



## How ticks became a major public health issue

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The tall grass at my cottage outside Lunenburg, N.S., is a no-go zone. This is Tickland.

If the barbecue tongs should happen to slip off the deck, a debate ensues over who will tread into Tickland to fetch them. We find ourselves tiptoeing across the grass, which my husband cuts regularly with a weed trimmer, his pants tucked into his socks.

At night, there are the full body checks for ticks, to see if any have slipped through despite our best efforts. This is no easy search: The blacklegged tick, which carries the bacteria that cause Lyme disease, is often the size of a grain of sand – or as one researcher put it, a “tiny mole with legs.” A few weeks ago, the mayor of the municipality of Lunenburg, Don Downe, found one in his belly button – but only after applying ointment for several days on what he thought was a bite. He finally “dug around,” he said, and pulled out a tick, puffy with blood. A gross discovery, but ticks are found in far more delicate places.

And they continue to spread northwards in Canada – partly courtesy of climate change, scientists believe. That’s a public health concern because ticks are among nature’s most efficient transmitters of infectious bacteria. Lyme disease is still the one to watch for – it’s now tracked in Canada, with the number of cases steadily rising – but it’s not the only illness ticks have to offer humanity; in the United States, different tick varieties can transmit more than a dozen rare but potentially fatal diseases.

Public health officials in Belleville, Ont., announced in late June that they were investigating a potential case of tick-borne encephalitis, an inflammation of the brain that can cause seizures and memory loss and for which there is no specific treatment. These symptoms can be caused by the Powassan virus, which takes its name from the Ontario town where it was discovered in 1958. There have only ever been 16 reported cases in Canada, but the virus has been found in ticks across the country, and the Public Health Agency of Canada is now screening for it.

“There is nothing good inside a tick,” says Vett Lloyd, a biologist at New Brunswick’s Mount Allison University who studies ticks and has experienced her own serious case of Lyme disease. “Personally, if every tick vanished on the planet, I wouldn’t be sorry.”

But ticks are doing the opposite. Their numbers have grown 10 times over in the past two decades. Draw a line marking tick territory across Canada and, researchers estimate, it encroaches farther

into the country by 45 kilometres a year. Increasingly, blacklegged ticks are showing up in cities such as Toronto. Predictions of an “invasion,” as researchers put it, have already proven conservative; according to Lloyd, the number of ticks in New Brunswick has already exceeded estimates for 2020. And Lyme disease has been found or declared endemic in southern parts of British Columbia, Manitoba, Ontario, Quebec, New Brunswick and Nova Scotia.

To get in front of the ticks, researchers such as Jianhong Wu, the director of the York Institute for Health Research in Toronto, say careful tracking of Lyme disease hot spots needs to happen.

“It is going to grow – that is very clear from the mapping,” Wu says. And it’s impossible to stop them: “How long,” he points out, “have we been fighting mosquitoes?”

The risk of getting Lyme disease from a tick bite, even from an infected one, is still small – between 1 and 3 per cent. In one New York State study, about 3.7 per cent of people bitten by a tick in an area known to have endemic rates of Lyme disease became infected. But the number of people falling ill has been rising steadily. In the United States, the Centers for Disease Control and Prevention estimates that 300,000 people get the disease annually. In Canada, between 2008 and 2013 the number of reported cases grew to 682 from 128 – and that’s a conservative estimate. Last December saw a private member’s bill from Green Party Leader Elizabeth May passed that called for treatment guidelines and co-ordinated surveillance of the disease. A conference of Lyme disease experts is scheduled for this fall.

Thomas Mather, who runs the Tick Encounter Resource Center at the University of Rhode Island, is a fierce advocate for more government funding – pointing out that while viruses such as West Nile make more headlines, tick-borne viruses make more people sick.

“It would be tick illiterate to flush one down the toilet these days” when researchers need help tracking their spread, he says. His organization receives more than a hundred photos a day from people wondering if the insect they found is a tick – and what kind. Mather usually replies via e-mail within 24 hours, preventing “an unnecessary crowd at the doctor’s door.” (At Mount Allison University, Lloyd also receives thousands of ticks each year from the public, which she then tests for different viruses.)

