Heartworm in Dogs in Canada in 1983

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Summary

In late December 1983, 2 800 veterinarians across Canada were sent a questionnaire in order to assess the status of heartworm disease in Canada in 1983 and 26% of them responded. Veterinarians reported that 59 504 dogs were blood-tested to check for microfilariae and 771 dogs (1.30% of those tested) were found with *Dirofilaria immitis*. Heartworm disease was diagnosed in all provinces except New Brunswick and Newfoundland but most (733) of the cases were in Ontario.

Heartworm disease was found most frequently in companion dogs over three years of age maintained mainly outdoors in rural areas. About 31% of the cases were observed with clinical signs of heartworm disease and 64% had a history of not having left Canada. Southwestern Ontario continues to be the focus of the infection and most of the dogs there had not left the province previously.

Résumé

Dirofilariose canine, au Canada, en 1983

À la fin de décembre 1983, les auteurs adressèrent un questionnaire à 2 800 vétérinaires des diverses provinces du Canada, dans le but de connaître la situation de la dirofilariose, au pays, en 1983, et 26% y répondirent. Ce relevé démontra que 59 504 chiens avaient subi l'épreuve sanguine destinée à déceler la dirofilariose et que 771 d'entre eux, i.e. 1,3%, étaient parasités par *Dirofilaria immitis*. Les cas positifs provenaient de toutes les provinces, à l'exception du Nouveau-Brunswick et de Terre-Neuve, et 733 se retrouvaient en Ontario.

La maladie affectait surtout des chiens de compagnie, âgés de plus de trois ans et gardés en liberté, à l'extérieur, dans des régions rurales. Environ 31% des chiens parasités manifestaient les signes cliniques de la maladie et l'anamnèse de 64% révéla qu'ils n'avaient pas séjourné hors du Canada. Le sud-ouest de l'Ontario représente toujours le foyer de l'infection et la plupart des chiens parasités qu'on y retrouve n'ont jamais vécu en dehors de cette province.

In late December 1983, 2 800 questionnaires were sent to institutional veterinarians and small and mixed animal practitioners throughout Canada to assess heartworm disease (HWD), primarily in dogs, in 1983 as was done previously (1,2,3,4,5,6,7,8). The number returned was 737 (26% response). A few additional questionnaires were returned because of inappropriate addresses. The findings are presented in two figures and three tables and a few brief comments about these should be made.

1. The percentage response for 1983 was similar to that for 1982 (25% response), and of those responding 84% indicated an interest in information on HWD and 94% stated that they would complete a questionnaire if offered again.

2. In 1983, 23 341 more dogs were checked for microfilariae than in 1982. There was a marked increase in testing of dogs in 1983 over 1982 in Ontario and Alberta, some increase in British Columbia and Saskatchewan and a decrease in the other provinces. We have commented previously that the smear procedure is very inefficient for recovering microfilariae. In 1983, only 13 practices reported that they used the smear as the only blood test procedure. We would encourage those prac-

