



ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE



RABIES

In the ASEAN Region

FOCUS REPORT

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ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE

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Acronyms and Abbreviations

ABVC	: ASEAN Biological Threats Surveillance Centre	MMWR	: Morbidity and Mortality Weekly Reports
AEGCD	: ASEAN Experts Group on Communicable Diseases	MOAF	: Ministry of Agriculture and Forestry
AMS	: ASEAN Member States	MOES	: Ministry of Education and Sport
ARES	: ASEAN Rabies Elimination Strategy	MOH	: Ministry of Health
ASEAN	: Association of Southeast Asian Nations	MPRT	: Ministry of Primary Resources and Tourism
ASWGL	: ASEAN Sectoral Working Group on Livestock	MyRES	: Malaysia Strategic Plan for Rabies Elimination
AVS	: Animal and Veterinary Service	ORV	: Oral Rabies Vaccination
CSF	: Cerebrospinal Fluid	PCR	: Polymerase Chain Reaction
DFAT	: Direct Fluorescent Antibody Test	PCSS	: Pet Cat Sterilisation Support
DRIT	: Direct Rapid Immunohistochemical Test	PEP	: Post-Exposure Prophylaxis
EBS	: Event-Based Surveillance	PHE	: Public Health Emergencies
EID	: Emerging Infectious Diseases	PrEP	: Pre-Exposure Prophylaxis
FAO	: Food and Agriculture Organization of the United Nations	RIG	: Rabies Immunoglobulin
FAT	: Fluorescent Antibody Test	SEARO	: South-East Asia Region
GARC	: Global Alliance for Rabies Control	TNRM	: Trap-Neuter-Rehome/Release-Manage
IBCM	: Integrated Bite Case Management	TRN	: Thai Rabies Net
IDRV	: Intradermal Rabies Vaccination	WAHIS	: World Animal Health Information System
IEC	: Information, Education, and Communication	WHO	: World Health Organization
IMCC	: Inter-Ministerial Coordination Committee	WOAH	: World Organisation for Animal Health
JAPOHR	: Japan and Philippines One Health Rabies	WPRO	: Western Pacific Region Office
MDV	: Mass Dog Vaccination		

RABIES

Introduction & Methods



Introduction

Rabies is a viral zoonotic disease that affects the central nervous system, almost always resulting in death once symptoms appear (WHO, 2024). The virus is primarily transmitted through the bite or scratch of an infected animal, with domestic dogs being the main source of human rabies cases worldwide (WOAH, n.d). After entering the body, the virus travels along peripheral nerves to the brain, causing progressive neurological symptoms such as fever, hydrophobia (fear of water), aerophobia (fear of air drafts), agitation, paralysis, and ultimately coma and death.

Rabies is entirely preventable through prompt wound care, post-exposure prophylaxis (PEP), and pre-exposure vaccination for high-risk groups (WHO, n.d.a). However, individuals who do not receive PEP after exposure remain at extreme risk of developing fatal disease. Children under 15 years are disproportionately affected, as they are more likely to play with animals and may not report bites or scratches. Wildlife, including bats, foxes, and raccoons, also contribute to rabies transmission in certain regions, complicating control efforts.

Globally, dog vaccination programs, combined with improved access to human vaccines and immunoglobulins, have reduced the incidence of rabies in several regions. Maintaining high vaccination coverage in dogs, ensuring timely access to PEP, and strengthening community awareness remain essential to eliminating human rabies deaths. Regional strategies, such as those supported by ASEAN member states, align with the World Health Organization (WHO) and global partners' "Zero by 2030" goal to end human deaths from dog-mediated rabies (WHO, FAO, WOAH, and GARC, 2018).

This report provides an overview of rabies, covering its transmission, symptoms, prevention, and control measures, along with data on reported cases, vaccination programs, and gaps in access to PEP. It also analyses the regional situation within ASEAN and highlights the importance of surveillance, intersectoral collaboration, and rapid public health response to achieve rabies elimination across vulnerable communities.

Methods

This report employs a comprehensive literature review to examine the global landscape of rabies, with a particular focus on the ASEAN region. Information on the disease was gathered from existing guidelines, WHO press releases, and other established academic sources. Additionally, data on disease incidence, diagnostic criteria, preventive measures, and policy strategies were collated from WHO publications, World Organisation for Animal Health (WOAH) surveillance data, official reports from ASEAN Member States, and reputable news sources.

The incidence of human rabies deaths covers data reported to WHO from 2010 to 2024, and official data from ASEAN Member States from January 2025 to July 2026. Cases in animals were collected from WOAH surveillance data, covering the period of 2010 to 2024. This approach enabled a detailed analysis of current trends, patterns, and challenges in managing rabies within the ASEAN region.



Case Definition and Clinical Features



Case Definition

Case definitions provide standardized criteria for the identification, classification, and reporting of rabies cases for surveillance purposes. Standardized case definitions should be applied to both human and animal rabies as notifiable diseases and be published and widely disseminated by national

health and veterinary services to promote awareness and vigilance and to facilitate timely data sharing and analysis. Cases may be classified based on clinical signs or symptoms (suspected or probable) or diagnostic tests (confirmed or non-case) (WHO, 2018a; WHO, 2025a).

Table 1. Classification of Rabies Cases

Case Classification	Animal Case Definition	Human Case Definition
Suspect Case	An animal that presents with any of the following clinical signs: • Hypersalivation • Paralysis • Lethargy • Unprovoked abnormal aggression (bitting ≥ 2 animals, and/or inanimate objects) • Abnormal vocalization • Diurnal activity of nocturnal species	A person presenting with an acute neurological syndrome (i.e., encephalitis) that progressively worsens towards coma and death, typically within 7-10 days of onset, if no intensive care is instituted. May include any of the following signs and symptoms: • Aerophobia • Hydrophobia • Paraesthesia or localized pain • Dysphagia • Localized weakness • Nausea of vomiting
Probable Case	A suspect animal with a history of a bite by another (suspect/probable/confirmed) animal <i>and/or</i> A suspect animal that is killed, dies or disappears within 4-5 days of observing illness	A suspect human with a reliable history or contact with a (suspect/probable/confirmed) rabid animal
Confirmed Case	A suspect or probable animal confirmed using a standard diagnostic test as defined by WHO or OIE (WOAH)	A suspect or probable human that is laboratory-confirmed using a standard diagnostic test
Not a Case	A suspect or probable animal in which rabies is ruled out by appropriate laboratory testing	A suspect or probable human that is ruled out by appropriate laboratory testing <i>or</i> A suspect or probable human with no reasonable risk of animal contact in the past 6 months

Assessment of contact with suspected rabid animals is an important component of rabies case classification. Exposure categories are classified according to the type of contact (WHO, 2025a).

Table 2. Categories of contact with suspected rabid animals

Exposure category	Definition
Category I	Touching or feeding animals and animal licks on intact skin, which is considered no exposure.
Category II	Nibbling of uncovered skin, minor scratches, or abrasions without bleeding, which is considered exposure.
Category III	Single or multiple transdermal bites or scratches, contamination of mucous membranes or broken skin with saliva from animal licks, and exposure due to direct contact with bats, which is considered severe exposure.

Source: WHO, 2025a

When diagnostic testing is not available or when antigen is not detected by non-primary diagnostic tests, the WHO clinical

case definition for rabies should be applied, and appropriate follow-up should be determined by public health officials (WHO, 2018a).

Transmission

Rabies is caused by the rabies virus, which infects mammals, including dogs, cats, livestock, and wildlife. Once clinical symptoms appear, rabies is virtually 100% fatal (WHO, 2018b; WHO, 2024). The main source of human rabies infection is infected animals. Dogs are responsible for up to 99% of human rabies cases. However, rabies virus can be transmitted from any rabid animal, including cats, bats, mongooses, jackals, foxes, wolves, and other carnivorous animals (WHO, 2018b). In the Americas, where dog-mediated rabies is mostly controlled, hematophagous bats are the primary source of human rabies (WHO, 2024). Human deaths following exposure

to foxes, raccoons, skunks, and other wild mammals are very rare (WHO, FAO, WOA, and GARC, 2018).

Rabies virus is mainly transmitted through the saliva of a rabid animal when it bites or scratches a person. Transmission can also occur when saliva contacts wounds, lesions, broken skin, or the lining of the mouth and nose. In animals where biting is not common, such as cattle and buffalo, transmission can still occur through exposure to saliva. Rabies virus has also been found in other bodily fluids such as tears and nervous tissue. However, rabies virus is not found in blood or faeces (WHO, 2018b).

After entering the human body, for example through an animal bite, the rabies virus enters the peripheral nervous system and migrates to the central nervous system, including the spinal cord and brain. Behavioural changes and clinical signs appear when the virus reaches the brain. Clinical signs typically appear 2–3 months after a person has been infected, although in exceptional cases they can develop after a few days or after more than six months following exposure (WHO, 2018b).

Mammals from the orders Chiroptera (bats) and Carnivora are the major natural reservoirs in which lyssaviruses persist and evolve. Rabies virus is highly adapted to circulation in carnivores,

while bats contain the major diversity of lyssaviruses. Different rabies virus lineages are associated with specific host populations, including bats, dogs, wild canids, foxes, raccoons, and skunks (WHO, 2018a).

Human-to-human transmission of rabies is extremely rare. Human-to-human transmission has never been confirmed outside organ transplantation. Organs transplanted from rabid organ donors can transmit rabies to organ recipients. Caregivers of patients with rabies should avoid contact with saliva and other excretions, and hand washing and good personal hygiene are important when caring for patients with rabies (WHO, 2018b).

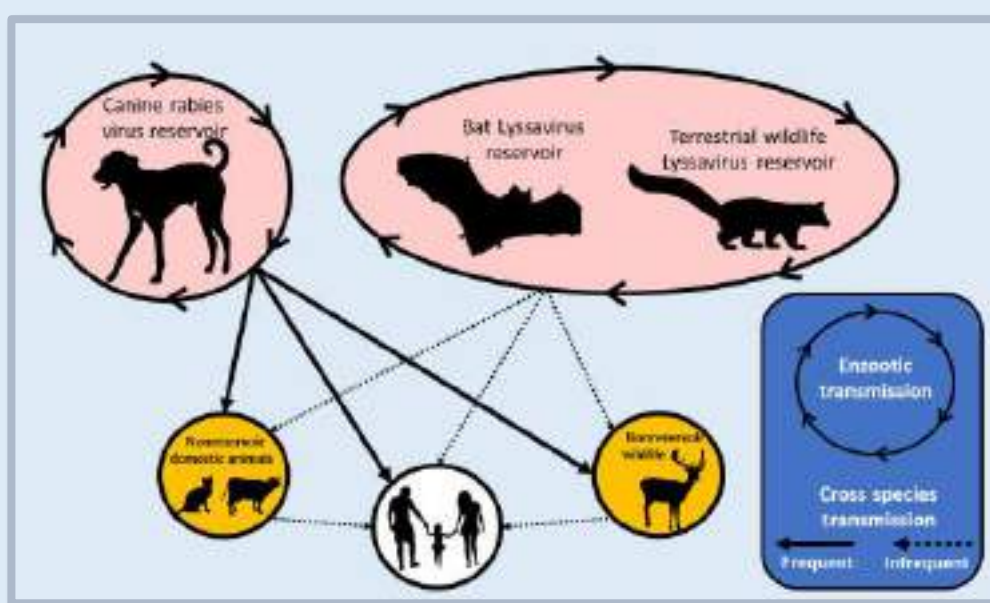


Figure 1. Rabies Transmission

Source: WHO (<https://www.sciencedirect.com/topics/immunology-and-microbiology/rabies-transmission>)

Risk Factors and Risk Groups

Certain populations have a higher risk of rabies exposure due to behavioural, occupational, and environmental factors (WHO, 2018b; WHO, 2025a). Children represent a vulnerable group, particularly those between 5 and 14 years of age, due to their frequent close contact with animals, increased likelihood of facial or neck bites, and potential underreporting of minor injuries. Occupational groups, including veterinarians, animal health workers, and individuals handling potentially rabid animals, are also at increased risk because of possible exposure to infectious fluids, particularly through skin abrasions. In addition, travelers visiting rabies-endemic regions, especially those engaging in rural or outdoor activities, may face increased exposure risk due to greater interaction with animals and limited access to timely medical care. These high-risk groups may

benefit from targeted education and pre-exposure prophylaxis according to their level and duration of exposure.

The risk of developing rabies is influenced by several exposure-related factors (WHO, 2018b). The severity and type of exposure affect transmission risk, with deep or multiple bites carrying a higher risk compared with superficial scratches. The anatomical location of the bite also influences disease progression, as bites involving the head, neck, or fingers may result in faster progression due to their proximity to the central nervous system. Furthermore, the species and health status of the biting animal, particularly bats and unvaccinated dogs, contribute to the likelihood of transmission. Individual factors, including the immune status of the exposed person, may also affect susceptibility to infection.

