

Measles: What Goes Around Comes Around

2026 GVN Annual International
Scientific Meeting

March 4, 2026



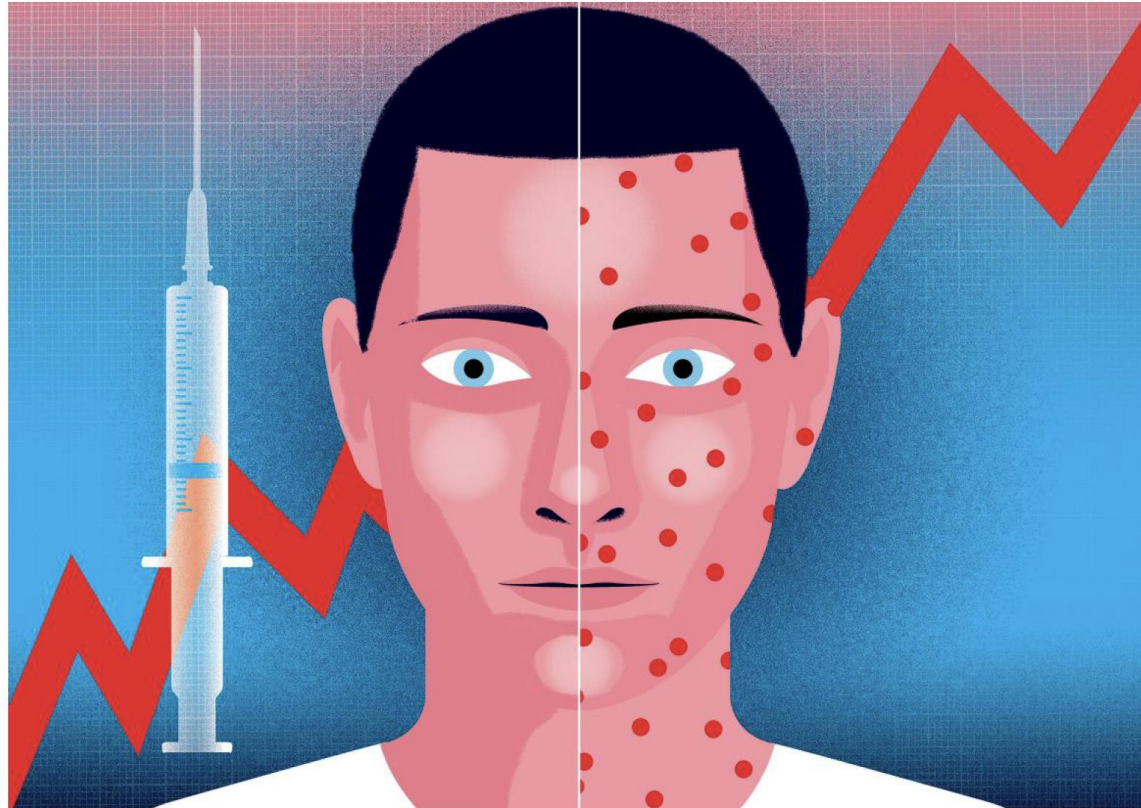
JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

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Measles: What Goes Around, Comes Around

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In Memoriam: Diane Edmund Griffin, MD, PhD, 1940–2024





“The simplest of all infectious diseases is measles.”

Dr. Kenneth Maxcy

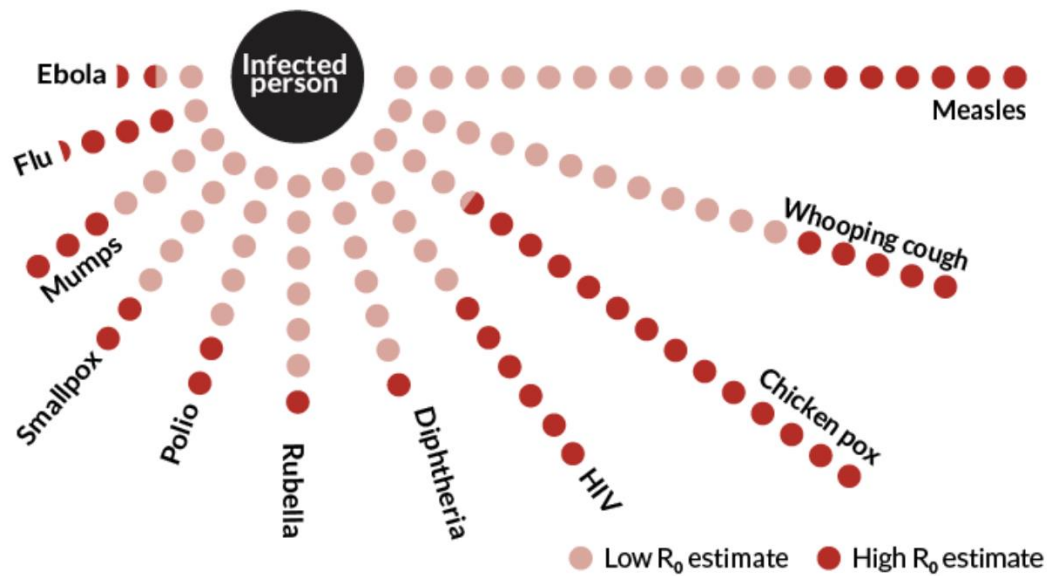
Second chair of the Department of Epidemiology
Johns Hopkins University School of Hygiene and Public Health
Viral and Rickettsial Infections of Man 1948



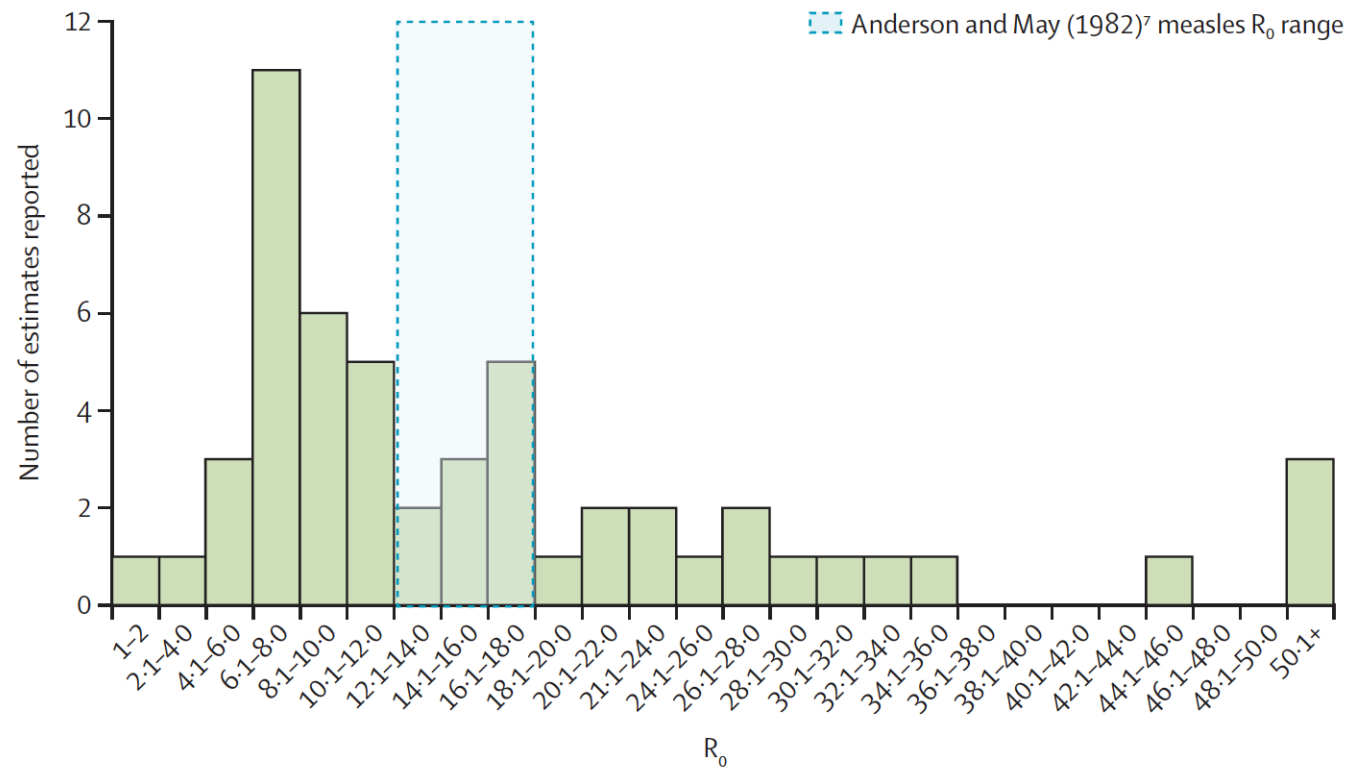
Five Facts About Measles and Measles Vaccines