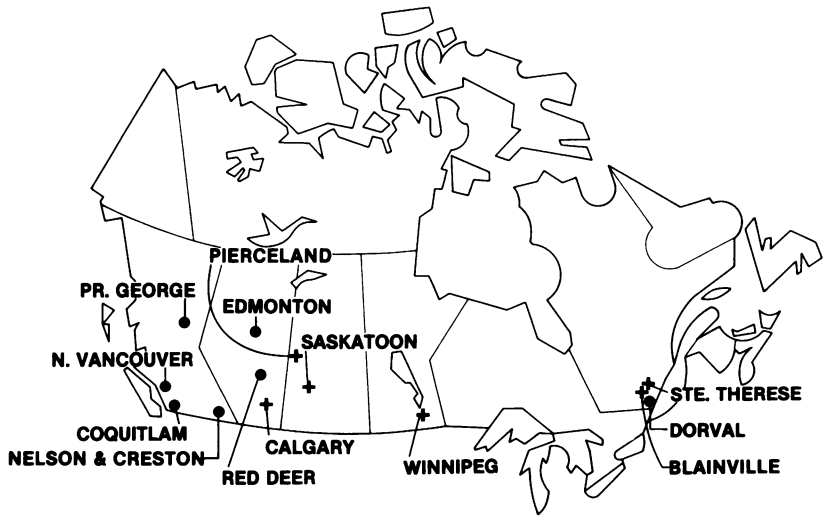

FIGURE 1. Areas in Canada with diagnoses of heartworm disease in dogs in 1983.
- • Areas with dogs which had been outside of Canada and presumed infected before returning or with dogs whose movements were unknown.
- + Areas with dogs some of which had never left Canada.

TABLE I

RESULTS OF A QUESTIONNAIRE WHICH WAS SENT TO 2 800 VETERINARIANS IN CANADA IN DECEMBER 1983 AND COMPUTED FROM 737 REPLIES

HEARTWORM IN CANADA 1983

Name: _____ Address: _____

1. Does your professional activity include examination of dogs and cats? YES 654 NO 83
   If YES go to Question 2. If NO go to Question 21.
2. Which category would fit your activity best?
   Mixed practice 194 Small animal practice 447
   Reserach Laboratory 4 Diagnostic Laboratory 7
   Other 3
3. What technique(s) do you use for diagnosis of HWD? %
   Clinical Signs 52 Radiography 32 Blood Test 89
   Necropsy 22
4. If blood test, specify technique(s) used routinely. %
   Knotts 26 Filter 47 Smear 18 Microcapillary 8
   Submitted to a Diagnostic Lab 35
5. What time of year do you test (blood) most dogs for HWD? %
   Spring 47 Summer 38 Fall 19 Winter 11
6. Did you diagnose HWD in 1982? (note year) YES 85
7. No. of dogs blood tested in 1983. (note year) 59 504
8. No. of dogs diagnosed with HWD in 1983. 771
   If none go to Question 17.
9. If HWD was diagnosed in 1982 are the no. of cases for 1983 an:
   Increase 6% Decrease 1.1% Similar 3.4%
10. No. of dogs in 1983 diagnosed with HWD and with clinical signs of HWD. 240
11. Circle month(s) you diagnosed most heartworm cases in 1983: %

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1	2	4	12	17	22	16	13	6	4	2	1

12. How many cases had the following histories in 1983?

Six months or more prior to diagnosis was outside of Canada	60	(7.8%)
Six months or more prior to diagnosis was in another Province	4	(0.5%)
Never left the Province	489	(63.4%)
Movement Unknown	218	(28.3%)

For Questions 13 to 16 give the number of dogs with HWD in 1983 which are in each of the classifications. (The numbers were converted to frequencies where most frequent = 1).

13. Domicile of Dogs City — 2, Suburb — 3, Rural — 1, Unknown — 4
14. Location of Domicile Primarily indoors — 2; Primarily outdoors — 1; Unknown — 3
15. Age of Dogs Less than 1 year — 3, 1-3 years — 2; Greater than 3 years — 1, Age unknown — 4
16. Principle activity of dogs Companion dog — 1, Show dog — 5, Hunting dog — 3, Farm dog — 2, Unknown — 4
17. Do you recommend a preventive program for your area? YES 200 (31%) NO
18. No. of cases diagnosed with *Dipetalonema reconditum* in 1983? 87
19. No. of cases of *D. immitis* in cats diagnosed in 1983? 2
20. No. of cases of *D. immitis* in other animals. 0
21. Would you be interested in the results of this questionnaire? % YES 93 NO 4
22. Would you be interested in information on HWD? YES 84 NO 11
23. Would news releases on HWD be helpful to the public? % YES 80 NO 12
24. Did you respond to the 1982 Heartworm questionnaire? % YES 66 NO 25
25. Did you see the results of the 1982 questionnaire? % YES 67 NO 27
26. Would you respond to the questionnaire if it was offered again? % YES 94 NO 2
27. Any other comments: 130 respondents requested information or made comments.

tices to incorporate a concentration technique.

