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ASEAN
BIOLOGICAL THREATS
SURVEILLANCE CENTRE

TETANUS
In the ASEAN Region
FOCUS REPORT

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PUBLISHER
ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE

EDITORIAL ADDRESS
ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE
Health Policy Agency
Ministry of Health of Indonesia,
Building 6- Center of Global Health Strategy and Governance Policy, 2nd floor
Percetakan Negara No. 29 Johar Baru, Jakarta Pusat, Indonesia 10560
E-mail: support@aseanbiosurveillance.org
E-mail: data@aseanbiosurveillance.org

Table of Contents

TETANUS FOCUS REPORT

ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE

Acronyms and Abbreviations

ASEAN	:	Association of Southeast Asian Nations	NT	:	Neonatal Tetanus
AMS	:	ASEAN Member States	PAB	:	Protection at Birth
ANC	:	Antenatal Care	SIA	:	Supplementary Immunization Activities
DT	:	Diphtheria and Tetanus	Td	:	Tetanus and Diphtheria
DTaP	:	Diphtheria, Tetanus, and Pertussis	Tdap	:	Tetanus, Diphtheria, and Pertussis
DTP	:	Diphtheria, Tetanus, and Pertussis	TIG	:	Tetanus Immune Globulin
EPI	:	Expanded Programme on Immunization	TT	:	Tetanus Toxoid
GVAP	:	Global Vaccine Action Plan	TTCV	:	Tetanus-Toxoid-Containing Vaccines
MNTE	:	Maternal and Neonatal Tetanus Elimination	UNFPA	:	United Nations Population Fund
NAIS	:	National Adult Immunisation Schedule	UNICEF	:	United Nations Children' Fund
NCIS	:	National Childhood Immunisation Schedule	VPD	:	Vaccine Preventable Disease
NIP	:	National Immunization Programme	WHO	:	World Health Organization

TETANUS

Introduction & Methods

Introduction

Tetanus is an acute infectious disease caused by *Clostridium tetani* spores, which are ubiquitously present in environmental reservoirs such as soil, ash, faecal matter, and contaminated surfaces, including rusted instruments (WHO, 2024a). The disease is acquired predominantly through wound contamination, and person-to-person transmission does not occur. Despite the availability of tetanus-toxoid-containing vaccines (TTCV), natural infection with *Clostridium tetani* does not confer protective immunity. Therefore, immunization remain necessary to prevent infections for all susceptible populations. Neonatal and maternal tetanus remain the primary contributors to global morbidity and mortality, particularly in regions with insufficient immunization coverage and unhygienic birth practices. In neonates, exposure to contaminated instruments or materials used during cord care represents a critical risk factor, whereas inadequate booster coverage in adolescents and adults predisposes males undergoing circumcision to infection.

Global health initiatives significantly reduced disease burden, notably achieving a 97% drop in neonatal tetanus mortality (1988-2018) via scaled-up TTCV immunization. Nevertheless, tetanus continues to pose a public health challenge in low-resource settings, underscoring the necessity for sustained vaccination programs, hygienic perinatal practices, and comprehensive surveillance to prevent morbidity and mortality associated with this preventable yet potentially fatal disease.

This report provides an overview of tetanus, covering its transmission, symptoms, treatment, and complications, along with data on number of reported cases and vaccine coverages. It also analyzes the regional situation within ASEAN and highlights the importance of surveillance, rapid response, and public health initiatives to reduce the burden of tetanus across vulnerable populations.

Methods

This report employs a comprehensive literature review to examine the global landscape of tetanus, 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, official reports from ASEAN Member States, and reputable news sources. This approach enabled a detailed analysis of current trends, patterns, and challenges in managing tetanus within the ASEAN region.

Case Definition and Clinical Features

Case Definition

Tetanus is an acute infectious disease caused by the bacterium *Clostridium tetani*, which spores are found in the environment, particularly in soil, ash, intestinal tracts/faeces of animals and humans, and on the surfaces of skin and rusty tools (WHO, 2024a). In terms of surveillance reports, the World Health Organization (WHO) distinguish and separately categorizes cases as neonatal (aged 0–28 days) and non-neonatal (aged >28 days) tetanus (WHO, 2023a). The clinical criteria are as follows:

Neonatal Tetanus

A case of neonatal tetanus occurs when an infant with a normal ability to suck and cry in the first two days of life loses this ability between days three and 28, becoming rigid or experiencing spasms (WHO, 2024a). The infant subsequently develops progressive difficulty and then inability to feed, excessive crying, spasms of facial muscles (trismus or lockjaw), stiffness of back muscles leading to backward arching of the back and generalized convulsions. Classification of neonatal tetanus cases is based solely on clinical criteria and the outcome of case investigations.

- **Suspected case:** Any neonate who could suckle and cry normally during the first two days of life but subsequently loses this ability and develops tetanus-like illness or dies between 3 and 28 days after birth, **OR** any neonate dies of an unknown cause during the first month of life.
- **Confirmed case:** Any suspected case of neonatal tetanus who has normal ability to suckle and cry normally during the first two days of life **AND** progressively lost the ability to suckle between 3 and 28 days after birth **AND** developed muscle stiffness and/or spasms resulting in seizures.
- **Discarded case:** Any case that has been investigated and found not to meet the clinical criteria for confirmation or has an alternative diagnosis explaining the illness.
- A case is classified as **not investigated** when no investigation was conducted or when information on age and symptoms is insufficient to confirm the diagnosis.

Non-Neonatal Tetanus

A non-neonatal tetanus case is defined as tetanus occurring in an individual older than 28 days with a history of injury or wound WHO, 2024a). However, tetanus may also occur in patients who are unable to recall a specific wound or injury. A non-neonatal tetanus case is further classified as follows (WHO, 2023a):

- **A suspected case** is any person of age > 28 days with acute onset of at least one of the following: trismus (lockjaw), **OR** risus sardonicus

(sustained spasm of the facial muscles), **OR** generalized muscle spasms (contractions).

- **Confirmed case:** Any suspected case that has been **clinically confirmed** by a physician/trained clinician.
- **Probable case:** Any suspected case lacking clinical confirmation by a qualified physician.
- **Discarded case:** Any case that, after investigation, does not meet the clinical criteria for tetanus **OR** has an alternative diagnosis that explains the symptoms.

Pregnant women are at risk of contracting tetanus during unsafe practices related to miscarriage, abortion, and childbirth (WHO, 2019a). The WHO characterises tetanus that occurs during pregnancy or within six weeks of any form of pregnancy termination (including birth, miscarriage, or abortion) as **maternal tetanus**. To achieve and sustain Maternal and Neonatal Tetanus Elimination (MNTE), countries must ensure that at least 80% of pregnant women in every district are fully vaccinated against tetanus. Maternal tetanus is generally assumed to be eliminated once neonatal tetanus elimination has been achieved, as the neonatal tetanus indicator acts as a proxy for maternal tetanus.

Transmission

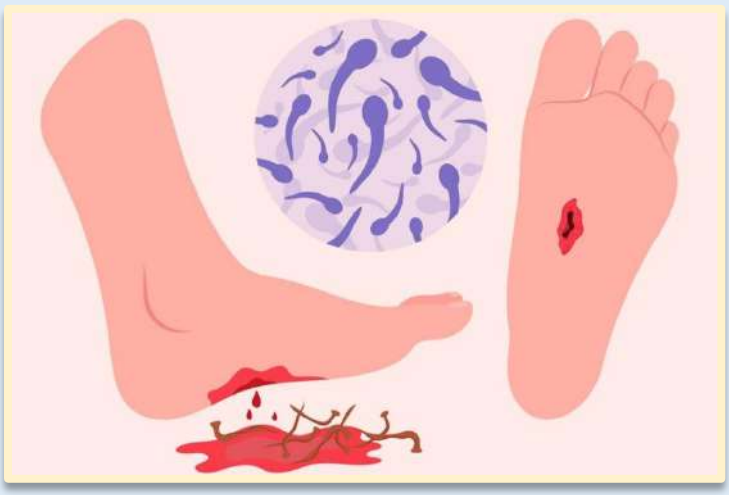


Figure 1. Transmission of Tetanus from Wound
Source: https://www.onlymyhealth.com/what-is-tetanus-and-tips-to-protect-yourself-from-this-infection-1722249063

There is a difference in the mode of transmission between non-neonatal tetanus and neonatal tetanus (WHO, 2023a). In non-neonatal tetanus, *Clostridium tetani* spores are introduced into the body through wounds such as lacerations, burns, punctures, or even trivial or unnoticed injuries contaminated with soil, street dust, or animal or human faeces (Figure 1). Transmission may also

