

Diphtheria in the Americas - Summary of the situation

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The following is the epidemiological situation for diphtheria for countries where new confirmed cases or an update has been reported since the prior PAHO/WHO Epidemiological Update on Diphtheria published on 18 June 2020³.

In **Brazil**, between epidemiological week (EW) 1 and EW 30 of 2020, 12 suspected cases of diphtheria were reported, of which 2 were confirmed and 2 remain under investigation. The first confirmed case is a 25-year-old female resident of Timóteo Municipality, Minas Gerais State. The second confirmed case is a 32-year-old female resident of Uruguaiana Municipality, Rio Grande do Sul State. Both cases were confirmed by clinical-epidemiological criteria.

In Brazil, between 2010 and 2019, 662 suspected cases of diphtheria were reported, of which 77 (12%) were confirmed, including 8 deaths (**Figure 1**). The federal units that reported the highest numbers of confirmed cases during the same period were Maranhão (28 cases) and Pernambuco (16 cases). The Northeast Region reported the highest proportion of confirmed cases (58%), followed by the Southeast (18%) and South (10%) regions.

The 77 confirmed cases of diphtheria reported between 2010 and 2019 had a median age of 10 years, 51% were male, 64% received 3 or more doses of the vaccine⁴, and 22% had an unknown vaccination status. The most frequent signs and symptoms among confirmed cases were: pseudomembrane (90%), fever (71%), and lymphadenopathy (69%). Overall, 27% of the confirmed cases developed at least one complication; the most frequent complications, either associated or not associated with diphtheria, were palatal paralysis (17%), myocarditis (4%), and bilateral and symmetric paralysis of the extremities (4%). Overall, 80% of the

¹ Following the analysis of the epidemiological situation of diphtheria in Brazil in 2020, information recently received on cases reported in Brazil between 2010 and 2019 is presented.

² Following the analysis of the epidemiological situation of diphtheria in the Dominican Republic in 2020, information on cases reported in the Dominican Republic in 2019 is presented.

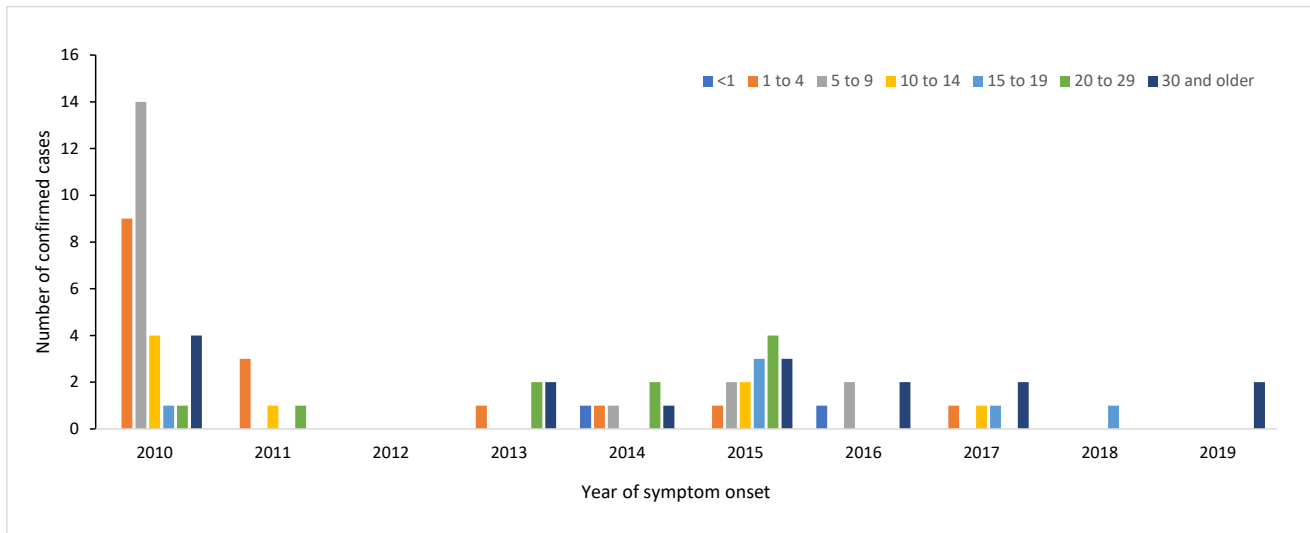
³ Pan American Health Organization / World Health Organization. Epidemiological Update: Diphtheria. 18 June 2020, Washington, D.C.: PAHO/WHO; 2020. Available at: <https://bit.ly/2EISf5E>

⁴ Completing the basic vaccination schedule recommended by the Ministry of Health.

confirmed cases required hospitalization. Regarding outcome among confirmed cases, 82% recovered without sequelae and 10% died.

