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ASEAN BIODIASPORA VIRTUAL CENTER

MEASLES

In the ASEAN Region

FOCUS REPORT

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Kemenkes

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Editorial

PUBLISHER
ASEAN Biodiaspora Virtual Center

EDITORIAL ADDRESS
ASEAN Biodiaspora Virtual Center
Health Policy and Development Agency
Ministry of Health of Indonesia,
Building 6- Global Health Policy, 2nd floor
Jalan Percetakan Negara No. 29 Johar Baru,
Jakarta Pusat, Indonesia 10560
E-mail: support@biodiaspora.org

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MEASLES FOCUS REPORT

MEASLES

Introduction

Measles is a highly contagious viral infection that spreads through respiratory droplets from an infected person when they breathe, cough or sneeze. Measles can cause severe complications and, in some cases, death. Measles can affect individuals of any age, but it is most common in children. Vaccination remains the most effective strategy to prevent measles infection and transmission. Prior to the introduction of the measles vaccine in 1963 and the subsequent expansion of immunization programs, major measles epidemics occurred approximately every two to three years, resulting in approximately 2.6 million deaths annually (WHO,2024a). Countries around the world, including ASEAN member states, have a vision and mission to achieve elimination in the WHO Southeast Asia Region by 2026, as outlined in the WHO Southeast Asia Regional Vaccine Implementation Plan 2022-2026.

This report provides an overview of measles, including its transmission, symptoms, and treatment, as well as current data on incidence and mortality. It also focuses on the regional situation within ASEAN, analysing the impact of the disease and the region's collective efforts to control it through surveillance, rapid response, and public health initiatives. Through this focus, the aim of the report aims to highlight the critical role of prevention and preparedness in reducing the burden of measles across vulnerable populations.

Methods

This report employs a comprehensive literature review to explore the global landscape of measles, with a particular focus on the ASEAN region. Data were collected from the established databases, namely PubMed, Embase and Scopus. Furthermore, data on the incidence of disease – including data published by the World Health Organization and ASEAN Member States – diagnostic criteria, preventative measures and policy strategies were collated from official reports and news sources on measles cases. This comprehensive approach enabled a detailed analysis of the current trends, patterns, and challenges associated with the management of measles within the ASEAN region

Case Definition and Clinical Features

Case Definition

The case definition is a crucial element to determine whether an individual meets the criteria for a specific disease or health condition. Case definition ensures that each case is assessed consistently, regardless of when or where it occurs or who identifies it (CDC, 2012). According to individual diagnosis, the WHO document titled Measles Outbreak Guide - 2022 states that measles cases can be classified based on clinical, epidemiological, and laboratory criteria. All measles cases that meet the clinical and epidemiological criteria must be either laboratory-confirmed or ruled out as non-measles, as detailed in Table 1 (WHO, 2022).

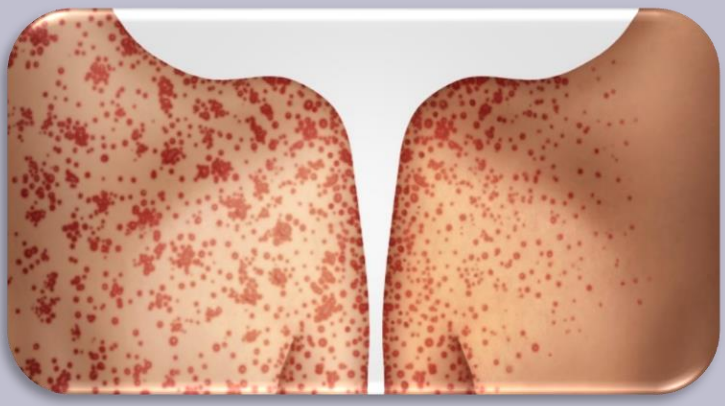


Figure 1 Measles Rash

Table 1. Measles case definitions for case finding

Case Definition	Description
Suspected measles case	An illness in a patient with fever and generalized maculopapular (non-vesicular) rash, or in a patient whom a health care worker suspects has measles.
Clinical measles case	• Any person in whom a clinician suspects measles infection; or • Any person with fever and maculopapular rash (i.e. non-vesicular) and: cough, or coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes).

Table 2. Measles final case classifications

Case Definition	Description
Laboratory-confirmed measles case	A measles case was confirmed when a suspected case tests positive in a proficient laboratory, with vaccine-related illness excluded.
Epidemiologically linked measles case	A clinical measles case without laboratory confirmation, but was geographically and temporally linked to a confirmed case, with rash onset occurring 7–21 days apart from a confirmed or epidemiologically related case.
Clinically compatible measles case	A clinical measles case without an adequate specimen for laboratory testing and no established epidemiological link to a confirmed measles case or another communicable disease.
Discarded case	Suspected measles cases that have been investigated and discarded as non-measles if: • Negative laboratory results from a proficient lab on an adequate

	specimen, • Epidemiological linkage to a confirmed outbreak of another disease that is not measles, • Identification and conformation another etiology, • Failure to meet the clinical case definition for measles.

Table 3. Others definitions of measles

Case Definition	Description
Acute measles-related death	A measles-related death is the death of an individual with confirmed measles (clinically, laboratory, or epidemiologically) that occurs within 30 days of rash onset and it's not caused by unrelated factors, such as trauma.
Suspected measles outbreak	A measles outbreak is defined as five or more epidemiologically linked measles cases with rash onset occurring 7–21 days apart.
Laboratory-confirmed measles outbreak	A measles outbreak is defined as two or more laboratory-confirmed cases that are temporally related (rash onset 7–21 days apart) and either epidemiologically or virologically linked, or both.

This classification of measles case definitions is widely utilized in public health surveillance to ensure standardized reporting. These definitions facilitate the confirmation of outbreaks, the aggregation and analysis of data, and the comparison of trends across different geographic regions and time periods.

Transmission

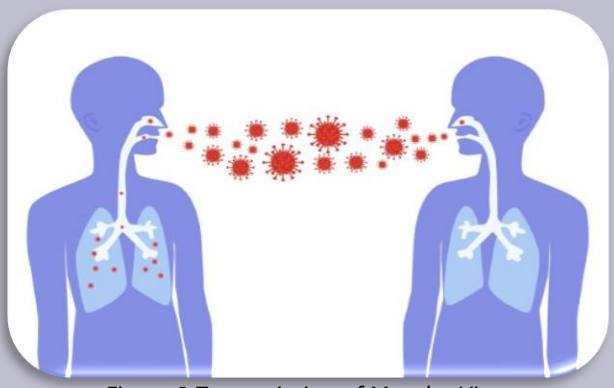


Figure 2 Transmission of Measles Virus

The measles virus is a single-stranded, enveloped, negative-sense RNA virus belonging to the genus *Morbillivirus* within the *Paramyxoviridae* family (WHO, 2017a). Measles is one of the most highly contagious diseases globally, caused by a virus that resides in the nasal and throat mucus of infected individuals. Transmission primarily occurs through direct contact with infected respiratory secretions via coughing and sneezing or through airborne exposure. The virus remains active and infectious in the air and on contaminated surfaces for up to two hours, significantly enhancing its transmissibility. Individuals can contract the infection by inhaling contaminated air or by touching infected surfaces and subsequently making contact with their eyes, nose, or mouth (CDC, 2024a). Several studies have indicated that measles virus RNA can be detected in blood and urine for a prolonged period, persisting for several months (Misin et al., 2020). An infected individual can spread the virus to approximately 90% of unvaccinated close contacts and remains contagious from four days before to four days after the onset of the rash (WHO, 2024a). In specific instances, individual patients have been identified as sources of transmission to over 200 new cases, a phenomenon known as "superspreading" events in epidemiological studies (Misin et al., 2020).

Risk Factors and Risk Groups

Individuals who lack immunity, either due to the absence of vaccination or an insufficient immune response after vaccination, are susceptible to measles infection. Young children who are unvaccinated and pregnant persons have the highest risk of experiencing severe complications from the disease (WHO,2024a). European CDC data from 2023 shows measles cases in all age groups, with children aged 1-4 years (36%) and 5-9 years (21%) being most affected. Adults 19+ years accounted for 15% of cases (ECDC, 2024).

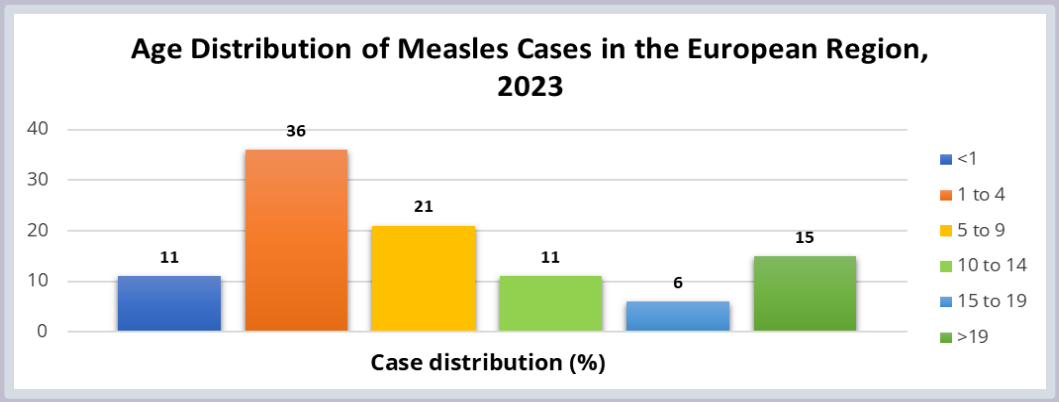


Figure 3 Age Distribution of Measles Cases in the European Region, 2023

(Source: https://www.ecdc.europa.eu/en/publications-data/measles-annual-epidemiological-report-2023)

Measles fatalities in Africa, the Middle East, and Asia are primarily driven by low per capita income and inadequate healthcare infrastructure. Key contributing factors include limited access to care, inconsistent healthcare-seeking behaviors, poor service quality, and ineffective control programs. Malnutrition, secondary infections, and epidemiological patterns further increase mortality. These complexities place considerable strain on available resources, hindering efforts to achieve widespread immunization coverage and contributing to increased measles mortality (Sbarra et al., 2023). Vulnerable populations, such as migrants, nomadic groups, and conflict-affected individuals, are especially at risk due to inadequate vaccination coverage. (WHO, 2020a).

Clinical Presentation

The incubation period for measles typically ranges from 10 to 14 days following exposure, with initial symptoms including cough, fever, malaise, conjunctivitis, and coryza. While the incubation period may vary between 7 and 23 days, for quarantine and contact tracing purposes, it is generally defined as 7 to 21 days post-exposure. The characteristic morbilliform rash usually appears approximately 2 to 4 days after the onset of the prodromal phase. Measles is most transmissible from about 4 days before to 4 days after rash onset, coinciding with peak viral levels in the respiratory tract (WHO, 2022).

The maculopapular rash is often accompanied by fever, which may reach 39.0–40.5°C. Prior to rash onset, Koplik's spots—bluish-white lesions pathognomonic for measles—may be observed on the oral mucosa. In uncomplicated cases, clinical improvement is typically noted by the third day after rash onset, with complete recovery occurring within 7 to 10 days after disease onset (WHO, 2022). The maculopapular rash, characterized by both flat and raised skin lesions, initially appears on the head and face before progressing downward to the neck, trunk, arms, legs, and feet. As the rash spreads, the lesions may coalesce (CDC,2024b).

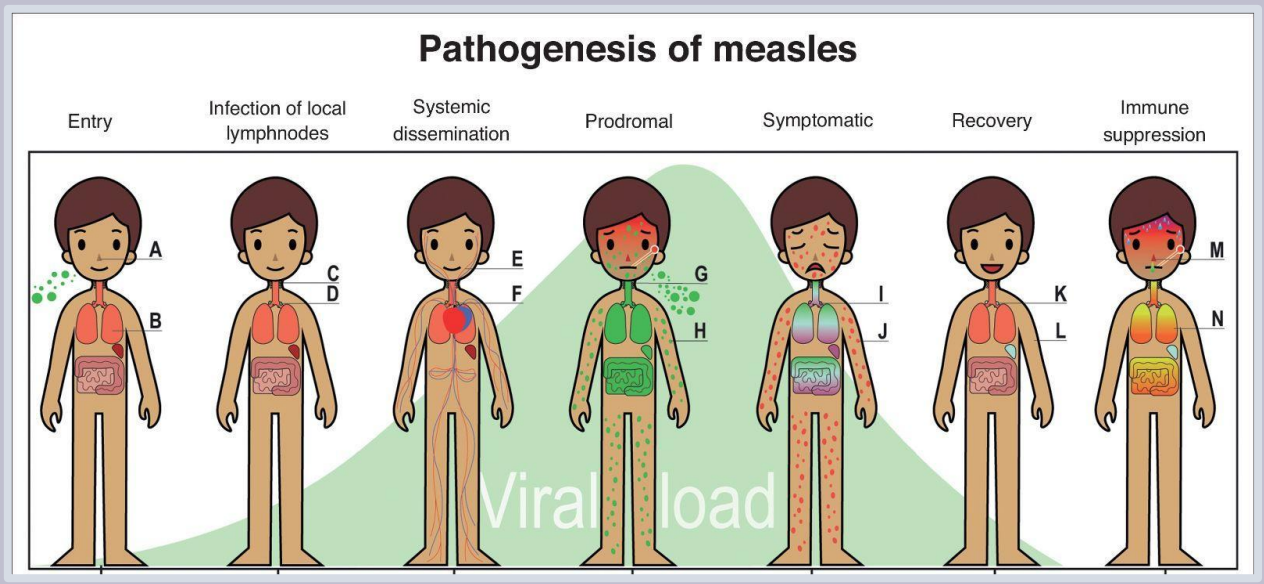


Figure 4 The Pathogenesis of Measles: A Schematic Overview of MV Infection Progression (Source: https://www.sciencedirect.com/science/article/pii/S1879625720300110)

The green bell-shaped curve in Figure 4 illustrates changes in viral load over time. Measles virus (MV) enters the respiratory tract through either the upper (A) or lower pathways (B) by targeting CD150+ cells or interacting with DC-SIGN+ dendritic cells (DCs) and alveolar macrophages. These infected immune cells then migrate to bronchus-associated lymphoid tissues (C) or draining lymph nodes (D), facilitating further infection of susceptible lymphocytes. MV-infected CD150+ lymphocytes, primarily CD4+ memory T cells, spread the virus systemically via the circulatory system (E) or the lymphatic system (F). Viral invasion of respiratory epithelial cells from the basolateral side, along with epithelial damage, enables the release of MV particles into the respiratory lumen (G). Additionally, infection of dermal myeloid and lymphoid cells leads to viral dissemination among epidermal keratinocytes in a nectin-4-dependent process (H). As the immune system mounts a response, MV-specific lymphocytes proliferate to clear the infection (I). Skin capillary hyperemia triggers the recruitment of MV-specific lymphocytes and activated macrophages, which, together with edema, contribute to the formation of the characteristic erythematous, morbilliform rash (J). Upon recovery, lymphocyte loss is partially compensated by the expansion of newly generated immune cells (K), leading to the resolution of the rash and elimination of the virus from the epidermis (L). While recovered patients gain lifelong immunity against measles, the depletion of pre-existing lymphocytes and plasma cells (M) reduces antibody levels (N), increasing vulnerability to other infectious diseases, particularly respiratory infections.

