

Global updates on COVID-19 and other diseases

2025-R5

May 2025

Prepared by the Science Team, SIDC

Edited by Prof Andrew Kiyu (Faculty of Medicine and Health Sciences, UNIMAS)

Contents

Summary	4
1.0 COVID-19 and related issues	5
1.1 The World Health Organization updates	5
1.2 Surge, Asia	5
1.2.1 Hong Kong and China	5
1.2.2 Singapore	7
1.2.3 Malaysia	7
1.2.4 Indonesia	8
1.2.5 India	9
1.2.6 The US	9
1.3 Vaccines	9
1.3.1 Novavax COVID-19 vaccine, full approval in the US	9
1.3.2 Vaccination, updates from the US	10
1.3.3 The World Health Organization and the European Medicines Agency, updates	11
1.4 New strain, NB.1.8.1	12
2.0 Tuberculosis	12
Non-invasive diagnostic methods	12
3.0 Vector-borne diseases	13
3.1 Chikungunya, update from Indian Ocean nations	13
3.2 West Nile virus, the UK	14
4.0 Rabies	15
4.1 Sarawak, Malaysia	15
4.2 The Philippines	16
4.3 Bhutan, a success story	16
5.0 African swine flu	17
5.1 Asia and the Pacific update, the Food and Agriculture Organization	17
5.2 Vaccine standard adopted, World Organisation for Animal Health update	17

Global updates on COVID-19 and other diseases

2025-R5

May 2025

6.0 Avian/zoonotic influenza.....	18
6.1 Avian influenza H5N1	18
6.1.1 The US, update	18
6.1.2 Brazil, halts exports	19
6.1.3 Cambodia, human death	19
6.2 Avian influenza H5Nx	19
The Philippines, ducks	19
6.3 H9N2 and H10N3 avian influenza	20
China, human cases	20
6.4 Vaccine for cows, update	20
6.5 World Health Organization updates	20
6.6 European CDC updates	21
6.7 World Organisation for Animal Health updates	21
6.8 Research findings	22
6.8.1 Surge in H5N1 Clade 2.3.4.4b infections among domestic cats	22
6.8.2 How H5 avian influenza adapts to infect more animals: a review	22
7.0 Other diseases/current outbreaks.....	24
7.1 Nipah virus, Kerala	24
7.2 Mpox, updates from the World Health Organization	25
7.2.1 Africa, updates	25
7.2.2 Other countries	26
7.2.2.1 Australia	26
7.2.2.2 The Philippines	27
7.2.3 Global distribution of the virus	27
7.2.4 Operational response	29
7.3 Measles.....	30
7.3.1 Morocco.....	30
7.3.2 The US, update	31
7.4 Circulating vaccine-derived poliovirus type 2, Papua New Guinea	31
7.5 Middle East Respiratory Syndrome coronavirus, Kingdom of Saudi Arabia	31
7.6 Anthrax, human cases	32
8.0 Other issues and updates	33
8.1 Fiji, disease surveillance	33
8.2 Health inequity, shortening of lives	33

Global updates on COVID-19 and other diseases

2025-R5

May 2025

8.3 World No Tobacco Day 2025	34
8.4 Pandemic Agreement, adopted	34
8.5 Pertussis (whooping cough) vaccine, Malaysia	34
Implications for Sarawak based on the views of SIDC	35
Reference	38

Summary

- WHO warns of rising COVID-19 activities in three global regions.
- The updated Novavax COVID-19 vaccine was given full approval in the US.
- The US has revised its COVID-19 vaccination policy.
- According to the WHO and ECDC, the monovalent JN.1 or KP.2 vaccine remains an appropriate COVID-19 vaccine antigen and the monovalent LP.8.1, a suitable alternative.
- Non-invasive TB diagnosis method using tongue swab is being explored.
- The chikungunya outbreak in the Indian Ocean nations continues.
- West Nile virus has been detected in mosquitoes in the UK.
- Animal rabies continues to occur in Sarawak.
- Sarawak reported its first human rabies case for 2025.
- Bhutan's success with rabies is a boost for LMICs to emulate.
- The Philippines' first outbreak of HPAI H5N9 involved ducks.
- The ASF outbreak continues to fluctuate in the Philippines
- An ASF vaccine standard has been adopted by WOAHP Members.
- The H5N1 outbreak in the US seems to be slowing down, while sporadic outbreaks continue across Europe.
- Brazil had to stop poultry exports due to H5N1.
- A boy in Cambodia died of H5N1.
- More cases of human H9N2 and H10N3 are reported from China.
- H5N1 vaccine candidate for cows shows promising early results.
- The risk of human H5N1 infections is low, but vigilance is required.
- There has been a substantial increase in HPAI H5N1 cases among cats.
- A *Nature Reviews* article highlights the ongoing threat of avian influenza to lives and the economy.
- A case of Nipah virus infection was reported in Kerala, India.
- The global mpox epidemic continues, with the outbreak in Africa continuing to spread.
- Australia confirms its first case of clade Ib MPXV.
- Morocco is slowly controlling a measles outbreak by vaccination, while the situation in the US escalates.
- The Kingdom of Saudi Arabia reported 9 cases of MERS.
- Thailand reported 5 cases of human anthrax.
- Fiji launched its Pathogen Surveillance Laboratories.
- Health inequity has been linked to a shortened lifespan.
- World No Tobacco Day calls out predatory marketing to youths.
- World Health Assembly adopts the Pandemic Agreement.
- Pertussis vaccine for pregnant mothers is available in Malaysia.

1.0 COVID-19 and related issues

1.1 The World Health Organization updates

Based on available data, global SARS-CoV-2 activity has been increasing since mid-February 2025, with the test positivity rate reaching 11% - a level not observed since July 2024. This rise is primarily observed in countries in the WHO Eastern Mediterranean, South-East Asia, and Western Pacific regions. However, reports of hospitalisation, intensive care unit (ICU) admissions and deaths are limited from these countries.¹

A shift in circulating variants was also observed; the circulation of LP.8.1 has been declining, while reporting NB.1.8.1, now a Variant Under Monitoring (VUM, refer to **Section 1.4**), is increasing, reaching 10.7% of global sequences reported as of mid-May.

Recent increases in SARS-CoV-2 activity are broadly consistent with levels observed during the same period last year; however, it still lacks a clear seasonality. The main constraint in determining this is limited surveillance for continued monitoring.

Countries are to continue applying a risk-based, integrated approach to managing COVID-19. Vaccination remains important in preventing severe disease and death from the disease, especially among people at high risk of the infection.

1.2 COVID-19 Surge, Asia

Reports of COVID-19 cases rising sharply in Hong Kong and Singapore continue to circulate. The increase in cases possibly indicates a decline in immunity against the disease. Individuals have been urged to stay updated with their COVID-19 vaccinations and boosters.²

1.2.1 Hong Kong and China

As of 28 May 2028, Hong Kong's Centre for Health Protection (CHP) continues to report an overall high level of COVID-19 cases, despite the signs of an increase slowing down from previous weeks (**Figure 1**).

Global updates on COVID-19 and other diseases

2025-R5

May 2025

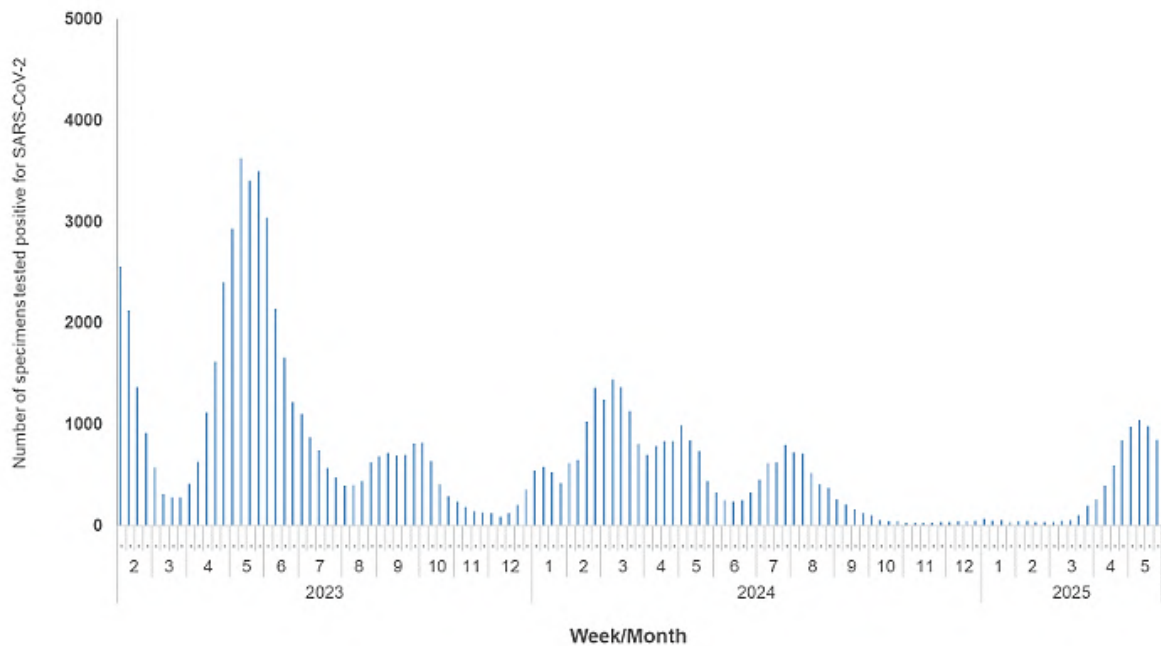


Figure 1. Weekly number of positive laboratory detections (nucleic acid tests) of the SARS-CoV-2 virus at Public Health Laboratory Services Branch, CHP, from February 2023 until May 2025. Since 30 January 2023, the cumulative number of positive nucleic acid test laboratory detections was 81,577. The graph and information were extracted from the latest report from CHP at [COVID-19 & Flu Express](#).

Outbreaks were associated with childcare centres, schools and institutions such as residential care homes (for the elderly and the disabled).³ The total number of severe COVID-19 cases, including deaths, reported between 13 April to 24 May was 143. Fatalities were associated with people in high-risk groups (older with underlying illness, and not up to date with COVID-19 vaccinations). Despite the situation, experts found that the overall impact of the virus on the community is weaker than previously.⁴

Hong Kong has had cycles of active COVID-19 over the last two years since the resumption of normalcy following the pandemic:⁴

- 7 weeks between February and March 2024, and
- 15 weeks between April and July 2023.

These periods were associated with changes in the dominant circulating strain.

As of 14 May 2025, Omicron XDV has become the most prevalent variant, comprising 76.5% of samples tested, while KP.3 accounted for 23.0%. Genetic analysis of 34 samples from severe and fatal cases showed that all belonged to the JN.1-like variants,

including XDV. However, there has not been any suggestion that the current prevalent strain will cause more severe disease.^{4,5}

The surge in cases in China has reached a peak or begun slowing down and is expected to start falling by June 2025. The National Disease Control and Prevention Association (NDCPA) has not found the dominant strain, NB.1.8.1, an offspring of the Omicron XDV subvariant, a threat. The surge of cases was observed as early as March 2025, in contrast to influenza and other respiratory infections. Approximately 168,500 COVID-19 infections, including 340 severe cases and 9 related deaths, were reported in April. COVID-19 positivity rate among all influenza-like cases at sentinel hospitals grew from 7% to 15.8% from 31 March to 28 April.⁶

1.2.2 Singapore

On 13 May 2025, Singapore's Ministry of Health (MOH) noted a spike in cases in early May 2025 and continues to monitor the situation. The estimated number of COVID-19 cases in the last week of April 2025 and early May (27 April - 3 May) rose to 14,200 compared to 11,100 cases in the previous week; hospitalisation rose from 103 to 133. However, the average intensive care unit (ICU) admissions decreased from three to two. The situation is manageable. There is no indication that the current circulating variants (LF.7 and NB.1.8, descendants of Omicron JN.1) are more transmissible. As with other endemic respiratory diseases, the wave is expected. The spike was likely caused by a combination of factors, including waning population immunity. Individuals at risk of severe disease are advised to keep updated with their COVID-19 vaccinations.⁷

1.2.3 Malaysia

Kementerian Kesihatan Malaysia (KKM) is aware of the current COVID-19 situation in neighbouring countries and stays updated with information from the ASEAN *Biological Threats Surveillance Centre*. The situation in Malaysia remains under control as levels are "below the alert threshold limit" – the average number of cases reported from 19 April until 10 May was 600.⁸

Appropriate control measures are being implemented, including monitoring the regional and global COVID-19 situation. Continuous risk assessments are conducted to ensure readiness should there be an outbreak. Individuals at higher risk of the disease are advised to keep up to date with their vaccine or booster doses. KKM continues to recommend that the public practise self-prevention measures, seek immediate treatment if feeling ill and protect the people in vulnerable groups.⁸

Between 1 January and 10 May 2025, Malaysia recorded a total of 11,272 cases nationwide, with 960 cases reported in the first week of January 2025, with a 7-day average of 187.6 cases reported on 8 January (**Figure 2**). Nationally, there has been a general downward trend in cases observed until mid-April 2025.^{8,9}