Of the 77 confirmed cases, 78% had nasopharyngeal secretion samples collected, and overall, 80% were confirmed by clinical-epidemiological criteria and 20% by laboratory criteria.

Figure 1. Distribution of confirmed diphtheria cases by age group and year of symptom onset. Brazil. 2010 – 2019.



Source: Data from the Ministry of Health of Brazil and reproduced by PAHO/WHO

In the **Dominican Republic**, between 14-17 February 2020, 2 confirmed cases of diphtheria were reported, both fatal. The first case is a 9-year-old Haitian female resident of Guanito Municipal District in San Juan Municipality who had symptom onset on 12 February 2020. The case had no travel history and had received 2 vaccine doses administered in Haiti. The case died on 24 February 2020. The second case is a 14-year-old Dominican male resident of the Capotillo Sector in the National District who had symptom onset on 9 February 2020. The case had no travel history and an unknown vaccination history. The case died on 14 February 2020. Both cases were laboratory-confirmed, and *Corynebacterium diphtheriae* biotype *mitis* was isolated from both samples. No epidemiological link was identified between these cases.

In the Dominican Republic, between EW 45 and EW 46 of 2019, a cluster of 7 confirmed cases of diphtheria was reported in the Capotillo Sector in the National District, including one death. The 7 confirmed cases were of Dominican nationality, 86% were female, age range was 2 to 29 years-old, and with no history of travel and an unknown vaccination status. Of these cases, one was confirmed by laboratory and 6 by clinical-epidemiological criteria. *Corynebacterium diphtheriae* biotype *mitis* was isolated in the sample of the laboratory-confirmed case.

In **Haiti**, between EW 32 of 2014 and EW 34 of 2020, there were 1,069 suspected cases⁵ of diphtheria reported, including 132 deaths; of the total cases, 349 were confirmed (339 laboratory-confirmed and 10 by epidemiological link) (**Table 1, Figure 2**).

⁵ According to a change in the case definition per the Haiti Ministère de la Santé Publique et de la Population (MSPP), a suspected case is defined as any person, of any age, that presents with laryngitis, pharyngitis, or tonsillitis with adherent pseudo-membranes in the tonsils, pharynx and / or nasal pits, associated with edema of the neck.

Table 1. Suspected and confirmed cases of diphtheria reported in Haiti, 2014-2020 (until epidemiological week 34 of 2020)⁶.

Year	Suspected cases	Confirmed cases*	Confirmed Deaths**	Case-fatality rate** (%)
2014	18	4	2	50%
2015	77	31	7	23%
2016	118	57	23	40%
2017	194	77	5	6%
2018	375	101	14	14%
2019	195	55	12	22%
2020	92	24	5	21%
Total	1,069	349	68	20%

*Confirmed by laboratory criteria or epidemiological link

**Among confirmed cases

Source : Haiti Ministère de la Santé Publique et de la Population (MSPP)

The number of suspected cases reported between EW 1 and EW 34 of 2020 (92 cases) is lower than the number reported during the same period in both 2018 (253 cases) and 2019 (139 cases). (**Table 1**). Considering the long duration that the disease has been transmitted within the country, diphtheria is considered endemic in Haiti.

