

Abstracts and Reports

EPIDEMIOLOGIC SURVEILLANCE OF RABIES IN THE AMERICAS

The rabies surveillance service performed by CEPANZO, the Pan American Zoonoses Center, in compliance with Resolution VII of the II Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control, was 11 years old in August 1980. On the basis of information sent in by the countries and reports submitted to periodic inter-American meetings, CEPANZO prepared monthly bulletins in Spanish and English and distributed them to agriculture and health agencies, researchers, universities, and specialized libraries of the Americas. Because of budgetary difficulties, however, in 1980 the PAHO Directing Council decided that this service should be transferred to the Pan American Foot-and-Mouth Disease Center. The account that follows is based on the last rabies surveillance report presented by CEPANZO.¹ It covers the salient developments during 1980 and over the decade 1970-1979.

Recent Developments

The Rabies Situation

Rabies in Humans

The most auspicious development in 1980 was the addition of Argentina to the list of countries where no human cases were reported (Table 1). However, Bolivia, Brazil, Nicaragua, and Paraguay reported more human cases in 1980 than in either of the two preceding years; and human cases reappeared in Haiti and the Dominican Republic (where human cases were last reported in 1978), as well as in Honduras (where the last previous human cases were reported in 1976).

The fact that fewer human cases were reported in 1980 than in 1979 does not thereby signal a departure from past trends; for even though the 1980 data are partial, the number of human cases reported exceeds that recorded in some years during the period 1970-1979.

Vaccinations and Vaccine Testing

While data on vaccinations are not covered by the surveillance system, information available at CEPANZO indicates that an average of 260,000 people a year were vaccinated against rabies in 1970-1979. Partial data for 1980 indicate that the year's total was not below that average.

With regard to rabies vaccine for human use, research done by CEPANZO in collaboration with several countries established that fewer doses of suckling mouse brain (SMB) vaccine than are normally administered could elicit a serologic response similar to that obtained by using conventional vaccine schedules. Chile officially approved the use of this shorter schedule for the entire country on 8 October 1979.

During 1980 CEPANZO performed reference tests on 65 batches of rabies vaccine for human and animal use sent in by 10 countries of the Americas. Eighty-one per cent (53 of 65 batches) met the minimum requirements. Of the 23 batches of vaccine for human use, 21

¹PAHO Document RIMSA 2/10, 24 March 1981.

Table 1. Human rabies cases reported in the Americas by country and year, 1970-1980.

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 ^a
Argentina	11	2	2	12	7	5	18	8	9	3	-
Belize	3	-	-	-	-	-	-	-	-	-	-
Bolivia	1	-	1	6	4	1	-	2	10	5	11
Brazil	111	116	62	42	63	86	99	140	134	148	155
Canada	1	-	-	-	-	-	-	-	-	-	-
Chile	-	1	1	-	-	-	-	-	-	-	-
Colombia	32	34	18	5	3	3	1	5	10	7	9
Costa Rica	1	-	-	-	-	-	-	-	-	-	-
Cuba	1	4	1	2	2	2	1	-	-	...	-
Dominican Republic	6	1	3	4	1	4	3	4	1	-	4
Ecuador	19	20	12	14	23	24	2	24	16	25	18
El Salvador	6	5	9	4	15	15	12	8	10	11	11
Grenada	1	-	-	-	-	-	-	-	-	-	...
Guatemala	1	-	3	3	8	2	1	4	5	10	5
Haiti	-	4	-	-	-	-	4	1	6	-	2
Honduras	3	2	5	5	10	-	14	-	-	-	5
Mexico	65	73	67	44	69	56	61	34	84	59	40
Nicaragua	1	2	3	2	3	-	1	2	3	1	5
Panama	-	1	-	1	-	-	-	-	-	-	-
Paraguay	3	2	4	1	2	1	2	1	1	1	6
Peru	11	12	5	11	16	13	15	8	12	17	6
United States	2	2	2	1	-	2	2	1	2	3	...
Venezuela	13	7	4	6	3	5	5	6	9	11	6
Total	292	288	202	163	229	219	241	248	312	301	283

^aPartial data.

- = No cases reported.

... = No data.

(91 per cent) passed the tests, as did 32 (76 per cent) of the 42 batches of vaccine for animal use.

A periodic survey of laboratories producing rabies vaccines is being conducted this year (1981) to ascertain national and regional production levels. Data on 1971 and 1977 vaccine production are presented in Table 2.

Laboratory Diagnosis

As in earlier years, many human cases were notified without laboratory confirmation. More cases of rabies in animals, particularly in urban cats and dogs, had diagnostic confirmation, but in most bovine cases the diagnosis was purely clinical. The reason for this is that many of these unconfirmed cases oc-

curred at great distances from laboratories, which made it difficult or impossible to send in specimens. It may well be that some of these cases were caused by other pathogens. However, the trouble is not caused by lack of laboratory manpower, facilities, and equipment for the diagnosis of rabies, but rather by logistical difficulties. It is therefore urgent that government services take steps to reduce the logistical problems and promote provision of specimens.