The schematic also illustrates lymphopenia and shifts in lymphocyte populations before and after measles. Due to its lymphotropic nature, MV infects

and depletes CD150+ pre-existing lymphocytes, but the loss is masked by the proliferation of MV-specific and newly generated immune cells through homeostatic mechanisms. Over time, different cell types play distinct roles in infection: myeloid cells initially serve as viral carriers, delivering MV to CD150+ lymphocytes in lymphoid tissues, while lymphocytes are central to systemic viral dissemination. Respiratory epithelial cells are key to transmission, whereas dermal immune cells and epidermal keratinocytes contribute to the formation of the rash. Although most MV-infected cells are eventually eliminated by immune responses, some lymphocytes retain MV RNA long after recovery.

Complications

Measles-associated complications primarily affect the respiratory and digestive systems, including pneumonia, croup, otitis media, oral ulcers, and diarrhea. Additionally, measles can lead to neurological complications such as seizures and encephalitis. These complications may arise directly from measles infection, particularly in the early stages of the disease, but frequently result from secondary bacterial infections. The incidence of bacterial infections, including pneumonia, otitis media, and diarrhea, peaks approximately 2 to 3 weeks after rash onset (WHO, 2022).

Vitamin A levels decline significantly during measles infection, particularly in children with pre-existing deficiencies or malnutrition. Vitamin A plays a crucial role in maintaining epithelial integrity in the respiratory and gastrointestinal tracts, and its deficiency increases susceptibility to viral and bacterial superinfections following measles infection. Severe vitamin A depletion during measles may lead to xerophthalmia, a progressive eye disease characterized by corneal inflammation, Bitot's spots (conjunctival keratinization), corneal opacity, and potential blindness. Moreover, vitamin A deficiency may exacerbate measles severity and its associated complications (WHO, 2022).

A severe long-term complication of measles is subacute sclerosing panencephalitis (SSPE), a progressive, degenerative, and fatal neurological disorder caused by persistent measles virus infection in the brain. SSPE occurs in approximately one per 5,000 measles cases, with symptom onset typically appearing an average of seven years after acute infection (range: one month to 27 years). In adults, measles complications may include hepatitis and adverse pregnancy outcomes. Pregnant individuals infected with measles are at increased risk of miscarriage, preterm birth, neonatal low birth weight, and maternal mortality (WHO, 2022).

Clinical Diagnostic

Measles should be considered in patients presenting with febrile rash illness and clinical symptoms consistent with measles, particularly those with recent international travel history or exposure to individuals with febrile rash illness. Laboratory confirmation is crucial for both sporadic measles cases and outbreak investigations. The primary diagnostic methods include detecting measles-specific IgM antibodies in serum and identifying measles RNA via RT-PCR from respiratory specimens, as follows (CDC,2024c):

Serology Testing

1. **Immunoglobulin M (IgM):** Measles-specific IgM detection serves as a key diagnostic tool for confirming measles infection, with optimal sensitivity occurring three or more days after rash onset. A negative IgM result within the first three days should be interpreted with caution, as sensitivity may be lower during this period. Additionally, false-positive IgM results can occur due to cross-reactivity with other febrile rash illnesses, such as Parvovirus. And, it is important to note that IgM testing is not suitable for assessing measles immunity.
2. **Immunoglobulin G (IgG):** Measles-specific IgG indicates past or recent measles virus exposure or vaccination and serves as a reliable marker of immunity. Usually, IgG can be detected around two weeks after vaccination. In contrast, the IgM test is not suitable for assessing immunity.
3. **Real Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)**

   Reverse transcription polymerase chain reaction (RT-PCR) can be performed on respiratory specimens, including nasopharyngeal or throat swabs, as well as on urine samples. The sensitivity of RT-PCR is highest within the first 3 days after rash onset but remains detectable for up to 10 days. PCR testing is generally not recommended if more than ten days have passed since rash onset. For comprehensive evaluation, RT-PCR and serological testing should ideally be performed together for all suspected measles cases. In many jurisdictions, RT-PCR testing is primarily conducted through state or local health departments.

Furthermore, molecular analysis through genotyping allows for the characterization of measles virus strains, aiding in epidemiological investigations by tracing transmission pathways, linking or distinguishing cases, and identifying potential sources of imported infections. Genotyping is the only definitive method to differentiate wild-type measles virus infection from vaccine-associated rash illness.

Epidemiology

Global Situation

Measles remains a global public health concern. In 2023, WHO recorded nearly 670,000 measles cases in several countries, more than three times the number reported in 2022 (WHO, 2025). However, 2019 remains the year with the most reported cases of the decade, with 873,730 cases reported.

In 2023, a global analysis of reported measles cases revealed a diverse landscape. Africa and Asia had a worrying number of countries with significant outbreaks, ranging from hundreds to thousands of cases (WHO, 2025). Conversely, most European countries reported low to moderate case numbers, with higher levels in some areas. North America showed predominantly low case numbers, while South America presented a mixed picture, with some countries reporting minimal cases and others experiencing moderate outbreaks. Australia remained at a low level. Notably, data were not available for several countries, highlighting the challenges of global disease surveillance. This review underscores the continuing threat of measles, particularly in certain regions, and highlights the importance of robust data collection and public health interventions for effective disease control.

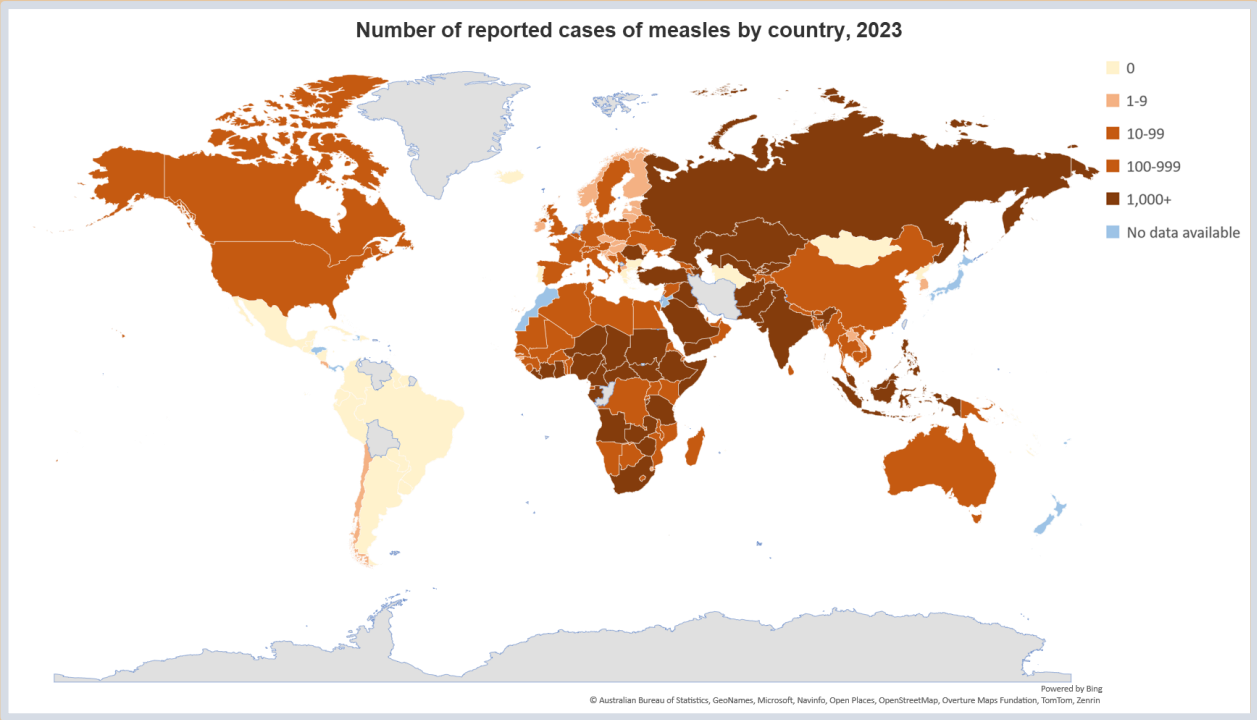


Figure 5 Number of reported cases of measles by country, 2023
(Source: WHO (https://immunizationdata.who.int/global/wiise-detail-page/measles-reported-cases-and-incidence?GROUP=Countries&YEAR=))

Figure 5 shows global and regional trends in measles incidence and vaccine coverage from 2004 to 2023. It shows global trends for six WHO regions. Each graph shows the incidence of measles per million population and the coverage rates for the first and second doses of measles-containing vaccines. The figure shows the improvement in global immunization coverage. Coverage of the first dose of measles vaccine was 75% in 2004 and improved steadily, peaking at 86% in 2018-2019. However, it declined slightly to 81% in 2021 and then increased to 83% in 2022. In particular, coverage of the second dose increased significantly from 22% in 2004 to 74% in 2023.

Global and WHO Regional Trends in Measles Incidence and Vaccine Coverage, 2014-2023

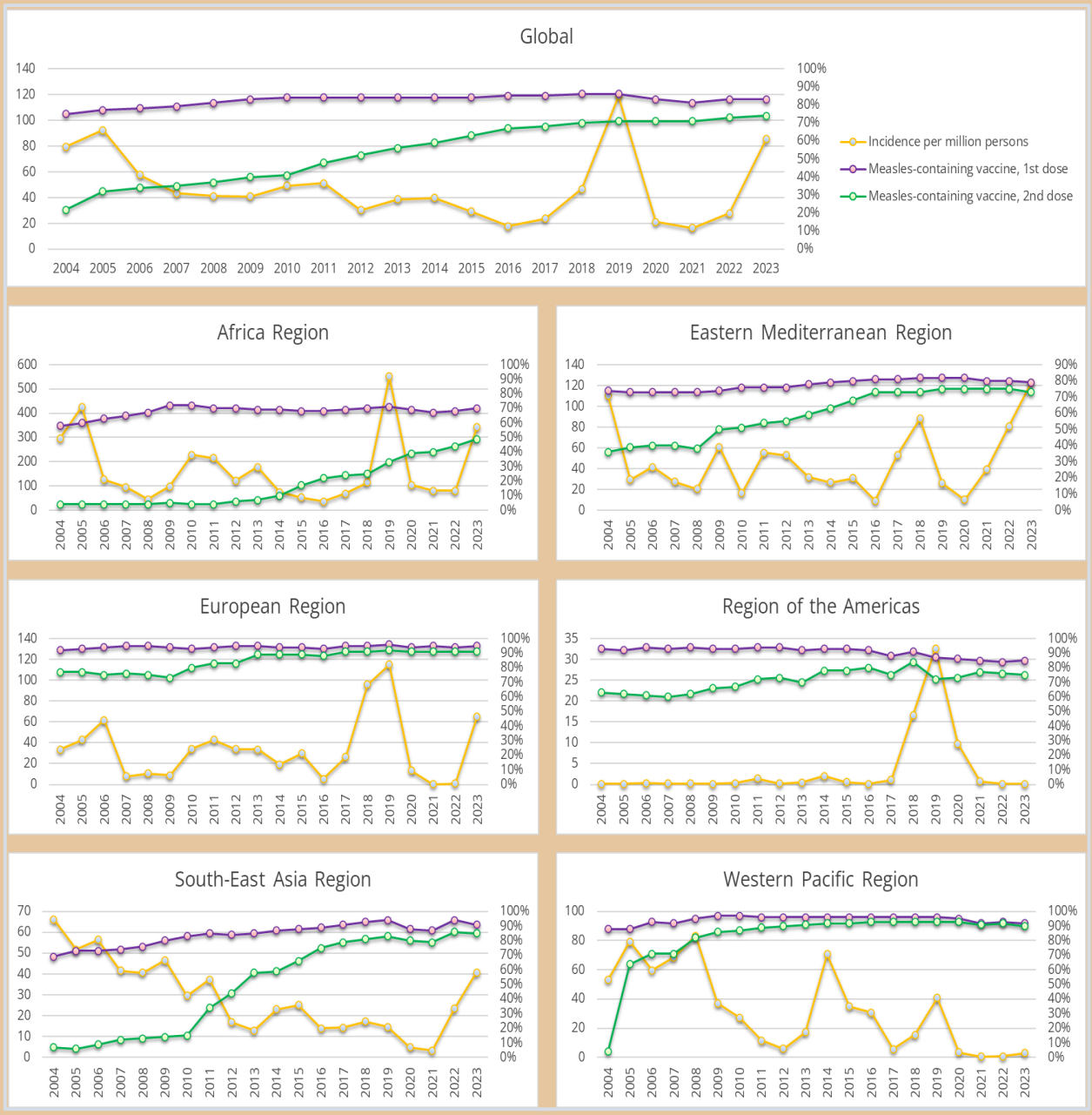


Figure 6 Global and WHO Regional Trends in Measles Incidence and Vaccine Coverage, 2014–2023 (Source: WHO (https://immunizationdata.who.int/global?topic=&location=))

The WHO data allow comparative analysis of measles control efforts in different regions, and highlight the relationship between immunization coverage and disease incidence over time. In particular, the graphs show variations in vaccine coverage and measles outbreaks, suggesting different challenges and successes in measles prevention and control strategies globally.

