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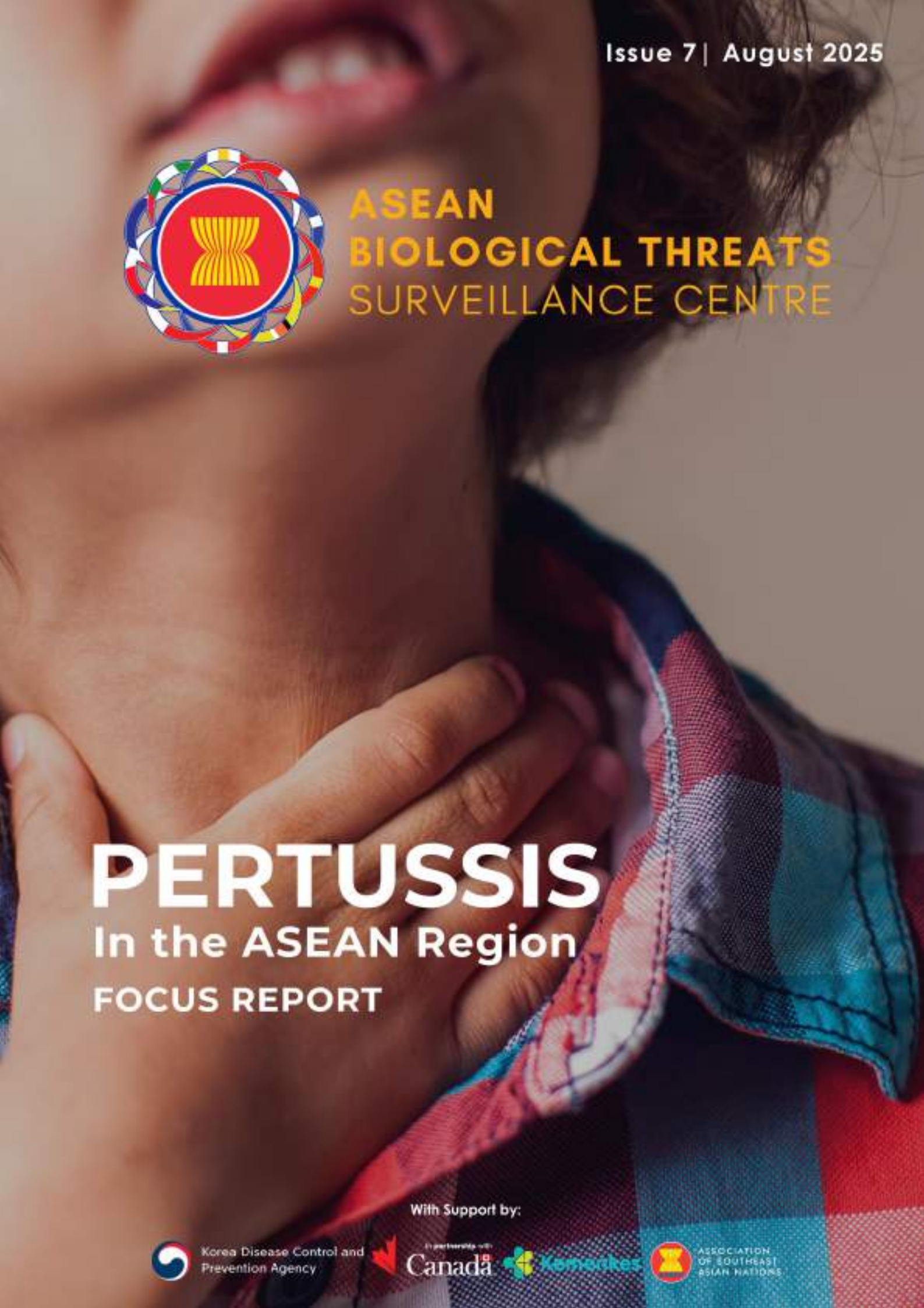
ASEAN BIOLOGICAL THREATS SURVEILLANCE CENTRE



PERTUSSIS
In the ASEAN Region
FOCUS REPORT

With Support by:

Korea Disease Control and Prevention Agency

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ASSOCIATION OF SOUTHEAST ASIAN NATIONS

ASEAN
BIOLOGICAL THREATS
SURVEILLANCE CENTRE

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PERTUSSIS FOCUS REPORT

ASEAN
BIOLOGICAL THREATS
SURVEILLANCE CENTRE

Acronyms and Abbreviations

AEFI = Adverse Events Following Immunisation
AMS = ASEAN Member States
ASEAN = Association of Southeast Asian Nations
CHC = Community Health Center
CHDs = Centers for Health and Developments
cMYP = comprehensive Multi-Year Plan
DOH = Department of Health
DTaP = Diphtheria, Tetanus, and acellular Pertussis DTaP-Hib HepB-IPV
DTP = Diphtheria, Tetanus, and Pertussis
DTP1 = Diphtheria, Tetanus, and Pertussis 1
DTP3 = Diphtheria, Tetanus, and Pertussis 3
DTP-HepB-Hib = Diphtheria, Tetanus, Pertussis, Hepatitis B and Haemophilus influenzae type b
ECI = Expert Committee on Immunisation
EPI = Expanded Programme on Immunization
GVAP = Global Vaccine Action Plan
IA2030 = Immunization Agenda 2030
IgG = Immunoglobulin G
LGUs = Local Government Units
MOH = Ministry of Health
NCIS = National Childhood Immunisation Schedule
NIP = National Immunization Program
NOH = National Objectives for Health
PCR = Polymerase Chain Reaction
VPD = Vaccine Preventable Disease
WHO = World Health Organization
wP = whole-cell Pertussis

PERTUSSIS

Introduction & Methods

Introduction

Pertussis, also known as whooping cough, is a bacterial infection primarily affecting the respiratory tract, characterized by severe coughing fits that may include a distinctive "whooping" sound. The bacterium produces toxins that damage the respiratory lining and can lead to serious complications, especially in young infants, such as pneumonia, apnea (pauses in breathing), encephalopathy (brain dysfunction), rib fractures, and in severe cases, death. Although pertussis is vaccine-preventable, immunity requires a full primary series plus booster doses, and unvaccinated or under-vaccinated individuals remain at high risk for severe disease and complications.

During infancy, pertussis can be particularly dangerous, with about one-third of infected infants needing hospitalization. Infants under 12 months, especially those younger than 6 months or whose mothers were not vaccinated during pregnancy, are most vulnerable to severe outcomes like apnea and pneumonia. Older children, adolescents, and adults typically experience milder symptoms, often without the classic whooping cough, but can still transmit the infection.

Globally, vaccination programs including pertussis-containing vaccines have significantly reduced incidence and mortality. Ensuring high vaccine coverage and timely boosters remains critical to controlling pertussis, with regional efforts such as those by ASEAN countries aligning with World Health Organization (WHO) goals to eliminate vaccine-preventable diseases including pertussis by 2026, as outlined in WHO regional vaccine implementation plans.

This report provides an overview of pertussis, 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 pertussis across vulnerable populations.

Methods

This report employs a comprehensive literature review to examine the global landscape of pertussis, 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 pertussis within the ASEAN region.

Case Definition and Clinical Features

Case Definition

Pertussis, or whooping cough, is an acute respiratory tract infection caused by the bacterium *Bordetella pertussis*. After an incubation period of nine to ten days, the clinical symptoms of the disease progress from a catarrhal phase to a paroxysmal cough, followed by persistent cough with characteristic whooping (WHO, n.d.). A case of pertussis may be confirmed through laboratory testing or epidemiological linkage.

A suspected case is an individual of any age who has had a cough lasting ≥ 2 weeks, or of any duration in infants or individuals in areas with ongoing outbreaks without a more likely diagnosis (WHO, 2018). Based on observation or caregiver report, the case must also exhibit at least one of the following symptoms:

a. Paroxysmal coughing (uncontrolled coughing that is exhausting and painful),
b. inspiratory whooping,
c. post-tussive vomiting (vomiting after coughing), or vomiting without other apparent cause,
d. apnoea (only in < 1 year of age), or
e. clinician suspicion of pertussis.

In immunized or previously infected individuals, pertussis may not present with the classic signs of cough and whooping and thus may not be captured by the above case definition.

Final case classification

A case of pertussis may be confirmed through laboratory testing or epidemiological linkage.

Laboratory-confirmed case: An individual who meets the suspected case definition and has laboratory confirmation by one of the following:

a. isolation of *B. pertussis*,
b. detection of genomic sequences of B. pertussis by means of polymerase chain reaction (PCR) assay, if PCR meets performance criteria, or
c. elevated IgG antibodies to pertussis toxin in an individual ≥ 11 years of age, one year or longer after last vaccine dose.

Epidemiologically linked case: An individual who meets the suspected case definition and had close contact with a laboratory-confirmed case (or another epidemiologically linked case in an outbreak setting) within the three weeks prior to cough onset. Close contact is defined as:

a. having face-to-face exposure to a case, including household or family contact,
b. staying overnight in the same room as a case, or
c. having direct contact with respiratory, oral, or nasal secretions of a laboratory-confirmed case.

Clinically compatible case: A suspected case who meets the case definition of pertussis but either sample could not be collected, or lab results are negative for pertussis.

An individual who meets the suspected case definition but does not meet the criteria for confirmed classification is considered a **possible case**. This includes individuals who were not tested in the laboratory as well as those who tested negative.

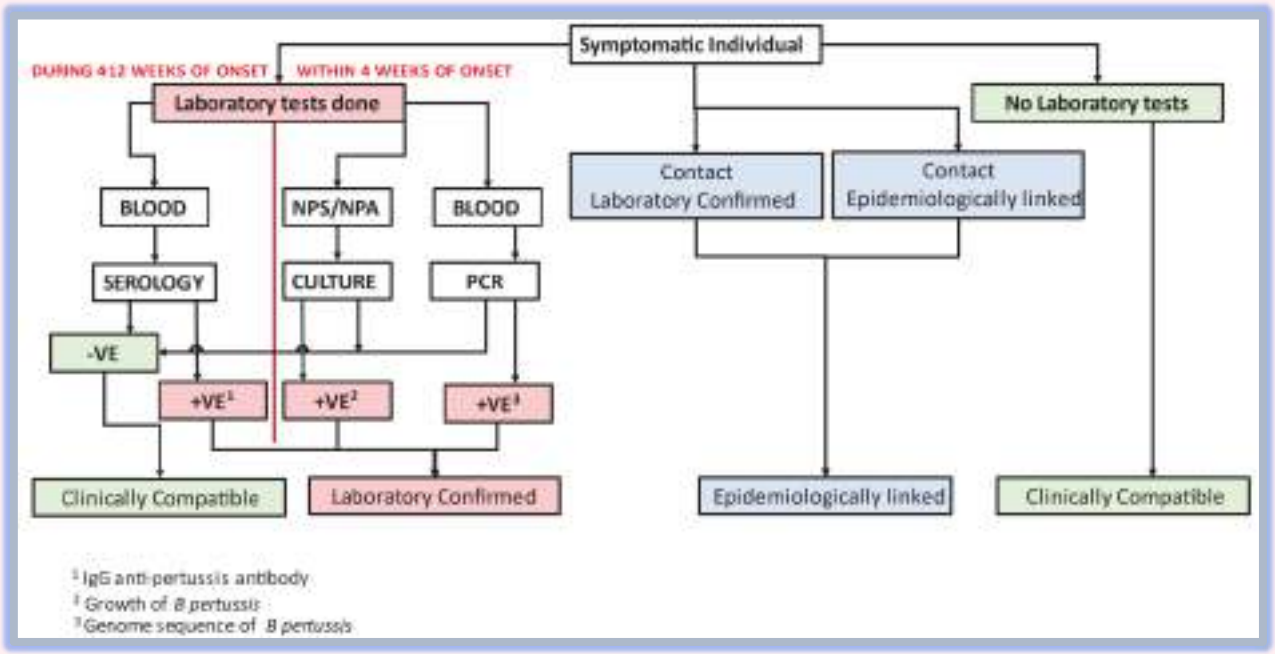


Figure 1. Final case classification
Source: https://www.who.int/publications/i/item/9789290210092

Transmission

Pertussis is a highly contagious acute respiratory illness caused by *Bordetella pertussis*, with humans being the only known reservoir of infection (WHO, 2023). Pertussis is a respiratory disease that is primarily transmitted through direct contact with respiratory secretions, usually through large droplets expelled during coughing or sneezing. The incubation period ranges from 6 to 20 days, with an average of 9–10 days.