Neurologic Postvaccination Complications

Since 1970 the number of cases involving these complications has ranged from seven to 16 per year, the average being 11 cases. Nine

Table 2. Rabies vaccine production in the Americas in 1971 and 1977, by country, showing the numbers of laboratories producing vaccine for use in humans and animals and the number of doses produced.

Country	Vaccine for use in:											
	Vaccine for use in humans				Dogs and cats				Cattle			
	No. of laboratories		No. of doses		No. of laboratories		No. of doses		No. of laboratories		No. of doses	
	1971	1977	1971	1977	1971	1977	1971	1977	1971	1977	1971	1977
Argentina	3	3	348,900	682,000	5	7	1,691,671	6,490,000	5	3	720,910	555,000
Bolivia	1	1	-	31,024 ^a	-	1	-	35,160	1	1	140,000	29,252
Brazil	2	5	1,794,900	2,620,000	1	6	2,118,566	9,388,500	1	10	1,581,700	9,079,782
Canada	1	-	26,792	-	-	-	-	-	2	-	1,723,297	-
Chile	1	1	89,010	100,000	1	1	262,900	300,000	-	-	-	-
Colombia	1	1	592,000	200,000	3	1	718,317	1,165,100	1	1	21,830	1,165,100
Cuba	1	1	85,700	100,000	1	-	400,000	-	-	-	-	-
Dominican Republic	-	-	-	-	-	1	-	60,000	-	-	-	-
Ecuador	1	1	201,882	250,000	-	1	-	950,000	-	1	-	10,000
El Salvador	1	1	88,615	202,000	-	-	-	-	-	-	-	-
Guatemala	1	1	151,566	152,048	1	1	36,077	150,000	1	1	4,620	-
Mexico	3	1	2,098,000	1,057,340	3	1	1,162,490	556,140	1	1	-	753,320
Nicaragua	-	-	-	-	1	-	448	-	-	-	-	-
Peru	1	1	212,373	380,000	1	1	342,040	500,000	1	1	5,230	28,300
United States	1	-	391,641	-	-	-	-	-	-	-	-	-
Uruguay	2	-	20,000	-	1	1	10,000	5,000	1	1	70,000	20,000
Venezuela	-	1	-	200,000	-	2	-	730,000	-	1	-	220,000
Total	20	18	6,101,379	5,974,412	17	24	6,742,509	20,329,000	14	21	4,267,587	11,860,754

Source: CEPANZO survey.

^aOn an experimental basis

Table 3. Reported canine rabies cases in the Americas by country and year, 1970-1980.

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 ^a
Argentina	671	646	773	1,364	1,277	1,871	4,811	2,334	1,115	1,033	550
Belize	44	5	-	-	-	3	10	2	-	1	7
Bolivia	276	247	536	509	173	158	86	280	501	672	718
Brazil	2,913	455	405	289	594	525	4,735	5,231	1,414	4,510	4,551
Canada	130	98	135	94	113	109	87	73	79	91	34
Chile	12	17	5	9	3	2	4	11	4	2	-
Colombia	9,421	9,847	3,043	2,501	2,665	2,304	1,577	2,117	3,051	2,210	2,043
Costa Rica	47	7	7	4	25	13	25	11	-	-	2
Cuba	72	160	163	207	105	86	45	45	43	43	26
Dominican Republic	171	117	73	118	80	178	140	86	55	50	82
Ecuador	918	1,215	645	178	434	1,279	198	927	345	1,342	2,273
El Salvador	1	48	86	62	48	38	57	68	39	55	63
Grenada	5	3	1	2	-	1	5	2	5	-	...
Guatemala	215	137	182	283	214	79	79	201	472	310	273
Haiti	54	144	99	86	31	8	2	2	...	64	64
Honduras	98	66	127	229	165	82	72	129	156	225	1,410
Mexico	4,557	7,239	3,078	2,604	3,221	3,771	3,937	11,705	14,109	11,978	9,903
Nicaragua	154	204	169	189	123	40	68	270	169	126	268
Panama	20	31	6	4	-	-	-	-	-	-	-
Paraguay	160	258	227	286	204	205	208	206	284	183	291
Peru	1,048	646	310	442	760	682	407	595	871	792	362
Suriname	-	-	-	-	-	-	-	-	-	-	1
Trinidad and Tobago	1	3	-	-	-	-	1	-	-	-	-
United States	182	235	240	180	208	98
Venezuela	561	371	266	281	452	445	325	502	698	558	389
Total	21,731	22,199	10,576	9,921	10,905	11,977	16,879	24,797	23,410	24,245	23,310

^aPartial data.