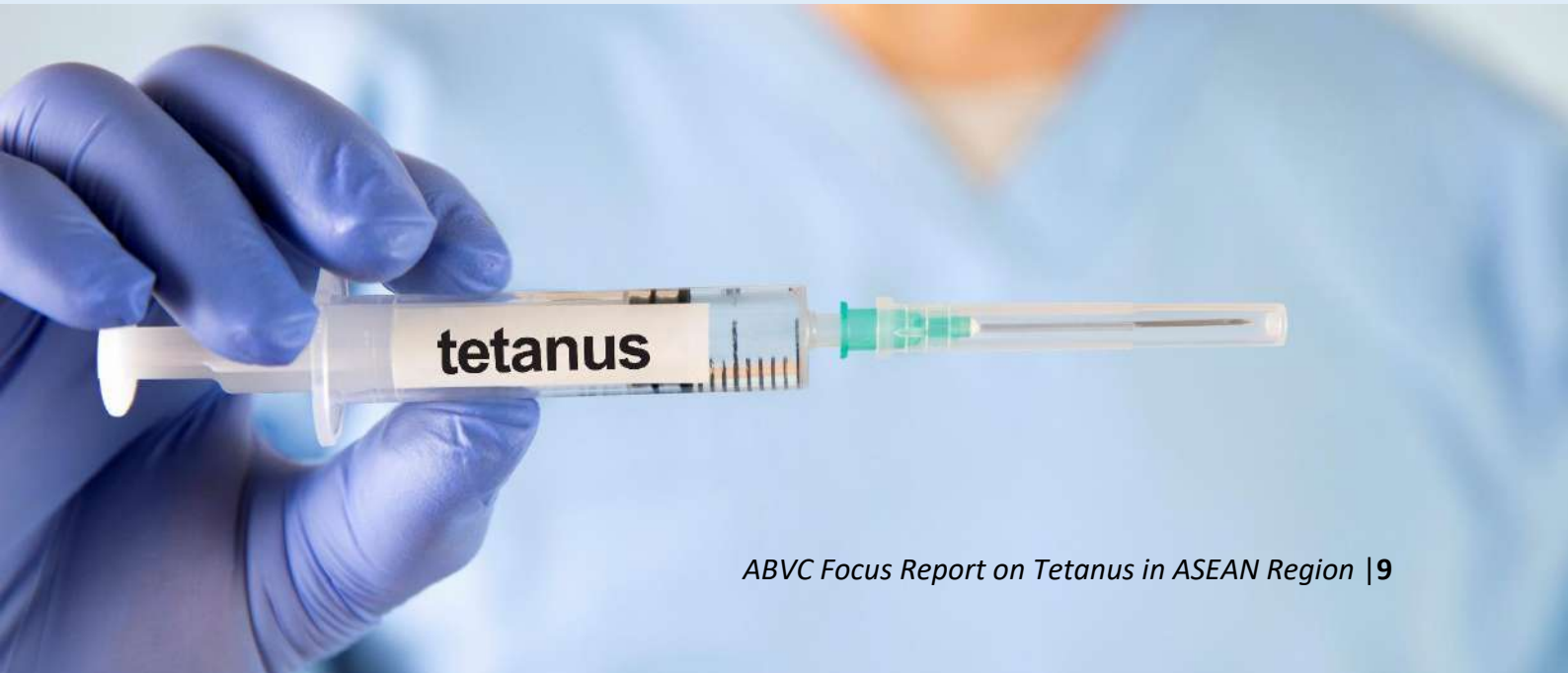
occur through the injection of contaminated street drugs or, less commonly, after surgical procedures performed under non-sterile conditions. The presence of necrotic tissue or foreign bodies creates an anaerobic environment that favors bacterial growth and toxin production.

In contrast, neonatal tetanus occurs when tetanus spores enter the newborn's body through the umbilical stump because of unhygienic delivery and poor cord care practices (WHO, 2023a). Examples include the use of non-sterile instruments to cut the umbilical cord, application of contaminated substances to the stump, and deliveries conducted by attendants with unwashed hands or on contaminated surfaces. Understanding these distinct transmission pathways is essential for designing targeted preventive strategies, including safe delivery practices, maternal immunization, and community hygiene interventions.

Risk Factors and Risk Groups

Tetanus primarily affects individuals who are unvaccinated or not up to date with their booster immunizations (CDC, 2025; WHO, 2024a). Most cases occur among adults who either never received a tetanus vaccine or have not maintained their 10-year booster schedule. Specific populations at higher risk include adults aged 80 years and older, individuals with diabetes, those with compromised immune systems, and people who use intravenous drugs.

The incidence of tetanus may rise during natural disasters such as earthquakes, floods, hurricanes, or tsunamis (CDC, 2025). Although such events do not increase the presence of *Clostridium tetani* in the environment, the risk of infection may heighten due to injuries that facilitate bacterial entry and limited access to timely medical care and vaccination services.



Clinical Presentation

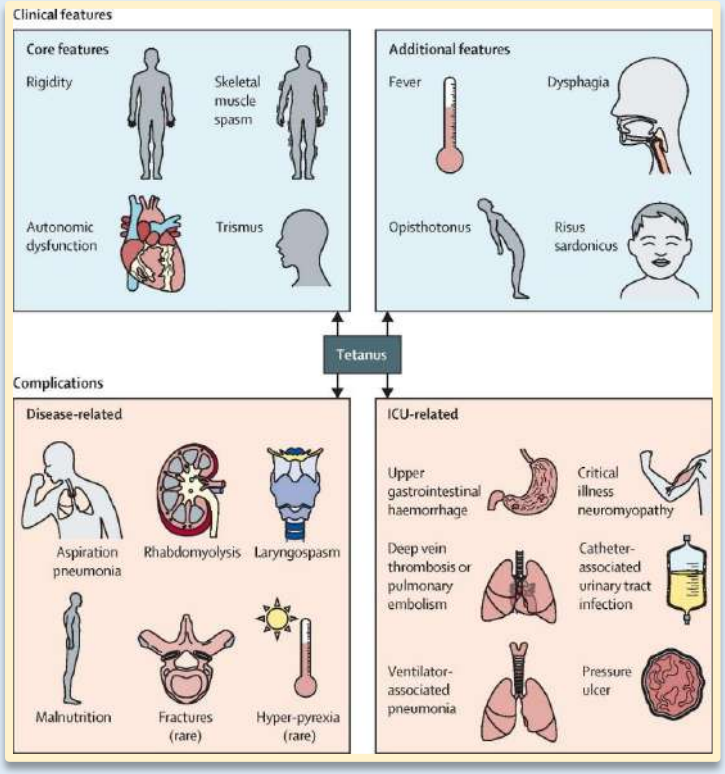


Figure 2. Clinical Features and Complications of Generalised Tetanus
Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(25)00292-0/fulltext#fig3

The incubation period of tetanus ranges from 3 to 21 days after infection, with most cases occurring within 14 days (WHO, 2024a). The disease is characterized by:

1. Jaw cramping or the inability to open the mouth (trismus).
2. Muscle spasms affecting the back, abdomen, and extremities.
3. Sudden painful spasms that may be triggered by noise.
4. Difficulty swallowing, seizures, headache,
5. Fever, excessive sweating, and fluctuations in blood pressure or heart rate.

In neonatal tetanus, the clinical presentation typically includes muscle spasms that are often preceded by the newborn's inability to suck or breastfeed, accompanied by excessive crying.

Clinical Diagnostic

There is no specific diagnostic test for tetanus; the diagnosis is made based on clinical signs and symptoms (WHO, 2024a). In some cases, *Clostridium tetani* may be cultured from the umbilical stump, but this is possible in only about one-third of cases, and laboratory confirmation is not recommended. Therefore, diagnosis relies entirely on the recognition of characteristic clinical features. Clinicians should also consider and rule out other conditions that may present with similar symptoms, such as hypercalcaemic tetany, drug-induced dystonia (particularly from phenothiazines), meningoencephalitis, strychnine poisoning, and trismus resulting from dental infections.

Epidemiology

Global Situation

Tetanus remains an important public health problem in many parts of the world, but especially in low-income countries or districts, where immunization coverage is low, and unclean birth practices are common (WHO, 2024a). Figure 3 shows the global distribution of tetanus cases from 2015 to 2024, based on data reported to the WHO (WHO, 2025a). Countries are color-coded by number of reported cases, ranging from 0 cases (green) to over 1,000 cases (dark orange). Several countries/territories appear in grey, indicating unavailable or unreported data for the period.

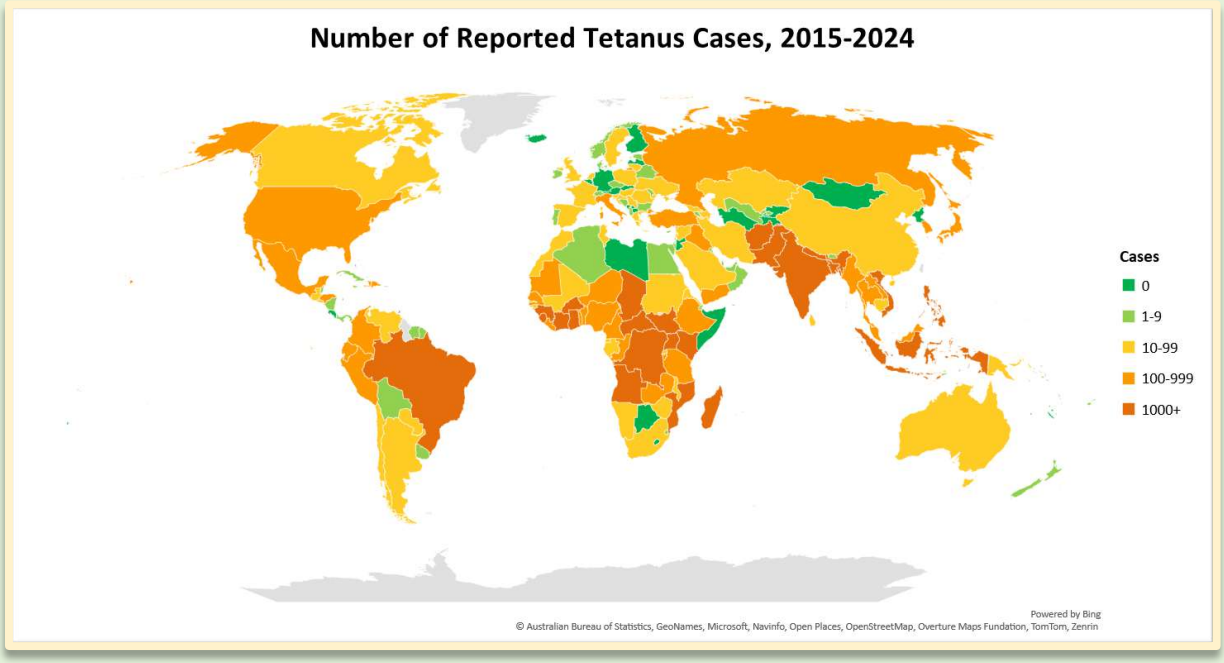


Figure 3. Number of Reported Tetanus Cases by country, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

The three-panel figure describes global tetanus incidence in 2004, 2014, and 2024, illustrating both long-term progress and persistent geographic disparities (Figure 4). The 2004 map shows widespread moderate incidence across Sub-Saharan Africa and parts of South and Southeast Asia, with several countries exceeding 10 cases per million population. Large portions of the Middle East, Central Africa, and parts of Asia appear as no-data zones, reflecting gaps in surveillance during that period. Most countries in the Europe, North America, and Australia record either zero incidence or very low levels.