Risk Factors and Risk Groups

The severity of pertussis infection is influenced by both age and underlying medical conditions (CDC, 2024). Infants under one year of age are at the highest risk for contracting pertussis and developing serious complications. Individuals with pre-existing health conditions that may be exacerbated by respiratory infections are also considered high-risk. These include, but are not limited to, immunocompromising conditions and moderate to severe asthma requiring medical management.

Clinical Presentation

There are three phases of symptoms, including catarrhal, paroxysmal, and convalescent stage (WHO, 2023). The catarrhal stage starts with a mild cough, intensifies over 1-2 weeks, and can lead to complications like subconjunctival haemorrhage, hernias, and rib fractures. The paroxysmal stage is severe, often resulting in vomiting or mucus expulsion, and a characteristic inspiratory "whoop" may follow. The convalescent stage gradually reduces cough severity and frequency, with fever generally absent throughout the illness.

Asymptomatic or mildly symptomatic *Bordetella pertussis* infections are frequently observed, particularly among older individuals with prior vaccination (WHO, 2018). In children, the classical clinical manifestation consists of paroxysmal coughing, ending with the characteristic whoop with post-tussive emesis (vomiting). However, in young infants, pertussis can initially present as apnoeic (stopped breathing) or cyanotic (bluish colour) episodes prior to development of cough.

Clinical Diagnostic

Several diagnostic methods are available for confirming *Bordetella pertussis* infection, each with distinct advantages, limitations, and recommended testing period.

Culture

Bacterial culture remains the gold standard for confirming *Bordetella pertussis* infection, with average growth occurring within 3 to 7 days, though up to 10 days may be required (WHO, 2023). Culture is essential not only for diagnosis but also for antimicrobial susceptibility testing and molecular characterization. Despite its high specificity, the sensitivity of culture is relatively low (less than 60%), with the highest positivity rates observed in infants. Factors that reduce culture sensitivity include prior antibiotic use, delayed specimen collection beyond the first two weeks of illness, delays in specimen transport, and prior vaccination. Additionally, culture is less sensitive in adolescents and adult.

Polymerase Chain Reaction (PCR)

PCR is a more rapid and sensitive diagnostic method for *Bordetella pertussis* compared to culture, but it has limitations such as false-positive and false-negative results (WHO, 2023). False positives can occur due to cross-contamination during collection or processing, laboratory processing. Conversely, the likelihood of false negatives increases if the sample is collected more than four weeks after symptom onset or following more than five days of antibiotic therapy. False negatives increase with sample collection over four weeks after symptom onset or after antibiotic therapy. The lack of a single gene target for B. pertussis can cause cross-reactivity with other *Bordetella* species. To improve accuracy, multiple gene targets are recommended. Standardized PCR protocols also lead to variability in assay procedures, sensitivity, and specificity.

Serological Testing

Serological testing for pertussis detects IgG antibodies, which appear 4–12 weeks after symptom onset; thus, testing should be conducted no earlier than four weeks after the onset of cough (WHO, 2023). The most accurate results come from assays targeting pertussis toxin IgG, calibrated to international standards. Testing for other antigens or using IgM is not recommended due to low sensitivity and specificity. IIn infants, serological results may be unreliable because of the presence of maternal antibodies. Additionally, serology is not advised for individuals of any age who have received a pertussis-containing vaccine within the previous 12 months, as vaccine-induced IgG can remain elevated for an extended period, leading to false-positive results. Due to these limitations, culture and PCR are preferred for diagnosing acute pertussis.

Epidemiology

Global Situation

Pertussis remains a significant global public health concern. Figure 2 shows the worldwide distribution of pertussis incidence in 2004, 2014, and 2024, based on data reported to the WHO (WHO, 2025). Countries are color-coded by incidence level, ranging from 0 cases per million people (green) to more than 1,000 cases per million (dark orange), while grey indicates missing surveillance data. The maps, as shown in Figure 2, highlight country-level shifts in disease burden over time.

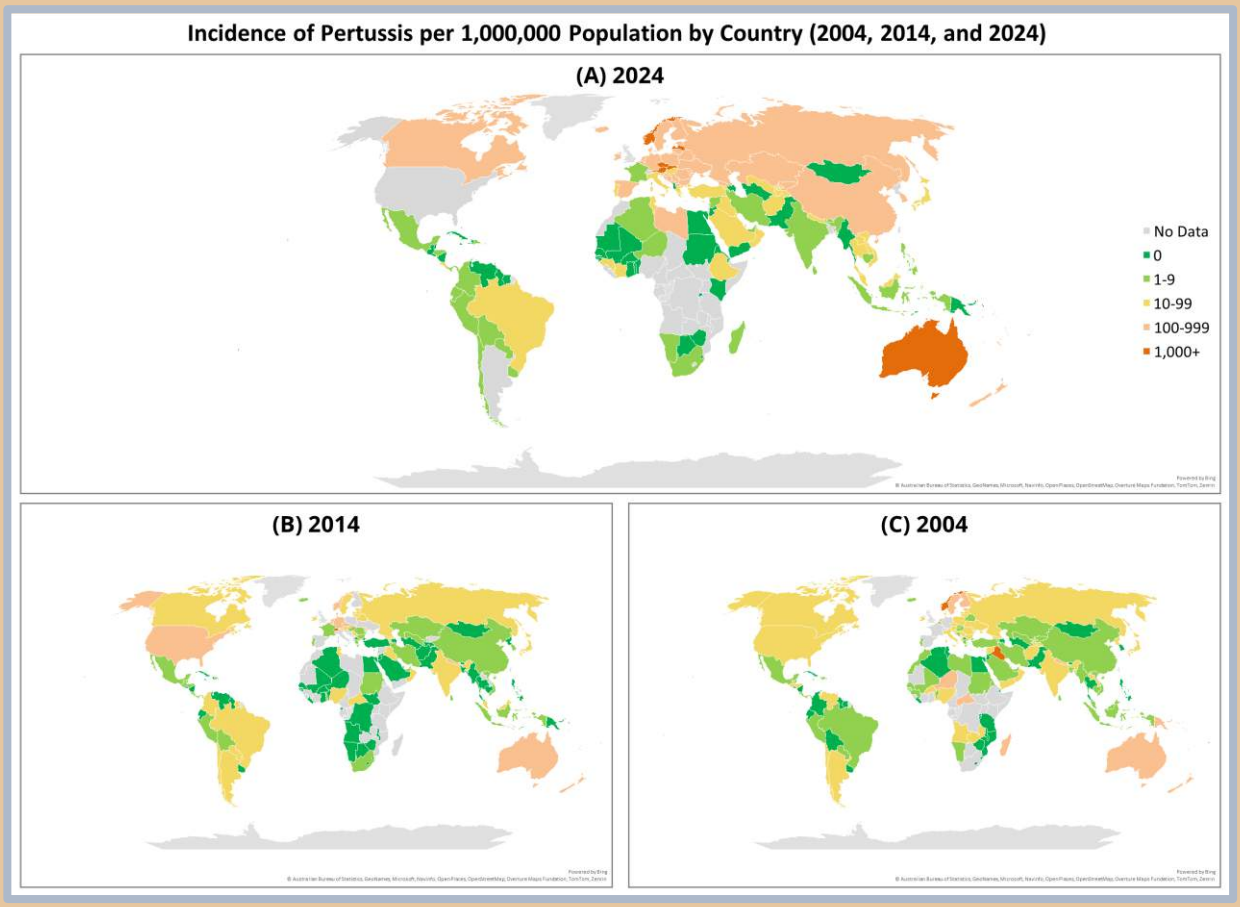


Figure 2. Incidence of pertussis per 1,000,000 population by country in 2004, 2014, and 2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence))

In 2004 (C), the highest pertussis incidence was recorded in Iraq and Norway, each exceeding 1,000 cases per million population. Several countries—Australia, Central African Republic, New Zealand, Papua New Guinea, Nepal, Madagascar, Niger, Estonia, Finland, Sweden, and the Netherlands, reported incidence rates in the hundreds per million. By 2014 (B), Switzerland was the only country with incidence above 1,000 cases per million, while incidence in the hundreds per million was observed in Australia, Belgium, Czechia, Denmark, Germany, Israel, Nepal, the Netherlands, New

Caledonia, New Zealand, Norway, Slovakia, Slovenia, and the United States.

In 2024 (A), the global distribution of pertussis showed notable shifts. Australia recorded the highest burden, exceeding 1,000 cases per million people. Incidence rates in the hundreds per million were observed across several countries in Eastern Europe, Central Asia, and parts of East Asia. In contrast, much of Africa, South America, and some areas of Southeast Asia reported lower levels, between 1 and 99 cases per million, with scattered regions reporting no cases at all. Large areas, particularly in Sub-Saharan Africa, had no available surveillance data, underscoring persistent gaps in global monitoring.

Vaccine Coverage and Annual Incidence

According to the WHO Immunization Agenda 2030, the Global Vaccine Action Plan (GVAP) sets a goal of achieving 90% coverage for essential vaccines by 2030 (WHO, 2021b). To assess how well national immunization programs are working, WHO tracks coverage of the first (DTP1) and third (DTP3) doses of the diphtheria, tetanus, and pertussis vaccine. DTP1 coverage indicates whether people can access immunization and health services, while DTP3 coverage shows whether individuals complete the vaccine series and reflects the overall performance of the immunization system.

Figure 3 shows global and regional trends in pertussis incidence together with DTP1 and DTP3 vaccine coverage from 2015 to 2024, based on WHO data (WHO, 2025). Each panel presents pertussis incidence per million population alongside DTP1 and DTP3 coverage rates. Globally, incidence remained relatively low (9–26 cases per million) between 2015 and 2023 but rose sharply in 2024 to 137 cases per million (A). The European Region reported the highest incidence among all regions (E), exceeding 50 cases per million between 2015 and 2019. Although incidence gradually declined through 2022, it rose again to nearly 100 cases per million and then spiked to over 300 cases per million in 2024. A similar surge in 2024 was also observed in the Region of the Americas (B) and the Western Pacific Region (G).

DTP1 coverage stayed relatively stable at 86–90%, achieving the 90% target in 2017–2019 before gradually declining to 86% in 2021 and recovering to nearly 89% by 2024. DTP3 coverage was consistently lower than DTP1, ranging between 81% and 86% (A).