Unfortunately, in the 1983 questionnaire and in the question requesting information on blood tests used, we did not list the new commercially available ELISA procedure. A few respondents had written on the questionnaire that they had used this procedure. With the reports of false negatives and false positives with that technique, the American Heartworm Society has recommended that neither the ELISA nor any other serological test should replace parasitological diagnosis (9). We recommend that the primary screening procedure whould be the identification of microfilariae using a concentration technique.

3. In 1983, 771 dogs (1.30% of dogs tested) were found with HWD compared with 558 (1.49%) in 1982. Heartworm disease was diagnosed in all provinces except New Brunswick and Newfoundland, but as seen previously, nearly all of the cases were in Ontario. Heartworm disease was found most frequently in companion dogs over three years of age maintained mainly outdoors in rural areas. Clinical signs of HWD were observed in 31% of the cases.

4. The percentage of dogs with HWD with a history of not having left Canada was about 64%. This was similar to that for previous years except in 1982 when it was 43%. For about 28% of dogs with HWD the movement in and out of the province or Canada was unknown. Southwestern Ontario continued to be the focus of the infection in Canada. Two cases in Manitoba and 12 in Quebec were reported not to have left those provinces previously. One case in each of Calgary, Alberta and Pierceland and Saskatoon, Saskatchewan, were reported to have been in another province six months or more prior to diagnosis.

5. In Ontario, the number of dogs with HWD in 1983 was 733 (521 in 1982). There were 65 towns reporting a diagnosis of HWD in 1983 (41 in 1982) and the distribution of these towns was more widespread than previously found. However, 82% of the increase in case numbers in 1983 over 1982 were found in areas previously described as endemic.

There was also an increase in the number of reported cases along or

TABLE II

AREAS IN CANADA WITH TWO OR MORE DOGS DIAGNOSED WITH HEARTWORM DISEASE IN 1983

Area	Number of Cases	
	Had Been Outside Canada or Movement Unknown	Never Left Canada
Coquitlam, British Columbia	2	0
Calgary, Alberta	2	1
Edmonton, Alberta	2	0
Red Deer, Alberta	4	0
Pierceland, Saskatchewan	1	1
Saskatoon, Saskatchewan	1	1
Winnipeg, Manitoba	0	2
Amherstburg, Ontario	2	26
Aylmer, Ontario	1	8
Brantford, Ontario	13	9
Burford, Ontario	0	3
Caledon East, Ontario	0	2
Cambridge, Ontario	2	0
Charing Cross, Ontario	1	4
Chatham, Ontario	0	12
Dunnville, Ontario	0	10
Essex, Ontario	61	0
Fonthill, Ontario	3	0
Forest, Ontario	0	2
Glencoe, Ontario	1	2
Hamilton, Ontario	0	3
Kingsville, Ontario	0	7
Leamington, Ontario	0	25
London, Ontario	0	4
Milton, Ontario	3	1
Mississauga, Ontario	2	0
Mt. Brydges, Ontario	2	5
Niagara Falls, Ontario	0	2
Oldcastle, Ontario	14	26
Orangeville, Ontario	2	0
Peterborough, Ontario	0	4
Picton, Ontario	2	0
Sarnia, Ontario	1	11
Simcoe, Ontario	0	68
Thornhill, Ontario	0	3
Tillsonburg, Ontario	0	125
Wallaceburg, Ontario	31	1
Welland, Ontario	5	5
Weston, Ontario	0	6
Wheatley, Ontario	0	38
Willowdale, Ontario	0	3
Windsor, Ontario	92	50
Dorval, Quebec	2	0
Ste. Therese, Quebec	0	10