Clinical Presentation

Human rabies is an acute neurological syndrome typically progressing to coma and death within 7–10 days of symptom onset absent intensive care, usually via cardio-respiratory failure (WHO, 2025a). The disease presents in two primary forms, furious and paralytic rabies (WHO, n.d.b).

a. Furious Rabies: Characterized by hyperactivity, excitable behavior,

hydrophobia (fear of water), and aerophobia (fear of drafts/fresh air). This form progresses rapidly to death.

b. Paralytic Rabies: Accounting for approximately 20% of cases, this form follows a longer, less dramatic course. Muscles gradually paralyze, starting at the site of the bite or scratch, followed

by a slow progression to coma and death. Due to its subtle presentation, this form is frequently misdiagnosed and under-reported.

Following an incubation period typically ranging from 2–3 months, although it may vary from one week to one year depending on the site of entry and viral load, the virus travels along peripheral nerves to the brain. Early clinical manifestations may include paraesthesia or localized pain at the bite site, localized weakness, dysphagia, and nausea or vomiting (WHO, 2025).

As the disease progresses, neurological dysfunction develops within days and may include (WHO, 2018b):

- discomfort, pain, prickling or itching sensation at the site of bite wound;
- neurological dysfunction, progressing within days, including but not limited to anxiety, confusion and agitation. As the

disease progresses, the person may experience delirium, hallucinations, insomnia and other abnormal behaviour;

- aerophobia (fear of air)
- hydrophobia (fear of water); at a later stage the mere sight of water may provoke spasms in the neck and throat
- intolerance to noise, bright light or drafts;
- hyperactivity (typically in furious rabies)
- difficulty swallowing, nausea, vomiting;
- localized weakness, paralytic syndromes;
- coma and death.

At the late stage of disease, rabies progresses to coma and death. Death is caused by cardiac or respiratory failure, typically within 7–10 days after the first signs if intensive care is not instituted. There is currently no effective treatment for rabies after clinical signs appear.



Figure 2. Rabies Symptoms in Humans

Source: Global Alliance for Rabies Control (<https://rabiesalliance.org/resource/rabies-symptoms-humans-infographic>)

Clinical Diagnostic

The clinical diagnosis of human rabies remains challenging because the disease may present with a wide range of neurological manifestations that overlap with other conditions (WHO, 2018b). Clinical findings alone are therefore insufficient to establish a definitive diagnosis, particularly when the history of exposure is unclear, and laboratory confirmation is recommended whenever feasible.

Currently, no WHO-approved tests can diagnose human rabies before the onset

of clinical symptoms (WHO, 2024). During the incubation period, the virus is present in low concentrations within peripheral tissues, its location is unpredictable, and a detectable immune response is usually absent.

Consequently, laboratory confirmation is most reliable during the clinical stage of illness or after death, when viral dissemination allows detection using validated diagnostic methods (WHO, 2018b).

Laboratory diagnosis is based on the detection of rabies virus antigens, nucleic acids, or, in certain circumstances, antibodies (WHO, 2018b WHO, n.d.c). Antemortem diagnosis typically involves testing saliva, nuchal skin biopsies, hair follicles, cerebrospinal fluid (CSF), urine, or tears. Reverse transcriptase polymerase chain reaction (RT-PCR) and other nucleic acid amplification methods

have significantly improved antemortem diagnosis by enabling viral detection in minimally invasive specimens (Figure 3). However, diagnostic sensitivity depends on the stage of disease, specimen quality, sampling strategy, vaccination history, and laboratory expertise. As viral shedding may be intermittent, a negative result does not exclude rabies.

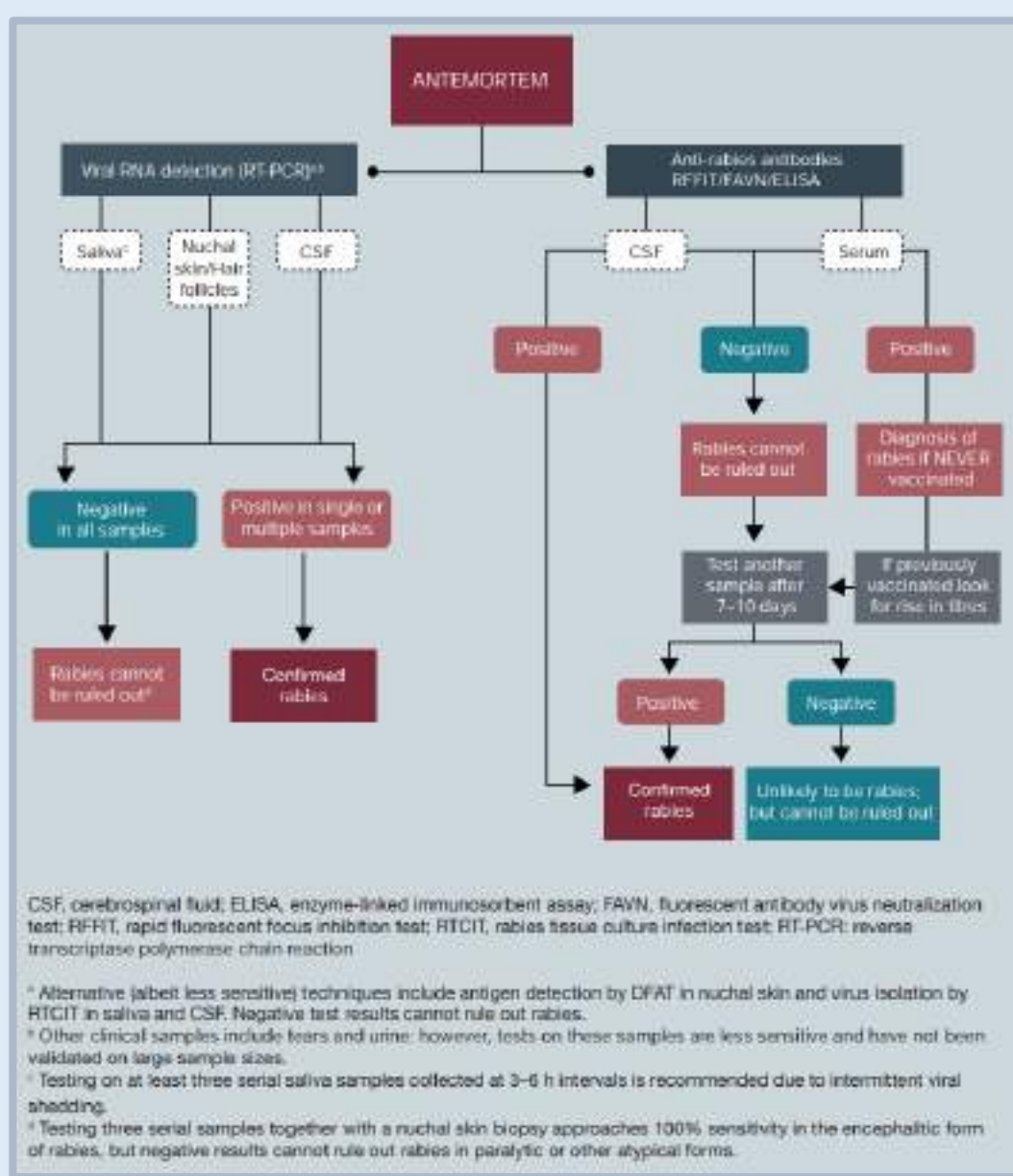


Figure 3. Algorithm for Human Rabies Antemortem Diagnosis
Source: WHO (<https://www.who.int/publications/i/item/9789241515153>)

Postmortem confirmation remains the reference standard when brain tissue is available. The direct fluorescent antibody test (DFAT/FAT) on brain tissue is recognized internationally as the gold standard for rabies diagnosis in both humans and animals because of its high sensitivity and specificity (WHO, 2018b; WOA, 2023). Other recognized methods include the direct rapid immunohistochemistry test (DRIT) and RT-PCR. Brain tissue, particularly from the brainstem, provides the most reliable specimen, although postmortem nuchal skin samples may be used when brain tissue is unavailable, with lower diagnostic sensitivity.

Accurate laboratory confirmation is essential for patient management, implementation of infection prevention measures, administration of post-exposure prophylaxis to exposed individuals, and strengthening rabies surveillance systems to support disease prevention and control programmes (WHO, 2018b). The accuracy of laboratory diagnosis depends not only on the diagnostic method employed but also on appropriate specimen collection, sample quality, and quality assurance procedures. Inadequate or poorly preserved specimens may result in indeterminate or false-negative findings, making confirmatory testing with an alternative method necessary in some cases.



Epidemiology



Global Situation

Rabies is one of the oldest known zoonotic diseases and has affected human and animal populations for more than 4,000 years (WOAH, n.d). The earliest documented reference to rabies dates to approximately 2300 BCE in the Mesopotamian Laws of Eshnunna, which described legal penalties for owners of “mad dogs” that caused human deaths, demonstrating an early recognition of the disease's association with dog bites and its fatal outcome (Biology Insight, 2025). Subsequent accounts by Greek and Roman scholars, including Aristotle and Celsus, further documented the clinical manifestations and transmission of rabies, indicating that the disease was recognized across multiple ancient civilizations long before its viral cause was understood.

Despite being entirely preventable through vaccination and timely post-exposure prophylaxis, rabies remains a significant public health and veterinary concern, particularly in Asia and Africa. The disease continues to cause thousands of human deaths annually, predominantly following exposure to infected dogs, which remain the principal reservoir and source of transmission to humans in most endemic countries (WHO, 2026, WOAH, n.d).

The following sections provide an overview of the current global epidemiology of rabies, including trends in human mortality and the occurrence of rabies in animal populations.

Human Rabies Cases

WHO has reported country-level rabies mortality data since 2010, revealing a persistent concentration of human rabies deaths in Asia and Africa, with 2,983 rabies-associated deaths recorded globally across 105 Member States in the first year of reporting (WHO, 2026).

As of July 2026, WHO rabies mortality data cover the period from 2010 to 2024 (WHO, 2026). To illustrate temporal trends, fluctuations in reporting, and

missing surveillance data, Figure 4 presents the data across three consecutive five-year periods: 2010–2014, 2015–2019, and 2020–2024. Countries are shaded according to the number of reported deaths, ranging from 0 (green) to more than 1,000 (brown), while grey areas indicate unavailable surveillance data.

Throughout the 15-year period, the highest reported rabies mortality burden

remained concentrated in Asia and Africa, whereas most countries in Europe, North America, and Oceania reported few or no deaths (WHO, 2026). India consistently remained in the highest mortality category across the 2015-2019 and 2020-2024 periods, while other Asian countries, including China and the Philippines, also reported substantial mortality.

During 2010–2014 (Figure 4-A), reporting gaps were widespread, particularly across Africa and parts of Asia, resulting in considerable areas with unavailable data (WHO, 2026). Among reporting countries, the highest mortality was concentrated in South and East Asia,

while several African countries reported moderate to high numbers of deaths. Most countries in Europe and the Americas reported either no deaths or only a small number of cases.

In 2015–2019 (Figure 4-B), the geographic distribution of rabies mortality remained broadly unchanged, but reporting coverage improved (WHO, 2026). More African countries submitted data to WHO, revealing a wider distribution of rabies deaths across the continent. High mortality continued to be reported from several Asian countries, while many African countries recorded tens to hundreds of deaths.

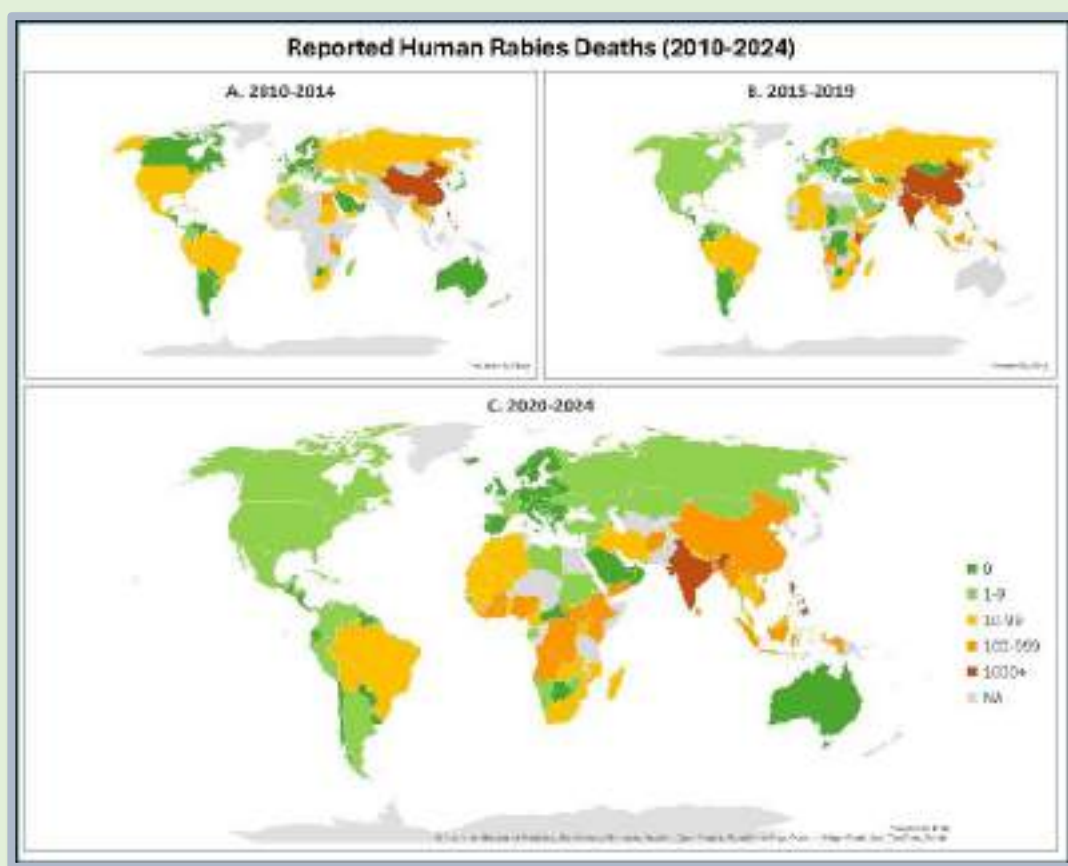


Figure 4. Reported human rabies deaths by country, 2010–2024
(Source: WHO global health observatory (<https://www.who.int/data/gho/data/indicators/indicator-details/GHO/reported-number-of-human-rabies-deaths>))

Further improvements in reporting coverage were observed during 2020–2024 (Figure 4-C), with fewer countries classified as having unavailable data. Rabies mortality remained concentrated in Asia and Africa, with India continuing to report the highest burden. Several countries in Southeast Asia and Africa also reported substantial mortality, while most countries in Europe, the Americas, and Oceania continued to report no deaths.

