection is linked to a relative who had travelled from the DRC to visit Brazil. Contact tracing did not detect secondary infection.[84]

Republic of Congo: The country reported two confirmed cases of clade Ib MPXV mpox on 17 March 2025, verified through genomic sequencing analysis. The Republic of Congo is the first country outside of the DRC to document the co-circulation of clade Ia and Ib MPXV.[84]

United Republic of Tanzania: The country reported two confirmed cases due to clade Ib MPXV on March 10, 2025. Two days later, the number of cases surged to 22 confirmed cases scattered across 10 regions of the country. The identification of these numerous dispersed cases within a short span suggests ongoing and undetected community transmission of mpox in Tanzania.[84]

6.4 Measles

6.4.1 The US

The Centers for Disease Control and Prevention (CDC) issued a Health Alert Network (HAN) Health Advisory on 7 March 2025 to notify clinicians, public health officials, and potential travellers regarding the ongoing measles outbreak in Texas and New Mexico [85] which began in January 2025. The advisory highlights that all U.S. residents should be up to date on their MMR vaccinations, particularly before travelling internationally.

As with cases, the number of locations reporting outbreaks has increased from the initial two. On 20 March 2025, a total of 378 confirmed measles cases were reported by 18 jurisdictions (Alaska, California, Florida, Georgia, Kansas, Kentucky, Maryland, Michigan, New Jersey, New Mexico, New York City, New York State, Ohio, Pennsylvania, Rhode Island, Texas, Vermont, and Washington). The CDC identified 5 outbreaks (defined as ≥ 3 related cases), and 90% of the confirmed cases (341 of 378) are outbreak-associated. For comparison, only 69% of cases (198 of 285) were outbreak-associated in 2024, although 16 outbreaks were reported. Seventeen percent of confirmed cases (64 of 378) were hospitalised, and children < 5 years old are most susceptible to hospitalisation (27%). [86]

On 25 March 2025, West Texas remains the epicentre of the outbreak with 327 cases reported: 325 cases were unvaccinated, two vaccinated (2-dose), 40 hospitalised, and one death. New Mexico has reported 43 cases: 31 were unvaccinated, four had at least a single dose vaccination, 8 had unknown vaccination status, two were hospitalised, and one suspected death (all data updated by NMHealth). [87,88]

<u>Note:</u>
As of 28 March, measles cases in Texas and New Mexico rose 20% from the previous report, with Texas reporting 400 cases and two deaths (one still under investigation). New

Mexico's total increased to 44. Two additional states are seeing outbreaks of ≥10 cases. A total of 483 cases have been reported to date, surpassing the total in 2024. [89]

6.4.2 Hong Kong/China, precautions

The Centre for Health Protection (CHP) of the Department of Health (DH) reminded the public to ensure that they have completed two doses of measles vaccination before travelling abroad to reduce the risk of infection. This advisory was based on the WHO reports of the high number of measles cases reported from Europe and Central Asia in 2024, as well as the ongoing outbreak reported in North America, specifically in the US. Sporadic cases have been reported from Hong Kong's neighbouring countries. Hong Kong has so far reported one case, which involved a person who travelled to Vietnam during the incubation period. No other cases were identified. Nonetheless, residents who have not completed a measles vaccination, such as non-local born people (for example, new immigrants, foreign workers, overseas employees, and international students), are still at risk of measles infection and may spread the virus to people without immunity against the disease, namely children < 1 year old who yet to receive the first vaccination dose. [90–92]

6.4.3 Europe

6.4.3.1 Situation update

Measles remains a significant global threat. In 2024, a total of 359,521 measles cases were reported worldwide. According to the WHO and the United Nations Children's Fund (UNICEF), the number of measles cases reported in Europe in 2024 (n=127,000) doubled the number reported for 2023 and was the highest number since 1997. Children < 5 years old accounted for more than 40% of reported cases in the Region, comprising 53 countries in Europe and Central Asia, and over half of the reported cases required hospitalisation. Based on preliminary data received, as of 6 March 2025, a total of 38 deaths have been reported.[93]

While some progress was made in controlling the disease from 1997 to 2016, a resurgence occurred in 2018 and 2019 due to declining vaccination rates. The COVID-19 pandemic exacerbated this, as vaccination rates have not rebounded to pre-pandemic levels. By 2023, the European Region accounted for a third of all measles cases globally, with as many as 0.5 million children missing the first dose of the measles vaccine (MCV1). [91,93]

