

The Rabies Reporter

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RABIES IN ONTARIO A REVIEW OF 1995 RABIES CASES

There were only 328 laboratory confirmed rabid animals in southern Ontario during 1995. That was less than any year of the present outbreak except 1961 (283). It was only slightly more than half the 1994 record low, and represents an 84% reduction in rabies from the 1980's average of 2050 cases per year. In addition, there were 25 rabid cattle diagnosed clinically, giving a total of 353 rabid animals.

The tables and figure 1 on this page show very low numbers of rabies

cases during 1995. Rabies was reduced in all regions compared to 1994. The second year of baiting across our whole rabies zone had a dramatic effect during the last two months of the year, an effect similar to what we saw in late 1994. However, the highlight of the good news was the complete absence of fox strain rabies in eastern Ontario from March to December, and the near disappearance from the central part of the region.

Unfortunately, the number of humans treated because of exposure to rabies did not drop as rapidly as the number of rabies cases. There were 1241 post-exposure treatments given in 1995, compared to 1437 in 1994, and 2586 in 1993. As noted on last year's summary, the long-term ratio of rabid animals to post-exposure treatments was 1:1.2. In 1993 and 1994 that ratio was 1:2.1 and 1:2.4, while the comparable figure for 1995 was 1:3.8. If you look at figure 1 of

Dr. LeBer's article on page 4, you will see that this trend began in 1992. To put the problem another way, if treatment numbers dropped at the same rate as rabies cases, there should have been only 394 courses of vaccine administered last year. It will be interesting to find out what proportion of these treatments are in response to a bite or scratch from an animal which then disappeared, and could not be tested for rabies.

There were only three cases of fox strain virus in the whole of the eastern Ontario experimental area, all early in the year, a dog and two cattle. There was a collective sharp intake of breath in the rabies unit during the second week of February, 1996, when we heard of the coyote which attacked two small boys near North Gower. Two days later we let that breath out, when ADRI reported that the offending animal was not, repeat not, rabid. If it had been rabid, how on earth did it turn up in the middle of the rabies-free area?

Eastern Ontario had seven rabid bats during the year, a "normal" number, according to figures reported in the Rabies Reporter a year ago (vol. 5, no. 4).

There were no fox virus cases in Quebec close to the Ontario border. In fact, there were only four rabid animals reported from all of Quebec during the last quarter. One of these was just north of the Island of Montreal, and the other three were south and east of the St Lawrence River, roughly opposite Trois Rivières.

The central wall baiting in 1993 was supposed to prevent rabies from moving eastward past Toronto, and that seems to have worked. The only rabies east of Durham region during the last half of 1995 was a

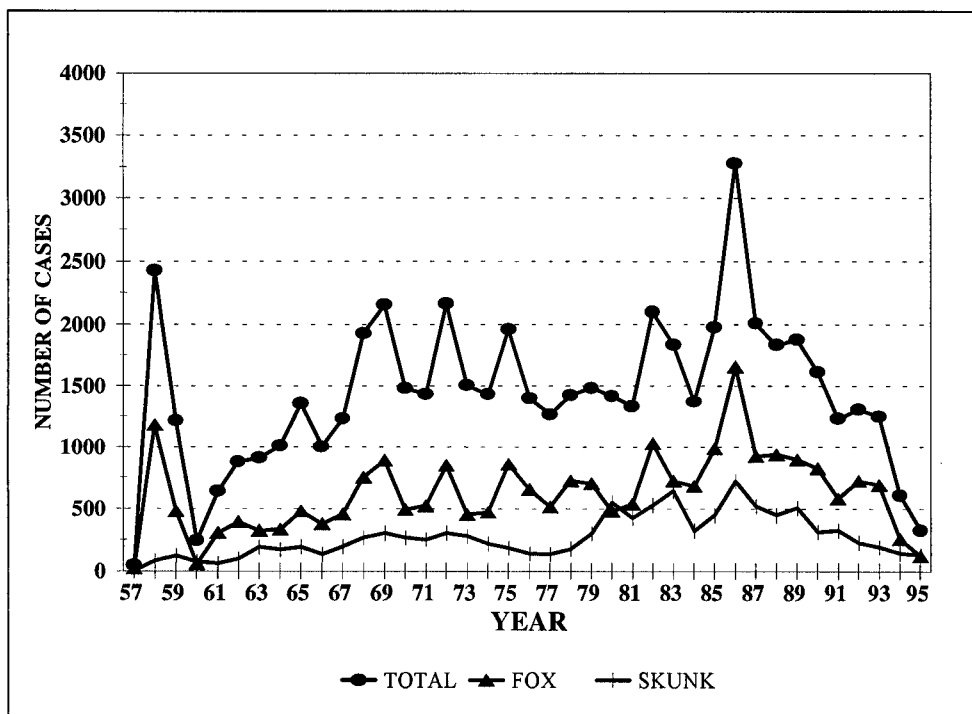


Figure 1. Summary of annual rabies cases in Ontario, 1957 - 1995.

cluster of skunk cases in Peterborough County.

The rabies outbreak in Grey County seemed to have subsided during the last quarter, but it is too early to say whether that was a natural event, or a result of the 1995 bait campaign.

There were surprising numbers of rabid cattle in Ontario during 1995, especially in Grey County. In addition to the laboratory confirmed cases, there were 25 livestock cases identified by clinical diagnosis.