While the distribution of reported rabies mortality has changed since 2010, reporting completeness has gradually improved. However, persistent gaps in reporting suggest that the observed mortality burden likely underestimates the true global impact of rabies, particularly in endemic countries with limited diagnostic and surveillance capacity (WHO, 2018c).

Distinct regional trends were observed over the reporting period (Figure 5). The

Western Pacific Region reported the highest annual mortality during the early years of surveillance, contributing to most global deaths between 2010 and 2014 (WHO, 2026). This burden gradually declined thereafter, although the region remained a major contributor in the following years. In contrast, the African Region showed substantial year-to-year fluctuations, with notable increases in reported deaths between 2015 and 2017 and during 2022–2024. The South-East Asia Region also experienced a pronounced peak in 2015–2017 before declining in subsequent years. Meanwhile, the Eastern Mediterranean Region generally reported comparatively low numbers of deaths but showed a marked increase in 2024. Throughout the period, reported deaths in the Americas and Europe remained consistently low. Annual global totals fluctuated considerably, with peaks observed in the mid-2010s and again during 2023–2024.



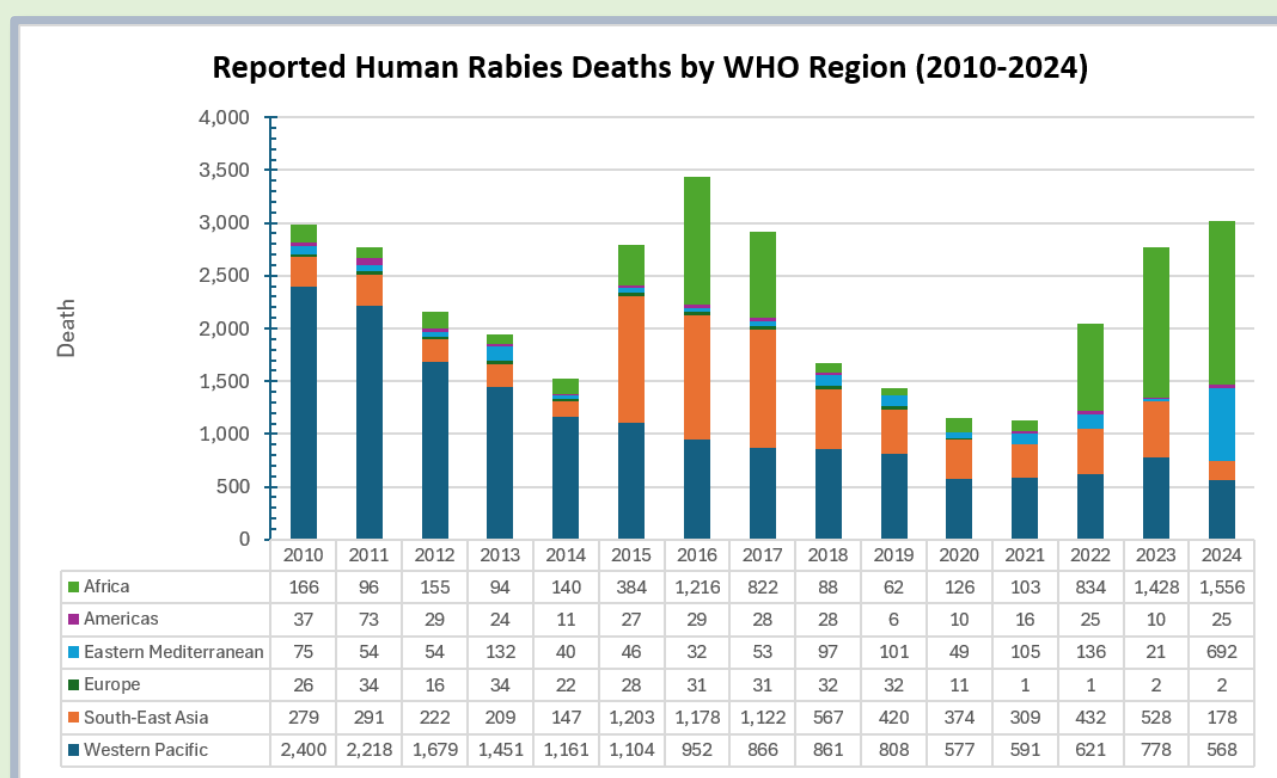


Figure 5. Distribution of reported rabies deaths by WHO Region, 2010 - 2024
(Source: WHO global health observatory (<https://www.who.int/data/gho/data/indicators/indicator-details/GHO/reported-number-of-human-rabies-deaths>))

Animal Rabies Cases

Animal rabies data for this report were sourced from the WOAHA via its World Animal Health Information System (WAHIS), which has been collecting and disseminating standardized, validated animal health data since 2005 (WOAH, 2026;). This platform provides

standardized global surveillance records on disease occurrence across reporting countries. The animal rabies detections from 2010 to 2024 by host type (domestic vs. wild) and species, providing essential context to complement the human mortality data is shown in Figure 6.

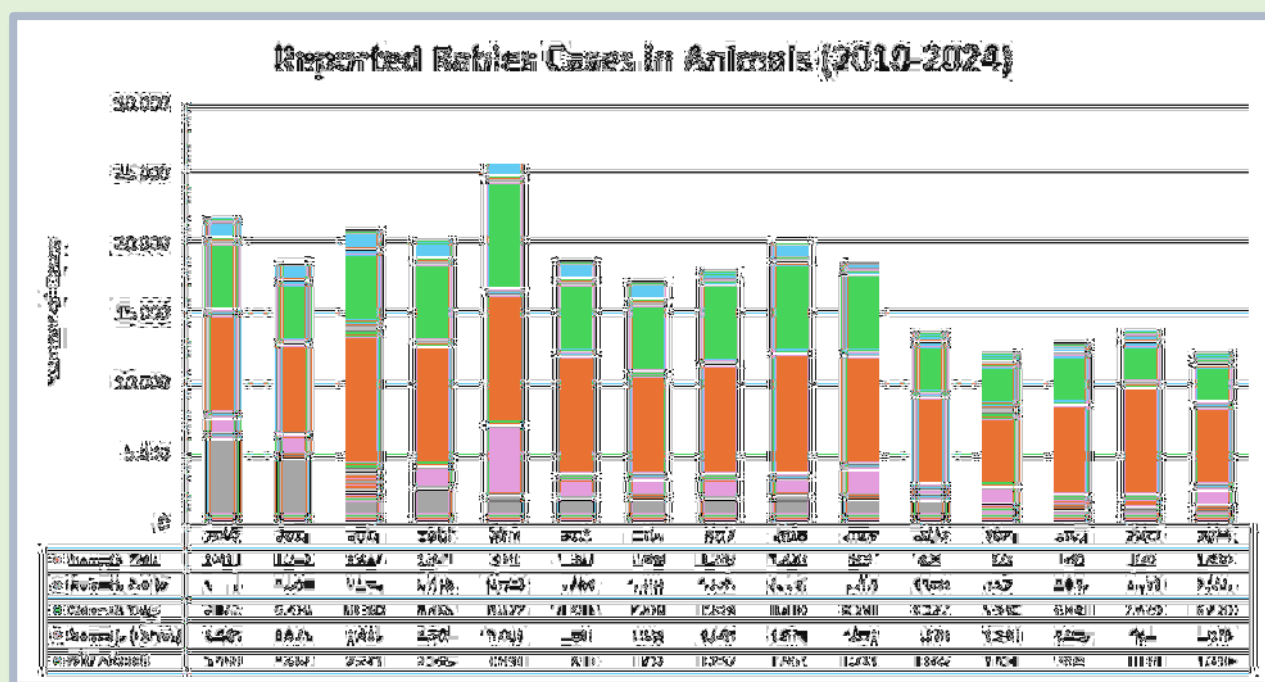


Figure 6. Distribution of reported rabies cases in animals, 2010 - 2024
(Source: WAHIS (<https://wahis.woah.org/#/dashboards/qd-dashboard>))

From 2010 to 2024, a total of 266,458 animal rabies cases were reported to WOA (WOAH, 2026). Annual detections fluctuated substantially over the period, ranging from 12,369 to 25,801 (Figure 6). However, a clear declining trend shows from 2019 onwards, with reported cases falling sharply from 18,708 in 2019 to 13,786 in 2020 and reaching a low of 12,376 in 2021. Although a modest rebound was observed in 2022 and 2023, the number of reported cases remained well below levels recorded during the first decade of the reporting period and declined again to 12,369 cases in 2024. Overall, annual animal rabies detections decreased by nearly half between the peak observed in 2014 and the most recent reporting year, indicating a substantial downward trend over time.

Domestic dogs consistently accounted for the largest share of reported animal rabies detections, contributing 34.5%–54.9% of annual records (WOAH, 2026). The proportion increased over time, exceeding half of all detections in 2023 and 2024. Domestic cattle represented the second-largest category (20.7%–32.5%), while wild animals accounted for 7.7%–27.1% of detections. Other domestic animals contributed 6.7%–19.6%, whereas domestic cats consistently represented the smallest proportion (3.6%–8.3%).

Overall, the composition of reported animal rabies detections shifted towards a greater predominance of dogs, while the relative contribution of cattle declined slightly. Wild animal detections fluctuated substantially from year to year (7.7–27.1%), whereas cats and other

domestic animals remained relatively stable throughout the reporting period. These findings highlight the central role of dogs in the epidemiology of rabies and underscore the importance of sustained dog vaccination and surveillance programmes.

The incidence of rabies in wildlife, however, is likely underestimated because surveillance systems primarily detect animals that are found, submitted for testing, or involved in human or domestic-animal exposures (WHO, 2018c). WHO therefore recommends risk-based investigation of suspected animal cases and integrated reporting across human and animal health sectors.

While direct comparisons between human and animal rabies data should be interpreted with caution, the findings demonstrate the continued importance of animal reservoirs in sustaining rabies transmission. The large proportion of cases reported in domestic dogs, combined with the persistence of human rabies deaths, highlights the critical role of controlling rabies at its animal source. Strengthening surveillance and reporting across both human and animal health sectors remains essential for improving burden estimates and guiding effective rabies control strategies.



Burden of Rabies in the ASEAN Region

Rabies is often under-reported, misdiagnosed, or undiagnosed, resulting in limited data on human deaths, vaccine access, and animal infections. Existing data typically indicate disease presence rather than its full burden. As control

programmes expand toward dog-mediated rabies elimination, surveillance and data quality are expected to improve (WHO, 2025b). The distribution of reported human rabies deaths in ASEAN region is shown in Figure 7.

