Epidemiological Update
Measles

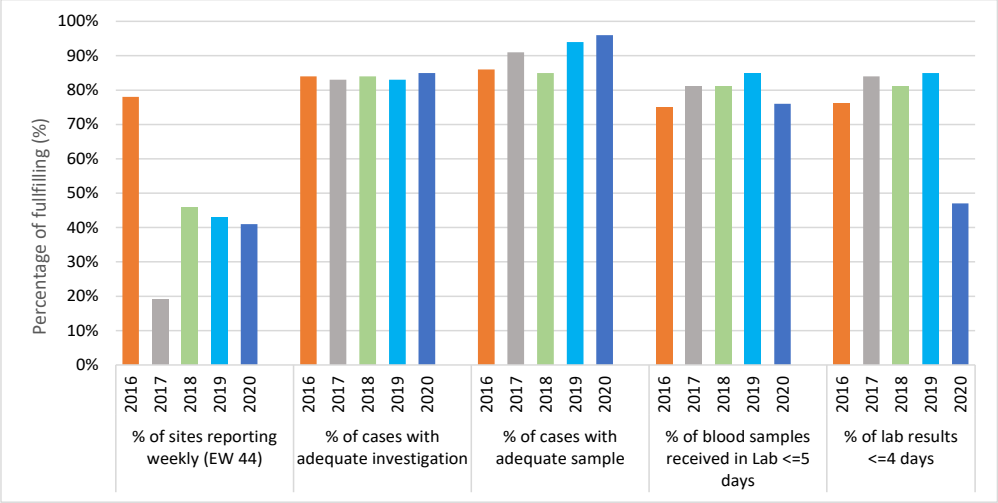
16 November 2020

Situation Summary

In 2020, between epidemiological week (EW)1 and EW 41, 9 countries in the Region of the Americas have reported a total of 8,479 confirmed cases of measles, including 8 deaths: Argentina (61 cases including 1 death), Bolivia (2 cases), Brazil (8,202 cases including 7 deaths), Canada (1 case), Chile (2 cases), Colombia (1 case), Mexico (196 cases), the United States of America (12 cases), and Uruguay (2 cases). Currently, only Brazil is reporting active outbreaks of measles, however, this event constitutes a hazard for other countries and territories in the Region of the Americas.

Several factors have contributed to the outbreaks of measles in the Americas occurring between 2018 and 2020, including lack of compliance with 2-dose measles vaccination coverage and now influenced by the COVID-19 pandemic. During 2018-2020, 3 of the 6 international indicators for integrated measles/rubella surveillance were met: 1) Notification rate of suspected cases per 100,000 population; 2) the percentage of cases with adequate blood samples; and 3) the percentage of cases with adequate investigations. However, 3 indicators related to the percentage of sites reporting weekly, percentage of blood samples received by the laboratory in ≤5 days, and the percentage of laboratory results in ≤4 days, have not been met (**Figure 1**). Therefore, considering these gaps among the indicators, the low vaccination coverage in many countries, and the wide circulation of viruses in other Regions, the occurrence of new outbreaks of VPDs of varying magnitude in the Americas cannot be ruled out.

Figure 1. Distribution of 5 of the 6 international indicators of integrated measles/rubella surveillance. Region of the Americas, 2016 to 2020 (as of EW 44)



Source: PAHO/WHO Weekly bulletin. Measles, Rubella, and Congenital Rubella Syndrome. Available at: https://bit.ly/3enCUho

