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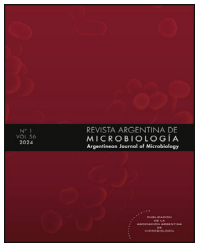

EDITORIAL

The re-emergence of vaccine-preventable diseases: The case of measles

El resurgimiento de enfermedades inmunoprevenibles: el caso del sarampión

The re-emergence of measles outbreaks in Argentina and across the Americas Region not only poses a major threat to public health but also underscores deficiencies in immunization programs and reflects a concerning decline in public engagement with vaccination.

The measles virus (MeV), a member of the genus *Morbillivirus* within the *Paramyxoviridae* family, is one of the most contagious human pathogens. It spreads through respiratory droplets and can lead to severe complications, including pneumonia, encephalitis, and death – especially in young children and immunocompromised individuals. Measles infection is associated with immune memory suppression, which is the primary cause of measles-related morbidity and mortality. This suppression can persist for weeks, months, or even years after recovery, creating an immunological 'amnesia' that increases susceptibility to secondary infections.

The introduction of the measles vaccine in the 1960s stands as a major milestone in global public health. Prior to the vaccine era, measles was a leading global cause of childhood morbidity and mortality, responsible for more than two million deaths annually. The consolidation of global immunization programs in the 1980s significantly reduced the disease burden, with measles-associated mortality decreasing by 95%. It is estimated that more than 60 million deaths were prevented between 2000 and 2023[5]. In recent years, however, there has been a concerning resurgence of outbreaks in various parts of the world, fueled by gaps in immunization coverage, growing vaccine hesitancy, and disruptions to healthcare services caused by the COVID-19 pandemic. Over the past two years, both suspected and confirmed measles cases increased significantly worldwide. In 2023 alone, the World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) estimated approximately 322 000 measles infections worldwide, marking an 85% rise from 2022. This surge is primarily attributed to inadequate immunization coverage, with global coverage reaching only 83% for the first dose of the measles, mumps, and rubella (MMR) vaccine and 74% for the second dose in 2023. Consequently, 57 countries experienced large or disruptive outbreaks, marking an increase of nearly 60% from the previous year[6].

Measles is one of six vaccine-preventable diseases that had been officially eliminated from the Americas[5]. Most PAHO/WHO Member States introduced the MMR vaccine between the 1980s and early 2000s. By 2002, the endemic transmission of measles in the region was successfully interrupted, with the last case reported in Brazil in 2015. However, following the formal declaration of measles elimination in the Americas in 2016, the region experienced an unusual and sustained resurgence of confirmed cases between 2017 and 2019. The largest increase in reported measles cases occurred between 2018 and 2019 (40 111 confirmed cases), primarily driven by large outbreaks in Venezuela and Brazil, where endemic transmission of MeV had been reintroduced. The emergence of COVID-19 and the implementation of lockdown measures were associated with a sharp decline in confirmed measles cases: 8734 in 2020, 722 in 2021, 169 in 2022, and 73 in 2023[5,6]. During that period, Brazil reported the last endemic case of measles in the Americas in 2022 and, in 2024, the elimination of measles in the region was reverified. Regarding the situation in 2025, between epidemiological week (EW) 1 and EW 24, 7150 measles cases have been confirmed, in Argentina (n = 34), Brazil (n = 5), Canada (n = 3391), Mexico (n = 2434; 1 death), the United States of America (n = 1210, including three deaths, two children and one adult, reported among the unvaccinated), the Caribbean (n = 28), Costa Rica (n = 1), Peru (n = 4) and Bolivia (n = 43)[4]. The overall risk of this event in the Americas, especially in countries with low vaccination coverage, is classified as ''High'' with a ''High'' confidence level based on available information.