Fact #1: Measles virus is highly contagious...but context matters

Basic reproduction number (R_0) range for selected infectious diseases



T. TIBBITTS

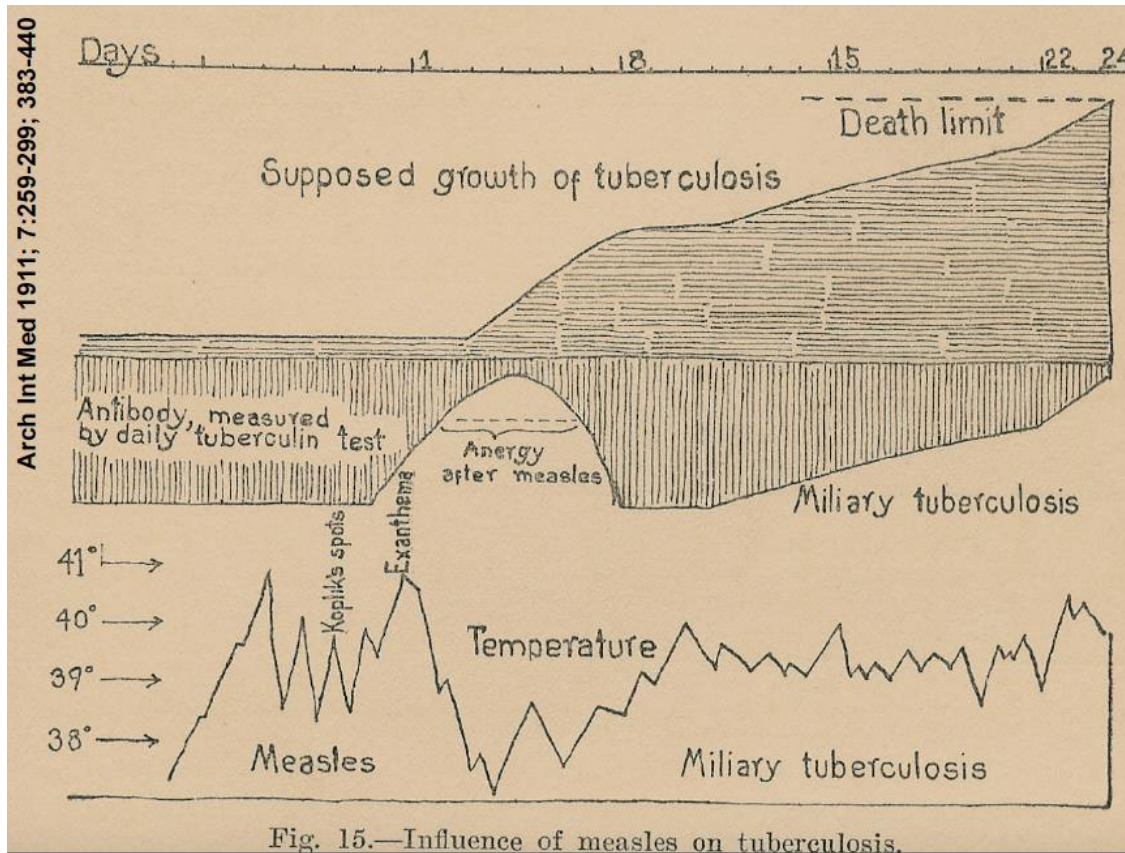


Guerra FM, Bolotin S, Lim G, Heffernan J, Deeks SL, Li Y, Crowcroft NS. **The basic reproduction number (R_0) of measles: a systematic review.** *Lancet Infect Dis* 2017;17:e420-e428.

<https://www.sciencenews.org/article/one-number-can-help-explain-why-measles-so-contagious>

Fact #2: Measles virus was the first immunosuppressive virus identified

Clemens von Pirquet



von Pirquet CE. Das Verhalten der kutanin Tuberkulinreaktion während der Masern. *Dtsch Med Wochenschr* 1908;34:1297-300.

VIRAL IMMUNOLOGY

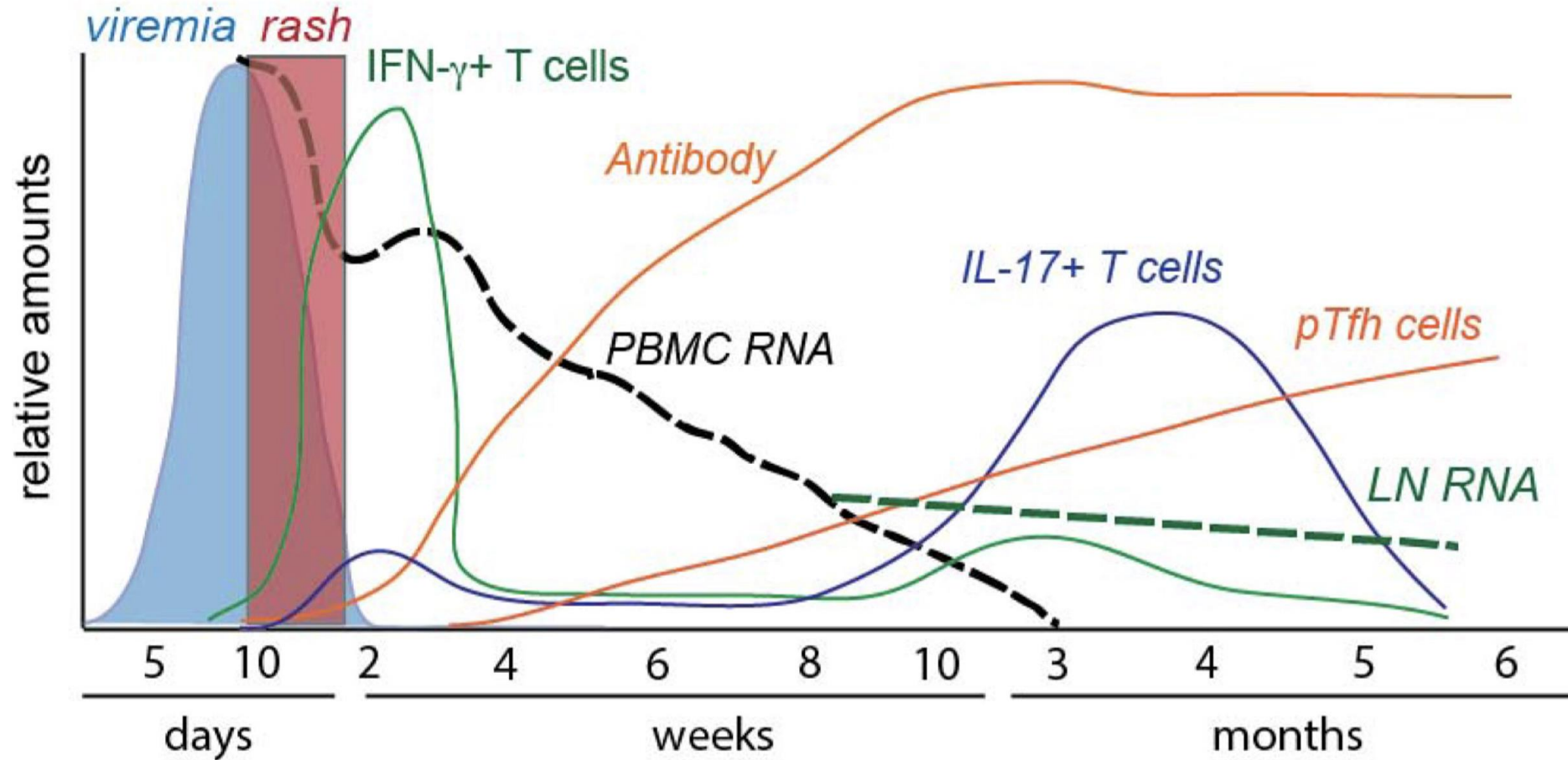
Measles virus infection diminishes preexisting antibodies that offer protection from other pathogens