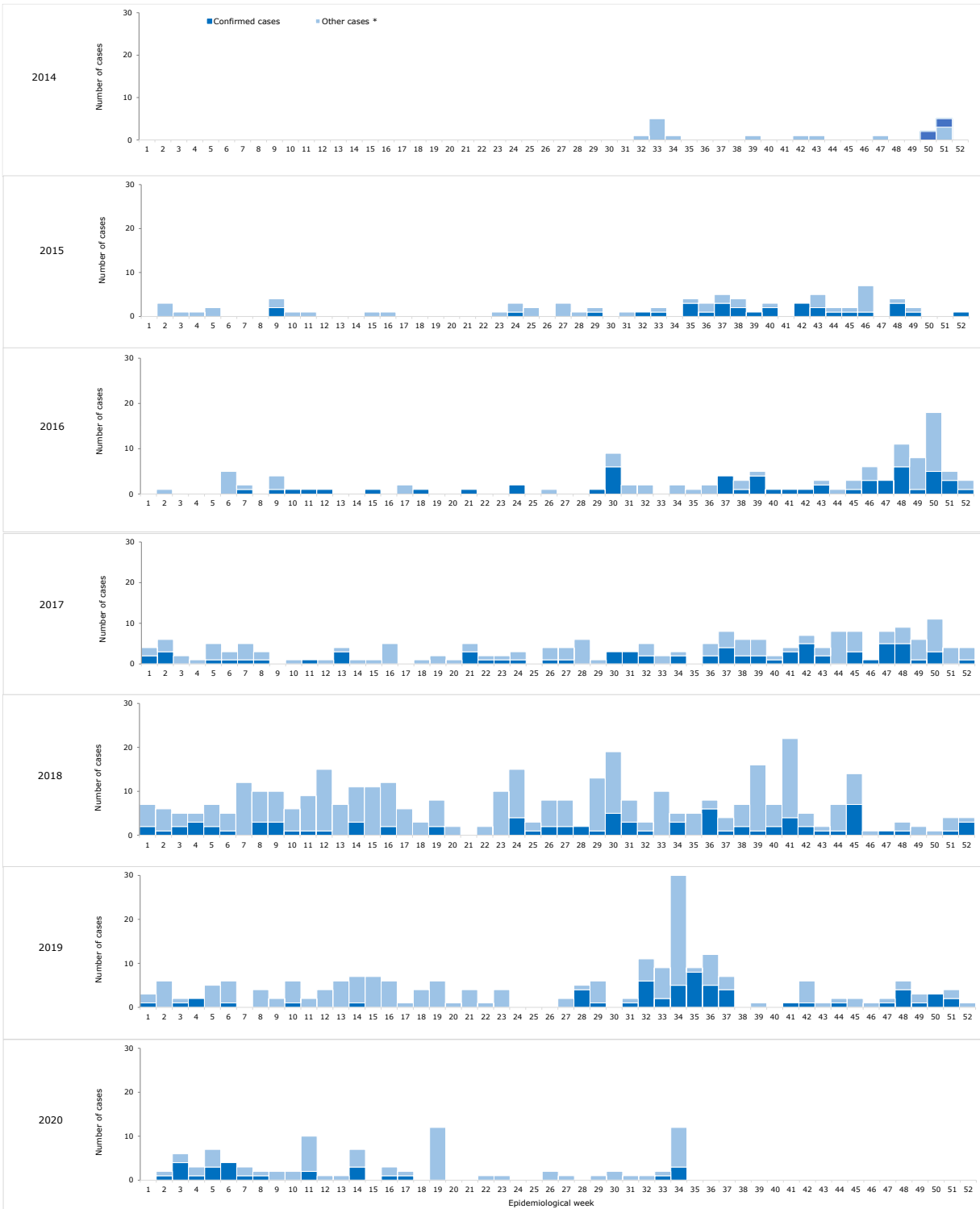
In 2020, among the 92 suspected cases, 24 cases including 5 deaths were confirmed (23 cases were laboratory-confirmed and one by epidemiological link). The case-fatality rates among cases confirmed by laboratory or epidemiological link were 23% in 2015, 40% in 2016, 6% in 2017, 14% in 2018, 22% in 2019, and 21% in 2020.

Between EW 1 and EW 34 of 2020, among the 24 confirmed cases, 62% were among 6 to 14-year-olds and 21% among 15-year-olds and older. Regarding deaths, 4 were among 6 to 14-year-olds and one was among 1 to 5-year-olds.

In 2020, the highest cumulative incidence rates of suspected cases have been reported in the communes of Mont Organisé (70 cases per 100,000 population) in the Nord Est Department; Pignon (25 cases per 100,000 population) in the Nord Department, and Thiotte (8 cases per 100,000 population) in the Sud Est Department.

⁶ Preliminary data subject to change based on retrospective investigation.

Figure 2. Distribution of reported diphtheria cases by epidemiological week (EW) of symptom onset and year. Haiti, EW 32 of 2014 to EW 34 of 2020.



*'Other cases' refers to all cases with negative laboratory results, those for which test results are pending, or those for which viable samples were not available.

Source : Haiti Ministère de la Santé Publique et de la Population (MSP). Data reproduced by PAHO/WHO.

In **Venezuela**, the diphtheria outbreak began in July 2016 and, as of EW 34 of 2020, a total of 3,114 suspected cases have been reported (324 cases in 2016, 1,040 in 2017, 1,208 in 2018, 488 in 2019, and 54 in 2020). Of the total, 1,790 have been confirmed (582 by laboratory and 1,208 by clinical criteria or epidemiological link), including 294 deaths.