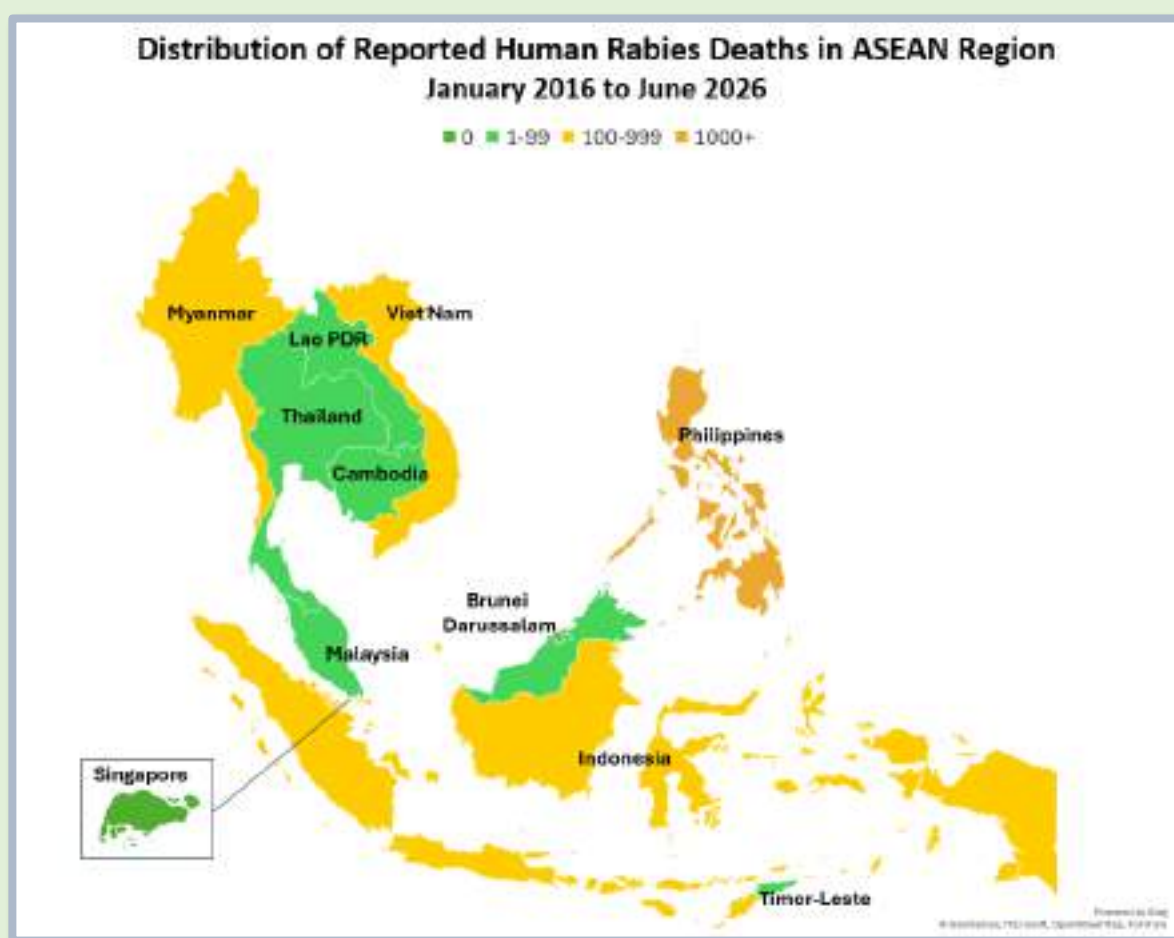


Figure 7. Distribution of reported rabies deaths in ASEAN, 2015 - 2024
(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>))

According to WHO and ABVC surveillance data, AMS reported a total of 5,482 human rabies deaths between January 2016 and June 2026 (Figure 8). Data for 2016–2024 were obtained from WHO, while data for 2025 and January-June

2026 were compiled from ABVC Weekly Epidemiological Monitoring and Morbidity Reports (MMWR).

The Philippines accounted for the largest share of reported deaths, contributing 2,952 deaths (53.8% of the regional total)

over the reporting period. Annual deaths in the Philippines increased from 209 in 2016 to a peak of 425 in 2024 before declining to 211 in 2025 and 17 deaths during the first half of 2026. Viet Nam reported the second-highest cumulative number of deaths, with annual totals ranging from 66 to 103 deaths, followed by 23 deaths during the first half of 2026. Indonesia followed with 771 deaths recorded since data became available in 2019. Reported deaths fluctuated substantially, ranging from 40 in 2020 to peaks of 146 in both 2023 and 2025. Myanmar reported 637 deaths, with

annual totals varying considerably and increasing from 53 deaths in 2023 to 82 in 2024 and 112 in 2025, the lowest annual death was six, reported in 2017.

Lower but persistent numbers of rabies deaths were observed in Malaysia (97 deaths), Thailand (78 deaths), Lao PDR (70 deaths), and Cambodia (37 deaths). Timor-Leste reported 23 deaths, while Brunei Darussalam and Singapore reported no human rabies deaths throughout the reporting period, consistent with their rabies-free status.



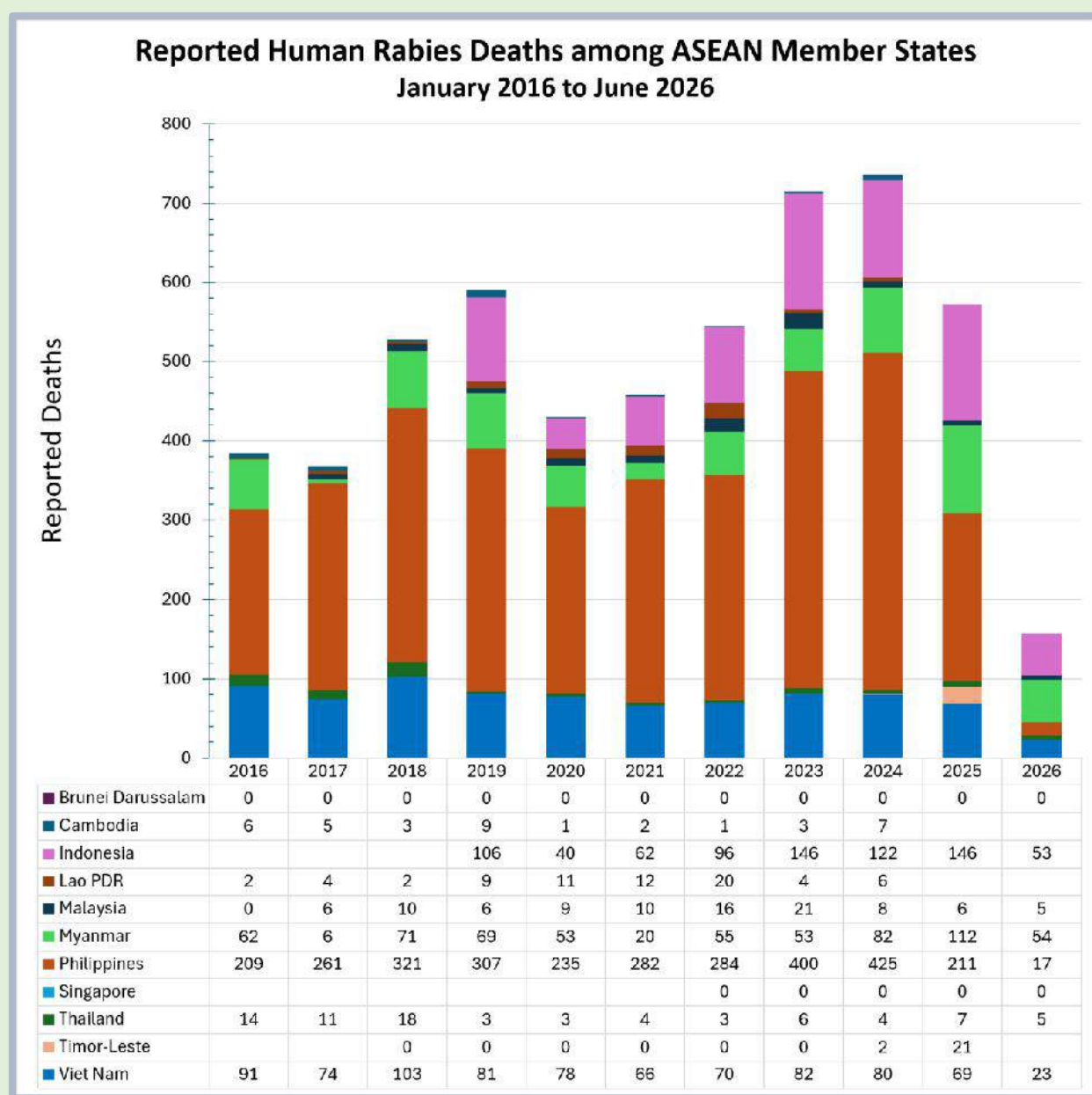


Figure 8. Trend of reported rabies deaths in the ASEAN Region, January 2016 – June 2026
(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))

Figure 8 summarizes reported human rabies deaths in the ASEAN region between January 2016 and June 2026. The regional burden is unevenly distributed, with few countries accounting for most reported deaths, while others report only sporadic cases or remain free from rabies. The country-

level description presented below provide further insight into national mortality trends, highlighting variations in disease burden, recent epidemiological developments, and progress towards rabies prevention and control across ASEAN Member States.



Brunei Darussalam

No human rabies deaths were reported in Brunei Darussalam between 2015 and

2026, reflecting the country's continued maintenance of its rabies-free status.



Cambodia

Cambodia reported relatively few human rabies deaths during 2016–2024, with annual totals remaining below 10 cases throughout the period (Figure 9). Reported deaths declined from six cases in 2016 to three cases in 2018 before increasing to a peak of nine cases in 2019. Following this peak, deaths

decreased markedly, reaching one case in both 2020 and 2022. A slight increase was observed thereafter, with three deaths reported in 2023 and seven deaths in 2024. No human rabies deaths had been reported in 2025 or during the first half of 2026.

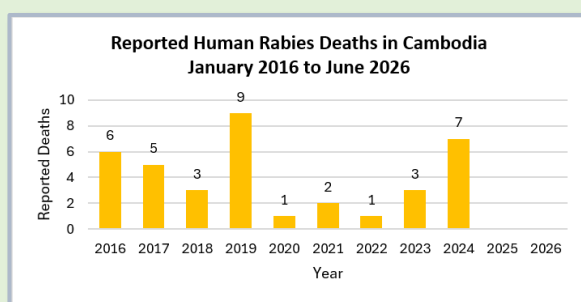


Figure 9. Trend of reported rabies deaths in Cambodia, 2016–2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Indonesia

Human rabies mortality in Indonesia fluctuated considerably over time, with 106 deaths reported in 2019 before declining sharply to 40 deaths in 2020 (Figure 10). Thereafter, the number of reported deaths increased steadily, reaching 62 cases in 2021 and 96 cases in

2022, before peaking at 146 deaths in 2023. Although deaths declined to 122 in 2024, the annual total returned to 146 in 2025. As of June 2026, 53 deaths had already been reported, suggesting that the full-year total may remain substantial.

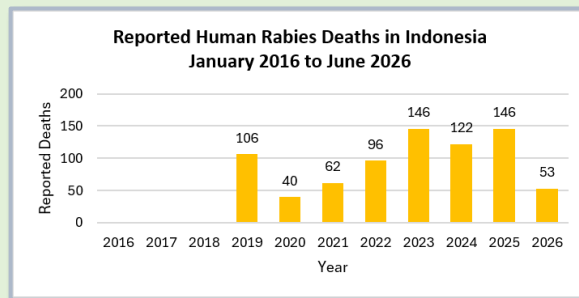


Figure 10. Trend of reported rabies deaths in Indonesia, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Lao PDR

Lao PDR reported relatively low but persistent human rabies mortality between 2016 and 2024, with a total of 70 reported deaths during the period (Figure 11). Annual deaths fluctuated from 2 to 20 deaths per year. Following two deaths reported in 2016, mortality increased to four deaths in 2017 before declining to two deaths in 2018.

Reported deaths subsequently rose steadily, reaching nine deaths in 2019, 11 in 2020, and 12 in 2021. The highest annual total was recorded in 2022, with 20 reported deaths. Thereafter, the number of deaths declined markedly to four in 2023 before increasing slightly to six in 2024.



Figure 11. Trend of reported rabies deaths in Lao PDR, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Malaysia

Malaysia reported a total of 97 reported deaths between 2016 and June 2026 (Figure 12). No human rabies deaths were reported in 2016, but annual mortality increased to six deaths in 2017 and 10 deaths in 2018. Reported deaths subsequently fluctuated between six and

10 cases annually from 2019 to 2021 before increasing to 16 deaths in 2022 and peaking at 21 deaths in 2023. Thereafter, the number of deaths declined to eight in 2024 and six in 2025. As of June 2026, five deaths had been reported.

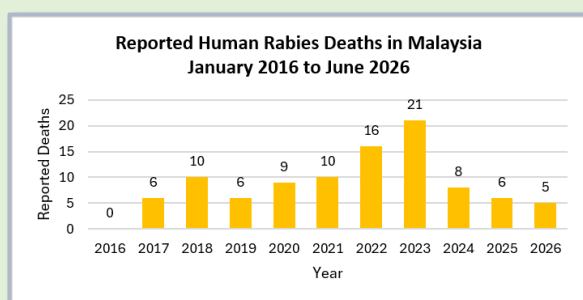


Figure 12. Trend of reported rabies deaths in Malaysia, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Myanmar

Myanmar reported 637 human rabies deaths between 2016 and June 2026 (Figure 13). Following 62 deaths in 2016, reported deaths declined sharply to six in 2017 before increasing to 71 in 2018 and remaining high at 69 in 2019. Deaths subsequently decreased to 53 in 2020 and reached a low of 20 in 2021. Thereafter, rabies mortality increased

again, with 55 deaths reported in 2022 and 53 in 2023, followed by a marked rise to 82 deaths in 2024. The highest annual total was recorded in 2025, with 112 reported deaths. As of June 2026, 54 deaths had already been reported, indicating that the annual total may remain substantial by the end of the year.