By 2014, the global pattern indicates measurable improvement. Many countries in Africa and Asia have shifted from higher-incidence categories into the 1–10 per million range. More countries report zero cases or incidence below one per million. However, surveillance gaps remain visible in several regions.

The 2024 map reflects further consolidation of gains. Large parts of the

world, including Europe, North America, East Asia, and South America, report zero incidence. Incidence above 10 per million becomes more geographically limited, primarily concentrated in parts of Central and Western Africa and a few countries in South and Southeast Asia. However, some countries still report moderate incidence in the 1–10 per million range, indicating that tetanus elimination remains a challenge.

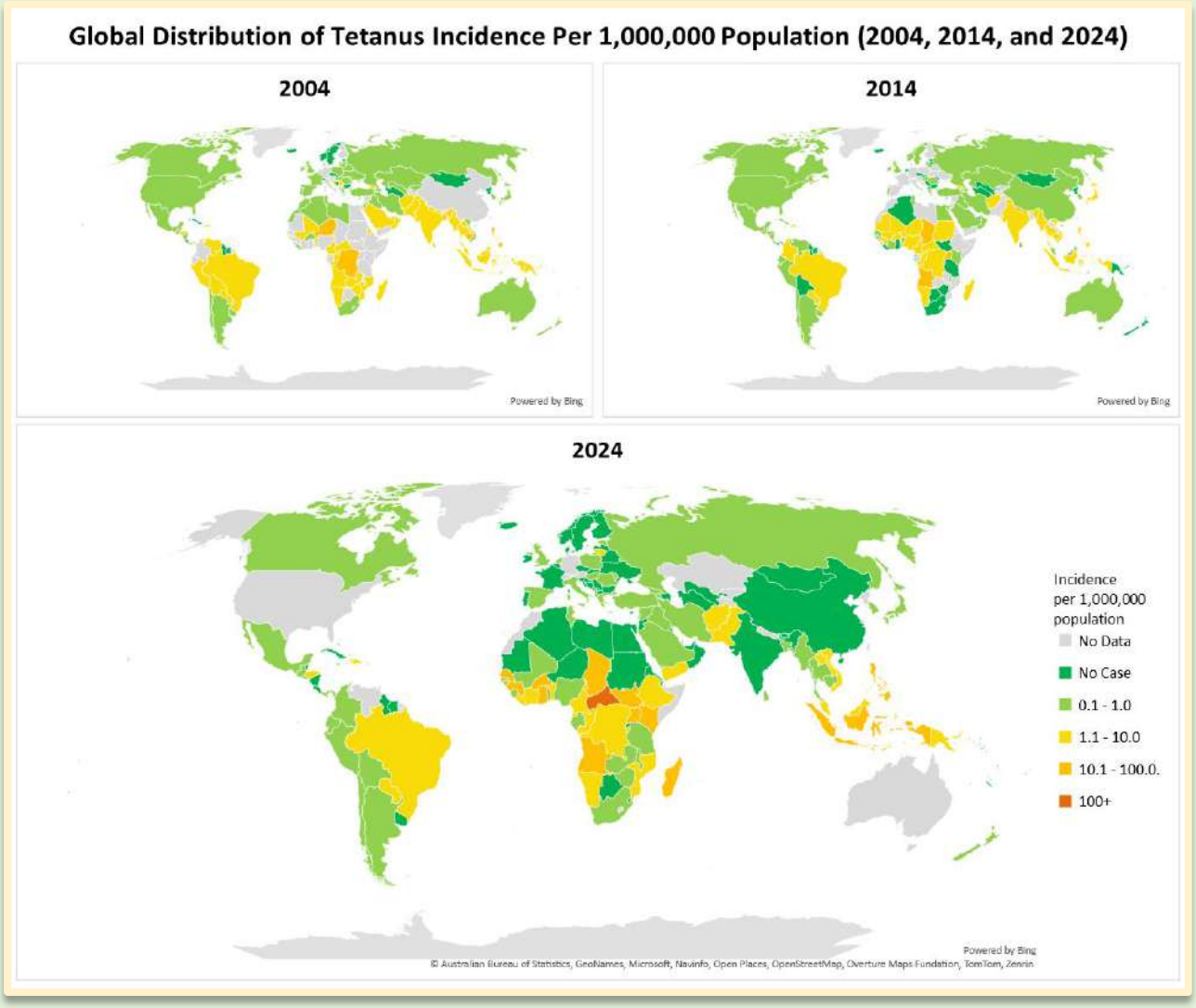


Figure 4. Tetanus Incidence per 1,000,000 population by country in 2004, 2014, and 2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Vaccine Coverage and Annual Incidence

The WHO tracks the coverage of the first (DTP1) and third (DTP3) doses of the diphtheria, tetanus, and pertussis vaccine to assess how well national immunization programs are working (WHO, 2021). The DTP1 coverage indicator signifies the extent to which the population has access to immunisation and healthcare services, while DTP3 coverage serves as a barometer for the completion of the vaccine series, reflecting overall performance of the immunization system. According to the WHO Immunization Agenda 2030, the Global Vaccine Action Plan (GVAP) sets a goal of achieving 90% coverage for essential vaccines, including DTP3, by 2030.

Figure 5 presents global and regional trends in tetanus incidence, alongside DTP1 and DTP3 vaccine coverage from 2015 to 2024, derived from data provided by the WHO (WHO, 2025a). As demonstrated in panel A, the global incidence remained low, ranging from 0.9 to 3.6 cases per million population. However, the vaccination coverage, particularly the third dose of the diphtheria, tetanus, and pertussis (DTP3) vaccine, remains below the targeted 90%, ranging from 81–86%. DTP1 coverage only slightly surpassed the 90% threshold between 2017 and 2019 (90.1%, 90.2%, and 90.5%, respectively).

Regionally, the European Region (E) reported the lowest incidence among all regions, ranging from 0.1 to 0.2 cases per million population, while the African Region (C) reported the highest incidences, ranging from 2.8 to 14 cases per million population. In terms of vaccine coverage, only the European Region (E) and the Western Pacific Region (G) consistently surpassed the 90% target for both DTP1 and DTP3 coverage.

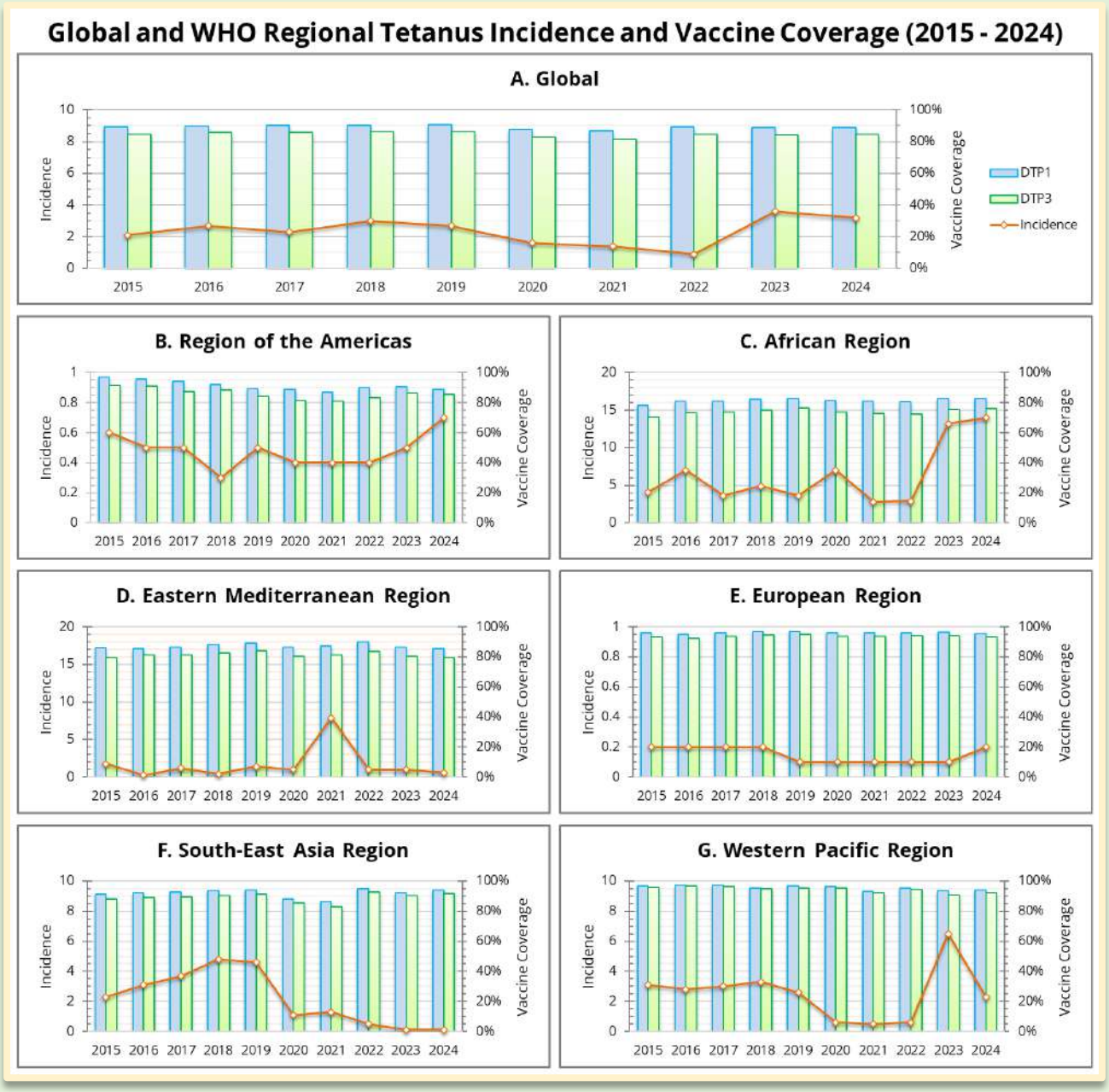


Figure 5. Global and WHO Regional Trends in Tetanus Incidence and Vaccine Coverage, 2015–2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence*))

Neonatal Tetanus Incidence and Protection at Birth

Figure 6 presents global and regional trends in protection at birth (PAB) against neonatal tetanus alongside neonatal tetanus incidence per 1,000 live births from 2015 to 2024 (WHO, 2025a). Globally, PAB remains consistently high, rising modestly from 83% in 2015 to 86% by 2017 and then stabilizing.