- = No cases reported.

... = No data.

cases occurred in 1980 (two in Argentina, one in Brazil, two in Venezuela, and four in Nicaragua). These data draw attention to the four Nicaraguan cases, which occurred in a two-month period (May-June 1980) after three years when the country was free of reported complications. As of early 1981, however, CEPANZO had no further information about this matter.

Animal Cases

Dogs. The number of dog cases reported in the Americas as a whole in 1980 stayed at about the 1979 level (Table 3). Nevertheless, in some countries (notably Argentina, Canada, and Venezuela) the figure dropped markedly. Chile reported no cases for the first time, Panama completed seven years with no recorded cases, and Trinidad and Tobago completed four.

On the other hand, considerably higher numbers of cases were reported in Belize, the Dominican Republic, Ecuador, Honduras, and Nicaragua. After two years with no reported cases, Costa Rica reported two cases, and Suriname reported a case for the first time in 11 years.

Cats. The number of reported 1980 cases (1,148) exceeded the 1979 total of 948. Belize reported cases for the first time since 1970, and Brazil reported 432, many times the number reported in 1978 (12) and 1979 (6). The number of cases reported in Argentina dropped from 95 in 1979 to 35 in 1980.

Cattle. The number of bovine cases reported was significantly smaller than in preceding years. However, underreporting of cattle cases is very substantial—as shown by data PAHO's Member Countries provided recently for inclusion in a study of the animal health situation in the Americas. The 85,704 cases therein reported by only three countries (Argentina, Brazil, and Mexico) for the period 1973-1977 greatly exceed the total number of cases (40,545) reported to CEPANZO during all 11 years of surveillance service operations.

The reasons for this underreporting include the following:

- veterinary services are not adequately developed in all the countries, and their structures are poorly suited to meeting the needs of the different technical and administrative levels;
- surveillance and reporting systems have not yet attained the requisite level of development;
- most cases occur in vast, sparsely populated, and hard-to-reach areas where cattle are raised on an extensive basis;
- the communities involved, being relatively unaware of hygienic considerations and being only indirectly affected by the problem, tend to report suspected cases either too late or not at all.

Wildlife. The largest numbers of wildlife cases are still reported in the countries of North America. Canada reported 698 of the 1,225 1980 cases reported in the Americas. And although the United States did not break down its 6,220 reported 1980 cases by species, it may be supposed on the basis of earlier data that most of these cases occurred in wildlife.

Developments of 1970-1979

The 1970-1979 record of rabies cases shows results far removed from the goal recommended in the Ten-Year Health Plan for the Americas; in fact, over this period the number of cases remained more or less unchanged (Table 4). This situation should spur PAHO's Member Countries to redouble their efforts against rabies, with a view to attaining this goal as soon as possible.

The data assembled for the decade indicate that different situations prevail in two major areas. In the first area, which embraces Canada and the United States, the disease has been virtually confined to wildlife. In the second, composed of the rest of the countries in the Americas, rabies is transmitted to people chiefly by dogs (91 per cent) and cats (4 per cent); and it remains, with the variations to be expected among the different countries, a serious public health problem. The gravity of this problem is demonstrated by the large number of people (an estimated 2,600,000)

Table 4. Reported rabies cases in humans, postvaccination complications, and rabies cases in animals in the Americas, 1970-1980.

Rabies cases	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 ^a
<i>Human cases and complications:</i>											
Cases	292	288	202	163	229	219	241	248	312	301	273
Complications	30	16	11	14	11	8	9	7	15	10	7
<i>Animal cases in:</i>											
Dogs	21,731	22,199	10,576	9,921	10,905	11,977	16,879	24,797	23,410	24,245	23,310
Cats	1,572	1,337	903	874	866	924	1,328	1,501	979	948	1,148
Cattle	5,251	4,050	4,515	4,296	3,978	3,828	3,169	2,984	3,475	3,685	1,314
Other domesticated animals	477	414	548	723	429	444	333	372	573	647	236
Wildlife	3,701	4,808	5,229	4,465	3,397	3,269	1,279	1,550	1,766	1,894	1,225
Unspecified animals ^b	393	331	324	379	65	21	3,579	3,901	3,948	5,162	7,158

^aPartial data.

^bAfter 1975 the U.S. data are not broken down by species and so are included in the "unspecified animals" category.

who had to undergo treatment following exposure during the decade.

Human Cases

The number of human deaths from rabies per year has remained high, with variations being accounted for by improvement of some reporting systems and the implementation of temporary control measures in some countries.

Animal Cases

Dogs and Cats. Outside of Canada and the United States, dogs and cats remain the Hemisphere's major sources of rabies transmission to humans. Like the data on human cases, recorded information on dog and cat cases showed some years in which control measures caused reduction of those cases; however, the number of cases soon rose again because such measures were not continued long enough.