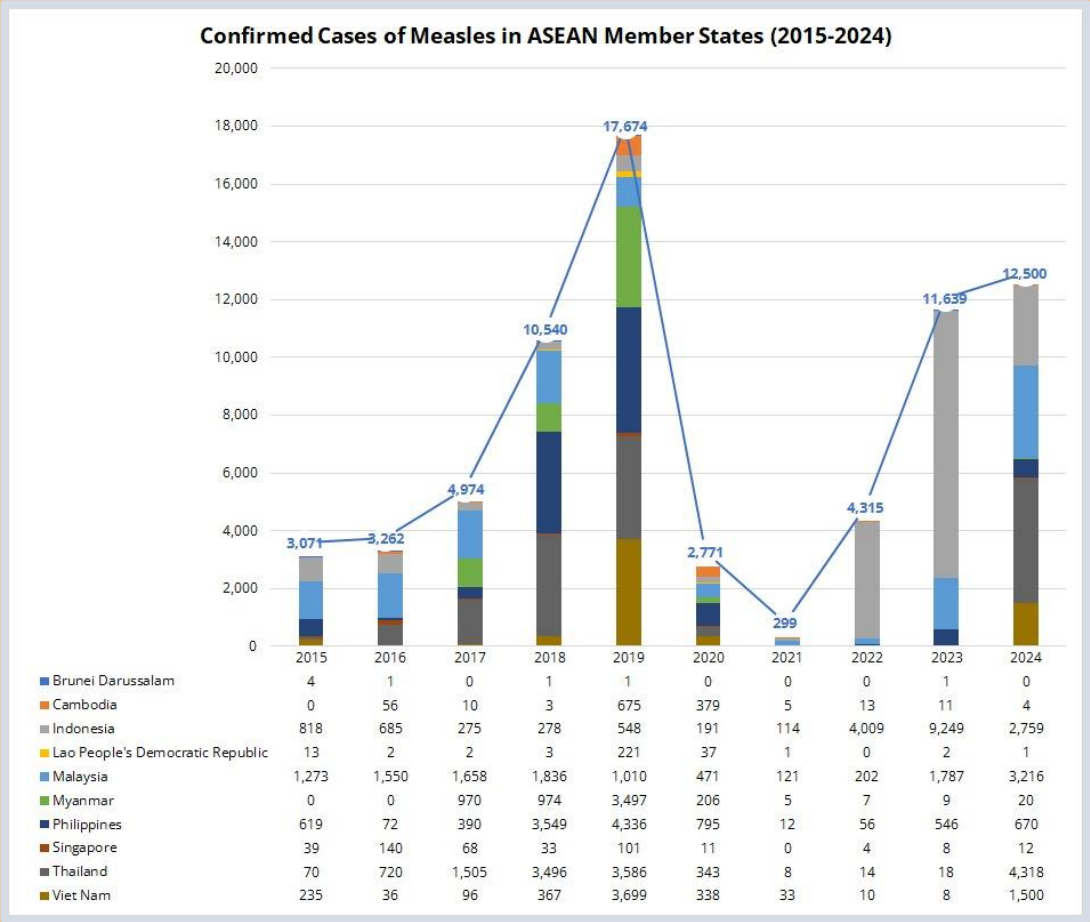
Africa is the most affected region throughout the two-decade period. Incidence was 296 per million persons in 2004, increased to 427 the following year, and fluctuated (between 45 and 228 per million persons) since 2018 (Figure 6). In 2019, reflecting the global situation, the incidence increased significantly to 552 per million persons, almost five times higher than the global average. After several years of decline, the incidence rose again to 343 per million persons in 2023.

Contrary, the Americas region was the least affected, with an annual incidence of <2 from 2004 to 2017. However, in 2018, the region showed a spike in incidence, with 17 per million persons in 2018, and continued to rise to 33 per million persons in 2019, the highest recorded during the period. Incidence then declined in the following years.

Burden of Measles in the ASEAN Region

Measles continues to pose a significant challenge in the ASEAN region, with all member states recording cases each year over the past decade. This section provides an overview of annual confirmed cases and incidence per million population, based on WHO immunization data.

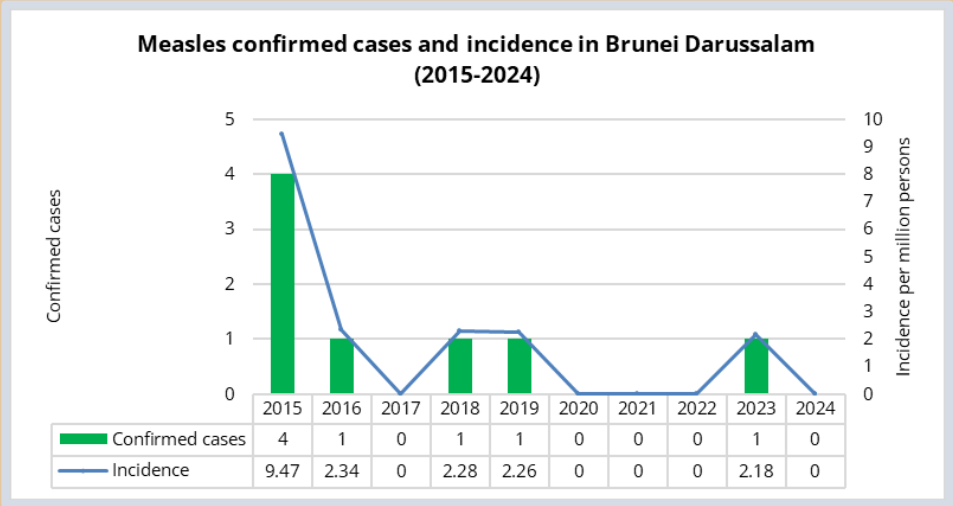
During the past decade, all 10 ASEAN Member States reported a total of 71,045 measles cases from 2015 to 2024 (Figure 7). The most significant surge occurred in 2019, when the region recorded 17,674 cases, marking the highest annual burden within the period. Following this peak, cases sharply declined in 2020 due to COVID-19 pandemic to 2,771 and reached the lowest level in 2021, with only 299 cases reported. However, reported measles cases began to resurge in 2022 after COVID-19 pandemic, rising to 4,315 cases, followed by a substantial increase in 2023 with 11,639 cases. The upward trend continued into 2024, with the number of reported cases reaching approximately 12,500, signaling an ongoing challenge for measles control efforts in the region.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Brunei Darussalam	4	1	0	1	1	0	0	0	1	0
Cambodia	0	56	10	3	675	379	5	13	11	4
Indonesia	818	685	275	278	548	191	114	4,009	9,249	2,759
Lao People's Democratic Republic	13	2	2	3	221	37	1	0	2	1
Malaysia	1,273	1,550	1,658	1,836	1,010	471	121	202	1,787	3,216
Myanmar	0	0	970	974	3,497	206	5	7	9	20
Philippines	619	72	390	3,549	4,336	795	12	56	546	670
Singapore	39	140	68	33	101	11	0	4	8	12
Thailand	70	720	1,505	3,496	3,586	343	8	14	18	4,318
Viet Nam	235	36	96	367	3,699	338	33	10	8	1,500

Figure 7 Confirmed cases of measles in ASEAN Member States (2015-2024)

Brunei Darussalam

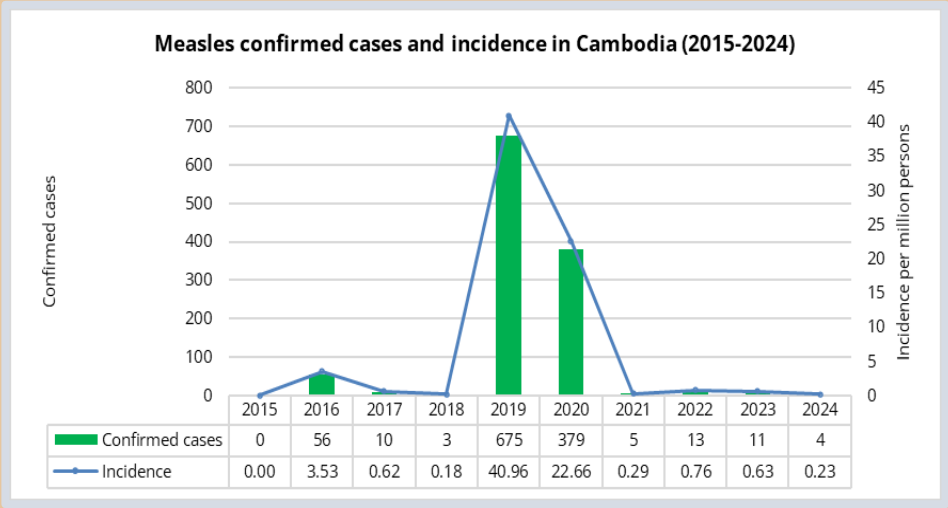


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	4	1	0	1	1	0	0	0	1	0
Incidence	9.47	2.34	0	2.28	2.26	0	0	0	2.18	0

Figure 8 Trend of measles cases and incidence in Brunei Darussalam, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Figure 8 illustrates the trend in confirmed measles cases in Brunei Darussalam from 2015 to 2024 (WHO, 2025). The highest number of confirmed cases was recorded in 2015, with four cases. Since then, case numbers have remained consistently low, with only a few isolated cases reported, and several years with no confirmed cases. The incidence per million population follows a similar pattern, remaining low throughout the period. The highest incidence was recorded in 2015, with 9.47 per million persons, aligning with the peak in confirmed cases, while in several years, the incidence was zero, reflecting the absence of confirmed cases.

Cambodia

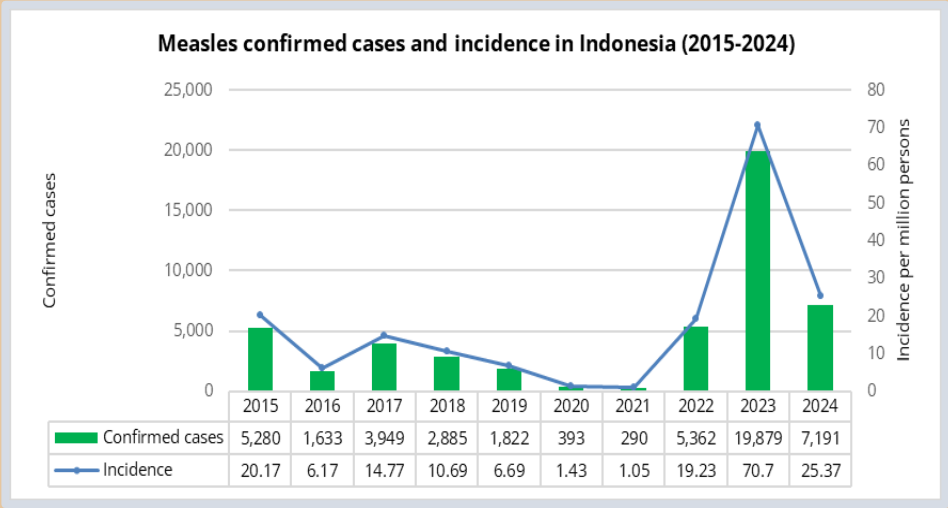


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	0	56	10	3	675	379	5	13	11	4
Incidence	0.00	3.53	0.62	0.18	40.96	22.66	0.29	0.76	0.63	0.23

Figure 9 Trend of measles cases and incidence in Cambodia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

As illustrated in Figure 9, confirmed cases of measles in Cambodia from 2015 to 2019 remained low (0–56), followed by a sharp rise to 675 in 2019 (WHO, 2025). Cases then declined to 379 in 2020 and dropped in later years. Incidence peaked at 40.96 per million in 2019 before falling to 22.66 in 2020 and below 1 per million afterward.

Indonesia



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	5,280	1,633	3,949	2,885	1,822	393	290	5,362	19,879	7,191
Incidence	20.17	6.17	14.77	10.69	6.69	1.43	1.05	19.23	70.7	25.37

Figure 10 Trend of measles cases and incidence in Indonesia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Figure 10 illustrates the trend of measles-confirmed cases and incidence in Indonesia. Between 2016 and 2021, annual confirmed cases remained below 4,000, with a noticeable decline from 2019 to 2021, reaching a low of 290 cases in 2021 (WHO, 2025). A resurgence occurred in 2022 and 2023, with confirmed cases rising to 5,362 in 2022 and peaking at 19,879 in 2023. Although cases declined to 7,191 in 2024, they remained elevated compared to pre-2023 levels. The highest incidence was recorded in 2023 at 70.7 per million, reflecting the surge in cases, while the lowest incidence occurred in 2021 at 1.05 per million, aligning with the lowest case count.

