

Alberta Health

Tick Surveillance

2017 Summary

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For more information contact:

Analytics and Performance Reporting Branch

Health Standards, Quality and Performance

Alberta Health

PO Box 1360 Stn Main

Edmonton, AB T5J 2N3

Email: Health.Surveillance@gov.ab.ca

Website: <https://open.alberta.ca/publications/2369-0690>

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Tick Surveillance 2017 Summary

Ixodes scapularis and *Ixodes pacificus* ticks are the primary vectors for carrying and transmitting *Borrelia burgdorferi*, which is the bacterium that can cause Lyme disease in humans. Alberta has a passive surveillance, Submit-a-Tick, program where people can submit ticks for species determination and *B. burgdorferi* testing. All *Ixodes* species of concern are tested for *B. burgdorferi* except for *I. kingi* and *I. ochtonae* since there is no evidence they can carry or transmit the bacterium. If a submitted tick suggests there is a risk that an *Ixodes* species of concern (primarily *Ixodes scapularis* and *Ixodes pacificus* in North America) could become endemic in Alberta, then active surveillance, including drag sampling in a particular area, is undertaken. The *Alberta Tick Surveillance Plan* is in place to determine the risk of Lyme disease in Alberta through passive and active surveillance activities.

Passive Tick Surveillance

- Of the 2,852 ticks submitted in 2017 through passive surveillance, 31 per cent were from human and environment and 69 per cent were from companion animals
- Only 324 out of 2,727 (12 per cent) speciated ticks were an *Ixodes* species of concern.
- Since 2013, the number of tick submissions has increased, however the proportion of *Borrelia burgdorferi*-positive *Ixodes* ticks has remained stable.
- In 2017, there were 59 out of 324 (18 per cent) *Ixodes* ticks positive for *B. burgdorferi*, of which 83 per cent were acquired in Alberta.
- The majority of *B. burgdorferi*-positive *Ixodes* ticks acquired locally (37 out of 40; 93 per cent) were found on companion animals.
- The Edmonton zone had the highest proportion of locally-acquired *Ixodes* ticks (118 out of 208; 57 per cent) and *B. burgdorferi*-positive *Ixodes* ticks (20 out of 40; 50 per cent).
- The pattern of tick submissions indicates that *Ixodes scapularis* and *Ixodes pacificus* ticks found in Alberta remain adventitious (e.g., brought into the province on migratory birds or other animals), and are not forming established populations.

Active Tick Surveillance

Between June and October 2017, the Parasitology Laboratory at Alberta Agriculture and Forestry (AF) identified three separate *Ixodes* nymph submissions and two *Ixodes* adults on the same host dog that had not traveled outside of the province: two submitted from the Vermillion area, one submitted from the Lethbridge area, and one submitted from the Fort McMurray area. These submissions met the passive data criteria for initiating drag sampling if a suitable location could be identified. Alberta Health (AH) and AF partners met to determine the appropriate follow-up as per the *Alberta Tick Surveillance Plan*. Two sites were chosen to perform drag sampling in both the Lethbridge and Vermillion areas. A suitable location could not be identified in the Fort McMurray area since the host dog had travelled within the province. No *Ixodes* species of concern were found after drag sampling, and therefore no further action was required.

Table 1: Total submissions* to the surveillance program by program type and year

Year Received	Companion Animal	Human and Environment	Total Submissions
	n (%)	n (%)	n
2013	753 (77)	219 (23)	972
2014	1,034 (72)	406 (28)	1,440
2015	1,297 (69)	574 (31)	1,871
2016	1,941 (68)	918 (32)	2,859
2017	1,966 (69)	886 (31)	2,852
Total	6,991 (70)	3,003 (30)	9,994

* Each tick is considered one submission. Multiple ticks could be submitted from one host/person at the same time. Also includes submissions that are not ticks (e.g. spiders, ants, and bed bugs)

Table 2: *Ixodes* tick submissions* by *Borrelia burgdorferi* positivity, area of acquisition, and year

Year Received	Submissions Speciated	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Acquired in Alberta***
	n	n	n (%)	n (%)
2013	959	169	27 (16)	22 (13)
2014	1,382	135	15 (11)	9 (7)
2015	1,816	138	20 (14)	11(8)
2016	2,773	236	38 (16)	30 (13)
2017	2,727	324	59 (18)	48 (15)
Total	9,657	1,002	159 (16)	120 (12)

* Each tick is considered one submission. Multiple ticks could be submitted from one host/person at the same time

*** Acquired in Alberta includes people with no history of travel or travel within Alberta in the previous two weeks.

Note 1: *Ixodes* spp. refers to *Ixodes* species of concern i.e. all *Ixodes* species of concern are tested for *B. burgdorferi* except for *I. kingi* and *I. ochotonae* since there is no evidence that they can carry or transmit the bacterium

Note 2: Percent positive is out of total *Ixodes* for each year.