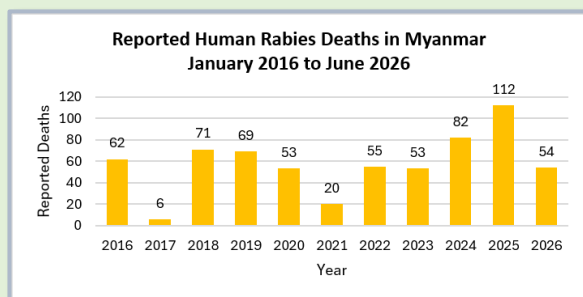


Figure 13. Trend of reported rabies deaths in Myanmar, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Philippines

The Philippines reported 2,952 deaths between 2016 and June 2026 (Figure 14). Annual deaths increased from 209 in 2016 to 321 in 2018, before declining to 235 in 2020. Following this decline, reported deaths rose again, reaching 282

cases in 2021 and 284 in 2022, before increasing peaking at 425 deaths in 2024. A total of 211 deaths were recorded in 2025, and in 2026, as of June, 17 deaths had been reported.

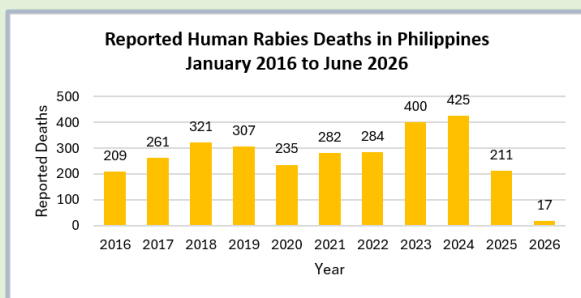


Figure 14. Trend of reported rabies deaths in the Philippines, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Singapore

Singapore reported no human rabies deaths during 2015–2026 and continued

to maintain its rabies-free status throughout the reporting period.





Thailand

Thailand reported 78 human rabies deaths between 2016 and June 2026, with annual mortality remaining relatively low throughout the reporting period (Figure 15). Reported deaths declined from 14 cases in 2016 to 11 in 2017 before increasing to a peak of 18 deaths in 2018. Thereafter, the number

of reported deaths decreased sharply to three cases in both 2019 and 2020. From 2021 onwards, annual mortality remained stable at low levels, fluctuating between three and seven deaths per year. In 2026, five deaths had been reported as of June.

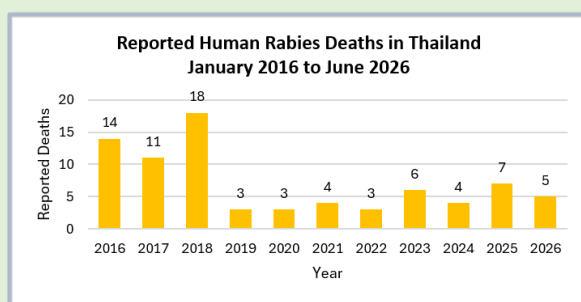


Figure 15. Trend of reported rabies deaths in Thailand, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Timor-Leste

Timor-Leste reported no human rabies deaths from 2018 to 2023 (Figure 16). The first reported rabies deaths occurred

in 2024, when two deaths were recorded, followed by a marked increase to 21 deaths in 2025.

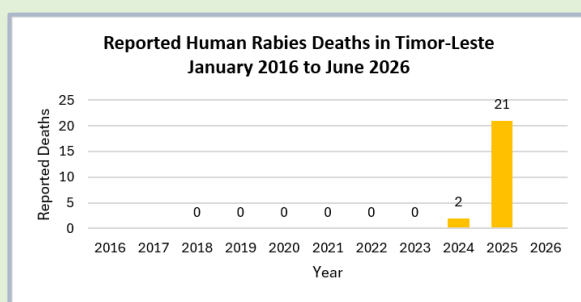


Figure 16. Trend of reported rabies deaths in Thailand, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Viet Nam

Viet Nam reported 817 human rabies deaths between 2016 and June 2026 (Figure 17). Annual mortality fluctuated from 2016 to 2025 but generally remained between 66 and 103 deaths per year. Following 91 reported deaths in 2016, the number declined to 74 in 2017 before increasing to a peak of 103 deaths

in 2018. Reported deaths gradually decreased, reaching a low of 66 deaths in 2021. Thereafter, mortality increased again to 82 in 2023 before remaining relatively high at 80 deaths in 2024. In 2025, 69 deaths were reported, while 23 deaths had already been reported by June 2026.

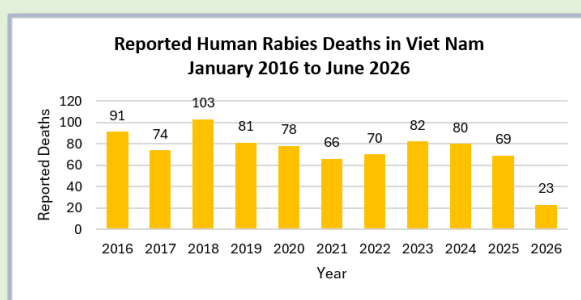


Figure 17. Trend of reported rabies deaths in Viet Nam, 2016-2026

(Source: WHO global health observatory (<https://www.who.int/data/gho/data/themes/topics/rabies>), ABVC MMWR data (<https://asean-phe.org/asean/data-publications/morbidity-and-mortality-weekly-report-mmwr>))



Case *Management and Prevention*



Case Management

Rabies is almost always fatal once clinical symptoms appear; therefore, effective case management relies on timely intervention following exposure and appropriate management of suspected or confirmed cases (WHO, 2025a). As there is currently no reliably effective treatment after the onset of clinical disease, prevention of disease progression through prompt post-exposure prophylaxis (PEP) remains the cornerstone of rabies case management. Appropriate wound management and administration of rabies biologicals when indicated are essential to prevent viral invasion of the central nervous system and subsequent fatal outcomes.

Post-exposure prophylaxis (PEP)

Post-exposure prophylaxis is an emergency intervention provided following suspected rabies exposure. The decision to initiate PEP requires assessment of the exposure event, including wound characteristics, type of exposure, and circumstances involving the potentially rabid animal.

Wound assessment includes evaluation of exposure date, anatomical location, number and severity of wounds, and exposure category.



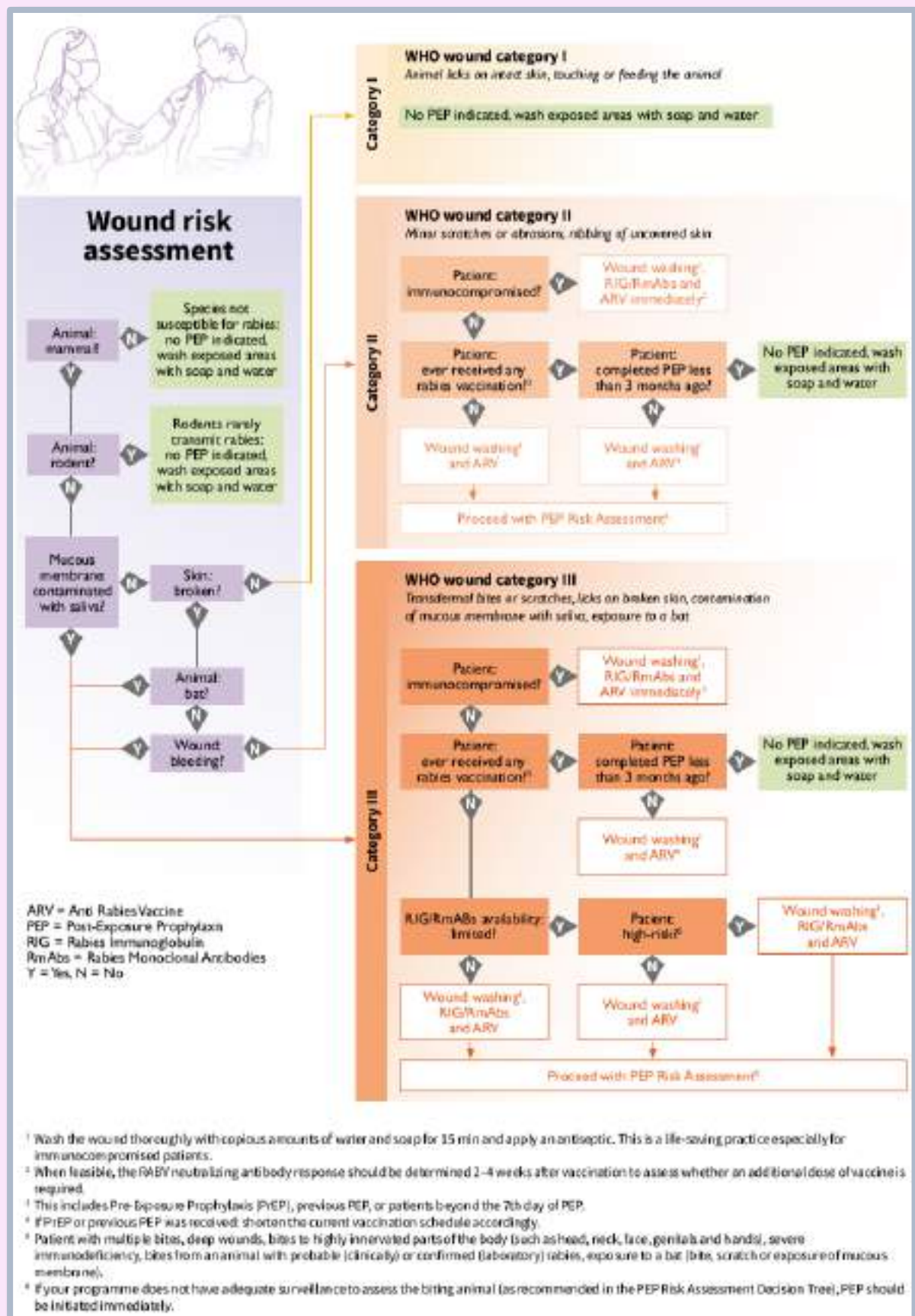


Figure 18. Decision tree for wound risk assessment in clinical settings
(Source: WHO (<https://www.who.int/publications/i/item/9789240107304>))

The wound risk assessment framework supports healthcare providers in evaluating exposure severity and determining the appropriate management pathway. Following wound assessment, animal-related risk factors, including animal species, health status, and vaccination status, are considered to determine the likelihood of rabies exposure.

Based on the integrated assessment of wound characteristics and animal-related risks, PEP may be initiated immediately, delayed while awaiting further assessment when appropriate, or considered unnecessary when the exposure does not meet criteria for suspected rabies exposure.

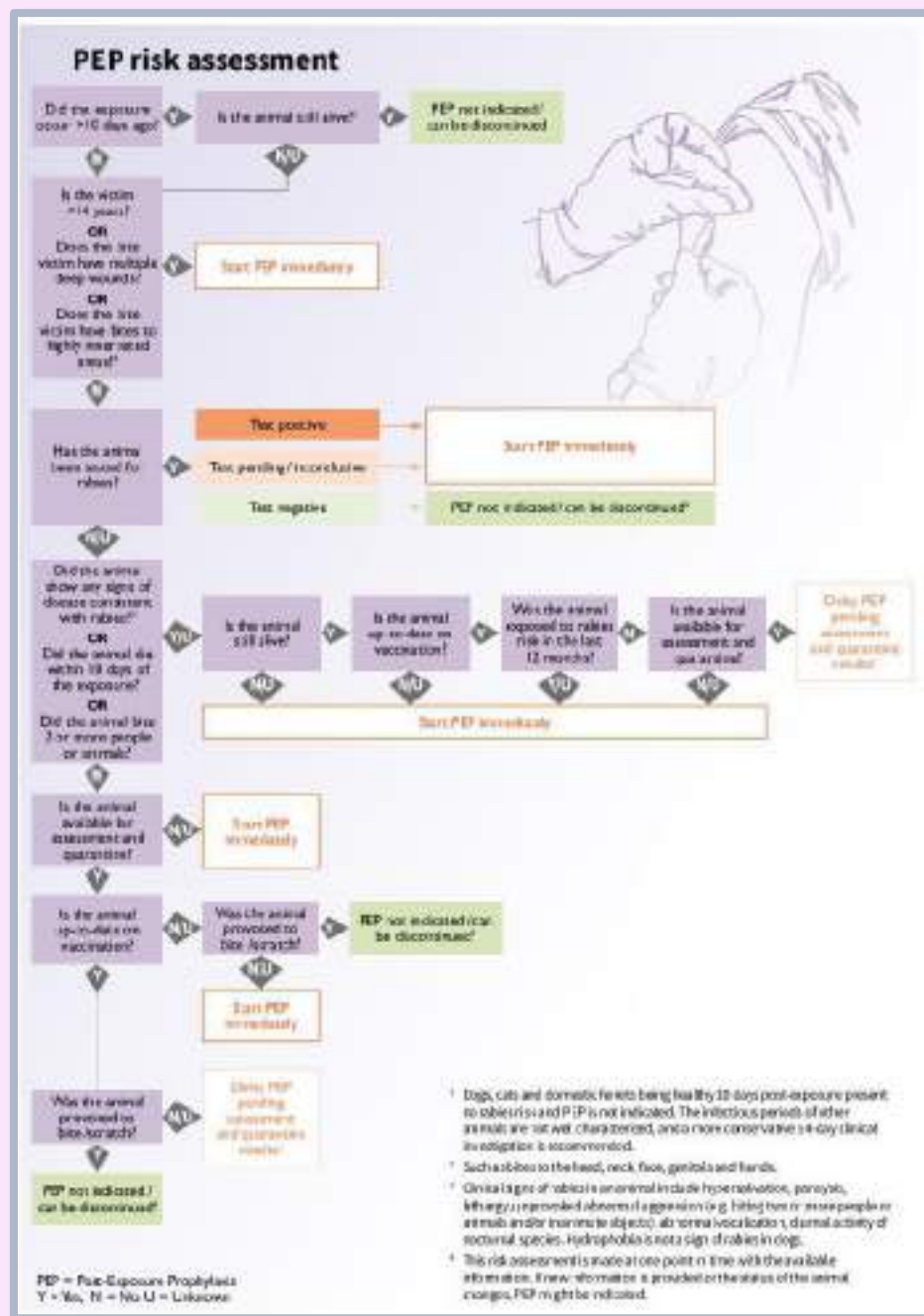


Figure 19. Decision tree for post-exposure prophylaxis risk assessment
(Source: WHO (<https://www.who.int/publications/i/item/9789240107304>)

The WHO decision tree supports healthcare providers in determining whether PEP is indicated by integrating patient information, wound characteristics, and exposure risk assessment. It facilitates consistent decision-making regarding the administration of rabies biologicals while allowing clinical decisions to be adapted according to individual patient circumstances.

