Epidemiological Update
Diphtheria

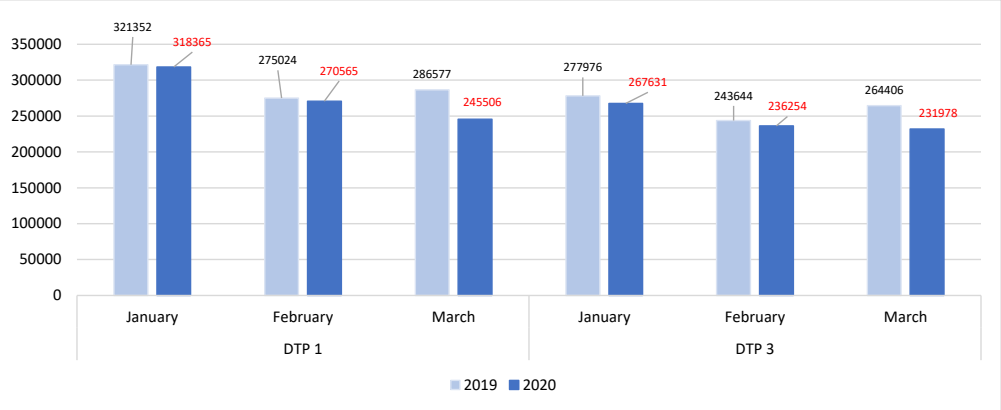
17 November 2020

Diphtheria in the Americas - Summary of the situation

In 2020, as of 11 November, 5 countries reported a total of 56 confirmed cases of diphtheria, including 16 deaths in the Region of the Americas: Brazil (2 confirmed cases), the Dominican Republic (3 confirmed cases, including 2 deaths), Haiti (42 confirmed cases, including 11 deaths), **Peru**[1] (4 confirmed cases, including one death) and the Bolivarian Republic of Venezuela (5 confirmed cases, including 2 deaths).

Various factors have contributed to the occurrence of diphtheria outbreaks in the Region of the Americas, including non-compliance with vaccination coverage. Moreover, the onset of the COVID-19 pandemic has affected vaccination, among other essential health services, with a decrease in the demand for vaccination services: coverage of the first dose of the diphtheria, tetanus and pertussis vaccine (DPT1) and the third dose of the diphtheria, tetanus and pertussis vaccine (DPT3); in addition to the postponement of vaccination campaigns (**Figure 1**).

Figure 1. Distribution of the number of DTP1 and DTP3 vaccines administered in countries/territories that responded to the PAHO/WHO Comprehensive Family Immunization Unit Surveys (N=23). Region of the Americas. January-March 2019 and January-March 2020 (as of 31 March 2020)



Source: PAHO/WHO. Summary of the Status of National Immunization Programs during the COVID-19 Pandemic, July 2020. Available at: https://bit.ly/36jiNA9

[1] Between EW 44 and EW 45 2020, 4 confirmed cases of diphtheria, including one death were reported in Peru. The last confirmed case of diphtheria in Peru was notified in 2000 in the Santa Province, Ancash region.

Suggested citation: Pan American Health Organization / World Health Organization. Epidemiological Update: Diphtheria. 17 November 2020, Washington, D.C.: PAHO/WHO; 2020

In 2019, the 3-dose diphtheria, tetanus, pertussis (DTP3) vaccination coverage of ≥95% had not been achieved in 24 countries/territories in the Region of the Americas, and 6 countries (Argentina, Bolivia, Brazil, Haiti, Paraguay, and Venezuela) had <80% coverage for DPT3.

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 22 September 2020[2].

In the **Dominican Republic**, between EW 7 and EW 45 of 2020, a total of 3 confirmed cases of diphtheria including 2 deaths, were reported. The information about the first two cases notified in 2020 was published in the Epidemiological Update of 22 September 2020[2]

The following is a description of the last confirmed case:

The case 3 corresponds to a pregnant 14-year-old Dominican female resident of National District who had symptom onset on 28 September 2020. The case had no travel history and no vaccination history.