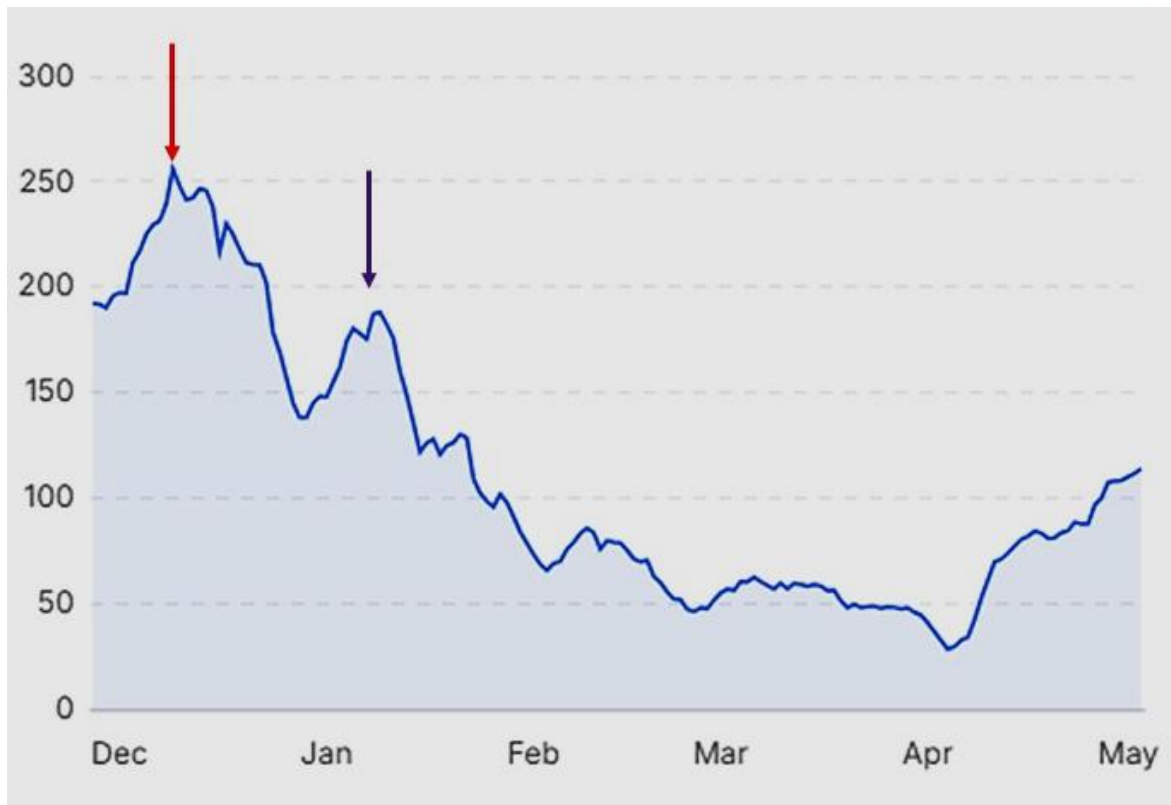


Figure 2. The 7-day average of cases reported in Malaysia from December 2024 until early May 2025 (data as of 4 May 2025). The red arrow indicates the peak of cases observed on 8 December 2024 (7-day average of 239.4), and the purple arrow indicates the peak of cases in early 2025, 9 January 2025 (7-day average of 188.3).⁹ The graph was adapted from the original from KKMNOW [COVID-19 · Malaysia | KKMNOW](#). In the latest update, based on data up to 31 May 2025, the number of confirmed cases reported to KKM has stabilised and plateaued.¹⁰

1.2.4 Indonesia

Indonesia has not experienced a significant surge in COVID-19 cases. According to reports from the Indonesian Ministry of Health (Kemenkes RI), the last peak was observed in January 2024, with a range of 400 cases reported, with an average of 10 cases daily subsequently observed. Up to April 2025, a total of 138 cases have been reported

with no deaths by Kemenkes RI.¹¹ The country is on the alert and continues to strengthen the surveillance of infectious diseases, including COVID-19, both through the sentinel system and monitoring at the country's entrances. The public is urged to be more vigilant, especially when travelling to countries experiencing the surge, and to comply with health protocols there.¹²

1.2.5 India

India is on high alert for a surge in COVID-19 cases, and hospitals and laboratories are ready. The situation in the country has not reached a point where the public needs to worry. As of 28 May 2025, India recorded 1,621 active cases; those from 6 states – Kerala, Maharashtra, Delhi, Gujarat, Tamil Nadu and Karnataka – account for >90% of the total active cases reported.^{13–15}

1.2.6 The US

The new Omicron sublineage, LB.1.8.1, has been detected in the US among travellers returning from countries where the variant is circulating. The total number of cases linked to this variant has not been updated. There were an estimated 735 deaths in May 2025; 3% of the estimated tests conducted from 26 March to 24 May were positive for COVID-19. The current dominant strain in the US, LB.1.8, has stabilised and is expected to wane over time. Another novel variant, XFC, is rising.^{16,17}

Note:

Pfizer and Moderna selected the LB.1.8 as the strain for the autumn/winter (2025/2026) COVID-19 booster.^{18,19}

1.3 Vaccines

1.3.1 Novavax COVID-19 vaccine, full approval in the US

Novavax (NVX), the protein-based COVID-19 vaccine, gained full approval from the US Food and Drug Administration (FDA) for adults ≥ 65 years old, or those 12-65 years old with at least one comorbidity, such as weakened immune systems or underlying health conditions, which puts them at risk for severe disease.^{20,21} Until recently, it only received the Emergency Use Authorisation (EUA) from the agency for individuals ≥12 years old. The vaccine was found safe and effective based on a Phase III clinical trial involving nearly 30,000 adults.²²

Novavax will be conducting additional trials for people at lower risk in the general population at the request of the FDA, including whether the vaccine might be associated with myocarditis/pericarditis or other heart conditions. This will be followed by an assessment of the benefits of continuing vaccination in older people (50-64 years) who do not have comorbidities that increase their risk of COVID-19.²³

Previously, a real-world study (SHIELD-UTAH) conducted on frontline health care workers (HCWs) and first responders (FRs) in the US who received the updated 2024-2025 NVX COVID-19 vaccine (based on the JN.1 variant) found fewer and less severe side effects than those who received the updated mRNA vaccine by Pfizer-BioNTech.^{24,25}

Additionally, interim results from a Phase II/III study conducted between September 2023 and January 2024 using the authorised prototype vaccine NVX-CoV2373 containing XBB.1.5 recombinant spike protein demonstrated significant improvements in immune response, suggesting its potential as an effective booster for adults in the US.²⁶

Note:

Pfizer and Moderna were granted full license for use for individuals ≥ 12 years old. They have also been authorised for children as young as 6 months.^{27,28}

1.3.2 Vaccination, updates from the US

The US FDA, on 20 May 2025, announced its departure from the current recommendations of seasonal COVID-19 vaccinations, aligning with an evidence-based approach^{footnote1} to COVID-19 vaccination, adopted by many high-income countries in targeting adults ≥ 65 years old and people at risk of severe illness.²⁹ This announcement was unusual as such decisions have previously been made only after both the US FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) and the Centers for Disease Control and Prevention's (CDC's) Advisory Committee on Immunization Practices (ACIP) have agreed on a policy. This announcement also counters the current CDC recommendations that everyone ≥ 6 months old receive an annual COVID-19 vaccination.³⁰

A subsequent announcement was made on 27 May 2025 by the Department of Health and Human Services (HHS) to remove healthy children and pregnant women from the CDC's COVID-19 immunisation schedule,³¹ without the involvement of the CDC's Advisory Committee for Immunization Practices (ACIP). The former traditionally votes for

¹ The evidence-based approach mentioned in the statement could not be clarified; therefore, it could not be compared with current practices in other high-income countries.

recommendations on vaccines.^{32 33} As of 28 May, the CDC website has not changed its original guidance for anyone ≥ 6 months old to get vaccinated, including pregnant individuals. Pregnancy remains on the CDC's list of underlying medical conditions that put people at risk of severe disease from a SARS-CoV-2 infection.³⁴

The FDA on 22 May 2025, recommended of monovalent JN.1 lineage vaccine for COVID-19 vaccines for the upcoming US respiratory virus season. The announcement, however, did not mention a specific sub-lineage.³⁵

1.3.3 The World Health Organization and the European Medicines Agency, updates

According to the latest update by the World Health Organization (WHO) Technical Advisory Group on COVID-19 Vaccine Composition (TAG-CO-VAC) on 15 May 2025, monovalent JN.1 or KP.2 vaccine remains an appropriate vaccine antigen, while monovalent LP.8.1 is a suitable alternative. The use of monovalent JN.1 lineage for the updated COVID-19 vaccine was recommended in April 2024 and was maintained in December 2024. Their continued use was based on the evaluation of the genetic and antigenic evolution of the current circulating Omicron lineages. Both monovalent JN.1 or KP.2 vaccines continue to stimulate broadly cross-reactive immune responses against circulating JN.1-derived variants. The LP.8.1 vaccine antigen provides similar or slightly enhanced cross-reactive antibody responses compared to monovalent JN.1 or KP.2 vaccines. This suggests that higher neutralising antibody titres could lead to improved vaccine effectiveness and longer-lasting protection.³⁶

As of May 2025, based on available data (paraphrased): currently circulating SARS-CoV-2 variants are derived from JN.1. The weekly proportion of Variant Under Monitoring (VUM) LP.8.1 among all SARS-CoV-2 sequences submitted to the Global Initiative on Sharing All Influenza Data, GISAID, continues to increase. The weekly proportion of JN.1 (Variant of Interest, VOI) is slowly increasing, largely due to increases in LF.7 and its descendent variants, while all other VUMs (KP.3, KP.3.1.1, XEC, and LB.1) are declining.

³⁶

On 17 May 2025, the European Medicines Agency (EMA) recommended that updated vaccines target the LP.8.1 variant. Vaccines targeting JN.1 and KP.2 could still be used until vaccines containing the LP.8.1 antigen are available.³⁷

1.4 New strain, NB.1.8.1

Omicron NB.1.8.1 has been designated as a variant under monitoring (VUM) by the WHO Technical Advisory Group on Virus Evolution (TAG-VE) on 23 May 2025. This subvariant clusters with other JN.1 sublineages, descending from the recombinant XDV lineage. NB.1.8.1 has been linked to the increasing cases reported in some countries in the WHO Western Pacific Region.³⁸

Preliminary data from China suggest that NB.1.8.1 has a greater ability to bind to human cells, suggesting it could be more transmissible. Current understanding of this VUM suggests that it is only slightly more immune-invasive than the dominant LP.8.1 sublineage.³⁹ Currently approved COVID-19 vaccines are expected to remain effective against symptomatic and severe NB.1.8.1 infection.³⁸

First detected on 22 January 2025, it was estimated that NB.1.8.1 made up 10.7% of sequences submitted at the end of April 2025 – a significant increase from 2.5% four weeks before (late March/early April or 31 March – 6 April). The risk is currently low. However, as the assessment is based on only one study, the confidence in the assessment is low; more studies are needed to further assess the risk of antibody escape. Current limited evidence has not found resistance to the antiviral drug nirmaltelvir, one of the components of Paxlovid.^{38,40}

Over 20 countries globally have sent NB.1.8.1 sequences for analysis, with experts monitoring the situation.^{41–43}

2.0 Tuberculosis

Non-invasive diagnostic methods

Tongue swab-based molecular testing offers a promising, less invasive approach for pulmonary tuberculosis (TB) diagnosis (or active TB) and drug resistance detection, with high specificity and moderate sensitivity, supporting its potential role in expanding TB diagnostic access and improving patient care.

A study conducted in China evaluates this method. The key findings are summarised as follows:⁴⁴

- **Diagnostic Performance:**
Tongue swabs showed moderate sensitivity but high specificity for detecting *Mycobacterium tuberculosis* (Mtb) using molecular assays such as *GeneXpert* and *Mycobacterial Growth Indicator Tube* (MGIT) culture. While sputum samples

remain more sensitive, tongue swabs detected TB in a substantial proportion of cases, especially in patients with higher bacterial loads.⁴⁵

- **Comparison with Sputum:**
Tongue swabs had lower positivity rates than sputum samples across routine clinical tests. However, they offer a useful alternative when sputum collection is difficult or not possible.⁴⁶
- **Advantages:**
Tongue swabs are easier and safer to collect, potentially allowing self-collection and better applicability in populations unable to produce sputum, such as children or people with HIV.
- **Sensitivity Variation:**
Sensitivity of tongue swabs was higher than cheek swabs and correlated with bacterial load in sputum. Sensitivity ranged widely (36%-91%) across studies, with specificity generally high (66%-100%).
- **Drug Resistance Detection:**
The study also explored molecular detection of drug resistance from tongue swabs, indicating potential for monitoring resistance without invasive sampling, though further improvement in culture-based detection is needed.

The study found that tongue swab molecular diagnostics could complement existing TB diagnostic methods, especially in resource-limited settings or where sputum collection is challenging. However, larger scale studies are needed to optimise the protocols and validate performance in diverse populations, including children and HIV-positive individuals.

3.0 Vector-borne diseases

3.1 Chikungunya, update from Indian Ocean nations

Until recently, the islands in the Indian Ocean had not had an outbreak for almost two decades.