When indicated, PEP consists of immediate and thorough wound washing, administration of rabies vaccine, and administration of rabies immunoglobulin (RIG) or monoclonal antibodies. Wound management should be performed as soon as possible through extensive washing with soap or detergent and copious amounts of water for approximately 15 minutes to reduce the risk of viral entry at the exposure site.

Follow-up during PEP

Completion of the recommended vaccination schedule is essential for successful PEP. Healthcare providers should ensure adherence to scheduled visits, document administration of rabies biologicals, and monitor potential adverse reactions.

Delays in seeking medical care, inadequate wound management, unrecognized exposure, high-risk exposure sites such as the head and neck, and incomplete adherence to vaccination schedules may contribute to

PEP failure. Accurate exposure assessment is also important to avoid unnecessary administration of rabies biologicals in individuals without eligible exposures. Appropriate use of PEP ensures that individuals at risk receive timely treatment while minimizing avoidable healthcare burden.

Management of clinical rabies and public health measures

Although PEP is highly effective before symptom onset, management options become limited once clinical rabies develops. Early confirmation of rabies can support clinical decision-making, including consideration of intensive care, experimental therapeutic approaches, or palliative management. Supportive care remains essential for patients with clinical rabies, particularly in managing disease progression and providing appropriate care for patients and their families.

Confirmation of rabies in hospitalized patients supports implementation of infection prevention measures, including barrier nursing and assessment of possible exposures among healthcare workers and family members. Individuals exposed to infectious secretions from a confirmed rabies patient may require PEP according to their exposure risk assessment.

Laboratory-confirmed cases also contribute to public health actions by supporting identification of other

potentially exposed individuals and guiding appropriate response measures. Therefore, case management of rabies requires coordination between clinical

care and public health services to reduce preventable deaths and limit further transmission.

Prevention

Rabies is preventable, and effective tools are available to interrupt transmission in animals and prevent infection in humans. The elimination of dog-mediated human rabies requires a combination of interventions targeting both animal and human populations, supported by strong surveillance and cross-sectoral collaboration. Rabies prevention is therefore based on three complementary approaches: community awareness, mass dog vaccination, and human vaccination (WHO, n.d.c).

Community awareness

Awareness of rabies disease engages communities and empowers people to protect themselves by seeking appropriate care when needed. This includes understanding how to prevent rabies in animals, when to suspect rabies, and what actions should be taken following a bite or scratch from a potentially rabid animal (WHO, n.d.c). Public education for both children and

adults on dog behaviour and bite prevention, what to do if bitten or scratched by a potentially rabid animal, and responsible pet ownership are essential extensions of rabies vaccination programmes (WHO, 2024).

Mass dog vaccination

Mass dog vaccination is a proven and cost-effective strategy for preventing human rabies by stopping transmission at its source. Although various animal species can host rabies, dogs are responsible for 99% of human rabies cases. Therefore, eliminating rabies in dogs is key to sustainably preventing human disease (WHO, n.d.c).

Vaccinating dogs, including puppies, through mass dog vaccination programs is the most cost-effective strategy for preventing rabies in people because it stops the transmission at its source. Culling free roaming dogs is not effective in controlling rabies (WHO, 2024).

Human vaccination

Human rabies vaccines are available to provide protection both before and after potential exposure. Pre-exposure prophylaxis (PrEP) is recommended for people in high-risk occupations, including laboratory workers handling live rabies and related viruses, and people whose professional or personal activities might lead to direct contact with infected animals, including animal disease control staff and wildlife rangers (WHO, 2024). PrEP might be indicated before recreation or travel in some areas, and for people living in remote, highly rabies-endemic areas with limited local access to rabies biologicals.

PEP is an emergency intervention provided following suspected rabies exposure (WHO, n.d.c). Prompt wound management and timely access to quality-assured PEP are highly effective in preventing human rabies deaths.

PrEP does not replace the need for PEP. Any person exposed to a suspected rabid

animal should still seek post-exposure care (WHO, 2024). As listed under the WHO Prequalification of Medical Products, as of 2024, there are only three WHO pre-qualified human rabies vaccines available globally: RABIVAX-S by Serum Institute of India Pvt. Ltd., VaxiRab N by Zydus Lifesciences Limited, and VERORAB by Sanofi Pasteur.

One Health Collaboration

Engaging communities to build awareness of rabies and vaccinating dogs to prevent human disease requires close One Health collaboration between the human and veterinary health sectors (WHO, n.d.c). National and regional elimination plans increase preparedness and surveillance and mobilize domestic resources. This coordinated response between animal and human health systems strengthens rabies surveillance and supports efforts to prevent human rabies.



Control Measures Strategy



In 2015, the global community, comprising WHO, WOA (formerly OIE), FAO, and GARC, joined forces under the United Against Rabies collaboration (WHO, FAO, WOA, and GARC, 2018). The collaboration aims to achieve zero human deaths from dog-mediated rabies by 2030 through coordinated global

action and a One Health approach. The Zero by 30 global strategic plan provides a country-led, globally supported framework for rabies elimination, with countries leading implementation and global partners providing coordinated support.

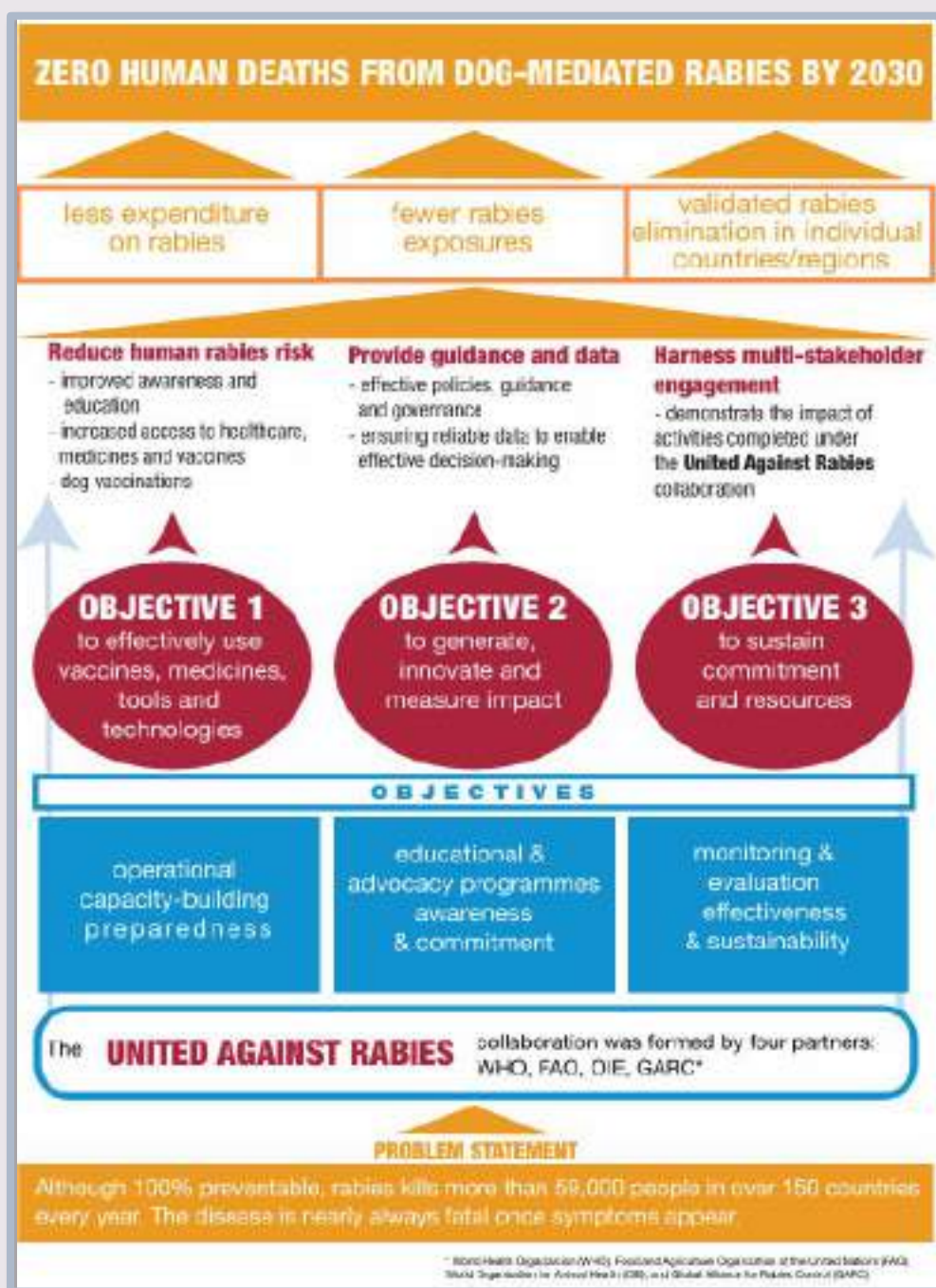


Figure 20. Global Strategic Plan Prioritizes the Objectives
(Source: WHO (<https://www.who.int/publications/i/item/9789241513838>))

Implementation of rabies elimination activities is supported by operational capacity-building and preparedness, educational and advocacy programmes, and monitoring and evaluation. Surveillance and reliable data support effective decision-making, while policies, guidance, and governance provide a framework for implementation. National and regional elimination plans are intended to increase preparedness and surveillance, mobilize domestic resources, foster collaboration across ministries, and enhance national capacity at all levels. These plans also promote the inclusion of dog-bite treatment within health systems, increase access to dog and human vaccines, and support the development of a One Health approach.

The United Against Rabies collaboration brings together the respective roles and expertise of WHO, FAO, WOAH, and GARC to support global rabies elimination efforts. WHO provides global public health leadership, technical support, and capacity-building. FAO engages governments, civil society, and private-sector partners and links local

communities with regional and global initiatives. WOAH develops evidence-based international standards, guidelines, and recommendations for animal disease control, manages the WAHIS, and promotes the strengthening of Veterinary Services. GARC develops information, surveillance, and training tools, provides training and capacity-building, coordinates regional intersectoral rabies networks, and undertakes advocacy, education, and communication activities.

At the country level, national governments lead implementation through national and regional rabies elimination plans, while countries take control of and own their elimination efforts. The United Against Rabies collaboration supports this process through advocacy and prioritization of rabies elimination, establishment of global norms and standards, coordination of global elimination efforts, and monitoring of progress and results. The country-centric and multi-stakeholder structure of this approach is presented in Figure 21.



Figure 21. United Against Rabies a country-centric, multi-stakeholder collaboration
(Source: WHO (<https://www.who.int/publications/i/item/9789241513838>))

This global framework provides the basis for coordinated implementation of rabies elimination efforts at national and regional levels, with countries leading implementation and global partners providing coordinated support. The

regional application of these efforts is further described through the strategies of the WHO South-East Asia Region (SEARO) and the WHO Western Pacific Region (WPRO).

Regional Control Measures Strategy

South-East Asia Region (SEARO)

The WHO SEARO has established a regional framework for the elimination of human rabies transmitted by dogs, emphasizing prevention, promotion and partnership in May 5, 2016 (WHO SEARO, 2016). Control of canine rabies is centered on sustained dog vaccination, with 70% vaccination coverage identified as sufficient to stop transmission. The

framework also promotes cost-effective approaches to improve access, availability and affordability of PEP, including IDRV, alongside responsible dog ownership and dog population management. Community awareness, education and advocacy are also identified as key measures to improve dog-bite prevention, wound management and timely access to PEP.

