Canada's Measles Resurgence

A public health system under strain

Recurring measles outbreaks are testing Canada's public health system and laboratories, straining resources at a time when vaccination rates have fallen and misinformation continues to spread. For laboratory professionals, the resurgence has meant rising diagnostic demand and workforce stress, and renewed pressure on systems that once helped keep the disease at bay.

The nadir came last November, when the Pan American Health Organization (PAHO), a specialized United Nations health agency, revoked Canada's measles elimination status, which it had held since 1998. This loss came after more than a year of uninterrupted measles transmission beginning in October 2024, when an international traveller attended a Mennonite wedding in New Brunswick. Since then, cases have been reported in every province, except for Newfoundland and Labrador, as well as Nunavut and Yukon.

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It's sad to see what can happen from a public health perspective... when people become complacent and think, I don't need it [a measles vaccination] because we haven't had this disease here," says Mazzulli.

After a dramatic rise to 5,425 measles cases in 2025[1] — compared with just 157 cases[2] between 2018 and 2023 — numbers have now fallen, with only 19 reported in the last full week of the year. To regain measles elimination status, Canada must be free of continuous transmission of the same measles virus strain for at least 12 months, says Dr. Eleni Galanis, Director General of the Centre for Emerging and Respiratory Infections and Pandemic Preparedness at the Public Health Agency of Canada (PHAC).

Measles, which is spread through airborne transmission, can cause severe illness in a small proportion of patients, particularly children and people who are immunocompromised, Galanis says. Complications include severe pneumonia and encephalitis as well as infection during pregnancy that can harm both the pregnant person and the fetus. In rare cases, measles can be fatal,[3] she adds. (In 2025, two premature babies died from measles in Canada[1]).

Despite its potential severity and high transmissibility — more than 90 per cent of susceptible individuals exposed to the virus will become infected — many people still view measles as a harmless childhood infection, says Dr. Tony Mazzulli, MD, FRCPC, FACP, microbiologist and infectious diseases specialist for Sinai Health/University Health Network in Toronto. Compared to COVID-19, which is most likely spread through infectious droplets, measles is "miles ahead" in contagiousness, he says. Susceptible individuals may only need to be in the same room as an infected person for 10 to 15 minutes to acquire the virus and develop clinical measles, while for those in reasonably close contact with a person with COVID-19, the risk of transmission is closer to 5 to 15 per cent, he says. According to the "Global measles surveillance: trends, challenges, and implications for public health interventions"[4] article, edited by Maria Chironna, a single individual with measles can infect 12 to 18 people in a fully susceptible population during typical social interactions.