The last outbreak in La Reunion (a French overseas island located in the midst of the Indian Ocean, 700 kilometres east of the island of Madagascar) occurred in 2005-2006 with an estimated 244,000 to 300,000 cases recorded. The current widespread transmission of the chikungunya virus disease has been documented since August 2024. It began with three locally transmitted cases and grew to >47,500 by 4 May 2025. The surge of cases was observed from early 2025, with a 100-fold increase by mid-March 2025. While the overall clinical presentations were generally mild, almost 70% of severe cases (hospitalised) involved individuals >65 years old or children <6 months old. Of

those hospitalised, >95% had at least one risk factor for severe disease (co-morbidity, age or pregnancy).⁴⁷

In Mayotte (an overseas département of France comprising the two southeasternmost islands of the Comoros archipelago and is situated in the Mozambique Channel of the western Indian Ocean, about 310 km northwest of Madagascar) ever since the first locally transmitted cases were detected in 2005-2006, more are being reported, with rising concerns about similar large outbreaks occurring. Following the first imported case identified on 5 March 2025 in the northeastern part of the island, more cases are being reported across multiple sites on the island. As of 4 May 2025, a total of 116 cases (29 imported, 57 locally acquired, 30 cases under investigation) have been reported. During the 2005-2006 outbreak, a total of 7,300 cases were reported.⁴⁷

Both islands have activated plans specified by the French comprehensive emergency response framework (*Organisation de la Réponse de Sécurité Civile, ORSEC*) to combat mosquito-borne diseases. The objectives of this framework include ensuring prevention and surveillance of arboviruses, coordinating stakeholders, and defining intervention methods.⁴⁷

3.2 West Nile virus, the UK

The UK Health Security Agency (UKHSA) reported the presence of West Nile Virus (WNV) in mosquito samples collected as part of a research study.⁴⁸ Mosquitoes feeding on infected birds may have become infected; however, they may not necessarily be part of an ongoing virus transmission. There are no known cases of locally acquired WNV in the UK. The small numbers that have been reported were associated with travel.⁴⁹

Vector-borne diseases are becoming a growing concern in the UK, with climate-sensitive mosquito-borne illnesses beginning to emerge. Factors such as global travel and trade, shifts in land use, and climate change are contributing to this trend.^{50,51} However, the probability of a WNV outbreak in the UK is low. The UK continues to assess the risks of these emerging diseases.⁵⁰

Note:

West Nile Virus (WNV) is a mosquito-borne virus is a flavivirus from the *Flaviviridae* family. It was first isolated in a woman in the West Nile District in Uganda in 1937. Other viruses from the *flavivirus* genus include those that cause dengue, Zika and yellow fever. WNV is classified within a subgroup of related viruses known as the Japanese encephalitis antigenic complex (or serocomplex). The virus's natural reservoir is birds, while bird-biting mosquitoes, *Culex pipiens*, maintain the transmission within birds.

Humans are dead-end hosts – mosquitoes cannot spread the virus from infected persons.⁵²

Bridge vectors – mosquitoes that bite both birds and mammals – can transmit WNV to humans. The virus may also be transmitted through contact with other infected animals, their blood, or other tissues. Human infections through organ transplant, blood transfusions and breast milk have been reported, though in small numbers; one reported case of transplacental (mother-to-child) WNV transmission has been reported.⁵²

The virus is known to circulate in Europe, the African continent, North America, Asia and other parts of the world. There are currently no vaccines for humans against the virus, and treatment is supportive. Diagnosis of WNV is based on several methods: the detection of antibodies against the virus (serological tests), detection of the virus (reverse transcriptase-polymerase chain, RT-PCR) and virus isolation (viral culture).⁵²

4.0 Rabies

4.1 Sarawak, Malaysia

Sarawak reported at least six (6) new animal rabies cases in May 2025,^{53,54} highlighting the ongoing presence of rabies in the state. The Sarawak government and Department of Veterinary Services (DVS) continue to strengthen measures to control the spread by capturing stray animals, enforcing pet vaccination laws (with fines up to RM2,500 for unvaccinated pets), and urging the public to seek immediate medical treatment after animal bites or scratches.⁵⁵

Sarawak recorded its first human rabies case for 2025 in May. The case involved a 13-year-old boy from Kampung Segedup, Kuching, who was bitten and scratched by a stray cat. He later developed symptoms such as fever, loss of appetite, vomiting, hallucinations, delirium, difficulty walking, and hydrophobia. He sought treatment initially at a private hospital before being referred to Sarawak General Hospital, where rabies infection was confirmed. The boy had a history of playing and feeding stray cats, and not having sought medical attention after being scratched.^{56–58}

According to reports, >122,300 cases of animal bites and scratches were recorded between 2017 and 17 May 2025. Of this, approximately 52% were from dogs (bites), 47% were from cats (bites and scratches), while the remaining were bites from other animals. An estimated 25% of the 4,912 samples taken were found positive for the rabies virus – approximately 90% were from dogs, while the remaining were from cats.⁵⁹

Animal lovers were urged to comply with the laws on stray control and not to obstruct enforcement officers, while pet owners were reminded of responsible ownership to curb the spread of the disease. While compassion for animals is important, public safety and human lives must be protected amid ongoing rabies cases in Kuching.⁶⁰

4.2 The Philippines

Two separate incidents of human rabies fatalities were reported in May 2025. The first involved a 31-year-old factory worker in Cabuyao, Laguna, who died 9 months after being bitten by a dog. He had received one dose of the anti-rabies vaccine and had not completed the series because of work concerns. The other death occurred in Midsayap, North Cotabato. This case prompted local authorities to conduct contact tracing and urge exposed individuals to get vaccinated.⁶¹

On 25 May 2025, a 25-year-old woman from Bacolod City died of rabies two months after being bitten by a dog. She did not seek medical attention or vaccination, which underscores the severe risks of untreated rabies. Cases in the Philippines highlight the importance of promptly seeking treatment after animal bites. The disease is fatal once symptoms appear. However, it is preventable with timely intervention.^{62,63}

4.3 Bhutan, a success story

Bhutan shared its success story with rabies recently in the *World Organisation for Animal Health* newsletter.⁶⁴ A summary of the article is as follows.

Rabies was prevalent in the country in the 1970s and 1980s. Efforts to control the disease focused on the culling of dogs. However, it was not successful as it garnered public opposition, as it went against the spiritual and cultural beliefs of Bhutan. The nation then concentrated on vaccination campaigns that were supported by extensive awareness and advocacy programmes, along with dog population management.

This combined effort resulted in strong public support and became the backbone of the nation's "most ambitious health initiative" launched in 2021: the Nationwide Dog Population Management and Rabies Control Programme.⁶⁵ The programme aimed to achieve mass anti-rabies vaccination as well as 100% sterilisation of free-roaming dogs. This initiative was a whole-of-nation approach in which Bhutan's well-established Veterinary Service secured financial resources, engaged communities, and worked with 12,000 volunteers.

By October 2023, the country, which has a sizeable dog population of >100,000 compared to approximately 786,400 humans^{footnote2}, had successfully sterilised all free-roaming dogs and achieved 90% rabies dog-vaccination coverage across the population.⁶⁶ The country is now almost free of rabies. It continues to work hard to sustain this achievement, placing control in the hands of the local governments and looking beyond its own borders to achieve rabies-free status by 2030. Challenges remain, among which is the transborder nature of the disease – Bhutan faces occasional outbreaks due to cross-border incursions. To mitigate this issue, the nation piloted a cross-border vaccination program in collaboration with neighbouring countries in 2024.

5.0 African swine fever

5.1 Asia and the Pacific update, the Food and Agriculture Organization

According to the Food and Agriculture Organization (FAO) African swine fever (ASF) situation update in Asia and the Pacific on 15 May 2025, the Philippines continues to report cases of ASF across multiple districts (or barangays), mainly in the Visayas and Samar. These outbreaks involve both domestic pigs and wild boars. Since the Department of Agriculture (DA) confirmed the first outbreak in July 2019, ASF outbreaks have occurred in 76 of its 82 provinces. As of 25 April 2025, 47 barangays in 23 municipalities of 7 provinces reported having active ASF cases, 30 (64%) of which were in Bohol in Region VII (Central Visayas). Local Government Units (LGUs) in Bohol have been implementing control measures, including movement control and biosecurity. This is to protect the livelihoods of producers and help stabilise the pork industry, and to ensure food security. According to the Provincial Information & Media Office, the situation is improving.^{67,68}

5.2 Vaccine standard adopted, World Organisation for Animal Health update

Effective disease management relies on a combination of biosecurity measures, import regulations, and animal movement control, with vaccines serving as a supportive intervention. The World Organisation for Animal Health (WOAH) encourages innovation in vaccine development. However, these vaccines must be of high quality, effective and safe; able to protect the animals. Poor or substandard vaccines may not only not confer

² According to the WHO's data on Bhutan 2023 population statistics.

sufficient protective coverage, but they could also result in the spread of the disease or create new strains of ASF that could spread easily and escape detection.⁶⁹

An ASF vaccine standard was adopted at WOA's 92nd General Session, held from 25 to 29 May 2025. The standard aims to provide Members and manufacturers with minimum standards for safe and effective vaccines. It highlights the need for vaccines to have the following characteristics to reduce production losses due to the disease:⁶⁹

- effective in reducing the severity of the disease,
- limiting transmission of the virus,
- providing immunity to the animal, and
- match the circulating ASF genotype in the region of vaccination.

They must be proven safe before use, do not cause lasting or severe clinical signs, harm the environment or contain wild ASF viruses or other harmful agents. Matching the vaccine to the current strain circulating locally or regionally ensures effectiveness and will limit the risk of two different strains combining to form a new, harder to manage strain.

6.0 Avian/zoonotic influenza

6.1 Avian influenza H5N1

6.1.1 The US, update

The highly pathogenic avian influenza (HPAI)^{footnote3} H5N1 outbreak in the US has shown signs of subsiding, with human infections markedly decreasing over the past several months. There were about 70 cases reported over the past 14 months, mostly mild and among poultry and dairy workers.⁷⁰ This drop likely reflects seasonal patterns and reduced testing, especially in states like California.⁷¹ Experts warn mild cases may be underreported due to decreased surveillance and immigration concerns.⁷⁰

Animal infections persist, including over 120 domestic cats infected via contaminated poultry or milk. Most cases have been identified in cats that died from the infection. However, less is understood about milder cases, the potential for feline recovery from bird flu, or the risk of the virus spreading to humans. The CDC considers the public health risk low, though it advises caution for those in close contact with birds or livestock.⁷¹

³ HPAI and HPAIV are used synonymously, as with LPAI and LPAIV.

The US cancelled a USD590 million Moderna bird flu vaccine contract amid low case numbers, reflecting shifting priorities amid the current low incidence.⁷² However, research about avian influenza continues. A CDC-funded Texas A&M project aims to assess farmworker exposure, with findings expected by July 2025.⁷⁰ Experts continue to stress the continued surveillance and protection of at-risk groups as migratory bird activity resumes.⁷¹

6.1.2 Brazil, halts exports

Brazil has suspended all poultry exports to the European Union (EU) after confirming an H5N1 outbreak on a commercial farm in Rio Grande do Sul, leading the country to lose its 'HPAI-free' status required for EU imports.⁷³ This halt affects a key poultry supplier; Brazil accounted for 32% of the EU's poultry imports in 2024, though only 4.4% of Brazil's total poultry exports went to the EU last year. As a containment measure, Brazilian authorities destroyed about 1.7 million eggs in the affected region. The European Commission is monitoring the situation and remains in contact with Brazilian officials to ensure compliance with export regulations.⁷⁴

6.1.3 Cambodia, human death

Cambodia has reported its fourth human death from the H5N1 avian influenza virus recently, doubling the number reported in 2024.^{75,76} The latest victim was an 11-year-old boy. Ducks and chickens were getting sick or dying near the child's house a week before he became ill. In January 2025, a 28-year-old man died; he raised poultry at home. Two children, aged two and three years old, died in February and March this year.^{76,77}

According to the WHO, 43 people died from the H5N1 avian influenza virus in Cambodia between 2003 and 2024.⁷⁸

6.2 Avian influenza H5Nx

The Philippines, ducks

An outbreak of HPAI H5N9 virus in Luzon was confirmed on 30 April 2025. The ongoing outbreak, which started on 14 April 2025, has affected a population of ducks grazing in a rice field situated within Camaligan, Camarines Sur, where they may have encountered wild birds carrying the virus. Of the 110 birds affected, 84 died and 26 were culled.⁷⁹

6.3 H9N2 and H10N3 avian influenza

China, human cases

From 16 to 22 May 2025, 8 additional human cases of H9N2 avian influenza and another human case of H10N3 avian influenza were reported from China,⁷⁸ bringing the current cumulative number of human H9N2 cases in China in 2025 to 18.

The individuals infected with H9N2 were from four different provinces, namely, Hunan, Guizhou, Yunnan and Chongqing, with illness onset dates ranging from 1 April to 19 April 2025. Seven of these cases were children ≤ 7 years old, and one person was 67 years old. While it was not disclosed how these cases were exposed to the virus, infections typically involve contact with virus-contaminated poultry or poultry products. Most human cases of H9N2 are mild, though some can be severe or fatal.

The H10N3 case is the first in 2025; the last was reported in December 2024. A 68-year-old from Guangxi province developed symptoms on 13 April 2025. Her history of exposure was not reported. There are now a total of 5 recorded human cases of H10N3 infections – most were severe.

No new cases of H9N2 and H10N3 were reported from 23 to 30 May 2025.⁷⁶

6.4 Vaccine for cows, update

A newly developed mRNA vaccine for cows has successfully passed early-stage trials, showing promise in preventing avian influenza infections in cattle and thereby reducing the risk of animal-to-human transmission.⁸⁰ This vaccine represents a significant advancement in controlling the spread of bird flu among livestock, which is crucial since infected cows can serve as a bridge for the virus to jump to humans. By protecting cattle, the vaccine helps minimise outbreaks in animals and lowers the potential for spillover infections, enhancing overall public health safety. Further studies and larger trials are underway to confirm its efficacy and safety before wider deployment.