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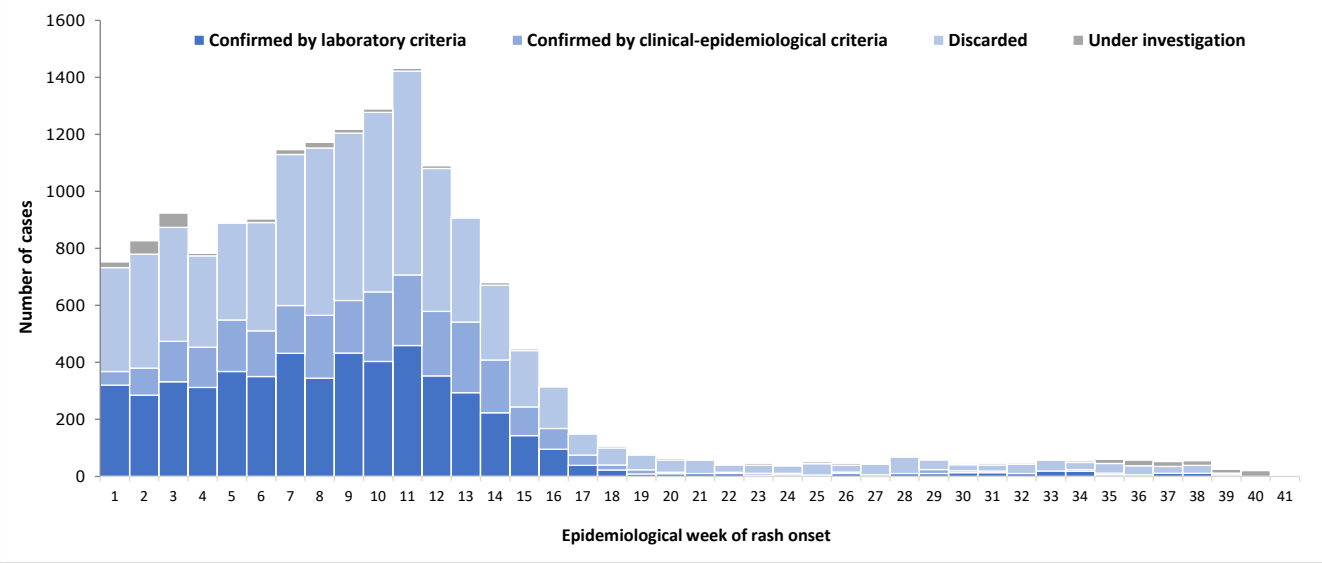
In 2019, measles, the first mumps, rubella vaccine (MMR1) dose coverage of ≥95% had not been achieved in 22 countries/territories in the Region of the Americas, and 4 countries (Bolivia, Haiti, Mexico, and Paraguay) had <80% of coverage. For MMR2, vaccination coverage of ≥95% had not been achieved in 29 countries/territories in the Region of the Americas, and 14 countries/territories (Anguilla, Barbados, Bolivia, Brazil, British Virgin Islands, Dominican Republic, Ecuador, Guatemala, Haiti, Mexico, Peru, Saint Lucia, Suriname, and Venezuela) had <80% coverage.

The following is a summary of the epidemiological situation of measles for Brazil and Mexico—countries that have reported confirmed measles cases since the last PAHO/WHO Epidemiological Update on Measles published on 27 May 2020[1].

In **Brazil**, between EW 1 and EW 41 of 2020, a total of 16,169 suspected cases have been reported, of which 8,202 (51%) were confirmed, including 7 deaths, 7,536 were discarded, and 431 remain under investigation. The predominant genotype and lineage in 2020 continue to be D8, lineage MVs/Gir Somnath.IND/42.16/, which was also circulating in 2019.

Between EW 1 and EW 41 of 2020, there have been an average of 404 cases per epidemiological week. Since EW 11, there has been a progressive decline in the number of reported suspected cases that coincides with the onset of the COVID-19 pandemic and the prioritization of public health actions in that context (**Figure 2**).

Figure 2. Reported cases of measles by epidemiological week (EW) of rash onset. Brazil. EW 1 to EW 41 of 2020.



Source: Data provided by the Brazil International Health Regulations National Focal Point and reproduced by PAHO/WHO.

Among the 8,202 confirmed cases, 4,505 (55%) were unvaccinated, 1,573 (19%) were vaccinated. For 2,106 cases (26%), no information regarding vaccination status was available.

[1] PAHO/WHO Epidemiological Update: Measles. 17 April 2020, Washington, D.C.: PAHO/WHO; 2020, Available at: https://bit.ly/3enCUho

In 2020, the federal units with the highest cumulative incidence rates of confirmed measles cases in Brazil are: Pará (94 cases per 100,000 population), Maranhão (32 cases per 100,000 population), Ceará (19 cases per 100,000 population), and Amapá (18 cases per 100,000 population).

The 4 federal units with ongoing outbreaks[2] in 2020 are: Pará with 5,287 confirmed cases including 5 deaths, Rio de Janeiro with 1,333 confirmed cases including 1 death, São Paulo with 822 confirmed cases including 1 death, and Amapá with 107 confirmed cases

Between EW 26 of 2019 and EW 41 of 2020, the genotype identified in the federal units with active outbreaks has been D8, lineage MVs/Gir Somnath.IND/42.16/.