The figure shows negligible global neonatal tetanus incidence across the decade, but the regional panels reveal the few measurable deviations. The Eastern Mediterranean Region reports a peak of 0.4 cases per 1,000 live births in 2021, while the African Region records 0.1 cases per 1,000 live births from 2023 to 2024.

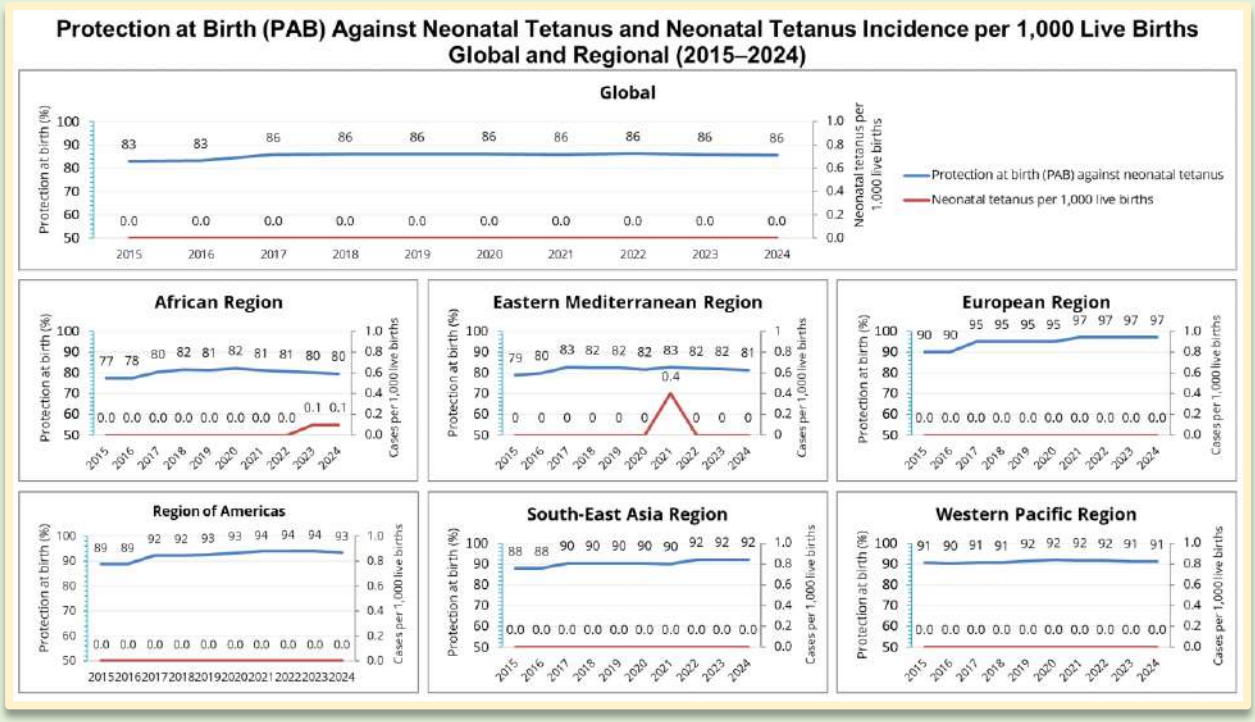
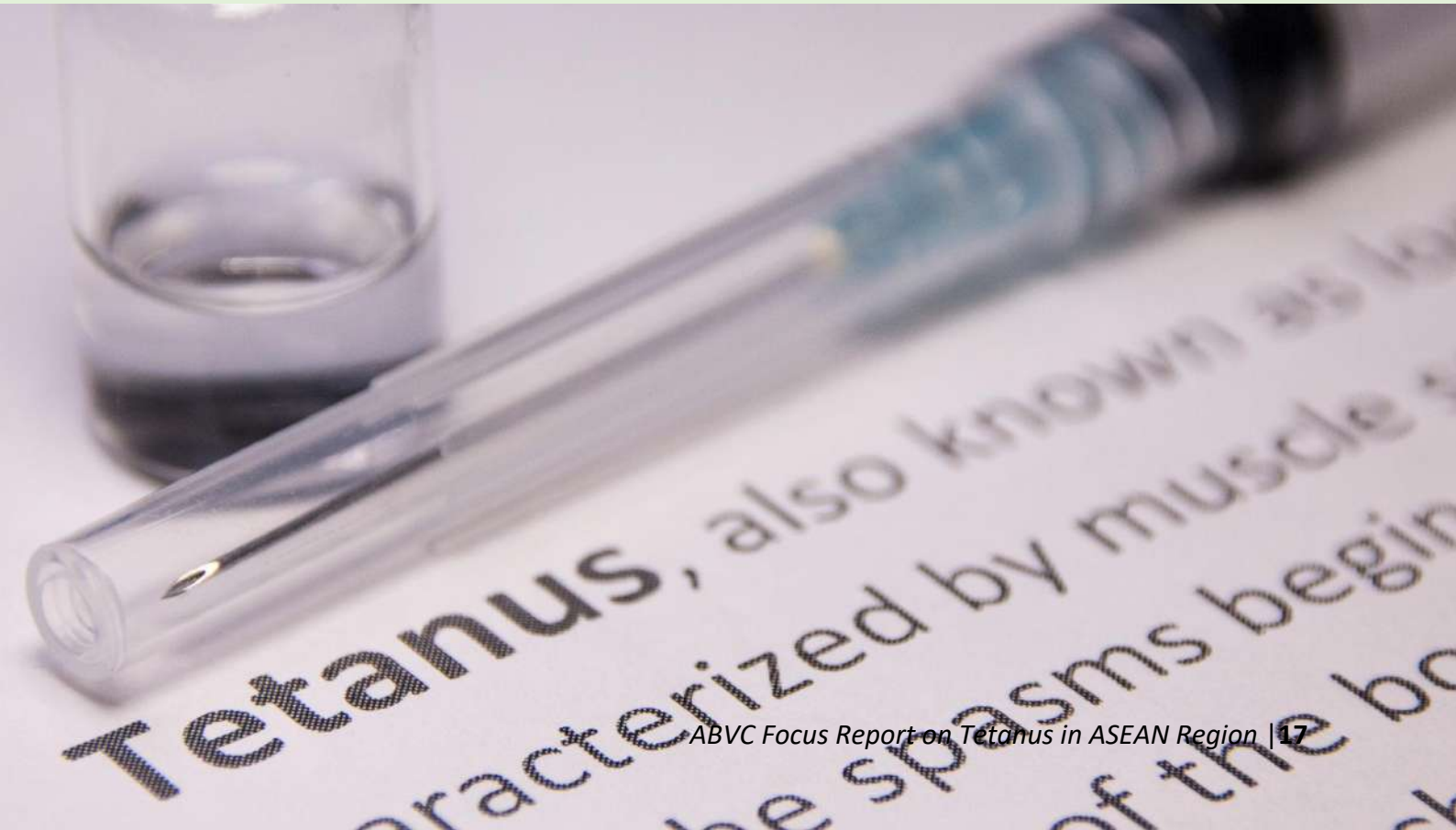


Figure 6. Protection at Birth Against Tetanus and Neonatal Tetanus Incidence, 2015–2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/protection-at-birth-(pab)-against-neonatal-tetanus-vaccination-coverage-and-vaccination-coverage-among-pregnant-women-of-tetanus-toxoid-containing-vaccine-(tt2-td2-)-and-pertussis-containing-vaccine))



Burden of Tetanus in the ASEAN Region

Tetanus remains a significant challenge in the ASEAN region, with all member states reporting cases over the past decade. This persistence is likely linked to immunity gaps and policy barriers that limit the availability of booster doses (WHO, 2023b). This section summarizes annual confirmed cases based on WHO immunization data (WHO, 2025a).

Figure 7 shows the distribution of reported tetanus cases in the ASEAN region from 2015 to 2024. Reported cases varied across AMS: Indonesia, Philippines, and Viet Nam each recorded thousands of cases (7,013, 9,559, and 3,234, respectively) while Lao PDR, Malaysia, Myanmar, and Thailand reported hundreds (171 to 398). Cambodia reported 56 cases. Timor Leste reported 8 cases, while Brunei Darussalam and Singapore reported the lowest number, with two cases over the period.