6.5 World Health Organization updates

The World Health Organization (WHO) Western Pacific Regional Office continues to monitor avian influenza activity, emphasising that human infections with avian influenza A(HxNy) viruses remain rare and are primarily linked to direct contact with infected poultry or contaminated environments.⁸¹

The WHO noted that while these viruses do not currently spread easily between humans, their ongoing circulation in poultry is concerning due to the risk of severe illness and the

potential for the viruses to mutate and become more transmissible. Member States in the Western Pacific Region are required to promptly report any human cases through the International Health Regulations (IHR 2005) system. The WHO then shares these cases via its weekly situation summaries to track and assess the public health risk. As of May 2025, no significant increase in human cases or evidence of sustained human-to-human transmission has been reported in the region.⁸¹

6.6 European CDC updates

Europe experienced a significant decline in HPAI outbreaks, with HPAI A(H5N1) clade 2.3.4.4b continuing to be the main strain detected in both wild and domestic birds. As the region transitioned towards summer, fewer new cases were reported in commercial poultry and wild birds.⁸² However, isolated outbreaks persisted, including notable incidents in the Czech Republic and Bulgaria, where large numbers of birds died or were culled to control the spread. Overall, 17 countries reported 249 outbreaks in commercial flocks, with Hungary, Poland, and Italy most affected, while wild bird cases remained widespread across 30 countries.⁸³ Despite the reduced outbreak risk, European health authorities, including the ECDC, continue to emphasise vigilant surveillance and preparedness due to the ongoing threat and potential for zoonotic transmission.⁸² Discussions about Europe's readiness for a possible human infection highlight the need for enhanced monitoring, vaccine development, and contingency planning to mitigate future risks.⁸⁴

6.7 World Organisation for Animal Health updates

The World Organisation for Animal Health (WOAH) released its first Global Animal Health Report, highlighting a sharp increase in avian influenza outbreaks, especially among mammals, with 1,022 outbreaks reported in 2024 compared to 459 in 2023.^{85,86} The report underscores that while the risk to humans remains low, the expanding host range, including dairy cattle and domestic pets, raises concerns about the virus adapting for mammal-to-mammal or even human transmission.^{85,86}

WOAH stresses the urgent need for strengthened surveillance, enhanced biosecurity, and wider access to effective animal vaccines to control avian influenza and prevent zoonotic spillover.⁸⁶ The report also notes a positive trend: while the global antimicrobial use in animals dropped by 5% between 2020 and 2022, it calls for continued efforts to reduce antimicrobial resistance and promote responsible antibiotic use.^{85,86} WOA emphasizes that investing in animal health, especially through vaccination and

international cooperation, is essential for safeguarding both animal and public health worldwide.⁸⁶

The full report can be found at [The State of the World's Animal Health 2025 - WOA - World Organisation for Animal Health](#).

6.8 Research findings

6.8.1 Surge in H5N1 Clade 2.3.4.4b infections among domestic cats

A May 2025 systematic review published in *Open Forum Infectious Diseases* analysed 607 avian influenza virus (AIV) infections across 12 feline species in 18 countries from 2004 to 2024, revealing a 71.3% fatality rate among polymerase chain reaction confirmed (PCR-confirmed) cases.^{87,88} The study identified a dramatic increase in domestic cat infections coinciding with the global spread of H5N1 clade 2.3.4.4b, which accounted for 33.8% of highly pathogenic avian influenza (HPAI) H5N1 cases and 89.6% of clade-specific fatalities.⁸⁸ Notably, 135 domestic cats infected with this clade were reported in Finland, France, Poland, the US., Italy, Peru, and South Korea, with outbreaks intensifying in 2023–2024 alongside mammalian adaptations in dairy cattle and wild birds.⁸⁷

The review highlighted unconventional infection routes beyond traditional bird-to-cat predation, including two indoor-only (Colorado, the US) cats with no known exposure to infected animals.⁸⁷ Contaminated raw milk from H5N1-positive dairy cattle emerged as a vector, with feline cases linked to consumption of colostrum containing high viral loads.^{87,88} Neurological and ocular manifestations – such as encephalitis, blindness, and chorioretinitis – complicated clinical diagnoses, often leading to misidentification as rabies or other neurotropic diseases.⁸⁷ Subclinical infections further obscure surveillance efforts, as asymptomatic carriers evade detection until fatal outcomes occur.⁸⁸

6.8.2 How H5 avian influenza adapts to infect more animals: a review

The A/Goose/Guangdong/1/1996 (Gs/Gd) lineage was first detected in 1996. It was responsible for the 1997 outbreak in humans in Hong Kong, which resulted in several fatalities. These viruses have caused widespread outbreaks in domestic and wild birds globally, leading to significant morbidity, mortality, and economic losses, as well as sporadic infections in humans (**Figure 3**).⁸⁹

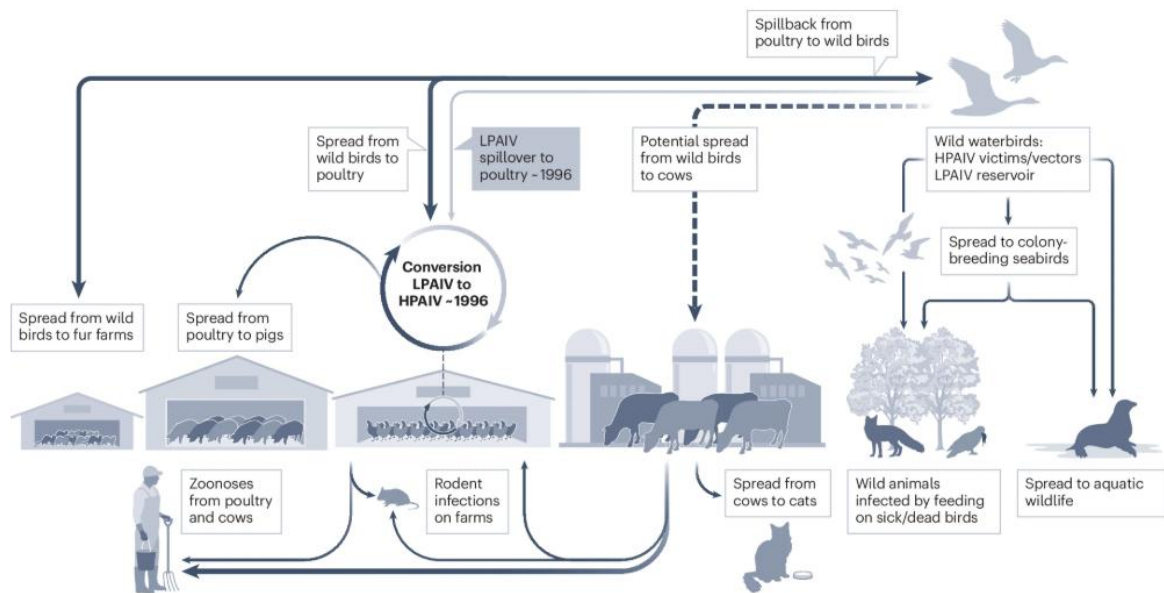


Figure 3. Evolution, spread and impact of influenza A/Goose/Guangdong/1/1996 virus lineage across species. Wild waterfowl such as ducks, geese and gulls serve as a reservoir of low pathogenic avian influenza viruses (LPAIVs), generally with relatively minor consequences to wild and domestic animals. HPAIVs emerge in poultry and cause substantial damage to poultry. Uniquely, viruses of the A/Goose/Guangdong/1/1996 (Gs/Gd) lineage spilled back to wild birds, caused mass mortalities in wild birds (specifically waterfowl, seabirds and raptors) and subsequently wild mammals (specifically marine mammals and terrestrial carnivores). They affected numerous fur farms and caused massive outbreaks in dairy farms in the US. The Gs/Gd lineage viruses of domestic animals frequently spilled over to various other domestic animals and humans. The dark grey and light grey arrows show the direction of spread of LPAIVs and Gs/Gd lineage viruses, respectively, with solid arrows when evidence for spread is strong and dashed arrows when evidence is equivocal. The diagram and its description were extracted from [Evolution, spread and impact of highly pathogenic H5 avian influenza A viruses | Nature Reviews Microbiology](#).

An article published in *Nature Reviews* recently provides a comprehensive overview of the HPAI H5 avian influenza viruses, from their emergence to their current global impact. It highlights their rapid evolution, wide host range, geographic spread, and ongoing threat and challenges they pose to global animal and public health.⁹⁰

Key points from the article include:

- **Evolution and Diversification:** Since their emergence, Gs/Gd lineage H5 viruses have continuously circulated in poultry, diversifying into numerous genetic and antigenic subclades. Their genetic diversity has been further enhanced by reassortment with low-pathogenic avian influenza (LPAI) viruses from wild birds, leading to a complex and evolving viral population.
- **Global Spread:** These viruses have spread extensively across continents, posing a major threat to wildlife, domestic animals, and humans. Notably, recent epidemic waves in Europe (2020–2022) involved unusually large outbreaks affecting wild birds, poultry, and even mammals such as wild carnivores and dairy cows.⁹¹
- **Changing Epidemiology:** The virus has shown a remarkable ability to infect a growing variety of host species, including mammals, raising concerns about zoonotic and pandemic potential. Recent outbreaks have included unusual mass mortality events in wild birds during summer months and spillovers into mammals, indicating shifts in transmission dynamics and host range.
- **Genetic Diversity and Reassortment:** There is high genetic diversity of circulating H5 viruses, with frequent reassortment events creating multiple genotypes. For example, the clade 2.3.4.4b viruses have undergone significant genetic changes, including the emergence of genotypes adapted to new ecological niches such as gulls, facilitating endemic circulation in wild bird populations in Europe.
- **Origins and Spread Patterns:** Phylogeographic analyses suggest that Central Asia and the Middle East have been key sources for the virus's spread to other regions, including Europe and East Asia. Wild bird migration plays a critical role in long distance dissemination of the virus.
- **Impact and Risks:** The virus causes severe economic losses in poultry industries worldwide and threatens endangered wild bird species. The zoonotic risk to humans persists, with nearly a thousand human infections reported up to mid-2023.^{footnote4} The article emphasises the importance of One Health approaches to mitigate risks and prepare for potential (pre-)pandemic scenarios.

7.0 Other diseases/current outbreaks

7.1 Nipah virus, Kerala

Officials at the Kerala State Health confirmed the detection of Nipah virus (NiV) on 8 May 2025. The infection was found in a 42-year-old woman from the Malappuram district.⁹³ A

⁴ As of 22 April 2025, there WHO has recorded 1,443 human H5N1 cases, 470 which resulted in deaths.⁹²

high-level meeting was held immediately after the confirmation, and the authorities swiftly took action to tackle the outbreak. Some of the notable responses include:

- A special order to declare a three-kilometre radius of the infected individual's home as a containment zone.
- Administering monoclonal antibodies to treat the patient. The state invested heavily in antibody and antiviral treatment after experiencing repeated NiV outbreaks. The investment reduced mortality from over 90% (2018) to 33% (2023).⁹⁴
- Contact tracing. The task force quickly identified the contact list to track down potential infections. As of 12 May 2025, no positive cases were detected among the 112 contacts.
- As part of the fever surveillance effort, trained health workers visited 3,868 homes. Officials have also been instructed to take note of any animal deaths in the area.

According to the latest report on 31 May 2025, the patient's condition has stabilised and is recovering steadily following the antibody and antiviral treatment. She is technically free from the NiV as the last two serum samples have tested negative.⁹⁵

No new case of Nipah has been reported within the first 21-day incubation period. Though the outbreak is ending, the Kerala Health Department has opted to continue operating the call centre and other infrastructural arrangements set up to contain the disease until further notice.

7.2 Mpox, updates from the World Health Organization

7.2.1 Africa, updates

There has been a change in the epidemiology of mpox in Africa.

According to the latest update from the WHO and the Africa Centres for Disease Control and Prevention (Africa CDC) published on 29 May 2025, 10 countries in Africa have reported community transmission of mpox due to clade Ib monkeypox virus (MPXV) in the past 6 weeks.^{96,97}

The Democratic Republic of the Congo (DRC) continues to be the epicentre of the outbreak in Africa. Though it continues to report the highest number of confirmed cases in 2025, the trend for new cases reported has stabilised and is declining. Reporting and information gaps continue to occur, likely due to a reduction in testing and confirmation capacity.^{footnote5} Clades Ia and Ib MPXV continue to circulate in the country.^{98,97}

⁵ Civil unrest leading to displacement and insecurity, and funding cuts.

