Endemic *Cryptococcus gattii* Infections, Nova Scotia, Canada, 2016–2024

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Cryptococcus gattii is poorly characterized in Atlantic Canada. We identified 6 species-confirmed infections in Nova Scotia during 2016–2024. Of those, 5 in western Nova Scotia were genotype VGIIb, including 4 cases without travel outside the province. Previous VGIIb-like detection in a wild animal further supports local acquisition and regional endemicity.

Cryptococcus gattii is an environmental fungal pathogen that can cause severe central nervous system (CNS) and pulmonary disease, including meningoencephalitis and cryptococcoma, often in persons without recognized immunocompromising conditions (*1*–*3*). Prolonged and variable incubation, typically 2–11 months but occasionally extending for years, complicates attribution to travel or local exposure (*4*). Molecular genotypes are VGI–VI; VGII, including VGIIb, has been associated with severe disease (*5*).

C. gattii emerged in British Columbia, Canada, after a 1999 Vancouver Island outbreak and subsequent endemic establishment (*6*). Two human infections were reported in Quebec in 2008 and 2015; neither case-patient had traveled outside Quebec, although the infection sources remained unidentified (*7*). In 2014, a VGIIb-like strain was identified in a free-ranging white-tailed deer (*Odocoileus virginianus*) in Nova Scotia, suggesting possible environmental presence in Atlantic Canada (*8*). We describe epidemiologic, clinical, and molecular characteristics of *C. gattii* infections in Nova Scotia during 2016–2024 and assess evidence for local acquisition.

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The Study

We conducted a retrospective descriptive analysis of deidentified clinical and public health data from Nova Scotia Health to identify *C. gattii* cases from January 1, 2016–December 31, 2024. Because *C. gattii* was not provincially notifiable during the study period, we ascertained cases retrospectively through laboratory and clinical records; infectious diseases physicians assisted in case identification and clinical interpretation. We classified 6 cases as confirmed *C. gattii* according to Nova Scotia Communicable Disease Surveillance Guidelines (*9*).

Initial diagnostic testing reported for the cases included routine fungal culture using sheep blood and inhibitory mold agar of clinical specimens and cryptococcal antigen testing of serum or cerebrospinal fluid. We identified species of cultured isolates by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. *C. gattii* isolates were referred to the British Columbia Centre for Disease Control Public Health Laboratory (Vancouver, BC, British Columbia) for molecular typing by multilocus sequence typing. We interpreted test results according to the Nova Scotia Communicable Diseases Manual (*10*). Three additional cryptococcal antigen–positive cases did not meet the confirmed *C. gattii* case definition because species-level identification was unavailable; we therefore excluded them from the analysis.

We obtained demographic information, clinical characteristics including initial symptoms, and reported exposures through chart review, case investigation, and public health nurse–led interviews (Table) and documented the data in Nova Scotia's Public Health surveillance system. Infectious diseases physicians supported case identification and clinical interpretation. We obtained verbal consent for interviews. Data were collected during

January–February 2025, and final extraction was completed March 11, 2025.

We identified 6 species-confirmed *C. gattii* infections that were reported during 2016–2024 (Figure). Five cases occurred in the Western Zone and 1 in the Eastern Zone of Nova Scotia. All 5 Western Zone isolates were VGIIb; 4 case-patients reported no travel outside Nova Scotia, whereas 1 reported travel to British Columbia. The Eastern Zone isolate was VGI. That case-patient had previously resided in South Africa, where VGI has been identified through national laboratory surveillance (*11*); therefore, the geographic source of acquisition was uncertain.

Table. Demographic, clinical, and reported exposure characteristics of 6 confirmed *Cryptococcus gattii* infections, Nova Scotia, Canada, 2016–2024

Characteristic	No. confirmed cases
Year of diagnosis	
2016	0
2017	0
2018	2
2019	0
2020	0
2021	1
2022	0
2023	2
2024	1
Geographic zone	
Western	5
Eastern	1
Age group, y	
<30	3
30–59	2
≥60	1
Sex	
F	2
M	4
Species confirmation method*	
Culture and molecular characterization	6
Genotype	
VGI	1
VGIIb	5
Travel outside province	
Y	2
N	4
Smoking or vaping	
Y	3
N	3
Regular outdoor activity	
Y	6
N	0
Presumed immunocompetent†	
Y	5
N	1
Clinical syndrome	
Central nervous system involvement‡	6
Pulmonary involvement§	2
Hospitalization	
Not hospitalized	0
Hospitalized	6
Outcome	
Intensive care unit admission	1
Death	1