During the last quarter of the year, rabies cases in skunks outnumbered those in foxes by 35 to 21, a sure sign that vaccination was having an effect. It took 9 months for rabies to disappear from the eastern Ontario skunk population, after the last fox case in September 1993. It is possible that it will take longer for rabies among skunks to die out in southwestern Ontario. In eastern Ontario there was a strong tendency for peaks of rabies in skunks to occur 3 - 12 months after a peak in fox rabies. In western Ontario, and especially in the warmer and less snowy regions along the north shore of Lake Erie, there was less linkage in the 1960-1990 period between peaks of rabies in foxes and skunks. That is the basis for predicting that there may be less linkage in disappearance as well.

There is no doubt now that the drop in rabies cases is at least in part a result of the vaccine-bait program. We hoped that the program would reduce rabies to below 10% of its 1980's levels by 1998. If next year's results continue the sharp downward trend, we should achieve that target earlier than planned.

There will be a big change in the 1996 bait distribution, as eastern Ontario will not be baited at all. We will, of course, watch the rabies maps carefully, and change plans to adapt to unexpected events.

Charlie MacInnes
O.M.N.R. Rabies Unit
Maple

RABIES IN NEW YORK STATE ANNUAL SUMMARY FOR 1995

Three trends characterized the occurrence of rabies in New York during 1995: (i) the second human rabies death in a New York hospital in three years associated with an unrecognized exposure to a relatively rare bat rabies variant; (ii) the continued spread of the raccoon rabies outbreak into previously unaffected areas of the state, including another "jump" of more than 40 miles; and (iii) the emergence of a "second wave" in the number of rabid raccoons in those counties first affected by this major rabies epizootic.

A 13-year-old resident of a nearby Connecticut community died of rabies in October in a Westchester County hospital. The variant of rabies virus implicated in the case is that which is associated with the silver-haired bat, a solitary, arboreal animal that is not frequently encountered by humans. Similar to a 1993 New York case and several other recent cases in the United States, there was no history of known bite, scratch, or other direct contact with a rabies suspect animal. However, as in several of the other cases, there was a history of a bat flying around in the home one month before the illness, while the victim slept in a room with an open door. This recurrent pattern in human rabies mortality in the U.S. has resulted in more aggressive recommendations regarding the need for rabies examination of bats found in close proximity to sleeping persons or unattended young children, even in the absence of evidence of a bite, scratch, or other direct contact.

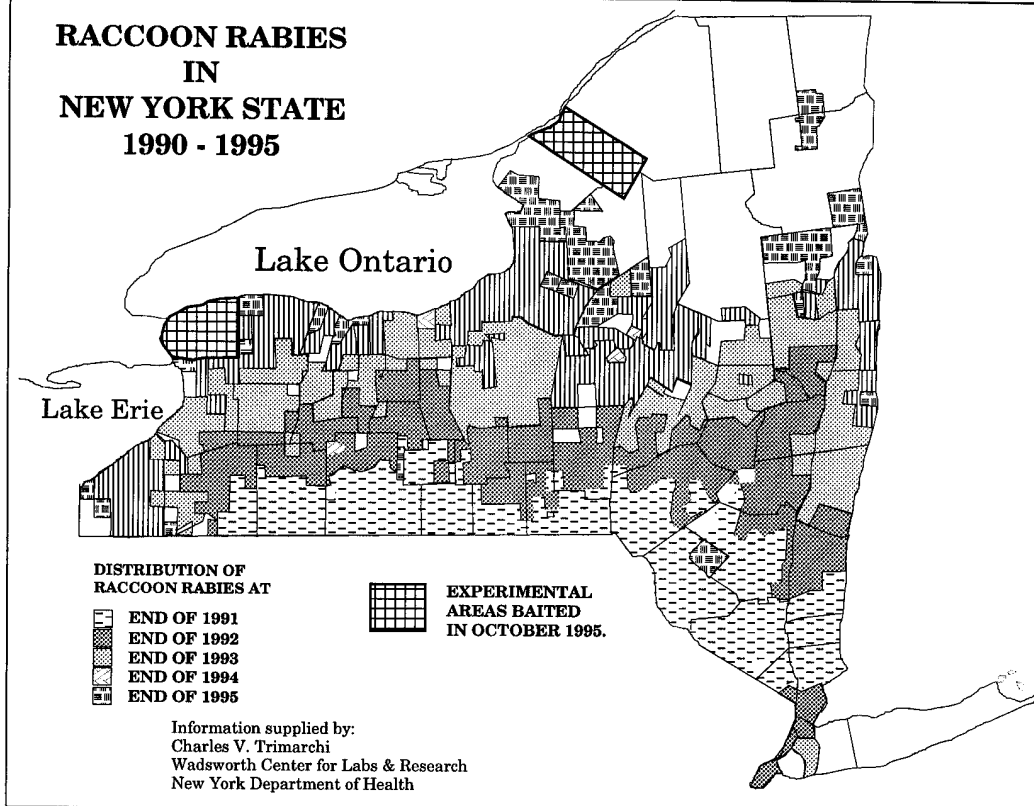
There were 8,865 animals examined for rabies in the state in 1995: 8,027 at the Wadsworth Center Rabies Laboratory and 838 at the New York City Health Department Laboratory. Characteristically, cats were the most commonly examined animals, accounting for 27% (2,421)

of all submissions to the laboratories. Raccoons were next, comprising 25% (2,201) of all rabies examinations. Domestic animals comprised 43% (3,776) of submissions. Among all animals examined at Wadsworth Center, 62% (4,937) had reportedly bitten or otherwise potentially exposed a human to rabies, 44% (3,535) had a history of contact with a domestic animal, and 17% (1,344) were strictly surveillance specimens with no reported human or animal contacts. Among the domestic animals examined, 90% (3,193) had potentially exposed a human to rabies.

