

Due to a decline in vaccination coverage for the first and second doses of the measles, mumps, rubella vaccine (MMR1 and MMR2) and the occurrence of measles cases in the Region, the Pan American Health Organization / World Health Organization Health (PAHO/WHO) urges Member States to update their response plans for potential outbreaks and reiterates that vaccination and epidemiological surveillance of vaccine-preventable diseases are essential healthcare services that should not be interrupted.

Summary of the situation

After the WHO Region of the Americas was declared measles-free in 2016, a steady increase in imported measles cases from other WHO Regions and between countries within the Region of the Americas was observed between 2017-2019. The highest regional incidence rate was reported in 2019, with 21.5 cases per million population. The increase in cases was related to measles outbreaks reported in Brazil and the Bolivarian Republic of Venezuela, which contributed to 93% of the cases reported during that period. The rash onset date of the last confirmed case of measles in the Bolivarian Republic of Venezuela was 11 August 2019 (1), while in Brazil it was 5 June 2022¹.

In 2020, the number of confirmed measles cases decreased by 2.7 times compared to 2019, with outbreaks reported in Argentina and Mexico. Between 2020 and 2022, endemic circulation of the measles virus continued in Brazil (1). Additionally, between 2021 and 2022, confirmed cases of measles were reported in Argentina, Canada, Ecuador, French Guiana, and the United States of America (2); the cases reported in French Guiana had a history of travel to Brazil.

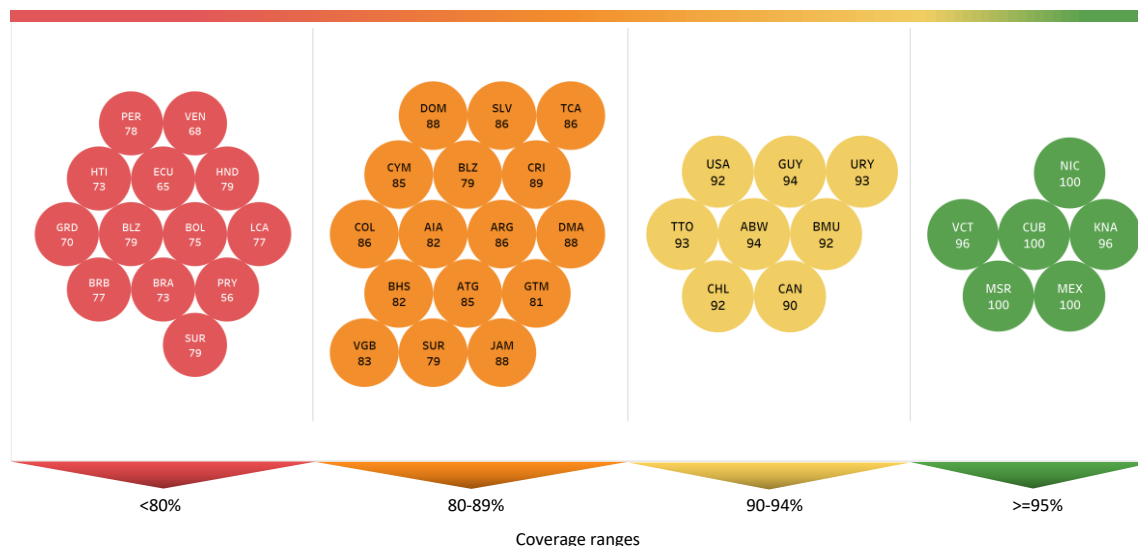
The genotypes identified between 2018 to 2022 were D8 and B3 among 100% of the confirmed cases in which genetic sequencing was performed (1); between 2018 and 2020, the proportion of the D8 genotype was higher, with an average of 94%, compared to B3 (average of 6%). However, the proportion of the B3 genotype increased in 2021 (20.5%) and 2022 (89.5%) among the samples for which genetic sequencing was performed.

According to the PAHO/WHO Technical Advisory Group (TAG) on vaccine-preventable diseases, the risk of vaccine-preventable disease outbreaks in the WHO Region of the Americas is at its highest point in the last 30 years. The reported Expanded Programme on Immunization (EPI) vaccination coverage rates continue to decline worldwide. According to the national immunization coverage estimates reported by WHO and the United Nations Children's Fund (UNICEF) for 2021 (WUENIC), more than 2.7 million children under 1 year of age in the WHO Region of the Americas do not have a complete vaccination schedule, meaning that 19.7% of eligible children are susceptible to vaccine-preventable diseases (3).