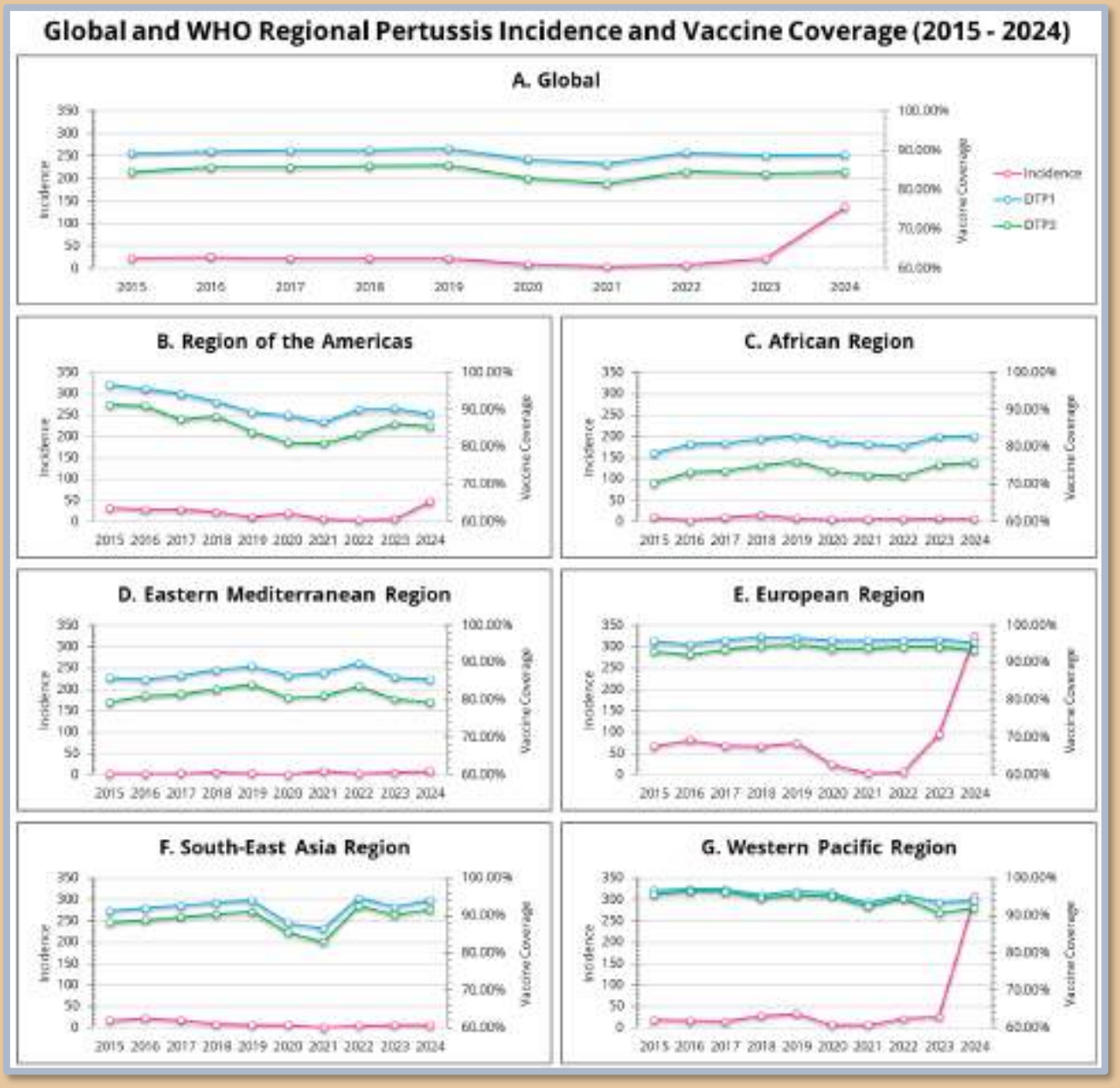


Figure 3. Global and WHO Regional Trends in Pertussis Incidence and Vaccine Coverage, 2015–2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence))

Burden of Pertussis in the ASEAN Region

Pertussis 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 and incidence per million population, based on WHO immunization data (WHO, 2025).

Figure 4 shows the distribution of reported pertussis cases in the ASEAN region from 2015 to 2024. Reported cases varied across ASEAN Member States (AMS): Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Viet Nam each recorded thousands of cases (ranging from 1,149 to 7,015), while Cambodia, Myanmar, and Singapore reported hundreds (244 to 646). Brunei Darussalam reported the lowest number, with nine cases over the period.

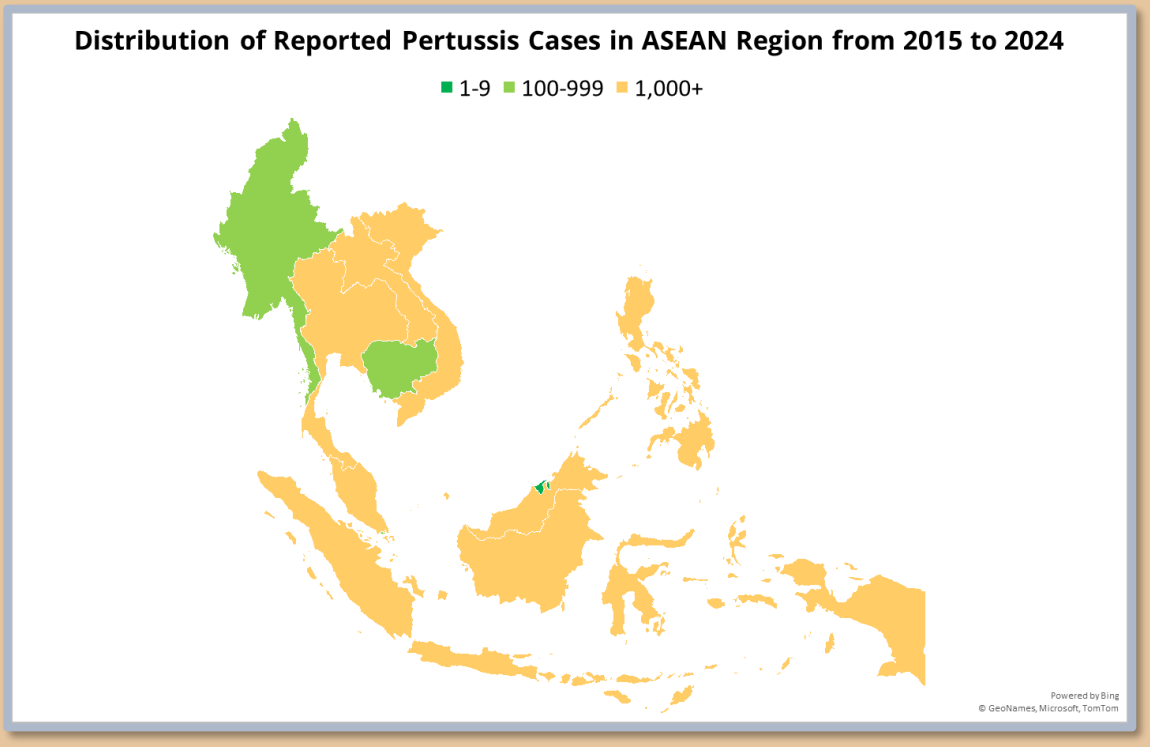
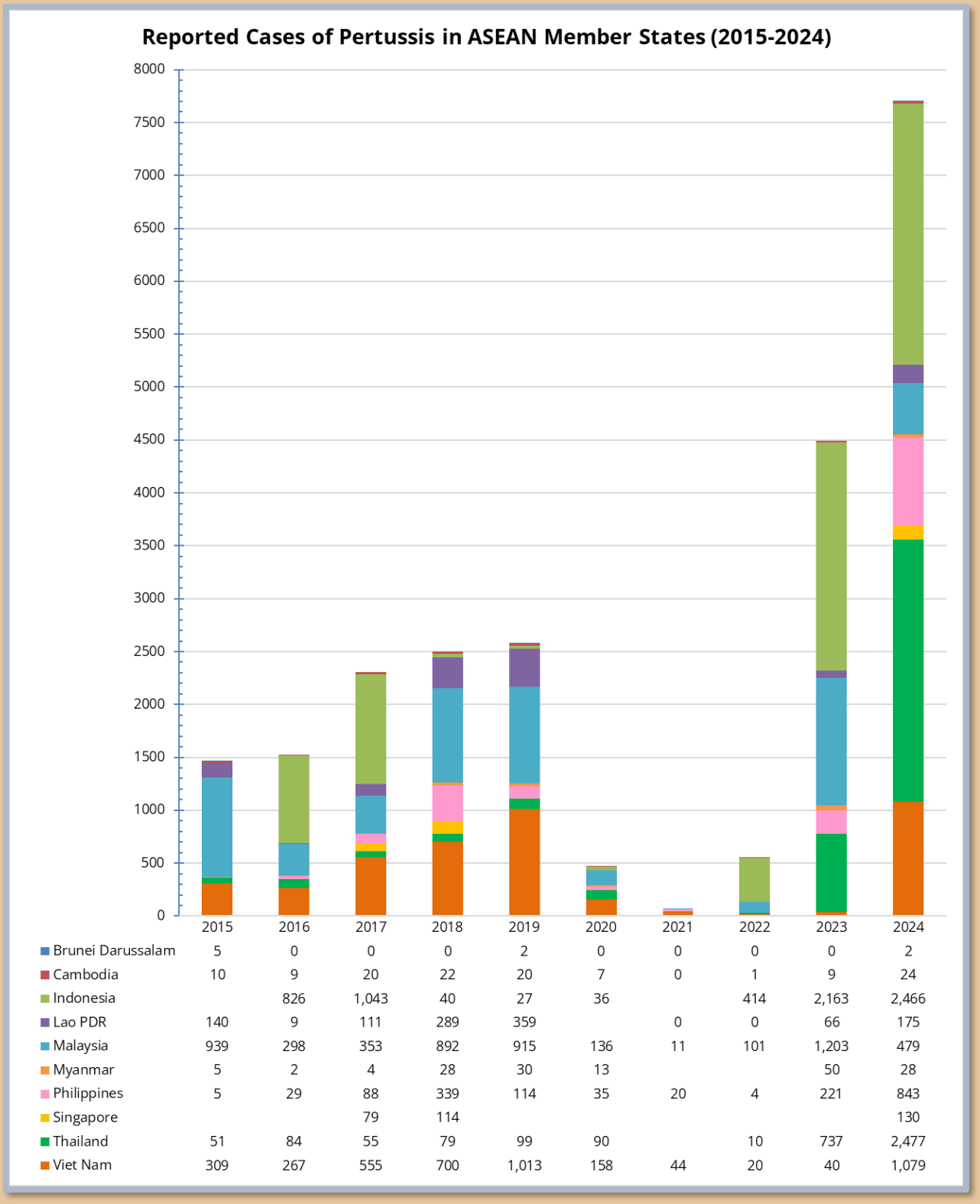


Figure 4. Distribution of reported pertussis cases in ASEAN 2015 - 2024
(Source: WHO immunization data (https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence))

Figure 5 provides detailed information on the number of reported pertussis cases in the ASEAN region. The number of reported cases fluctuated during the period, starting from 1,464 cases in 2015 and gradually increasing to 2,579 cases in 2019. Cases then declined to 75 in 2021. However, cases reemerged since 2022, reaching 7,703 cases in 2024, the highest since 2015. This mirrors the global situation where pertussis spiked 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	5	0	0	0	2	0	0	0	0	2
Cambodia	10	9	20	22	20	7	0	1	9	24
Indonesia		826	1,043	40	27	36		414	2,163	2,466
Lao PDR	140	9	111	289	359		0	0	66	175
Malaysia	939	298	353	892	915	136	11	101	1,203	479
Myanmar	5	2	4	28	30	13			50	28
Philippines	5	29	88	339	114	35	20	4	221	843
Singapore			79	114						130
Thailand	51	84	55	79	99	90		10	737	2,477
Viet Nam	309	267	555	700	1,013	158	44	20	40	1,079

Figure 5. Trend of reported cases of pertussis in the ASEAN Region, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Brunei Darussalam

Brunei Darussalam reported very few pertussis cases between 2015 and 2024, with five cases in 2015 and two cases each in 2019 and 2024, for a total of nine cases over the past decade (Figure 6).

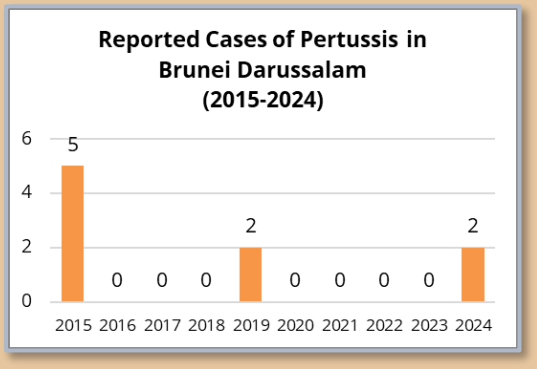


Figure 6. Trend of reported cases of pertussis in Brunei Darussalam, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Cambodia

Cambodia reported fluctuating pertussis cases over the past decade (Figure 7). The highest counts were observed in 2017 (20 cases), 2018 (22), 2019 (20), and 2024 (24). A sharp decline occurred in 2020 (7 cases) followed by no cases in 2021, before cases reappeared since 2022 (1 case) and increased again in 2023 (9 cases) and 2024 (24 cases).