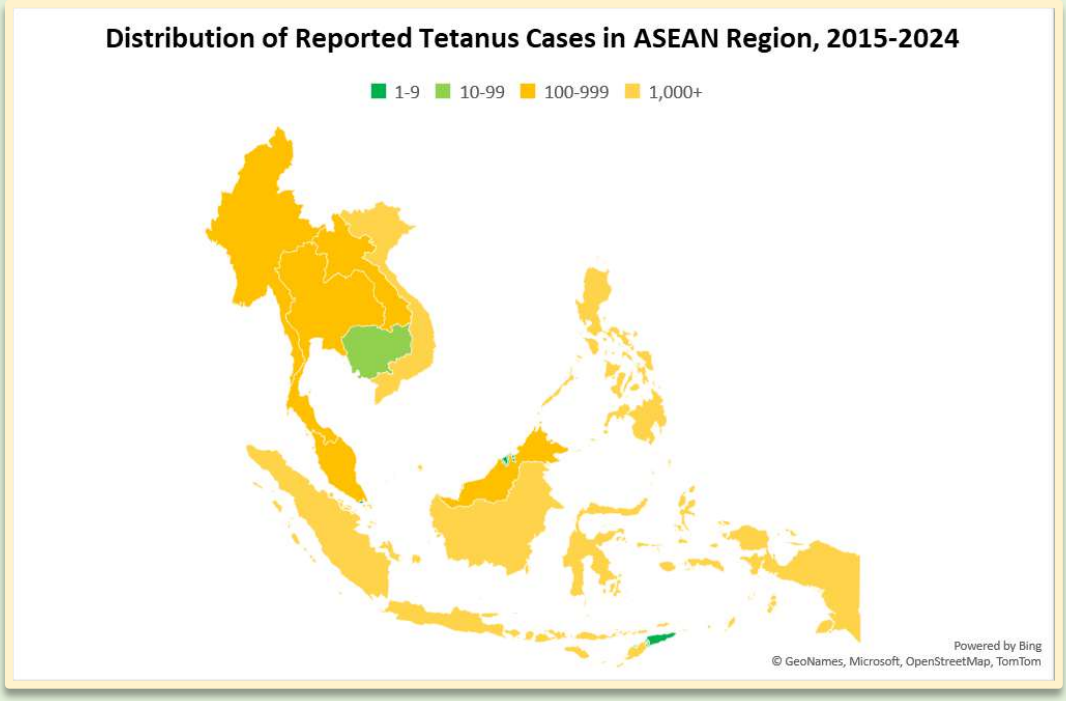
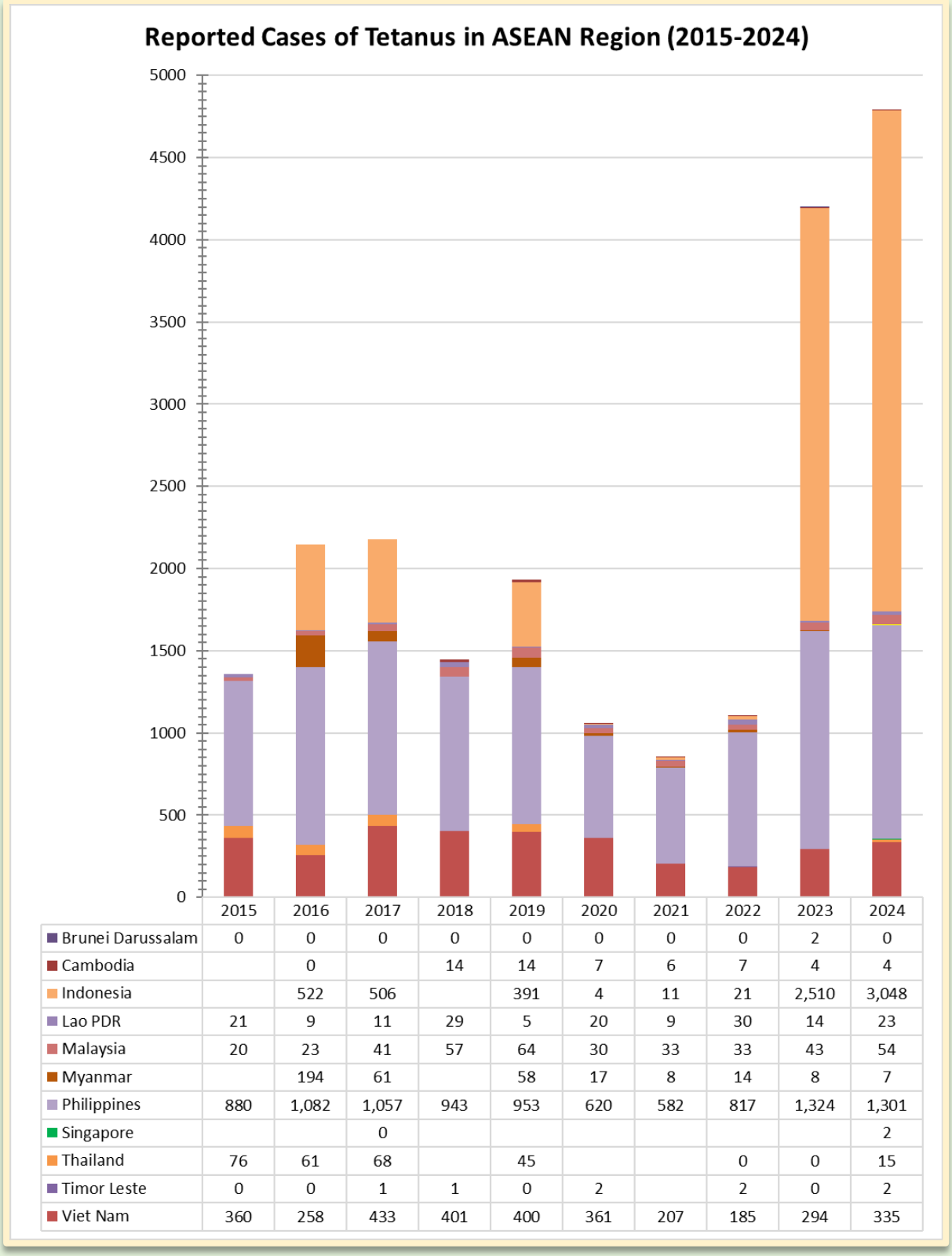


Figure 7. Distribution of reported Tetanus cases in ASEAN 2015 - 2024
(Source: WHO immunization data ((https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence*))*

Figure 8 provides detailed information on the number of reported tetanus cases in the ASEAN region, showing significant fluctuations, particularly a sharp increase since 2023. Starting at 1,357 cases in 2015, the numbers increased significantly to 2,149 in 2016 and slightly to 2,178 in 2017. Cases then declined to 1,445 in 2018 before rising again to 1,930 in 2019. Following a declining trend over the next two consecutive years (1,061 in 2020 and 856 in 2021), cases re-emerged with 1,109 in 2022, then sharply increased by nearly four-fold to 4,199 in 2023 and 4,791 in 2024. It should be noted, however, that surveillance data were absent for several countries in certain years.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Brunei Darussalam	0	0	0	0	0	0	0	0	2	0
Cambodia		0		14	14	7	6	7	4	4
Indonesia		522	506		391	4	11	21	2,510	3,048
Lao PDR	21	9	11	29	5	20	9	30	14	23
Malaysia	20	23	41	57	64	30	33	33	43	54
Myanmar		194	61		58	17	8	14	8	7
Philippines	880	1,082	1,057	943	953	620	582	817	1,324	1,301
Singapore			0							2
Thailand	76	61	68		45			0	0	15
Timor Leste	0	0	1	1	0	2		2	0	2
Viet Nam	360	258	433	401	400	361	207	185	294	335

Figure 8. Trend of reported cases of tetanus in the ASEAN Region, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Brunei Darussalam

During the past decade, Brunei Darussalam reported very few cases of tetanus, with two recorded in 2023. (Figure 9).

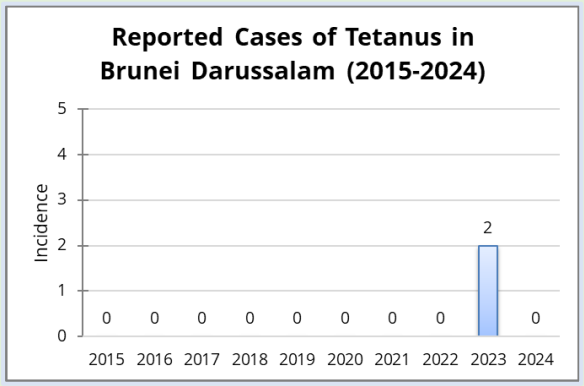


Figure 9. Trend of reported cases of tetanus in Brunei Darussalam, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Cambodia

Cambodia reported no cases of tetanus in 2016 (Figure 10). The highest counts were observed in 2018 and 2019 (14 cases), followed by declining trend (7 in 2020 and 6 in 2021). After slightly rose to 7 in 2022, cases lowered to 4 from 2023 to 2024.

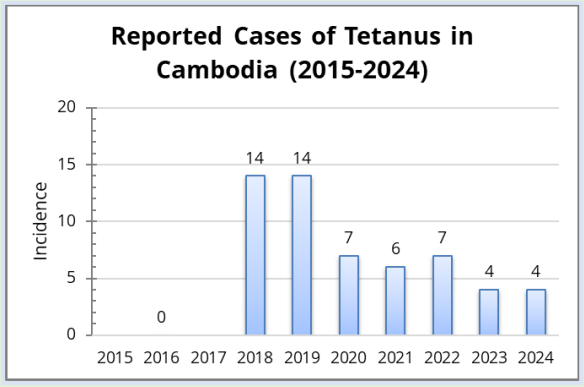


Figure 10. Trend of reported cases of tetanus in Cambodia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Indonesia

Indonesia recorded notable fluctuations in tetanus cases during 2015–2024. With 522 cases reported in 2016 and 506 in 2017, cases dropped sharply in 2020–2022 (4 cases) cases rose again in 2021 (11cases) before surging in 2023 (2,510) and 2024 (3,048), marking the highest counts in the decade (Figure 11).

