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VIRTUAL CENTER**



Image by the World Health Organization

DIPHTHERIA RISK ASSESSMENT: ASEAN Region August 9, 2023



Korea Disease Control and
Prevention Agency



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ASSOCIATION
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ASIAN NATIONS



DIPHTHERIA RISK ASSESSMENT IN THE ASEAN REGION

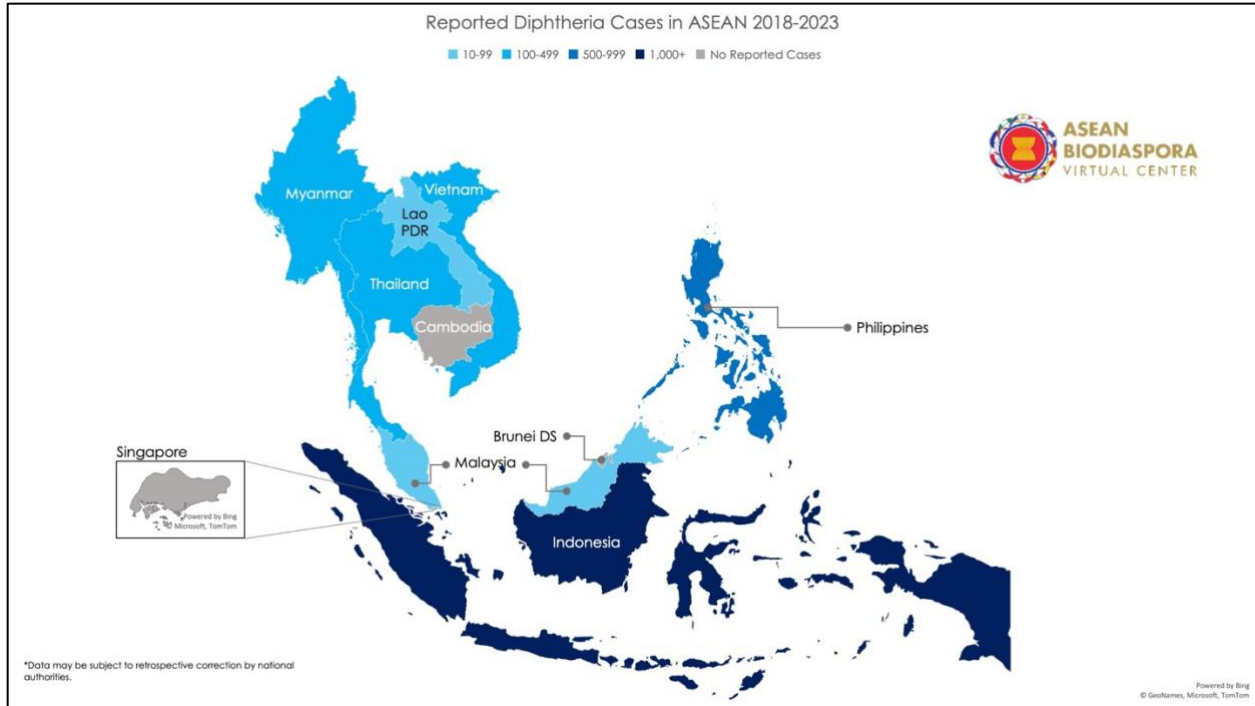
Introduction

According to the World Health Organization (WHO), Diphtheria is caused by the bacterium *Corynebacterium diphtheriae*, with symptoms typically appearing 2 – 5 days post-exposure. These symptoms can vary in intensity. The onset is usually gradual, marked by a sore throat and fever. In severe cases, the bacteria generate a toxin, leading to a dense grey or white patch at the throat's rear. This obstruction can impede breathing and swallowing, accompanied by a hoarse cough. Enlarged lymph nodes might cause neck swelling. The toxin may enter the bloodstream, resulting in complications like heart muscle inflammation, nerve inflammation, kidney issues, and bleeding due to reduced blood platelets. Damaged heart muscles may yield irregular heart rates, while nerve inflammation can lead to paralysis.