The large outbreak continues in Uganda, though with a downward trend in confirmed cases in recent weeks. Approximately 200 cases are being confirmed weekly. Clade Ib MPXV continues to circulate.⁹⁷

Skyrocketing cases from Sierra Leone have added to the outbreak in Africa. First reported in January 2025, cases escalated by March, and by the third week of May 2025, Sierra Leone had reported 74% of Africa's total confirmed cases. Sequencing analysis revealed a clade IIb outbreak.⁹⁷ Over 600 new confirmed cases were reported in the most recent weeks, highlighting the rising transmission in the country that outpaces the country's health services' capacity to cope. Young adults from urban settings concentrated in urban areas, particularly in and around the capital, Freetown, are mainly affected in the current outbreak. High population density and tourism are driving the spread. Sex workers were found not to play a prominent role in the spread of mpox in the country, while cases involving students and drivers have been reported. Clade IIb MPXV, previously linked to the outbreak in the country, is the main circulating strain.^{96,99,97}

Togo's Health Ministry declared an mpox outbreak in mid-May 2025 with three confirmed cases, raising concerns about further spread of the disease in West Africa. None of the cases in Togo had a travel history to other outbreak countries. However, one had recently been to Benin, which neighbours Togo and has not reported any confirmed cases. Sequencing revealed clade IIb MPXV, the same virus type circulating in Sierra Leone and Liberia.^{97,99}

Ethiopia confirmed its first mpox cases involving a 21-day-old infant and its parents, who are from a region bordering Kenya and Somalia. Kenya has had clade Ib MPXV circulating. Contact tracing is underway.⁹⁷

7.2.2 Other countries

7.2.2.1 Australia

Australia confirmed its first case of clade Ib MPXV, linked to travel to Thailand, where he reported having high-risk sexual exposure, which likely led to the infection. Thailand has only reported travel-related cases of mpox due to clade Ib MPXV so far. This suggests potential undetected clade Ib MPXV transmission in high-risk sexual networks in Thailand. Before this update, Australia's mpox cases were from clade IIb MPVX. The risk of community transmission from this case is low. Authorities continue to monitor the situation.^{96,100}

7.2.2.2 The Philippines

The Iloilo City Health Office (CHO) confirmed its first case of mpox on 27 May 2025, with four additional suspected cases currently under close observation. All 5 are in isolation and stable condition. The confirmed case had no recent travel history, and there is currently no evidence of widespread community transmission; investigations are ongoing. Authorities are expected to release official advisories about mpox (prevention and symptoms).¹⁰¹

7.2.3 Global distribution of the virus

The following was extracted from the WHO's latest report on the multi-country outbreak of mpox.⁹⁶

Clade Ia MPXV is mainly found in the DRC in locations where it is endemic. It is now increasingly found elsewhere in previously unaffected areas in the country, and neighbouring states, with different epidemiological patterns; in the DRC and the Central African Republic (CAR), reports a higher proportion of cases involving children, and in the Republic of Congo, most cases are among adults. This variant continues to emerge in human populations through zoonotic exposure, leading to limited secondary human-to-human transmission. However, there is emerging evidence from the DRC of increasing sustained human-to-human transmission via sexual contact. This lineage of clade Ia MPXV has been detected in mpox cases in Ireland and China. Evidence of clade Ia MPXV human-to-human transmission has not yet been documented in CAR or the Republic of Congo.

Clade Ib MPXV is currently spreading predominantly in the DRC and its neighbouring countries. When reported in other countries, cases are primarily associated with international travel (**Table 1**). To date, no human has been confirmed to have been infected with clade Ib MPXV from animals.

Outbreaks of clade IIa in human populations are of concern, as this clade has previously been detected or linked to animals. In countries where clade IIa MPXV is circulating, cases have been reported in adults and children, with many lacking a known epidemiological link. While the modes of transmission of clade IIa MPXV are not fully understood, preliminary indications from genomic sequencing analysis suggest the occurrence of repeated zoonotic spillover events followed by limited secondary human-to-human transmission. While sexual contact transmission for this strain has not been documented, all forms of close contact likely contribute to its spread, as with other MPXV strains.

Table 1. A total of 34 cases of clade Ib MPXV have been reported from 7 countries from January 2024 until 21 May 2025. The information was extracted from [multi-country-outbreak-of-mpox--external-situation-report--53.pdf](#)

Country	Number of cases
The UK	12
Germany	10
Thailand	5
France	3
United Arab Emirates (UAE)	2
Switzerland	1
Australia	1
<i>Total</i>	<i>34</i>

Clade IIb MPXV outbreak in Africa and the rest of the world is a continuation of the multi-country outbreak which began in 2022. Most regions report the circulation of clade IIb lineage B.1, while lineage A.1 continues to circulate in Nigeria, neighbouring countries, and some countries in the WHO Eastern Mediterranean Region. Where low levels of transmission are reported (regions outside of Africa), it continues to be men who have sex with men (MSM), primarily exposed through sexual contact. When others have been affected, such as women and children, it has not led to sustained transmission. In western Africa, cases are reported in different age groups, occurring in both males and females, highlighting potentially different transmission dynamics which are currently not fully understood.

As of 18 May 2025, the distribution of reported MPXV is summarised in **Figure 4**.

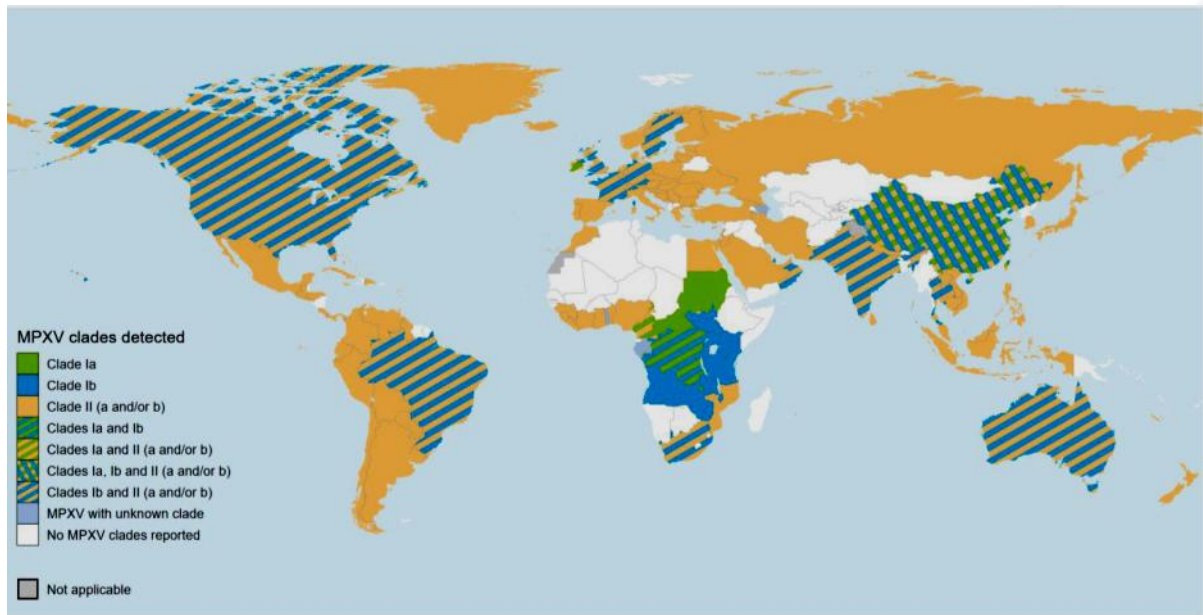


Figure 4. MPXV clades detected globally from 1 January 2022 to 18 May 2024. The map was obtained and modified from [multi-country-outbreak-of-mpox--external-situation-report--53.pdf](#).

7.2.4 Operational response

The updated WHO Global Strategic Preparedness and Response Plan (SPRP),¹⁰² which aligns with the WHO's health emergency prevention, preparedness, response and resilience (HEPR) framework¹⁰³ for mpox focuses on strengthening 5 core components (5Cs):

1. Emergency coordination: Efficient coordination for timely crisis response.
2. Collaborative surveillance: Real-time data integration for early threat detection.
3. Community protection: Engaging communities in prevention and resilience-building measures.
4. Safe and scalable care: Equipping health systems to provide essential care with scalable capacity.
5. Access to and delivery of countermeasures: Ensuring equitable distribution of medical countermeasures.

Details of the response can be found at [Strategic framework for enhancing prevention and control of mpox- 2024-2027](#) and [Mpox global strategic preparedness and response plan – April 2025](#).

7.3 Measles

7.3.1 Morocco

Morocco has been experiencing an ongoing outbreak of measles since 2023, when the first cases were detected in central Morocco. Until 13 April 2025, >25,000 suspected cases were reported in the country, of which 13,706 were laboratory-confirmed; 184 people died.

A peak in incidence rate was observed by late January 2025, and a declining trend has been observed since then. Most of the cases (68%) were reported among people <18 years old, and 49% of all cases were among unvaccinated individuals. Genomic characterisation of samples from the 2024-2025 outbreak revealed a predominance of genotype B3, common in Africa and associated with outbreaks globally. A case linked to the D8 genotype was found, likely from importation, with no evidence of sustained local transmission.

Morocco has reported >95% coverage of the 2-dose measles-containing vaccine (MCV2) – a threshold required to achieve the elimination goal. However, this trend was not achieved in the last three years.

The country used a multipronged approach to mitigate the situation:

- **Leadership and coordination:**
The activation of various entities associated with the national public health emergency management system. This is supported by regional public health emergency operation centres and rapid epidemiological intervention teams across the country.
- **Surveillance and case management:**
Established and implemented a system for early case detection and monitoring, facilitating timely response and continuous epidemiological tracking, in parallel with a laboratory confirmation plan. It also included updated protocols for case management.
- **Vaccination:**
Nationwide catch-up vaccination was held in collaboration with various ministries (Ministry of Interior, Ministry of National Education, Preschool and Sports, and the Ministry of Islamic Affairs) to target children <6 years old, followed by youths <18 years old and adults. As of 25 April 2025, the immunisation status verification rate reached 98.45% for children. The programme also included vaccination against other vaccine-preventable diseases (polio, diphtheria, tetanus and pertussis), with an achieved rate of 58-74%.
- **Risk communication and community engagement:**

The Ministry of Health and Social Protection (MOHSP) developed a communication strategy, using various types of platforms and media, and engaging local leaders and actors, to support and enhance risk communication and community engagement (RCCE). The aim was to raise public awareness and increase vaccination uptake.

7.3.2 The US, update

The situation continues to escalate in the US. As of 29 May 2025, there have been 1,088 confirmed cases reported. There have been 14 outbreaks reported in 2025, and 90% of confirmed cases (977 of 1,088) are outbreak-associated; the majority were linked to a large outbreak in Texas (738 cases). Other confirmed cases were linked to instances of community transmission or travel. The large majority of these cases (96%) are unvaccinated or have unknown vaccination status. Those affected are children <5 years old (30%) and individuals 5 to 19 years old (32%).¹⁰⁴

7.4 Circulating vaccine-derived poliovirus type 2, Papua New Guinea

On 9 May 2025, the WHO was notified of the detection of circulating vaccine-derived poliovirus type 2 (cVDPV2) from stool specimens of two healthy children from Morobe province, Papua New Guinea (PNG). The detection of wild poliovirus (WPV) or vaccine-derived poliovirus (VDPV) in healthy people is considered a serious public health event. Coupled with suboptimal routine vaccine coverage, the risk of the potential spread of the virus is high. Countries with frequent travel and connections to polio-affected areas are advised to strengthen acute flaccid paralysis (AFP) and environmental surveillance for the disease while maintaining a high level of immunisation coverage to quickly detect and respond to virus importation and prevent further spread by closing immunity gaps.

105

7.5 Middle East Respiratory Syndrome coronavirus, Kingdom of Saudi Arabia

Nine cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection, including two deaths, have been reported by the Ministry of Health (MoH) of the Kingdom of Saudi Arabia (KSA) between 1 March and 21 April 2025. A cluster of 7 cases was identified in Riyadh. It consisted of 6 health and care workers who acquired the infection from a single infected patient. They were identified through contact tracing. Of the 6, two had non-specific mild symptoms while the rest were asymptomatic. The overall risk of the infection remains moderate at both global and regional levels. The MERS-CoV

infection continues to pose a threat in nations where the virus circulates in dromedary camels and spills over into the human population.¹⁰⁶

Epidemiological data showed a decline in reported cases since the beginning of the COVID-19 pandemic. Initially, this was likely because of the prioritisation of COVID-19 surveillance. However, noticeable improvement in controlling the spread of MERS-CoV was observed when the MoH emulated COVID-19 testing and surveillance, and measures that reduced SARS-CoV-2 virus transmission.¹⁰⁶

7.6 Anthrax, human cases

The Thailand International Health Regulations National Focal Point (IHR NFP) reported four cutaneous anthrax cases to the WHO between 1 and 4 May 2025; the fifth was detected on 28 May 2025. All five cases were found in the Mukdahan Province and were epidemiologically linked to cattle slaughter. One death was reported due to disease complications – the first since 1994. Three other instances confirmed in early May 2025 underwent a 10-day post-exposure prophylactic course of antibiotics (levofloxacin and doxycycline) and have been discharged from the hospital. The clinical status of the latest case remains unknown.¹⁰⁷

Anthrax is a zoonotic disease caused by the bacteria *Bacillus anthracis*. The spore-forming bacteria predominantly affect grazing herbivores. The spores may remain infectious in soil and animal tissues for years. Anthrax manifests in different forms in humans based on the type of exposure, namely cutaneous, gastrointestinal, inhalation, and injection anthrax. The most common form, cutaneous anthrax, results from direct contact with infected animals, occurring in approximately 95% of cases. Direct person-to-person transmission is rare.¹⁰⁸

The WHO assessed a low risk of international spread following the swift response by the Thai authorities, including environmental disinfection, enhanced risk screening, and the restriction of animal movement. The risk for human health is also low, given the rapid public health measures implemented and heightened anthrax surveillance in the neighbouring countries such as Malaysia and the Lao People's Democratic Republic.¹⁰⁷

While the WHO does not advise any restrictions on travel or trade, the present circumstances could result in the enforcement of animal trade regulations. Some neighbouring countries have already introduced restrictions on the importation of animals and animal products from Thailand.