*Initial diagnostic testing included fungal culture on sheep blood and inhibitory mold agar and cryptococcal antigen testing of serum or cerebrospinal fluid. Cultured isolates were identified by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. *Cryptococcus gattii* isolates were referred to the British Columbia Centre for Disease Control Public Health Laboratory for multilocus sequence typing.
†Defined as absence of HIV infection, malignancy, immunosuppressive therapy, or other specified conditions.
‡Includes central nervous system manifestations and related neurologic symptoms.
§Includes pulmonary involvement and related respiratory symptoms.

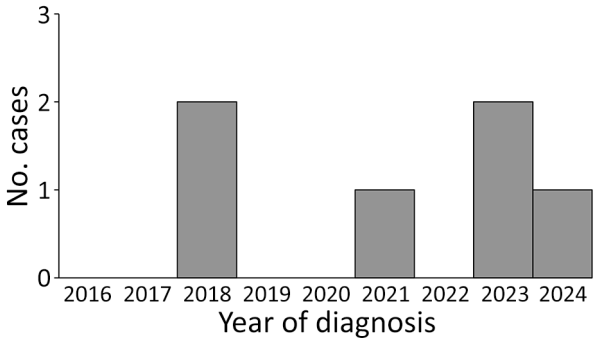


Figure. Number of confirmed *Cryptococcus gattii* infections by year of diagnosis, Nova Scotia, Canada, 2016–2024.

All 6 case-patients had clinical syndromes involving the CNS; 2 also had pulmonary involvement. Five case-patients were presumed immunocompetent, and 1 was immunocompromised. All 6 case-patients were hospitalized; 1 required intensive care, and 1 died. Because information on smoking, vaping, sharing of smoking or vaping devices, and outdoor and occupational exposures were obtained retrospectively, that information was incomplete for some cases.

Conclusions

The concentration of VGIIb *C. gattii* infections in western Nova Scotia, including 4 cases in persons without travel outside the province, together with previous detection of a VGIIb-like strain in a free-ranging white-tailed deer in the region, supports local acquisition and suggests possible environmental persistence (*8*). The clinical findings demonstrate potentially severe disease: all confirmed cases had clinical syndromes involving the CNS, 1 patient required intensive care, and 1 died. Five of 6 case-patients were presumed immunocompetent, reinforcing the importance of considering *C. gattii* in compatible CNS manifestations regardless of recognized immune compromise. The small number of cases and incomplete exposure ascertainment precluded conclusions regarding smoking, vaping, sharing of smoking or vaping devices, occupational exposures, or specific environmental exposures as risk factors, although all cases included reported regular outdoor activities. Targeted environmental and One Health investigations are needed to

characterize potential reservoirs and exposure information, and potential recall bias.

This analysis was limited by the small number of cases, retrospective design, incomplete clinical and exposure information, and potential recall bias. Because *C. gattii* was not notifiable during the study period, infections might have been missed. Three additional cryptococcal infections lacked species-level confirmation and were therefore excluded from analyses supporting genotype distribution and local acquisition. Environmental sampling was not conducted, precluding direct confirmation of a local reservoir. Differences in surveillance, diagnostic practices, and case ascertainment also limit comparisons with established endemic regions such as British Columbia (*12*).

In summary, addition of *C. gattii* to cryptococcosis in Nova Scotia's notifiable disease list in 2026 provides an opportunity to improve case ascertainment, standardized investigation, and laboratory characterization. Integrated human, animal, and environmental surveillance could better define the geographic distribution, environmental reservoirs, and ecology of *C. gattii* in Atlantic Canada.

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The Nova Scotia Health Research Ethics Board reviewed this initiative and determined that it fell under Article 2.5 of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans and was therefore outside the scope of Research Ethics Board review (REB file no. 1033065). The Nova Scotia Health Quality Improvement and Safety team subsequently confirmed that no additional review or approval was required.

About the Author

Dr. Zayed is a regional medical officer of health in Western Zone, Nova Scotia Health Authority. Her primary interests are epidemiology, emergent and infectious diseases, and social determinants of health.

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