The following is a summary of the epidemiological situation of federal units with ongoing outbreaks:

In *Pará State*, between EW 1 and EW 41 of 2020, a total of 8,078 suspected cases of measles were reported, of which 5,287 were confirmed (including 5 deaths, 4 among 1-year-olds or under and one adult), 2,775 were discarded, and 16 remain under investigation. The highest incidence rates by age group are among 1-year-olds and under (737 cases per 100,000 population), followed by 15 to 19-year-olds (182 cases per 100,000 population) and 20 to 29-year-olds (146 cases per 100,000 population). Among the confirmed cases, 3,638 (69%) were unvaccinated, 670 (13%) were vaccinated (information regarding the number of doses per person was unavailable). For 979 cases (18%), no information regarding vaccination status was available.

In *Rio de Janeiro State*, between EW 1 and EW 41 of 2020, a total of 2,783 suspected cases of measles were reported, of which 1,333 were confirmed (including 1 death, in a 8 month-old child), 1,388 were discarded, and 62 remain under investigation. The highest incidence rates by age group are among 1 to 4-year-olds (150 cases per 100,000 population), followed by 1-year-olds and under (126 cases per 100,000 population), and 50 to 59-year-olds (3 cases per 100,000 population). Among the confirmed cases, 497 (37%) were unvaccinated, 500 (38%) were vaccinated (information regarding the number of doses per person was unavailable). For 336 cases (25%), no information regarding vaccination status was available.

In *São Paulo State*, between EW 1 and EW 41 of 2020, a total of 2,704 suspected cases of measles were reported, of which 822 were confirmed (including 1 death, in a 1 year-old child), 1,767 were discarded, and 115 remain under investigation. The highest incidence rates by age group are among 1-year-olds and under (43 cases per 100,000 population), followed by 1 to 4-year-olds (7 cases per 100,000 population), and 15 to 19-year-olds (5 cases per 100,000 population). Among the confirmed cases, 284 (34%) were unvaccinated, 378 (46%) were vaccinated (information regarding the number of doses per person was unavailable). For 160 cases (20%), no information regarding vaccination status was available.

In *Amapá State*, between EW 1 and EW 41 of 2020, a total of 255 suspected cases of measles were reported, of which 107 were confirmed, 117 were discarded, and 31 remain under investigation. The highest incidence rates by age group are among 1-year-olds and under (252 cases per 100,000 population), followed by 1 to 4-year-olds (62 cases per 100,000 population), and 5 to 9-year-olds (22 cases per 100,000 population). Among the confirmed cases, 65 (61%) were unvaccinated, 6 (6%) were vaccinated (information regarding the number of doses per person was unavailable). For 36 cases (34%), no information regarding vaccination status was available.

[2] Federal units that have reported confirmed cases in the last 90 days.

In **Mexico**, between EW 7 and EW 45 of 2020, a total of 2,182 probable[3] measles cases have been reported, of which 196 were confirmed, 1,878 were discarded, and 108 remain under investigation.

Of the 196 confirmed cases, 144 were reported in Mexico City, 49 in Mexico State, 2 in Campeche State and one in Tabasco State. The following is a summary of the epidemiological situation in each locale.

In *Mexico City*, a total of 520 probable cases were reported, of which 144 were laboratory-confirmed (137 by laboratory and 7 by clinical epidemiological criteria) and 5 remain under investigation. Confirmed cases have been reported in 14 out of the 16 town halls: Gustavo A. Madero (82 cases), Miguel Hidalgo (17 cases), Iztapalapa (10 cases), Cuajimalpa de Morelos (8 cases), Alvaro Obregon (7 cases), Xochimilco (4 cases), Coyoacán (3 cases), Cuauhtémoc (3 cases), Venustiano Carranza (3 cases), Tlahuac (2 cases), Tlalpan (2 cases), Azcapotzalco (1 case), Milpa Alta (1 case), and Iztacalco (1 case). Of the 144 confirmed cases in Mexico City, all are Mexican citizens and 61% are male. The highest proportion of confirmed cases by age group is among 20 to 29-year-olds (28%), followed by 2 to 9-year-olds (17%), 30 to 39-year-olds (15%), 40-year-olds and older (12%), under 1-year-olds (10%), 1-year-olds (9%), and 10 to 19-year-olds (9%). Of the confirmed cases in Mexico City, 26 (18%) have a proven history of vaccination. The most recent confirmed case had rash onset on 1 May 2020 and was reported in the Iztapalapa Town hall.