Rabies infection was confirmed in 1,162 animals statewide, with infected wild species accounting for 96% (1,120) of all cases. Rabid wildlife included: 846 raccoons (73%); 182 skunks; 49 bats; 22 gray fox; 10 red fox; 7 woodchucks; 2 white-tailed deer; 1 beaver; 1 bobcat. Domestic animal cases occurred in: 27 cats; 8 cattle; 3 dogs; 3 horses; 1 ferret. For the fifth straight year The rabid ferret was the first recorded in New York, and the nineteenth confirmed in the U.S. It was one of forty ferrets examined in the State in 1995. Three weeks before the onset of rabies the ferret had been at-large for several days near its home in Oneida County, and was unvaccinated at the time of its potential exposure. The rabies virus implicated in the case was identified as the raccoon rabies variant.

The raccoon rabies outbreak continued its steady advance across the State, affecting 60 new towns and 3 new counties during 1995, bringing the total of affected towns and counties to 889 and 57, respectively, since the outbreak entered New York State in 1990. This leaves unaffected only Kings County (Brooklyn) in metropolitan New York, Nassau and Suffolk Counties on Long Island, and Franklin and St. Lawrence Counties in northernmost New York. The advance in 1995 resulted from spread of the disease of about 20 miles from the 1994 epizootic front, into Jefferson, Lewis, Warren, Washington

RACCOON RABIES IN NEW YORK STATE 1990 - 1995



and Essex Counties. Early in the year there was also an unexplained "jump" of the disease, approximately 40 miles from the existing front into a remote area at the boundary of Clinton and Essex Counties.

A "second wave" of epizootic activity is emerging in the first tier of counties in New York affected by the

raccoon rabies outbreak. Analysis of the number of rabid raccoons confirmed in the 11 counties that were fully involved with the outbreak by the end of 1991 discloses that each of these counties experienced a greater than 200% increase in cases from 1994 to 1995, and that the combined number of rabid raccoons in those

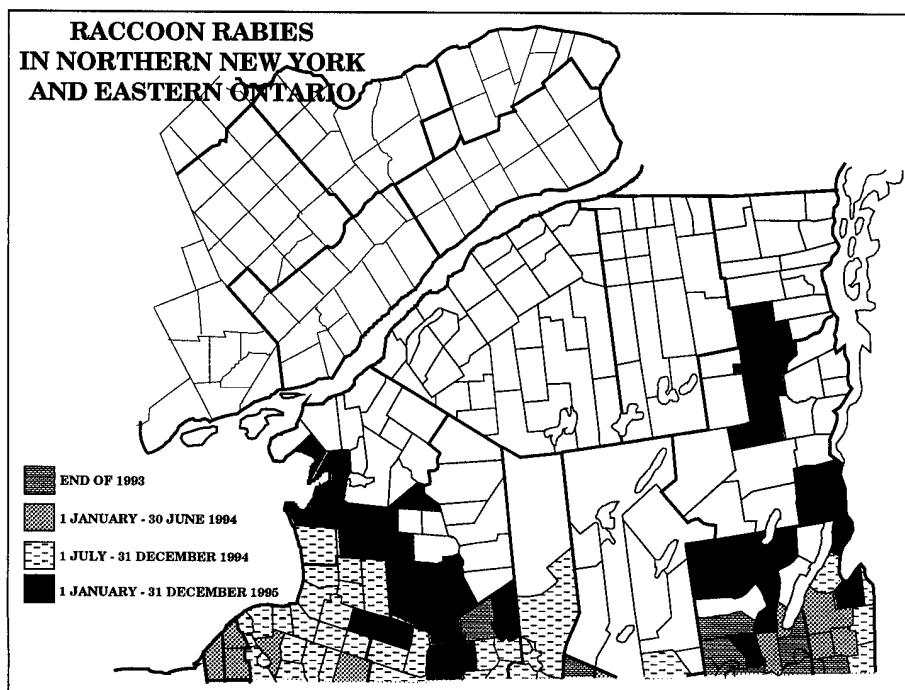
counties increased by 345%, from 40 in 1994 to 138 in 1995. Another interesting attribute of the raccoon rabies outbreak is that during the three-year period 1993-1995, 60% (306) of 513 spillover cases in skunks occurred in the fall months (September - November).

Among 1,840 raccoons received at the Wadsworth Center, 96% (1,763) were testable, and 48% (842) of those were determined to be rabid. Fourteen New York counties had active surveillance related to oral rabies vaccine field trials or were participating in a laboratory-initiated enhanced surveillance trial during 1995: of 781 testable raccoons from those counties, 41% (307) were rabid.

Among 903 raccoons that had a history of contact with a domestic animal, 66% (598) were rabid. Among the 842 rabid raccoons, 3% had reported contact with livestock, 7% had contact with a cat, 32% human contact and 64% contact with one or more dogs.

Rabies in bats was once again geographically widespread in the State in 1995, with the 49 cases occurring in 43 towns in 24 counties. Since 1981, 369 towns in 60 counties have had at least one confirmed rabid bat. Among bats submitted to the Wadsworth Center, big brown bats accounted for 63% (710) of the 1,125 bats tested, and 89% (39 of 48) of rabid bats. The little brown accounted for 23% (257) of the bats examined, but only 6% (3) of the rabid bats. Rabies was also confirmed in 2 hoary bats, 1 Keen's bat and one red bat during 1995. Despite the emerging role of the silver-haired bat strain of rabies in human rabies mortality in the U.S., none of the 15 silver-haired bats tested in New York during 1995 was positive for rabies. Overall, rabies was confirmed in 4.3% of bats tested,

RACCOON RABIES IN NORTHERN NEW YORK AND EASTERN ONTARIO



5.5% of big brown bats tested, and 1.2% of little brown bats tested. These figures are characteristically very similar to the cumulative rabies prevalence figures compiled since 1981: 4.2% (781 of 18,491) for all bat species combined, 6.0% (656 of 10,999) for big brown bats and 1.0% (58 of 5,756) for little brown bats. Among all bats submitted for rabies during 1995, 33% reportedly had contact with a human, 45% with a cat, and 8% with a dog. Among rabid bats in 1995, 37% reportedly had contact with a human, 38% with a cat, and 18% with a dog.

