

Rabies in Europe and a Comparison of U. S. and European Rabies Data

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A WILDLIFE RABIES EPIZOOTIC first observed in the early 1940s has invaded most European countries and is still progressing. The fox has been implicated as the primary source of rabies, which has crossed national and natural boundaries in all directions. Except for a few notable examples, wildlife rabies outbreaks have not been stopped in any one country.

European Rabies Surveillance

During informal consultation held at the World Health Organization (WHO) Center in Tubingen, Germany, in March 1976, the directors of veterinary services of some European countries and representatives of WHO and the International Office of Epizootics (OIE) discussed the technical feasibility of a European rabies surveillance system and expressed their willingness for international cooperation. In compliance with the recommendations made by the WHO European Conference on the Surveillance and Control of Rabies in 1968, and following recommendations of the WHO Expert Committee on Rabies, a European Rabies Surveillance System has now been established.

European rabies data collection in a computer-compatible form has entered a preparatory stage, but much more time will elapse before computerized rabies data for regular reporting will be available for most parts of central Europe. Until this goal is reached, routinely available rabies data and other relevant information from national authorities are being collected, compiled, and presented in joint rabies bulletins. For the first issue, rabies data were requested from the veterinary service of 14 European countries, and 13 responded.

The first bulletin (1), issued August 1977, presented the rabies situation in Europe. Each country described its rabies problems and especially emphasized the situation on the borders with neighboring countries. European rabies data continue to be available through other sources as well, such as national, WHO, and OIE reports (2-6).

European Rabies Situation, 1977

In the first half of 1977 exceptionally high numbers of rabies cases were reported in portions of Austria, France, Germany, and Switzerland. New territories previously considered rabies free as well as some for-

merly involved areas reported infected animals. Although France recorded fewer cases of rabies in the first 6 months of 1977 than in the same period in 1976, more areas were affected. Via Austria, fox rabies has crossed the Alps into northern Italy. The disease is spreading southward in France and Switzerland and northward from the Schleswig-Holstein areas of Germany into Denmark.

Denmark, which had not reported rabies since November 1970, diagnosed a case in a fox in September 1977. This animal was found dead approximately 500 meters north of the German-Danish frontier. Subsequently two more foxes were found positive for rabies in the same area in September.

In contrast, a significant decrease of rabies cases is presently being reported from Belgium, the Netherlands, and Luxembourg. No animal rabies and one imported human case were reported by Great Britain in the first half of 1977.

In the first 6 months of 1977, the following numbers, by types, of rabies cases were reported by participating countries:

Country	Types of rabies cases		
	Wild	Domestic	Human
Austria	1,450	85	0
Belgium	20	29	0
Czechoslovakia	187	13	0
Federal Republic of Germany ..	2,547	302	0
France	755	172	0
Great Britain	0	0	1
Hungary	337	50	0
Italy	29	0	0
Luxembourg	14	2	0
The Netherlands	1	0	0
Poland	401	148	0
Switzerland	459	76	2
Total	6,200	877	3

Wildlife Rabies Studies

Within the WHO/FAO (Food and Agriculture Organization) Coordinated Research Program on Wildlife Rabies in Europe, intensive epidemiologic and ecologic studies have been carried out on the inter-

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action between fox populations, rabies, and control measures under different topographic conditions (7). In addition, the role of other wild carnivores and the effect of rabies and fox control on these species, as well as small game and rodents, have been investigated (8-12). In some European countries, these research projects were supplemented by ecologic studies on the composition and annual turnover of stable fox populations and on the recovery rate of fox populations after reduction by rabies and control measures (13-15). The results of these investigations have led to a better understanding of the mechanism of spread of the epizootics and to proposals for the improvement of rabies control in animals and the protection of man.

Rabies Control

Rabies control programs stress the importance of reducing the fox (*Vulpes vulpes*) population since this species maintains a major position in the epizootiology of the disease in Europe. Although there is no uniform control program throughout Europe, the majority of countries conduct the following activities:

1. Shooting, trapping, and poisoning of foxes and gassing of fox dens.
2. Annual compulsory vaccination of dogs and voluntary vaccination of cats especially in affected areas.
3. Strict enforcement of stray animal control measures.
4. Active information and education campaigns regarding rabies and control measures.

Great Britain maintains a strict 6-month quarantine period for dogs entering the country. In addition, vaccination of animals against rabies in Great Britain is not allowed except that a licensed, inactivated vaccine is used in dogs or cats entering quarantine kennels and in animals being exported to countries with import regulations requiring vaccination.