Note:

The pathogen, *B. anthracis*, produces toxins which determine its virulence. Symptoms of the infection do not appear immediately, making diagnosis difficult. When the bacteria

is inhaled, the infections are usually fatal. Due to the bacteria's characteristics, it has been recognised as a potential pathogen that could be used as a biological weapon.¹⁰⁸

Anthrax is endemic in several countries in the Southeast Asia Region. The main risk factor for anthrax is occupational exposure. Those at risk include workers involved in industrial processing of hides, wool, hair or bone products, veterinarians, agricultural and wildlife workers in areas with a high incidence of anthrax in animals and laboratory personnel.¹⁰⁷

Better control of the disease in animals will help prevent anthrax in humans. Following a suspected outbreak in livestock, affected herds and flocks must be quarantined. In addition, proper disposal of carcasses, environmental decontamination, and vaccination of unexposed animals are necessary control measures. At-risk individuals should be educated about anthrax transmission, clinical manifestations of the disease, and hygiene practices. They should immediately seek medical advice in case of any illness or suspected symptoms of disease.

8.0 Other issues and updates

8.1 Fiji, disease surveillance

On 7 May 2025, Fiji launched its Pathogen Genomics Laboratory, based at the Fiji Centre for Disease Control. The state-of-the-art facility marks a historic milestone in the country's ability to rapidly detect, characterise, and respond to infectious disease threats - from antimicrobial-resistant (AMR) bacteria to viral diseases such as influenza, COVID-19 and mpox. The launch emphasises the importance of building up local public health capacities that will save time, cost and lives.¹⁰⁹

8.2 Health inequity, shortening of lives

The WHO World report on social determinants of health equity, launched on 6 May 2025, confirms that the health and well-being of an individual depend a lot more than on our genes and access to health care. Non-medical root causes that shape most of our health and well-being must be addressed to reduce these avoidable and unjust health gaps.

The [World Report on Social Determinants of Health Equity](#) has more about it.

8.3 World No Tobacco Day 2025

The WHO and global partners celebrate World No Tobacco Day every year on 31 May. This year's theme, "*Unmasking the Appeal: Exposing Industry Tactics on Tobacco and Nicotine Products*", exposes how the tobacco and nicotine industries use manipulative tactics,¹¹⁰ such as appealing product designs, attractive flavours, and glamourised marketing, to target young people and mask the dangers of their highly addictive products.¹¹¹

Globally, an estimated 37 million children aged 13-15 years use tobacco. Specifically, an estimated 6 million adolescents in the Western Pacific Region used tobacco in 2022. These numbers underscore the urgent need to protect the youth from these harmful products and deceptive industry tactics. So far, only 6 countries have comprehensive bans on tobacco advertising, promotion and sponsorship. Flavours, associated with e-cigarettes, are known gateway for youth initiation, and remain largely unregulated.^{111,112}

To know more about World No Tobacco Day and what can be done about keeping our youth and our future safe from its harms, visit [World No Tobacco Day 2025](#).

8.4 Pandemic Agreement, adopted

The WHO member states have formally adopted the Pandemic Agreement¹¹³ on 20 May 2025 at the 78th World Health Assembly (WHA) held in Geneva after three years of intensive negotiations. The agreement boosts global collaboration to ensure a stronger, more equitable response to future pandemics built on the International Health Regulations (IHR).¹¹⁴

However, it is still not yet open for signatures, as member states must continue to deliberate over sections involving pathogen access and benefit sharing (PABS) – a task not without problems and can be difficult to reach.^{115,116} These provisions must be finalised before the next WHA. As disease outbreaks normally emerge from, or are linked to, low- or middle-income countries (LMICs), the PABS system aims to secure pathogen samples for research and development in exchange for prioritising LMICs' access to vaccines, therapeutics and diagnostics (VTD).¹¹⁴

8.5 Pertussis (whooping cough) vaccine, Malaysia

The Tetanus-Diphtheria-Pertussis (TDaP) vaccine will be available for free to all pregnant women in Malaysia. They can opt to get the vaccine, available at all KKM facilities providing health services for mothers and their children, beginning 26 May 2025.¹¹⁷

Pertussis, or whooping cough, is a highly contagious yet preventable bacterial disease caused by *Bordetella pertussis*. Babies <1 year old are at the greatest risk of the disease, including severe complications. By vaccinating mothers, newborns will be protected against the disease.¹¹⁸ The vaccine carries no risk of neurological problems or adverse foetal effects.¹¹⁹ The antibodies made by the mother's immune system will protect the babies in the womb until the baby is born and completes the three primary doses of the vaccine at 5 months old.^{120,121}

According to KKM, from 1 January to 23 August 2023, 50.4% of cases reported (173/343) were in babies <5 months old, and 97.2% of fatalities reported (19/24) were among infants <5 months old.^{122,123}

Implications for Sarawak based on the views of SIDC

"The success of vaccines is that, basically, nothing happens."

Dr Kate O'Brien, Director of the Department of Immunization, Vaccines, and Biologicals, WHO, in a 21 May 2025 podcast for the Center For Strategic and International Studies (CSIS).¹²⁴

In general, vaccines and immunisation have saved lives by protecting us against severe infections, disability and deaths from many types of infections, such as measles, tetanus, diphtheria, polio, Japanese encephalitis, as well as COVID-19. It plays a main role in disease eradication; for example, immunisation against smallpox eradicated the disease. While there may be side effects, vaccines are generally safe and immunisation is key to primary healthcare, a human right, and the most cost-effective health intervention ever. While immunising against childhood diseases may be compulsory for babies and children, adult immunisation against several other diseases is recommended.^{125–127}

Due to generational differences, for many of us, the deaths of young children and babies from preventable diseases cannot be imagined (relate this to the caption above). This allows for vaccine complacency to set in. Coupled with misinformation and popular beliefs, false information – gathered from local, national and/or international sources, as well as fatalism, this issue can escalate. For those sitting on the fence, the argument put forth by anti-vaxxers can sound convincing.

The focus for public health agencies and associated partners from various ministries, agencies and non-governmental agencies (NGOs) is to communicate effectively the necessary up-to-date information based on science.^{footnote6} Community leaders and community health workers understand their communities best and can play a large role in disseminating the right information to ensure that the health and welfare of their communities are taken care of.

Should vaccines become available and accessible, for example, the Tdap vaccine, or an updated version of the COVID-19 vaccine, it is best to get them. This is to ensure personal and community protection against severe disease.

The option to defer from getting vaccinated also comes with civic responsibility, meaning observing the correct (proper) public health rules and etiquette, using the very tools we used during the acute phase of the COVID-19 pandemic and common sense, such as keeping our environment clean.

The roles of climate change and regional travel (connectivity) in the spread of vector-borne diseases are significant and interconnected, influencing the geographic distribution, transmission dynamics, and outbreak risks of these diseases.^{128,129} The report on the detection of West Nile Virus (WNV) in the UK further highlights this. It does not take long for the virus to establish itself in the local transmission network, progressing from causing sporadic outbreaks to becoming a potential emerging global pathogen.¹³⁰

Early research found that the antibodies against the WNV and members of its group have been detected among the Orang Asli and captive bird populations in West Malaysia, while in Sarawak, the virus was detected in mosquitoes. The most recent evidence of West Nile virus (WNV) in Southeast Asia and the Western Pacific region, specifically Malaysia, comes from studies conducted as recently as 2017-2018, which confirmed the enzootic cycle of the virus.¹³¹ Serological studies found antibodies against the virus in domesticated mammals, though no clinical infections have been reported in humans and animals to date.¹³² The virus has been considered a potential public health risk to Malaysia.¹³³ The disease presents similarly to dengue, Chikungunya and Zika and can be difficult to diagnose. With no WNV-specific treatment or vaccine available, prevention depends on organised, sustained vector mosquito control, public education and continued surveillance.¹³⁴

⁶ The information about a disease can change as more research unveils new information about the pathogen and the pathogenesis of the disease, as seen with COVID-19 and the SARS-CoV-2 virus. How this information is accepted by the public strongly depends on communicating these changes effectively.

While the threat of avian influenza may seem far away for Sarawak, preparedness is important. The report about Brazil (and, previously, the US) having to withhold its animal and/or animal produce exports shows the extent of the outbreak in the poultry industry, affecting livelihoods directly or indirectly.

Understanding bird flyways helps identify high-risk regions and times for avian influenza outbreaks. Enhanced surveillance of wild birds at key breeding, stopover, and wintering sites along flyways can provide early warning of emerging virus strains. This knowledge supports biosecurity measures such as maintaining exclusion zones around poultry farms to prevent contact with wild birds.^{135,136}

The situation remains dynamic in Southeast Asia and Western Pacific Regions, with ongoing risks to poultry industries and potential zoonotic transmission to humans, necessitating the use of the One Health approach for continued surveillance, control, and preparedness efforts.¹³⁷

Rabies control is a significant public health challenge that requires strong community involvement to protect both animals and humans. It is important to remind the public of their civic responsibilities—such as refraining from abandoning pets and avoiding indiscriminate backyard breeding driven by financial gain—and to encourage collaboration with authorities and animal welfare organisations. Together, these efforts can help prevent the escalation of rabies cases in animals and people.

Lessons from Bhutan tell us that rabies control and a subsequent rabies-free Sarawak are possible. The combined use of ORV and injectable vaccine should be reconsidered, especially for free-roaming dogs, as advocated by the United Nations organisations Food and Agriculture Organisation (FAO), WHO and WOAH.^{139,140}

The global disease dynamics of mpox, from 2022 through mid-2025, show a complex, multi-clade outbreak with widespread geographic distribution and varying epidemiological patterns. The latest updates highlight reports of people getting infected from locations not having reported cases are signs of potential undetected cases and/or virus circulating undetected as the driver of the epidemic. Awareness about the risks of high-risk sexual activities or lifestyles is important in controlling the spread of the disease.

Recent advances in diagnostic tools for TB and other infectious diseases are followed closely. Those that are sensitive, specific, and easy to deploy, as well as cost-effective, are the most sought after.

The recent adoption of the Pandemic Agreement is being followed closely, especially the PABS component.

Reference

1. COVID-19 - Global Situation. <https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON572>.
2. Desk, I. T. W. New Covid-19 wave spreads in Asia, infections rise in Hong Kong and Singapore. *India Today* <https://www.indiatoday.in/world/story/new-covid-19-wave-spreads-in-asia-infections-rise-in-hong-kong-and-singapore-glbs-2725563-2025-05-16> (2025).
3. Centre for Health Protection, Department of Health - COVID-19 & Flu Express. <https://www.chp.gov.hk/en/resources/29/100148.html>.
4. Explainer | Covid-19 in Hong Kong: guide to the resurgence in cases and how to stay safe. *South China Morning Post* <https://www.scmp.com/news/hong-kong/health-environment/article/3310682/covid-19-hong-kong-guide-resurgence-cases-and-how-stay-safe> (2025).
5. COVID-19 & Flu Express. https://www.chp.gov.hk/files/pdf/covid_flux_week20_22_5_2025_eng.pdf.

Global updates on COVID-19 and other diseases

2025-R5

May 2025

6. 孙汝. COVID-19 spread subsiding across China: NDCPA.

<https://www.chinadaily.com.cn/a/202505/28/WS6836fabba310a04af22c2101.html>.
7. UPDATE ON COVID-19 SITUATION. *Ministry of Health*

<https://www.moh.gov.sg/newsroom/update-on-covid-19-situation-/>.
8. (20) Kenyataan Media Kementerian... - KEMENTERIAN KESIHATAN MALAYSIA | Facebook.

<https://www.facebook.com/kementeriankesihatanmalaysia/posts/1105468428281826>.
9. Health, M. of. COVID-19 · Malaysia | KKMNOW. <https://data.moh.gov.my>.
10. Health, M. of. COVID-19 · Malaysia | KKMNOW. <https://data.moh.gov.my>.
11. K, N. S. S. RI Tak Alami Lonjakan COVID Seperti Singapura, Betulan Aman atau Sudah Jarang Tes? *detikHealth* <https://health.detik.com/berita-detikhealth/d-7922381/ri-tak-alami-lonjakan-covid-seperti-singapura-betulan-aman-atau-sudah-jarang-tes>.
12. Media, K. C. Kasus Covid-19 Melonjak di Asia Tenggara, Bagaimana Situasi di Indonesia? *KOMPAS.com* <https://www.kompas.com/tren/read/2025/05/20/131500065/kasus-covid-19-melonjak-di-asia-tenggara-bagaimana-situasi-di-indonesia-> (2025).
13. *www.ETHealthworld.com*. Govt ready for all situations: CM on Covid - ET HealthWorld.