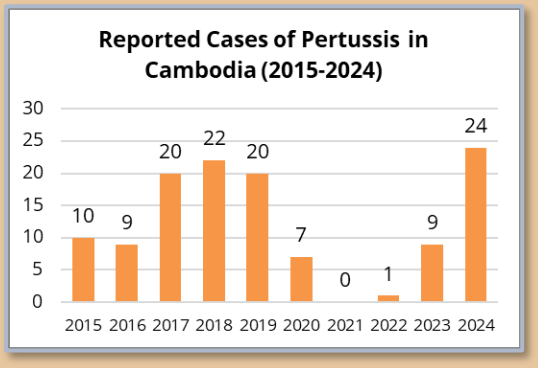


Figure 7. Trend of reported cases of pertussis in Cambodia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Indonesia

Indonesia recorded notable fluctuations in pertussis cases during 2015–2024. With 826 cases reported in 2016 and rose in 2017 (1,043), reports dropped sharply in 2018–2020 (40, 27, and 36 cases). Cases rose again in 2022 (414) before surging in 2023 (2,163) and 2024 (2,466), marking the highest counts in the decade (Figure 8).

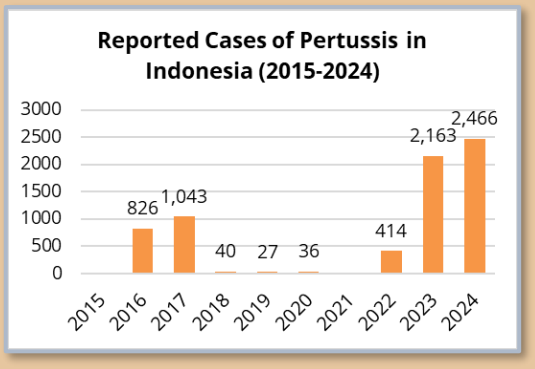


Figure 8. Trend of reported cases of pertussis in Indonesia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Lao PDR

Lao PDR reported fluctuating pertussis cases between 2015 and 2024. Cases peaked in 2019 (359) after a steady rise from 2017 (111) and 2018 (289). Following a drop to zero cases in 2021–2022, reports resumed in 2023 (66) and increased further in 2024 (175) (Figure 9).

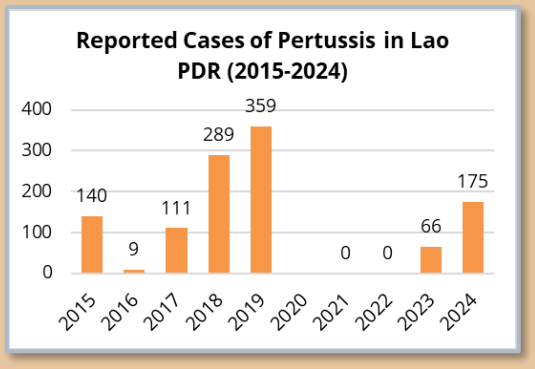


Figure 9. Trend of reported cases of pertussis in Lao PDR, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Malaysia

Malaysia reported fluctuating pertussis cases during 2015–2024 (Figure 10). Cases were highest in 2023 (1,203) and lowest in 2021 (11). After peaking in 2015 (939), reports declined sharply in 2016 (298) but rebounded in 2018 (892) and 2019 (915). A steep drop occurred in 2020–2022, followed by resurgence in 2023 and a decrease in 2024 (479).

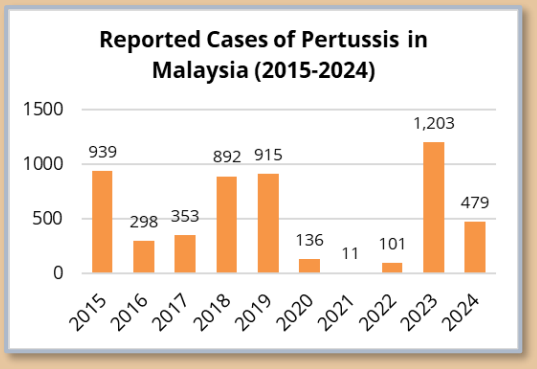


Figure 10. Trend of reported cases of pertussis in Malaysia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Myanmar

Myanmar reported fluctuating pertussis cases from 2015–2024 (Figure 11). After very low levels in 2015–2017 (2–5 cases annually), cases rose to 28 in 2018 and 30 in 2019, then declined to 13 in 2020. In 2023, cases surged to 50, before dropping to 28 in 2024.

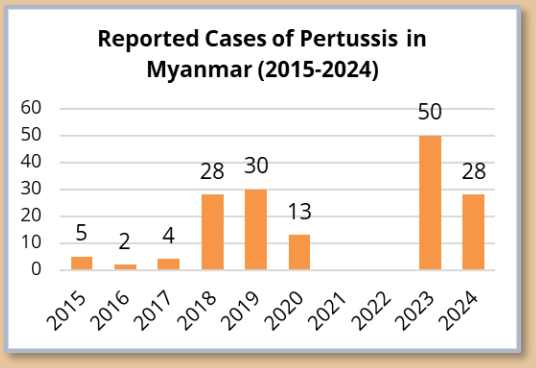


Figure 11. Trend of reported cases of pertussis in Myanmar, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Philippines

The Philippines experienced fluctuating pertussis trends over the past decade. Reported cases rose from 5 in 2015 to a peak of 339 in 2018, then declined to 20 by 2021 and just 4 in 2022 (Figure 12). A resurgence followed with 221 cases in 2023 and a sharp increase to 843 in 2024, marking the highest level in the period.

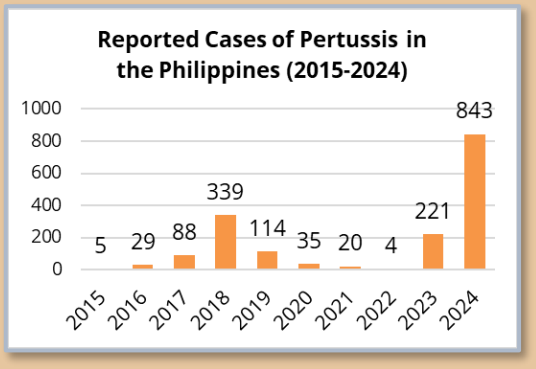


Figure 12. Trend of reported cases of pertussis in the Philippines, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Singapore

Figure 13 shows reported pertussis cases in Singapore from 2015 to 2024. During this period, Singapore recorded 79 cases in 2017, 114 in 2018, and 130 in 2024, respectively.

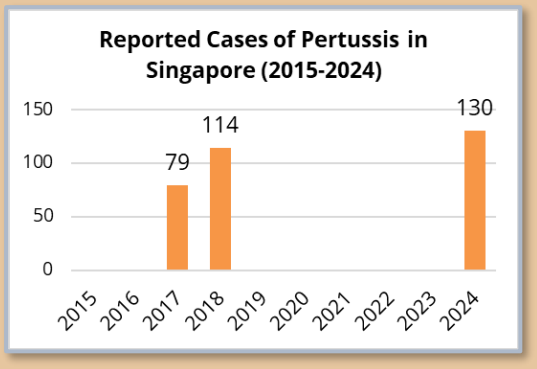


Figure 13. Trend of reported cases of pertussis in Singapore, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Thailand

From 2015 to 2022, Thailand reported relatively few pertussis cases, ranging between 10 and 99 annually. However, cases surged in 2023 with 737 reported, before peaking in 2024 at more than 2,400 cases.

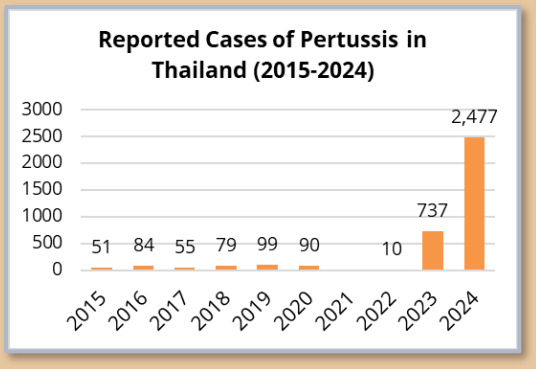


Figure 14. Trend of reported cases of pertussis in Thailand, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Viet Nam

In 2015, Viet Nam reported 309 cases of pertussis in 2015, followed by a slight drop to 267 cases in 2016. However, cases significantly rose to 555 cases in 2017and peaked to 1,013 in 2019 (Figure 15). Cases then dropped to 158 in 2020 and fell below 50 from 2021 to 2023 (44, 20, and 40, respectively). In 2024, however, cases surged again to 1,079, the highest level of the decade).

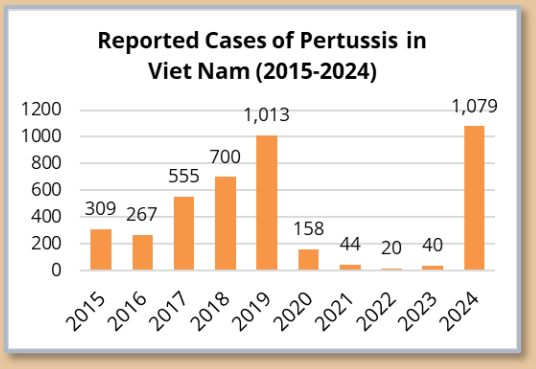


Figure 15. Trend of reported cases of pertussis in Viet Nam, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Case Management and Prevention

Case Management

To manage suspected pertussis cases, the steps are as follows (WHO, 2023):

- **Antibiotic treatment.** Macrolide antibiotics, such as erythromycin are effective in treating pertussis during the incubation or early catarrhal stage, preventing or attenuating the disease's clinical manifestation. During the paroxysmal phase, these antimicrobial agents do not alter the disease's progression but may facilitate bacterial clearance from the nasopharynx, reducing transmission risk.

- **Isolation.** Suspected cases of having pertussis should avoid contact with high-risk populations, particularly young children and pregnant women in their third trimester, especially if they are unvaccinated until they complete at least five days of antibiotic therapy. If antibiotic treatment hasn't been initiated, contact with vulnerable individuals should be avoided for the entire infectious period. Hospitalized patients should be managed under respiratory isolation, and infection prevention measures should include contact and droplet precautions, such as using face masks in proximity.

- **Vaccination.** Natural infection with *Bordetella pertussis* does not provide long-lasting immunity. So, individuals with confirmed clinical pertussis who haven't completed the full primary vaccination series should receive remaining doses during the convalescent phase, and if necessary, an age-appropriate booster dose.

Prevention

Immunization is the most effective strategy for preventing pertussis. Administration of the three-dose primary series of DTP-containing vaccines significantly reduces the risk of severe disease during infancy (WHO, n.d). The WHO advises initiating vaccination as early as six weeks of age, followed by two additional doses at intervals of 4–8 weeks, typically at 10–14 weeks and 14–18 weeks of age. A booster dose is recommended during the second year of life, and depending on the local epidemiological context, additional boosters may be indicated later in life. Vaccination during pregnancy has also proven effective in protecting newborns who are not yet eligible for routine immunization.

Control Measures Strategy

In 2020, WHO introduced the Immunization Agenda 2030 (IA2030), a global vision and strategy for vaccines and immunization from 2021 to 2030 (WHO, 2020). This agenda positions immunization as both a human right and an investment in a healthier, safer, and more prosperous future. IA2030 seeks to sustain past gains, address emerging challenges, and ensure no one is left behind. The agenda aims to align stakeholders at all levels (governments, agencies, healthcare providers, researchers, manufacturers, civil society, and the private sector) through efficient resource use, innovation, and sustainable financing. Its success depends on strong cross-sector partnerships to strengthen primary healthcare, advance universal health coverage, and accelerate progress toward the Sustainable Development Goals.

Through this framework, Member States, stakeholders, partners, and WHO aim to work more effectively together to eliminate vaccine-preventable morbidity, mortality, and disability through the seven strategic priorities outlined in the global IA2030 strategy (Figure 16).