Michael J. Mina^{1,2,3*†}, Tomasz Kula^{1,2}, Yumei Leng¹, Mamie Li², Rory D. de Vries⁴, Mikael Knip^{5,6}, Heli Siljander^{5,6}, Marian Rewers⁷, David F. Choy⁸, Mark S. Wilson⁸, H. Benjamin Larman⁹, Ashley N. Nelson^{10‡}, Diane E. Griffin¹⁰, Rik L. de Swart⁴, Stephen J. Elledge^{1,2,11†}

Measles virus is directly responsible for more than 100,000 deaths yearly. Epidemiological studies have associated measles with increased morbidity and mortality for years after infection, but the reasons why are poorly understood. Measles virus infects immune cells, causing acute immune suppression. To identify and quantify long-term effects of measles on the immune system, we used VirScan, an assay that tracks antibodies to thousands of pathogen epitopes in blood. We studied 77 unvaccinated children before and 2 months after natural measles virus infection. Measles caused elimination of 11 to 73% of the antibody repertoire across individuals. Recovery of antibodies was detected after natural reexposure to pathogens. Notably, these immune system effects were not observed in infants vaccinated against MMR (measles, mumps, and rubella), but were confirmed in measles-infected macaques. The reduction in humoral immune memory after measles infection generates potential vulnerability to future infections, underscoring the need for widespread vaccination.

Mina MJ, Kula T, Leng Y, Li M, de Vries RD, Knip M, Siljander H, Rewers M, Choy DF, Wilson MS, Larman HB, Nelson AN, Griffin DE, de Swart RL, Elledge SJ. **Measles virus infection diminishes preexisting antibodies that offer protection from other pathogens.** *Science*. 2019;366:599-606.

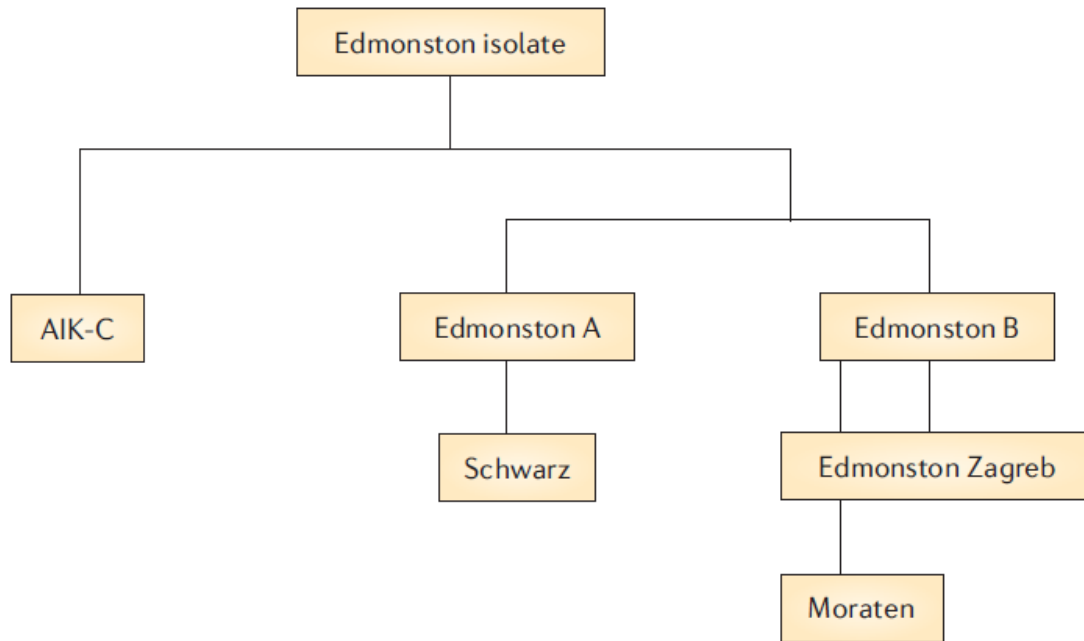
Fact #3: Measles virus RNA persists for months after acute infection



Fact #4: Measles vaccines remain effective after 70 years



John Enders, Thomas Peebles, David Edmonston



David (second from right) appeared on TV with the doctors who invented the vaccine once it was launched in 1963. (Supplied: David Edmonston)

<https://www.abc.net.au/news/2019-05-12/meet-the-man-whose-illness-led-to-the-measles-vaccine/11100052>

Fact #5: Measles vaccine is the most cost effective vaccine

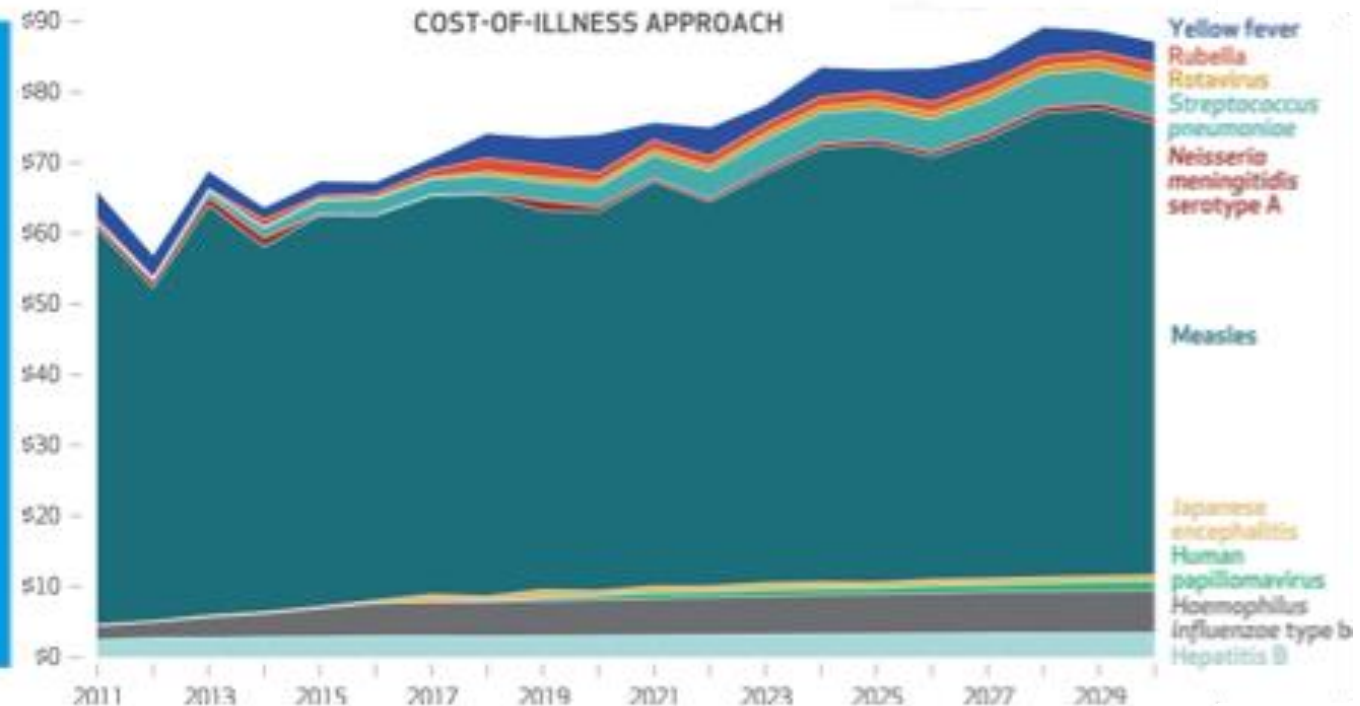
Measles Vaccine Dominates Global Return on Investment of Immunization

10 Pathogens In 94 Low- And Middle-Income Countries, 2011–30

So Yoon Sim et al 2020 <https://www.healthaffairs.org/doi/10.1377/hlthaff.2020.00103>