All 3 cases were laboratory-confirmed, and *Corynebacterium diphtheriae* was isolated from all samples. The samples were sent to the international reference laboratory (Center for Disease Control and Prevention - CDC) and Elek test results are pending. No epidemiological link was identified between these cases.

The vaccination schedule in Dominican Republic includes 3 doses in children under 1 year of age, and 2 boosters, which are administered at 18 months and 4 years of age.

The country does not meet the 95% goal established in the regional immunization action plan, and 34% of the country's municipalities report coverage ≥95%.

The country has a national vaccination policy for health personnel.

In **Haiti**, between EW 32 of 2014 and EW 43 of 2020, there were 1,112 suspected cases[3] of diphtheria reported, including 73 deaths; of the total cases, 364 were confirmed (352 laboratory-confirmed and 12 by epidemiological link) (**Table 1, Figure 2**).

The number of suspected cases reported between EW 1 and EW 43 of 2020 (135 cases) is lower than the number reported during the same period in both 2018 (266 cases) and 2019 (174 cases) (**Table 1**). Considering the long duration that the disease has been transmitted within the country, diphtheria is considered endemic in Haiti.

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[2] Pan American Health Organization / World Health Organization. Epidemiological Update: Diphtheria. 22 September 2020, Washington, D.C.: PAHO/WHO; 2020. Available at: https://bit.ly/32QARiC

[3] 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.

In 2020, among the 135 suspected cases, 42 cases including 11 deaths were confirmed (39 cases were laboratory-confirmed and 3 by epidemiological link). The case-fatality rates among cases confirmed by laboratory or epidemiological link were 23% in 2015, 39% in 2016, 8% in 2017, 13% in 2018, 22% in 2019, and 26% in 2020.

Table 1. Suspected and confirmed cases of diphtheria reported in Haiti, 2014-2020 (until epidemiological week 43 of 2020)[4].

Year	Suspected cases	Confirmed cases*	Confirmed Deaths**	Case-fatality rate** (%)
2014	18	4	2	50%
2015	77	31	7	23%
2016	118	54	21	39%
2017	194	73	6	8%
2018	375	105	14	13%
2019	195	55	12	22%
2020	135	42	11	26%
Total	**1,112**	**364**	**73**	**20%**

*Confirmed by laboratory criteria or epidemiological link
**Among confirmed cases