¹ Report of the International Health Regulations (IHR) National Focal Point (NFP) of Brazil, received by PAHO/WHO by email.

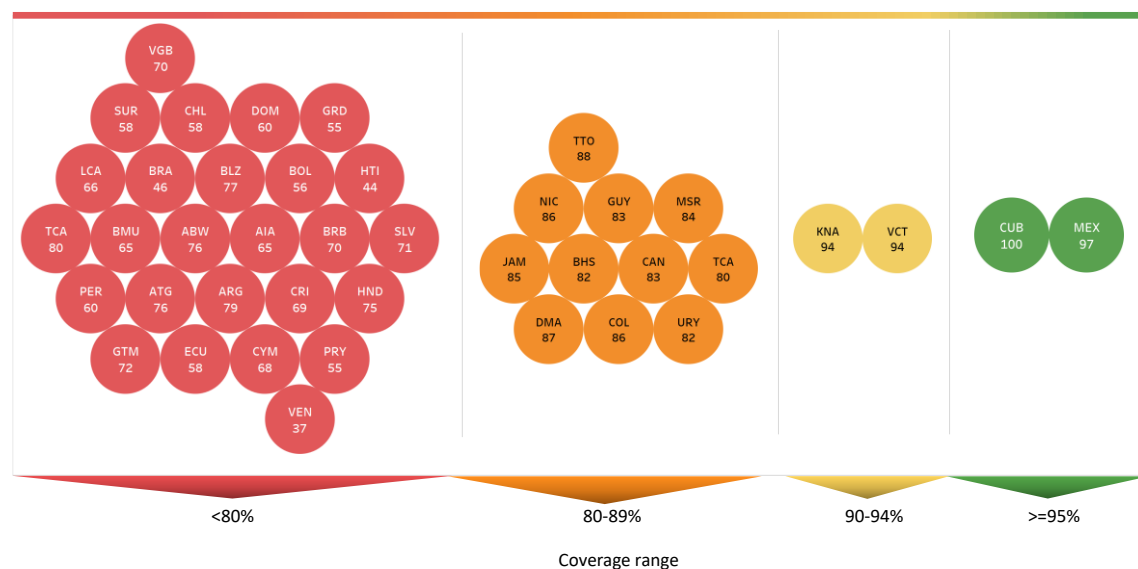
In addition to the low vaccination coverage (**Figures 1-4**), there are gaps in the performance of international indicators for integrated measles and rubella surveillance (**Figure 5**). This, along with wide circulation of the virus in other WHO Regions as well as the re-opening of borders (closed due to the COVID-19 pandemic) for productivity reasons, the occurrence of new outbreaks of measles of varying magnitude in the WHO Region of the Americas cannot be ruled out (2).

Figure 1. Distribution of countries according to the range in vaccination coverage for the *first dose* of the measles, mumps, rubella vaccine (MMR1), Region of the Americas, 2021².



Source: Country report on the WHO/UNICEF Joint Electronic Immunization Reporting Form (eJRF), 2022. MMR-Measles-Rubella-Mumps

Figure 2. Distribution of countries according to the range in vaccination coverage for the *second dose* of the measles, mumps, rubella vaccine (MMR2), Region of the Americas, 2021¹.

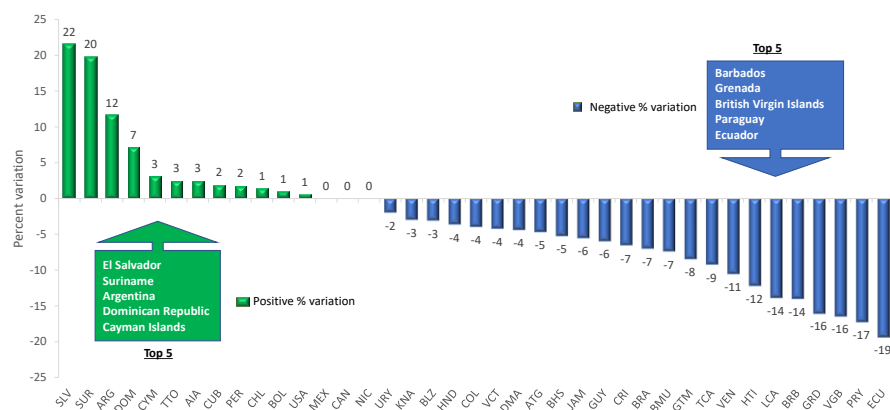


Source: Country report on the WHO/UNICEF Joint Electronic Immunization Reporting Form (eJRF), 2022. MMR-Measles-Rubella-Mumps