ETHealthworld.com <https://health.economictimes.indiatimes.com/news/policy/delhi-government-prepared-for-covid-19-challenges-chief-minister-assures-safety/121510694>.
14. *www.ETHealthworld.com*. Send daily Covid report, Bengal govt asks pvt hosps, labs - ET HealthWorld. *ETHealthworld.com*

<https://health.economictimes.indiatimes.com/news/policy/bengal-government-mandates-daily-covid-reporting-from-private-hospitals-and-labs/121528109>.
15. *www.ETHealthworld.com*. Health ministry seeks report on preparedness for Covid-19 by June 2 - ET HealthWorld. *ETHealthworld.com*

Global updates on COVID-19 and other diseases

2025-R5

May 2025

- <https://health.economictimes.indiatimes.com/news/policy/health-ministry-mandates-covid-19-preparedness-report-by-june-2-amid-rising-cases/121528130>.
16. CDC. COVID Data Tracker. *Centers for Disease Control and Prevention*
<https://covid.cdc.gov/covid-data-tracker> (2020).
17. New COVID variant NB.1.8.1 behind surge in China, now detected in U.S. - CBS News.
<https://www.cbsnews.com/news/us-reports-cases-new-covid-variant-nb-1-8-1-behind-surge-china/> (2025).
18. Pfizer and BioNTech Submit EMA Application for COVID-19 Vaccine Targeting LP.8.1 for 2025-2026 Season | Pfizer. <https://www.pfizer.com/news/announcements/pfizer-and-biontech-submit-ema-application-covid-19-vaccine-targeting-lp81-2025>.
19. Moderna Files FDA Application for the LP.8.1 Targeting COVID-19 Vaccine.
<https://investors.modernatx.com/news/news-details/2025/Moderna-Files-FDA-Application-for-the-LP-8-1-Targeting-COVID-19-Vaccine/default.aspx>.
20. Commissioner, O. of the. FDA Approves and Authorizes Updated mRNA COVID-19 Vaccines to Better Protect Against Currently Circulating Variants. *FDA*
<https://www.fda.gov/news-events/press-announcements/fda-approves-and-authorizes-updated-mrna-covid-19-vaccines-better-protect-against-currently> (2024).
21. May 16, 2025 Approval Letter - NUVAXOVID.
<https://www.fda.gov/media/186545/download?attachment>.
22. Dunkle, L. M. *et al.* Efficacy and Safety of NVX-CoV2373 in Adults in the United States and Mexico. *N. Engl. J. Med.* **386**, 531–543 (2022).
23. FDA Requests Additional Trial of Novavax NVX-CoV2601 Vaccine Prior to Approval. *ContagionLive* <https://www.contagionlive.com/view/fda-requests-additional-trial-novavax-nvx-cov2601-vaccine-prior-approval> (2025).

24. SHIELD-Utah Study Shows Novavax's COVID-19 Vaccine Induces Lower Reactogenicity Symptoms Compared to mRNA - Apr 15, 2025. <https://ir.novavax.com/press-releases/2025-04-15-SHIELD-Utah-Study-Shows-Novavaxs-COVID-19-Vaccine-Induces-Lower-Reactogenicity-Symptoms-Compared-to-mRNA>.
25. Novavax COVID-19 Vaccine Linked to Fewer Adverse Effects in Health Care Workers and First Responders. *ContagionLive* <https://www.contagionlive.com/view/novavax-covid-19-vaccine-linked-to-fewer-side-effects-in-health-care-workers-and-first-responders> (2025).
26. Immunogenicity and safety of a monovalent omicron XBB.1.5 SARS-CoV-2 recombinant spike protein vaccine as a heterologous booster dose in US adults: interim analysis of a single-arm phase 2/3 study. <https://www.thelancet.com/action/showPdf?pii=S1473-3099%2824%2900670-4>.
27. Research, C. for B. E. and. Pfizer-BioNTech COVID-19 Vaccine. *FDA* (2024).
28. Research, C. for B. E. and. Moderna COVID-19 Vaccine. *FDA* (2024).
29. Prasad, V. & Makary, M. A. An Evidence-Based Approach to Covid-19 Vaccination. *N. Engl. J. Med.* **0**,.
30. The Committee Behind American Vaccine Recommendations | Johns Hopkins | Bloomberg School of Public Health. <https://publichealth.jhu.edu/2025/the-committee-behind-american-vaccine-recommendations> (2025).
31. Secretary Kennedy [@SecKennedy]. Today, the COVID vaccine for healthy children and healthy pregnant women has been removed from @CDCgov recommended immunization schedule. Bottom line: it's common sense and it's good science. We are now one step closer to realizing @POTUS's promise to Make America Healthy Again. <https://t.co/Ytch2afCLP>. *Twitter* <https://x.com/SecKennedy/status/1927368440811008138> (2025).

Global updates on COVID-19 and other diseases

2025-R5

May 2025

32. Mishra, M. & Erman, M. US drops COVID vaccine recommendation for healthy kids, pregnant women. *Reuters* (2025).
33. Fiore, K., Enterprise, D. of, Reporting, I. & Today, M. RFK Jr. Ends CDC Recommendation for COVID Vaccine in Healthy Kids, Pregnant Women.
<https://www.medpagetoday.com/infectiousdisease/covid19vaccine/115762> (2025).
34. CDC. Underlying Conditions and the Higher Risk for Severe COVID-19. *COVID-19*
<https://www.cdc.gov/covid/hcp/clinical-care/underlying-conditions.html> (2025).
35. Research, C. for B. E. and. COVID-19 Vaccines (2025-2026 Formula) for Use in the United States Beginning in Fall 2025. *FDA* (2025).
36. Statement on the antigen composition of COVID-19 vaccines.
<https://www.who.int/news/item/15-05-2025-statement-on-the-antigen-composition-of-covid-19-vaccines>.
37. EMA recommendation to update the antigenic composition of authorised COVID-19 vaccines for 2025-2026. https://www.ema.europa.eu/en/documents/other/ema-recommendation-update-antigenic-composition-authorised-covid-19-vaccines-2025-2026_en.pdf.
38. 22052025_NB.1.8.1_IRE. https://cdn.who.int/media/docs/default-source/documents/epp/tracking-sars-cov-2/23052025_nb.1.8.1_ire.pdf.
39. Caiwan Guo, Yuanling, Jingyi Liu, Fanchong Jian, Sijie Yang, Weiliang Song. Antigenic and Virological Characteristics of SARS-CoV-2 Variant BA.3.2, XFG, and NB.1.8.1. *bioRxiv*.
40. WHO adds NB.1.8.1 as SARS-CoV-2 variant under monitoring | CIDRAP.
<https://www.cidrap.umn.edu/covid-19/who-adds-nb181-sars-cov-2-variant-under-monitoring> (2025).
41. covSPECTRUM. <https://cov-spectrum.org>.

42. SARS-CoV-2_variant-reports/reports/variant_report_latest_draft.md at main · neherlab/SARS-CoV-2_variant-reports. *GitHub* https://github.com/neherlab/SARS-CoV-2_variant-reports/blob/main/reports/variant_report_latest_draft.md.
43. Re3data.Org. GISAID. Preprint at <https://doi.org/10.17616/R3Q59F> (2012).
44. Wang, Y. *et al.* Tongue Swab-Based Molecular Diagnostics for Pulmonary Tuberculosis and Drug Resistance in Adults: A Prospective Multicenter Diagnostic Accuracy Study. *J. Infect.* **0**, (2025).
45. Ealand, C. S. *et al.* The performance of tongue swabs for detection of pulmonary tuberculosis. *Front. Cell. Infect. Microbiol.* **13**, 1186191 (2023).
46. Church, E. C. *et al.* Oral swabs with a rapid molecular diagnostic test for pulmonary tuberculosis in adults and children: a systematic review. *Lancet Glob. Health* **12**, e45–e54 (2024).
47. Chikungunya - La Réunion and Mayotte. <https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON567>.
48. UK detects West Nile virus for first time in mosquitoes. *Reuters* (2025).
49. West Nile virus: epidemiology, diagnosis and prevention. *GOV.UK* <https://www.gov.uk/guidance/west-nile-virus> (2025).
50. How we protect the UK from vector-borne diseases like dengue and West Nile virus – UK Health Security Agency. <https://ukhsa.blog.gov.uk/2025/05/21/how-we-protect-the-uk-from-vector-borne-diseases/> (2025).
51. West Nile virus reaches the UK: should you be worried? <https://www.gavi.org/vaccineswork/west-nile-virus-reaches-uk-should-you-be-worried>.
52. West Nile virus. <https://www.who.int/news-room/fact-sheets/detail/west-nile-virus>.
53. Rabies Update:... - Department of Veterinary Services Sarawak | Facebook. https://www.facebook.com/100068846335561/posts/1022623790042489/?_rdr.

Global updates on COVID-19 and other diseases

2025-R5

May 2025

54. RABIES... - Department of Veterinary Services Sarawak | Facebook.
<https://www.facebook.com/DVSSarawak/posts/rabies-updatethis-week-may-1st-9th-2025-the-sarawak-veterinary-diagnostic-labora/1019586053679596/>.
55. DVS SARAWAK. <https://dvs.sarawak.gov.my/web/home/index/>.
56. First human rabies case reported in Sarawak for 2025 after 13yo boy tests positive for virus | Borneo Post Online. <https://www.theborneopost.com/2025/05/25/first-human-rabies-case-reported-in-sarawak-for-2025/>.
57. Thirteen-year-old first rabies case in Sarawak this year, says state minister | Malay Mail. <https://www.malaymail.com/news/malaysia/2025/05/26/thirteen-year-old-first-rabies-case-in-sarawak-this-year-says-state-minister/178266>.
58. S'wak records first human rabies case for 2025 after 13yo boy tests positive | DayakDaily. <https://dayakdaily.com/swak-records-first-human-rabies-case-for-2025-after-13yo-boy-tests-positive/>.
59. News - DVS SARAWAK. https://dvs.sarawak.gov.my/web/subpage/news_view/146.
60. As Kuching fights rabies, mayor reminds advocates 'I totally get your love for animals, but human lives are equally precious' | Malay Mail. <https://www.malaymail.com/news/malaysia/2025/05/25/as-kuching-fights-rabies-mayor-reminds-advocates-i-totally-get-your-love-for-animals-but-human-lives-are-equally-precious/178106>.
61. Bagsik ng rabies! 2 kelot tigok sa sakmal ng aso. <https://tonite.abante.com.ph/2025/05/25/bagsik-ng-rabies-2-kelot-tigok-sa-sakmal-ng-aso/>.
62. Woman in Bacolod City Dies of Rabies Months After Dog Bite | PhilNews. <https://philnews.ph/2025/05/27/woman-in-bacolod-city-dies-rabies-months-after-dog-bite/>.

Global updates on COVID-19 and other diseases

2025-R5

May 2025

63. 25-anyos na babaeng kinagat ng aso noong Marso, namatay ngayong Mayo - KAMI.COM.PH.
<https://kami.com.ph/philippines/176166-babae-kinagat-aso-agosto-namatay-mayo/>.
64. How vaccination is powering Bhutan's rabies control success. *WOAH - World Organisation for Animal Health* <https://www.woah.org/en/article/how-vaccination-is-powering-bhutans-rabies-control-success/>.
65. Managing-free-roaming-dog-population-in-Bhutan—A-unique-journey.pdf. <https://rr-middleeast.woah.org/app/uploads/2024/04/Managing-free-roaming-dog-population-in-Bhutan-%E2%80%93-A-unique-journey.pdf>.
66. How Bhutan became the first country in the world to achieve 100% sterilisation of its free roaming dog population. *The Bhutanese* <https://thebhutanese.bt/how-bhutan-became-the-first-country-in-the-world-to-achieve-100-sterilisation-of-its-free-roaming-dog-population/>.
67. ASF situation in Asia & Pacific update. *Animal Health* <https://www.fao.org/animal-health/situation-updates/asf-in-asia-pacific/en>.
68. ASF Zoning Update as of 05 MAY 2025 – DEPARTMENT OF AGRICULTURE.
<https://rfo12.da.gov.ph/index.php/asf-zoning-update-as-of-05-may-2025/>.
69. African swine fever: WOAHA vaccine standard adopted. *WOAH - World Organisation for Animal Health* <https://www.woah.org/en/article/african-swine-fever-woah-vaccine-standard-adopted/>.
70. by. U.S. Hasn't Seen a Human Bird Flu Case in 3 Months. Experts Are Wondering Why.
<https://www.medpagetoday.com/infectiousdisease/birdflu/115648> (2025).
71. CDC. H5 Bird Flu: Current Situation. *Avian Influenza (Bird Flu)* <https://www.cdc.gov/bird-flu/situation-summary/index.html> (2025).

Global updates on COVID-19 and other diseases

2025-R5

May 2025

72. US cancels US\$590 million contract with Moderna for bird flu shot. *CNA*
<https://www.channelnewsasia.com/world/us-cancels-moderna-bird-flu-shot-us590-million-contract-5158231>.
73. Bird flu outbreak halts Brazilian poultry exports to the EU. *euronews*
<https://www.euronews.com/my-europe/2025/05/19/bird-flu-outbreak-halts-brazilian-poultry-exports-to-the-eu> (18:12:06 +02:00).
74. Bird flu outbreak halts Brazilian poultry exports to the EU. *euronews*
<https://www.euronews.com/my-europe/2025/05/19/bird-flu-outbreak-halts-brazilian-poultry-exports-to-the-eu> (18:12:06 +02:00).
75. Coston, M. Avian Flu Diary: Cambodia Reports 4th Fatal H5N1 Case Of 2025. *Avian Flu Diary* <https://afludiary.blogspot.com/2025/05/cambodia-reports-4th-fatal-h5n1-case-of.html> (2025).
76. ai_20250530.pdf. https://cdn.who.int/media/docs/default-source/wpro---documents/emergency/surveillance/avian-influenza/ai_20250530.pdf?sfvrsn=30965cc4_1&download=true.
77. Isa. Cambodia reports fourth fatal human case of H5N1 in 2025. *aviNews*
<https://avinews.com/en/cambodia-reports-fourth-fatal-human-case-of-h5n1-in-2025/> (2025).
78. Avian Influenza Weekly Update Number 998. https://cdn.who.int/media/docs/default-source/wpro---documents/emergency/surveillance/avian-influenza/ai_20250523.pdf?sfvrsn=1230cc33_1&download=true (2025).
79. WAHIS. <https://wahis.woah.org/#/in-review/6473?reportId=174223>.
80. magazine, H. B., Nature. Bird Flu Vaccine for Cows Passes Early Test. *Scientific American*
<https://www.scientificamerican.com/article/bird-flu-vaccine-for-cows-passes-early-test/>.

