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Science and Public Health Research in Alaska: Animal-Borne Diseases [PHR Brief]

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The New Frontier

Science and Public Health Research in Alaska

Reader's Guide

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Animal-Borne Diseases



The study of diseases transmissible from lower vertebrates to man has been carried on since 1948 in Alaska by the Arctic Health Research Center. Emphasis to date has been placed on diseases of helminthic origin.

Hydatid Disease

It has been recognized for many years that the tapeworm *Echinococcus granulosus* exists in North America and that the wolf and the moose are essentially involved in its natural life cycle. Ruminants other than the moose may also serve as intermediate hosts, and dogs and foxes often harbor the adult parasite.

Postmortem examinations of canine animals as well as the moose have disclosed that this parasite is common in Alaska. As high as 25 percent of the sledge dogs in certain villages have been found infected. The necessarily close association between man and dog in Alaska provides ample opportunity for human infection, which occurs as a result of the ingestion of tapeworm eggs eliminated in the excreta of canine animals. Living conditions in the far north often make impossible the sanitary precautions necessary to prevent human contact with the parasites.

On St. Lawrence Island, a much more pathogenic form of *Echinococcus* has been found. Its natural life cycle involves the arctic fox and at least two species of small, mouselike rodents; thus, the development of an effective control program would not be feasible should this tapeworm become established on the mainland. Dogs are as readily infected through eating

infected rodents as are foxes, and it is probable that most of the human infections are attributable to eggs disseminated by infected dogs. It is hoped that introduction of this disease into continental North America can be prevented by rational quarantine measures. Stringent control of dogs, particularly on St. Lawrence Island, is recommended. An educational program is badly needed to inform the people of the importance of this disease.

Trichinosis

An investigation of the prevalence of trichinosis in Alaskan mammals was undertaken in 1949. It was found that a wide variety, including bears, dogs, wolves, foxes, and wolverines, often harbor *Trichinella spiralis*. The parasite was also recorded from tree squirrels. A white whale was found infected, and larvae were recovered from hair seals. It is probable that trichinosis is transmitted to man from bears more often than from any other group of Alaskan mammals. Polar bears are sometimes eaten under conditions which preclude adequate cooking. The problem of trichinosis, however, is not considered a serious threat to human health in Alaska.

Diphyllobothriasis

A survey of possible terminal hosts of cestodes of the genus *Diphyllobothrium* has disclosed their occurrence in a variety of mammal species, including, besides man, bears, dogs, and foxes. They have also been observed in gulls and eagles. No comprehensive survey of the fish intermediate hosts of this tapeworm has been made, but it is obvious that in certain areas most trout exceeding 6 inches in length are infected. Some contain so many plerocercoids that fishermen consider them unfit for food.

No attempt has been made to evaluate the importance of *Diphyllobothrium* to human health. In regions where fish make up a high proportion of the diet (for example, lower Kuskokwim-Yukon country) incidence of human infection is high. Treatment so far has little value because of the probability of immediate reinfection.

If it can be established that a single species of *Diphyllobothrium* occurs in the various car-

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nivores, birds, and man, the problem of control will be complex. Infected birds particularly would serve to maintain infection in fish. Much work remains to be done on this problem.

Diseases of Nonhelminthic Origin

Important in Alaska among diseases of non-helminthic origin is rabies. Known to be enzootic over most of the Territory, it constitutes an ever-present threat to public health. Almost every year there is an outbreak among wild or domestic canids somewhere in the Territory, but so far it has not been reported to attain epizootic proportions.

The great numbers of stray dogs to be found at any time around the larger towns, particularly Anchorage and Fairbanks, constitute an animal reservoir through which rabies might spread rapidly if once introduced. There is no provision for dog control outside the limits of incorporated towns, and control within their limits is far from adequate. No program for vaccination of dogs has been established, and there is little expectation of any.

Tularemia in man is rarely reported in Alaska, although it has been known for several years that it does occur. With increasing sport hunting of hares in the populated portions, this disease may attain some importance.

Various other diseases—brucellosis, leptospirosis, ratbite fever—have been investigated to some extent in Alaska, but their present status is indefinite. It is anticipated that these diseases and many others will receive attention in coming years.