² ARG: Argentina; ATG: Antigua and Barbuda; ABW: Aruba; AIA: Anguilla; BHS: Bahamas; BOL: Bolivia; BLZ: Belize; BRA: Brazil; BRB: Barbados; BMU: Bermuda; CAN: Canada; CHL: Chile; COL: Colombia; CRI: Costa Rica; CUB: Cuba; CYM: Cayman Islands; DMA: Dominica; DOM: Dominican Republic; ECU: Ecuador; GTM: Guatemala; GRD: Grenada; GUY: Guyana; HTI: Haiti; HND: Honduras; JAM: Jamaican; KNA: Saint Kitts and Nevis; LCA: Saint Lucia; MEX: Mexico; MSR: Montserrat; NIC: Nicaragua; PRY: Paraguay; PER: Peru; SLV: El Salvador; SUR: Suriname; TCA: Turks and Caicos Islands; TTO: Trinidad and Tobago; URY: Uruguay; VEN: Bolivarian Republic of Venezuela; BVI: British Virgin Islands; VCT: Saint Vincent and the Grenadines.

Vaccination coverage with the first dose of the measles, mumps, rubella vaccine (MMR1) declined between 2020 and 2021 in 16 countries and territories of the WHO Region of the Americas. The largest declines were observed in 5 countries/territories: Barbados, Grenada, British Virgin Islands, Paraguay, and Ecuador, respectively (Figure 3). In 2021, an MMR1 vaccination coverage of greater than or equal to 95% was not achieved in 28 countries/territories in the WHO Region of the Americas, including 11 countries (Barbados, Belize, Bolivia, Brazil, Ecuador, Haiti, Paraguay, Peru, Saint Lucia, Suriname, and Venezuela) with MMR1 vaccination coverage less than 80% (2).

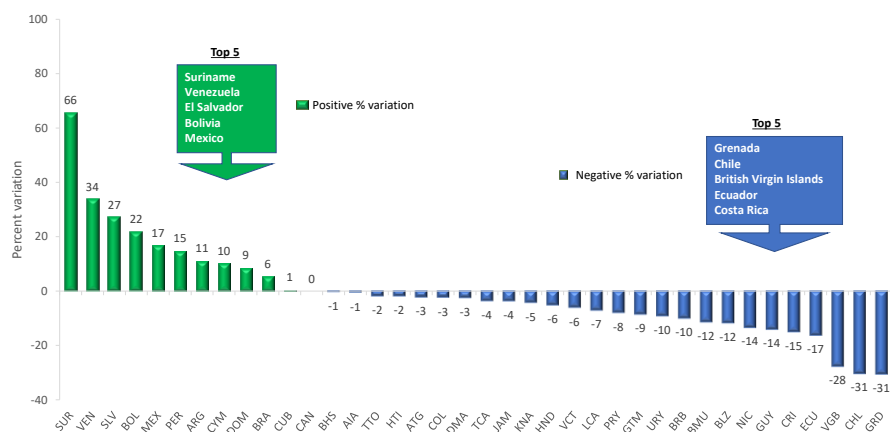
Figure 3. Difference (in %) in the vaccination coverage for the first dose of the measles, mumps, rubella vaccine (MMR1) administered in the Region of the Americas, by country/territory, 2020-2021.