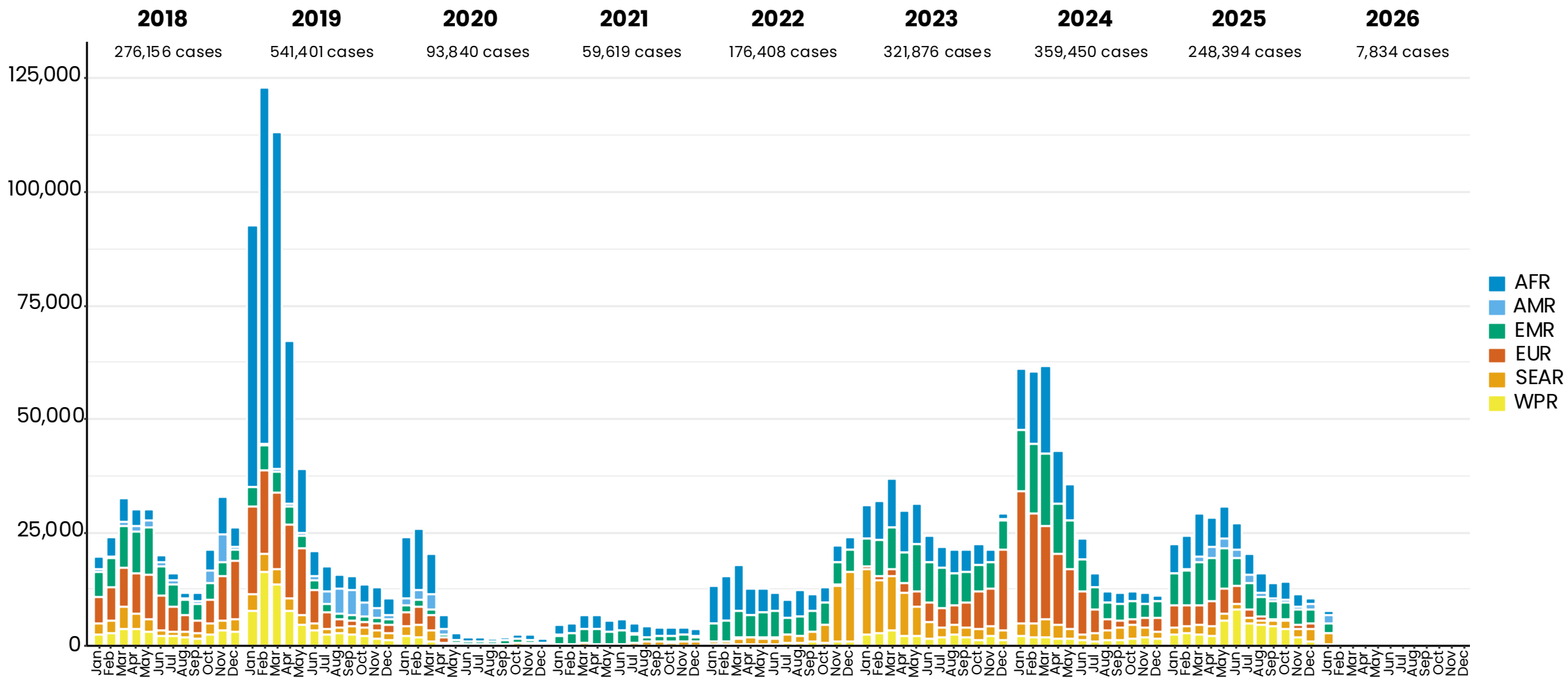
Across all countries and years measles accounts for **76.4%** benefits based on cost-of-illness, or **58.5%** benefits based on value-of-a-statistical-life analysis.





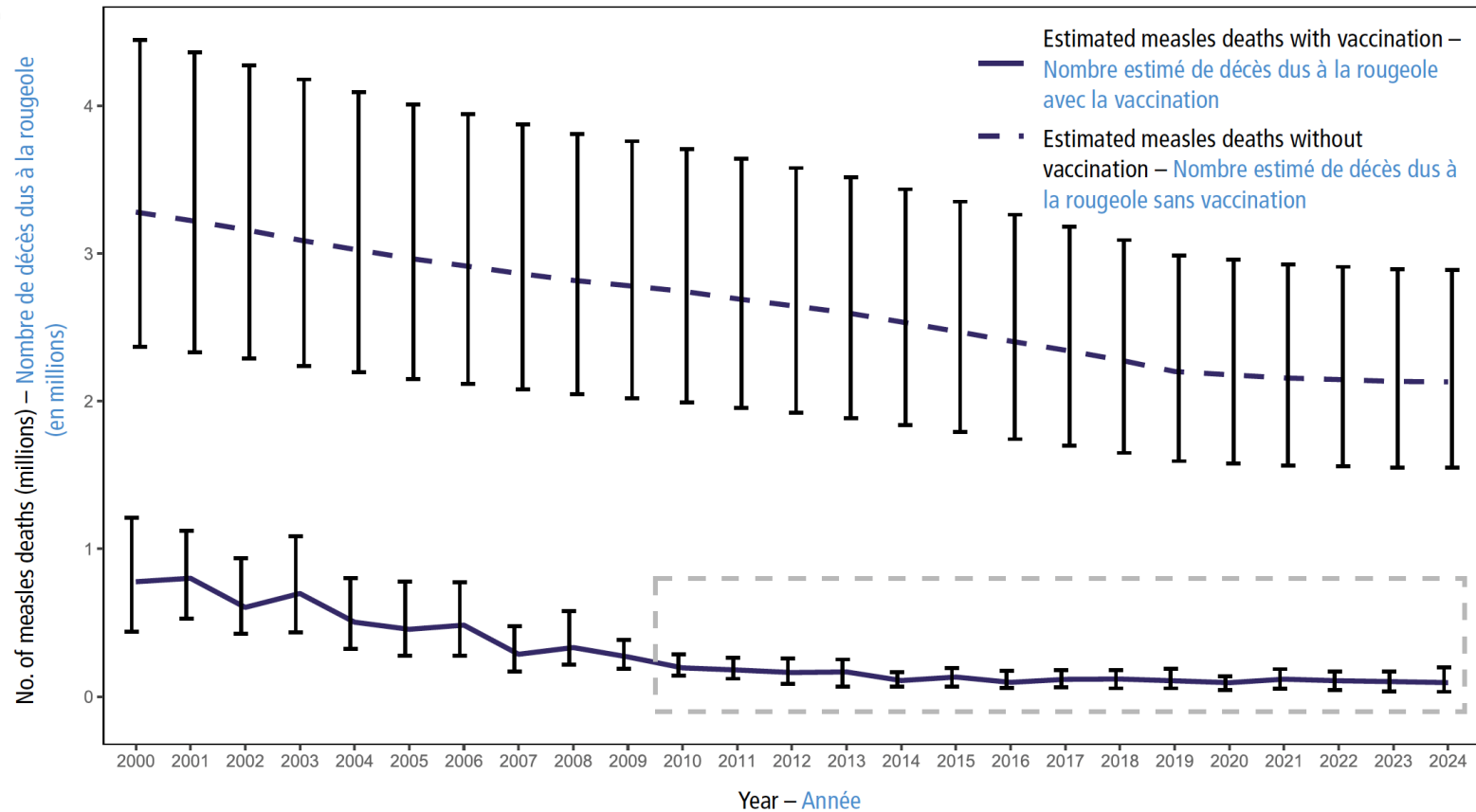
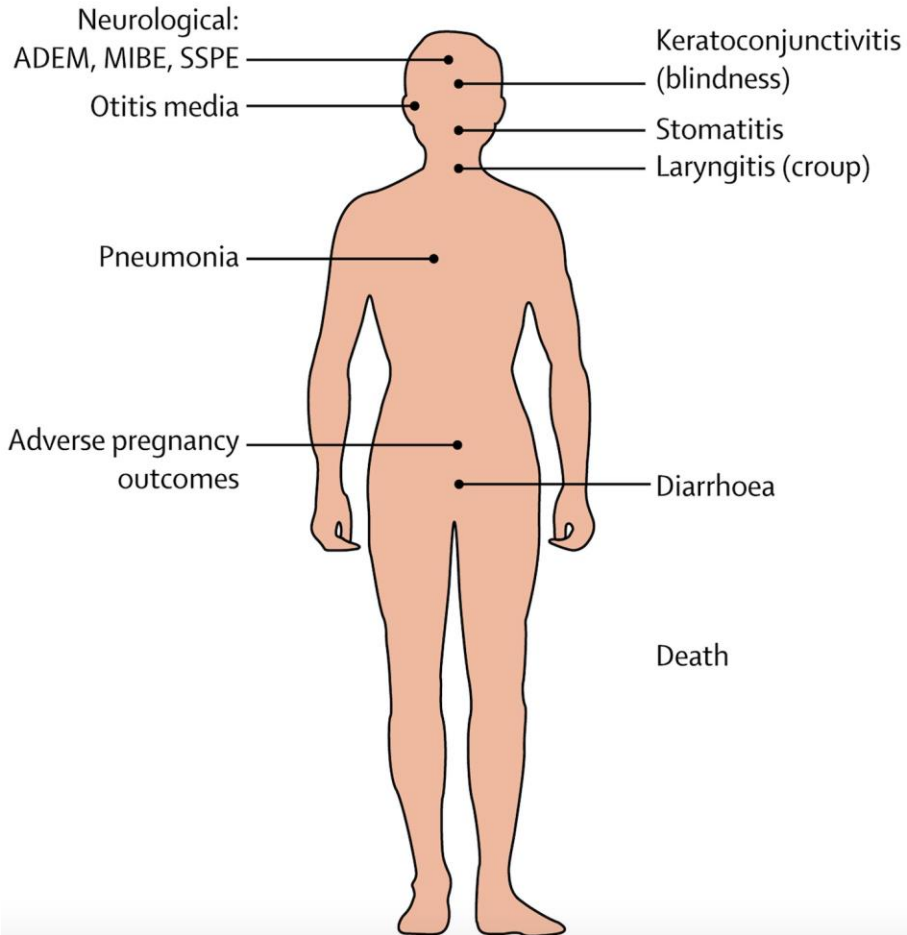
Global Measles Situation

