

The Americas Region has again been re-verified as a measles-free region while sustaining the elimination of rubella and congenital rubella syndrome (CRS) (1). Given the recent identification of measles clusters and cases in countries and territories in the Americas Region that may put this progress at risk, the Pan American Health Organization/World Health Organization (PAHO/WHO) urges Member States to continue strengthening vaccination, epidemiological surveillance, and rapid response activities. In addition, it recommends the implementation of active community, institutional and laboratory searches for the timely identification of cases, as well as complementary vaccination activities to close possible immunity gaps.

Global summary

According to monthly measles and rubella surveillance data published by the World Health Organization (WHO) in 2024, as of 26 November 2024, 526,277 suspected measles cases were reported in 183 Member States in the six WHO regions, of which 283,840 (54%) were confirmed¹. In 2023, 623,411 suspected measles cases were reported in 176 WHO Member States, of which 321,887 (52%) were confirmed¹ (2, 3).

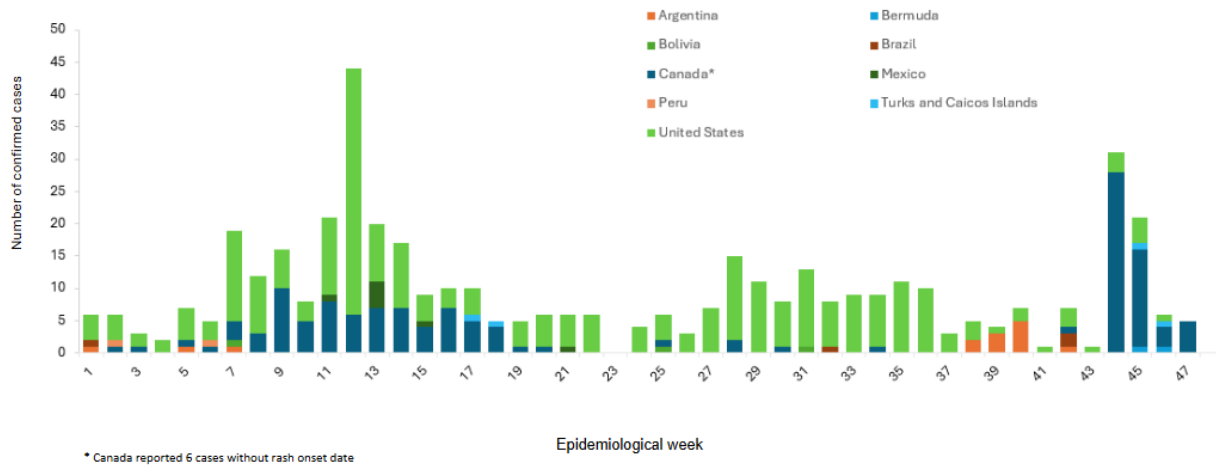
Summary of the situation in the Americas Region

In 2024, between epidemiological week (EW) 1 and EW 48, in the Americas Region, 16,841 suspected measles cases of which 452 cases have been confirmed in Argentina (n= 14), Bermuda (n= 2), the Plurinational State of Bolivia (n= 3), Brazil (n= 4), Canada (n= 138), Mexico (n= 7), Peru (n= 2), Turks and Caicos Islands (n= 2), and the United States of America (n= 280), (**Figure 1**) (1, 4-9).

The distribution of confirmed cases by epidemiological week shows an increase in cases starting in EW 7 of 2024, with the maximum number of cases recorded in EW 12. Starting in EW 13, there is a general downward trend that continues through EW 43. As of SE 44, a second increase in confirmed cases was observed due to an outbreak in a community reluctant to vaccinate. According to the information available on confirmed cases, the age group with the highest proportion of cases corresponds to the 10-19 years age group (27%), the 1-4 years age group (25%) and the 20-29 years age group (23%). Regarding vaccination history, 62% of the cases were not vaccinated and in 19% this information was unknown or absent (**Figure 2**) (4).