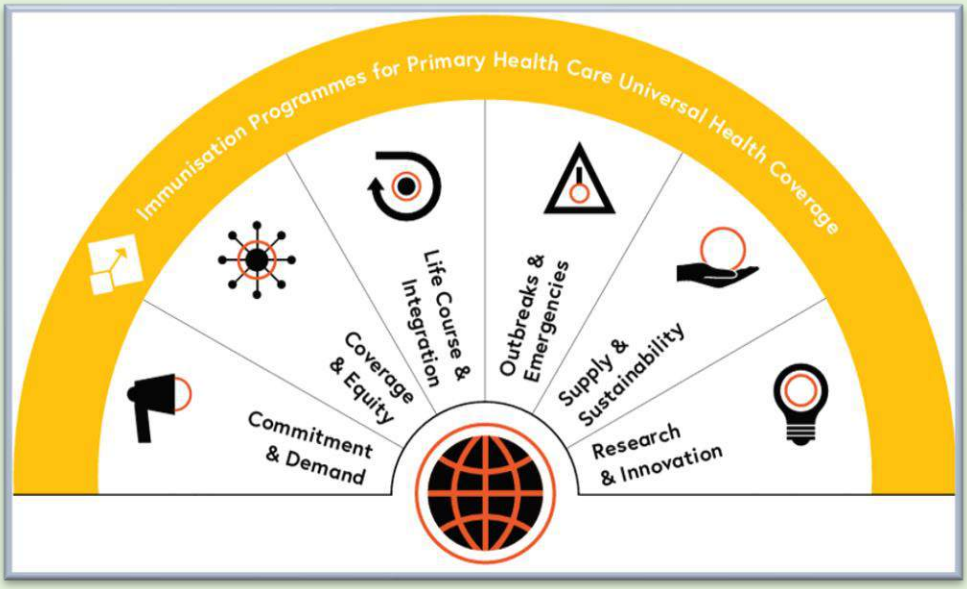


Figure 16. The seven strategic priorities of IA2030
Source: *https://www.who.int/publications/m/item/immunization-agenda-2030-a-global-strategy-to-leave-no-one-behind*

1. **Primary Health Care and Universal Health Coverage.** Immunization services that are effective, efficient, and resilient are integral to primary health care and play a critical role in advancing universal health coverage by ensuring equitable access for all populations.
2. **Commitment and Demand.** Immunization is recognized and actively pursued by all individuals, while health authorities remain committed to ensuring its

availability as a vital component in realizing the highest attainable standard of health, acknowledged as a fundamental human right.

3. **Coverage and Equity.** Equitable access to the full benefits of immunization is ensured for all individuals, irrespective of their geographic location, age, sex, socioeconomic status, ethnicity, or gender-related barriers.
4. **Life Course and Integration.** All individuals receive the full benefits of recommended immunizations across the life course, with services effectively integrated into broader essential health care delivery.
5. **Outbreaks and Emergencies.** Immunization programmes are designed to proactively anticipate, prepare for, and detect outbreaks of vaccine-preventable and emerging diseases, while ensuring a rapid and effective response. They also play a critical role in sustaining immunization services during acute emergencies, including those arising from conflict, natural disasters, and humanitarian crises.
6. **Supply and Sustainability.** All countries maintain a dependable supply of high-quality, appropriate, and affordable vaccines, supported by sustainable financing mechanisms to ensure the continuity and effectiveness of immunization programmes.
7. **Research and Innovation.** Innovations aimed at expanding the reach and enhancing the impact of immunization programmes are promptly accessible to all countries and communities.

In the Western Pacific Region, pertussis remains a priority, and the proposed goal is accelerated control, with the specific target of achieving zero deaths caused by infection with *Bordetella pertussis* by 2030. To achieve this goal, several strategic directions have been identified, including (WHO, 2020b):

- Achieve and sustain high-level population immunity against pertussis, through high coverage of a three-dose pertussis vaccine series and at least one booster dose of DTP at ages 1 to 6, preferably at age 1.
- Develop strategies to provide booster doses in adolescents to extend the durability of pertussis immunity and in pregnant women to protect young infants through maternal antibodies.
- Strengthen pertussis surveillance systems to support outbreak response and to identify specific risk groups for targeted interventions, such as health-care workers and adult caregivers of young children.
- Adapt national immunization strategies to include new vaccine technologies under development, such as improved whole-cell Pertussis (wP) that may be less reactogenic while providing more durable immunity.

Contact Tracing

For case-based surveillance, suspected pertussis cases should be reported to public health authorities promptly to enable timely investigation (WHO, 2018). Individual cases should be investigated within two days of notification, and outbreaks within two days of identification. A case investigation form and specimen collection are required for all suspected cases. Suspected cases should be advised to avoid contact with infants, children, and women in late pregnancy for three weeks after cough onset or until five days of antibiotic treatment are completed, whichever comes first.

Each suspected case should trigger contact tracing to identify additional cases in the community. This helps determine the magnitude of transmission and limit spread to vulnerable groups. For aggregate or event-based surveillance, individual cases are generally not investigated, and samples are not collected unless an outbreak is detected. However, local health authorities are encouraged to investigate suspected cases and take public health action when appropriate.

A close contact is defined as someone who has had face-to-face exposure to a case. This includes household or family, people who have stayed overnight in the same room as a laboratory-confirmed case, and those who have had direct contact with the patient's respiratory, oral or nasal secretions.

Control Measures in ASEAN Member States

In line with WHO guidance, ASEAN member states have adopted comprehensive measures to control and prevent pertussis. The following section outlines the specific strategies implemented in each country.

Brunei Darussalam

Brunei Darussalam has a comprehensive Expanded Programme Immunization (EPI) to protect children against ten vaccine-preventable diseases, including pertussis. Established in 1957, the program is regularly updated to align with WHO recommendations (WHO, 2020c). The pertussis-containing DTaP-Hib-HepB-IPV vaccine schedule consists of three primary doses administered at 2, 4, and 6 months of age, followed by a booster dose at 5 years (WHO, n.d). Vaccination services are available at four centres nationwide and serve individuals aged 5 years and older (Ministry of Health Brunei Darussalam, n.d).

Pertussis incidence in Brunei Darussalam remained very low over the past decade, with small peaks recorded in 2015 (11.8 cases per million), 2019 (4.5 cases per million), and 2024 (4.3 cases per million) (Figure 15). Throughout the period, vaccine coverage was consistently high. DTP1 coverage remained high at over 99% to 100% every year, while DTP3 coverage was nearly universal, ranging from 99.0% in 2015 to 99.84–100% in subsequent years.

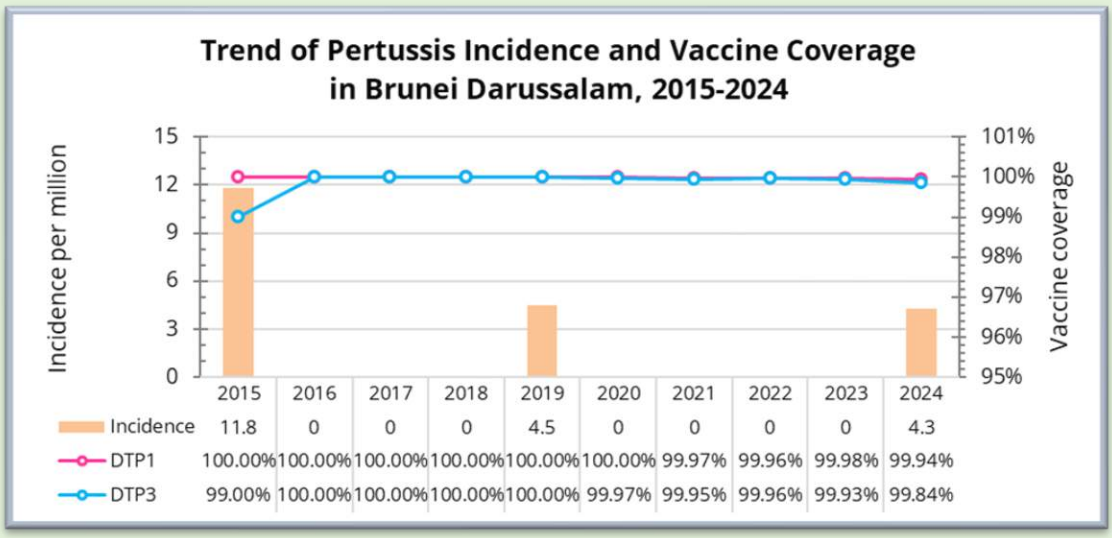


Figure 17. Trend of pertussis incidence and vaccine coverage in Brunei Darussalam, 2015-2024 (Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Cambodia

The National Immunization Program (NIP) of the Ministry of Health, Cambodia, established in 1986, has played a vital role in saving the lives of children and pregnant women and protecting communities from vaccine-preventable diseases for more than three decades (Ministry of Health Cambodia, 2022). The Cambodia National Immunization Strategy 2021-2025 and its extension to 2030 align with WHO's 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. The strategy supports the National Health Strategic Plan 2022-2030 and outlines immunization policies, strategies, interventions, and monitoring, recognizing immunization as a crucial part of primary health care. The agreed priorities and strategies include (Ministry of Health Cambodia, 2022):

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

Cambodia has one of Southeast Asia's strongest routine immunization programs, with DPT3 vaccine coverage exceeding 80% (UNICEF, 2024). With support from Gavi, the Vaccine Alliance, seven new vaccines, including the pentavalent vaccine (DTP-HepB-Hib), have been added over the past decade. The country's target, in line with the Western Pacific Regional Strategic Framework 2021–2030, is zero deaths from pertussis (Ministry of Health Cambodia, 2022).

From 2015 to 2024, pertussis incidence in Cambodia remained low, fluctuating between 0 and 1.4 cases per million population (Figure 16). Small peaks were observed in 2017–2019 and again in 2024, while no cases were reported in 2021. DTP1 and DTP3 coverage were generally high but showed a gradual decline after 2020. DTP1 ranged from 104% in 2015 to 95% in 2024, while DTP3 ranged from 98% in 2015 to 95% in 2024. Both indicators peaked in 2020, with DTP1 coverage exceeding 108% and DTP3 at 106%, before decreasing in subsequent years (WHO, 2025).

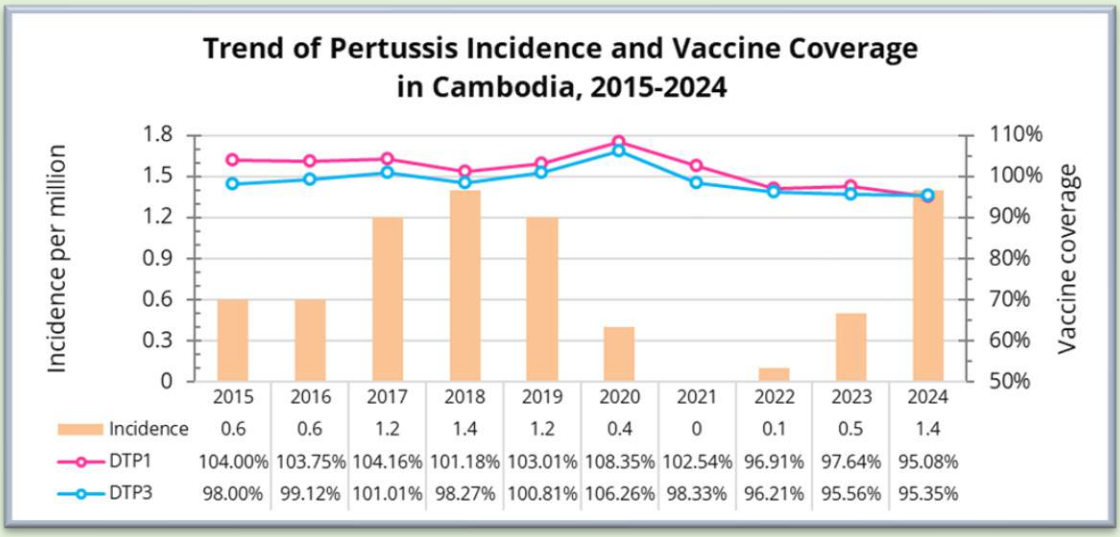


Figure 18. Trend of pertussis incidence and vaccine coverage in Cambodia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Indonesia

Pertussis requires effective coordination between disease surveillance and immunization programs to ensure effective prevention and control. Immunization activities in Indonesia began in 1956 and were expanded in 1977 through the establishment of the EPI. This initiative aimed to prevent the transmission of VPDs, including pertussis (Ministry of Health Indonesia, 2017). According to national immunization guidelines, pertussis immunization is included in both routine and booster immunization schedules, administered through the combination DPT-HB-Hib vaccine. Children receive primary immunization doses at the ages of 2, 3, and 4 months, followed by a first booster dose at 18 months.