Eleni Galanis

Tony Mazzulli

James Talbot

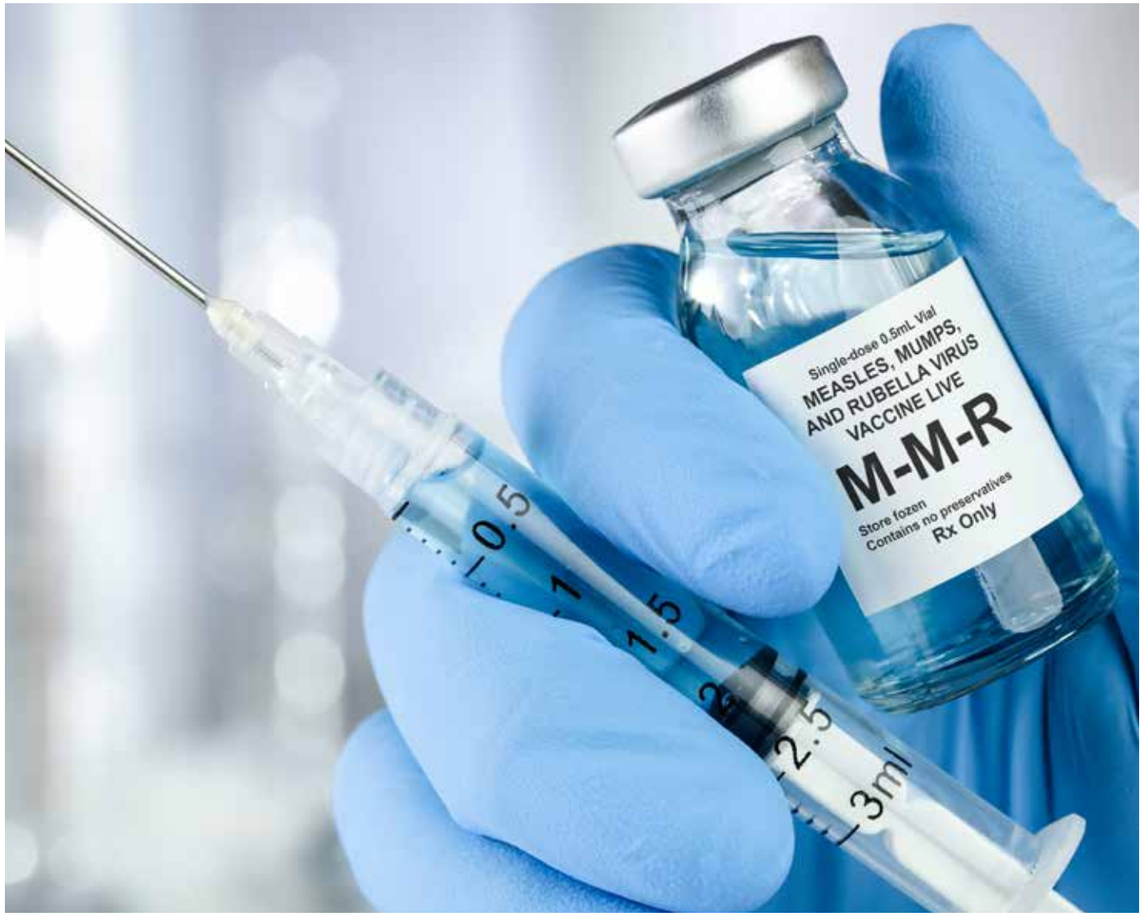
Declining immunization: The core driver

The former Chief Medical Officer of Health (CMOH) for both Alberta and Nunavut, Dr. James Talbot, BSc, MD, PhD, has been outspoken about his concerns about the outbreaks, particularly in Alberta and Ontario, which he calls "the two worst offenders." Virtually all the territories and the other provinces had a fraction of the cases of those two provinces, he says. As of July 2025, the national incidence reached 99 cases per million population, with Alberta reporting 262 cases per million and Ontario 152 cases, according to The Lancet.[5]

The primary driver of the recent measles outbreaks is declining immunization coverage, which has increased the number of susceptible individuals, making transmission more likely, says Talbot, an adjunct professor at the University of Alberta's School of Public Health. Vaccination rates were already falling before the COVID-19 pandemic and declined further when public health systems were diverted to emergency response, he adds. According to Alberta health analytics,[6] in 2024, only 68 per cent of children in the province aged two and 72 per cent aged seven had received two measles doses.

Vaccination remains the most effective tool for both preventing and controlling measles, with one dose providing 95 per cent protection, and two doses, 99 per cent, according to Galanis. Sustained transmission can only be interrupted through high levels of population immunity, generally above 90 per cent coverage, adds Mazzulli. In addition to increasing immunization rates, Talbot says a second key strategy for controlling measles outbreaks is rapid case identification, testing of contacts, and ensuring infected people remain in isolation until they are no longer infectious.

Misinformation, disinformation and malinformation (MDM) have further complicated outbreak control. False claims about COVID-19 vaccines circulating on social media have spilled over to measles, despite decades of evidence supporting the vaccine's safety and effectiveness, says Mazzulli, who is also a professor in the Department of Laboratory Medicine at the University of Toronto. "This vaccine has been around for over 50 years, this vaccine has been highly effective, and that's why we were able to be considered as measles-free for so many years."



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The first thing we need to do to contain the spread of measles is to educate Canadians about the disease, he says. "They need to understand the implications of measles, that this is not just one of those mild childhood diseases. Anybody can get it. It's more severe if you're older when you get it, and it is preventable." He points out that health professionals, including medical laboratory professionals, can play a critical role in countering MDM as the public often views them as educated, knowledgeable and trustworthy sources. Talbot echoes this view. "We need people who are trusted sources. Who are competing on social media to get the truth out so that we don't leave confusion in the minds of people... about the effectiveness of vaccines, the safety of vaccines, the importance of them in preventing serious lifelong disability and death." Lab professionals have been trained to understand the importance of scientific evidence and how to judge the reliability of the evidence, he adds.

Public health infrastructure under strain

Talbot argues that rebuilding immunization rates must go hand in hand with strengthening public health infrastructure, particularly in Ontario and Alberta. In the latter province, political interference weakened the system, he says. The government has been "very heavily influenced by a radical fringe of Albertans, who are anti-vaccine and anti-public health, and who are in fact anti-science." In recent years, he notes, Alberta lacked a CMOH with formal public health training and experience in things like measles outbreak investigation and control and immunization programs until late 2025.

"When your leadership doesn't have the experience, doesn't have the training, doesn't have the knowledge that it needs, it's rare to find the system operating at its optimum."

He points out that measles outbreaks were less severe in the United States, where public health leadership and medical officers largely remain professionally trained, experienced and independent. Despite mixed messages about measles vaccines from Robert F. Kennedy Jr., who now leads the U.S. Department of Health and Human Services and has a history of vaccine skepticism, the country has controlled measles more effectively than Canada, Talbot says. (The United States, with more than eight times Canada's population, reported fewer than half as many measles cases [2,144[7]] in 2025.) Although Talbot acknowledges there may have been some under reporting in the U.S., he doesn't believe this was extensive. It's less likely with a disease like measles, because the rash is so distinctive, as opposed to COVID-19 where the cough symptoms can be mimicked by bacteria and virus, he adds.