Diphtheria is highly contagious, transmitting through direct contact and respiratory droplets released during coughing or sneezing. Additionally, it can spread via contaminated clothing and objects.¹

Diphtheria in the ASEAN Region

- From 2018 to 2022, the ASEAN region collectively documented 4,102 cases of diphtheria (refer to Figures 1 and 2). Among the ASEAN Member States (AMS), the countries that reported diphtheria cases during this period include Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam. There were no reported cases in Brunei Darussalam, Cambodia, Lao PDR, and Singapore.
- In 2023, the ASEAN region reported 276 total confirmed cases and 34 total deaths in 2023 with 12.32% CFR.
- The average immunization coverage across each country attained more than 80%, although some AMS still fall below this benchmark (Figure 3). During the COVID-19 pandemic, vaccination coverage across all countries has declined. This underscores the significance of upholding and strengthening disease surveillance and immunization initiatives within the region.
- In Indonesia, recent reports of diphtheria cases have emerged in Gresik Regency, affecting residents of Suci Village, Manyar, and Sukowati Village, Bunga. A 3-year-old child from Sukowati Village in Bungah was exposed to the disease but is showing progress (Jawapos, 2023). The health office identified risk factors, including vaccine refusal history. Additionally, a 52-year-old male from Suci Village in Manyar was exposed after receiving treatment at Ibnu Sina Hospital. Diphtheria, a potentially fatal condition, can cause harm to the heart, kidneys, and brain through toxins. The health office swiftly declared an outbreak, administered antidiphtheria serum, conducted epidemiological investigations and surveillance, and initiated mass immunization to halt the virus's spread.



Country	Diphtheria Cases					
	2018	2019	2020	2021	2022	2023*
Indonesia	1026	495	259	235	540	185
Malaysia	18	16	12	5	9	0
Myanmar	127	22	169	3	31	0
Philippines	183	201	75	38	88	88
Thailand	90	70	79	0	0	0
Vietnam	13	53	237	6	2	3

*Data as of August 7, 2023

Figure 1. 2018 to 2023 Diphtheria cases in the ASEAN Region

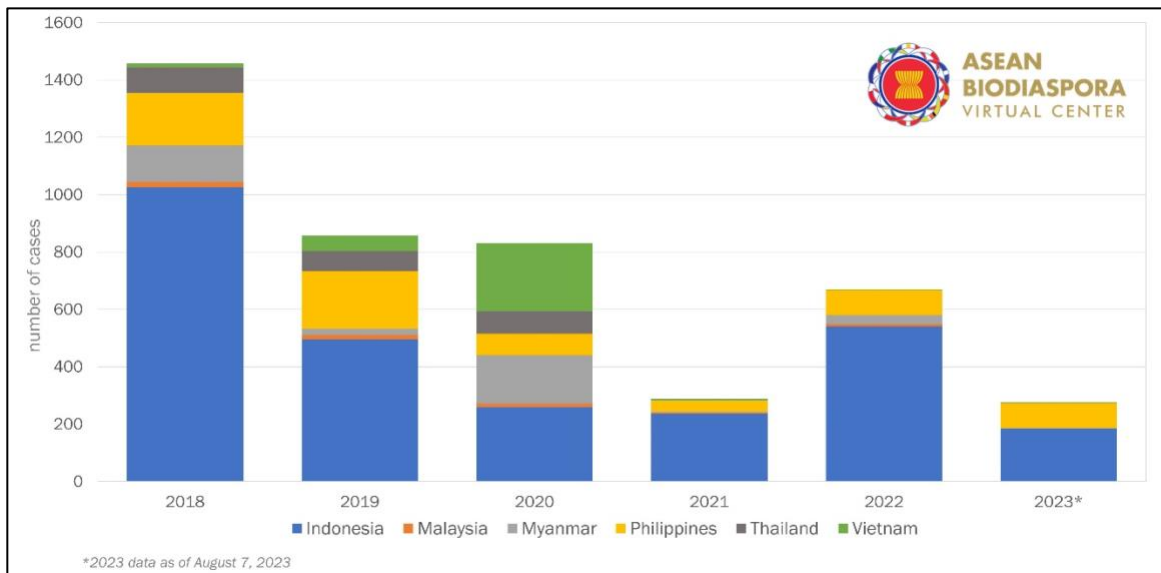


Figure 2. 2018 to 2023 Diphtheria cases in Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam

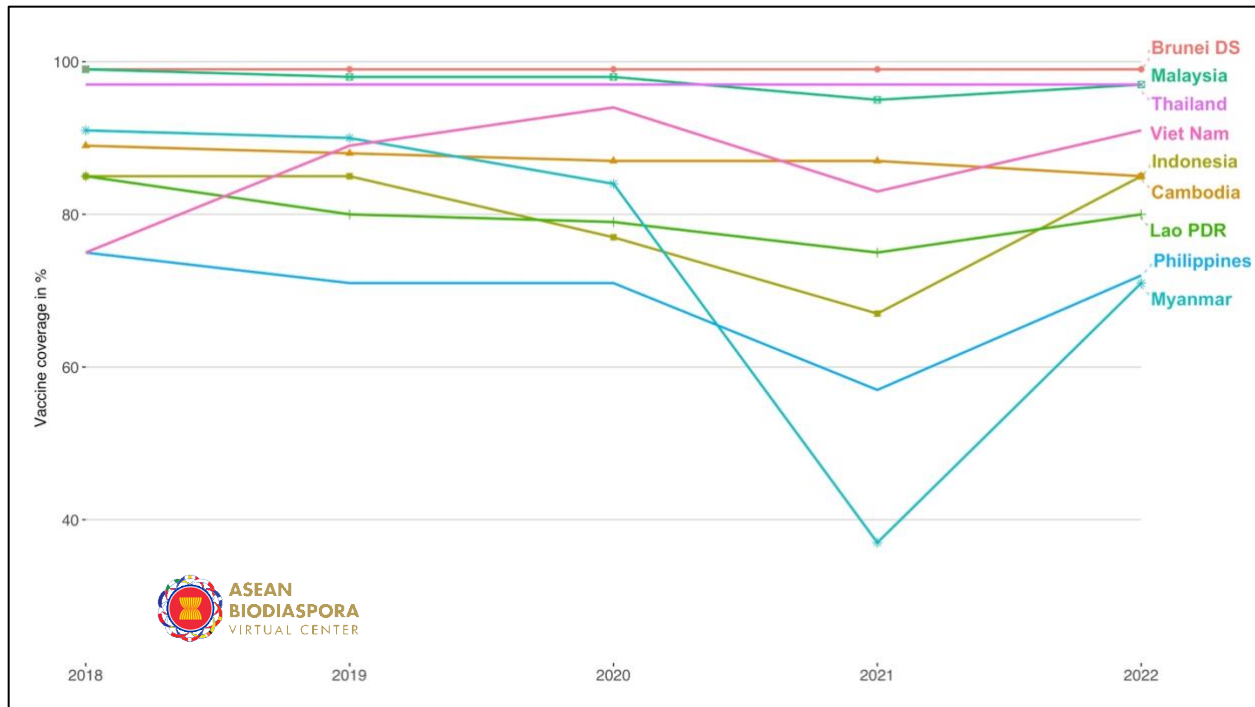


Figure 3. Diphtheria vaccine coverage in the ASEAN Region 2018-2022 (Source: WHO Global Health Observatory <https://www.who.int/data/gho>)

Outbreak Vulnerability Index

The Outbreak Vulnerability Index offers a comparative assessment of the AMS country’s susceptibility to an infectious disease outbreak. The scoring comprises multiple factors such as demographics, healthcare, public health, disease dynamics, domestic political landscape, international political landscape, and economic indicators. Elevated scores correlate with improved epidemic readiness for a location (with 1 denoting high preparedness and 0 indicating lower preparedness).