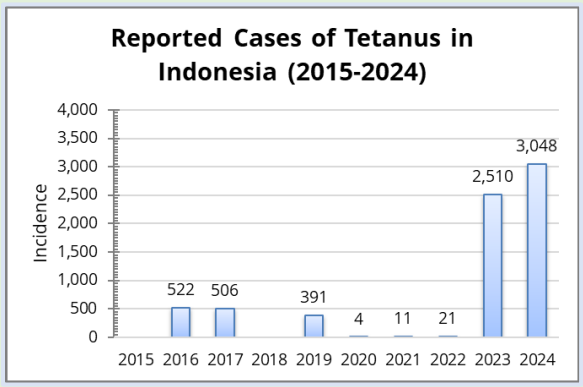


Figure 11. Trend of reported cases of tetanus in Indonesia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Lao PDR

As shown in Figure 12, Lao PDR recorded 21 cases in 2015, decrease to 9 in 2016, and rise slightly to 11 in 2017. A marked increase is observed in 2018 with 29 cases, followed by a drop to 5 cases in 2019. Reports rise again to 20 cases in 2020 and fall to 9 in 2021. The highest count in the period occurs in 2022 with 30 cases, after which cases decline to 14 in 2023 and increase again to 23 in 2024.

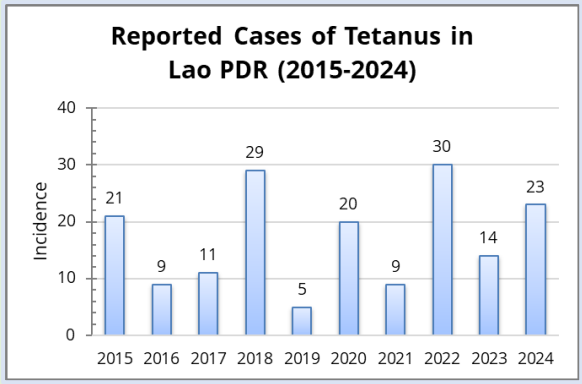


Figure 12. Trend of reported cases of tetanus in Lao PDR, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Malaysia

Malaysia reported fluctuating tetanus cases during 2015–2024 (Figure 13). The number of cases begins at 20 in 2015 and rises to 23 in 2016. A larger increase is observed in 2017 with 41 cases, followed by 57 cases in 2018 and a peak of 64 cases in 2019. Cases then decrease to 30 in 2020 and rise slightly to 33 in both 2021 and 2022. Reports increase again to 43 cases in 2023 and further to 54 cases in 2024.

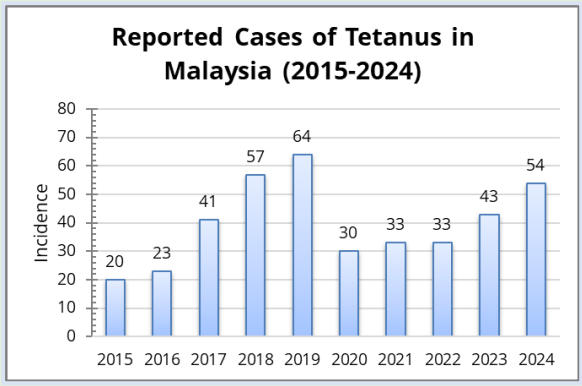


Figure 13. Trend of reported cases of tetanus in Malaysia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Myanmar

Figure 14 shows a sharp spike in tetanus reports in Myanmar in 2016, reaching 194 cases, followed by a steep decline to 61 cases in 2017 and 58 in 2019. From 2020 onward, incidence falls into single-digit to low-double-digit levels, ranging from 17 cases in 2020 to 7–14 cases between 2021 and 2024.

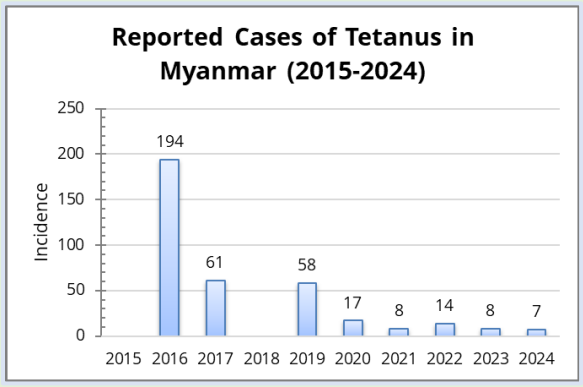


Figure 14. Trend of reported cases of tetanus in Myanmar, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Philippines

Figure 15 shows a relatively high burden of tetanus in the Philippines across 2015–2024, with annual reported cases generally ranging between 880 and 1,082 during 2015–2017, followed by a gradual decline to 582 cases in 2021, and then a sharp rebound to 1,324 in 2023 and 1,301 in 2024.

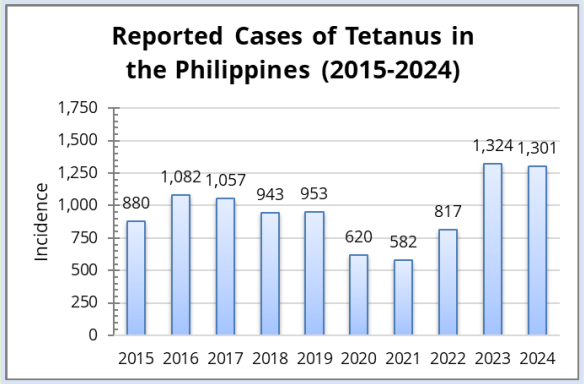


Figure 15. Trend of reported cases of tetanus in the Philippines, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Singapore

Figure 16 shows reported tetanus cases in Singapore from 2015 to 2024. During this period, Singapore recorded two cases in 2024.

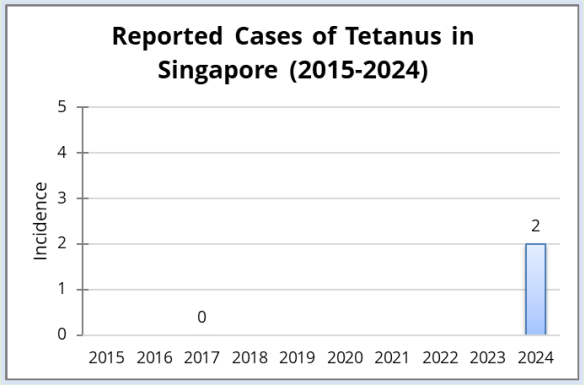


Figure 16. Trend of reported cases of tetanus in Singapore, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Timor-Leste

From 2015 to 2024, Timor-Leste reported relatively few tetanus cases, ranging from 1 to 2 annual cases. Additionally, no cases were reported in 2015, 2016, 2019, and 2023 (Figure 17)

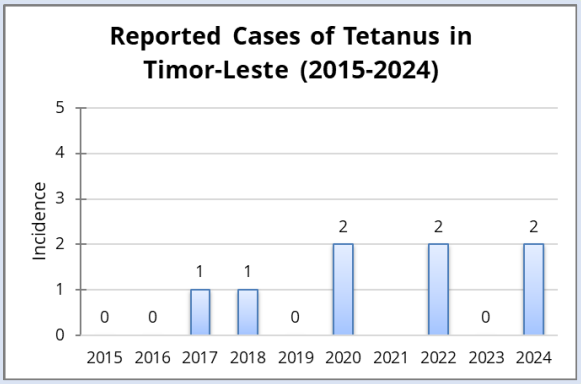


Figure 17. Trend of reported cases of tetanus in Timor Leste, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Thailand

Thailand reported 76 cases of tetanus in 2015, which decreased to 61 in 2016 before rising slightly to 68 cases in 2017 (Figure 18). By 2019, the country reported 45 cases. Notably, Thailand reported no cases from 2022 to 2023, but the number re-emerged with 15 cases in 2024.

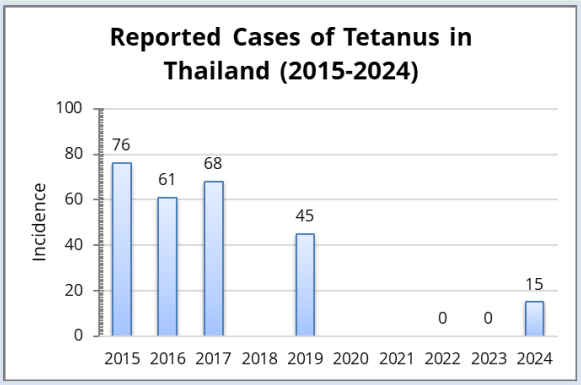


Figure 18. Trend of reported cases of tetanus in Thailand, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Viet Nam

Viet Nam reported 360 tetanus cases in 2015, followed by a drop to 258 cases in 2016 (Figure 19). However, cases significantly rose to 433 cases in 2017 and then gradually decreased to 361 cases in 2020. Cases dropped further to 185 in 2022. In 2023, however, cases surged again to 294 and continued rising to 335 cases in 2024.

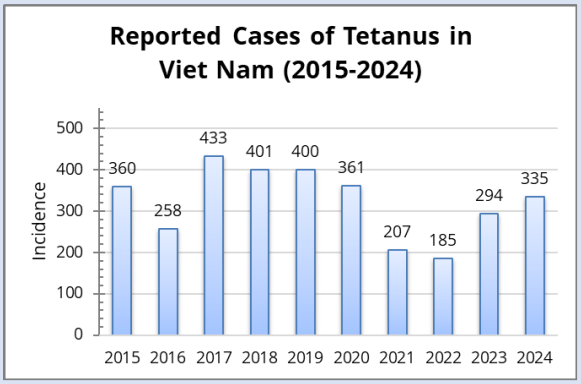


Figure 19. Trend of reported cases of tetanus in Viet Nam, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/tetanus-reported-cases-and-incidence))

Case Management and Prevention

Case Management

Tetanus is a medical emergency that requires prompt hospital care and comprehensive management (WHO, 2024a). Immediate treatment includes the administration of human tetanus immune globulin (TIG) to neutralize unbound toxin, along with aggressive wound care to remove the source of infection. Additional interventions involve the use of medications to control muscle spasms, appropriate antibiotic therapy to eliminate *Clostridium tetani*, and tetanus vaccination to ensure active immunization. Importantly, recovery from tetanus does not confer natural immunity; therefore, individuals who have recovered must still receive vaccination to prevent future infection.