Source: PAHO/WHO, Weekly Bulletin - Measles-Rubella-Congenital Rubella Syndrome. Available at: <https://bit.ly/3DRUyZM>

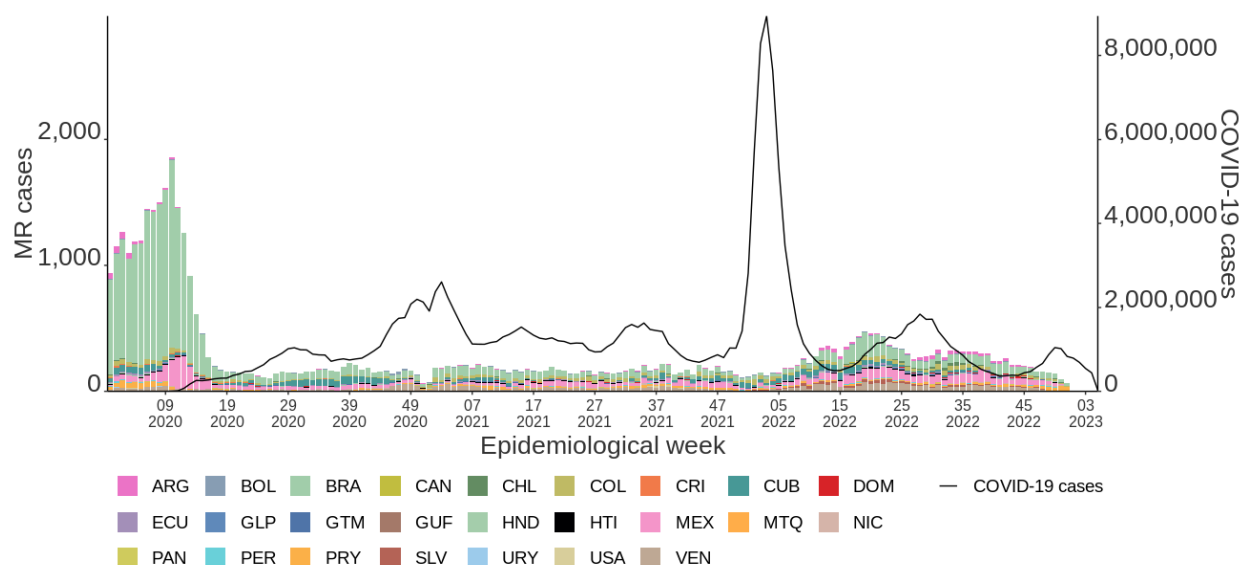
Vaccination coverage with the second dose of the measles, mumps, rubella vaccine (MMR2) declined between 2020 and 2021 in 19 countries and territories in the WHO Region of the Americas. The largest declines were observed in 5 countries/territories: Grenada, Chile, British Virgin Islands, Ecuador, and Costa Rica, respectively (Figure 4). In 2021, an MMR2 vaccination coverage of greater than or equal to 95% was not achieved in 29 countries/territories in the WHO Region of the Americas, including 20 countries (Antigua and Barbuda, Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Haiti, Honduras, Paraguay, Peru, Saint Lucia, Suriname, and Venezuela) with MMR2 vaccination coverage less than 80% (3).

Figure 4. Difference (in %) in the vaccination coverage for the second dose of the measles, mumps, rubella vaccine (MMR2) administered in the Region of the Americas, by country/territory, 2020-2021.



Source: PAHO/WHO, Weekly Bulletin - Measles-Rubella-Congenital Rubella Syndrome. Available at: <https://bit.ly/3DRUyZM>

Figure 5. Impact of the COVID-19 pandemic on the notification of suspected measles and rubella cases in the WHO Region of the Americas, by epidemiological week (EW) and country/territory, EW 1 of 2020 to EW 52 of 2022³.



Source: PAHO/WHO, Weekly Bulletin - Measles-Rubella-Congenital Rubella Syndrome, available at: <https://bit.ly/3DRUyZM> and the PAHO/WHO dashboard for COVID-19, available at: <https://bit.ly/40mo57G>

In 2022, between epidemiological week (EW) 1 and EW 52, six countries in the WHO Region of the Americas reported confirmed cases of measles: *Argentina* with 2 confirmed cases; *Brazil* with 43 confirmed cases in 4 federal units; *Canada* with 3 confirmed cases; *Ecuador* with 1 confirmed case; the *United States of America* with 121 confirmed cases in 6 jurisdictions; and *Paraguay* with 1 confirmed case.

In 2023, between EW 1 and EW 4 in the WHO Region of the Americas, 177 suspected cases were reported. The *United States of America*⁴ is the only country in the Region that has reported confirmed cases in 2023.

An update of the epidemiological situation for measles in the six countries that have reported confirmed cases in 2022 and in 2023 to date is presented below.