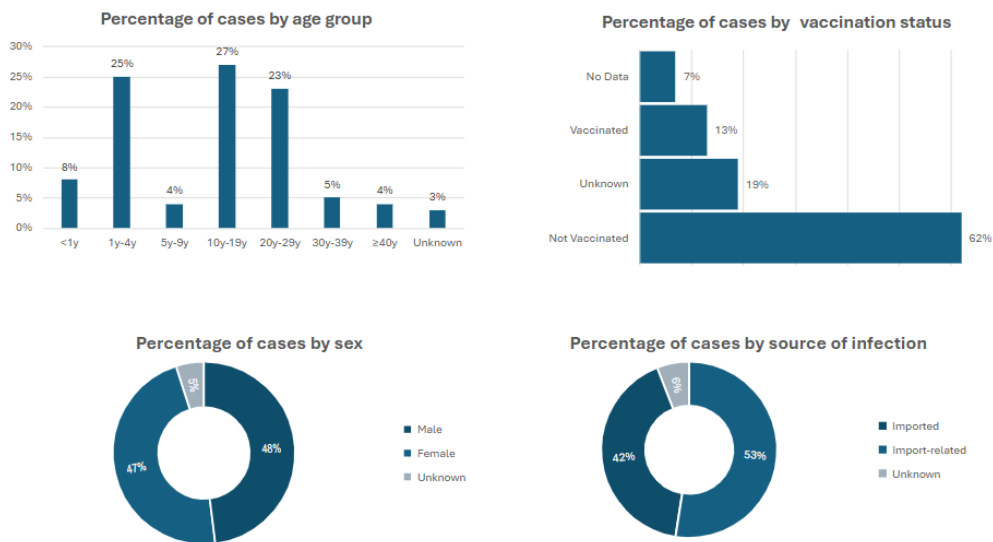
¹ Includes cases confirmed by laboratory, clinical or epidemiological criteria.

Figure 1. Confirmed cases of measles by epidemiological week and country in the Americas Region, 2024



Source: Adapted from Pan American Health Organization. Integrated Surveillance Information System (ISIS) for polio, measles, rubella, and congenital rubella syndrome and country report to CIM/PAHO. Washington, D.C.: PAHO; 2024 [Cited 4 December 2024]. Unpublished, and from the U.S. Centers for Disease Control and Prevention. Measles cases and outbreaks. Atlanta: CDC; 2024 [cited 26 November 2024]. Available from: <https://www.cdc.gov/measles/data-research/index.html>.

Figure 2. Percentage distribution of confirmed measles cases by age group, sex, vaccination status, and source of infection in the Americas Region, 2024.



Source: Adapted from Pan American Health Organization. Integrated Surveillance Information System (ISIS) for polio, measles, rubella, and congenital rubella syndrome and country report to CIM/PAHO. Washington, D.C.: PAHO; 2024 [cited 4 December 2024]. Unpublished.

Vaccination coverage in the Americas Region

During 2024, the Pan American Health Organization / World Health Organization (PAHO/WHO) alerted on three occasions (29 January, 3 June, and 28 October) about the decrease in coverage of the first and second doses of measles, rubella and mumps vaccine (MMR1 and MMR2) and the occurrence of measles cases in countries and territories of the Americas Region (10-12).

By 2023, 42 countries and territories in the Americas reported MMR1 and MMR2 vaccination coverage to PAHO. Regarding the application of the first dose of MMR1, 12 countries and territories in the Region have coverage above 95%, 15 have coverage between 90-94%, nine have coverage between 80-89%, and six have coverage below 80% (12, 13). With respect to the application of the second dose of MMR2, only seven countries and territories have coverage higher than 95%, while 21 have coverage lower than 80%. Coverage for the Americas Region is 87% for MMR1 and 76% for MMR2 (12, 13).

Data on vaccination coverage for measles and other diseases in the Americas Region are available on the PAHO dashboard Immunization across the life course in the Americas, which data are current as of 3 October 2024 (13).