Implementation requires coordinated action across human health, animal health, government agencies, communities, civil society and international partners (WHO SEARO, 2016). SEARO emphasizes national rabies programmes, intersectoral coordination, appropriate legislation, community participation and technical support from regional and WHO collaborating centres. Surveillance and monitoring are also integral to the framework, covering human and animal rabies cases, dog vaccination coverage, PEP availability and programme implementation.

Recent regional assessments show that all seven surveyed rabies-endemic countries have a National Rabies Control Programme, while almost all have a National Strategic Plan (WHO SEARO, 2024). PEP is widely available free of charge at public health facilities, and ID vaccination is used in most countries. However, implementation remains uneven. Vaccine stockouts and shortages of RIG can affect PEP access, while the recommended shortened one-week ID schedule is not consistently used. Surveillance systems are in place, but reporting between human and animal health sectors is not always systematic, case reviews are not consistently conducted, and diagnostic capacity remains concentrated in a limited number of facilities.

Community engagement remains another area requiring strengthening Plan (WHO SEARO, 2024). Although countries conduct awareness campaigns, including programmes targeting schoolchildren, limited local understanding, myths and misinformation, difficulties in reaching target populations and insufficient behaviour change continue to affect programme implementation. Across the Region, limited capacity and resources for dog rabies control, together with gaps in coordination, collaboration and political commitment, remain key challenges.

To accelerate progress towards zero human deaths from dog-mediated rabies by 2030, SEARO therefore emphasizes strengthening One Health surveillance and rapid response, universal access to quality and affordable PEP, community engagement, and political commitment and resources (WHO SEARO, 2024). The WHO South-East Asia Regional Strategic Framework for the Elimination of Human Rabies Transmitted by Dogs remains an important regional reference, while WHO SEARO has further strengthened its rabies elimination efforts through alignment with the Zero by 30 global target and the establishment of a new Regional Technical Advisory Group for 2026–2029.

Western Pacific Region (WPRO)

The WHO WPRO continues to face a substantial rabies burden, with more than 10,000 human rabies cases reported by eight countries between 2013 and 2024 (WHO WPRO, 2024). Endemic countries have established national rabies control programmes and strengthened capacities in vaccination, laboratory diagnostics and dog vaccination campaigns.

To achieve zero human deaths from dog-mediated rabies by 2030, WPRO

identifies four priority actions: strengthening human and animal rabies surveillance; promoting multisectoral collaboration across health, veterinary and other relevant sectors; enhancing and sustaining rabies control capacities; and raising awareness of rabies prevention and control, particularly in at-risk communities 2024 (WHO WPRO, 2024). Enhanced coordination, investment and prevention strategies are identified as critical to addressing the ongoing impact of rabies in the Region.

Control Measures in ASEAN Member States

Recognising rabies as a significant zoonotic disease and a continuing public health challenge, ASEAN Member States adopted the ASEAN Rabies Elimination Strategy (ARES) in 2014 as the regional framework for achieving zero human deaths from dog-mediated rabies by 2030 (WOAH, 2025a). Developed jointly by the ASEAN Sectoral Working Group on Livestock (ASWGL) and the ASEAN Experts Group on Communicable Diseases (AEGCD), ARES promotes a One Health approach that integrates human health, animal health, and community engagement to strengthen rabies prevention, control, and elimination efforts across the region.

To support implementation of the strategy, the ARES Implementation Plan was reviewed and updated during the

ASEAN Rabies Meeting in Thailand in February 2025, aligning it with the Global Strategic Plan for the Elimination of Dog-Mediated Human Rabies and reaffirming WOA's support for ASEAN under the ASEAN-WOAH Memorandum of Understanding signed in 2021 (WOAH, 2025a). ASEAN subsequently established the ASEAN Rabies Coordination Group (ARCG) as a regional platform bringing together animal and public health focal points from all ASEAN Member States, supported by the ASEAN Secretariat and Quadripartite partners (WHO, FAO, WOA, and UNEP). During its inaugural meeting in Manila in June 2026, the ARCG advanced the implementation plan, strengthened mechanisms for data sharing, laboratory networking, and cross-border coordination, and agreed

on regional priorities for 2026–2027 (WOAH, 2025b).

ARES focuses on strengthening dog vaccination programmes, improving access to PEP, enhancing surveillance and reporting systems, securing sustained political commitment, and promoting regional cooperation (WOAH, 2025b). Through these coordinated efforts, ASEAN aims to accelerate progress towards eliminating dog-

mediated human rabies while maintaining rabies-free status in areas where the disease has already been controlled.

The following sections describe the rabies prevention and control measures implemented by individual ASEAN Member States in support of ARES and the regional goal of eliminating dog-mediated human rabies by 2030.

Brunei Darussalam

Brunei Darussalam continues to maintain its official rabies-free status across all four districts, reporting zero cases in both human and animal populations. The national strategy focuses primarily on sustaining this disease-free baseline through strict border controls, active disease surveillance, and proactive preventive measures in domestic pets (WOAH, 2025c).

Brunei's rabies prevention programme is supported by strong intersectoral collaboration. In line with the ASEAN Rabies Elimination Strategy (ARES), the Ministry of Health (MOH) and the Ministry of Primary Resources and Tourism (MPRT) jointly developed a Rabies Surveillance Plan in 2014 (WOAH, 2025c). This was further strengthened through the establishment of a Joint Task Force for Zoonotic Diseases in 2018,

bringing together multiple government agencies under a One Health framework to coordinate preparedness, surveillance, and response activities. The country also established a National One Health Coordinating Centre to strengthen national and regional health security.

Key preventive measures include the provision of pre-exposure rabies vaccination for high-risk occupational groups, such as veterinarians, laboratory personnel, animal handlers, and staff from animal welfare organizations (WOAH, 2025c). PEP is also available for individuals exposed to potentially rabid animals. In the animal health sector, Brunei maintains legal measures through the Animal (Disease and Quarantine) Act and Dog Act, supported by routine surveillance, tabletop simulation exercises, and vaccination

programmes for dogs and cats, including nationwide drive-through vaccination campaigns. Public awareness activities are regularly conducted to promote rabies prevention and responsible pet ownership.

Despite its rabies-free status, Brunei faces several ongoing challenges. These include increasing numbers of stray animals, rising dog bite incidents, limited public awareness, and difficulties implementing population control

measures such as neutering (WOAH, 2025c). Additional challenges relate to maintaining public trust and strengthening coordination among stakeholders. To address these issues, Brunei plans to review existing legislation, strengthen interagency collaboration through the Joint Task Force, expand public awareness programmes, and increase engagement with animal welfare groups as part of its 2025–2026 One Health agenda.

Cambodia

Cambodia is strengthening its efforts to eliminate rabies through a One Health approach led by the Ministry of Health and the General Directorate of Animal Health and Production (WOAH, 2025d). Coordination is facilitated through the Inter-Ministerial Coordination Committee (IMCC) for One Health, which has overseen the updating of Cambodia's National Strategic Plan for Rabies Elimination by 2030, national rabies surveillance and control guidelines, and the implementation of Integrated Bite Case Management (IBCM) in several provinces. Standard operating procedures for IBCM, PEP, and mass dog vaccination (MDV) have also been developed to support programme implementation.

MDV remains a key component of Cambodia's rabies control strategy

(WOAH, 2025d). In 2024, more than 230,000 dogs were vaccinated, with coverage reaching approximately 85% in targeted areas. Animal surveillance activities were also strengthened, with around 180 suspected canine rabies cases tested annually during 2023 and 2024, of which more than 40–50% were confirmed positive. Public awareness campaigns were conducted through schools and community outreach programmes to improve understanding of rabies prevention and responsible animal ownership.

Human rabies prevention efforts focus on improving access to PEP and strengthening surveillance (WOAH, 2025d). In 2023, more than 60,000 individuals received PEP, while in 2024, over 58,000 PEP recipients were reported. Dog bites remain a major

public health concern, with an estimated 425,000 bite incidents occurring annually, many involving children and severe exposures requiring medical attention.

Despite recent progress, several challenges continue to hinder rabies elimination efforts. These include limited information on dog population size and distribution, the fact that rabies is not currently a notifiable disease in either

humans or animals, and difficulties delivering PEP and dog vaccination services in remote areas (WOAH, 2025d). To address these challenges, Cambodia plans to expand PEP, IBCM, and mass dog vaccination programmes nationwide, strengthen public awareness activities, improve laboratory capacity, enhance community-level surveillance, and mobilize additional support from development partners and the private sector.

Indonesia

Indonesia continues to strengthen rabies prevention and control through a One Health approach involving close collaboration between the human and animal health sectors. In March 2025, the Ministry of Health issued Circular Letter No. HK.02.02/C/508/2025 to enhance national vigilance against rabies, highlighting the continued burden of animal bites and human rabies deaths in endemic provinces (Ministry of Health of Indonesia, 2025). The circular called for strengthened health promotion, integrated human and animal rabies surveillance, joint epidemiological investigations, improved reporting systems, animal vaccination, population management, and enhanced access to rabies prevention and treatment services.

A key component of Indonesia's rabies control programme is the establishment

of Rabies Centers, designated health facilities located primarily in community health centres and hospitals (Ministry of Health of Indonesia, 2023). These centres aim to improve access to timely rabies prevention and management services for victims of animal bites. In addition to providing standardized case management, Rabies Centers support health promotion, maintain adequate stocks of rabies vaccine and RIG/serum, and contribute to rabies surveillance, recording, and reporting activities. Their overall objective is to prevent human rabies deaths through prompt post-exposure management and increased public awareness.

Rabies Centers operate within a One Health framework and are required to coordinate closely with veterinary authorities whenever a case of animal bite exposure is reported (Ministry of

Health of Indonesia, 2023). This collaboration supports animal investigation, observation, laboratory testing, risk assessment, and follow-up actions, while facilitating routine information exchange between the human and animal health sectors. Rabies Centers also play an important role in strengthening surveillance through case investigation, documentation, and reporting to district and provincial health authorities.

Standard management of animal-bite cases includes immediate wound washing with soap and running water for at least 15 minutes, administration of antiseptics, and provision of rabies

vaccine and RIG/serum when indicated (Ministry of Health of Indonesia, 2023). To support these services, Rabies Centers are responsible for maintaining cold-chain systems, ensuring continuous vaccine availability, and providing communication, information, and education materials to promote rabies prevention and appropriate health-seeking behaviour. Successful implementation is measured by adherence to standard treatment protocols, uninterrupted availability of vaccines and biologicals, effective surveillance and reporting, and the prevention of rabies deaths among individuals receiving appropriate post-exposure care.

Lao People's Democratic Republic

Since 2023, Lao People's Democratic Republic (Lao PDR) has strengthened rabies prevention and control through a national strategy, multisectoral collaboration, and improved surveillance systems (WOAH, 2025e). These coordinated activities aim to reduce rabies incidence in humans and animals, in line with regional and global health security objectives.

1. The National Strategic Plan on Rabies Prevention and Control (2020–2024) includes key activities under the “Zoonosis” focus area, aligned with the national workplan on Emerging Infectious Diseases

(EID), Public Health Emergencies (PHE), and health security (2016–2020).

2. Human and animal health surveillance systems have been in place since 2009.
3. A Technical Working Group Rabies Committee was established in 2021 to guide national rabies prevention and control activities.
4. A pilot community-based surveillance program was launched in Xayabouly province in 2023.
5. The National Animal Health Laboratory provides diagnostic services for rabies.

6. Annual dog vaccination campaigns are conducted during World Rabies Day and Lao National Vaccine Day in November.
7. Human rabies vaccines are supplied from central stores to district health facilities nationwide.
8. Strong collaboration exists among the MOH, Ministry of Agriculture and Forestry (MOAF), and Ministry of Education and Sport (MOES) to coordinate rabies prevention and control activities.

Despite progress since 2023, Lao PDR continues to face several challenges. Laboratory confirmation of rabies

remains limited, with diagnostic capacity available only at the central level (WOAH, 2025e). Dog population data and wildlife surveillance are also limited, while public awareness and access to human rabies vaccines, particularly in rural areas, remain insufficient. To strengthen national efforts, Lao PDR is working to expand mass dog vaccination, improve access to human post-exposure prophylaxis, strengthen laboratory and surveillance capacity, and increase public awareness through school and community outreach. Continued advocacy and funding support will be important to sustain rabies prevention and control efforts.

Malaysia

Malaysia has maintained a strong focus on rabies prevention and control, with the national target of achieving zero rabies deaths by 2030 (WOAH, 2025f). Although Malaysia was declared rabies-free in 2013, rabies remains endemic in Sarawak, and there is an ongoing risk of cross-border introduction. In 2023, one imported human rabies case was reported in Selangor, while all reported animal rabies cases originated from Sarawak, with dogs accounting for nearly 89% of cases.

Rabies control is supported through multisectoral coordination, including annual interagency meetings on zoonotic diseases, a Joint Risk Assessment

conducted in 2024, and the National Strategic Plan for Rabies Elimination (MyRES). High-risk personnel receive PrEP, while preparedness is strengthened through simulation exercises, training programmes, and the National Rabies Animal Vaccine Bank (WOAH, 2025f).