Lao People's Democratic Republic

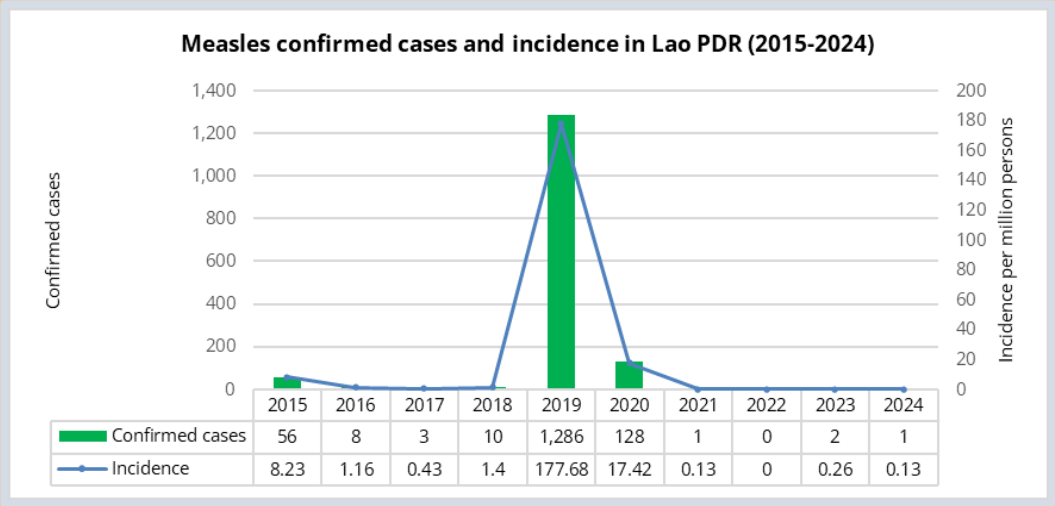
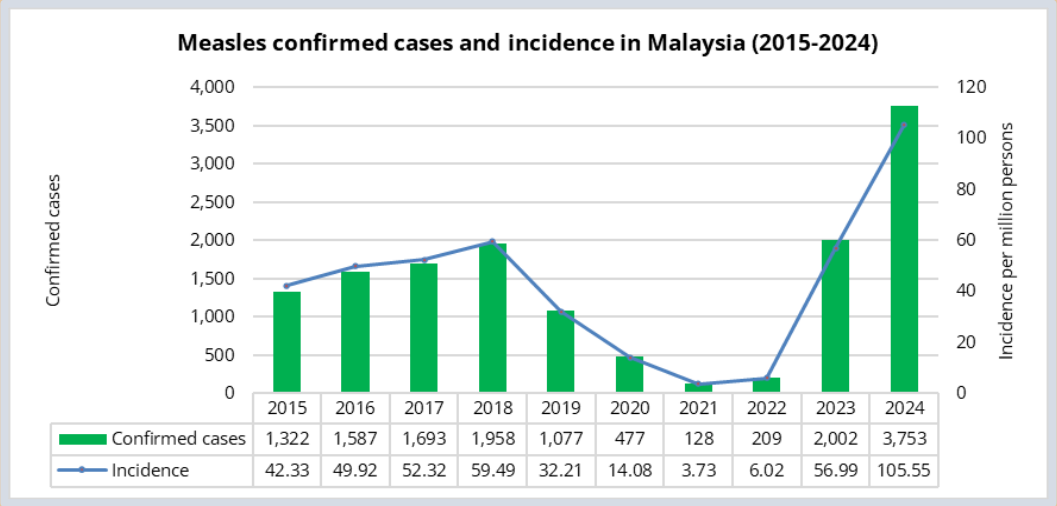


Figure 11 Trend of measles cases and incidence in Lao PDR, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

As demonstrated in Figure 11, the number of confirmed measles cases remained relatively low from 2015 to 2018, ranging from 3 to 56 cases annually (WHO, 2025). A significant spike occurred in 2019, when confirmed cases rose sharply to 1,286.

After the peak in 2019, cases fell to 128 in 2020 and then to single digits (or zero) in subsequent years. The incidence per million population mirrored the trend in confirmed cases. It remained low in the early years, increased dramatically in 2019 and then fell sharply.

Malaysia

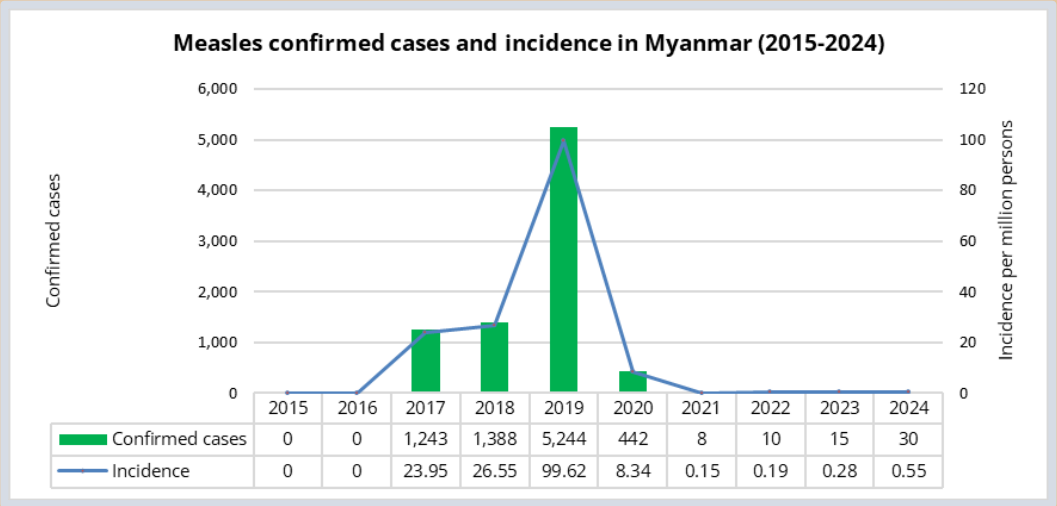


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	1,322	1,587	1,693	1,958	1,077	477	128	209	2,002	3,753
Incidence	42.33	49.92	52.32	59.49	32.21	14.08	3.73	6.02	56.99	105.55

Figure 12 Trend of measles cases and incidence in Malaysia, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

As shown in Figure 12, Malaysia's confirmed measles cases rose from 1,322 in 2015 to 1,958 in 2018 (WHO, 2025). Cases declined from 2019 to 2022, reaching a low of 128 in 2021, before surging to 2,002 in 2023 and 3,753 in 2024. Incidence peaked at 59.49 per million in 2018 and 105.55 per million in 2024, with the lowest at 3.73 per million in 2021

Myanmar

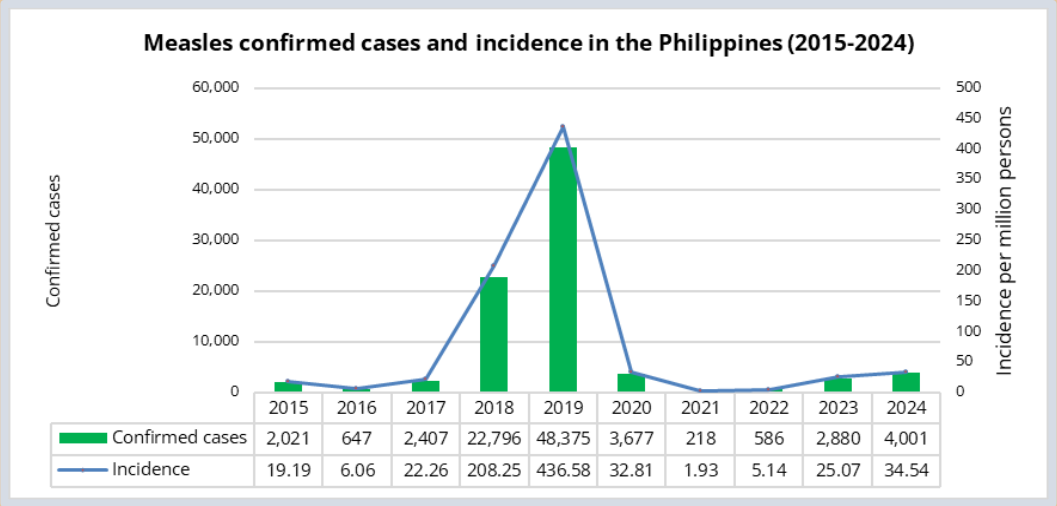


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	0	0	1,243	1,388	5,244	442	8	10	15	30
Incidence	0	0	23.95	26.55	99.62	8.34	0.15	0.19	0.28	0.55

Figure 13 Trend of measles cases and incidence in Myanmar, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=)))

Figure 13 presents the trend of measles cases and incidence in Myanmar from 2015 to 2024. No confirmed cases were reported in 2015–2016, followed by a rise to 1,243 in 2017 and 1,388 in 2018 (WHO, 2025). Cases peaked at 5,244 in 2019 before dropping to 442 in 2020 and declining further in later years. Incidence remained at zero initially, peaked at 99.62 per million in 2019, then fell to 8.34 in 2020 and below 1 per million thereafter.

Philippines



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	2,021	647	2,407	22,796	48,375	3,677	218	586	2,880	4,001
Incidence	19.19	6.06	22.26	208.25	436.58	32.81	1.93	5.14	25.07	34.54

Figure 14 Trend of measles cases and incidence in the Philippines, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=)))

Figure 14 shows measles trends in the Philippines. Cases remained low from 2015 to 2016 (647–2,407 cases, incidence 6–22 per million) before rising to 22,796 in 2018 and surging to 48,375 in 2019, the highest in the past decade (WHO, 2025). After 2019, cases dropped sharply to 3,677 in 2020 and remained low. Incidence peaked at 436.58 per million in 2019, then declined to 32.81 in 2020 and stayed below 35 in later years.

Singapore

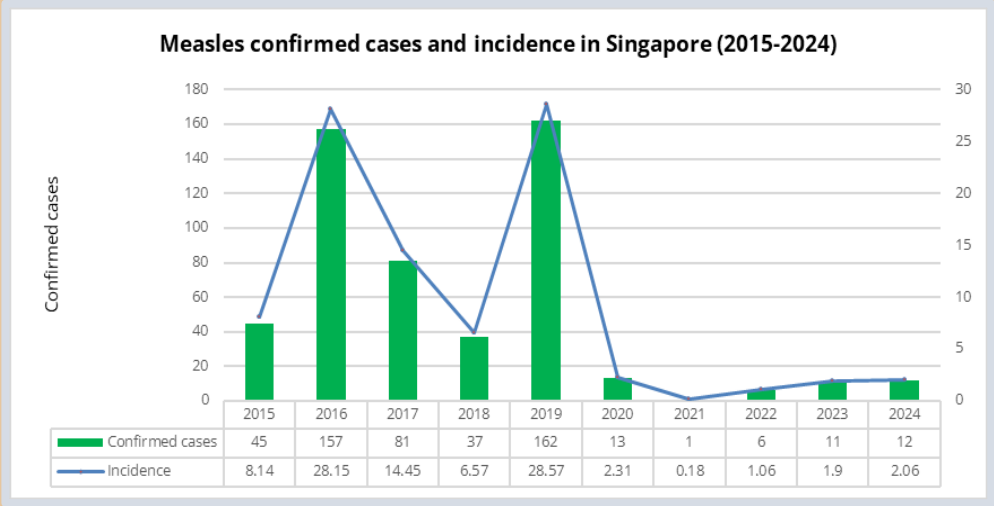


Figure 15 Trend of measles cases and incidence in Singapore, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=)))

Figure 15 illustrates a fluctuating measles trend in Singapore, with peaks in 2016 and 2019, followed by a sharp decline (WHO, 2025). Cases rose from 45 in 2015 to 157 in 2016, then dropped to 81 in 2017 and 37 in 2018. A higher peak occurred in 2019 with 162 cases, surpassing 2016 levels. Cases then declined sharply to 13 in 2020 and remained below this level in subsequent years. The incidence followed a similar pattern, peaking at 28.15 per million in 2016 and 28.57 in 2019, with the lowest rate in 2021 at 0.18 per million.