Location	Outbreak Vulnerability Index
Singapore	0.82
Brunei Darussalam	0.74
Malaysia	0.70
Thailand	0.63
Indonesia	0.62
Vietnam	0.59
Philippines	0.55
Laos	0.46
Myanmar	0.40
Cambodia	0.37

Source: Data from <https://developer-portal.bluedot.global/api>



Risk Assessment

- Based on data on diphtheria cases (2018-2022) from WHO, almost all countries in the ASEAN Region have reported cases of Diphtheria.
- Diphtheria outbreaks/cases were reported in Indonesia, the Philippines, and Vietnam in 2023.
- Diphtheria vaccination coverage in the ASEAN Region is on average above 90%. Nonetheless, outbreaks were still reported in several areas, especially in areas where diphtheria vaccination coverage was still low and in areas where the population refused the vaccination program.
- Transmission is most often person-to-person through respiratory droplets. Transmission occurs mainly in residents who refuse vaccination or in residents whose vaccination status is incomplete.
- The risk of spreading diphtheria cases between regions or countries is possible through travelers/migrants/internally displaced persons who do not have complete diphtheria vaccination status.
- Countries bordering diphtheria endemic areas from other countries have a risk of contracting diphtheria through migrating residents (*As of 31 July, Thailand is hosting 8,983 refugees from Myanmar and sheltered them in five Temporary Safety Areas, according to reports by the Royal Thai Government. According to the UN, an estimated 1,927,200 internally displaced people were reported across the country, including 1,599,200 displaced after 1 February 2021*)⁴.

Proposed Government Response

Surveillance

1. Enhanced surveillance, including molecular typing and whole genome sequencing of patient isolates. The timely collection and sharing of sequencing data combined with epidemiological information can support generating hypotheses on where transmission has occurred.²
2. Verification of the availability of laboratory diagnostics in each country, as timely laboratory confirmation of cases is vital for implementing control measures.

Prevention

1. Implementation of routine immunization program, seeking to achieve high vaccination coverage rates with the primary series of three doses of the diphtheria toxoid-containing vaccine, followed by booster doses;
2. Reaching out to the unvaccinated or partially vaccinated population with a primary immunization series and/or booster doses;



3. Provision of booster vaccination doses to the adult and elderly population. Booster doses of diphtheria should be considered when more than 10 years have passed since the previous vaccination.
4. Equal access to immunization. This applies particularly to vulnerable populations or population groups at risk of being socially marginalized.
5. Traveler vaccination is also critical. Countries should continue to advise travelers to diphtheria-endemic countries to check whether they have completed primary vaccination against diphtheria before departure, and to receive a booster dose of diphtheria toxoid if more than 10 years have passed since the last dose, in line with national recommendations.

Clinical Management

1. Isolation of all confirmed cases until the elimination of the organism is demonstrated by two negative cultures obtained at least 24 hours apart after completion of antimicrobial treatment.
2. Identification and monitoring of close contacts for 10 days; swabbing (nose and throat) of close contacts should be performed regardless of their immunization status.
3. Antimicrobial post-exposure prophylaxis and vaccination of incompletely vaccinated or unvaccinated close contacts

Travel Alert

- On May 1, 2023, the U.S. Centers for Disease Control and Prevention (CDC) issued a Level 2 Travel Health Notice regarding Diphtheria in the Philippines due to a surge in reported cases across multiple regions.³



References:

¹World Health Organization. (n.d.). *Diphtheria*. Retrieved from <https://www.who.int/news-room/questions-and-answers/item/diphtheria>

²European Centre for Disease Prevention and Control (ECDC). (2022). Increase of reported diphtheria cases among migrants in Europe due to *Corynebacterium diphtheriae*. <https://www.ecdc.europa.eu/sites/default/files/documents/diphtheria-cases-migrants-europe-corynebacterium-diphtheriae-2022.pdf>

³*Health Alert – U.S. Embassy Manila*. U.S. Embassy in the Philippines. (2023, May 2). <https://ph.usembassy.gov/health-alert-u-s-embassy-manila-03-may-2023/>

⁴United Nations High Commissioner for Refugees (2023). Myanmar Emergency - UNHCR Regional Update. <https://data.unhcr.org/en/documents/details/102067>