In **Argentina**, between EW 1 and EW 52 of 2022, 920 suspected measles cases⁵ were reported, of which 2 were laboratory-confirmed—one which was imported and one which had an unknown probable site of infection.

The first confirmed case (imported) was reported in EW 13 of 2022 and corresponds to a 25-year-old female with rash onset on 17 March 2022, resident of the city of Buenos Aires, and with a history of travel to Maldives with stops in Qatar, Dubai, and Brazil (São Paulo). The viral genotype identified for this case was B3.

The second confirmed case (probable site of infection unknown) was reported in EW 28 and corresponds to a 2-year-old female residing in the province of Buenos Aires with a history of vaccination. The viral genotype could not be identified for this case.

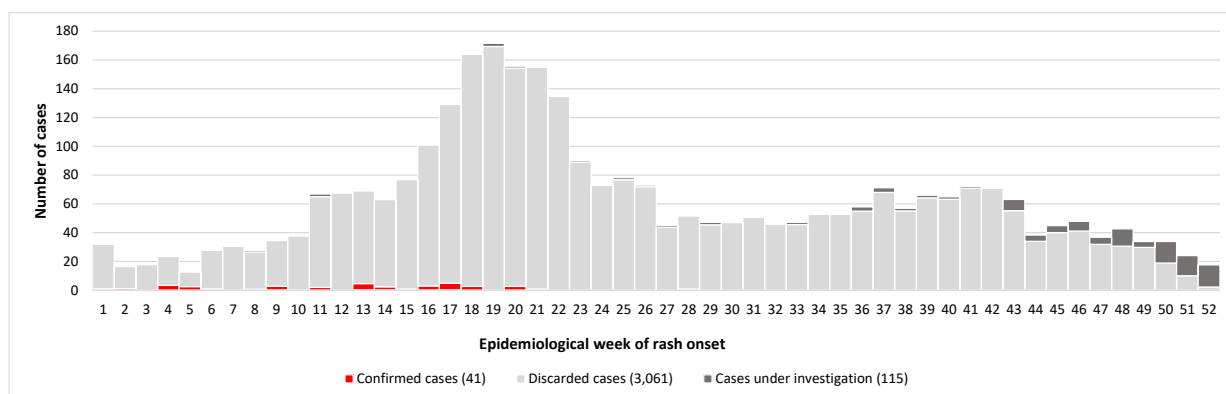
³ Canada and the United States of America report only confirmed cases of measles and rubella.

⁴ United States Centers for Disease Control and Prevention (US CDC), available at: <https://bit.ly/3iwfnzm>

⁵ Data subject to change based on retrospective review.

In **Brazil**, between EW 1 and EW 52 of 2022, 3,217 suspected cases were reported, of which 41 (1.3%) were confirmed, 3,061 (95.2%) were discarded, and 115 (3.6%) remain under investigation (**Figure 6**). During the same period, no deaths were recorded.

Figure 6. Reported measles cases by epidemiological week (EW) of rash onset, Brazil, EW 1- EW 52 of 2022.



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

In 2022, up to EW 52, the federal units that reported confirmed measles cases in Brazil were: Amapá (30), São Paulo (8), Rio de Janeiro (2), and Pará (1).

In 2022, up to EW 52, the highest cumulative incidence rates of confirmed measles cases by age group in Brazil were reported in the 6-to-11-month age group (10.8 cases per 100,000 population), followed by children under 6 months (5.4 cases per 100,000 population) and children aged 1 to 4 years (1.5 cases per 100,000 population).

In 2022, four federal units reported active outbreaks⁶: Amapá, São Paulo, Rio de Janeiro, and Pará. The D8 genotype was identified among the confirmed cases. The epidemiological situation in these federal units is presented below:

In *Amapá*, between EW 1 and EW 52 of 2022, 118 suspected cases were reported, of which 30 were confirmed, 85 were discarded, and 3 remain under investigation. The highest incidence rates by age group were observed in the 6-to-11-month age group (178.0 cases per 100,000 population), followed by children under 6 months (113.3 cases per 100,000 population) and children aged 1 to 4 years (15.9 cases per 100,000 population). Of the total confirmed cases, 20 (66.7%) were unvaccinated, 9 (30.0%) were vaccinated (no information on the total doses per person was available), and one case (3.3%) had no information on vaccination history. The last confirmed case in the state of Amapá had rash onset on 5 June 2022, in Macapá Municipality. The state of Amapá shares a border with *French Guiana* and *Suriname*.