In *Mexico State*, a total of 224 probable cases were reported, of which 49 were laboratory-confirmed (47 by laboratory and 2 by clinical-epidemiological criteria) and 10 remain under investigation. Confirmed cases were reported in 13 municipalities of Mexico State: Ecatepec de Morelos (13 cases), Tlalnepantla de Baz (13 cases), Nezahualcóyotl (5 cases), Cuautitlán (5 cases). Tecámac (3 cases), Chalco (2 casos), Toluca (2 cases), Atizapán de Zaragoza (1 case), Chimalhuacán (1 case), Zinacantepec (1 case), Naucalpan (1 case), Zumpango (1 case), and Huehuetoca (1 case). Of the 49 confirmed cases, all are Mexican citizens and 50% are male. The highest proportion of confirmed cases by age group is among 2 to 9-year-olds (25%) followed by 1-year-olds (19%), under 1-year-olds (12%), 10 to 19-year-olds (12%), 20 to 29-year-olds (12%),30 to 39-year-olds (10%), and 40-year-olds and older (8%). Of the confirmed cases, 21% have a proven history of vaccination. The most recent confirmed case in the State of Mexico had rash onset on 31 May 2020 and was reported in Nezahualcóyotl Municipality.

In *Campeche State*, a total of 10 probable cases were reported, of which 2 were confirmed and no cases remain under investigation. The cases were reported in the last PAHO/WHO Epidemiological Update on Measles published on 17 April 2020[4] and 27 May 2020[5].

In *Tabasco State*, a total of 41 probable cases were reported, of which one was confirmed and 4 remain under investigation. The case is an 11-year-old male resident of Balancán Municipality, with vaccination history and no travel history. Rash onset was on 29 June 2020.

[3] Mexico probable measles/rubella case definition: Any person of any age with fever and maculopapular rash, and one or more of the following signs or symptoms: cough, coryza, conjunctivitis, or adenomegaly (retroauricular, occipital, or cervical). Available at: https://bit.ly/2VgsoBN

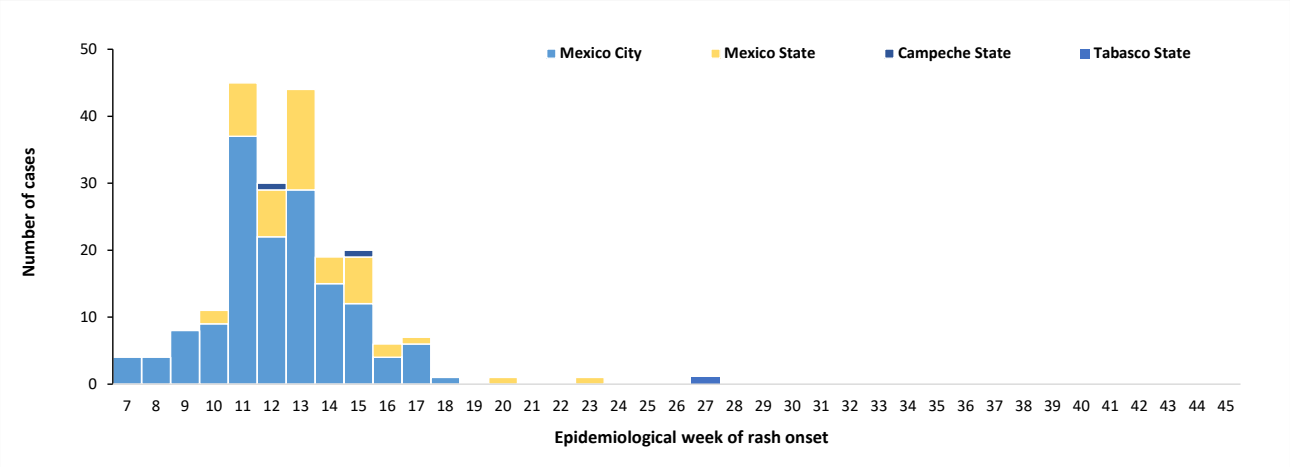
[4] PAHO/WHO Epidemiological Update: Measles. 17 April 2020, Washington, D.C.: PAHO/WHO; 2020, Available at: https://bit.ly/2XztfgZ

[5] PAHO/WHO Epidemiological Update: Measles. 27 May 2020, Washington, D.C.: PAHO/WHO; 2020, Available at: https://bit.ly/3kwyDLf

In Mexico, the ages of the confirmed measles cases range from 3 months to 67 years old, and 58% of the cases were males. Rash onset dates of the confirmed cases in Mexico were between 12 February and 29 June 2020 (**Figure 3**).

