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The 2025-2026 US Measles Resurgence: Why the Virus is Back and Spreading

Biology * Public Health * Epidemiology

Introduction: Erosion of Domestic Measles Elimination

In 2000, the United States eliminated endemic measles -- a public health milestone achieved through widespread two-dose measles, mumps, and rubella (MMR) vaccination.[1][2] Because measles remains endemic globally (causing 10.3 million cases in 2023 after pandemic immunization disruptions), importations into under-vaccinated pockets pose a continuous threat.[3][4] Surpassing the 2014 (649 cases) and 2019 (1,274 cases) outbreaks, epidemiological surveillance across 2025 and early 2026 documents the largest U.S. resurgence since 1992.[2][5]

Measles exhibits a basic reproduction number (R0) of 12 to 18 and remains infectious in airborne aerosols for up to two hours.[1][5] Under Kermack-McKendrick compartmental dynamics, preventing sustained transmission requires 93 to 95 percent population immunity.[1] In 2025, a West Texas cluster expanded nationwide to 2,281 confirmed cases across 45 jurisdictions, followed by 982 additional cases by mid-February 2026, driven by declining MMR coverage, federal schedule changes, and measles-induced immune amnesia.[6][7]

Epidemiological Landscape and Geographic Epicenters

Following 285 cases across 16 outbreaks in 2024, U.S. measles incidence surged in 2025 to 2,281 cases across 49 outbreaks (89 percent outbreak-associated), with 982 more cases logged across 26 jurisdictions by February 19, 2026.[5][6] Children and adolescents bore the brunt: in 2025, 26 percent of cases occurred in children under five, 44 percent in ages 5-19, and 29 percent in adults over 20; in early 2026, 58 percent concentrated in ages 5-19.[6] In 2025, 246 patients (11 percent overall; 18 percent of children under five) required hospitalization, and three unvaccinated individuals died (two Texas children and one New Mexico adult) -- the first U.S. measles fatalities in over a decade.[8][2][6] Across 2025-2026, 93 to 94 percent of cases were unvaccinated or status-unknown.[6]

| Epidemiological & Clinical Metric | | 2024 (Full Year) | | 2025 (Full Year) | | 2026 (Through Feb 19) |

| Total Confirmed Cases | | 285 | | 2,281 | | 982 |

| Recognized Outbreaks | | 16 | | 49 | | 7 (New in 2026) |

| Unvaccinated / Unknown Status | | Data Insufficient | | 93% | | 94% |

| Cases Aged <5 / 5-19 / 20+ Years | | -- | | 26% / 44% / 29% | | 25% / 58% / 15% |

| Overall Hospitalizations (<5 yr Rate) | | -- | | 11% (18% in <5 yr) | | 3% (6% in <5 yr) |

| Confirmed Fatalities | | 0 | | 3 | | 0 |

Transmission radiated from three main epicenters:

* Southwest Cluster (Texas & New Mexico): Gaines County recorded 413 of Texas's 803 cases in 2025, centered in a Low German-speaking Old Colony Mennonite community where homeschooling and non-accredited private schools bypassed vaccine mandates.[3][2] The cluster drove 92.6 percent of Texas cases, spread into Lea County, New Mexico (100 cases), and seeded an outbreak in Chihuahua, Mexico.[2][9] Public health teams in Lubbock paired evening MMR clinics with outreach countering misinformation that promoted cod liver oil and vitamin A as prophylactic substitutes.[7][9]

* South Carolina Surge: Sparked in July 2025, transmission in Spartanburg and Greenville public schools grew from 330 cases in 2025 to 634 additional cases by mid-February 2026 (964 total; 97 percent unvaccinated).[6][10]

* Utah & Western Outbreaks: Utah logged 300 cumulative cases (194 in Southwest Utah; 68 per 100,000 incidence; 25 hospitalizations) alongside Arizona (269 cumulative cases).[6]

Sociological Drivers and the 2026 Federal Schedule Overhaul

During the 2024-2025 school year, national kindergarten MMR coverage fell to 92.5 percent, ranging from 98.2 percent in Connecticut and Virginia to 78.5 percent in Idaho, with only ten states and D.C. meeting the 95 percent threshold.[1][11] Non-medical exemptions reached a record 3.4 percent (~138,000 kindergarteners) amid exemption-expansion bills in 15 states.[1][12]