Measles epidemiological situation by country/territory in the Americas Region

The following is an update of the epidemiological situation of measles in the countries and territories that have reported confirmed cases in the Americas in 2024. Since the last published epidemiological alert on 28 October 2024, the countries and territories that have reported confirmed cases in the Americas Region were Argentina, Bermuda, Brazil, Canada, and the United States of America (5 - 9).

In **Argentina**, between EW 1 and EW 44 of 2024, a total of 14 measles cases have been confirmed (5). On 8 October, the Argentina Ministry of Health issued an epidemiological alert (14) due to the confirmation of two measles case in Lamarque, province of Río Negro, in individuals with no history of travel, but history of contact with persons who had traveled and upon their return had presented compatible symptoms. As of EW 42 of 2024, eleven cases were confirmed in this outbreak, three of them with a history of recent travel to Colonia Piraí, Santa Cruz de la Sierra, Bolivia (5), in the same area where a confirmed case of measles had been reported in August. The remaining eight cases are relatives of the three cases that traveled (secondary cases related to this importation). Other family contacts with a history of vaccination remained asymptomatic during the follow-up period (15). There were no confirmed cases outside the family contacts. All cases were laboratory confirmed (15). The symptomatic persons identified had no history of measles vaccination. The confirmed cases corresponded to persons between 18 months and 34 years of age. In this outbreak, genotype B3 (Sequence ID 8532) was identified, which was previously reported in the United States in measles cases in the state of Oregon (5, 15).

Previously in Argentina, in January 2024, a case was confirmed in a 19-month-old child with no history of vaccination in the province of Salta, detecting the D8 genotype MVs/Patan.IND/16.19 lineage. The source was not identified so the case was classified as a source of unknown origin. There were no secondary cases (5, 16). In February 2024, two cases were reported in the Autonomous City of Buenos Aires: a six-year-old male (imported case)

and their 13-month-old sibling (male) (import-related). The minors were residents of Barcelona, Spain, and were traveling in Argentina when they were detected. They were not vaccinated for measles. The genotype detected was B3, MVs/Manchester.GBR/44.23 lineage (5, 15).

In **Bermuda**, in EW 47 of 2024, the Ministry of Health confirmed two cases of measles in an adult and a minor with a history of travel to Singapore (6). On 20 November 2024, the first case of measles was confirmed in a 45-year-old male with onset of symptoms on 1 November, requiring hospitalization, and has since recovered. A serum sample was obtained from the case on 11 November and was positive for IgM antibodies at the private diagnostic reference laboratory in the United States (16, 17). The second case is a seven-month-old minor with no history of vaccination due to his age and home contact of the first case, who onset of symptoms on 9 November. The minor required hospitalization and has since recovered. A serum specimen and nasopharyngeal swab were obtained from the case on 14 November; the serum specimen was positive for IgM antibodies at the private diagnostic reference laboratory in the United States. The nasopharyngeal swab was positive by rT-PCR polymerase chain reaction at the Caribbean Public Health Agency (CARPHA) reference laboratory (6, 17).

In **Bolivia**, between EW 1 and EW 48 of 2024, three cases of measles were confirmed. In February 2024, the Bolivian Ministry of Health and Sports confirmed a case in a seven-year-old female resident Bermejo City, Tarija Department, Bolivia. The case had a recent history of travel within the country to the city of El Alto in the department of La Paz. The case presented favorable clinical evolution. The source of infection was not identified, and no secondary cases have been detected (18). In July 2024, the second measles case was confirmed in a two-year-old male resident of the department of Oruro. The case presented with history and probable place of exposure via a trip to the department of La Paz to the municipality of Colquiri. There were no secondary cases (19).

The third confirmed measles case in Bolivia was reported on 8 August 2024, by the Bolivia Ministry of Health and Sports. This was an imported case corresponding to a 42-year-old person residing in the United States, of Russian origin, who was treated at a Resident Community Health Center, in the municipality of San Pedro, in the Russian colony Piraí, department of Santa Cruz. The case referred recent contact with a case of measles in the state of Oregon, in the United States (20, 21). As of EW 48 of 2024, Bolivia has not reported any new cases of measles related to this imported case, nor any additional cases (21).