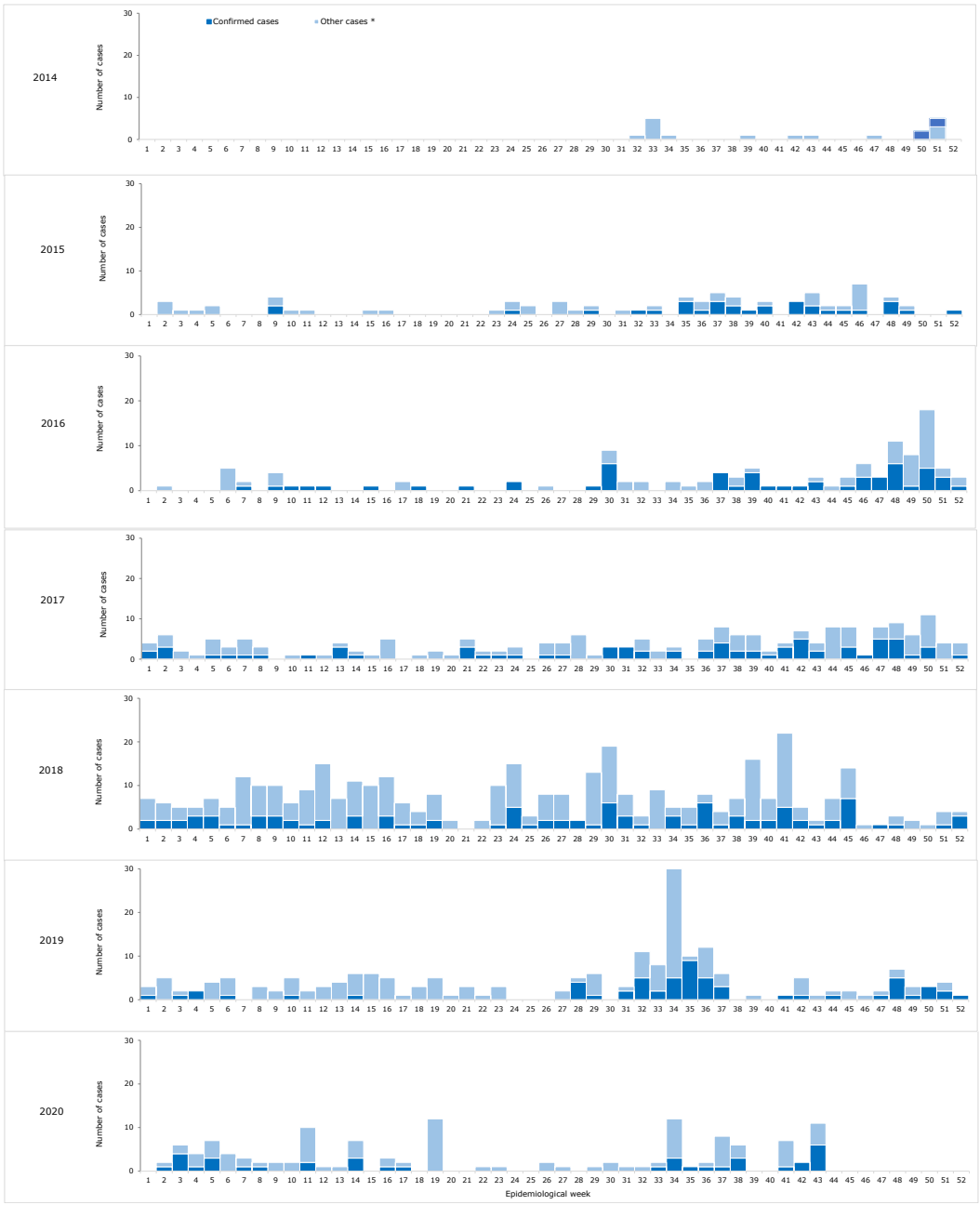
Source : Haiti Ministère de la Santé Publique et de la Population (MSPP)

Between EW 1 and EW 43 of 2020, among the 42 confirmed cases, 60% were among 6 to 14-year-olds and 19% among 15-year-olds and older. Regarding deaths, 8 were among 6 to14-year-olds and 3 were 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 (17 cases per 100,000 population) and Trou du Nord (9 cases per 100,000 population) in the Nord Est Department; and Pignon (8 cases per 100,000 population) in the Nord Department.

[4] 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 43 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 (MSPP). Data reproduced by PAHO/WHO.

The vaccination schedule in Haiti includes 3 doses in under 1-year-olds, and 1 booster, which are administered between 12 and 23 months of age.

The country does not meet the 95% goal established in the regional immunization action plan, 15% of the country's communes reported ≥95% coverage in 2019 and 34% of the municipalities reported ≥95% coverage in 2020 until September.

The country does not have a national vaccination policy for health personnel.

In **Peru**, between EW 44 and EW 45 of 2020, 16 suspected cases of diphtheria were reported, of which 4 were confirmed, including 1 death. The cases were confirmed by RT-PCR and *Corynebacterium diphteriae* was isolated from the samples. Biotype determination and Elek[5] test are still pending to complete laboratory diagnosis.

The 4 confirmed cases are found in the same family cluster, belong to an indigenous community in the eastern part of the country, and for the past year, have resided in a densely populated district of the Lima City in Peru.