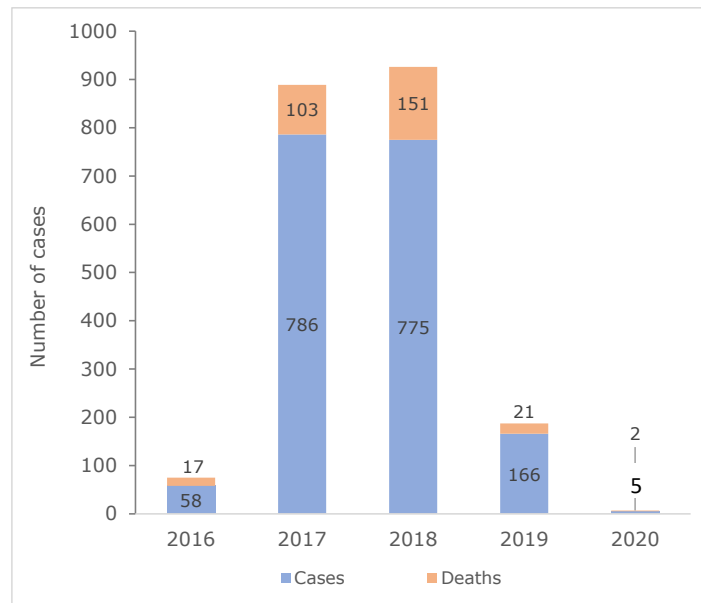
Among confirmed cases, 58 cases including 17 deaths had symptom onset in 2016, 786 cases including 103 deaths in 2017, 775 cases including 151 deaths in 2018, 166 cases including 21 deaths in 2019, and 5 cases including 2 deaths in 2020.

Since the beginning of the outbreak, a sustained increase in cases was observed until 2018, followed by a decrease in 2019; it is expected that in 2020, the number of cases will continue to decrease (**Figure 3**).

In 2019, the highest case-fatality rate was observed among 5 to 9-year-olds (33%), followed by 1-year-olds (25%) and 40 to 49-year-olds (20%).

Between EW 1 and EW 34 of 2020, 54 suspected cases were reported, of which 5 were confirmed (3 by laboratory and 2 by clinical criteria or epidemiological link) among 2 to 9-year-olds and 10 to 14-year-olds. The most recent confirmed case had symptom onset on 25 January 2020, from Bruzual Municipality, Yaracuy State.

Figure 3. Distribution of confirmed diphtheria cases and deaths by year of symptom onset. Venezuela, 2016 to 2020 (as of EW 34 of 2020).



Source: Data from the Venezuela Ministry of Popular Power for Health and reproduced by PAHO/WHO

Between EW 1 and EW 34 of 2020, confirmed cases have been reported from the states of Anzoátegui (José Gregorio Monagas Municipality), Miranda (Brión Municipality,) and Yaracuy (Bruzual Municipality).

Advice for Member States

In light of the current COVID-19 pandemic, the Pan American Health Organization/World Health Organization (PAHO/WHO) has issued guidelines for immunization programs in the context of the COVID-19 pandemic, updated on 24 April 2020, available at <https://bit.ly/2YK9SIV>, in consultation with members of the PAHO/WHO Technical Advisory Group (TAG) for vaccine preventable diseases (VPD). These guidelines are aligned with the recommendations from the WHO's Strategic Advisory Group of Experts on Immunization (SAGE).

PAHO/WHO reiterates the recommendations to Member States to continue their efforts in ensuring vaccination coverage of more than 95% with the primary series (3 doses) and booster doses (3 doses). This vaccination schedule will provide protection throughout adolescence and adulthood (up to 39 years and possibly beyond). Booster doses of the diphtheria vaccine should be given in combination with tetanus toxoid, using the same schedule and age-appropriate vaccine formulations; namely diphtheria, tetanus, and pertussis (DPT), for children aged 1 to 7 years old, and diphtheria toxoid (Td) for children over 7 years old, adolescents, and adults.

PAHO/WHO emphasizes that the most at-risk populations are unvaccinated children under 5 years of age, school-aged children, healthcare workers, military service personnel, inmate communities, and persons who, due to the nature of their occupation, are in contact with a large number of persons on a daily basis.

Although travelers do not have a special risk for diphtheria infection, it is recommended that national authorities remind travelers going to areas with diphtheria outbreaks to be properly vaccinated prior to travel in accordance with the national vaccination scheme established in each country. If more than five years have passed since their last dose, a booster dose is recommended.

PAHO/WHO recommends that Member States strengthen their surveillance systems and laboratory diagnostic capacity for cultures, ELEK tests, and polymerase chain reaction (PCR) for the diphtheria toxin (tox) gene.

PAHO/WHO recommends maintaining a supply of diphtheria antitoxin for its timely use and reduction of fatality rates.

Vaccination is key to preventing cases and outbreaks, and adequate clinical management reduces complications and mortality.

References and useful links

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