Talbot notes that chronic underfunding has left public health, including public health laboratories, ill-prepared to deal with infectious disease outbreaks. "Acute care is more newsworthy, as it's easier to talk about the number of measles cases flooding into hospitals than to talk about strategies to stop that." He is certain the measles outbreaks severely strained Alberta and Ontario's laboratory systems, as the workload was high and the public health workforce has shrunk since the pandemic.

He stresses that governments must implement a five-year plan to restore childhood immunization rates to 90–95 per cent, backed by a recruitment and retention strategy informed by accurate workforce data. Going forward, he says, it is "absolutely vital" that we have enough properly trained and qualified medical lab professionals, particularly in public health. Beyond staffing, he contends that public health laboratories also require adequate computing capacity, new reagents and modern automated technologies to withstand future pressures.

Community engagement and tailored strategies

In communities with historically low vaccination rates, public health agencies work with provincial, territorial and local partners to build trust and develop culturally appropriate strategies to reduce transmission, says Galanis. In Ontario, some Mennonite, Amish and other Anabaptist communities were disproportionately affected by measles because of under-immunization and exposure to the virus, according to the province's Chief Medical Officer of Health, Dr. Kieran Moore, as reported by The National Post.[8] Although public health has succeeded in the past in raising vaccination rates in hard-to-reach communities, Talbot notes that the work requires sustained engagement.

Immunization efforts can be reinforced by making vaccines more convenient and accessible, Talbot and Galanis say. They point to such initiatives as pharmacy-based delivery, extended clinic hours, services in multiple languages and childcare for parents. Talbot says several approaches were experimented during the pandemic to help people cope. In the Northwest Territories (NWT), for example, communities organized grocery shopping and doorstep delivery for Elders along with porch visits to maintain social connection, says Talbot, who filled in for medical officers of health in NWT and the Yukon during the pandemic. "There's no shortage of innovative solutions out there," he says, emphasizing that the real challenge is making sure "we have the will" to restore vaccination rates and strengthen public health.

Sustaining control

In a highly connected world, an infectious disease such as measles does not stop at the community level. As Mazzulli points out, changes to U.S. public health leadership, including weakened capacity at the Centers for Disease Control and Prevention (CDC), also have implications for Canada.

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Any increased measles activity south of the border poses a direct risk due to frequent cross-border travel, he notes. He adds that the CDC historically played a central role in tracking global measles cases and identifying outbreak hotspots, meaning that diminished global surveillance undermines early warning systems and increases the likelihood that outbreaks will spread undetected.

In Canada, surveillance of measles remains strong, says Mazzulli. PAHO has recommended, however, that Canada strengthen vaccine coverage in areas with low uptake and improve data collection to better identify high-risk pockets, says Galanis. Enhanced monitoring of suspected cases based on clinical presentation or travel history, rather than laboratory confirmation alone, is also critical.

Ultimately, even the strongest surveillance systems cannot compensate if gaps in vaccine coverage continue to grow. "It's sad to see what can happen from a public health perspective… when people become complacent and think, I don't need it [a measles vaccination] because we haven't had this disease here," says Mazzulli. "It's the wrong mentality. You always have to stay vigilant. You always have to be aware that with something that's so highly contagious and infectious, you must stay on top of it, or it's going to get out of hand."

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Special to the CJMLS

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Inside the lab:

Testing, surveillance and capacity

Accurate and timely laboratory confirmation remains essential for case isolation, contact tracing and outbreak control — and that reliance has translated into an increase in testing demand for measles. In the laboratory, the increased workload associated with Canada's measles outbreaks has been felt most acutely in public health and satellite laboratories, where the bulk of measles testing is concentrated, says Dr. Tony Mazzulli of Sinai Health/University Health Network, who is also a consulting medical microbiologist at Public Health Ontario Laboratories. While the number of laboratories with measles testing capacity has expanded in recent years, he notes that shifting testing to community laboratories is unlikely unless vaccination rates fall further or testing volumes rise substantially, as centralized testing remains more cost-effective.

Part of the pressure on laboratories, Mazzulli explains, stems from the fact that after decades of low measles activity, many practising physicians have never encountered the disease firsthand. As a result, when patients present with symptoms such as rash, runny nose, cough or a cold, measles is now being considered earlier in the diagnosis, driving significant increase in testing, says Mazzulli.

Despite the rarity of measles in recent decades, laboratory testing itself remains highly reliable, as available assays are specific for measles virus and generally yield unambiguous results. However, Mazzulli cautions that as testing volumes rise, so does the absolute number of false-positive and false-negative results. This makes it critical for health care practitioners to understand which specimens to collect, the optimal timing of testing, and the limitations of each test. The ideal testing window, he says, is approximately 10 days after exposure. "If you test too early or too late, you may get false negatives because they haven't made enough antibodies, or there isn't enough virus to pick it up — that doesn't mean they don't or didn't have measles."

Molecular testing using polymerase chain reaction (PCR) is the preferred diagnostic approach, as it allows for early detection and offers high sensitivity. Mazzulli emphasizes that strict adherence to good laboratory practices is essential, given the inherent susceptibility of PCR-based assays to sample contamination.