Following the description of the 4 confirmed cases:

Case 1 corresponds to a 5-year-old Peruvian female, resident of La Victoria district in Lima City, who had the onset of symptoms on 21 October 2020, with no travel or vaccination history. The case died on 30 October 2020.

Case 2, mother of case 1, corresponds to a 20-year-old Peruvian female, resident of La Victoria District in Lima City, asymptomatic, with no travel or vaccination history.

Case 3, father of case 1, corresponds to a 30-year-old Peruvian male, resident of La Victoria District in Lima City, asymptomatic, with no travel or vaccination history.

Case 4, sister of case 1, corresponds to a 2-year-old Peruvian female, resident of La Victoria district in Lima City, who had the onset of symptoms on 15 October 2020, and had no travel or vaccination history.

The last confirmed case of diphtheria in Peru was reported in 2000 in the Province of Santa, Ancash Region.

The vaccination schedule in Peru includes 3 doses of pentavalent vaccine in under 1-year-olds, and 2 boosters, which are administered at 18-months and 4 years of age.

The country does not meet the 95% target established in the regional immunization action plan. 16% (4/25) of the country's regions reported coverage ≥95% and 96% (24/25) of the regions reported coverage ≥80% in 2019.

The country has a national vaccination policy for health personnel.

[5] The Elek test will be performed to confirm whether the isolates were toxigenic or non-toxigenic.

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/2YK9SlV, 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.

PAHO / WHO urges countries with ongoing diphtheria outbreaks to conduct high-quality vaccination campaigns targeting specific population groups, following the guidelines set out in the WHO Framework for decision-making: implementation of mass vaccination campaigns during COVID-19.

Vaccination of health care workers and neglected groups living in densely populated areas is also recommended.

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.

PAHO/WHO recommends carrying out training courses on the epidemiology of diphtheria, clinical picture, laboratory diagnosis, management, epidemiological investigation, and response to outbreaks.

References and useful links

1. **Dominican Republic** International Health Regulations (IHR) National Focal Point (NFP) report received by PAHO/WHO via email communication.

2. **Haiti** Ministère de la Santé Publique et de la Population (MSPP) report received by PAHO/WHO via email communication.

3. **Peru** International Health Regulations (IHR) National Focal Point (NFP) report received by PAHO/WHO via email communication.

4. Diphtheria vaccine: WHO position paper – August 2017. Available at: http://bit.ly/2CCN7UW

5. Final report of the 3rd Ad-Hoc Meeting of the Technical Advisory Group (TAG). Ad-hoc Virtual Meeting, March 19, 2018. Available at: https://bit.ly/2wsLelk

6. Pan American Health Organization/ World Health Organization. The Immunization Program in the Context of the COVID-19 Pandemic. Version 2 (24 April 2020). Available at: https://bit.ly/35lZwgQ

7. UNICEF. Immunization coverage estimates data visualization. July 2020. Available at: https://bit.ly/2SetRqa

8. UNICEF. Immunization data. July 2020. Available at: https://bit.ly/349Baop

9. WHO/UNICEF. Joint Reporting Form. Available at: https://bit.ly/2TcT8S3

10. World Health Organization. Framework for decision-making: implementation of mass vaccination campaigns in the context of COVID-19, 22 May 2020. Available at: https://bit.ly/2Zkha0K

11. Pan American Health Organization/ World Health Organization. Immunization throughout the Life Course at the Primary Care Level in the Context of the COVID-19 Pandemic. Available at: https://bit.ly/3m50K6i

12. Pan American Health Organization/ World Health Organization. Summary of the Status of National Immunization Programs during the COVID-19 Pandemic, July 2020. Available at: https://bit.ly/2GHpO2V

13. World Health Organization. Framework for decision-making: implementation of mass vaccination campaigns in the context of COVID-19, 22 May 2020. Available at: https://bit.ly/2ZkhaOK

14. Pan American Health Organization/ World Health Organization. Summary of the Status of National Immunization Programs during the COVID-19 Pandemic, July 2020. Available at: https://bit.ly/32QJv0y