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In Argentina, the latest cases of endemic measles occurred in 2000, and the country was subsequently declared measles-free. Between 2001 and 2008, no locally transmitted measles cases were detected in the country. Starting in 2009, imported and import-related measles cases began to be reported, with the largest outbreaks occurring in 2010 (17 cases), 2018 (14 cases), and between 2019 and 2020, when 179 cases of unknown origin and twenty imported or import-related cases were reported. The measles-free status was maintained following the successful control of the last major outbreak. The National Immunization Schedule includes the administration of the MMR vaccine at 12 months of age and again at 5 years of age. Data from Argentina reveal a steady decline in measles vaccination coverage, which has significantly increased the risk of virus reintroduction. Coverage for the first dose of the MMR vaccine in children under one year of age decreased from 86% in 2019 to 81.4% in 2023; the coverage of the second dose also decreased during the same period. This downward trend, further exacerbated by the impact of the COVID-19 pandemic, has kept vaccination rates well below the critical 95% threshold required for herd immunity, resulting in a growing pool of susceptible individuals.[2]

Until EW24 2025, Argentina reported 2383 notifications of febrile rash illness in the National Health Surveillance System. During this period, 34 cases of measles were confirmed nationwide: 13 cases were confirmed in the Autonomous City of Buenos Aires, 20 in the surrounding areas of Buenos Aires and 1 case in San Luis province[1]. Of the 34 confirmed cases, six were imported. Most of the cases registered were linked to an imported case identified in January: an unvaccinated 6-year-old girl, along with her family, with a travel history from Russia with stops in Vietnam, Dubai, and Rio de Janeiro. The detected virus belonged to genotype B3 DSID 9240 (according to WHO's MeaNS2 tool; https://who-gmrln.org/means2). So far, the epidemiological link between a few of these cases remains undefined. The remaining imported cases were detected: one of them in EW11 in an adult patient with a travel history to Thailand, where the detected virus was identified as genotype D8, MVs/Patan.IND/16.9 [D8] lineage, another in EW17 in a 8-month-old unvaccinated girl with a travel history to Chihuahua, Mexico, where the virus was identified as genotype D8, MVs/Ontario.CAN/47.24 [D8] lineage, and the last two imported cases were detected in May coming from England and belonged to genotype B3, MVs/Quetta.PAK/44.20 [B3] lineage. The Respiratory Viruses Service of INEI – ANLIS ''Dr. Carlos G. Malbrán'', the National Reference Laboratory of the Ministry of Health, PAHO/WHO Reference Laboratory, analyzed and finally confirmed all cases detected.

Following the recent cases detected in Argentina, in April 2025, the Ministry of Health launched a measles and rubella (MR) vaccination campaign in the Buenos Aires Metropolitan Area. The target population includes children aged 6–11 months (dose 0) and those aged 13 months to 4 years and 11 months (additional dose). Additionally, all children who receive the MR vaccine must complete their routine vaccination schedule at 12 months and 5 years of age, in accordance with the National Immunization Schedule. The campaign's goals are to protect at-risk populations, interrupt the chain of transmission, and prevent virus spread within the community[2].

The primary cause of the re-emergence of measles outbreaks, both regionally and globally, is the decline in vaccination coverage, which in many countries fails to reach the community immunity threshold of 95%. In contrast to many other RNA viruses, MeV exhibits remarkable genetic and antigenic stability, allowing the measles vaccine to maintain robust and long-lasting effectiveness against all circulating strains since its introduction in the 1960s.

Understanding the underlying causes of this decline in vaccination coverage is crucial to implement effective public health interventions, as it poses a significant challenge to the maintenance of measles elimination status in the Americas. Several factors have contributed to this trend, including the impact of the COVID-19 pandemic on routine immunization programs, structural barriers to healthcare access, and growing vaccine hesitancy fueled by misinformation.

Achieving $\geq$95% of vaccination coverage along with strengthening epidemiological surveillance is critical to interrupt measles transmission. Additionally, providing training to healthcare personnel to enable early detection, timely specimen collection, and prompt reporting to the health system is essential. Governments at the national, regional, and local levels, in collaboration with healthcare systems and active community participation, must make a significant effort to protect and preserve public health against this threat.

The main challenge ahead is to strengthen immunization programs and, most importantly, to restore public trust in vaccines. Even with safe and effective vaccines and a well-designed schedule – as in Argentina – it is not enough if coverage does not reach the entire population that needs to be vaccinated[3].

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