Prevention

Tetanus is a vaccine-preventable disease that can be effectively avoided through immunization with TTCV, which are routinely administered worldwide and during antenatal care visits (WHO, 2024a). To ensure lifelong protection, the World Health Organization (WHO) recommends a total of six doses consisting of:

a. Three primary doses, starting as early as 6 weeks of age, given at intervals of at least 4 weeks; and
b. Three booster doses, administered at 12–23 months, 4–7 years, and 9–15 years, with at least 4 years between boosters.

Several combination vaccines are used to provide protection, including:

a. DT (diphtheria and tetanus)
b. DTaP (diphtheria, tetanus, and pertussis)
c. Td (tetanus and diphtheria)
d. Tdap (tetanus, diphtheria, and pertussis)

For neonatal tetanus prevention, immunizing women of reproductive age with TTCV, either during pregnancy or outside of pregnancy is crucial. In addition to vaccination, safe medical and hygienic practices such as clean delivery and cord care during childbirth and proper wound management in surgical or dental settings play vital roles in prevention. Countries that have maintained high immunization coverage for several decades have consequently achieved very low tetanus incidence rates.

Control Measures Strategy

In the late 1980s, the WHO estimated that the global neonatal tetanus (NT) mortality rate was approximately 6.7 deaths per 1,000 live births, highlighting the urgent need for action to reduce NT incidence (WHO, 2019a). In response, the global health community initiated a coordinated effort to eliminate neonatal tetanus. In 1989, the 42nd World Health Assembly called for the elimination of neonatal tetanus in 59 priority countries by 1995, and in 1990, the World Summit for Children included it as a key goal. The 44th World Health Assembly endorsed MNTE in 1991, but slow implementation delayed the global target to 2000. By 1999, UNICEF, WHO, and UNFPA reviewed progress and expanded the initiative to include maternal tetanus elimination, first targeting 2005 and later 2015. Despite significant efforts, by the end of 2015, 21 countries had not yet achieved elimination. Progress continues, and to date, only 14 countries remain to achieve MNTE.

The strategies for achieving MNTE focus on reducing NT cases in high-risk areas and among women of reproductive age (15–49 years). Although these strategies have been very successful, once elimination status is achieved, the strategies used to reach it need to be adjusted to sustain elimination (Table 1).

Table 1. Recommended strategies for achieving and sustaining MNTE

Achieving MNTE	Sustaining MNTE
Strengthen antenatal care (ANC) immunization of pregnant women with TTCV.	Strengthen immunization of pregnant women and routine vaccination of all children/adolescents (both sexes) to receive 3 primary infant doses and 3 booster doses of TTCV before adolescence.
TTCV Supplementary Immunization Activities (SIAs) in selected high-risk areas, targeting women of reproductive age (15–49 years) with 3 properly-spaced doses of the vaccine.	Antenatal screening of pregnant women to verify tetanus vaccination status (to ensure tetanus protection at birth – PAB) and vaccinate if required.
Promotion of clean birth and clean cord care practices and health education.	Increased access to skilled health personnel at birth and clean birth/cord care practices.
Reliable NT surveillance including case investigation and response.	Strong T/NT surveillance and regular review of data to identify districts at risk of re-emergence of MNT and needing corrective action.

Sustaining MNTE also requires a shift toward long-term population-wide protection, national immunization schedules should aim for high homogeneous coverage (≥90%) with six doses of TTCV (three primary infant doses and three booster doses through routine childhood and adolescent vaccination) (WHO, 2019a). Once this is achieved, most future cohorts of women of reproductive age will be fully protected throughout their reproductive years and beyond. Consequently, ANC contacts will increasingly serve to verify vaccination status rather than as the primary route for TTCV administration, and SIAs targeting women of reproductive age will no longer be necessary.

Control Measures in ASEAN Member States

Brunei Darussalam

The Expanded Programme on Immunization (EPI) is well accepted throughout Brunei Darussalam (WHO, 2020). The National Immunization Programme currently comprises 12 vaccines targeting vaccine-preventable diseases, including tetanus (Ministry of Health Brunei Darussalam, 2025). For tetanus immunization, the TT (Tetanus Toxoid) vaccine is administered to primigravidas at 28 weeks and 32 weeks of pregnancy. The DTaP-Hib-HepB-IPV (acellular) vaccine is administered nationally at 2 months, 4 months, and 6 months of age (WHO, n.d). Brunei Darussalam has consistently achieved and maintained immunization coverage rates exceeding 95% annually (Ministry of Health Brunei Darussalam, 2025).

Cambodia

The Cambodia National Immunization Strategy 2021–2025, with an extension to 2030, is aligned with the WHO Regional Strategic Framework for Vaccine-Preventable Diseases and Immunization in the Western Pacific 2021–2030, the Immunization Agenda 2030, and the Gavi 5.0 Strategy, and supports the National Health Strategic Plan 2022–2030. The strategy outlines national immunization policies, strategies, interventions, and monitoring approaches, recognizing immunization as a key component of primary health care, and identifies priority areas including (Ministry of Health Cambodia, 2022):

1. Immunization governance and program management;
2. Human resources management;
3. Vaccine supply, vaccine management, cold chain and logistics;
4. Service delivery and new vaccine introduction;
5. Immunization coverage and performances monitoring;
6. VPD surveillance, eradication/elimination/control initiatives and outbreak response;
7. Demand generation and communication;
8. Immunization program financing;
9. Immunization in Cambodia at the horizon 2030;
10. Resources requirements and financing.

For tetanus immunization, Cambodia uses both the Td and DTwP-Hib-HepB vaccines (WHO, n.d). The Td vaccine for older children and adults is administered nationally at first contact, followed by doses at +1 month, +6 months, and +1 year, including for pregnant women, while the DTwP-Hib-HepB (whole cell) vaccine is

administered nationally at 1 month, 2 months, and 3 months.

In line with the goals and targets of the Western Pacific Regional Strategic Framework 2021–2030, Cambodia has established tetanus-related targets focused on the elimination of disease (Ministry of Health Cambodia, 2022). The country aims to achieve maternal and neonatal tetanus (MNT) elimination (defined as < 1 NT case/1000 live births in each district) in the Region, and to maintain MNTE in every country and area.

Indonesia

Indonesia achieved MNTE in 2016, becoming the last country in the WHO South-East Asia Region to be validated for MNT elimination. The country continues to maintain this status through ongoing tetanus surveillance and public health efforts. Key activities to sustain MNT elimination include (Ministry of Health Indonesia, 2021):

1. Conducting NT surveillance and related public health interventions, including immunization, maternal and child health services, and health promotion, at the district and city level.
2. Reporting all suspected or confirmed NT cases to the District/City and Provincial Health Offices within 24 hours of detection at primary health centres or other health facilities.
3. Conducting epidemiological investigations within seven days of case reporting and implementing rapid public health responses.
4. Submitting monthly zero reports even when no suspected or confirmed NT cases are identified.
5. Achieving and maintaining high and equitable coverage of both primary and booster tetanus immunization, including vaccination of women of reproductive age.

To support these surveillance and public health activities, Indonesia provides tetanus vaccination according to the national immunization schedule, targeting children and women of reproductive age (Ministry of Health Indonesia, 2017).Immunization activities have been conducted in Indonesia since 1956, and in 1977 the programme was expanded into the EPI to prevent the transmission of several vaccine-preventable diseases, including tetanus. Tetanus vaccination is provided as part of the primary immunization schedule for children under one year of age. Booster doses are recommended to maintain immunity and prolong protection, targeting children under two years, school-aged children, and women of reproductive age.

The national tetanus immunization schedule is as follows (WHO, n.d):

1. DTwP-Hib-HepB (whole cell) vaccine administered at 2, 3, and 4 months of

age for surviving infants (doses 1–3), with a fourth dose for children under two years.

2. DT vaccine (tetanus toxoid and diphtheria, children's dose) administered at 7 years of age (first grade of elementary school).
3. Td vaccine (tetanus toxoid and diphtheria for older children and adults) administered as follows:
    a. 1st dose at 7–8 years (second grade of elementary school)
    b. 2nd dose at 10 years (fifth grade of elementary school)
    c. For women of childbearing age (15–39 years): initial dose, followed by doses at +4 weeks, +6 months, +1 year, and a fifth dose one year after the fourth dose, according to immunization status for those who have not yet reached T5 protection.

Lao People's Democratic Republic

The Lao People's Democratic Republic has maintained a robust EPI since its launch in 1979 (WHO, 2025b). As of 2024, the programme includes vaccines for 12 vaccine-preventable diseases, including tetanus. All vaccines are fully funded under the National Immunization Programme (NIP), which provides technical and administrative support for EPI implementation through a network of 18 provinces, 148 districts, approximately 1,079 health centres, and more than 8,437 villages. The current immunization strategy, effective until 2025, aims to achieve 95% coverage for routine immunization. Policies are developed by the National Immunization Technical Advisory Group.