Analyses conducted by the National Reference Laboratory (InDRE) have identified genotype D8, lineage Mvs/GirSomnath.IND/42.16/, for 83 of the confirmed cases.

Figure 3. Confirmed measles cases by epidemiological week (EW) of rash onset. Mexico. EW 7 to EW 45 of 2020.



Source: Data published by the Mexico Department of Health and reproduced by PAHO/WHO.

Advice to national authorities

On 27 September 2016, the Region of the Americas was the first in the world to be declared measles-free, as a 22-year effort, which involved extensive administration of the measles, mumps, and rubella vaccine in the continent. The elimination of measles and rubella in the Region of the Americas has been a very important milestone, for which PAHO / WHO urges Member States to follow the recommendations of the XXV Meeting of the Technical Advisory Group (TAG) on Preventable Diseases 2019 Vaccination, which are subject to adjustments in the context of the COVID-19 pandemic, with the objective of reverifying the elimination of measles and rubella in the Region of the Americas.

In light of the current COVID-19 pandemic, the Pan American Health Organization/World Health Organization PAHO/WHO has issued guiding principles for immunization activities during the COVID-19 pandemic, 26 March of 2020, available at https://bit.ly/2VALMsi with the support of the in consultation with the members of the PAHO/WHO Technical Advisory Group (TAG) for vaccine-preventable diseases (VPD), and aligned with the recommendations of the WHO's Strategic Advisory Group of Experts on Immunization (SAGE).

Among the recommendations for countries with measles outbreaks, the following are highlighted:

Vaccination

- Involve the National Immunizations Technical Advisory Group (NITAG) in decision-making on the continuity of vaccination services.

- In health care facilities where vaccination activities are carried out, it is essential that health care workers are alert to signs and symptoms of respiratory diseases and offer patients with flu-like symptoms a surgical mask and refer them for medical evaluation, in accordance with local protocols for initial triage of suspected COVID-19 patients.
- Although there are currently no known medical contraindications to vaccination of a person who has had contact with a case of COVID-19, it is recommended to defer vaccination until quarantine has been completed (14 days after the last exposure).
- Under circumstances of a VPD outbreak, the decision to conduct outbreak response mass vaccination campaigns will require a risk-benefit assessment on a case by case basis and must factor in the health system's capacity to effectively conduct a safe and high-quality mass campaign in the context of the COVID-19 pandemic. The assessment should evaluate the risks of a delayed response against the risks associated with an immediate response, both in terms of morbidity and mortality for the VPD and the potential impact of further transmission of the COVID-19 virus.
- If an outbreak of a vaccine preventable disease (VDP) occurs, the risk-benefit of carrying out an outbreak-response vaccination campaign should be assessed taking into account the health system's capacity to effectively conduct a safe and high-quality mass campaign in the context of the COVID-19 pandemic. The assessment should evaluate the risks of a delayed response against the risks associated with an immediate response, both in terms of morbidity and mortality for the VPD and the potential impact of further transmission of the COVID-19 virus. Should an outbreak response vaccination campaign be pursued, stringent measures are required to uphold standard and COVID-19 infection prevention and control, adequately handle injection waste, protect health workers and safeguard the public. Should an outbreak response vaccination campaign be delayed, a periodic assessment based on local VPD morbidity and mortality, will be required to evaluate risk of further delay.
- Immunization services should be resumed when the risk of transmission of SARS-CoV-2 has been reduced and the capacity of the health system has recovered sufficiently to resume these activities. It is likely that some level of SARS-CoV-2 transmission will still be in progress when services resume. Stricter infection prevention and control measures and social distancing practices are likely to still be needed in the early stages of resuming the vaccination service. NITAG should advise the country on how to resume service and which populations should be prioritized.
- Vaccinate at-risk populations residing in areas where the measles virus is circulating that do not have proof of vaccination or immunity against measles and rubella, such as health personnel, people working in essential services companies, hotels and tourism, institutions with a captive population and transportation (hospitals, airports, jails, hostels, border municipalities, urban mass transportation and others), as well as international travelers.
- Vaccinate at-risk populations (without proof of vaccination or immunity against measles and rubella), such as healthcare workers, persons working in tourism and transportation (hotels, airports, border crossings, mass urban transportation, and others), and international travelers.
- Maintain a vaccine stock of the measles-rubella (MR) and/or MMR vaccine and syringes/supplies for prevention and control actions of imported cases.