Global updates on COVID-19 and other diseases

2025-R5

May 2025

81. Avian influenza. <https://www.who.int/westernpacific/wpro-emergencies/surveillance/avian-influenza>.
82. Avian influenza. <https://www.ecdc.europa.eu/en/avian-influenza> (2012).
83. Avian flu outbreak risk diminishes in Europe. *WATTPoultry.com*
<https://www.wattagnet.com/poultry-meat/diseases-health/avian-influenza/news/15746929/avian-flu-outbreak-risk-diminishes-in-europe> (2025).
84. Is Europe doing enough to prepare for the potential threat of bird flu to humans?
<https://www.msn.com/en-my/news/other/is-europe-doing-enough-to-prepare-for-the-potential-threat-of-bird-flu-to-humans/ar-AA1Fuml6?ocid=msedgntp&pc=HCTS&cvid=2adbd51fb3464e3d8b8517e95d60b93e&ei=30>.
85. Four takeaways from the State of the World's Animal Health report - The Animal Echo.
<https://theanimalecho.woah.org/en/four-takeaways-from-the-state-of-the-worlds-animal-health-report/> (2025).
86. david@agrinewsgroup.com. WOAHA Report: Avian Influenza and Antimicrobial Resistance.
aviNews <https://avinews.com/en/woah-report-avian-influenza-and-antimicrobial-resistance/> (2025).
87. Spike in avian flu cases in cats triggers worry about human spillover | CIDRAP.
<https://www.cidrap.umn.edu/avian-influenza-bird-flu/spike-avian-flu-cases-cats-triggers-worry-about-human-spillover> (2025).
88. Coleman, K. K. & Bemis, I. G. Avian Influenza Virus Infections in Felines: A Systematic Review of Two Decades of Literature. *Open Forum Infect. Dis.* **12**, ofaf261 (2025).
89. CDC. Past Reported Global Human Cases with Highly Pathogenic Avian Influenza A(H5N1) (HPAI H5N1) by Country, 1997-2025. *Avian Influenza (Bird Flu)* <https://www.cdc.gov/bird-flu/php/avian-flu-summary/chart-epi-curve-ah5n1.html> (2025).

Global updates on COVID-19 and other diseases

2025-R5

May 2025

90. Bellido-Martín, B. *et al.* Evolution, spread and impact of highly pathogenic H5 avian influenza A viruses. *Nat. Rev. Microbiol.* 1–16 (2025) doi:10.1038/s41579-025-01189-4.
91. Fusaro, A. *et al.* High pathogenic avian influenza A(H5) viruses of clade 2.3.4.4b in Europe—Why trends of virus evolution are more difficult to predict. *Virus Evol.* **10**, veae027 (2024).
92. 2025_table_h5n1_march.pdf. https://cdn.who.int/media/docs/default-source/influenza/h5n1-human-case-cumulative-table/2025_table_h5n1_march.pdf?sfvrsn=48cd7b0a_4&download=true.
93. www.ETHealthworld.com. Nipah virus case confirmed in Kerala's Malappuram district - ET HealthWorld. *ETHealthworld.com*
<https://health.economictimes.indiatimes.com/news/industry/nipah-virus-case-confirmed-in-keralas-malappuram-district/121014110>.
94. Nipah patient in Kerala declared virus-free, recovering says Health Minister.
<https://www.msn.com/en-in/news/other/nipah-patient-in-kerala-declared-virus-free-recovering-says-health-minister/ar-AA1FN7MA?ocid=BingNewsSerp>.
95. Bureau, T. H. Nipah virus index patient in Kerala on the way to recovery. *The Hindu* (2025).
96. Multi-country outbreak of mpox, External situation report #53 - 29 May 2025.
<https://www.who.int/publications/m/item/multi-country-outbreak-of-mpox--external-situation-report--53---29-may-2025>.
97. *Special Briefing on Mpox & Other Health Emergencies || May 29, 2025.* (2025).
98. WHO. *Mpox*. https://cdn.who.int/media/docs/default-source/documents/emergencies/multi-country-outbreak-of-mpox--external-situation-report--49.pdf?sfvrsn=21369ead_3&download=true (2025).
99. Togo reports mpox outbreak as activity escalates in West Africa | CIDRAP.
<https://www.cidrap.umn.edu/mpox/togo-reports-mpox-outbreak-activity-escalates-west-africa> (2025).

Global updates on COVID-19 and other diseases

2025-R5

May 2025

100. Control, A. C. for D. First mpox clade Ib confirmed in Australia.
<https://www.cdc.gov.au/newsroom/news-and-articles/first-mpox-clade-ib-confirmed-australia> (2025).
101. Iloilo City logs 1st mpox case; 4 others under observation | GMA News Online.
https://www.gmanetwork.com/news/topstories/regions/947608/iloilo-city-logs-1st-mpox-case-4-others-under-observation/story/#goog_rewarded.
102. Mpox global strategic preparedness and response plan – April 2025.
<https://www.who.int/publications/m/item/mpox-global-strategic-preparedness-and-response-plan-april-2025>.
103. Strategic framework for enhancing prevention and control of mpox- 2024-2027.
<https://www.who.int/publications/i/item/9789240092907>.
104. CDC. Measles Cases and Outbreaks. *Measles (Rubeola)*
<https://www.cdc.gov/measles/data-research/index.html> (2025).
105. Circulating vaccine-derived poliovirus type 2 (cVDPV2) - Papua New Guinea.
<https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON571>.
106. Middle East respiratory syndrome coronavirus - Kingdom of Saudi Arabia.
<https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON569>.
107. Anthrax – Thailand. <https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON573>.
108. Simonsen, K. A. & Chatterjee, K. Anthrax. in *StatPearls [Internet]* (StatPearls Publishing, 2023).
109. A milestone in public health and disease surveillance: Fiji launches Pathogen Genomics Laboratory. <https://www.who.int/westernpacific/about/how-we-work/pacific-support/news/detail/07-05-2025-a-milestone-in-public-health-and-disease-surveillance--fiji-launches-pathogen-genomics-laboratory>.

Global updates on COVID-19 and other diseases

2025-R5

May 2025

110. Tobacco: Industry tactics to attract younger generations. <https://www.who.int/news-room/questions-and-answers/item/tobacco-industry-tactics-to-attract-younger-generations>.
111. World No Tobacco Day 2025.
<https://www.who.int/westernpacific/newsroom/events/detail/2025/05/31/western-pacific-events/world-no-tobacco-day-2025>.
112. World No Tobacco Day 2025. <https://www.who.int/campaigns/world-no-tobacco-day/2025>.
113. A78_10-en.pdf. https://apps.who.int/gb/ebwha/pdf_files/WHA78/A78_10-en.pdf.
114. World Health Assembly adopts historic Pandemic Agreement to make the world more equitable and safer from future pandemics. <https://www.who.int/news/item/20-05-2025-world-health-assembly-adopts-historic-pandemic-agreement-to-make-the-world-more-equitable-and-safer-from-future-pandemics>.
115. Fate Unknown: The Pandemic Agreement's Pathogen Access and Benefit Sharing. *Think Global Health* <https://www.thinkglobalhealth.org/article/fate-unknown-pandemic-agreements-pathogen-access-and-benefit-sharing> (2025).
116. Gostin, L. O., Halabi, S. & Finch, A. The WHO Pandemic Agreement: The World Together Equitably. *JAMA* (2025) doi:10.1001/jama.2025.9198.
117. (3) Mulai hari ini, 26 Mei 2025,... - KEMENTERIAN KESIHATAN MALAYSIA | Facebook.
<https://www.facebook.com/kementeriaankesihatanmalaysia/posts/pfbid02xwyv1h77tct7hZnrr3v6HcJnqfjyQAKXnK2BCyPR4NMpy4ztKxiPRRxtQubdr4oPl?rdid=4Wm0FcPOG10kNXry#>.
118. Pertussis. <https://www.who.int/health-topics/pertussis>.

119. Tetanus, Diphtheria, and Pertussis FAQs for Providers.
<https://www.acog.org/programs/immunization-for-women/physician-tools/tetanus-diphtheria-and-pertussis-faqs-for-providers>.
120. Jadual Imunisasi Kebangsaan 2023.jpg (4961×3508).
https://infosihat.moh.gov.my/images/media_sihat/infografik/jpeg/Jadual%20Imunisasi%20Kebangsaan%202023.jpg.
121. Pemberian vaksin Tdap untuk semua ibu hamil di Malaysia tahun depan. *Astro Awani*
<https://www.astroawani.com/berita-malaysia/pemberian-vaksin-tdap-untuk-semua-ibu-hamil-di-malaysia-tahun-depan-434892> (2023).
122. CodeBlue. MOH: Pertussis Under Control, This Year's Cases 53% Lower Than 2019. *CodeBlue* <https://vgh.pth.mybluehost.me/2023/08/moh-pertussis-under-control-this-years-cases-53-lower-than-2019/> (2023).
123. KKMalsyiamy 🏥❤️ [@KKMPutrajaya]. Kenyataan Media Ketua Pengarah Kesihatan Malaysia Situasi Terkini Kes Pertussis (Batuk Kokol) Di Malaysia <https://t.co/atjyJJ1LjS>.
Twitter <https://x.com/KKMPutrajaya/status/1693906699864908248> (2023).
124. Dr. Kate O'Brien, WHO: "The success of vaccines is that, basically, nothing happens." | The CommonHealth | CSIS Podcasts. <https://www.csis.org/podcasts/commonhealth/dr-kate-obrien-who-success-vaccines-basically-nothing-happens>.
125. Immunise4Life. The Malaysian National Immunisation Programme (NIP) - Immunise4Life. <https://immunise4life.my/> <https://immunise4life.my/the-malaysian-national-immunisation-programme-nip/> (2021).
126. [faq_vaccines_immunisation.pdf](#).
https://infosihat.moh.gov.my/images/isusemasa/faq_vaccines_immunisation/faq_vaccines_immunisation.pdf.

127. Vaccines and immunization: What is vaccination? <https://www.who.int/news-room/questions-and-answers/item/vaccines-and-immunization-what-is-vaccination>.
128. de Souza, W. M. & Weaver, S. C. Effects of climate change and human activities on vector-borne diseases. *Nat. Rev. Microbiol.* **22**, 476–491 (2024).
129. Cadavid Restrepo, A., Furuya-Kanamori, L., Mayfield, H., Nilles, E. & Lau, C. L. Implications of a travel connectivity-based approach for infectious disease transmission risks in Oceania. *BMJ Open* **11**, e046206 (2021).
130. Chowdhury, P. & Khan, S. A. Global emergence of West Nile virus: Threat & preparedness in special perspective to India. *Indian J. Med. Res.* **154**, 36–50 (2021).
131. Natasha, J. A. *et al.* Circulation of West Nile virus in mosquitoes approximate to the migratory bird stopover in West Coast Malaysia. *PLoS Negl. Trop. Dis.* **17**, e0011255 (2023).
132. Mohammed, M. N. *et al.* Serological and molecular surveillance of West Nile virus in domesticated mammals of peninsular Malaysia. *Front. Vet. Sci.* **10**, (2023).
133. 14 Nur Ain Najwa.pdf. https://www.ukm.my/jsm/pdf_files/SM-PDF-48-12-2019/14%20Nur%20Ain%20Najwa.pdf.
134. West Nile virus. <https://www.who.int/news-room/fact-sheets/detail/west-nile-virus>.
135. The University of Edinburgh. <https://www.ed.ac.uk/sites/default/files/2024-11/Migration%20routes%20hold%20key%20to%20bird%20flu%20spread,%20global%20study%20finds%2018/10/2016.pdf>.
136. Yang, Q. *et al.* Synchrony of Bird Migration with Global Dispersal of Avian Influenza Reveals Exposed Bird Orders. *Nat. Commun.* **15**, 1126 (2024).
137. Global AIV with Zoonotic Potential. *AnimalHealth* <https://www.fao.org/animal-health/situation-updates/global-aiv-with-zoonotic-potential/en>.
138. Boulai, S. First Oral Rabies Vaccine for Dogs. *WOAH - World Organisation for Animal Health* <https://www.woah.org/en/first-oral-rabies-vaccine-for-dogs/> (2023).

139. monica. Bhutan becomes first country to sterilise all stray dogs after 14-year-long project. *Network for Animals* <https://networkforanimals.org/bhutan-becomes-first-country-to-sterilise-all-stray-dogs-after-14-year-long-project/> (2024).
140. WOAH, FAO, & WHO. *Oral Vaccination of Dogs against Rabies - Recommendations for Field Application and Integration into Dog Rabies Control Programmes*.
<https://doc.woah.org/dyn/portal/index.xhtml?page=alo&alold=43539> (2023)
doi:10.20506/woah.3398.