6.4.3.2 Vaccination Concerns

Vaccination remains the most effective public health approach to prevent measles infection. The herd community will protect most of the population when more than 95% of people in a community are vaccinated (coverage >95). However, vaccination coverage among US kindergartners has decreased from 95.2% during the 2019-2020 school year to 92.7% in the 2023-2024 school year, leaving approximately 280,000 kindergartners at risk in the latter group. Specifically, only 12 out of 50 states in the US achieved a vaccination rate of more than 95% for the 2023-2024 school year. Furthermore, vaccine coverage rates can vary considerably depending on locality, whereby pockets of unvaccinated individuals may exist in states with high vaccination coverage. These communities are prone to outbreaks when measles reaches the unvaccinated individuals.[94]

In other regions, < 80% of eligible children in Bosnia and Herzegovina, Montenegro, North Macedonia and Romania were vaccinated with the measles vaccine (MCV1) in 2023. The situation is especially dire in Bosnia and Herzegovina and Montenegro, where vaccination coverage rates have remained below 70% and 50%, respectively, for over five years.[95]

Experts are concerned that the measles outbreak could be the first of many resurgences of vaccine-preventable diseases. The world may need to prepare for the return of other nearly eliminated but less contagious illnesses, such as whooping cough, diphtheria, and polio, if vaccine hesitancy and declining vaccination rates are not addressed promptly. [95,96]

6.4.4 The World Health Organization issued an alert on the US outbreaks

On 11 March 2025, the WHO was notified of an ongoing measles outbreak, in accordance with the International Health Regulations (IHRs), given the unusual event with potentially significant health impacts that is currently occurring in the US. Two measles genotypes have been identified as linked to the outbreak: D8 and B3. The source of this outbreak is unknown. Currently, there is no evidence of decreased (measles) vaccine effectiveness or changes in the virus that would result in increased severity.[97]

6.5 Middle East Respiratory Syndrome

The Kingdom of Saudi Arabia, update from the World Health Organization

In a 13 March 2025 update, the WHO reported four new cases since September 6, 2024, two of them fatal. The four infected men, aged 27 to 78 years, all had underlying medical conditions. One was exposed to the virus in a hospital, and one was indirectly exposed to camels and their raw (unpasteurised) milk. None were healthcare workers. The cases were reported in Saudi Arabia's Hail (2), Riyadh (1), and Eastern (1) provinces. Investigations of close contacts did not find any secondary infections. The last case was reported on 4 February 2025. Since Middle East Respiratory Syndrome (MERS) was first detected in humans in Saudi Arabia in 2012, 2,618 people from 27 countries in all 6 WHO regions have been infected, with a case-fatality rate of 36%. The majority of cases, 84%, have been identified in Saudi Arabia. No MERS infections have been reported outside the Middle East since 2019. [98]

6.6 Pandemic agreement

The Intergovernmental Negotiating Body 13 (INB13) held from 17 to 21 February 2025, closed without achieving the progress needed to assure a final pandemic agreement by World Health Assembly 78 (WHA78) to be held in May 2025. Progress surrounding long-standing issues around pathogen access and benefits sharing (PABS), One Health, and technology transfer remains challenging to the negotiations.[99–101]

7.0 Implications for Sarawak based on the views of SIDC

Five years on, the COVID-19 pandemic continues to tell us about the need for outbreak preparedness. It also tells us about the long-term effects of a disease on the human body, communities and the economy of a country.

Preparedness also means resilience, being less dependent on outside entities, to becoming more self-reliant.

Reports of the ongoing issues related to TB, and outbreaks of H5 avian influenza, ASF, rabies, measles and other diseases inform us of the importance of sharing information on these outbreaks with the public.

In the case of TB, collectively, we can accelerate the work to end the disease in Sarawak. The role of various partners, private and public, is important to achieve this.

Close attention should be given to the updates on the H5N1 avian influenza study findings, especially the risk of transmission to humans now that more mammals have been reported to be infected by the H5N1 virus. Also, paying close attention to the possible treatment and vaccines being developed would help in the planning of outbreak mitigation.

While reports on avian influenza focus mainly on the US, its implications are highly relevant to Sarawak and Southeast Asia, given the region's poultry industry and migratory bird pathways. Strengthening surveillance, biosecurity, and cross-border collaboration is essential to prevent local spillover. Incorporating these efforts into Sarawak's broader pandemic preparedness strategy, alongside ongoing monoclonal antibody manufacturing initiatives, can enhance regional response capabilities.

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