TABLE III

NUMBER OF PRACTITIONERS REPORTING THAT THEY HAD BLOOD-TESTED (BT) DOGS AND THE NUMBER OF DOGS DIAGNOSED WITH HEARTWORM DISEASE (HWD) IN 1983 IN THE PROVINCES

	No. of Practitioners	No. of Dogs	
		BT	HWD
British Columbia	66	263	6
Alberta	66	459	9
Saskatchewan	28	175	4
Manitoba	22	1 091	2
Ontario	303	56 070	733
Quebec	61	1 233	14
Nova Scotia	17	119	2
New Brunswick	8	54	0
Prince Edward Island	4	31	1
Newfoundland	4	9	0
Total	579	59 504	771

close to the Lake Huron shoreline and between Toronto and Lake Simcoe. However it still appears that in areas east of the Niagara escarpment and also north of a line drawn from Toronto to Grand Bend, the prevalence of HWD is very low.

In the Windsor peninsula including Chatham and Charing Cross there were 358 cases (303 in 1982). There were 12 170 dogs tested (9 234 in 1982) to give a prevalence of 2.94% (3.28% in 1982).

In the Forest, Petrolia, Sarnia and Wallaceburg areas there were 47 cases (19 in 1982). There were 3 206 dogs tested (2 760 in 1982) to give a prevalence of 1.47% (0.68% in 1982).

Along Lake Erie including Aylmer, Caledonia, Dunnville, Fonthill, Fort Erie, Fisherville, Hagersville, Morpeth, Niagara Falls, Norwich, Port Colborne, Ridgetown, Simcoe, Smithville, St. Thomas, Thornhill, Thorold, Tillsonburg and Welland there were 230 cases (154 in that general area in 1982). As in previous years most of the cases were in Simcoe and Tillsonburg. There were 9 573 dogs tested (3 795 in that general area in 1982) to give a prevalence of 2.4% (4.05% in 1982).

In London and the surrounding areas of Arva, Glencoe, Ingersoll, Lambeth, Mt. Brydges and Woodstock there were 14 cases (ten in that general area in 1982). There were 7 467 dogs tested (7 422 in that general area in 1982) to give a prevalence of 0.18% (0.13% in 1982).

There were 22 cases in Brantford (seven in 1982) with four cases in surrounding towns. For the area including Brantford, Burford, Cambridge, Elora, Elmira, Fergus, Guelph, Kitchener, New Dundee, New Hamburg, Paris, Rockwood and Waterloo there were 5 643 dogs tested (2 655 in that general area in 1982) to give a prevalence of 0.45% (0.64% in 1982).

In Ancaster, Burlington, Dundas, Grassie, Grimsby, Hamilton, St. Catharines, Stoney Creek and Waterdown there were three times as many dogs tested in 1983 than in that general area in 1982 (6 517 and 2 249 respectively). Five cases were found in these areas to give a prevalence of 0.08% (0.17% in 1982).

In Bramalea, Brampton, Georgetown, Milton, Mississauga and Oakville there were six cases with five of