In *São Paulo*, between EW 1 and EW 52 of 2022, 1,120 suspected cases were reported, of which 8 were confirmed, 1,066 were discarded, and 46 remain under investigation. The highest incidence rates by age group were observed in the 6-to-11-month age group (2.4 cases per 100,000 population) and the 1-to-4-year age group (0.9 cases per 100,000 population). Of the total confirmed cases, 7 (87.5%) were vaccinated (no information on the total doses per person was available) and one case no information on vaccination history. The last confirmed case in the state of São Paulo had rash onset on 25 May 2022, in the city of São Paulo.

In *Rio de Janeiro*, between EW 1 and EW 52 of 2022, 249 suspected cases were reported, of which 2 were confirmed, 240 were discarded, and 7 remain under investigation. The highest incidence rates by age group were observed in the 6-to-11-month age group (2.48 cases per 100,000 population) and the 1-to-4-year age group (0.31 cases per 100,000 population). Of the 2 confirmed cases, one was unvaccinated, and the other was vaccinated (no information on the

⁶ Federal units that reported confirmed cases in the last 90 days.

total doses was available). The last confirmed case in the state of Rio de Janeiro had rash onset on 26 April 2022, in the municipality of Rio de Janeiro.

In **Pará**, between EW 1 and EW 52 of 2022, 255 suspected cases were reported, of which one was confirmed, 248 were discarded, and 6 remain under investigation. The incidence rate was 2.5 cases per 100,000 population, and the case had a history of vaccination. The confirmed case in the state of Pará had a rash onset on 27 January 2022, in the municipality of Afuá. The state of Pará shares a border with *Guyana* and *Suriname*.

In Brazil, between EW 1 and EW 2 of 2023, 21 suspected cases were reported, of which 5 (23.8%) were discarded and 16 (76.2%) remain under investigation. During the same period, there were no confirmed cases or deaths reported.

In **Canada**, between EW 1 and EW 52 of 2022, 3 confirmed imported measles cases were reported by the provinces of Ontario (1 case) and Quebec (2 cases). In 2022, genotyping performed on samples from 2 cases identified the B3 genotype.

This information is regularly updated by the Public Health Agency of Canada (PHAC), available at: <https://bit.ly/40ljthR>.

In **Ecuador**, between EW 1 and EW 52 of 2022, 445 suspected measles cases were reported, of which one was laboratory-confirmed; the probable site of infection is unknown.

The confirmed case had rash onset on 13 November 2022 and corresponds to an 8-month-old male resident of Ibarra Canton, San Antonio de Ibarra Parish, Imbabura Province, and had no history of travel abroad. Viral genotype results are pending.

In **Paraguay**, between EW 1 and EW 52 of 2022, 660 suspected measles/rubella cases were reported (integrated surveillance), of which one was laboratory-confirmed for measles in January 2023; the probable site of infection of the case is unknown.

The confirmed case had rash onset on 15 September 2022 and corresponds to a 1-year-old male residing in the department of Itapúa (near the border with Argentina), with a history of vaccination and no travel history. The viral genotype for this case could not be identified.

In the **United States of America**, between 1 January 2022 and 19 January 2023, 121 confirmed measles cases were reported in 6 jurisdictions. Of these, 118 were imported. The B3 genotype was identified amongst the imported cases.

Between 19-27 January 2023, 2 confirmed measles cases were reported in 2 jurisdictions.

This information is regularly updated on the United States Centers for Disease Control and Prevention (US CDC) website, available at: <https://bit.ly/3iwfnzm>.

Guidance for national authorities

PAHO/WHO recommends remaining alert for potential new outbreaks of varying magnitude in the WHO Region of the Americas, considering the following risk factors: 1) gaps in the performance of international indicators for integrated measles/rubella surveillance⁷, 2) low vaccination coverage of the first and second doses of the measles, mumps, rubella vaccine (MMR1 and MMR2) in many countries and territories in the Region during 2020, 3) active outbreaks of measles in Brazil, 4) active circulation of the virus in other WHO Regions, and 5) the migratory flow of vulnerable populations within the WHO Region of the Americas and from other WHO Regions.