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New York City data supplied by Dr. Igal Poshni, Director, Virus Laboratory, New York City Department of Health.

Editor's Note: The two maps on page 3 were compiled from the regular monthly reports from Mr. Trimarchi's laboratory.

COMPULSORY RABIES VACCINATION IN ONTARIO

The number of people requiring rabies post-exposure treatment each year in Ontario remains high. An average of 2,398 individuals received

a combination of rabies immune globulin and human diploid cell vaccine each year (Figure 1) from 1985 to 1994. Fortunately, the last reported death believed to have been acquired in Ontario occurred in 1967 (Table 1).^{1,2}

The case involved a four-year-old girl who was bitten and scratched by a confirmed rabid cat.

Rabid cats and dogs, while only contributing to 8% (1,571/20,604) of total animal rabies, accounted for 53% (12,954/24,671) of all human post-exposure treatments during the 10 year period from 1980

to 1989 (Figure 2). Almost nine people are exposed to each rabid cat or dog (Figure 3). In contrast, less than one person is involved with a confirmed rabid wild animal with the exception of rabid raccoons where

about six people are exposed to each animal. Of concern to public health agencies is the greater rabies risk that companion pets pose to the public, and the cost of investigating human exposures, treating individuals and increasing public awareness initiatives, all of which exceed \$3 million per year.

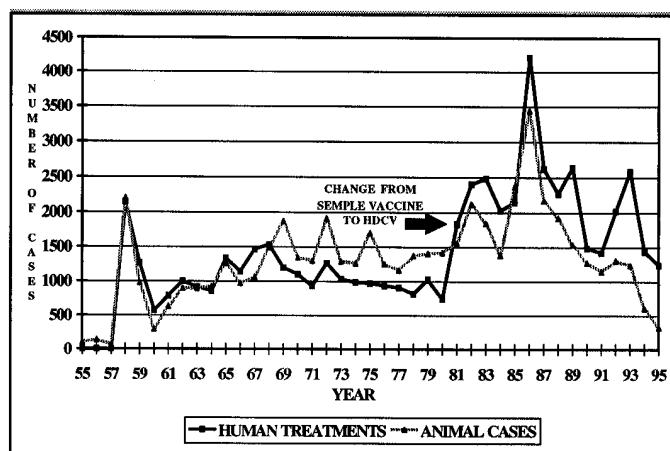


Figure 1. Rabid animals and people treated for exposure to rabies in Ontario.

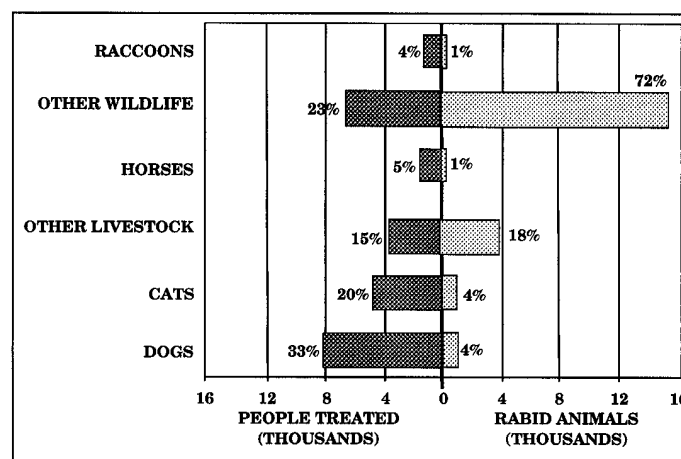


Figure 2. Frequency of animal groups among rabid animals, and as contacts for humans treated for exposure to rabies in Ontario, 1980 - 1989.

Table 1. Recorded Human Rabies Deaths in Ontario

Year	Case	Location	Contact
1819	4th Duke of Richmond	Richmond	Bitten by pet fox, Sorel, Quebec
1929	Male, 5 years	Ottawa area	Unknown
1931	Male, 3 years	Toronto area	Unknown
1944	Male, 11 years	Leamington area	Bitten by stray dog
1959	Male, 7 years	Port Perry	Bitten by rabid skunk
1959	Male, 25 years	Peterborough area	Unknown
1967	Female, 4 years	Richmond	Bitten by rabid cat

Compulsory Animal Rabies Immunization

In an effort to reduce the risk of human exposure to rabid cats and dogs, Ontario Regulation 567 under the *Health Protection and Promotion Act*

Table 2. Effectiveness of Compulsory Immunization (C.I.)

Health Unit(s)	C.I.	Number of rabies cases before and after start of C.I.			
		Dog and cat		Wildlife	
		Before	After	Before	After
Bruce-Grey-Owen Sound	Yes	62	39	698	547
Eastern Ontario	Yes	44	27	405	226
Peterborough	Yes	39	16	410	173
York Region	Yes	22	11	272	87
Perth District	Yes	17	13	146	156
Oxford County	Yes	31	23	240	151
Haldimand-Norfolk	Yes	50	23	172	147
Kent-Chatham	Yes	10	28	88	203
TOTAL		275	180	2,431	1,690
Wellington-Dufferin	No	44	63	417	449
Ottawa-Carleton	No	14	6	208	145
Durham Region	No	27	16	421	174
Halton-Peel	No	29	23	260	204
Waterloo Region	No	17	19	185	195
Huron County	No	27	22	242	244
Elgin-St. Thomas	No	29	35	181	178
Lambton	No	19	34	166	214
TOTAL		206	218	2,080	1,803

(Ministry of Health) was promulgated in 1984 which required as a minimum that every owner or person who had care or custody of a cat or dog ensure that their pet was vaccinated against rabies by a common date and re-immunized as required by the veterinary practitioner. Since its inception, 69% (29/42) of all health units in Ontario require compulsory immunization of cats and dogs. The regulation may be effective as the incidence of cat and dog rabies declined from a peak of 280 cases in

cat and dog rabies irrespective of the presence or absence of mandatory vaccination.