In **Brazil**, between EW 1 and EW 49 of 2024, four measles cases were confirmed with two additional cases reported since the last alert (7, 12). The first confirmed case was in the state of Rio Grande do Sul and the second in the state of Minas Gerais. The case in Rio Grande do Sul was a three-year-old male from Pakistan with no history of vaccination. The genotype detected was B3. The case has recovered, and no secondary cases were identified (22, 23). In August 2024, a measles case was confirmed in the state of Minas Gerais in a 17-year-old vaccinated male from England. The D8 genotype and Victoria lineage were detected with 100% genomic identity. The case has recovered, and no secondary cases were identified (23).

On 29 October, two new measles cases were confirmed in two travelers from Europe in the State of Sao Paulo. These were two imported cases and contacts of a confirmed case in

Portugal. The cases, a 35-year-old female, with a history of vaccination in 2019, presented onset of rash on 7 October 2024 and a 37-year-old male, with no history of vaccination, with onset of rash on 8 October 2024 (7, 23). The cases were confirmed by measles virus viral genome detection by RtqPCR. The D8 genotype was identified, with genomic identity of 99.6% with the MVs/Bern.CHE.17.24/2 strain. This lineage had not been detected in previous cases in Brazil. No new cases of measles related to the imported cases have been reported. In Brazil, the last endemic case of measles was reported in June 2022 (7, 23).

In **Canada**, between EW 1 and EW 48 of 2024, a total of 138 confirmed measles cases were reported in six provinces, including one fatal case. Cases were distributed among: Alberta (n= 1), British Columbia (n= 1), New Brunswick (n= 47), Ontario (n= 35), Quebec (n= 53), and Saskatchewan (n= 1). Of the 138 confirmed cases, 23% were imported, 72% were import-related, and 5% were of unknown origin. Of the 138 confirmed cases, 83% were unvaccinated or their history was unknown (n= 114 cases). Forty-six percent (n= 63) of the cases were over 18 years of age, followed by 24% (n= 33) of the cases in the under-five age group. The fatal case reported was a child under five years of age, with no history of vaccination, residing in the province of Ontario. B3 and D8 genotypes were identified in 53 and 24 of the confirmed cases, respectively (9). Six outbreaks have been identified, 41% (n= 56) of the cases are associated with the recent outbreak in New Brunswick and Ontario. The last confirmed case associated with this outbreak had onset of rash on 23 November 2024 (8, 24).

In **Mexico**, between EW 1 and EW 48 of 2024, seven measles cases have been confirmed. The first case reported in March 2024 corresponds to a four-year-old male from England. Related to this case, the second, third, fourth and fifth cases were identified, representing four additional cases: three adults and a six-month-old minor who were in contact with the index case during the flight and at the airport in Mexico. For these cases, sequencing and genotyping studies identified the D8 genotype with MVs/Patan.IND/16.19 lineage (26). The sixth case confirmed in April 2024 corresponds to an 11-year-old male, resident of Mexico City, with no history of vaccination and no history of travel outside the area of residence. The epidemiologic investigation concluded that it was a secondary case to the fourth case, with an import associated source of infection (25).

In May 2024, the Health Services of the State of Guanajuato, Mexico, reported a case of measles in an 18-year-old male of Turkish nationality, with a history of travel to Guatemala and El Salvador. Sequencing and genotyping studies determined the D8 genotype with MVs/Bern.CHE/17.24/2 lineage. The case was followed up only by telephone, without being able to establish the exact residence within Mexico. Through the National Institute of Migration, it was confirmed that the case had moved to the United States. There were no secondary cases (25).

In **Peru**, between EW 1 and EW 48 of 2024, two measles cases were confirmed. The first case was a 21-year-old male, resident of the district of Surco, Lima; with no evidence of measles vaccination, with a history of travel to several European countries, with onset of symptoms on 2 January 2024; the case tested positive for IgM and PCR at the National Reference Laboratory on 27 January. The second confirmed case was a 10-month-old female who had no history of vaccination due to her age and no history of travel; she was a resident of the district of Surco, Lima; she presented symptoms on 4 February and onset of rash on 7 February. The case tested positive for IgM and PCR on 14 February at the National Reference Laboratory of Peru (26).