In Indonesia, pertussis surveillance is governed by Ministry of Health Regulation No. 45 of 2014 aims to monitor trends, enable early outbreak detection, support timely response efforts, and facilitate the sharing of health information with relevant stakeholders. According to the technical guidelines for pertussis surveillance in Indonesia, several key policies to enhance the surveillance system including (Ministry of Health Indonesia, 2021):

1. Any case that meets the suspected or clinical pertussis criteria at a Community Health Center (CHC) or other healthcare facility must be reported to the District/City Health Office within 24 hours for immediate epidemiological investigation.
2. Collection of a nasopharyngeal swab or aspirate, in addition to a blood (serum) sample, is required

for submission to a designated reference laboratory for testing for each suspected case of pertussis.

3. The laboratory network for pertussis surveillance is maintained through the public health laboratory system.
4. Health facilities are required to submit a "zero report" in instances where no suspected or confirmed pertussis cases are identified, to maintain continuous surveillance.
5. Routine immunization coverage for DPT-HB-Hib doses 1, 2, and 3 in infants, as well as booster doses for toddlers, must be maintained at a high (≥95%) and equitable level across all regions.

From 2015 to 2024, pertussis incidence in Indonesia fluctuated, ranging from a low of 0.1 cases per million in 2018–2020 to a peak of 8.7 cases per million in 2024 (Figure 19). Small peaks were observed in 2016–2017 and 2022–2024, while incidence remained minimal in 2018–2021. DTP1 and DTP3 coverage were generally high but showed a declining trend after 2019. DTP1 coverage ranged from 95.00% in 2015 to 83.77% in 2024, while DTP3 ranged from 93.13% in 2015 to 80.15% in 2024.

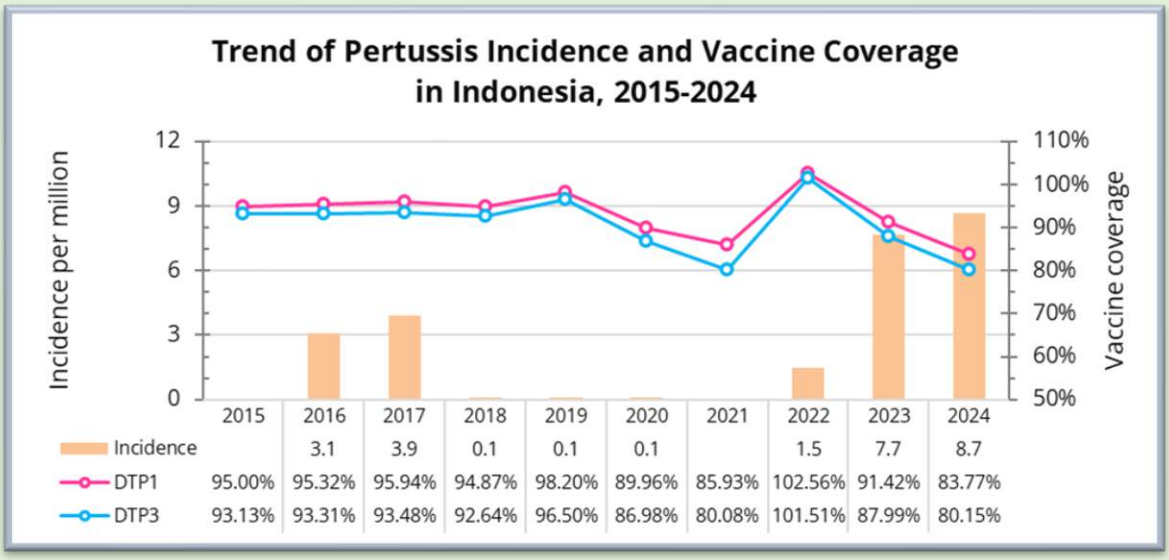


Figure 19. Trend of pertussis incidence and vaccine coverage in Indonesia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Lao People's Democratic Republic

The NIP in Lao People's Democratic Republic was launched in 1979 as the EPI, with the initial introduction of BCG, diphtheria, tetanus, pertussis, polio, and measles. It began as a pilot in two provinces and ten districts and expanded nationwide by 1989 (Ministry of Health Lao Peoples's Democratic Republic, 2007). Immunization is an important priority under the 6th national health strategy and is a core element of mother and child health promotion, covering the entire country from the central level to provinces, districts, health centres, and villages. There are 3 strategies in immunization such as (1) outreach strategy; (2) non-stay overnight outreach strategy; and (3) stay overnight outreach strategy. Regular immunization is conducted in 4–6 rounds per year, with special planning in place for hard-to-reach and high-risk areas, integrated into other maternal and child health activities (RTM, 2024). The current pertussis immunization schedule in Lao PDR uses the DTwP-Hib-HepB vaccine administered at 1, 2, and 3 months of age (WHO, n.d).

The Law on Immunization was developed and endorsed by the National Assembly on 25 June 2018 (RTM, 2024). In the 9th Five-Year Health Sector Development Plan (2021–2025), the immunization project includes the following activities, include carry out immunization activities in all 18 provinces; procure national-wide vaccines and distribute vaccines (including COVID-19 vaccines) to all provinces 4 times/year; install, maintain and monitor the cold chain system at central level and all 18 provinces; strengthen the capacity for routine immunization in the 18 provinces; improve vaccine supply and cold-chain management; review the dissemination and the implementation of the vaccination law; improve and maintain walk-in cold rooms; conduct quarterly meetings at provincial, district and health center levels with responsible committees and personnel, especially in high-risk areas; monitor and follow-up on the implementation of micro-plan training; provide immunization training for health workers at the health center level; print immunization forms/EPI tools; print the vaccination law and vaccine monitoring book; conduct annual EPI review meetings; improve health facilities and build waiting areas/rooms for healthcare workers to provide counselling on immunization while parents are waiting for service; conduct a study on community engagement and involvement on immunization; install autoclaves for 10 districts; procure tools for cold-chain maintenance; conduct training for cold-chain maintenance teams; procure refrigerators and cold boxes (RTM, 2024).

Between 2015 and 2024, Pertussis incidence in Lao PDR fluctuated, ranging from zero cases in 2020–2021 to a peak of

49.6 per million in 2019 (Figure 20). Other significant increases were observed in 2015 (20.6 per million), 2017–2018 (15.8–40.5 per million), and 2024 (22.5 per million). Vaccine coverage was generally high, with DTP1 consistently above 93% and reaching 105% in 2015. However, DTP3 coverage showed wider variation, from a high of 100% in 2015 to a low of 86.7% in 2021, before recovering to 95.5% in 2023.

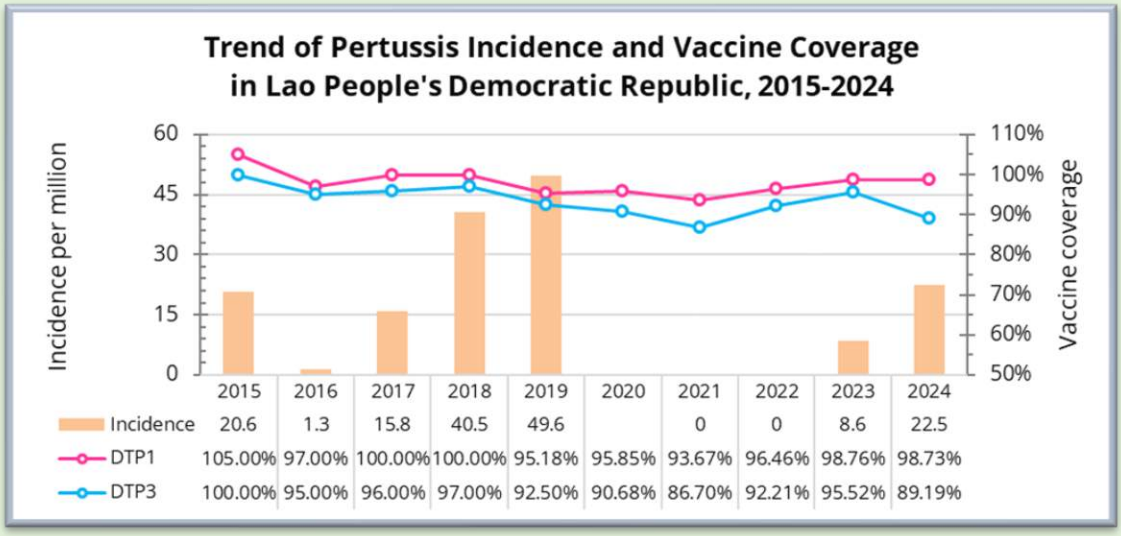


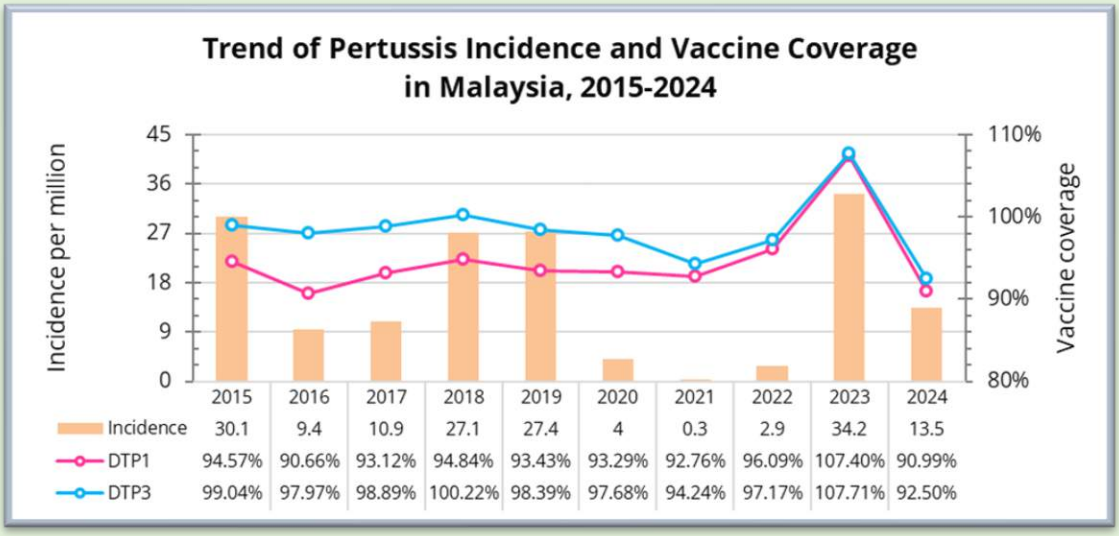
Figure 20. Trend of pertussis incidence and vaccine coverage in Lao PDR, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Malaysia

The NIP has been implemented in Malaysia since the 1950s to protect children from vaccine-preventable diseases. The triple antigen DPT vaccine was introduced in 1958. In 1974, the WHO launched the EPI, which Malaysia incorporated as a national programme in 1982 (Ministry of Health Malaysia, 2017). Currently, the National Immunisation Schedule of the Ministry of Health Malaysia for pertussis the administration of the DTaP vaccine in four primary doses at 2, 3, and 5 months of age, followed by a booster dose at 18 months (Ministry of Health Malaysia, n.d). In addition, to support ongoing efforts in the prevention and control of pertussis, the Ministry of Health Malaysia is currently assessing the need for implementing the administration of the combined Tdap vaccine for pregnant women (Ministry of Health Malaysia, 2023). Maternal immunisation with the pertussis vaccine provides protection to infants from the prenatal period until they are able to complete the primary series of the hexavalent vaccine under the National Immunisation Schedule.