In an effort to assess the effectiveness of compulsory immunization, eight health units in Ontario Regulation 567 were compared with eight neighbouring control health units (not in the regulation) with a similar wildlife rabies incidence. The number of cases of feline/canine and wildlife rabies for the five year period before and after initiating mandatory

vaccination were assessed in the health units with compulsory immunization and in the health units without the legislation. Pet and wildlife rabies declined 35% and 30% from 275 to 180 rabid cats and dogs and from 2,431 to 1,690 rabid wildlife respectively in regulated areas. A slight increase in cat and dog rabies, from 206 to 218 occurred in the control areas in spite of a 17% decline in wildlife rabies from 2,080 to 1,803 cases

1986 to 67 in 1994. However, the influence of compulsory pet immunization is not clear as there was a concurrent decline in total animal rabies from a peak of 3,448 in 1986 to 606 in 1994.

Epidemics of rabies in Ontario usually occur first in foxes, followed in subsequent months by increases of rabies in skunks, livestock and finally companion pets.³ On the other hand, a significant decrease in wildlife rabies would have been expected to reduce

(Table 2). The only two health units which experienced an increase of cat and dog rabies in the five year period after initiation of compulsory immunization were Kent-Chatham and its neighbouring control, Lambton. An epidemic of wildlife rabies occurred in these two health units from 1988 to 1990, likely as an extension of the 1986 epidemic which included most of Southern Ontario. If these two health units are excluded, the difference in the reduction of pet rabies in health units with compulsory immunization relative to the controls is more pronounced. The seven regulated health units had a reduction of canine/feline rabies from 265 to 152 cases (43% decline) compared to a small decrease from 187 to 184 cases (2% decline) in areas without compulsory immunization. These observations suggest that the compulsory vaccination regulation was effective in reducing the incidence of cat and dog rabies in these health units.

Compulsory vaccination may give higher vaccination rates among cats and dogs than other agency methods. In 20 counties in Ontario, 88,950 pets were vaccinated under compulsory vaccination (1988) compared to 6,670 vaccinated in voluntary veterinary association programs (1983) and to 49,885 vaccinated in free federal clinics (1985). Vaccination coverage among cats and dogs investigated is also higher in health units in the regulation (Figure 5).

Summary

Compulsory immunization will not eliminate the need for post-exposure treatment, as it is estimated that 28% of all rabies post-exposure treatments (unpublished data, Ontario Ministry of Health) are given following contact with non-vaccinated cats and dogs. More than 66% of post-exposure treatments are due to contact with rabid livestock, wildlife and suspect stray rabid cats and dogs not available for isolation procedures or submission of

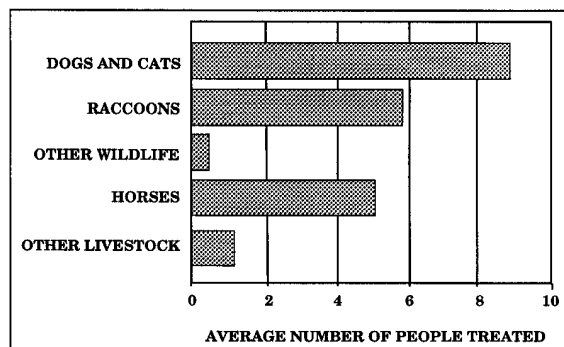


Figure 3. The average number of humans treated for exposure to rabies by a single individual animal of different species. Data are from Ontario, for 1980 - 1989.

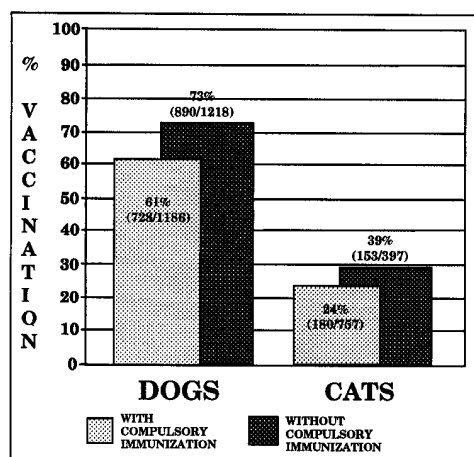


Figure 4. The influence of C. I. on the percent of dogs and cats investigated by Health Departments which were found to be vaccinated against rabies.

diagnostic specimens. However, when combined with the preventive efforts of the Ministry of Natural Resources, under the leadership of the Rabies Advisory Committee, for the immunization of fox, skunk, and raccoon populations, the risk of human rabies in Ontario will be greatly reduced.

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REFERENCES

1. Tabel H, Corner A, Webster W and Coseg C. History and Epizootiology of Rabies in Canada. *Can. Vet. Jour.* 1974;15:271-281.
2. Jackson A. The Fatal Neurologic Illness of the Fourth Duke of Richmond in Canada: Rabies. *Annals RCPSC*, 1994;27:40-41.
3. Johnston D and Beauregard M. Rabies Epidemiology in Ontario. *Bull Wildlife Dis. Assoc.* 1969; 7:357-370.