In **Turks and Caicos** Islands, two measles cases were reported during EW 20 of 2024 and confirmed by the CARPHA laboratory. These cases are the first measles cases reported in the Turks and Caicos Islands since 1991. The first case is a six-year-old male, a resident of the island of Providenciales, with no history of measles vaccination and no history of travel, who presented with onset of symptoms on 29 April 2024. The second case is a 21-year-old male, with no history of vaccination and no history of travel, resident of Providenciales Island, with onset of symptoms on 18 April 2024. These two cases are related by epidemiological link; the source of infection has not been identified and no secondary cases have been detected (27).

In the **United States**, between EW 1 and EW 48 of 2024, 280 confirmed measles cases were identified in 32 jurisdictions, including New York City, the District of Columbia, and the states of Arizona, California, Florida, Georgia, Idaho, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Washington, West Virginia, and Wisconsin (9). A total of 16 outbreaks have been reported², the largest in a migrant shelter in Chicago, Illinois (28). Overall, 70% of the reported cases (n= 197) are associated with these 16 outbreaks. The onset of the outbreak of the last confirmed case in the United States is 16 November. Among the cases, 41% are <5 years age group (n= 116), followed by the 5-19 years age group with 31% of the cases (n= 87). Regarding the vaccination history of the confirmed cases, 67% were not vaccinated, 22% had an unknown vaccination history, 7% had received one dose of measles, rubella and mumps (MMR) vaccine and 4% had received two doses of MMR. Forty percent of cases were hospitalized (n= 112) for isolation or management of complications. Hospital isolation was necessary during the Chicago, Illinois, outbreak because of a lack of isolation facilities, which contributed to an increase in the typical annual measles hospitalization rate of 20%. Of the 222 cases in the United States not associated with the Chicago, Illinois outbreak, 29% (n= 65) were hospitalized. Measles virus genotype B3 was identified in 58 cases (21%) and measles virus genotype D8 was identified in 156 confirmed cases (56%) (9, 29).

Guidance to Member States

PAHO/WHO recommends that Member States continue their efforts to strengthen surveillance, rapid response, and achieve adequate vaccination coverage against measles, rubella, and mumps, as these are the three major strategies for interrupting endemic transmission of these viruses.

There are several risk factors that could favor the spread of measles or rubella virus from an imported case, among them are: 1) low coverage of the first and second doses of measles, rubella, and mumps vaccine (MMR1 and MMR2) in most countries and territories in the region; 2) gaps in the performance of integrated measles/rubella surveillance indicators; 3) active circulation of the virus in several countries in other regions of the world; 4) the significant increase in the movement of persons within the Americas Region and from other regions of the world; and 5) the increase in dengue cases in the Region that could mask potential

² Measles outbreak definition used by the United States: three or more related cases (9)

measles or rubella cases, due to the similarity of the clinical manifestations of these diseases (30).

Taking into account the aforementioned risk factors and the current regional context, recommendations related to vaccination, surveillance and response are provided below (31, 32):

Vaccination

- a) Based on the results of the measles and rubella risk analysis, implement vaccination intensification activities to close the coverage gaps as a priority in high-risk municipalities, mainly in those that are considered tourist sites or through which there is a high transit of people, or with communities that are reluctant to be vaccinated.
- b) Implement and/or strengthen microplanning in routine vaccination services in order to achieve vaccination coverage equal to or greater than 95%. PAHO is developing guidelines that may be useful for this work.
- c) Offer to travelers or persons in transit through the country, the missing vaccine doses according to the age of the person and the national scheme, either through medical brigades or fixed vaccination posts.
- d) Make additional efforts to provide vaccination coverage to reluctant populations, including awareness-raising activities for local authorities, community and religious leaders, or other social actors and government sectors, such as education, that are strategic partners. Likewise, carry out complementary vaccination activities in host populations or communities neighboring unwilling populations to close possible gaps in population immunity.