Table 2: Probable location of tick acquisition of tick submissions*, 2013-2017

Year/ Travel History	2013			2014			2015		
	All Ticks	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive	All Ticks	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive	All Ticks	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive
	n (col %)			n (col %)			n (col %)		
Travel outside of Alberta	374 (39)	31(18)	2 (7)	514 (37)	39 (29)	4 (27)	647 (36)	54 (39)	9(45)
Travel within Alberta	161 (17)	25 (15)	4 (15)	219 (16)	15 (11)	5 (33)	357 (20)	15 (11)	2(10)
No Travel	351 (37)	101(60)	18 (67)	568 (41)	72 (53)	4 (27)	710 (39)	61 (44)	9 (45)
Unknown travel history	73 (8)	12 (7)	3 (11)	81 (6)	9 (7)	2 (13)	102 (6)	8 (6)	0 (0)
Total	959 (100)	169 (100)	27 (100)	1,382 (100)	135 (100)	15 (100)	1,816 (100)	138 (100)	20 (100)
Year/ Travel History	2016			2017					
	All Ticks	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive	All Ticks	<i>Ixodes</i> spp.	<i>Ixodes</i> spp. <i>B. burgdorferi</i> Positive			
	n (col %)			n (col %)					
Travel outside of Alberta	874 (32)	42 (18)	4 (11)	823 (30)	50 (15)	8 (14)			
Travel within Alberta	586 (21)	36 (15)	9 (24)	533 (20)	54 (17)	8 (14)			
No Travel	1,143 (41)	139 (59)	21 (55)	1,242 (46)	208 (64)	40 (68)			
Unknown travel history	170 (6)	19 (8)	4 (11)	129 (5)	12 (4)	3 (5)			
Total	2,773 (100)	236 (100)	38 (100)	2,727 (100)	324 (100)	59 (100)			

* Each tick is considered one submission. Multiple ticks could be submitted from one host/person at the same time

Note 1: *Ixodes* spp. refers to *Ixodes* species of concern i.e. all *Ixodes* species of concern are tested for *B. burgdorferi* except for *I. kingi* and *I. ochotonae* since there is no evidence that they can carry or transmit the bacterium

Table 3: Tick submissions* from Alberta residents with no history of travel in the previous two weeks, 2017**

Zone	Both Programs					Companion Animal Program					Human and the Environment Program				
	All Ticks	<i>Ixodes spp.</i>		<i>Ixodes spp. B. burgdorferi</i> Positive		All Ticks	<i>Ixodes spp.</i>		<i>Ixodes spp. B. burgdorferi</i> Positive		All Ticks	<i>Ixodes spp.</i>		<i>Ixodes spp. B. burgdorferi</i> Positive	
		n	%	n	%		n	%	n	%		n	%	n	%
Calgary	318	7	3	1	3	188	7	4	1	2	130	0	0	0	0
Central	219	31	15	9	23	174	29	15	9	24	45	2	9	0	0
Edmonton	220	118	57	20	50	196	109	59	18	49	24	9	43	2	67
North	173	39	19	6	12	127	31	17	5	14	46	8	38	1	33
South	292	9	4	3	8	178	7	4	3	8	114	2	9	0	0
Unknown	20	4	2	1	3	16	4	2	1	2	4	0	0	0	0
Alberta	1,242	208	100	40	100	879	187	100	37	100	363	21	100	3	100

* Each tick is considered one submission. Multiple ticks could be submitted from one host/person at the same time

** This program is based on a convenience sample of submissions from volunteers. The number of ticks analyzed per zone does not necessarily correspond to the prevalence of ticks in that particular zone

Note 1: *Ixodes* spp. refers to *Ixodes* species of concern i.e. all *Ixodes* species of concern are tested for *B. burgdorferi* except for *I. kingi* and *I. ochotonae* since there is no evidence that they can carry or transmit the bacterium

Table 4: Tick submissions from Alberta residents with no history of travel in the previous two weeks by species and zone of residence, 2017

Tick Species	Calgary	Central	Edmonton	North	South	Unknown	Total
<i>Amblyomma maculatum</i>	1	0	0	0	0	0	1
<i>Amblyomma</i> spp.	0	0	0	1	0	0	1
<i>Carios kelleyi</i>	0	0	0	0	1	0	1
<i>Dermacentor albipictus</i>	51	69	20	78	29	1	248
<i>Dermacentor andersoni</i>	135	19	7	17	101	4	283
<i>Dermacentor</i> spp.	2	0	0	5	0	0	7
<i>Dermacentor variabilis</i>	66	89	53	23	69	5	305
<i>Haemaphysalis leporispalustris</i>	0	1	11	6	1	0	19
<i>Ixodes kingi</i>	31	5	0	0	76	2	114
<i>Ixodes ochotonae</i>	0	1	0	2	0	0	3
<i>Ixodes scapularis</i>	6	25	107	33	7	4	182
Other <i>Ixodes</i> spp.	1	6	11	6	2	0	26
<i>Otobius megnini</i>	1	0	0	0	0	0	1
<i>Rhipicephalus sanguineus</i>	24	4	11	2	6	4	51
Not applicable	28	5	31	8	15	0	87
Total	346	224	251	181	307	20	1,329

Further resources

Alberta's submit-a-tick program

<http://www.health.alberta.ca/health-info/lyme-disease.html>

Lyme disease

<https://myhealth.alberta.ca/search/Pages/results.aspx?k=Lyme%20disease>

Alberta Health's Interactive Health Data Application (IHDA)

http://www.ahw.gov.ab.ca/IHDA_Retrieval/