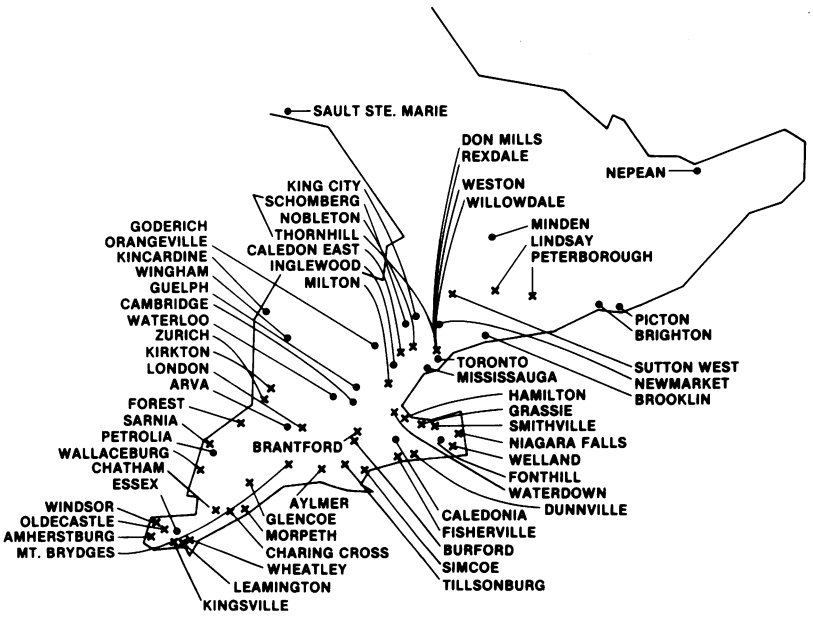

FIGURE 2. Areas in Ontario with diagnoses of heartworm disease in dogs in 1983.
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these reported as being outside Canada six months previously. There were 2 086 dogs tested (311 in that general area in 1982) with a prevalence of 0.28%.

In Metropolitan Toronto including Agincourt, Don Mills, Downsview, Etobicoke, Islington, Rexdale, Scarborough, Thornhill, Unionville, West Hill, Weston and Willowdale there were 15 cases (four in 1982). Three practices reported 12 of those cases and two of them identified that they had used the ELISA test. There were 3 243 dogs tested (1 212 in 1982) to give a prevalence of 0.46% (0.33% in 1982).

For the first time, there were several areas north of Toronto reporting cases of HWD. In Caledon East, Inglewood, King City, Newmarket, Nobleton and Schomberg there were seven cases, but three of these had a history of being outside Canada six months previously. If Alliston, Keswick, Oak Ridges, Sharon and Uxbridge are included in the above towns, then in those areas there were 1 031 dogs tested (401 in that general area in 1982) to give a prevalence of 0.67% (0.24% in 1982).

In Exeter, Goderich, Kincardine, Kirkton, Stratford, Wingham and Zurich there were five cases (two in 1982). There were 320 dogs tested (210 in 1982) to give a prevalence of 1.56% (0.95 in 1982).

6. The number (87) of cases of *Dipetalonema reconditum* reported was similar to that for 1982. In 1983, about 9% of the cases were found in Alberta, Manitoba, Nova Scotia and Prince Edward Island. The remainder were in Ontario with 75% of them reported from Simcoe, Peterborough and Sarnia. The two cases of HWD in cats were in Ontario (in Aylmer and Windsor).

7. We have attempted in this report to provide you with information which would be useful in making decisions with your clients about blood testing for HWD and the use of the preventive medication. We can define no precise level of infection when it becomes necessary to blood test all dogs or to put all dogs on a preventive program. The highest prevalence that we found in an area for 1983 is 2.94%. A few towns exceed that level, but that may be misleading because the number of dogs tested is low. The question, therefore, that practitioners and clients must debate is whether a prevalence of about 3 in 100 is a sufficient risk to dogs in a population to warrant blood testing and preventive medication on a regular basis. Our advice is that in order to gain the best estimate on the prevalence of HWD, we should encourage as much blood testing as the traffic will bear. This is especially important for practices south of a line drawn from Toronto to Grand Bend. We encourage blood testing of dogs once a year in the spring before the onset of the mosquito season. We have also encouraged consideration of the use of preventive medication where it seems most important — in the Forest-Sarnia-Chatham-Windsor peninsula areas, along the Lake Erie shoreline and in the triangular area bounded by Brantford, Niagara Falls and Aylmer and for all dogs entering those areas from June through September.

8. Your comments and advice were appreciated.

9. We acknowledge and are grateful for the support of Norden Laboratories, Inc., for making this survey possible. Unfortunately, our application to the Canadian Veterinary Research Trust Fund for funding for a survey of HWD for 1984 was unsuccessful. We will solicit your cooperation with another survey when there is support for such a venture.

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