Global reported measles cases decreased during the Covid pandemic – and are grossly underreported



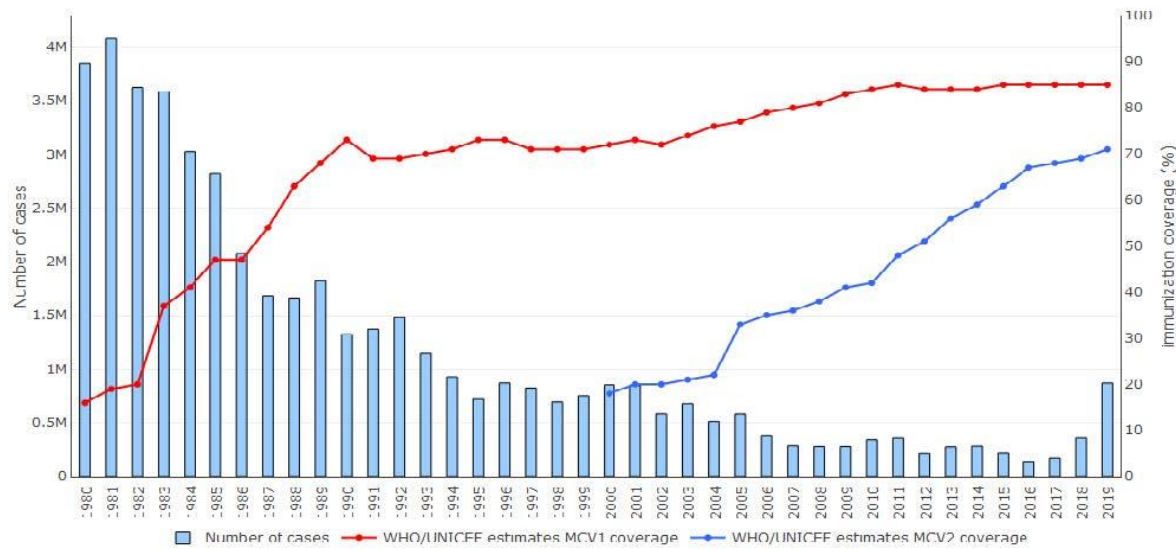
Based on data received 2026-02 - Data Source: IVB Database - This is surveillance data, hence for the last month(s), the data may be incomplete.

Modeled global measles deaths fell below 100,000 for the first time in 2024

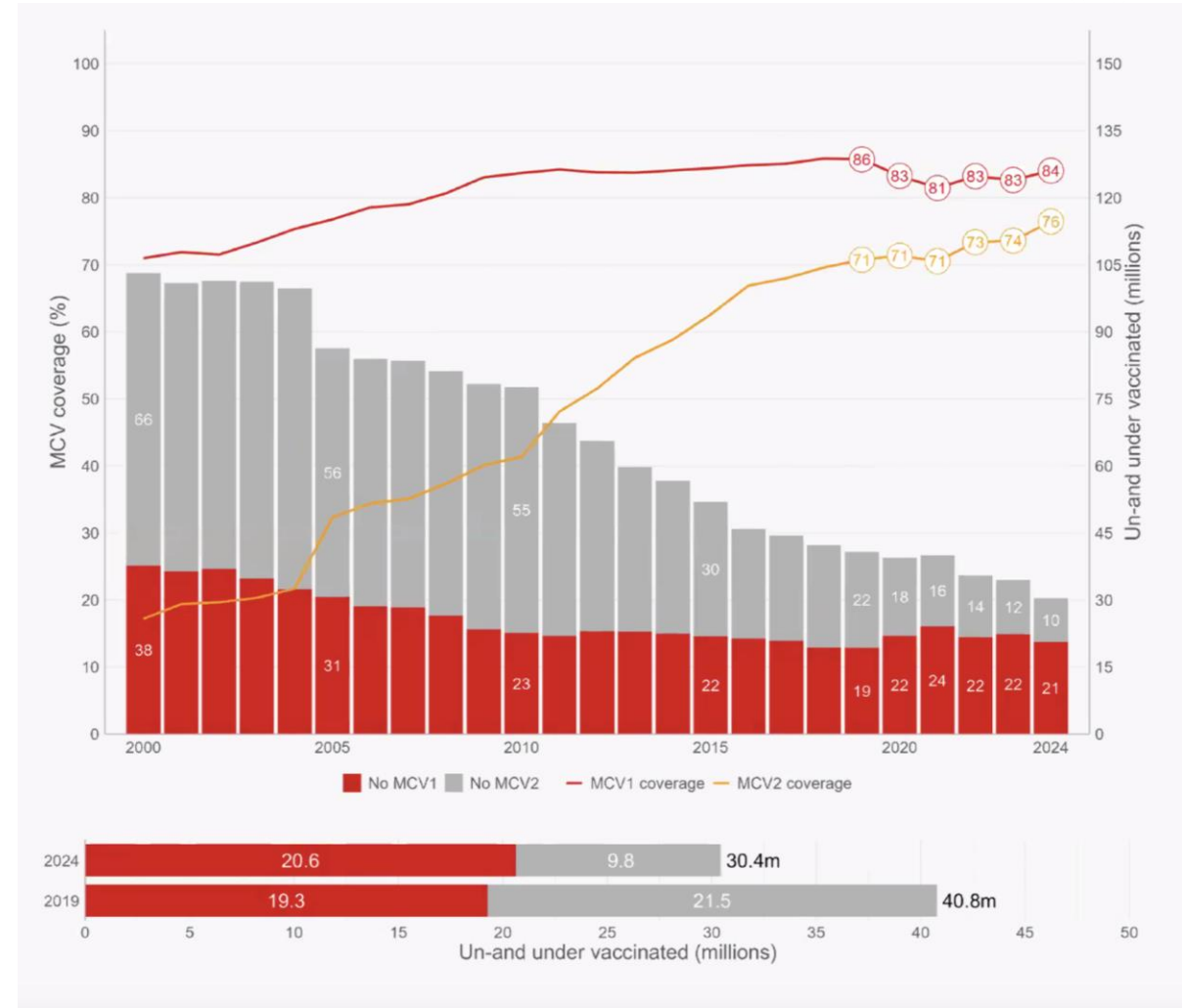


Antoni S, Ferrari MJ, Wimmer A, Nedelec Y, Steulet C, Gacic-Dobo M, Efe-Aluta O, Benassi V, Chang-Blanc D, Mulders MN, Crowcroft NS, Gurung S. **Progress towards measles elimination – worldwide, 2000–2024.** *Wkly Epi Rec* 2025;100:591–604.