⁷ International indicators for integrated measles/rubella surveillance are described in the weekly bulletin - Measles-Rubella-Congenital Rubella Syndrome. Available at: <https://bit.ly/3DRUyZM>

It is crucial that all the countries in the Region carry out the final classification of the 1,014 suspected cases that were pending classification in 2022⁸.

PAHO/WHO urges Member States to follow the recommendations of the meetings of the Technical Advisory Group (TAG) on Vaccine-Preventable Diseases, available at: <https://bit.ly/3JtvEmY> and the regional framework for follow-up and re-verification of the Elimination of Measles, Rubella, and Congenital Rubella Syndrome in the Region of the Americas, available at: <https://bit.ly/3Yz2dnU>

Among the guidelines and recommendations for countries with measles outbreaks, the following applies:

Vaccination

- Implement vaccination intensification activities to close immunity gaps in high-risk municipalities as soon as possible.
- Vaccinate at-risk populations residing in areas where the measles virus is circulating who do not have proof of vaccination or immunity against measles and rubella.
- In health facilities where vaccination activities are carried out, it is essential that health professionals be alert for signs and symptoms of respiratory diseases and offer patients with flu-like symptoms a surgical mask and refer them for medical evaluation according to the local protocols for patients with suspected COVID-19.
- Maintain infection prevention and control measures and social distancing practices during vaccination services.
- Although there are currently no known medical contraindications to vaccinating a person who has had contact with a COVID-19 case, it is recommended that vaccination be deferred until quarantine has been completed (14 days after last exposure).
- Maintain a stock of measles-rubella (MR) and/or measles, mumps, rubella (MMR) vaccine, and syringes/supplies for prevention and control actions in the event of imported cases.

Epidemiological surveillance

- Enhance epidemiological surveillance in high-risk areas and with epidemiological silence by implementing complementary surveillance measures in the field (for example, active searches).
- Strengthen epidemiological surveillance in border areas to quickly detect and respond to highly suspected measles cases.
- Obtain serum samples and nasopharyngeal swabs to perform serological tests for laboratory diagnosis and real-time RT-PCR test to confirm viral RNA and document the genotype associated with the infection.
- In an outbreak situation and if it is not possible to confirm the suspected cases by laboratory, use the confirmed case classifications by clinical criteria (presence of fever, maculopapular rash with at least one of the following symptoms and signs: cough, coryza, and conjunctivitis) and epidemiological link, so as not to delay the implementation of response actions.

⁸ PAHO/WHO, Weekly Bulletin - Measles-Rubella-Congenital Rubella Syndrome, available at: <https://bit.ly/3DRUyZM>

- Continue routine surveillance for other vaccine-preventable diseases (VPDs). Maintain supplies for the proper collection and transport of samples. If the laboratory does not have laboratory diagnostic capacity for the specific event, the samples must be sent to the reference laboratory to carry out the analyses that allow for the confirmation or discarding of the event, at the appropriate time and in accordance with what is defined in surveillance program. Countries must guarantee the adequate storage, preservation, and transportation of the samples.

Rapid Response

- Provide a rapid response to imported measles cases to prevent the reestablishment of endemic transmission through the activation of rapid response teams trained for this purpose and by implementing national rapid response protocols. Once the rapid response team is activated, coordination must be ensured between the national, subnational, and local levels, with continuous and fluid communication channels between all levels.
- In an outbreak situation, adequate intra-hospital case management must be established to avoid nosocomial transmission, with an adequate referral flow of patients to isolation rooms (at any level of care) avoiding contact with other patients in waiting rooms. and/or hospitalization rooms for patients hospitalized for other causes.

Additionally, PAHO/WHO recommends that Member States advise all travelers 6 months of age and older⁹ who cannot show proof of vaccination or immunity to **receive the measles and rubella vaccine**, preferably the MMR vaccine, **at least two weeks before traveling to areas where measles transmission has been documented**. PAHO/WHO recommendations regarding advice for travelers are available in the Epidemiological Update published by PAHO/WHO on October 27, 2017¹⁰.

References

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⁹ The dose of MMR or MR vaccine administered to children 6 to 11 months of age does not replace the first dose of the recommended schedule at 12 months of age.

¹⁰ PAHO/WHO Epidemiological Update for Measles. 27 October 2017, Washington, D.C. PAHO/WHO. 2017. Available at <https://bit.ly/3x8Garp>

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