Tetanus immunization in the Lao People's Democratic Republic is provided nationally as follows (WHO, n.d):

a. DTwP-Hib-HepB (whole cell) vaccine administered at 1, 2, and 3 months of age.
b. Td vaccine (tetanus toxoid and diphtheria for older children and adults) administered at 15 years of age and for pregnant women and women of childbearing age according to the following schedule: first contact, followed by doses at +1 month, +6 months, and +1 year. Up to five doses are provided over a woman's lifetime, with health centres planning for up to three doses per pregnancy, depending on previous tetanus vaccination records.

Malaysia

The Malaysian NIP targets children from birth to 15 years of age and provides vaccines to prevent several vaccine-preventable diseases, including tetanus (WHO, 2019b). Vaccination services are offered free of charge at government health facilities and through school-based vaccination programmes. One of the key goals of Malaysia's NIP is the elimination of maternal and neonatal tetanus.

Tetanus immunization in Malaysia is provided nationally as follows (WHO, n.d):

- DTaP-Hib-HepB-IPV (acellular) vaccine administered at 2, 3, 5, and 18 months of age (from November 2020 onwards).
- DT (tetanus toxoid and diphtheria, children's dose) vaccine administered at 7 years of age.
- TT (tetanus toxoid) vaccine administered at 15 years of age and to pregnant women during the second and third trimesters.

To support tetanus surveillance and control, the Disease Control Division of the Ministry of Health Malaysia issued the third edition of the *Case Definitions for Infectious Diseases in Malaysia* in 2017. This edition provides updated case definitions, revised diagnostic methods, current contact details, designated reference laboratories, and standardized notification requirements and mechanisms

Myanmar

Myanmar was certified as free from maternal and neonatal tetanus in May 2010, following sustained efforts to increase tetanus vaccination coverage among pregnant women and to implement strategies for the prevention of maternal and neonatal tetanus. To maintain this achievement, the following activities continue to be prioritized (Ministry of Health and Sports Myanmar, 2022):

1. Increasing tetanus vaccination coverage among pregnant women.
2. Providing three doses of tetanus vaccine to women of childbearing age in areas at high risk of disease outbreaks.
3. Promoting clean childbirth and umbilical cord care practices.
4. Strengthening surveillance and reporting of neonatal tetanus cases.

All opportunities should be utilized to maintain high tetanus vaccination coverage among pregnant women. Effective prevention of maternal and neonatal tetanus requires conducting Maternal and Child Health Days, periodically intensifying routine immunization, promoting school-based booster vaccination, encouraging clean

birth and umbilical cord care practices, and maintaining disease surveillance.

The EPI in Myanmar was launched in 1978 (WHO, 2024b). Tetanus immunization is provided nationally according to the following schedule (WHO, n.d):

a. DTwP-Hib-HepB (whole cell) vaccine: administered at 2, 4, 6, and 18 months of age.
b. DT (tetanus toxoid and diphtheria, children's dose) vaccine administered at 5–6 years of age as part of school-based vaccination for kindergarten students.
c. Td (tetanus toxoid and diphtheria for older children and adults) vaccine administered to pregnant women at first antenatal visit, with a second dose 4 weeks late

Philippines

The Philippines launched the NIP in 1976, originally as the EPI, to provide infants, children, and mothers with routine vaccines (Philippines Department of Health, 2023). Routine childhood immunization is mandated under Republic Act No. 10152 (2011), ensuring a comprehensive, mandatory, and sustainable program including tetanus immunization. The country has committed to MNTE, validated regionally in 2015 and nationally in 2017.

The NIP Comprehensive Multi-Year Plan (2016–2021) outlines the national goal of reducing morbidity and mortality due to vaccine-preventable diseases. This goal is supported by five strategic approaches (Philippine Department of Health, 2023):

1. **Strategy 1:** Expand the package of quality immunization services and scale up coverage.
2. **Strategy 2:** Generate client demand and multisectoral support for immunization services.
3. **Strategy 3:** Strengthen surveillance and response.
4. **Strategy 4:** Build up supervision, monitoring, and evaluation.
5. **Strategy 5:** Institute supportive governance, financing, and regulatory measures.

As part of long-term programme objectives, the Philippines aims to achieve 95% immunization coverage among children by 2028, supporting the national commitment to strengthen routine immunization and sustain disease elimination (Philippine Department of Health, 2023).

To maintain MNTE status, the Philippines implements the following measures:

1. Routine vaccination of pregnant women with tetanus toxoid until full childhood booster coverage is achieved.
2. Routine infant immunization with three doses of the Pentavalent vaccine.

3. School-based immunization with Td vaccine in Grade 1 and Grade 7 as the 4th and 5th tetanus doses.
4. Ensuring access to and use of clean delivery services.
5. Surveillance to identify high-risk areas, assess service quality, and monitor the maintenance of elimination status.

To support MNTE and routine tetanus immunization, the following national vaccination schedule is implemented (WHO, n.d):

a. DTwP–Hib–HepB (whole cell) vaccine administered at 1, 2, and 3 months of age for infants.
b. Td (tetanus and diphtheria) vaccine administered at first contact and one month later during the first trimester for pregnant women.
c. Td vaccine administered at 6–7 years and 12–13 years of age as part of school-based immunization for Grade 1 and Grade 7 students.

Neonatal tetanus remains one of the priority vaccine-preventable diseases targeted for eradication and elimination under the NIP. Surveillance approaches vary depending on the elimination or control goals for each VPD. The 2016–2022 NIP Strategic Plan includes the national target to eliminate maternal and neonatal tetanus, supported by strengthened immunization services and surveillance systems.

Singapore

The National Childhood Immunisation Schedule (NCIS) in Singapore includes routine tetanus vaccination as part of the childhood immunisation program (Communicable Disease Agency of Singapore, 2025). The tetanus vaccine was first combined with DTaP in 1959, with subsequent adjustments to the number of booster doses, vaccine types, and recommended ages based on scientific evidence and vaccine availability.

Singapore's immunisation program aims to maintain high coverage and protect children, adolescents, and pregnant women from tetanus. Key measures under the NCIS and National Adult Immunisation Schedule (NAIS) include (Communicable Disease Agency of Singapore, 2025):

a. 6-in-1 (DTaP-IPV-Hib) vaccine administered at 2, 4, and 6 months of age, with a fourth dose at 18 months.
b. Tdap (tetanus, diphtheria, acellular pertussis) vaccine administered at 10–11 years of age (primary five) as part of school-based vaccination.
c. Tdap-IPV vaccine administered as a single dose during each pregnancy.
d. Tdap or Tdap-IPV vaccine administered to adults with incomplete vaccination or specific medical indications.

To support tetanus surveillance and control, the Communicable Disease Agency of Singapore released a Tetanus Disease Surveillance and Information guideline, which provides updated information on the disease, including an overview, epidemiology, pathogen characteristics, modes of transmission, clinical features, risk factors, diagnosis, treatment and management, as well as precautions, prevention and control measures, and notification requirements.

Thailand

Thailand launched the EPI in 1977, with tetanus vaccination introduced the same year for infants at 2 and 4 months of age through the DTP vaccine WHO, 2024c). Since then, the national tetanus vaccination schedule has been progressively expanded to cover additional age groups (WHO, n.d):

- DTwP-Hib-HepB (whole cell) vaccine administered at 2, 4, and 6 months.
- DTwP (whole cell) vaccine administered at 1.5 years and 4 years.
- Td (tetanus toxoid and diphtheria) vaccine administered to children at 12 years (all school children in grade 6).
- Td vaccine for adults ≥20 years booster dose every 10 years, pregnant women administered at first contact, +1 month, and +6 months, depending on vaccination history.

To support tetanus surveillance and control, the Disease Control Division of the Ministry of Public Health Thailand has issued the Tetanus Disease Surveillance/Investigation Guidelines for Just-In-Time teams. In addition, wound care guidelines were provided to prevent post-wound tetanus through proper wound management, vaccination, or administration of immunoglobulin when necessary.

Timor-Leste

Timor-Leste initiated its EPI in 1978, and the programme was re-structured in March 2000. Tetanus vaccination was first introduced in the country in 2007 with the DTP-HepB vaccine, followed by the introduction of the DTP-Hib-HepB vaccine in 2012. In 2016, DPT/DT booster doses were added to further strengthen protection against tetanus (WHO, 2024d). The national tetanus immunization schedule is as follows (WHO, n.d):

1. DTwP-Hib-HepB (whole cell) vaccine administered at 1, 2, and 3 months of age.
2. DTwP (whole cell) vaccine administered at 18 months (1–2 years).
3. DT (tetanus toxoid and diphtheria, children's dose) vaccine administered at 6 years.
4. Td (tetanus toxoid and diphtheria for older children and adults) administered to pregnant women at first contact, +1 month, +6 months, and +1 year.

Viet Nam

Viet Nam has implemented a neonatal tetanus elimination programme since 1992, which has contributed significantly to reducing neonatal tetanus. The country was recognized as having achieved neonatal tetanus elimination in 2005, with tetanus vaccination for pregnant women playing a key role in achieving this milestone (Ministry of Health Viet Nam, 2015). Viet Nam aims to strengthen immunization coverage further by targeting a 90% TCMR by 2025 and 95% by 2030. To support this expansion, the Government issued Resolution No. 104/NQ-CP on 15 August 2022, outlining the roadmap for increasing the number of vaccines in the Expanded Immunization Program for 2022–2030 (Ministry of Health Viet Nam, 2024).

The national tetanus vaccination schedule is as follows (WHO, n.d):

1. DTwP-Hib-HepB (whole cell) vaccine administered at 2, 3, and 4 months.
2. DTwP (whole cell) vaccine administered at 18 months.
3. Td vaccine administered at 7 years, targeting children aged 7 years or those enrolled in grade 2.
4. TT vaccine for pregnant women administered at first contact, +1 month, +6 months, and +1 year.

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ASEAN Biological Threats Surveillance Centre
Email: support@aseanbiosurveillance.org
Email: data@aseanbiosurveillance.org
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