Global measles vaccination coverage has stalled at 85% for 15 years



Plateau of MCV1 coverage

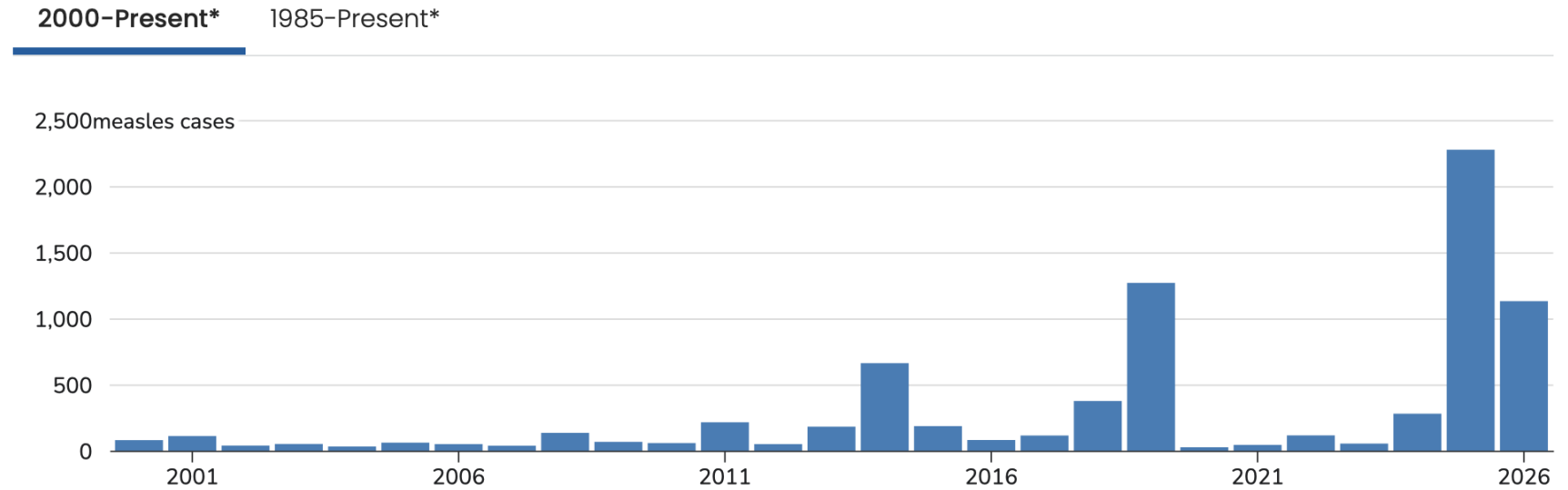


Measles in the United States

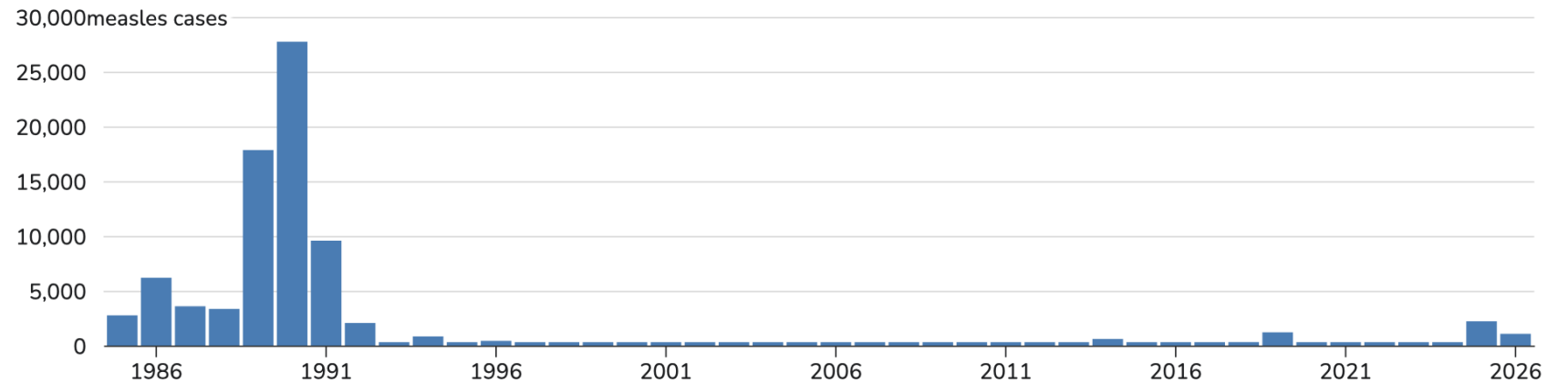
Measles Cases in the United States



2000 to February 26, 2026



1985 to February 26, 2026



Measles Cases in the United States

U.S. Cases

	2026 To date	2025 Full year
Total Cases	1136	2281
Age		
Under 5 years	278 (24%)	584 (26%)
5-19 years	653 (57%)	1012 (44%)
20+ years	198 (17%)	672 (29%)
Age unknown	7 (1%)	13 (1%)
Vaccination Status		
Unvaccinated or Unknown	92%	93%
One MMR dose	4%	3%
Two MMR doses	4%	4%

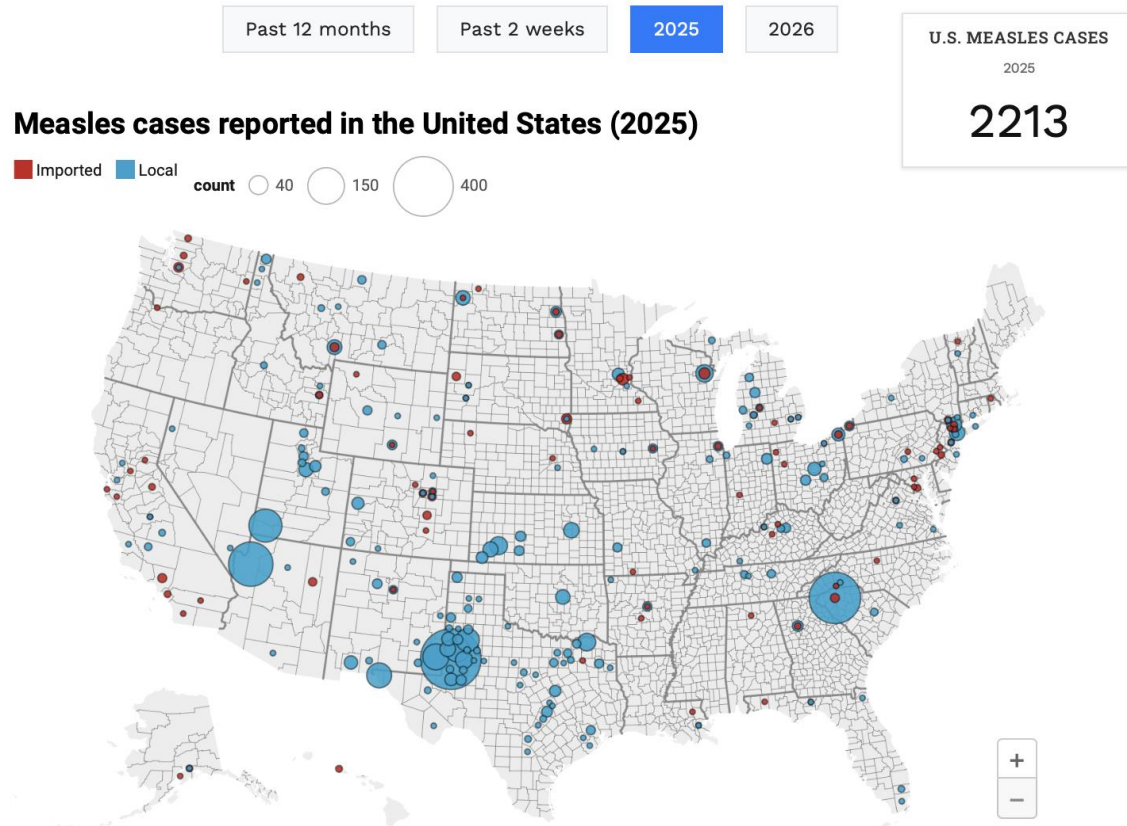
U.S. Hospitalizations

	2026	2025
Total Hospitalized	5% (58 of 1136 cases)	11% (242 of 2281 cases)
Percent of Age Group Hospitalized		
Under 5 years	7% (20 of 278)	18% (106 of 584)
5-19 years	3% (17 of 653)	6% (57 of 1012)
20+ years	10% (20 of 198)	12% (79 of 672)
Age unknown	14% (1 of 7)	0% (0 of 13)