Surveillance

- a) Strengthen epidemiological surveillance in high-risk areas, border areas, and areas with epidemiological silence by implementing active searches in health services and in the community. This should include continuous monitoring and analysis of epidemiological surveillance indicators, in conjunction with the National Sustainability Commission (NSC) for measles and rubella, to implement corrective measures if necessary (32).
- b) Implement active laboratory screening of serum samples collected for dengue or arboviral disease surveillance to detect measles and rubella cases that may have gone undetected. Following the guidance on measles and rubella testing in the laboratory network of the Americas Region is encouraged (33).
- c) Obtain serum, nasopharyngeal swab and urine samples in any suspected measles or rubella case for laboratory confirmation by serological and molecular real-time RT-PCR testing and genomic sequencing to document the genotype associated with the infection (33).
- d) The classification of suspected cases with a positive result for measles or rubella IgM should be done by triangulating clinical, epidemiological and laboratory information. It is recommended that the classification of these cases be the responsibility of the National Sustainability Commission.

Quick response

- a) Review and adjust -if necessary- operational preparedness and rapid response plans; and strengthen the capacity of health systems mainly in the risk areas mentioned in the section on **Vaccination**.
- b) Initiate a timely response to imported cases of measles or rubella, including activation of trained rapid response teams and implementation of national rapid response protocols (34, 35).
- c) Establish adequate in-hospital case management to avoid nosocomial transmission, mainly in outbreak situations, maintaining an adequate referral flow of patients in isolation wards (at any level of care), avoiding contact with other patients in waiting rooms and/or hospital wards of patients hospitalized for other causes.

Mass events and international travelers

The latest recommendations on mass events and international travelers in the Americas Region are available in the alert published on October 28, 2024, which is available from: <https://www.paho.org/en/documents/epidemiological-alert-measles-americas-region-28-october-2024>. (12).

Channels for the dissemination of guidelines

PAHO/WHO recommends that national authorities consider disseminating the guidelines in this document through:

- Public awareness campaigns to promote and improve the health of travelers before and after their trip so that they acquire responsible behaviors in relation to vaccination against measles and know the signs and symptoms of measles. For this activity, it is also recommended to consider health care services or clinics for travelers, airports, ports, train and bus stations, airlines operating in the country, among others.
- Travel agencies, tourism-related entities and diplomatic corps should also be aware of and disseminate the necessary recommendations that a traveler should consider prior to travel.
- Communication to physicians and other health workers of the contents of existing national surveillance guidelines, as well as timely dissemination of any new protocols that the country develops in relation to travelers.