Thailand

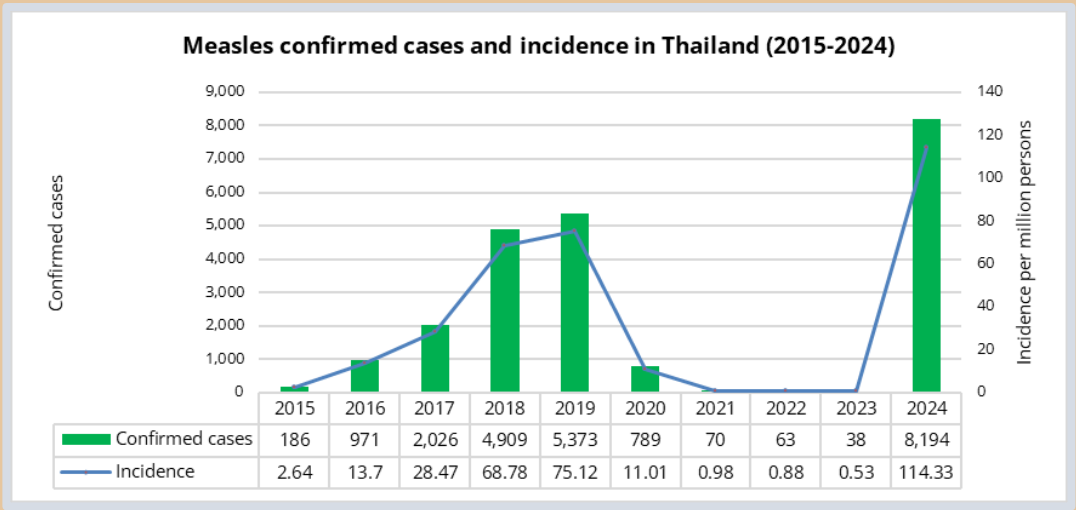
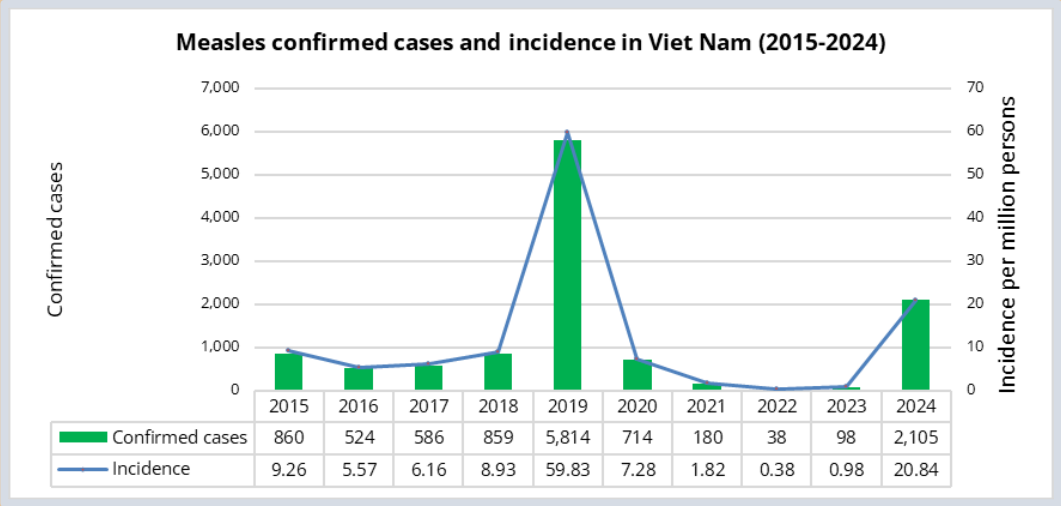


Figure 16 Trend of measles cases and incidence in Viet Nam, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=)))

Figure 16 shows an increasing trend in cases in Thailand from 2015, peaking in 2019 with 5,373 confirmed cases, then dropped sharply to 789 in 2020 and remained low (WHO, 2025). After the peak in 2019, cases fell dramatically to 789 in 2020 and then dropped significantly to very low levels in the following years. However, a surge occurred in 2024, reaching 8,194 cases. Incidence peaked at 75.12 per million in 2019, falling below 1 per million in subsequent years, and spiking above 100 per million in 2024.

Viet Nam



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Confirmed cases	860	524	586	859	5,814	714	180	38	98	2,105
Incidence	9.26	5.57	6.16	8.93	59.83	7.28	1.82	0.38	0.98	20.84

Figure 17 Trend of measles cases and incidence in Viet Nam, 2015-2024
(Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=)))

As shown in Figure 17, confirmed measles cases in Vietnam remained below 900 from 2015 to 2018 (WHO, 2025). Cases spiked to 5,814 in 2019, the highest in a decade, before dropping to 714 in 2020 and remaining low until 2023, then rose to 2,105 in 2024. However, there is a marked increase in cases in 2024, with 2 105 cases. Incidence followed a similar pattern, peaking at 59.83 per million in 2019, falling to 7.28 in 2020, and staying below 1 per million until rising to 20.84 in 2024.

Case Management and Prevention

Case Management

Immediate administration of vitamin A

There is no specific antiviral therapy for measles. Medical care is supportive and to help relieve symptoms and address complications such as bacterial infections (CDC, 2024c). Measles treatment should address potential complications. While not all measles cases require hospitalization, some can be managed at home with adequate fluid intake (such as oral rehydration solutions), fever management, and nutritional support. It may take children 4 to 8 weeks to regain their pre-measles nutritional status. Hospitalized measles cases must be isolated to prevent in-hospital transmission, with suspected measles patients kept in isolation until at least four days after the rash appears. Strict infection control measures, such as isolation and negative pressure rooms, are crucial due to the high contagiousness of measles. Healthcare settings must take precautions to prevent nosocomial transmission, particularly among non-immune healthcare workers and unvaccinated infants. Unless complications necessitate hospitalization or follow-up care, home-based management is preferable (WHO, 2017b).

Providing vitamin A to children with measles has been shown to reduce both disease severity and mortality. The WHO recommends administering vitamin A to all children diagnosed with measles 50,000 I.U. for infants under 6 months old, 100,000 I.U. for infants aged 6–11 months, and 200,000 I.U. for children aged 12 months and older. The first dose should be given at the initial health service visit, followed by a second dose the next day. If the child exhibits clinical signs of vitamin A deficiency, such as Bitot's spots, a third dose should be administered 4–6 weeks later. For children recovering at home, public health officers must ensure they receive the appropriate vitamin A supplementation (WHO, 2017b).

Symptomatic treatments for prevention of complications

Measles patients are more likely to experience complications, therefore it's important to take extra care for the skin, mouth, and eyes to avoid getting secondary infections. Ensuring enough nutrition is critical.

Table 4. Symptomatic treatments

Symptoms	Treatment
Fever	Fever treated with paracetamol.
Nutrition	• Daily, monitor the child's weight and consumption. • Encourage breastfeeding for newborns, frequent meals for children. • Consult with a dietitian. • If there is malnutrition, it should be treated.
Mouth ulcers	• To prevent mouth ulcers, wash mouth with clean, salted water four times daily, avoid spicy foods, and treat with antibiotics if they appear superinfected with bacteria.
Eye care	• Mild conjunctivitis with clear, watery discharge requires no treatment. If pus is present, treat for bacterial conjunctivitis. • If the discharge has more than clear watery discharge, treat for superinfection with bacteria with bacterial ointment like tetracycline ointment, applied three times a day for 7 days. Clean the eye carefully and consult an eye specialist as needed. Do not use steroid ointment on infected eyes.
Skin care	• Maintain clean and dry skin and closely monitor for signs of infection, such as cellulitis or severe soft tissue infections.

Source: (WHO, 2020b)

Early supportive care for sepsis/severe illness

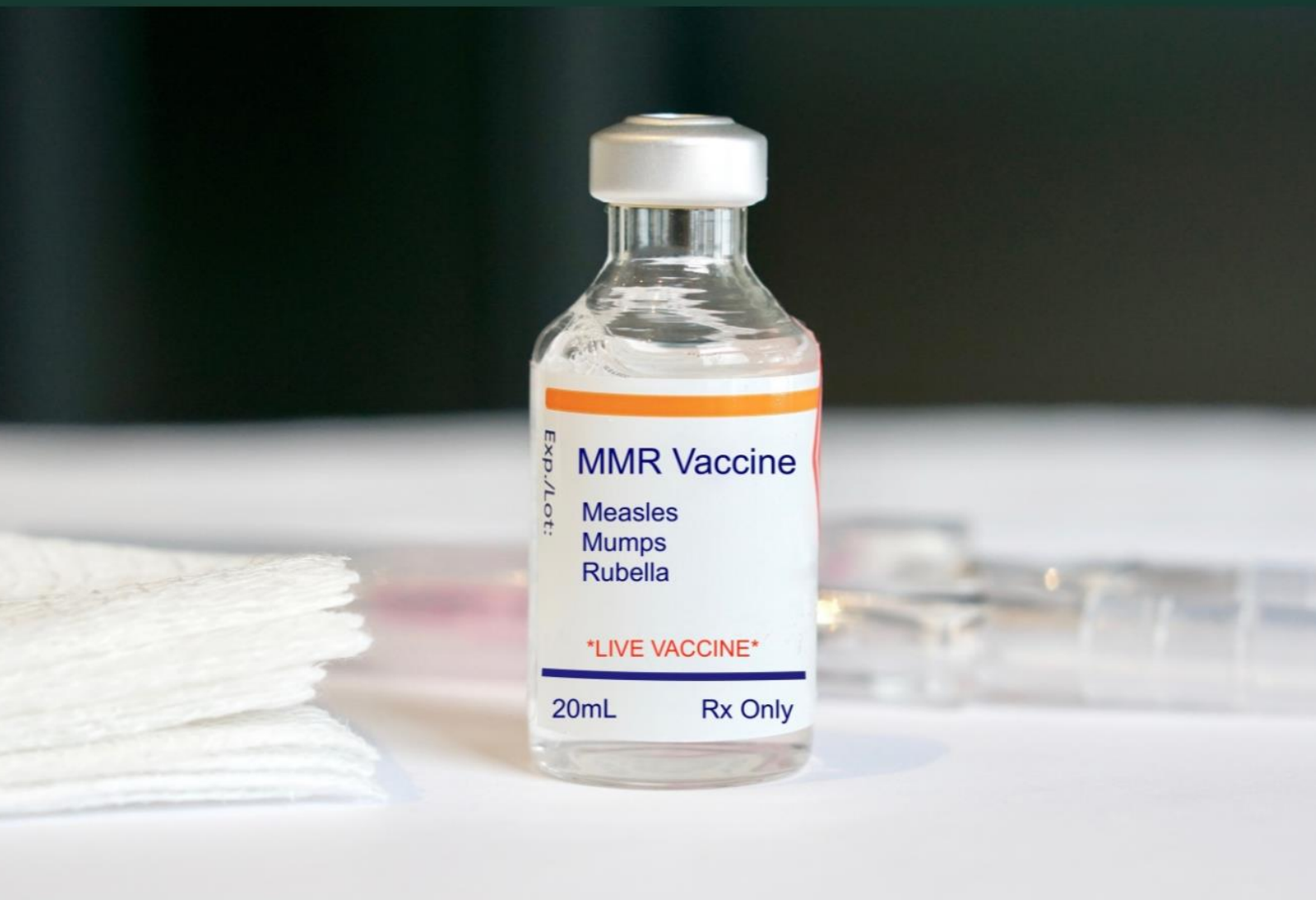
Severe measles symptoms or complications should be treated following the same guidelines as non-measles patients. Patients at high risk of complications or showing signs of severe illness or sepsis should be closely monitored and assessed at least every hour, ideally in an intensive care unit with adequate staffing and equipment. Those with mild illness or not at high risk should be assessed at least every eight hours, following local hospital admission policies for certain comorbidities. Assessments should include vital signs, mental status, urine output, and targeted physical examinations, with all observations recorded to track trends. If vital signs remain normal, reassessment can be done in 3–4 hours, but any clinical change requires immediate reevaluation and intervention. Early warning scoring systems should be used to identify deterioration and ensure timely escalation of care by experienced clinicians (WHO, 2020b).

Prevention

Figure 18 Immunization to Prevent Measles

The most effective method of preventing measles is through the implementation of vaccination programs targeting the entire community. It is recommended that all children receive two doses of the vaccine at 9 and 15-18 months of age. The vaccine is also utilized in emergency situations to halt outbreaks due to its affordability, safety, and efficacy. The implementation of mass immunization programs and the integration of routine vaccination services are essential for the global reduction of measles-related mortalities. Combining vaccines offers protection against rubella, a frequent vaccine-preventable infection in the pregnancy, as well as shared delivery and administration costs (WHO, 2024a).

Control Measures Strategy



In 2020, the WHO developed the Measles and Rubella Strategic Framework (MRSF) 2021–2030 to guide immunization stakeholders at all levels in planning and implementing effective measles and rubella elimination efforts. The framework aligns with the Immunization Agenda 2030 (IA2030) and other key strategic documents to support regional elimination targets. It adopts the IA2030 structure, including strategic priorities, targets, and focus areas (WHO, 2020a).

All six WHO regions have committed to measles and rubella elimination, though targets and milestones vary. To achieve and sustain these goals, the MRSF 2021–2030 outlines seven strategic priorities aligned with IA2030:

Strategic Priority 1: Primary Health Care and Universal Health Coverage

Integrate all measles and rubella-related activities, including surveillance and case management, as fundamental components of primary healthcare (PHC) systems to support the achievement of universal health coverage (UHC). Strengthen measles and rubella surveillance within the broader disease surveillance framework, while enhancing the collection, analysis, and utilization of monitoring and surveillance data for informed decision-making.

Strategic Priority 2: Commitment and Demand

This strategic priority aims to improve ownership and responsibility for measles and rubella objectives and targets at all levels of the health system, while also enhancing community involvement to improve demand and uptake of measles and rubella vaccinations.

Strategic Priority 3: Coverage and Equity

Identify and close immunity gaps for measles and rubella by utilizing all relevant points of contact between individuals and the health system. Establish or improve these contact points as needed, and use specific approaches to successfully reach underrepresented communities.

Strategic Priority 4: Life Course and Integration

Adopt a life-course approach to administering the second routine dose of measles- and rubella-containing vaccines and implementing catch-up vaccination. Integrate measles and rubella initiatives with other health and non-health interventions to enhance program efficiency and reach.

Strategic Priority 5: Outbreaks and Emergencies

Ensure comprehensive outbreak preparedness to facilitate the prompt identification and efficient management of measles and rubella outbreaks, which means reducing transmission and minimizing morbidity and related mortality.

Strategic Priority 6: Supply and Sustainability

Ensure the consistent availability of high-quality measles- and rubella-containing

vaccines, essential vaccination supplies, and laboratory reagents. Additionally, secure sustainable financing for measles and rubella programs, including surveillance activities, to support long-term disease control efforts.