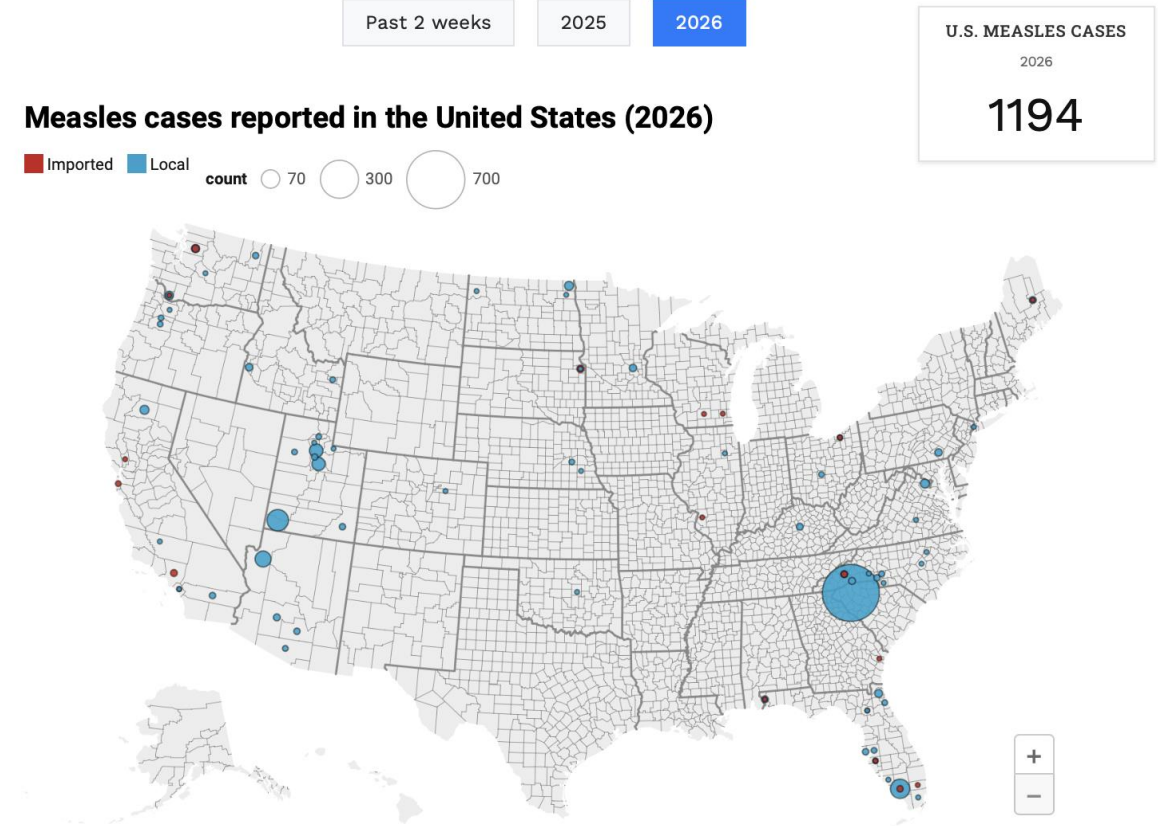
U.S. Deaths

	2026	2025
Total Deaths	0	3

Measles – United States 2025



Source: Johns Hopkins University • [Get the data](#) • [Download image](#) • [Download PDF](#) • [Download SVG](#)



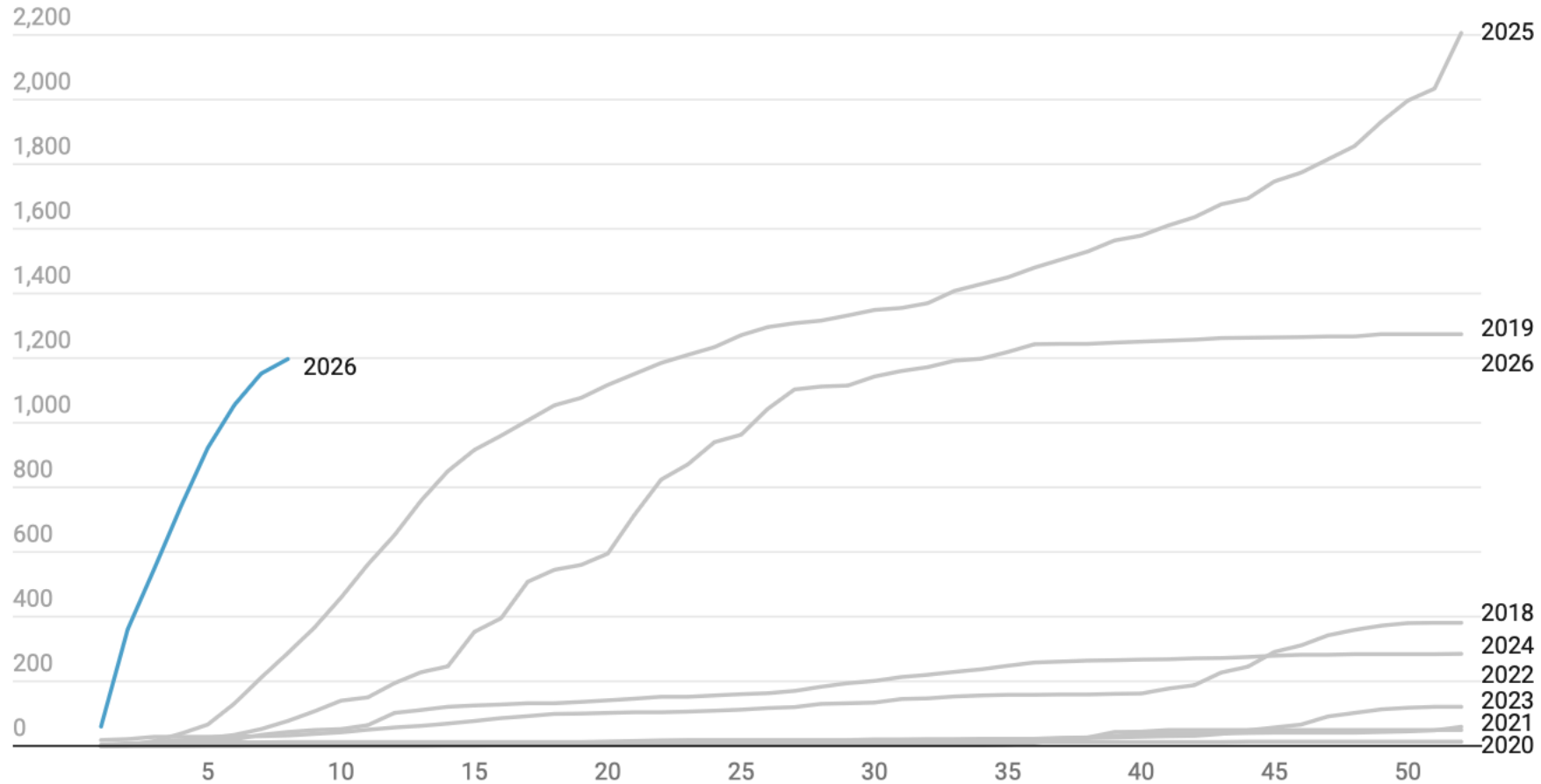
Source: Johns Hopkins University • [Get the data](#) • [Download image](#) • [Download PDF](#) • [Download SVG](#)

February 27, 2026

Measles – United States

February 27, 2026

Cumulative measles cases reported in the United States by year



Source: Johns Hopkins University • [Get the data](#) • [Download image](#)

Measles outbreaks in the United States are costly

Title: Quantifying the Cost of Measles Outbreak in the U.S. and How Costs Scale with Outbreak Size

Author: Salin Sriudomporn^{1,2}, Bryan Patenaude^{1,2}

Findings: A total of 120 articles were screened, 33 underwent full text review, and data were extracted from 19 articles, yielding outbreak relevant costs in 18 different states. Eight additional reports in the gray literature were identified. Outbreak size ranged from 1 to 802 cases. Average outbreak cost per case was estimated at \$43,203.65, while the average cost per contact was \$443.46. Average cost per case varied from \$33,415.75 from the medical provider perspective to \$58,591.50 when including public health response costs. The incremental cost per case was estimated at \$16,197.13 per additional measles case, after accounting for the fixed costs of initiating a public health response.