European and U.S. Rabies Problems

Wildlife rabies accounts for approximately 85-90 percent of all cases reported in both Europe and the United States, but the species of animals primarily involved differ because of corresponding differences in species populations readily available as potential reservoirs for the disease. In Europe approximately 85 percent of the wildlife cases and 74 percent of all cases are in foxes, whereas in the United States foxes presently represent approximately 7 percent of wild-

life cases and 6 percent of total reported cases. Fox rabies was once the major wildlife problem in the United States, representing approximately 61 percent of the wildlife cases and 22 percent of all cases reported in 1956. Fox hunting and trapping, decimation of the population by rabies and other infections, and reduction of suitable habitat may have been contributing factors in the appreciable reduction in fox rabies cases in the United States.

For 16 years the skunk has been the most frequently reported animal positive for rabies in the United States; it accounted for 54 percent of wildlife cases and 47 percent of the total cases in 1976. In contrast, Europe reports few cases of skunk rabies; only about 2.4 percent of wildlife cases and 2.1 percent of all rabies cases reported in the first half of 1977 were in skunks and other mustelids.

Only occasional cases of rabies in badgers and deer are reported in the United States, whereas in Europe in the first 6 months of 1977, 3.7 percent of all reported rabies cases were in badgers and 6.5 percent were in deer.

Raccoon rabies is not a problem in Europe, but in the United States it represents 10 percent of wildlife rabies and 9 percent of all rabies cases reported. Although 13 States reported raccoon rabies in 1976, 92 percent of the cases were in Georgia and Florida.

Cases of rabies in bats are more widely distributed geographically than those in any other animal host in the United States, whereas few bats have ever been found positive for rabies in Europe since relatively few bats exist there (16, 17). Bats represented approximately 27 percent of the wildlife rabies and 23 percent of all U.S. cases reported in 1976.

Approximately 10-15 percent of all rabies cases reported in both the United States and Europe are in domestic animals. Cat rabies comprises approximately 38 percent of the domestic animal rabies in Europe, compared with 25 percent in the United States. Cattle rabies represents approximately 26 percent of the domestic animal cases in Europe and 39 percent in the United States. Dog rabies comprises 20 percent of the European and 28 percent of the U.S. domestic animal cases. Equines (horses and mules) represent 4 percent of the European and 7 percent of the U.S. domestic animal cases. Although sheep and goat rabies represents 11 percent of the European domestic animal cases, these animals comprise only 0.2 percent of the U.S. cases.

Rabies-Free Countries

In addition to Great Britain, Northern Ireland, Denmark (no longer rabies free), and Italy (no longer

rabies free), the following European areas reported being free of rabies in 1976: Norway, Sweden, Finland, Iceland, the Faroe Islands, Ireland (Eire), Madeira, the Azores, Portugal, Malta, Cyprus, Bulgaria, and Albania.

Human Rabies, Europe and the United States

From 1970 through April 15, 1977, 15 cases—all fatal—of imported human rabies occurred in western Europe. "Imported" means that the patients were infected in other parts of the world but the onset of their disease occurred in developed European countries where rabies in man is uncommon. Of the 15 cases, 6 occurred in France, 5 in the Federal Republic of Germany, 3 in Great Britain, and 1 in Sweden. During the same period, five imported human cases occurred in the United States.

In the same period also, five indigenous cases (the patients were exposed in the countries in which they lived) occurred, two in Switzerland and three in the Federal Republic of Germany. The United States reported nine indigenous human cases. The States and the type of exposure in each were Arizona, skunk; Kentucky, bat; Maryland, bat; Minnesota, cat; New Jersey, bat; New York, laboratory; Ohio, bat; South Dakota, skunk; and Texas, laboratory.

From 1970 and through 1975, 83 additional cases, not specified whether imported or indigenous, were reported from European countries—66 in Turkey, 9 in Yugoslavia, 6 in Poland, and 1 each in Czechoslovakia and Spain.

Post-Exposure Prophylaxis

Human antirabies treatments vary from one country to another in Europe. Although most countries are using vaccination schedules similar to or the same as that recommended by the WHO Expert Committee on Rabies (18), there is considerable variation from country to country concerning immune serum application, number of boosters, and also in certain countries the volume per dose in relation to severity of exposure.

Vaccines used in Europe include the following types, all of which are inactivated: nervous tissue (sheep, rat, suckling mouse, or rabbit brain), duck embryo, and human diploid cell culture. Hyperimmune antirabies serum of equine origin or human origin rabies immune gamma globulin are used in conjunction with vaccine in less than 10 percent of persons treated. In the United States, human origin rabies immune globulin (RIG) is recommended in conjunction with duck embryo vaccine (DEV) for all postexposure antirabies treatments (19).

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