Strategic Priority 7: Research and Innovation

Support research and innovation to address challenges to getting high population immunity against measles and rubella, while also improving the creation and use of high-quality disease monitoring and programmatic data.

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Although the strategic priorities (SPs) are presented separately, they are interconnected and all are needed to achieve the goals of the MRSF 2021–2030. For example, monitoring plays and will continue to play a key role in supporting the achievement of the objectives of each SP. In addition, SP2 (Commitment and Demand), SP3 (Coverage and Equity) and SP4 (Lifecycle and Integration) must be applied holistically to achieve the required high level of population immunity. The SPs and CPs apply to stakeholders at the global, regional, national and subnational levels

Photograph: SehatNegeriku

Control Measures in ASEAN Member States

The ASEAN Vaccine Baseline Survey (AVBS) highlights ASEAN's commitment to vaccine security and self-reliance, including efforts relevant to measles control (ASEAN, 2019). Conducted by Thailand's National Vaccine Institute (NVI), the survey assessed the capacity, gaps, and challenges in the vaccine value chain, covering R&D, production, regulation, and immunization at regional and national levels. The AVBS served as the first step in the ASEAN Vaccine Security and Self-Reliance (AVSSR) initiative, forming the foundation for regional strategies and action plans to enhance vaccine availability. The ASEAN Health Cluster 3 Meeting endorsed the AVBS to guide future vaccine policies, reflecting ASEAN's collective commitment to vaccine security, self-reliance, and effective immunization programs, including measles control.ASEAN also follows the World Health Organization's (WHO) "Strategic Plan for Measles and Rubella Elimination and Sustainability in the WHO South-East Asia Region (2024-2028)" which outlines key steps to achieve and sustain disease elimination, with five key objectives: immunization, surveillance, laboratory support, outbreak preparedness and response, and enabling environment (WHO, 2024b). The plan emphasizes high vaccination coverage, improved surveillance and laboratory capacity, and strong collaboration among Member States, partners, and stakeholders to eliminate measles and rubella across the region.

Brunei Darussalam

Brunei Darussalam implements a comprehensive Expanded Programme on Immunization (EPI), mandated by the Infectious Disease Act Cap 204, to protect children against ten vaccine-preventable diseases, including measles (WHO, 2020c). Established in 1957, the National Childhood Immunization Programme is regularly updated to align with WHO recommendations and is widely accepted.

Immunization services are provided free of charge through 16 maternal and child health (MCH) clinics, school health services, and government hospitals, with additional services for military personnel through the Royal Brunei Armed Forces (RBAF) medical centers. Remote communities are reached through mobile clinics and the Flying Medical Service. A well-structured vaccine procurement system ensures a reliable supply, quality standards, and cost-effectiveness, while cold chain mechanisms safeguard proper storage and transportation.

Immunization coverage in Brunei Darussalam is monitored through healthcare facility reports, with records for children under five maintained in maternal and child health (MCH) clinics, despite the absence of a centralized national registry. Data collection and reporting are conducted manually via the Brunei Health Information Management System (Bru-HIMS), with the annual birth cohort serving as the denominator.

Effective monitoring and public awareness efforts have maintained immunization coverage above 95% for the first and second doses of the measles containing vaccines (MCV1 and MCV2) (Figure 19). To sustain high vaccination rates, national awareness campaigns are regularly conducted, and healthcare professionals provide targeted counseling to vaccine-hesitant families at community clinics. As a result, measles incidence dropped significantly from 9.47 per million persons in 2015 to a range of 0–2.34 in the following years (Figure 19) (WHO, 2025).

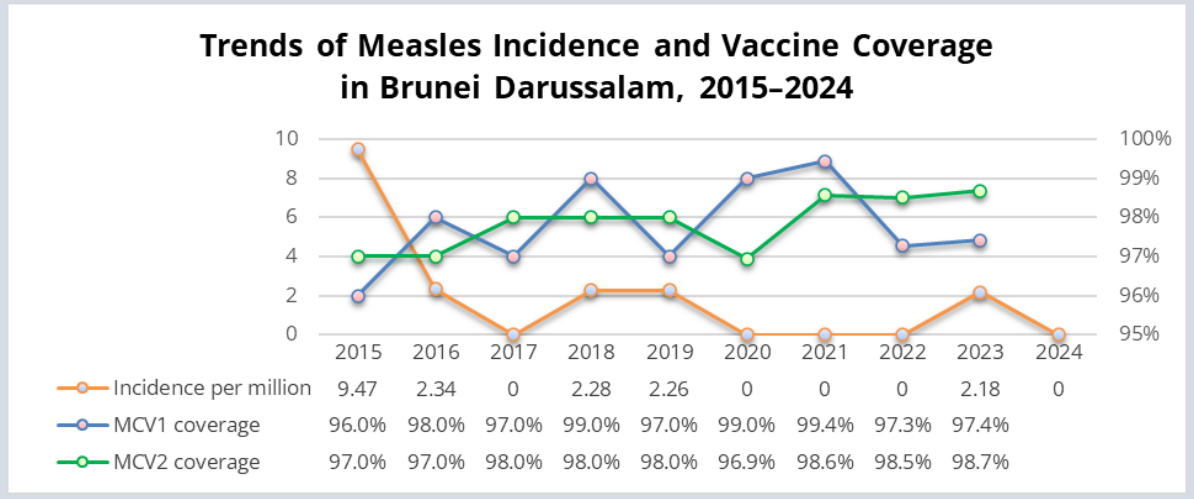


Figure 19 Trend of measles incidence and vaccine coverage in Brunei Darussalam, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Cambodia

Through the National Immunization Program Strategic Plan 2016-2020, Cambodia aimed to protect public health by preventing, controlling, and eliminating vaccine-preventable diseases (Ministry of Health Cambodia, 2016). To support SDG 3 on health and well-being, the Ministry of Health developed the Health Sector Strategic Plan 2016–2020 in collaboration with government departments, donors, health partners, NGOs, civil society, and private health providers. Nationwide immunization campaigns in 2000, 2007, 2011, and 2013 led to measles elimination in March 2015. However, cases re-emerged, with an incidence of 3.53 per million persons in 2015 (Figure 15). The incidence declined to below 1 by 2018 but surged to 40.96 per million in 2019 before gradually decreasing. From 2021 to 2024, incidence remained below 1 (WHO, 2025). In 2015, vaccine coverage was 95% for MCV1, and 72% for MCV2. The coverage then increased to over 100% for bothMCV1 and MCV2 in 2016. However, the coverage then decreased in the following years, maintaining over 96% for MCV1 and >80% for MCV2 (Figure 20).

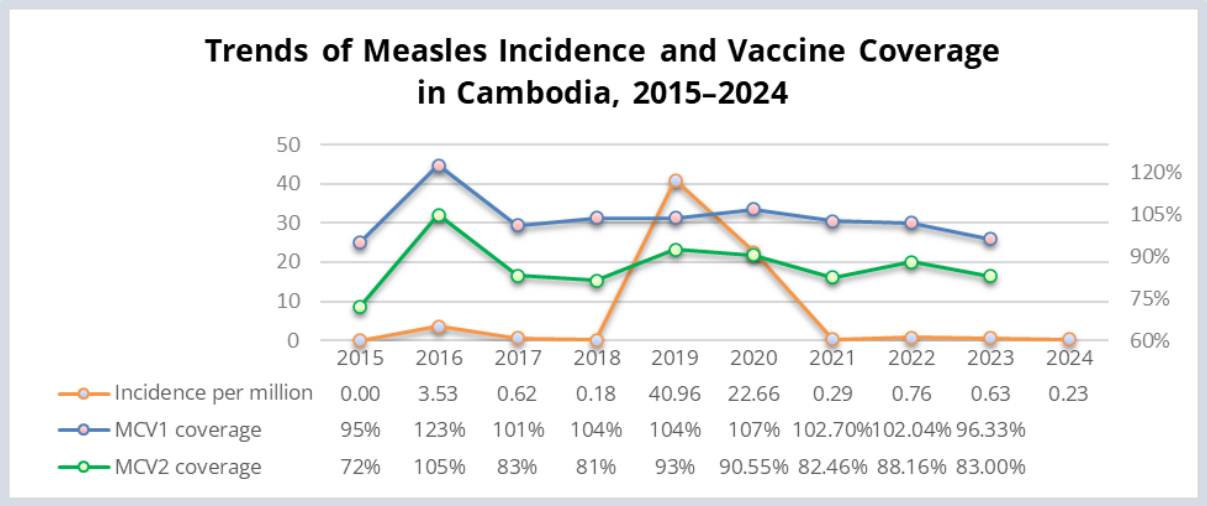


Figure 20 Trend of measles incidence and vaccine coverage in Cambodia, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

The strategic plan outlines key strategies for measles control and elimination, focussing on five key objectives:

1. Service Delivery: expand immunization coverage nationwide, prioritizing high-risk communities and reducing disparities linked to geography and socioeconomic status.
2. Cold Chain Management: enhance the vaccine supply system by implementing measures outlined in the Effective Vaccine Management (EVM) improvement plans.
3. Community Awareness and Demand: strengthen public awareness and increase demand for immunization services.
4. Surveillance: improve the quality of disease surveillance systems for vaccine-preventable diseases by actively involving all relevant stakeholders.
5. Management Capacity: strengthen the management and operational capacity at all levels to effectively implement the immunization program.

Cambodia launched a nationwide Measles-Rubella Supplementary Immunization Activity (MR SIA) on October 31, 2024, targeting over 1.5 million children under five across 25 provinces (CHAI, 2024). Funded by Gavi and supported by WHO, UNICEF, and CHAI, the campaign addresses immunity gaps from COVID-19 disruptions. Priority is given to high-risk and hard-to-reach populations, including migrant children, ethnic minorities, and urban poor communities. The WHO-prequalified MR vaccine is provided free at health centers, with the campaign running in two phases from November to December 2024. This initiative strengthens Cambodia's measles elimination efforts and national health security.

Indonesia

Indonesia adopted the agreement of the 66th Meeting of the Regional Committee for South-East Asia, which established regional targets for measles elimination and rubella control by 2020. Indonesia implemented various initiatives, including a measles crash program in 183 high-risk districts/cities, two-phase supplementary measles-rubella immunization campaign in 2017 and 2018, and the strengthening of routine measles immunization (Ministry of Health Republic of Indonesia, 2021).

Based on the Decision of the Director-General of Disease Prevention and Control Number HK.02.02/I/3510/2021 on the National Strategy for Measles and Rubella Elimination 2020–2024, five key strategies and activities have been outlined (Ministry of Health Republic of Indonesia, 2021):

1. Achieve and maintain at least 95% coverage for the first and second doses of measles-rubella immunization in each district/city through routine and/or supplementary immunization.
2. Achieve and maintain case-based measles surveillance (CBMS) and congenital rubella syndrome (CRS) surveillance that are sensitive, timely, and meet the recommended surveillance performance indicators.
3. Establish and sustain an accredited measles-rubella/CRS laboratory network to support specimen testing across all provinces in Indonesia.
4. Ensure the presence of a preparedness and rapid response system for every measles-rubella outbreak.
5. Strengthen cross-program and cross-sector collaboration to achieve elimination targets.

To accelerate the achievement of elimination targets, key measures include strengthening routine measles-rubella immunization for doses 1 and 2, ensuring a minimum coverage of 95%. Additionally, supplementary immunization efforts will be implemented gradually, targeting specific age groups based on the latest immunity profile and the progress of routine measles-rubella immunization coverage following the disruptions caused by the COVID-19 pandemic. MCV1 coverage remained high, exceeding 92% from 2015 to 2019, but declined to approximately 86%–87% in 2020–2021, likely due to the pandemic, before rebounding in subsequent years. MCV2

coverage increased gradually from 30.8% in 2015 to 72.7% in 2019 but declined to 60.5% in 2021. It then spiked to 98.4% in 2022 before dropping again to 78% in 2023 (Figure 21). As shown in Figure 21, measles incidence in Indonesia was 20.17 per million persons in 2015, decreasing to 6.17 per million in 2016. However, cases resurged in 2017, reaching 14.8 per million, followed by a gradual decline to nearly one per million in 2021. The incidence then spiked sharply to 70.7 per million in 2023 before declining again in 2024.