References

1. Pan American Health Organization / World Health Organization. Measles-Rubella biWeekly Bulletin (45-46)-16 November 2024. Washington, D.C.: PAHO/WHO; 2024. Available from: <https://www.paho.org/en/documents/measles-rubella-bi-weekly-bulletin-45-46-16-november-2024>.
2. World Health Organization. Immunization data- Provisional measles and rubella data. Geneva: WHO; 2024 [cited 26 November 2024]. Available from: <https://immunizationdata.who.int/global?topic=Provisional-measles-and-rubella-data&location=>.
3. World Health Organization. Measles and Rubella. Global Update. November 2024 (Power Point). Geneva: WHO; 2024 [cited 26 November 2024]. Available from: https://immunizationdata.who.int/docs/librariesprovider21/measles-and-rubella/global-mr-update.pptx?sfvrsn=3547ebab_11.
4. Pan American Health Organization / World Health Organization. Integrated Surveillance Information System (ISIS) for polio, measles, rubella, and congenital rubella syndrome. Washington, D.C.: PAHO/WHO; 2024 [cited 4 December 2024]. Unpublished.
5. Ministerio de Salud de la República Argentina. Boletín Epidemiológico Nacional. Semana epidemiológica 42. Buenos Aires: MSAL; 2024. Available from: https://www.argentina.gob.ar/sites/default/files/2024/04/ben-727-EW_42.pdf.
6. Ministry of Health Bermuda. Second measles case confirmed. Hamilton: MOH; 2024 [cited 26 November 2024]. Available from: <https://www.gov.bm/articles/second-measles-case-confirmed>.
7. Secretaria da Saúde do Estado de São Paulo. Alerta: Dois casos de sarampo importados em São Paulo. Secretaria de Saúde São Paulo, 2024 [cited 26 November 26, 2024]. Available from: http://portal.saude.sp.gov.br/resources/cve-centro-de-vigilancia-epidemiologica/areas-de-vigilancia/doencas-de-transmissao-respiratoria/sarampo/2024/alerta_sarampo_confirmado_29out.pdf.
8. Public Health Agency of Canada. Measles & Rubella Weekly Monitoring Report - Week 45: November 10 to 16, 2024. Ontario: PHAC; 2024 [cited 3 December 2024]. Available from: <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/measles-rubella-surveillance/2024/week-46.html>.
9. Centers for Disease Control and Prevention. Measles cases and outbreaks. Atlanta: CDC; 2024 [cited 26 November 2024]. Available from: <https://www.cdc.gov/measles/data-research/index.html>.
10. Pan American Health Organization / World Health Organization. Epidemiological Alert: Measles in the Region of the Americas, 29 January 2024. Washington, D.C.: PAHO/WHO; 2024. Available from: <https://www.paho.org/en/documents/epidemiological-alert-measles-region-americas-29-january-2024>.
11. Pan American Health Organization / World Health Organization. Epidemiological Alert: Measles in the Region of the Americas, 3 June 2024. Washington, D.C.: PAHO/WHO; 2024. Available from: <https://www.paho.org/en/documents/epidemiological-alert-measles-region-americas-3-june-2024>.

12. Pan American Health Organization / World Health Organization. Epidemiological Alert: Measles in the Region of the Americas, 28 October 2024. Washington, D.C.: PAHO/WHO; 2024. Available from: <https://www.paho.org/en/documents/epidemiological-alert-measles-america-region-28-october-2024>.
13. Pan American Health Organization. Immunization throughout the life course in the Americas. Washington, D.C.: PAHO; 2024 [cited 26 November 2024]. Available from: <https://paho-cim.shinyapps.io/immunization-dashboard/>.
14. Ministerio de Salud de la República Argentina. Alerta epidemiológica. Casos confirmados de sarampión en la provincia de Río Negro. Buenos Aires: MSAL; 2024. Available from: https://www.argentina.gob.ar/sites/default/files/2024/04/alerta_sarampion_rn_8102024.pdf.
15. Argentina International Health Regulations National Focal Point (IHR NFP). Communication received on 3 December 2024 via e-mail. Buenos Aires; 2024. Unpublished.
16. Bermuda Ministry of Health. Urgent Public Health Notice: Measles Case Confirmed. Hamilton: MOH; 2024 [cited 26 November 2024]. Available from: <https://www.gov.bm/articles/urgent-public-health-notice-measles-case-confirmed>.
17. United Kingdom International Health Regulations National Focal Point (IHR NFP). Communication received 5 December 2024 via e-mail. London; 2024. Unpublished.
18. Bolivia (Plurinational State of) International Health Regulations National Focal Point (IHR NFP). Communication received on 23 May 2024 by e-mail. La Paz; 2024. Unpublished.
19. Ministerio de Salud y Deporte del Estado Plurinacional de Bolivia. Salud recomienda a la población vacunarse contra el sarampión ante la aparición del primer caso en el país. La Paz: Minsalud; 2024. Available from: <https://www.minsalud.gob.bo/8024-salud-recomienda-a-la-poblacion-vacunarse-contra-el-sarampion-ante-la-aparicion-del-primer-caso-en-el-pais>.
20. Ministerio de Salud y Deporte del Estado Plurinacional de Bolivia. Salud reporta caso de sarampión importado en el departamento de Santa Cruz e instruye intensificar la vacunación en todo el país. La Paz: Minsalud; 2024 [cited 15 October 2024]. Available from: <https://www.minsalud.gob.bo/8257-salud-reporta-caso-de-sarampion-importado-en-el-departamento-de-santa-cruz-e-instruye-intensificar-la-vacunacion-en-todo-el-pais>.
21. Bolivia (Plurinational State of) International Health Regulations National Focal Point (IHR NFP). Communication received on 17 October 2024 via e-mail. La Paz; 2024. Unpublished.
22. Secretaria de Saúde do Governo do Rio Grande do Sul. Rio Grande do Sul confirma caso importado de sarampo e reforça recomendação de vacina. 26 de enero del 2024. Porto Alegre: SESRS; 2024. Available from: <https://saude.rs.gov.br/rio-grande-do-sul-confirma-caso-importado-de-sarampo-e-reforca-recomendacao-de-vacina>.
23. Brazil International Health Regulations National Focal Point (IHR NFP). Communication received on 3 December 2024 via e-mail. Brasília; 2024. Unpublished.
24. Canadian vaccination program. Communication received 4 December 2024 via email. Ontario; 2024. Unpublished.