In January 2026, HHS and the CDC overhauled the U.S. childhood immunization schedule, cutting universally recommended vaccines from 17 to 11.[7][13] While MMR remained routine, Hepatitis A, Hepatitis B, Meningococcal (MenACWY/MenB), Rotavirus, Influenza, and COVID-19 vaccines were downgraded to high-risk or shared decision-making tiers.[7][13]

| Policy Domain | | Pre-2026 Federal Guidelines | | January 2026 Federal Overhaul | | AAP & State Alliance Response |

| Universal Routine Vaccines | | 17 universally recommended | | Reduced to 11 routine vaccines | | Maintained full 17-vaccine schedule |

| Measles, Mumps, Rubella (MMR) | | Routine for all children | | Routine for all children | | Routine for all children |

| Hepatitis A, Hepatitis B & Meningococcal | | Routine for all children | | High-Risk / Shared Decision-Making | | Universal routine including Hep B birth dose |

| Rotavirus, Influenza & COVID-19 | | Routine for all children | | Shared Clinical Decision-Making | | Universal routine plus nirsevimab RSV antibody |

The American Academy of Pediatrics (AAP) and Infectious Diseases Society of America condemned the rollback -- noting the prior schedule prevented 1.1 million deaths over 30 years -- and issued an independent schedule preserving universal immunizations and nirsevimab RSV prophylaxis.[7][14][13] Over 25 states rejected the federal changes, forming the West Coast Health Alliance and Northeast Public Health

Collaborative to enforce AAP standards, while states like Idaho and Florida moved to weaken mandates.[7]

Viral Genomics, N-450 Surveillance, and Antigenic Stability

Though serologically monotypic, the measles genome comprises 24 genotypes tracked via the 450 nucleotides encoding the C-terminal 150 amino acids of the nucleoprotein (N-450).[9][15][16] Genotype D8 (sequence ID 9171 in 88 percent of detections) dominated 2025-2026 U.S. transmission alongside minor B3 chains (9 percent).[9][17][18] Among 208 specimens from Texas, New Mexico, and Kansas, all were genotype D8 and 94 percent shared an identical N-450 sequence (12 differed by 1 nucleotide), confirming sustained domestic transmission from a single introduction.[9][16]

Live-attenuated genotype A vaccines remain fully effective against D8 and B3 strains because surface hemagglutinin and fusion glycoproteins are highly conserved.[19][15][20] However, viral evolution can affect diagnostics: a 2025 Ontario case documented a vaccine-strain point mutation that caused a false-negative polymerase chain reaction (PCR) assay, highlighting the value of whole-genome sequencing across the MF non-coding region.[15][21]

Pathogenesis: CD150 Tropism and Measles-Induced Immune Amnesia

Beyond acute pneumonia and encephalitis, measles causes severe immune amnesia.[5][22] Inhaled virus infects alveolar macrophages and dendritic cells via the SLAM/CD150 receptor, depositing its genome into the cytoplasm and trafficking to lymph nodes before exiting via epithelial Nectin-4.[23][24] In lymphoid tissues, viral replication within CD150-expressing memory B and T lymphocytes triggers apoptosis, erasing 20 to 70 percent of pre-existing antibody diversity.[22][25] While measles-specific lymphocytes repopulate the host, prior memory against other pathogens is lost.[22][23][25]

Historical cohort analyses by Dr. Michael Mina show this erasure creates a 2-to-3-year "shadow of mortality" accounting for nearly half of non-measles childhood infectious deaths, corroborated by ferret studies showing loss of prior influenza vaccine immunity.[8][25][26][27] Recovering patients often require revaccination with routine childhood antigens.[27]

Conclusion: Restoring the Immunological Shield

The 2025-2026 U.S. measles resurgence illustrates how rapidly a virus with an R0 of 12 to 18 exploits declining MMR coverage and rising exemptions. Combined with federal policy fragmentation and CD150-mediated immune amnesia among thousands of survivors, preserving domestic elimination requires unified evidence-based immunization standards, whole-genome surveillance, and targeted community vaccination.

Updates... (Nov 22, 2026): According to U.S. Centers for Disease Control and Prevention surveillance through November 19, 2026, full-year 2025 confirmed cases finalized at 2,289 across 48 outbreaks while 2026 cases reached 5,838 (96 percent outbreak-associated across 43 new 2026 outbreaks), the highest U.S. annual total since 1991.[6] On November 17, 2026, following the November 10-13 meeting of its

Regional Monitoring and Re-Verification Commission, the Pan American Health Organization (PAHO) formally announced that the United States -- alongside Bolivia and Mexico -- lost its measles elimination status after continuous transmission persisted beyond 12 months from January 20, 2025.[28] Added verified publication dates to previously undated Refs. 10 (ArcGIS Dashboard, Feb 27, 2025; updated Oct 2, 2026), 11 (CDC SchoolVaxView, Sep 16, 2024; updated Aug 17, 2026), 22 (UCLA Health, Apr 4, 2025), and 26 (CU Anschutz, Apr 1, 2025), removed the access-date clause on Ref. 10, and refined exact publication dates across all 28 references.

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