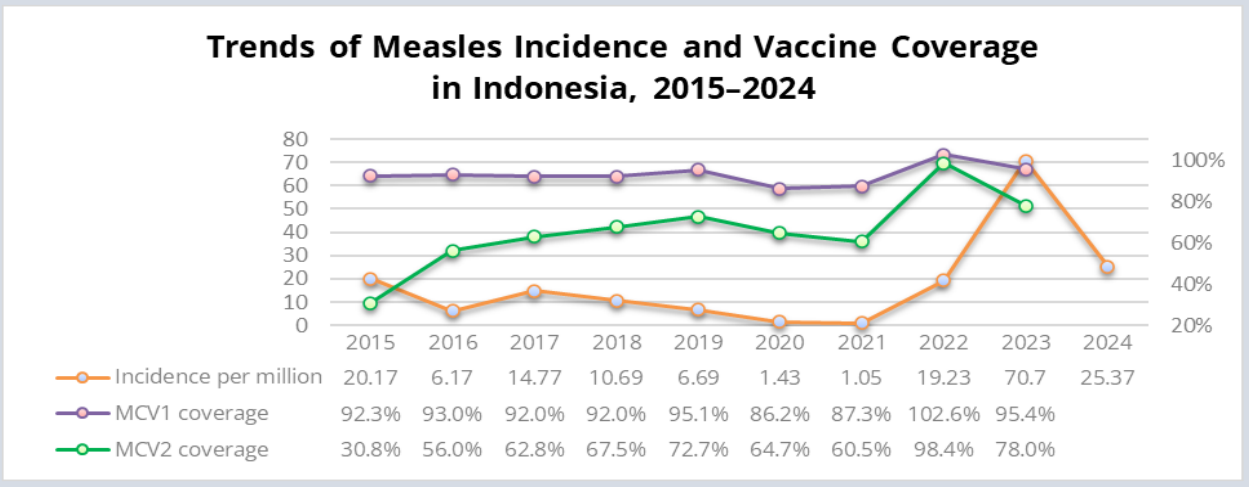


Figure 21 Trend of measles incidence and vaccine coverage in Indonesia, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Lao People's Democratic Republic

Lao PDR has made significant progress in measles prevention through the Measles and Rubella Supplementary Immunization Activity (MR SIA) launched in May 2024 by the Ministry of Health, with support from WHO, Gavi, the Australian Government, and UNICEF (WHO, 2024c). The campaign aimed to close immunity gaps caused by COVID-19-related disruptions, which had led to a decline in measles vaccination coverage and increased the risk of outbreaks. To address this, the National Immunization Programme (NIP) led a coordinated, multi-sectoral effort, involving ministries, local governance bodies, and mass organizations such as the Lao Women's Union and the Lao Front for National Construction. Achieving 95.2% coverage, the campaign significantly reduced outbreak risks while also providing vitamin A supplements to enhance immune health.

UNICEF supported cold chain management, supply logistics, and social mobilization to ensure broad vaccine distribution. This success underscores Lao PDR's commitment to measles elimination through strategic planning, inter-agency collaboration, and targeted immunization efforts.

The incidence was 8.23 per million persons in 2015, gradually decreasing to below 2 until 2018. However, a sharp surge occurred in 2019, reaching over 170 per million, the highest in the past decade, before gradually declining to below one per million since 2021 (Figure 22). In terms

of vaccine coverage, MCV1 coverage was 99% in 2015 but declined to 87% in 2016. It rebounded to 92% in 2017 before reaching its lowest level at 79.3% in 2021, then gradually increased to 86.4% in 2023. MCV2 coverage was 76% in 2018 but fluctuated, dropping to 55.6% in 2021 before gradually improving to 72.9% in 2023.

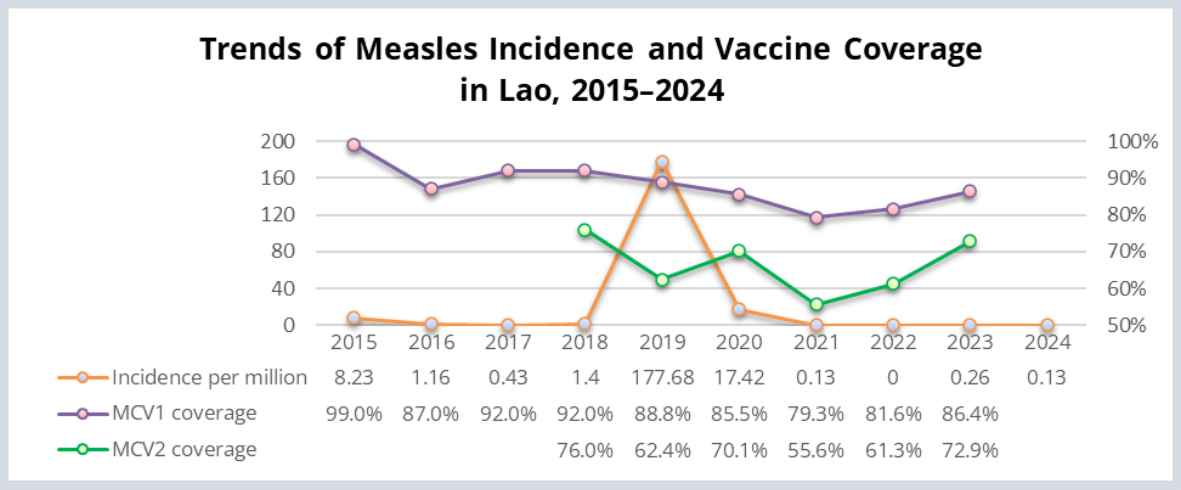


Figure 22 Trend of measles incidence and vaccine coverage in Lao PDR, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Malaysia

Malaysia initiated the Measles Elimination Program in 2004 to reduce the incidence of measles and has implemented the Western Pacific Region Plan of Action for Measles Elimination and the Field Guidelines for Measles Elimination. In 2016, the national immunization schedule was revised in line with WHO recommendations, shifting the first dose to nine months and the second to twelve months to enhance early immunity (Daud, 2022).

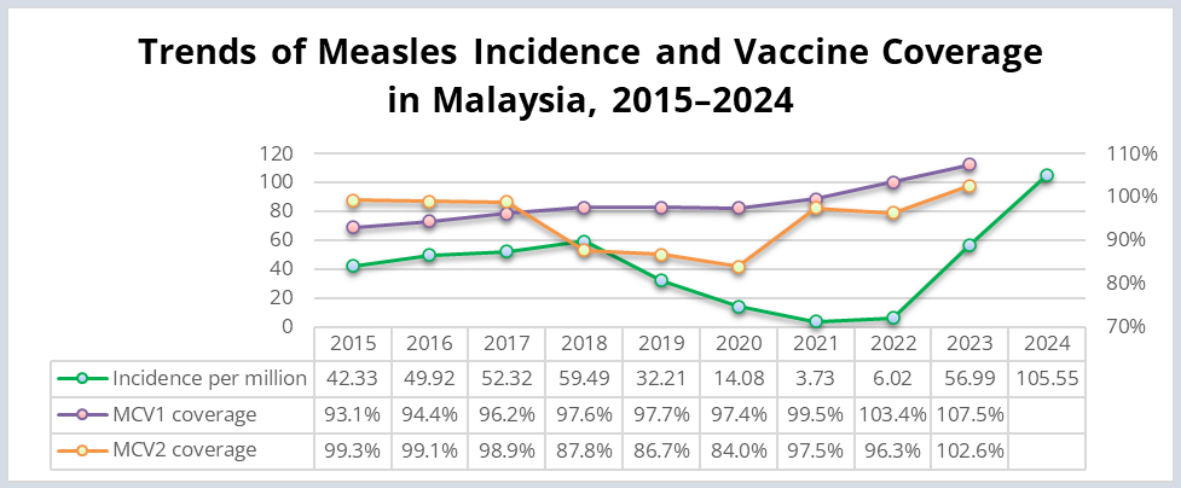
The Malaysia Ministry of Health's 2022–2025 Action Plan reports a significant increase in measles cases from 2013 to 2019, with eight fatalities linked to non-immunization (Ministry of Health Malaysia, 2021). To enhance prevention, Malaysia is developing a National Immunization Registry, expanding vaccination to all age groups, and prioritizing MMR coverage among Indigenous populations. The goal is to surpass 95% coverage for sustained measles elimination and improved public health resilience.

Challenges such as high population movement and the presence of migrants continue to hinder the country's efforts to achieve measles elimination. Therefore, those who are travelling into and out of Malaysia are advised to take note of the following (Ministry of Health Malaysia, 2015):

1. Travelers to endemic areas, particularly infants, should ensure that routine vaccinations, including MMR, are up to date. Older children and adults who have not received the two lifetime doses of measles should

be vaccinated before traveling. Travelers should consult the destination country's travel advice for further information.

2. Malaysia is currently working to eliminate measles by 2018. As a consequence, all visitors are urged to obtain a measles vaccine before their arrival.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Incidence per million	42.33	49.92	52.32	59.49	32.21	14.08	3.73	6.02	56.99	105.55
MCV1 coverage	93.1%	94.4%	96.2%	97.6%	97.7%	97.4%	99.5%	103.4%	107.5%	
MCV2 coverage	99.3%	99.1%	98.9%	87.8%	86.7%	84.0%	97.5%	96.3%	102.6%	

Figure 23 Trend of measles incidence and vaccine coverage in Malaysia, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

In 2015, Malaysia's measles incidence was 42.33 per million persons, rising to nearly 60 per million in 2018 before declining to its lowest at 3.73 per million in 2019. Incidence then slightly increased to 6.02 per million before surging to over 105 per million in 2023 (Figure 23). MCV1 coverage gradually increased from 93.1% to over 100% in 2024. MCV2 coverage fluctuated, remaining around 99% in 2015–2016 before declining to its lowest at 84% in 2020, then rebounding to over 100% in 2023.

Myanmar

Myanmar committed to the elimination of measles and the control of rubella and congenital rubella syndrome (CRS) by 2020, in alignment with the WHO South-East Asia Regional (SEAR) resolution (SEA/RC66/R5) in 2013 and the Global Vaccine Action Plan (GVAP) endorsed by the World Health Assembly in 2012 (Ministry of Health Myanmar, 2021). To achieve this goal, Myanmar developed a Measles Elimination and Rubella/CRS Control Strategy Plan, with a primary focus on measles case-based surveillance, outbreak investigation, and response. Measles case-based surveillance, introduced in 2007, is integrated into the Acute Flaccid Paralysis (AFP) surveillance system, operational since 1996. The Central Epidemiology Unit (CEU) under the Department of Public Health (DOPH) oversees 17 communicable diseases, including measles, and leads outbreak investigations. Surveillance and response efforts are implemented at local (Sub-RHC and RHC), township, and divisional/state levels. To sustain elimination progress,

Myanmar continues to strengthen surveillance, enhance outbreak investigation capacity, and improve response mechanisms.

Myanmar successfully conducted a nationwide measles vaccination campaign in March 2025, targeting 6.4 million children aged 9 months to 5 years. Supported by the Measles Initiative, the campaign demonstrated best practices in immunization efforts. Key highlights included (McNab, 2025):

1. Inviting the people

   Health workers and community leaders conducted door-to-door visits, individually inviting each household to the vaccination post, as well as information regarding measles. These activities also ensured families were informed about the campaign.

2. Smooth flow at the post

   At vaccination posts, a structured process was followed, from screening and registration to post-vaccination observation for 30 minutes to monitor for reactions.

3. Dedicated health workers and volunteers

   Midwives and nursing students played a crucial role, collecting vaccines from cold storage each morning to maintain accessibility and timely administration.

4. Meticulousness

   Health workers ensured precise dosage administration and accurate documentation. Volunteers and community leaders followed up with families of children who missed their appointments.

5. Results for Families and Communities

   Direct engagement and organized outreach efforts made this campaign a model for measles immunization, enhancing public trust and participation.

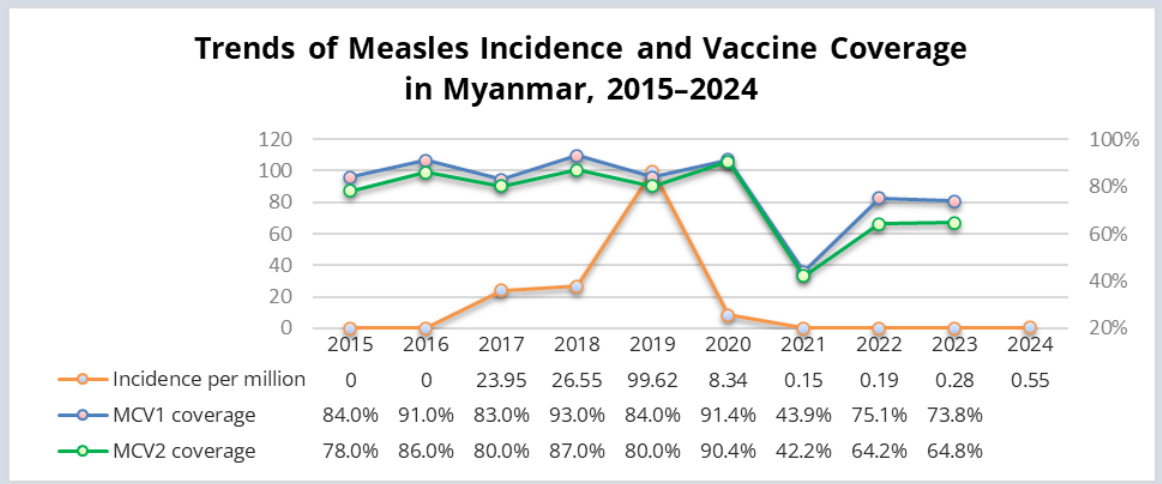


Figure 24 Trend of measles incidence and vaccine coverage in Myanmar, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

From 2015 to 2016, Myanmar reported zero measles incidence. However, cases resurged in the following years, reaching 23.95 per million persons in 2017, rising to 25.55 per million in 2018, and peaking at 99 per million in 2019. Incidence then declined, remaining below one per million since 2021. Myanmar consistently maintained MCV1 coverage above 83% and MCV2 above 78% from 2015 to 2020. However, coverage dropped below 45% for both in 2021 before rebounding to over 73% for MCV1 and over 64% for MCV2 from 2022 to 2023.