25. Mexico International Health Regulations National Focal Point (IHR NFP). Communication received on 4 December 2024 via e-mail. Mexico City; 2024. Unpublished.
26. Peru International Health Regulations National Focal Point (IHR NFP). Communication received on 3 December 2024 by e-mail. Lima; 2024. Unpublished.
27. United Kingdom International Health Regulations National Focal Point (IHR NFP). Communication received 29 May 2024 via e-mail. London; 2024. Unpublished.
28. Gressick K, Nham A, Filardo TD, et al. Measles Outbreak Associated with a Migrant Shelter - Chicago, Illinois, February-May 2024. MMWR Morb Mortal Wkly Rep 2024;73:424-429. Available from: <http://dx.doi.org/10.15585/mmwr.mm7319a1>.
29. United States Centers for Disease Control and Prevention. Communication received 5 December 2024 via e-mail. Atlanta; 2024. Unpublished.
30. Pan American Health Organization / World Health Organization. Measles/Rubella bi-Weekly Bulletin. Washington, D.C.: PAHO/WHO; 2024 [cited 26 November 2024]. Available from: <https://www.paho.org/en/measles-rubella-weekly-bulletin?amp%3Bd%5Bmin%5D=&%3Bd%5Bmax%5D=&%3Bpage=1&topic=All>.
31. Pan American Health Organization / World Health Organization. Strategic Advisory Group (SAG) on Vaccine Preventable Diseases (VPD). Washington, D.C.: PAHO/WHO; 2024. Available from: <https://www.paho.org/en/strategic-advisory-group-sag-vaccine-preventable-diseases-vpd>.
32. Pan American Health Organization / World Health Organization. Regional Framework for the Monitoring and Re-Verification of Measles, Rubella, and Congenital Rubella Syndrome Elimination in the Americas. Washington, D.C.: PAHO/WHO; 2024. Available from: <https://iris.paho.org/handle/10665.2/55074>.
33. Pan American Health Organization / World Health Organization. Guidance for testing of measles and rubella in the laboratory network of the Region of the Americas. Washington, D.C.: PAHO/WHO; 2018. Available from: <https://iris.paho.org/handle/10665.2/34932>.
34. Pan American Health Organization. Measles outbreak in the post-elimination era: Case study. Washington, D.C.: PAHO; 2024. Available from: <https://campus.paho.org/en/course/measles-case-study>.
35. Pan American Health Organization. Respuesta rápida a brotes de sarampión y rubéola en las Américas. Washington, D.C.: OPS; 2024. Available from: <https://campus.paho.org/es/curso/brotes-sarampion-rubeola>.
36. Pan American Health Organization / World Health Organization. 27 October 2017: Measles – Epidemiological Update. Washington, D.C.: PAHO/WHO; 2017. Available from: <https://www.paho.org/en/documents/27-october-2017-measles-epidemiological-update-0>.