A VERY SUCCESSFUL OPERATION

The Texas Department of Health carried out the largest single anti-rabies campaign in North America, and possibly the world, in January 1996. This was a response to two separate rabies problems, one in coyotes and the other in grey foxes. This represents a major step forward in control of rabies in wildlife, and the Texans deserve high commendations for developing such an ambitious program with long-term and large-scale mandates. Leadership came from the Commissioner of Health and several senior staff. Well done!

A combination of the Ontario Rabies Unit and Air Service was hired to help - specifically to provide the aircraft, bait dropping machines, navigation and flight planning, and expertise. Three Twin Otters and 18 MNR and OFAH staff left Sault Ste. Marie on 3 January, and got home on 4 February. Roly Tinline and Dave Ball from Queen's University joined us by commercial flights. We were away for 33 days, and flew on 32 of those, including the flights down and back. A total of 273 bait flights were completed successfully. There were 2,565,253 baits deployed, 1,315,960 to counter coyote/dog rabies in South Texas, and 1,249,293 against rabies in grey foxes in West and Central Texas (Figure 1). That was almost three times as many as the drop done in February 1995.

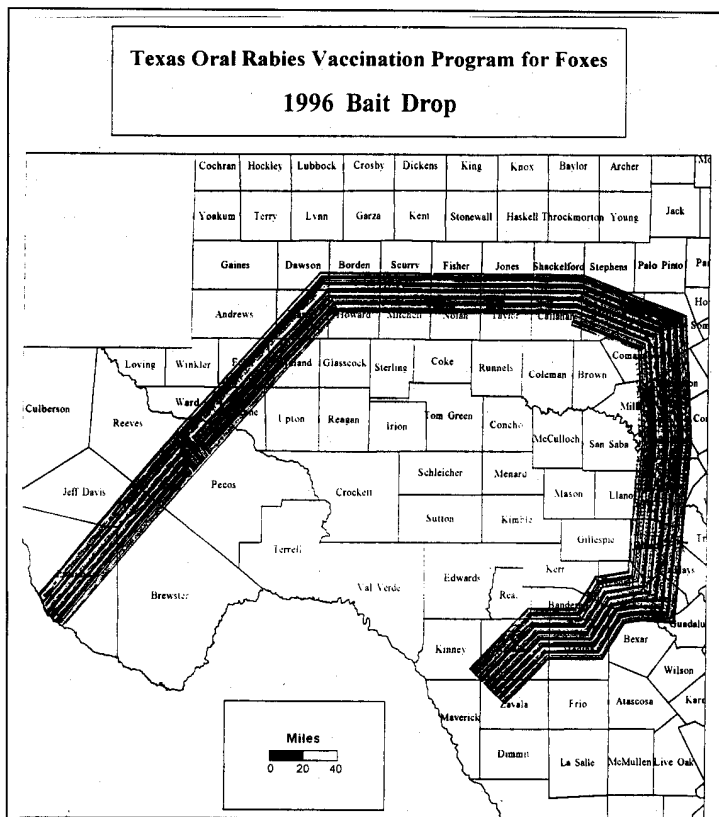
Gayne Fearneyhough, Director of the project for the Texas Department of Health, commented at a debriefing part way through the operation that he had doubted that we could do better in 1996 than the very smooth operation in 1995, but he was now convinced that we had.

The Texas contingent was varied. There was a core of TDH staff, who did all the navigating (for legal reasons). Then there were regular U.S. Army personnel (Veterinary Corps), a contingent from the Texas

National Guard, teams from Animal Damage Control, a joint U.S. - Texas group, and volunteers from several sources, from TDH and Texas Parks and Wildlife to county animal control officers, and some wildlife rehabilitators. Some were with the operation for the whole month, while others could only stay away from their regular jobs for a week or less. Despite the varied sources and the turnover, these people formed a team with tremendous spirit and enthusiasm. We all pitched in to get the job done in less time than predicted, because the whole operation was superbly organised. The Ontario staff trained Texans who were to load the bait machines, and flew regularly to help out, but especially when there were new crews aboard.

The 1996 operation was more complex than last year's, because the belt of baits to contain the spread of the gray fox outbreak covered so much country that three airbases were necessary. The 1996 flights began in the coyote area, based out of Cotulla, a small (3500) town southwest of San Antonio, on the way to Laredo. Cotulla was chosen instead of the 1995 base at Pleasanton because, among other things, all the buildings at the latter's airport were destroyed by a hurricane last summer! After two weeks at Cotulla, we moved to Fort Stockton, almost 300 miles to the west for four days, then three days at Brownwood, over two hundred miles to the northeast, and finally seven days at Burnet, which was "only" ninety miles from Brownwood.

Last year's operation against rabies in coyotes seems to be having an effect. Previously the rabies front was moving north at about 40 miles per year. Since February 1995, it moved only 5 miles. There is still rabies in the area, but less than predicted based on the case loads of the past five years. While we were at Cotulla one of the TDH regional staff received a call about a rabid coyote. A man was under his pickup working



on the engine. He felt several nudges on his shoulder and thought one of his coworkers was playing the fool. Finally he turned his head to yell at the offender, and found himself eyeball-to-eyeball with a coyote! He got out from under quickly, grabbed a gun and shot the coyote. It was rabies positive. Fortunately the weather was cold, and he was wearing enough clothing that the coyote did not maul him, only his jacket.

The coyote rabies spread has resulted in three human deaths. As usual, unfortunately, we know too little about the density of coyotes necessary for the spread and persistence of this strain of rabies. However, the proposition discussed in the last issue of the Rabies Reporter, that coyote rabies has the potential to spread all the way to Canada, and to cover most of the U.S.A., must be taken seriously. Thus, other states, and even Canadian provinces might well think of helping the Texans to contain the spread of this form of rabies.