Epidemiological surveillance

- Surveillance systems must continue to carry out early detection and the management of VPD cases, at a minimum for diseases with global surveillance mandates and elimination objectives such as measles and rubella, among others.
- During an outbreak and when it is not possible to confirm the suspected cases by laboratory, classifications of a confirmed case may be based on clinical criteria (fever, maculopapular rash with at least one of the following signs and symptoms: cough, coryza and conjunctivitis) and epidemiological link, in order to not delay the response actions. This is particularly important in scenarios with arbovirus circulation such as dengue, Zika, and Chikungunya.
- Routine surveillance for other VPD should continue as long as possible; when laboratory testing is not possible, samples should be stored appropriately for confirmation when laboratory capacity permits testing. Countries should ensure sufficient sample storage capacity at the provincial and central levels and this should be monitored regularly.
- Strengthen epidemiological surveillance in border areas to rapidly detect and respond to highly suspected cases of measles.

Rapid response

- Provide a rapid response to imported measles cases to avoid the re-establishment of endemic transmission, through the activation of rapid response teams trained for this purpose, and by implementing national rapid response protocols when there are imported cases. Once a rapid response team has been activated, continued coordination between the national and local levels must be ensured, with permanent and fluid communication channels between all levels (national, sub-national, and local).
- During outbreaks, establish adequate hospital case management to avoid nosocomial transmission, with appropriate referral of patients to isolation rooms (for any level of care) and avoiding contact with other patients in waiting rooms and/or other hospital rooms.

Additionally, PAHO/WHO recommends that Member States advise all travelers aged 6 months[6] and older who cannot show proof of vaccination or immunity to **receive the measles and rubella vaccine**, preferably the triple viral vaccine (MMR), **at least two weeks prior traveling to areas where measles transmission has been documented.** PAHO/WHO recommendations regarding advice for travelers are available in the 27 October 2017 PAHO/WHO Epidemiological Update on Measles[7].

Sources of information

1. **Brazil** International Health Regulations (IHR) National Focal Point (NFP) report received by PAHO/WHO via email.
2. **Mexico** International Health Regulations (IHR) National Focal Point (NFP) report received by PAHO/WHO via email.
3. PAHO/WHO. Measles, Rubella, and Congenital Rubella Syndrome Surveillance in the Americas, Weekly Bulletin. Vol. 26, No. 18. Available at: https://bit.ly/2B8O1MU

[6] The dose of the MMR or MR vaccine given to children aged 6 to 11 months does not replace the first dose of the recommended schedule at 12 months of age.

[7] Information available in the Epidemiological Update on Measles of 27 October 2017, Washington, D.C. PAHO/WHO. 2017. Available at: https://bit.ly/2I3gCSi

4. PAHO/WHO. The Immunization Program in the Context of the COVID-19 Pandemic. 26 March 2020. Available at: https://bit.ly/2VALMsi (in English), https://bit.ly/2XKtkAe (in Spanish) and https://bit.ly/2xCi1iM (in Portuguese)

5. WHO. Guiding principles for immunization activities during the COVID-19 pandemic. Interim guidance. 26 March 2020. Available at: https://bit.ly/34sfun8

6. WHO. COVID-19: Operational guidance for maintaining essential health services during an outbreak. Interim guidance. 25 March 2020. Available at: https://bit.ly/2xaOa0P

7. WHO: Framework for decision-making: implementation of mass vaccination campaigns in the context of COVID-19, 22 May 2020. Available at: https://bit.ly/35u5w79

8. PAHO/WHO. Immunization throughout the Life Course at the Primary Care Level in the Context of the COVID-19 Pandemic. 17 June 2020. Available at: https://bit.ly/3ltMy60

9. PAHO/WHO. Summary of the Status of National Immunization Programs during the COVID-19 Pandemic, July 2020. Available at: https://bit.ly/3eW2Kug

Related link:

- PAHO/WHO – Vaccine-Preventable Diseases. Available at: https://bit.ly/2Ksx97m