Measles Elimination



NATURE BRIEFING | 11 November 2025

Daily briefing: The Americas have lost their measles elimination status

A year-long outbreak of measles in Canada negates the country's disease-free status. Plus, the benefits of being multilingual and computers that run on human brains.

Measles and Rubella Elimination Regional Monitoring and Re-Verification Commission

Measles elimination status in the United States and Mexico



16 Jan 2026



Washington, D.C., 16 January 2026 (PAHO) — The Pan American Health Organization (PAHO) Regional Monitoring and Re-Verification Commission for Measles, Rubella, and Congenital Rubella Syndrome (RVC) has invited the United States and Mexico to meet virtually on April 13th, 2026, to review their measles elimination status.

The meeting follows measles outbreaks reported in the United States beginning on January 20th, 2025, and in Mexico beginning on February 1st, 2025.

PAHO will decide the U.S. has lost its elimination status if the following condition is met: **There is a chain of measles virus transmission of the same genotype and lineage that continues uninterrupted for 12 months or more within the country.**

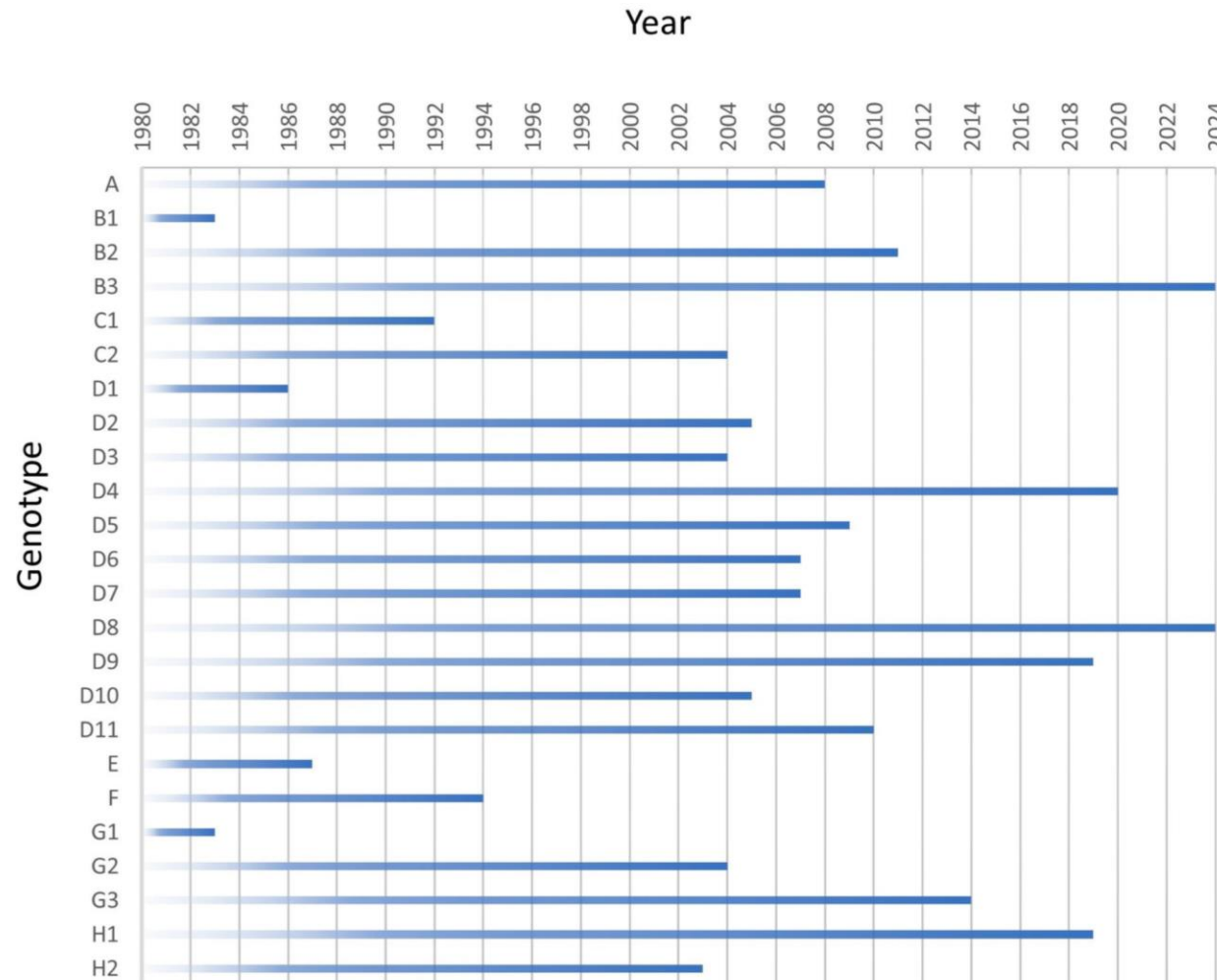
Genomic Analysis: Molecular evidence is used to determine if cases are part of the same ongoing chain or are separate, newly introduced infections from abroad.

Surveillance Quality: PAHO assesses if the U.S. has "high-quality surveillance" capable of detecting and investigating all suspected cases quickly.

Vaccination Coverage: The commission reviews national and sub-national immunization data, specifically looking for gaps where the virus could circulate undetected.

Outbreak Response Capacity: Evidence of the country's ability (or failure) to rapidly contain the spread of the virus once it is

Only two measles virus genotypes are currently circulating



Threats to measles control and elimination

Increases in vaccine-preventable disease outbreaks threaten years of progress, warn WHO, UNICEF, Gavi

Agencies call for sustained investments in immunization efforts amidst looming funding cuts

24 April 2025

GENEVA/NEW YORK, 24 April 2025 – Immunization efforts are under growing threat as misinformation, population growth, humanitarian crises, and funding cuts jeopardize progress and leave millions of children, adolescents, and adults at risk, warn WHO, UNICEF, and Gavi during World Immunization Week, 24-30 April.

Outbreaks of vaccine-preventable diseases such as measles, meningitis, and yellow fever are rising globally, and diseases like diphtheria, which have long been held at bay or virtually disappeared in many countries, are at risk of re-emerging. In response, the agencies are calling for urgent and sustained political attention and investment to strengthen immunization programmes and protect significant progress achieved in reducing child mortality over the past 50 years.

<https://www.unicef.org/lac/en/press-releases/increases-vaccine-preventable-disease-outbreaks-threaten-years-progress-amidst-funding-cuts>

President Donald Trump

Trump first brought up the idea of splitting the MMR vaccine during his news conference on autism last month, which was primarily focused on Tylenol, despite no evidence that the pain reliever and fever reducer causes autism.

"The MMR, I think, should be taken separately. This is based on what I feel," Trump said at the time.

"It seems to be that when you mix them, there could be a problem," the president continued, without identifying what that problem might be. "So there's no downside in taking them separately. In fact, they think it's better, so let it be separate."

Acting CDC Director Jim O'Neill

"I call on vaccine manufacturers to develop safe monovalent vaccines to replace the combined MMR and 'break up the MMR shot into three total separate shots,'" Jim O'Neill, who also serves as deputy secretary of the US

Department of Health and Human Services, wrote in a [post](#) on X on Monday. He quoted from a September 26 [post](#) by President Donald Trump.

Kennedy Allies Target States to Overturn Vaccine Mandates for Schoolchildren

Proponents of vaccines warn that the efforts will further dismantle the immunization infrastructure and lead to more outbreaks of disease.



By [Christina Jewett](#)

Feb. 13, 2026

Longtime allies of Robert F. Kennedy Jr., the nation's health secretary, have launched a new effort to repeal laws that for decades have required children to be vaccinated against measles, polio and other diseases before they enter day care or kindergarten.

<https://www.nytimes.com/2026/02/13/health/rfk-school-vaccine-mandates.html>



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