Philippines

To eliminate measles, The Philippines Department of Health has conducted four rounds of mass measles campaigns which were conducted in 1998, 2004, 2007, and 2011. In 2009, the 2-dose measles-containing vaccine (MCV) was implemented, with MCV1 for 9-11 months and MCV2 for 12-15 months. The Department of Health also implemented and strengthened the Laboratory surveillance for measles infection confirmation. In 2011, a supplemental immunization campaign was conducted and dubbed as “Iligtas sa Tigdas ang Pinas” or “Save the Philippines from Measles”. The campaign was to give the measles-rubella vaccine to 15.6 million children aged 9 months to 8 years. The Philippines conducted a rapid coverage assessment (RCA) to validate immunization coverage and ensure high quality. Results showed that 97.6% of children aged 9 months to 8 years in randomly selected barangays were vaccinated, with 97.6% of eligible children receiving the MR vaccine. The government spent PhP 635.7M on the successful immunization campaign. (Department of Health Republic of the Philippines, 2023)

The Philippines' MCV1 coverage declined from 79% in 2015 to 67% in 2018, then peaked at 77% in 2020 before dropping sharply to 57.1% in 2021. It later improved to 73.8% in 2023. MCV2 coverage followed a similar trend, decreasing from 64.1% in 2015 to 58.7% in 2018, rebounding to 69.2% in 2019, then dropping to 56% in 2021 before rising to 69% in 2023. From 2015 to 2017, measles incidence in the Philippines remained low, ranging from 6 to 22 cases per million (Figure 25). However, incidence surged to over 200 per million in 2018, peaking at 436 per million in 2019. It then dropped to 33 per million in 2020, reaching a low of under 2 per million in 2021, before re-emerging at 24 per million in 2023.

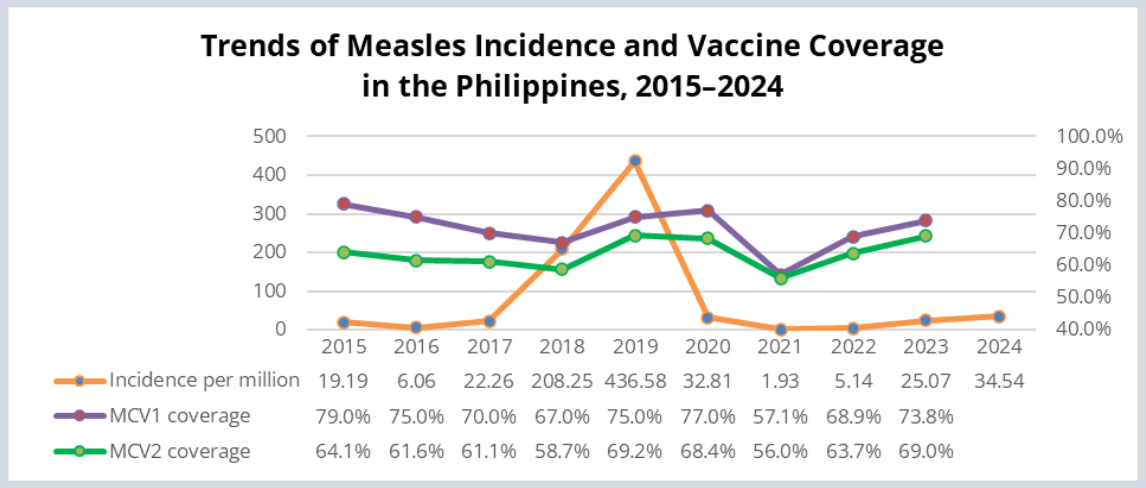


Figure 25 Trend of measles incidence and vaccine coverage in the Philippines, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Singapore

Measles vaccination was introduced in Singapore in October 1976 and became legally compulsory in 1985 for children aged 1–2 years under the Infectious Diseases Act (See, 2021). In response to rising global measles cases in the 1990s, Singapore adopted a two-dose schedule to enhance immunity and prevent transmission, even in highly vaccinated populations. To ensure accessibility, the Ministry of Health covers vaccination costs at designated government healthcare facilities. The World Health Organization verified that Singapore had eliminated endemic transmission of measles in October 2018.

Singapore has implemented comprehensive measures to prevent measles outbreaks, emphasizing high vaccination coverage as the most effective strategy (Ministry of Health Singapore, 2019). The national immunization schedule mandates the first measles vaccine dose at 12 months and the second between 15–18 months, with vaccination being compulsory for local children. In 2019, Singapore extended this requirement to foreign children applying for long-term passes to strengthen immunity. The Health Promotion Board (HPB) supports timely vaccination by sending reminders to parents and offering catch-up vaccinations in schools. Free vaccinations at polyclinics ensure accessibility, contributing to 95% coverage for the first dose at age 2 and 93% for the second dose at age 7, significantly reducing outbreak risks.

Despite these measures, Singapore remains vigilant, monitoring global outbreaks and imported cases while urging parents to vaccinate their children promptly. Plans are in place to further increase vaccination rates by introducing pre-school vaccination requirements and ensuring health workers caring for vulnerable groups are immunized. By maintaining high vaccination levels, Singapore aims to protect its population and prevent widespread measles transmission.

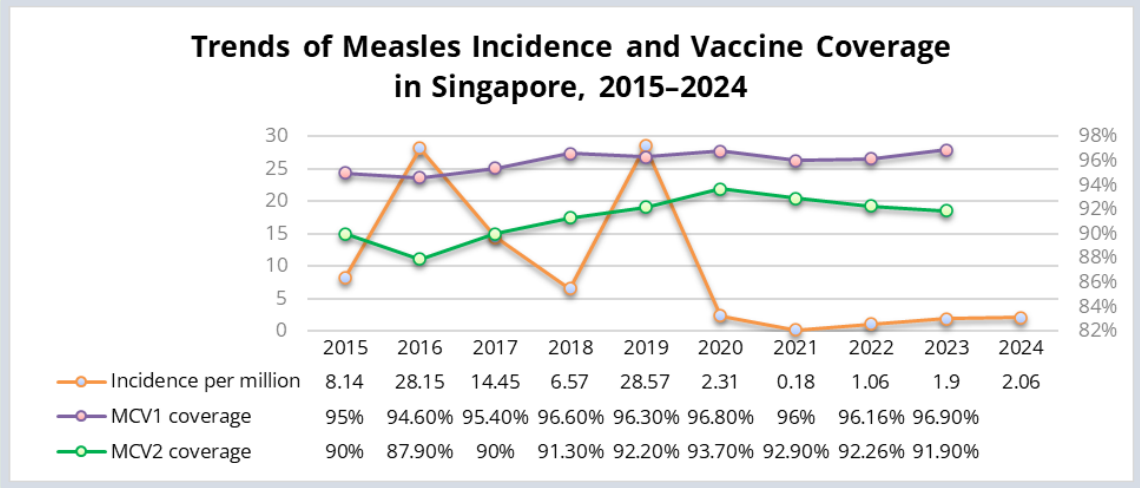


Figure 26 Trend of measles incidence and vaccine coverage in Singapore, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

Since 2015, Singapore has consistently maintained MCV1 coverage above 90% (Figure 26). MCV2 coverage has also remained high, exceeding 90% throughout the period, except for a slight decline to 87.9% in 2016. Despite this, the country experienced two spikes in measles incidence, exceeding 28 cases per million persons in 2016 and 2019.

Thailand

The Ministry of Public Health of Thailand has approved the Polio and Measles Eradication Project in Geneva, Switzerland in 2010. Implemented from October 1, 2010, the project aimed to reduce measles incidence to no more than 1 per million by 2020. Four key measures were introduced to support this goal (Ministry of Public Health of Thailand, 2020):

1. Ensure measles vaccination coverage remains above 95% nationwide.
2. Establish a network of certified laboratory measles testing centers nationwide.
3. Confirm at least 80% of suspected measles cases through laboratory testing.
4. Expand vaccination efforts, including targeted campaigns for at-risk populations, such as the working-age group, to boost coverage.

Thailand's Strategic Plan for Measles Elimination (2020–2024) aims to achieve measles and rubella elimination, which focuses on three key missions (Ministry of Public Health of Thailand, 2020):

1. Enhance immunity: Accelerating measles and rubella vaccination coverage in target populations to meet elimination criteria.
2. Strengthen disease surveillance and investigation: Expanding and improving the disease surveillance network for effective outbreak detection and response.
3. Develop comprehensive standard laboratories: Expanding certified laboratory networks nationwide to enhance accessibility and support comprehensive measles testing.

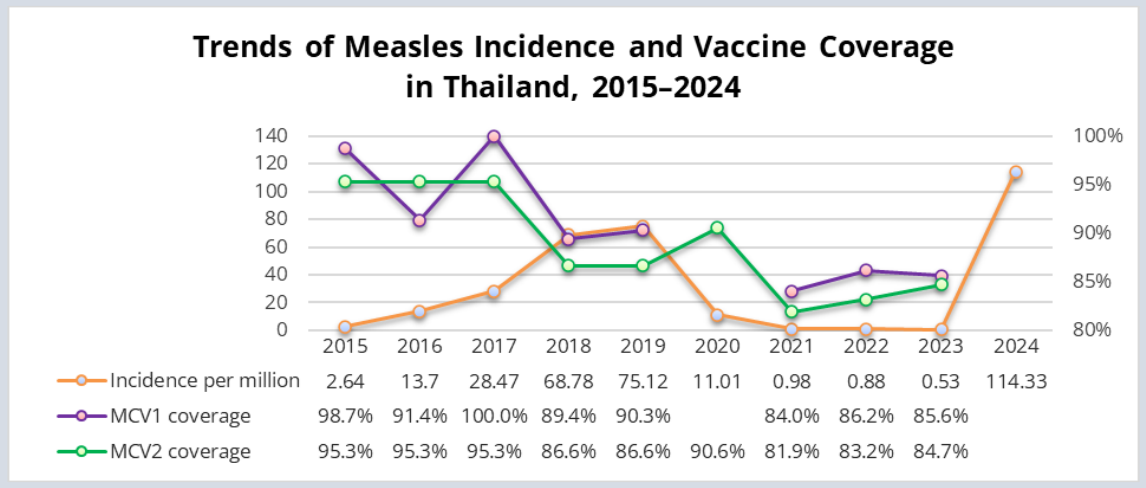


Figure 27 Trend of measles incidence and vaccine coverage in Thailand, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

From 2015 to 2017, Thailand consistently maintained both MCV1 and CMV2 coverage above 90% (Figure 27). However, MCV1 coverage declined to 89.4% in 2018 and remained below 90% from 2021 to 2023. MCV2 coverage dropped to 86.6% in 2018–2019, rebounded to 90.6% in 2020, then declined again in subsequent years. Measles incidence spiked twice, exceeding 68 cases per million persons in 2016–2017 and surging to over 114 per million in 2024, following a period of relatively low incidence from 2020 to 2023.

Viet Nam

Vietnam has intensified measles control efforts, focusing on vaccination campaigns for children aged 9 months to 10 years. The Ministry of Health, with support from WHO, UNICEF, and the UN Foundation, has strengthened routine immunization, providing free locally produced vaccines since 2011 (WHO, 2014). Hospitals have expanded capacity to manage severe cases, while public awareness campaigns address vaccine hesitancy. Recent increases in vaccinations indicate growing public confidence.

A nationwide measles vaccination campaign launched in September 2024 covers 31 provinces and cities (Ministry of Health of Viet Nam, 2025). Phase 1 is complete in seven provinces, with 24 others ongoing. To continue immunization in high-risk areas in 2025, the Ministry of Health is developing a strategic plan based on risk assessments and expert recommendations. This includes Phase 2 for children aged 1–10 years and a supplementary program for those aged 6–9 months.

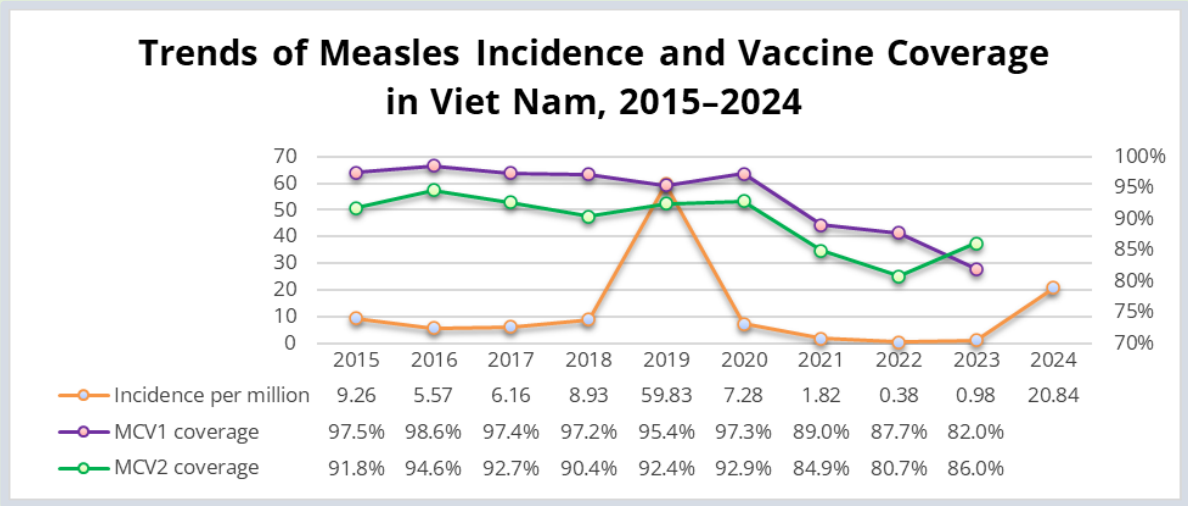


Figure 28 Trend of measles incidence and vaccine coverage in Viet Nam, 2015-2024 (Source: WHO immunization data (https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=))

From 2015 to 2020, Viet Nam consistently maintained both MCV1 and CMV2 coverage above 90% (Figure 28). However, MCV1 coverage declined to 89% in 2021 and 82% in 2023, while MCV2 dropped to 84.9% in 2021 before rebounding to 86% in 2023. Measles incidence spiked to over 59 cases per million in 2019 and re-emerged at 20 per million in 2024 after a period of low incidence from 2020 to 2023.

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