The gray fox rabies outbreak is very interesting. In the 1940's and '50's, there was rabies throughout the

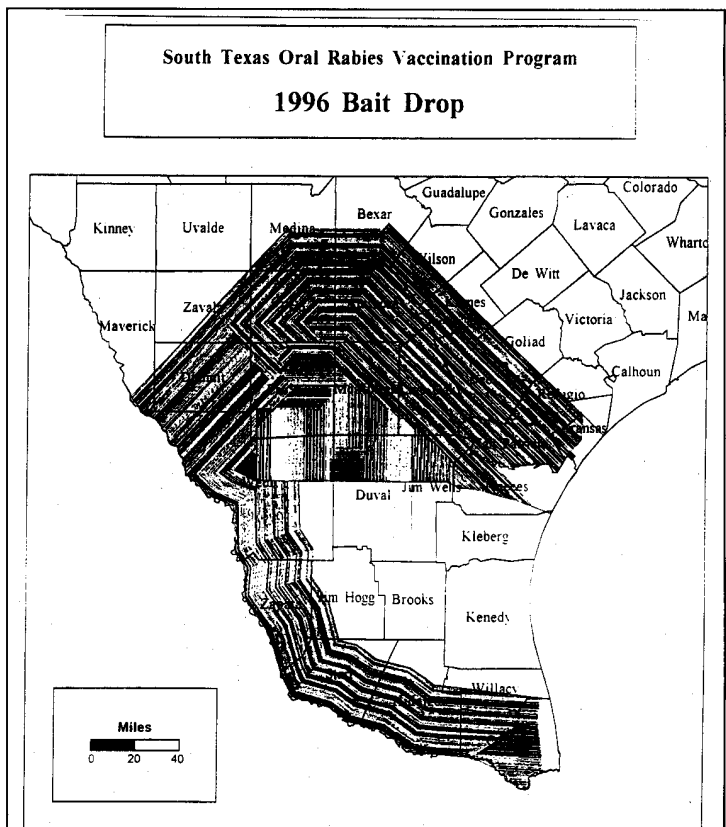
region. In recent years it has been spreading north and eastward from the Plateau, and is now close to the cities of San Antonio, Austin and Abilene. The TDH strategy is to establish a wall of baits 25 miles wide to surround the outbreak, and then to move the wall inwards, eventually to eliminate rabies from the whole area. This will be a long-term operation, but the basic planning is sound, and will keep the annual budget within reasonable bounds.

The coyote baits were made of fishmeal-polym er, and were

Appalachian Mountains, from northern Florida to the southern tier counties in New York. Sometime around 1960, that outbreak disappeared. However, as that was happening, there was spread westward through Mississippi, Arkansas and Louisiana, which culminated in a wave passing across central Texas. The strain then settled in the Edwards Plateau

about the size of a small matchbox (52 x 35 x 20mm). They each contained a 2-ml dose of V-RG vaccine, in a thin plastic sachet. The sachet was pushed into the rectangular cavity in the bait, and held in place by pouring melted wax in both ends. The fox bait was similar in cross-section, but the bait was shorter (35 mm), as experiments in captivity indicated the foxes would not eat the larger bait. The fox bait was made of dog food and ploymer, and had sugar and vanilla added as attractants. The bait is still large and hard, considering that the average gray fox weighs liittle more than most house cats.

The countryside around Cotulla is dry mesquite and cactus brushland. This is some of the best and most expensive deer hunting land in Texas. We saw lots of deer, a few feral hogs and many cattle from the air. There were deer blinds dotted all over the landscape, too. Fort Stockton was a new experience for the Ontario contingent. The countryside around the town itself, and to the north, is flat grassland, too dry to grow mesquite! Just south of the town, however, the



Davis Mountains start, and the southern end of the bait belt was near Big Bend National Park, in some spectacular mountain and canyon country. Imagine dropping baits from 8000 feet ASL, but only 200 feet above ground. There was an interesting discussion on one flight over the mountains. The navigator questioned the logic of dropping baits on the high cliffs. One of the loading crew was an ADC trapper whose territory we were flying over. He claimed that the gray foxes are most abundant on and near the cliffs. They are competent climbers, and use the crevices in the rock for dens, and to escape from coyotes. The country supports only about one cow and calf per square mile, unless the rancher imports feed.

The country north of Fort Stockton, and most of the way around the belt to Brownwood, is flat, covered with a mixture of brush, plowed fields, mostly for cotton, and oil wells. There are oil rigs over a very large area: we were almost never out of sight of at least one pump. From Brownwood to Burnet and south past the west side of San Antonio the country was hilly, but most hills were not more than 100 - 400 feet high. There are a lot of water impoundments, ranging from stock ponds to large lakes. There were cattle and deer everywhere, and occasionally other wildlife. Much of the very flat country probably had more coyotes than gray foxes, but there was no way to tell. Gray foxes are small enough that coyotes are an important predator to them. Just as red foxes in Ontario tend to avoid territory occupied by coyotes, gray foxes in Texas are more abundant where they find refuge from coyotes.

One unfortunate aspect of this year's operation was that the computer based controller and logging system for the bait machines did not get up and running, despite a lot of hard work by Pat Boudreau, Mike Pedde and others. The system is design to be a link between the ARNAV

GPS-based navigation system in the aircraft and the bait machine. It will read the ground speed of the aircraft, adjust the rate of bait drop automatically, and record both bait numbers and aircraft positions at regular intervals. The computer will also have much larger capacity to store flight information, so that uploading the GPS system before each flight will be unnecessary.