To facilitate pertussis surveillance 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 (Ministry of Health Malaysia, 2017b). This edition incorporates updated case definitions, revised and updated diagnostic methods, updated contact details, reference laboratories, as well as notification requirements and mechanisms. The Guideline on *Case Investigation and Outbreak Management for Healthcare Personnel: Pertussis*, published in 2010, also outlines the roles and responsibilities of healthcare personnel at different administrative levels. These include responsibilities at the hospital and clinic level, District Health Office, State Health Office, and Ministry level.

Pertussis incidence in Malaysia fluctuated between 2015 and 2024, a peak in 2015 (30.1 cases per million), 2018 (27.1 cases per million), 2019 (27.4 cases per million), and 2023 (34.2 cases per million), before declining to 13.5 cases per million in 2024 (Figure 21). Smaller increases were observed in 2016 (9.4 cases per million) and 2017 (9.9 cases per million), while the lowest incidence was recorded in 2021 (0.3 cases per million). DTP1 coverage ranged from 94.6% in 2015 to 107.4% in 2023, then declined to 91.0% in 2024. DTP3 coverage ranged from 99.0% in 2015 to 107.7% in 2023, with a decrease to 92.5% in 2024.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Incidence	30.1	9.4	10.9	27.1	27.4	4	0.3	2.9	34.2	13.5
DTP1	94.57%	90.66%	93.12%	94.84%	93.43%	93.29%	92.76%	96.09%	107.40%	90.99%
DTP3	99.04%	97.97%	98.89%	100.22%	98.39%	97.68%	94.24%	97.17%	107.71%	92.50%

Figure 21. Trend of pertussis incidence and vaccine coverage in Malaysia, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Myanmar

The EPI was launched in Myanmar in 1978. In 2012, the combined diphtheria, tetanus, pertussis, Haemophilus influenzae type b, and hepatitis B (DTP-Hib-HepB) vaccine was introduced. Under the National Immunisation Schedule, this vaccine is administered at 2, 4, and 6 months of age, followed by a booster dose at 18 months (WHO, 2024a). To strengthen immunization programme planning and sustainability, Myanmar implemented the comprehensive Multi-Year Plan (cMYP) for Immunisation 2017–2021 (Ministry of Health Myanmar, 2017):

1. To strengthen immunisation programme management, human resources, financing, and service delivery to ensure equitable access for all target populations, including through specific strategies for peri-urban, slum, migratory, geographically remote, socially disadvantaged, and conflict-affected areas.
2. To enhance demand generation and foster community ownership of immunisation through active participation and effective communication.
3. To improve the immunisation supply chain and vaccine management, and to establish a resilient cold chain system at all levels.
4. To achieve eradication, elimination, and control targets for VPDs.
5. To strengthen and sustain robust surveillance systems for adverse events following immunisation (AEFI) and other priority VPDs.
6. To introduce new and underutilised vaccines, as well as innovative technologies, into routine immunisation, guided by evidence of disease burden.

In Myanmar, to provide a quick reference on pertussis as a vaccine-preventable disease and its surveillance, the Ministry of Health, in collaboration with the WHO, developed the "Quick Guide: Vaccine-Preventable Disease Surveillance" (Ministry of Health and Sport Myanmar, 2018). This guide is intended for use by Township Public Health Officers and Medical Officers at the township level to strengthen case detection, reporting, and response activities.

From 2015 to 2024, pertussis incidence in Myanmar remained low, fluctuating between 0.1 and 0.9 cases per million population (Figure 22). Small increases were observed in 2018 (0.5 cases per million), 2019 (0.6 cases per million), 2020 (0.2 cases per million), and 2023 (0.9 cases per million), while the lowest incidence was recorded in 2016 (0.1 cases per million). DTP1 coverage ranged from 44.9% in 2021 to 94.4% in 2015, while DTP3 coverage ranged from 37.2% in 2021

to 90.9% in 2017. Both DTP1 and DTP3 coverage declined gradually after 2018, followed by a sharp drop in 2021 and partial recovery in 2022–2024.

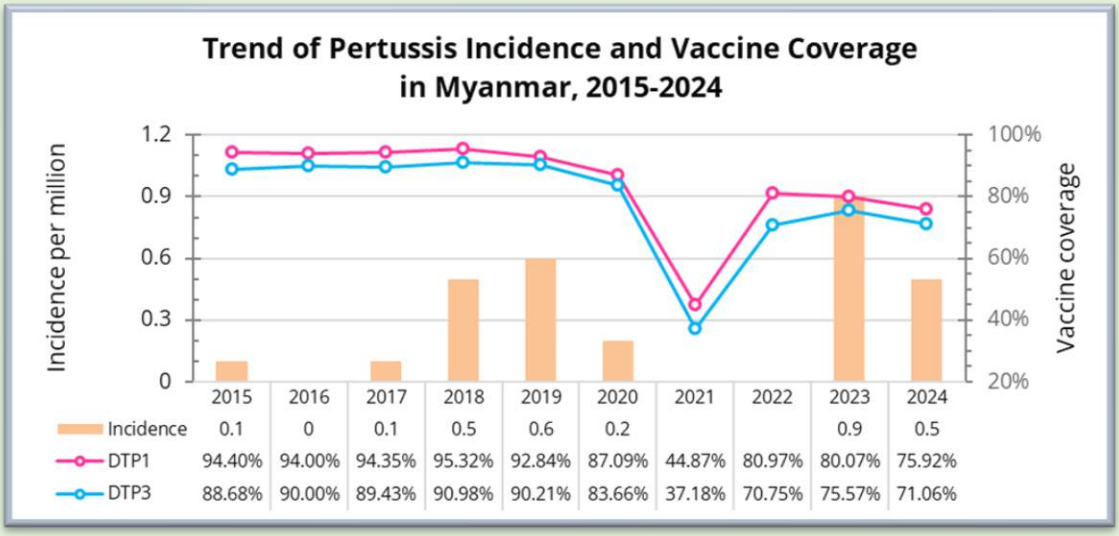


Figure 22. Trend of pertussis incidence and vaccine coverage in Myanmar, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Philippines

The NIP of the Philippines was officially launched in 1976 with the introduction of the DPT vaccine in priority areas, followed by nationwide provision in 1979 (Department of Health Philippines, 2018). In 2010, the pentavalent vaccine (DTwP-HepB-Hib) was introduced in three selected regions and expanded nationwide by 2012. By 2012, it provided broader coverage against hepatitis B and Haemophilus influenzae type b, in addition to DPT. Under the current national immunization schedule, the pertussis-containing vaccine is administered as part of the pentavalent series at 6, 10, and 14 weeks of age, with a booster dose at 18 months (WHO, n.d)

The Philippines Immunization Programme is mandated and supported by various laws and policies (Department of Health Philippines, 2018). One of the key legislative instruments is Republic Act No. 10152, or the *Mandatory Infants and Children Health Immunization Act of 2011*, which was enacted on 2 July 2011. This Act mandates the adoption of a comprehensive, mandatory, and sustainable immunisation programme against VPDs for all infants and children under five years of age.

According to the National Objectives for Health (NOH) 2023–2028 in the Philippines, one of the key indicators to measure program performance is the proportion of fully immunized children, with a national target of 95% coverage by 2028 (Department of Health Philippines, 2023). In line with this long-term target, the cMYP for Immunization 2016–2021 outlined the goal, objectives, and

strategies of the Philippine National Immunization Programme (Department of Health Philippines, 2018). Its specific objectives included: (i) increasing coverage of existing vaccines for targeted population groups across all life stages; (ii) providing additional protection to vulnerable groups through evidence-based introduction of new vaccines and technologies; and (iii) achieving the country's commitments to global immunisation goals.

The cMYP also outlined several strategies to achieve these objectives, including (Department of Health Philippines, 2018):

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

Following the strategic directions outlined in the cMYP, in August 2023 the Department of Health (DOH) released Department Memorandum No. 2023-0284, which provided interim guidelines for the PDITR strategy and outbreak response for pertussis and diphtheria (Department of Health Philippines, 2023). The memorandum aims to guide CHDs (Centers for Health Development), LGUs (Local Government Units) and health facilities in conducting active surveillance, preventing and containing outbreaks, ensuring early case detection and timely treatment, and implementing high-quality outbreak response immunization in affected and at-risk areas through coordinated efforts.

From 2015 to 2024, pertussis incidence in the Philippines remained low, ranging from zero cases in 2015 and 2022 to a peak of 7.3 cases per million in 2024 (Figure 23). Smaller increases were observed in 2018 (3.1 cases per million), 2019 (1.0 case per million), and 2023 (1.9 cases per million). Vaccine coverage for both DTP1 and DTP3 was highest in 2016 but declined thereafter, reaching the lowest levels in 2021, followed by partial recovery in 2022 and 2023 before decreasing again in 2024.

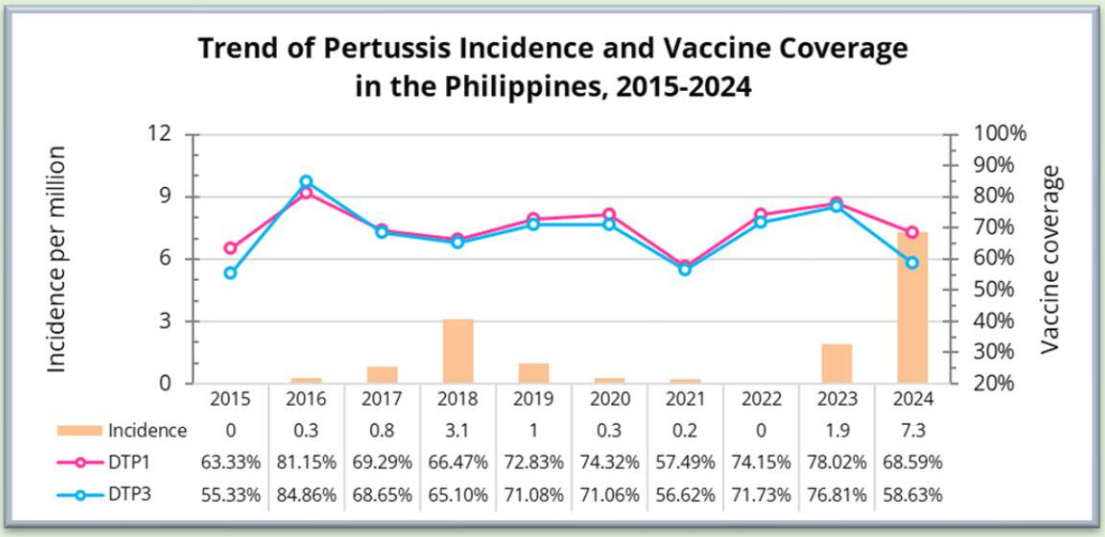


Figure 23. Trend of pertussis incidence and vaccine coverage in the Philippines, 2015-2024 (Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Singapore

The National Childhood Immunisation Schedule (NCIS) in Singapore is a set of recommended vaccinations for children to protect against vaccine-preventable diseases (Communicable Diseases Agency Singapore, 2025). In consultation with the Expert Committee on Immunisation (ECI), the Ministry of Health (MOH) regularly reviews vaccination policies and the inclusion of vaccines into the schedule, taking into consideration the local disease burden, vaccine safety, efficacy, and cost-effectiveness of vaccines.

Pertussis vaccination was first introduced in Singapore in 1959 as part of the combined DTP vaccine, following the earlier introduction of the diphtheria monovalent vaccine in 1938 (Communicable Diseases Agency Singapore, 2025). Over the years, numerous changes have been made to the diphtheria-tetanus-pertussis vaccinations based on updated evidence and vaccine availability, including adjustments to the number of booster doses, the type of vaccines used, and the recommended age in the schedule.

In June 2013, the diphtheria, tetanus, and acellular pertussis (DTaP) vaccine recommended for infants and pre-school children at three, four, five, and 18 months of age was replaced with the 5-in-1 vaccine, which also included inactivated poliovirus (IPV) and Haemophilus influenzae type b (Hib) (Communicable Diseases Agency Singapore, 2025). Most recently, in November 2020, the 6-in-1 vaccine replaced the 5-in-1 vaccine for the first and third doses, with the schedule adjusted to two, four, and six months of age, while the fourth dose remained at 18 months. For the fifth and final dose of a

diphtheria-containing vaccine, the tetanus, diphtheria, and acellular pertussis (Tdap) vaccine continued to be recommended at 10–11 years of age (Primary Five). Since 2021, Tdap has been given in the form of the Tdap-IPV vaccine.