Lunenburg County was one of the first areas in Canada where ticks were deemed endemic. Deer, which provide a mating ground for ticks (but are conveniently immune to Lyme disease), are plentiful. Birds, which carry Lyme disease, fly in for the summer. The ticks then snack on infected birds and rodents, building up a reservoir of the bacteria. Hard-shelled and durable, ticks can survive 48 hours in a laboratory freezer. Unlike mosquitoes, whose bite alerts their victims, ticks are sneaky hitchhikers, often waiting on long grass for unwitting hosts to pass. They can crawl up a leg without anyone noticing, latch on in a discreet spot and snack away for days, which gives the bacteria time to spread. (Your chances of getting Lyme disease from an infected tick increase the longer it stays attached.) Once sated, they fall off. People often don’t know they’ve been bitten until they see the trademark bull’s-eye rash or come down with a strange flu, though symptoms vary.

Left untreated, Lyme disease can be debilitating, causing headaches, severe fatigue and serious,

though not life-threatening, neurological or cardiac issues. A recent study at Halifax's IWK Health Centre recorded 17 cases of children reporting arthritis symptoms or inflamed joints – typically a swollen knee – who tested positive for Lyme disease; after a round of antibiotics, almost all of the patients recovered. But in some, the symptoms linger, leading to a push for more education for physicians, more precise laboratory tests and a debate about how soon medication should be administered – particularly when there's evidence that a single dose of antibiotics given within 72 hours of the tick's removal may prevent Lyme disease from developing. Also, it's not like chicken pox: You can get infected more than once.

My family's tick trepidation is well-earned. A few years ago, my husband returned home from renovating the cottage. Unfamiliar with Lyme disease, we first thought the bull's-eye rashes were spider bites. Soon he could hardly get out of bed, and one morning he woke up with Bell's palsy, one side of his face drooping so much he could not see out of one eye. Neither his family doctor nor an emergency-room intern diagnosed him properly. Finally, a friend – a physician from Germany, where Lyme disease is common – recognized his symptoms and referred him to an infectious disease specialist, who within an hour administered a spinal tap to see how far the bacteria had spread and hooked him up to intravenous antibiotics. He got better, but even three months later he was still being followed by a cardiologist to make sure his heart had not been damaged.

A few years have made a big difference. In Lunenburg today, a tick bite often results in a course of antibiotics and careful monitoring. Mayor Downe, who gave an interview while receiving his intravenous antibiotics after his symptoms worsened, credits the advocates who have for years been appearing before the municipal council to make the case for better vigilance.

So what's a Canadian to do? In Lunenburg, dog owners have made a nightly ritual of counting how many ticks they pick off their pets. People pull them off their own bodies with tweezers, present them to their doctors in Ziploc bags and go home with a prescription. My sons no longer spend hours playing in the forest on my family's property as I did as a child, and my parents rarely walk the overgrown paths any more – an encounter with the wrong tick could wreck an already too-short summer.

Still, worrisome as ticks are, eventually you get used to knowing they are lurking in the tall grass outside your cottage window. Hiding at home is no way to live – that would create a larger public health concern than Lyme disease.

“Check for ticks and just get on with your life,” says Lloyd.

So they can have their bush. We'll take the beach. At least they haven't learned to swim.

## **Tickland 101**

### **First, help yourself**

You could protect yourself from ticks while doing high-risk activities – hiking, fishing and camping – by sporting long sleeves and pants tucked into your socks. But are you really going to go out on a

steamy summer day dressed like that? Bug spray helps – and there’s evidence that dousing your shoes with a pesticide called permethrin can deter ticks. (Permethrin isn’t sold commercially in Canada yet, but you can order it from the United States.) Public health officials also recommend a hot shower every time you come in from tick-friendly territory, or popping your clothes in the dryer for 15 minutes – neither of which is an easy option while camping or at many cottages. It’s also advised that you stick to official trails, taking much of the fun out of exploring. But even with checks, warns Jean-Paul Paluzzi, a biologist who studies ticks at Toronto’s York University, they are easy to miss “unless you are using a magnifying glass.” If you find one, he suggests, remove it carefully with tweezers, pop it in a plastic bag, go to the doctor and watch for the telltale bull’s-eye rash. “The sooner you are on antibiotics, the better,” Paluzzi says.

### Then, help a researcher

Found a tick? Take a photo and send it to the Tick Encounter Resource Center in Rhode Island to assist their research and determine the type. (Only the blacklegged tick transmits Lyme disease.) E-mail your photo to [www.tickencounter.org/tickspotters](http://www.tickencounter.org/tickspotters)

*[<http://www.tickencounter.org/tickspotters>].*

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