The Ontario team will be back in Texas in January 1997. The proposal for this year's operation was issued as a public tender, and resulted in a two-year contract for OMNR. Everyone who was there is looking forward to renewing old acquaintances.

*Charlie MacInnes
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CHASING PHANTOM CATS AND OTHER STORIES

You will note that there is a corrected version of the summary table from vol. 6 no. 3 in this issue. The changes are small, but they do change the total numbers of rabies cases slightly. Charlie MacInnes makes up and enters the tables for each issue, then Wendy Sinclair proof-reads them, including checking that all the additions have been done correctly. We thought that was working until this issue, when we could not both make the totals add up the same way. This led to a hunt for errors, and we found several, all small ones. There are still some discrepancies to be tracked down. The problem originates with the "done by hand" steps in preparing the tables. Finger errors creep in! One problem we had was a cat which should not have been there, but was, hence the reference to phantom cats. It took Wendy and I an hour to track that one down. I thought computers would get us away from errors, but as a check, I

asked Dr. Elliot Salsberg of Agriculture and Agri-Food Canada to supply me a table of the year's rabies cases. His numbers and mine did not agree. Part, but not all, of the discrepancy involved inclusion of some, but not all, clinical diagnoses in the Rabies Reporter data. That flags a serious problem. In the interest of getting this issue, already late, out soon, I used the AAFC data for the 1995 total, but there is still a phantom case which I could not locate. We are going to re-examine the whole data stream during the coming quarter.

Rabies Reporter has never used the information from Agriculture and Agri-food Canada on clinical diagnoses. That was a conscious decision, because clinical diagnoses are done only on livestock, not on foxes or dogs, etc. Livestock numbers are also high because there is need to get diagnosis to receive compensation. The decision to leave out clinical diagnoses was arbitrary. They are reported for the year on the bottom of the summary table, and in a future issue there will be a summary of clinical cases, so that readers can add them to their databases if they wish.

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O.M.N.R. Rabies Unit
Maple*

The Rabies Reporter, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Rabies Research Unit, Ontario Ministry of Natural Resources; the Food Production and Inspection Branch of Agriculture Canada; The Ontario Ministry of Health and the Department of Geography, Queens University, Kingston.. Articles for future issues will be welcomed by the editor. Comments, letters, submissions and enquiries should be sent to:

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Animal Rabies Report: October to December 1995

Animal Type		Fox		Skunk		Other Wildlife		Dog		Cat		Livestock		Total	
County or Area	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		95	94		95	94		95	94		95	94		95	94
Eastern															
Stormont														0	0
Dundas												1		0	0
Glengary														0	0
Prescott						1							2	0	3
Russell							1							0	1
Carleton					2	4	4		1			1	1	2	6
Renfrew														0	0
Lanark							1							0	1
Grenville							1							0	1
Leeds														0	0
Frontenac							1							0	1
Lennox-Addington							1							0	1
Central															
Hastings		1	8			3	1	2	5				9	1	3
Prince Edward														0	0
Northumberland		1	1			2			1					0	1
Victoria			2			15					2		1	0	2
Haliburton														0	0
Peterborough		1	6	2	7	13		2	3		1		2	2	11
Durham			11	2	3	7						1	4	2	4
York Region			6	1	4	10		2				1	1	1	7
Scarborough														0	0
East York														0	0
City of Toronto														0	0
City of York														0	0
NorthYork														0	0
Etobicoke														0	0
Simcoe		2	3	2	2	3	1		3			4		8	11

Animal Rabies Report: October to December 1995

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	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		95	94		95	94		95	94		95	94		95	94		95	94		95	94
Thunder Bay																			0	0	0
Rainy River																			0	0	0
Kenora								1											0	1	0
Subtotals																					
Eastern							1	2	7	6		1					2	3	2	10	10
Central	2	6	36	7	19	51	1	7	12			5		1	2	4	6	17	14	39	123
Western	10	58	121	27	64	57	1	2	8	2		8		4	16	24	40	56	64	170	266
Southern	9	61	90	1	16	33		2	9		4	9	2	7	26	9	18	31	21	108	198
Northern			7					1				1						1	0	1	9
Totals	21	125	254	35	99	142	4	19	35	2	7	23	2	12	44	37	66	108	101	328	606

Livestock this quarter: 33 cattle; 2 horseS; 1 goat; 1 sheep
 Livestock for all of 1995: 61 cattle; 5 horses; 3 goats; 3 sheep
 Other wildlife this quarter: 3 big brown bats; 1 coyote
 Other wildlife for all of 1995: 16 big brown bat; 1 coyote; 1 arctic fox
 Clinical diagnoses for all of 1995: 25 cattle

Animal Rabies Report: July to September 1995 (Corrected February 1996)

Animal Type County or Area	Fox			Skunk			Other Wildlife			Dog			Cat			Livestock			Total		
	#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative		#	Cumulative	
		95	94		95	94		95	94		95	94		95	94		95	94		95	94
Thunder Bay																			0	0	0
Rainy River																			0	0	0
Kenora																			0	1	0
Subtotals																					
Eastern							1	4	4	3						1	1	4	6	5	5
Central		3	33	5	11	37		5	6	12			1	1			17	10	21	105	105
Western	33	47	108	15	37	30	1	1	6		2	4	16	8	22	35	59	111	197	197	197
Southern	30	50	80	7	13	22	2	2	6	1	3	6	1	5	17	2	10	25	43	83	156
Northern			7															1	0	1	8
Totals	63	100	228	27	61	90	12	14	27	1	4	13	3	10	34	10	33	79	116	222	471

Livestock this quarter: 10 cattle; 1 horse

Other wildlife this quarter: 13 big brown bats