A single dose of Tdap is recommended for pregnant women between 16 and 32 weeks of gestation during each pregnancy to protect infants against pertussis. In parallel, pertussis is legally notifiable in Singapore, with laboratories required to report confirmed cases within 72 hours to strengthen surveillance and response (Communicable Diseases Agency Singapore, 2025a).

From 2015 to 2024, pertussis incidence in Singapore showed intermittent increases, with peaks in 2017 (14.1 cases per million), 2018 (20.2 cases per million), and 2024 (22.3 cases per million), while incidence in other years was negligible or not reported. Despite these fluctuations, vaccine coverage for both DTP1 and DTP3 remained consistently high, with DTP1 ranging from 97.6% to 98.7% and DTP3 from 96.0% to 97.7%.

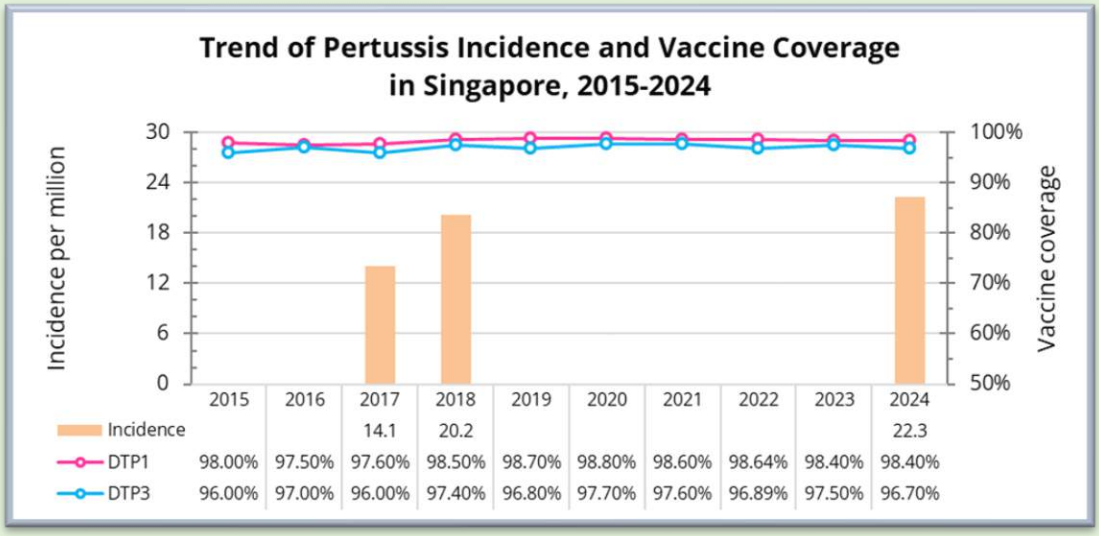


Figure 24. Trend of pertussis incidence and vaccine coverage in Singapore, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/global/wiise-detail-page/pertussis-reported-cases-and-incidence*))

Thailand

Thailand's EPI, launched in 1977, has undergone a long and steady journey of expansion (WHO, 2024b). Starting with BCG for newborns and two DTP doses for infants, the schedule gradually incorporated OPV in 1982, additional DTP boosters in 1991 and 2000, and combination vaccines such as DTP-HepB in 2008 and DTP-Hib-HepB in 2019. Most recently, in 2023, Tdap vaccination was introduced for pregnant women through a pilot project in Phatthalung province—reflecting Thailand's continued progress in strengthening immunization.

Current vaccination schedule of the Ministry of Public Health, pertussis protection is provided through DTP-HB-Hib vaccines (combined diphtheria-tetanus-pertussis-hepatitis B-Hib) at 2, 4, and 6 months of age, followed by DTP4 at 1 year 6 months and DTP5 at 4 years of age (Ministry of Public Health Thailand, 2024). According to National Action Plan for Health Security, the goal is to ensure that basic vaccines are administered to at least 90% of all target groups (Ministry of Public Health Thailand, 2023).

To further strengthen pertussis prevention and control, the Department of Disease Control and Health Emergency, in coordination with the Public Health Emergency Operations Center Group, submitted a request to the Ministry of Public Health in December 2023 for operational guidelines in epidemic areas (Ministry of Public Health Thailand, 2023a). The Department of Disease Control also has released guidelines for the prevention and control of pertussis, aimed at supporting medical and public health personnel in implementing effective measures against pertussis (Ministry of Public Health Thailand, 2024a). The guidelines cover surveillance, investigation, diagnosis, prevention strategies during outbreaks, and outline vaccine management approaches to strengthen immunity and prevent the spread of pertussis.

Between 2015 and 2022, Thailand reported a low incidence of pertussis, ranging from 0.1 to 1.4 cases per million population (Figure 25). Incidence then rose sharply to 10.3 in 2023 and peaked at 34.6 cases per million in 2024. Throughout the period, DTP1 coverage remained consistently high at above 90%, except in 2019 when it dropped slightly to 87%. Similarly, DTP3 coverage started above 99% in 2015 but dropped to under 90% since 2020.

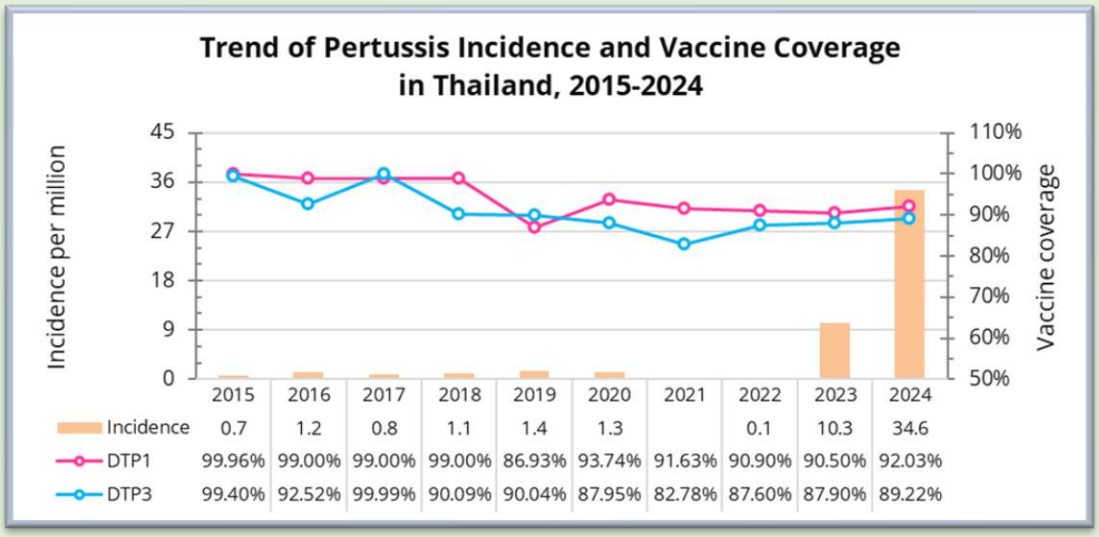


Figure 25. Trend of pertussis incidence and vaccine coverage in Thailand, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/*))

Viet Nam

The EPI in Viet Nam provides free mandatory vaccines to children and pregnant women to prevent common infectious diseases (Ministry of Health Viet Nam, 2024). Viet Nam has set national targets to achieve a 90% childhood immunization rate by 2025 and introduce two additional vaccines into the schedule. Currently, the program covers 10 vaccine-preventable diseases and has contributed significantly to reducing severe illness and mortality.

By 2030, the goal is to reach 95% coverage and expand with two more vaccines (Ministry of Health Viet Nam, 2024). In 2023, the National Assembly passed Resolution No. 109/2023/QH15, which directs the allocation of at least 30% of the health budget to preventive medicine, ensures sufficient vaccine supply, and maintains vaccination coverage of over 90% for all vaccines under the EPI.

According to the national immunization schedule, protection against pertussis is provided through Quinvaxem, a pentavalent vaccine (Ministry of Health Viet Nam, 2017). The vaccination schedule includes a first dose at 2 months of age, followed by additional doses at 3 and 4 months, with a booster at 18 months to maintain long-term immunity.

In 2024, the Department of Preventive Medicine issued Official Letter No. 218/DP-DT, directing provinces and centrally run cities to strengthen pertussis and vaccine-preventable disease control through six key actions, including (Ministry of Health Viet Nam, 2024a):

1. Strengthen surveillance, testing and early detection of cases of pertussis and vaccine-prophylactic diseases in the community and medical examination and treatment establishments; ensure

proper case management, infection control, and outbreak response in coordination with the Institute of Hygiene and Epidemiology and Pasteur Institutes.

2. Strengthen regular vaccination under the NIP and organize catch-up doses for those with missed or incomplete immunizations, especially during vaccine supply interruptions.
3. Promote communication on pertussis risks and prevention; encourage families to complete children's vaccinations on schedule and promote vaccination for pregnant women.
4. Guide educational institutions to ensure classroom hygiene, ventilation, and lighting; promote handwashing and personal hygiene; and monitor student health for early detection and reporting of suspected cases.
5. Promptly report cases and outbreaks through the Infectious Disease Surveillance Management System, as required under Circular No. 54/2015/TT-BYT.
6. Conduct inspections and direct outbreak control, prioritizing areas with reported cases, low vaccination coverage, or poor vaccination management.

In 2015, Viet Nam reported a pertussis incidence of 3.3 cases per million population, which declined slightly to 2.8 in 2016. Incidence then rose gradually, reaching 10.4 in 2019, before dropping sharply to 1.6 in 2020. From 2021 to 2023, incidence remained low, between 0.2 and 0.4, before surging again to 10.7 in 2024 (Figure 26). However, coverage dropped in 2018 to 78.5% for DTP1 and 74.7% for DTP3. Coverage then fluctuated, falling again in 2023 (79.7% for DTP1 and 64.9% for DTP3) before rebounding to above 96% for both in 2024.

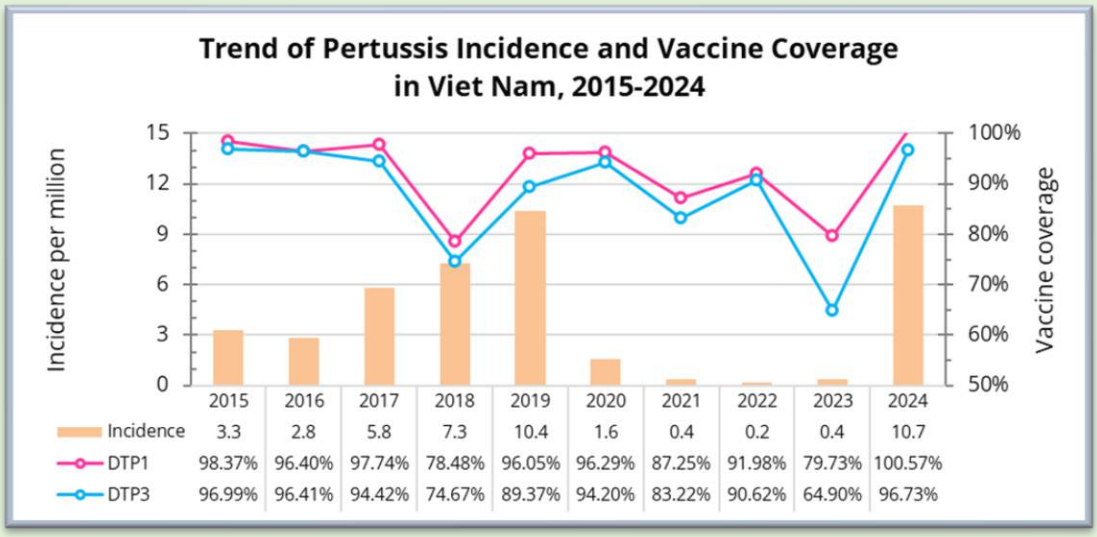


Figure 26. Trend of pertussis incidence and vaccine coverage in Viet Nam, 2015-2024
(Source: WHO immunization data (*https://immunizationdata.who.int/*))

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