IBCM is guided by national rabies guidelines updated in 2022. In Sarawak, animal bite management is supported by the digital i-Bite system, while PEP and RIG are available through designated public and selected private healthcare facilities. Animal control measures include mandatory dog vaccination and licensing, restrictions on free-roaming

dogs in outbreak areas, and strengthened laboratory surveillance through collaboration between national and state veterinary laboratories (WOAH, 2025f).

Public awareness and community engagement remain important components of the programme (WOAH, 2025f). Annual campaigns are conducted during World Rabies Day and in high-risk areas through mass media, social media, community outreach, and simulation exercises. Cross-border prevention is further supported by an established "immune belt" along the northern states of Peninsular Malaysia and bilateral collaboration with Thailand. In Sarawak, Immune Belt Enforcement Teams conduct dog vaccination, surveillance,

census activities, and community education in border areas (WOAH, 2025f).

Despite these efforts, Malaysia continues to face challenges related to limited access to veterinary and healthcare services in remote areas, increasing free-roaming dog populations, low vaccination compliance among some pet owners, cross-border animal movement, limited public awareness, and resource constraints (WOAH, 2025f). To address these gaps, Malaysia is developing MyRES and strengthening surveillance, One Health coordination, risk communication, vaccine availability, and cross-border collaboration to support progress towards rabies elimination.

Myanmar

Myanmar has made notable progress in rabies prevention and control through coordinated efforts across the animal and human health sectors (WOAH, 2025g). In the animal health sector, rabies is a notifiable infectious disease under the Animal Health and Livestock Development Law, requiring dog owners to report suspected cases and participate in control measures. A National Action Plan for Rabies Elimination in Dogs (2028–2030) has been developed around five strategic pillars: socio-cultural, technical, organizational, political, and resources. The plan supports

surveillance, dog vaccination, and population management through strengthened communication, collaboration, and coordination among stakeholders.

In the human health sector, rabies is included in the national surveillance system, with routine weekly and monthly reporting, and immediate notification of rabies-related deaths to enable rapid local response (WOAH, 2025g). rEP and PEP are available at designated Dog Bite Treatment Centers and public hospitals. Coordination meetings and national workshops are conducted at the central

level, while state and regional authorities promote clinical advocacy for zoonotic diseases through a One Health approach. At the township level, refresher training is provided to healthcare workers on rabies prevention and control.

Despite these efforts, Myanmar continues to face challenges including limited funding for vaccines, shortages of skilled vaccinators, and limited mass dog vaccination coverage (WOAH, 2025g).

Surveillance data quality and laboratory capacity also remain limited, while management of free-roaming dogs and enforcement of responsible pet ownership remain difficult. Recommended measures include strengthening political commitment and regulatory enforcement, expanding oral rabies vaccination (ORV), improving One Health collaboration, and strengthening public education and awareness to support rabies elimination.

Philippines

Since 2023, the Philippines has strengthened rabies prevention and control through improvements in laboratory capacity, surveillance, dog vaccination, public awareness, and access to post-exposure prophylaxis (WOAH, 2025h). The Bureau of Animal Industry renovated its national rabies laboratory to improve diagnostic and surveillance capacity, while the Basta Wais, Iwas Rabies campaign, implemented in partnership with Breakthrough Action, strengthened public awareness through targeted Information, Education, and Communication (IEC) materials. More than 104,000 vaccine vials were procured nationally to support dog vaccination, and diagnostic capacity was strengthened through training with Japan and Philippines One Health Rabies (JAPOHR). More than 900 Animal Bite

Treatment Centers are also operating nationwide, improving access to post-exposure prophylaxis.

Despite these advances, challenges include limited awareness among pet owners, shortages of personnel and funding, and limited local government capacity for sample collection and diagnostic services (WOAH, 2025h). Key activities planned for 2025–2026 include developing the National Rabies Prevention and Control Program Strategic Plan and Manual of Procedures, strengthening local government participation through the inclusion of rabies prevention and control in the Seal of Good Local Governance, and incorporating rabies prevention into the basic education curriculum. These measures aim to sustain progress towards the national rabies elimination goals.

Singapore

Singapore has remained rabies-free since 1953, although the disease remains a risk due to cases in neighbouring countries. The Animal and Veterinary Service (AVS), together with border control agencies, maintains strict animal import controls, quarantine requirements, and licensing. Rabies is legally notifiable in both humans and animals (WOAH, 2025i).

Since 2023, rabies prevention and control activities have focused on bio surveillance of dogs, cats, and wildlife, supported by horizon scanning, alert systems, and contingency planning (WOAH, 2025i). More than 91,000 dogs and 24,000 cats are licensed for traceability, while smart collars monitor animals under home quarantine. Targeted vaccination and serological monitoring are conducted in high-risk areas, including coastal fish farms and offshore islands, with a 70% vaccination coverage target for high-risk dog populations. An ORV bait acceptance study has also been completed.

Dog population management is supported through the Trap-Neuter-Rehome/Release-Manage (TNRM) programme, alongside Project ADORE.

The programmes aim to reduce the free-roaming dog population through sterilisation, rehoming, fostering, and responsible ownership (WOAH, 2025i).

The Cat Management Framework includes mandatory licensing and microchipping of pet cats, TNRM for community cats, and education on responsible pet ownership and community cat caregiving (WOAH, 2025i). The Pet Cat Sterilisation Support (PCSS) programme provides free sterilization and microchipping for pet cats from lower-income households. Education and community engagement are supported through roadshows, community events, school programmes, and collaboration with animal welfare groups and community caregivers.

Key challenges include maintaining coordination with animal welfare groups and community caregivers, strengthening public awareness of science-based approaches, and building trust. Looking ahead, Singapore will continue import controls, bio surveillance, vaccination, and preparedness measures, with an oral rabies vaccine bait distribution pilot planned for 2025–2026.

Thailand

Thailand's rabies control programme is built on a comprehensive approach that integrates surveillance, vaccination, outbreak response, laboratory diagnosis, and the establishment of rabies-free areas (WOAH, 2025j). National efforts are supported by active and passive surveillance systems, with all rabies data recorded in the Thai Rabies Net (TRN) database. Local administrative authorities are required to submit surveillance samples regularly to support early detection, outbreak investigation, and monitoring of rabies-free areas.

Prevention activities focus on achieving and maintaining high vaccination coverage in dogs and cats through collaboration between veterinary authorities, local governments, and community volunteers (WOAH, 2025j). Thailand targets vaccination coverage of more than 80% in susceptible animal populations while also implementing dog and cat population management programmes, particularly for free-roaming animals. Public awareness campaigns and community education activities are conducted to increase knowledge of rabies prevention and encourage responsible pet ownership.

Rabies control measures include rapid disease investigation, active case finding, quarantine and vaccination of exposed animals, ring vaccination in affected

areas, animal movement control, and public risk communication (WOAH, 2025j). Temporary outbreak control zones may be established under the Animal Epidemic Act, accompanied by monitoring and surveillance activities for at least six months following outbreak detection. These measures are intended to rapidly contain transmission and prevent further spread of the disease.

Thailand has also developed a nationwide network of rabies diagnostic laboratories, including the National Institute of Animal Health, the Queen Saovabha Memorial Institute, and regional Veterinary Research and Development Centers (WOAH, 2025j). This diagnostic capacity supports timely confirmation of cases and strengthens the country's surveillance system. In parallel, Thailand continues to expand and assess rabies-free areas based on established criteria covering surveillance, vaccination coverage, outbreak response, and disease-free status.

Despite substantial progress, challenges remain in controlling rabies among free-roaming dog and cat populations and maintaining effective surveillance in all areas of the country (WOAH, 2025j). Continued investment in vaccination, surveillance, laboratory capacity, and community engagement will be critical to achieving Thailand's goal of eliminating dog-mediated rabies.

Timor-Leste

Timor-Leste remained free from dog-mediated rabies until the emergence of rabies on Timor Island in 2023, following outbreaks and associated human deaths reported in neighbouring West Timor, Indonesia (WOAH, 2025k). In response to the heightened risk of cross-border transmission, the Veterinary Services of Timor-Leste implemented pre-emptive preparedness and response measures, including strengthened border surveillance, public awareness activities, and mass dog vaccination campaigns supported through the WOAHP Vaccine Bank and the Australian Government. Between January and June 2024, more than 45,000 animals, predominantly dogs, were vaccinated in high-risk municipalities and the capital, Dili, with several border areas achieving vaccination coverage exceeding 70% of the local dog population.

To strengthen outbreak response, Timor-Leste established a National Rabies Incident Management Team and adopted a multisectoral One Health approach involving veterinary services, healthcare providers, customs and border authorities, police, military personnel, community leaders, and local communities (WOAH, 2025k). Despite these efforts, the country's first dog rabies cases and associated human

rabies death were reported in Oecusse Municipality in March 2024, followed by additional canine cases in Bobonaro and Covalima municipalities. These events marked the first documented incursion of dog-mediated rabies into Timor-Leste and highlighted the continuing challenges posed by cross-border animal movement, dog population turnover, difficult terrain, and limited community awareness.

Since the introduction of rabies, Timor-Leste has continued to strengthen its response through expanded vaccination campaigns, enhanced surveillance, workforce training, and cross-border collaboration with Indonesia (WOAH, 2025k). In June 2024, Timor-Leste and Indonesia signed a bilateral agreement to improve information sharing, surveillance, IBCM, and coordinated vaccination and awareness activities. Additional support from WOAHP and international partners has focused on training veterinary personnel, strengthening field investigation capacity, and developing a National Strategic Plan for dog-mediated rabies control. These efforts form part of Timor-Leste's long-term commitment to achieving the global goal of "Zero by 30", the elimination of human deaths from dog-mediated rabies by 2030.

Viet Nam

Vietnam's rabies control efforts are anchored in a strong legal framework which formally establishes inter-sectoral mechanisms between the human and animal health sectors (WOAH, 2025I). National efforts are guided by the National Programme for Rabies Control 2022–2030, the National One Health Strategic Plan for Zoonoses (2021–2025), and several Prime Ministerial directives on rabies prevention and control.

Recent activities have focused on improving access to treatment and strengthening surveillance systems (WOAH, 2025I). High-risk provinces provide free rabies vaccination to vulnerable populations, including low-income households and ethnic minority communities. Real-time surveillance systems operate in both the human and animal health sectors, supported by IBCM, EBS, and laboratory diagnostic capacity. Additional measures include dog registration programmes, public awareness campaigns, school-based education, One Health training, and research on dog populations and vaccine use.

Despite these efforts, several challenges remain. Rabies continues to receive limited attention in some areas, while dog vaccination and population management are difficult in remote and mountainous regions. In addition, access

to vaccines, diagnostic services, and surveillance activities remains limited in some hard-to-reach communities (WOAH, 2025I).

To address these challenges, Viet Nam is implementing the National Program on the Control and Elimination of Rabies, 2022–2030 (Prime Minister of Viet Nam, 2021). The programme aims to strengthen both animal and human rabies prevention through improved surveillance, vaccination, and access to care. On the animal health side, the programme targets the registration and management of 70% of dog- and cat-owning households by 2025 and more than 90% by 2030. Vaccination coverage is expected to reach at least 70% of dogs and cats by 2025 and 80% by 2030. The programme also seeks to expand animal rabies surveillance to more than 70% of provinces by 2025 and over 90% by 2030, while establishing additional rabies-safe zones and maintaining existing rabies-free areas.

In the human health sector, the programme aims to ensure the availability of rabies vaccines and rabies immunoglobulin in all districts, strengthen public awareness and education activities, and improve reporting of rabies vaccination through the national information system (Prime Minister of Viet Nam, 2021). Key targets

include providing PEP to at least 90% of exposed individuals, eliminating high-risk areas by 2025 and medium-risk areas by 2027, reducing human rabies deaths by 50% by 2025 compared with the 2017–2021 baseline, and achieving zero human deaths from rabies by 2030.

Collectively, the experiences of ASEAN Member States demonstrate substantial progress towards the goal of eliminating dog-mediated human rabies by 2030. Countries have adopted a wide range of interventions, including mass dog vaccination, IBCM, enhanced surveillance systems, expanded access to PEP, public awareness programmes, and strengthened One Health coordination among human, animal, and environmental health sectors. Several Member States, including Brunei Darussalam and Singapore, have successfully maintained rabies-free status through sustained surveillance and strict preventive measures, while others continue to reduce disease burden through targeted control programmes and national elimination strategies.

Despite this progress, important challenges remain across the region.

These include limited access to prevention and treatment services in remote areas, insufficient dog vaccination coverage in some settings, management of free-roaming dog populations, cross-border animal movement, constraints in laboratory and surveillance capacity, and gaps in public awareness and community engagement. Continued political commitment, sustainable financing, strengthened multisectoral collaboration, and effective implementation of national rabies programmes will be essential to address these challenges and accelerate progress towards the regional goals outlined under ARES.

The establishment of ARCG, together with the updated ARES Implementation Plan, provides a strong platform for regional cooperation, knowledge sharing, surveillance coordination, and joint action. By maintaining a One Health approach and building on existing achievements, ASEAN Member States are well positioned to advance towards the shared vision of a region free from human deaths caused by dog-mediated rabies by 2030.

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