The actual extent to which dogs are vaccinated has been questioned recently, because the ratio of one dog to every 10 inhabitants, which is generally used to estimate the canine population, is often unrealistic. Consequently, the actual coverages achieved are often far below those regarded as useful.

The number of cats in which rabies was diagnosed is very high. It should be mentioned that the ratio of the animal to the human population is less known for that species than for dogs. The figures for laboratory-confirmed feline rabies cases were also relatively high—chiefly in Argentina, Canada, Colombia, Ecuador, and Mexico.

Cattle. The rabies problem in this species has special features. That is, the proportion of diagnoses confirmed by laboratories is very low, partly because of the difficulty of obtaining specimens and partly because in most cases the transmitting animals are wild (vampire bats, foxes, and so forth). The result is that the data for rabies in cattle has very limited utility. The countries reporting the

largest numbers of cases in 1970-1979 were Argentina, Brazil, Canada, Mexico, the United States, and Venezuela—all of which are major livestock-raising countries.

Wildlife. As previously indicated, wildlife cases are a constant source of concern to Canada and the United States, which together report over 80 per cent of such cases. It is to be hoped that the relatively lower incidence of reported wildlife cases in the rest of the Hemisphere arises not from ignorance of the problem (because priority must be given to controlling rabies transmitted by dogs and cats), but rather from the actual situation.

Concluding Remarks

The measures undertaken so far in most countries of the Americas have been isolated and of insufficient duration to have anything more than a brief and slight impact on the prevailing disease pattern. This situation is not helped by the fact that national reporting systems either fail to obtain all the data needed for control programs, or else obtain them too late, or that there remains an urgent need for other sorts of data, such as the numbers of people exposed and treated, the numbers of animals vaccinated, and the quantities of vaccines produced for human and veterinary use.

In view of the large number of people at risk from rabies and the costliness of the treatments to which they must be subjected, the disease can be considered a serious public health problem that should be dealt with using an all-inclusive inter-institutional approach. The present problem could also be aggravated by the explosiveness of population growth in Latin America and the Caribbean—current projections indicating that by the end of the 1980s some 80 per cent of the population of several American countries will be clustered in urban centers.

Overall, while the proper procedures for controlling and eradicating both canine rabies and human rabies originating in dogs and cats

are perfectly understood, these procedures have been very poorly implemented. Therefore, the solution to the problem lies not in a search for fresh control procedures or in development of vaccines that confer longer immunity, but in a more effective marshaling of existing institutional and managerial capa-

bilities to make use of the available technology. This requires a political decision to undertake programs that will enjoy the resources and continuity needed to eliminate transmission from dogs and cats to people and also to reduce the damage done to the health and productivity of the Region's livestock.

THE WORLD MALARIA SITUATION, 1979

Progress against malaria has been made recently in some countries, while in others the malaria prevalence is increasing. However, in considering available data it must be borne in mind that in all probability they provide an underestimate of the true parasite reservoir persisting in the affected countries for the following reasons: (1) countries do not report on all their malarious areas, and (2) case detection activities have been reduced drastically in some countries due to the high cost of maintaining a full surveillance system on a total coverage basis.

The key points to stress are that (a) there is a real risk of malaria being reintroduced as an endemic disease in areas that were freed of malaria but that are still receptive to it, especially in view of increasing international travel; and (b) there is danger of a nonimmune person being infected when traveling abroad in malarious countries. Providing advice to international travelers is a joint responsibility of the traveler's country of origin and his country of destination.¹

¹Sources: World Health Organization, Synopsis of the world malaria situation, 1979, *Weekly Epidemiological Record* 56(19):145-149, 1981, and Malaria situation by large epidemiological areas: Period from January to December 1979, *Weekly Epidemiological Record* 56(21):162-166, 1981.

Africa North of the Sahara (Population 89 Million)

Most of the 72 million people living in originally malarious areas can be considered at very limited risk. Egypt, the Libyan Arab Jamahiriya, and Tunisia reported fewer cases in 1979 than in 1978. In Algeria, 73 cases were reported as against 30 in 1978. In Morocco, the malaria incidence, which up to 1978 showed a downward trend, increased in 1979 with 397 cases reported (as against 64 in 1978). Defective surveillance caused the extension of a limited focus in Khémisset Province. Indigenous cases are reported from eight other provinces, and for the first time since 1974 indigenous *P. falciparum* cases were detected in two provinces.

Africa South of the Sahara (Population 367 Million)

Lesotho, the Seychelles, St. Helena, and the major part of South Africa are naturally malaria-free. La Réunion was officially registered as having eradicated malaria. Elsewhere, the number of cases reported from 31 countries in 1979 was 5.82 million, certainly representing only a fraction of the true number of cases (see Table 1).