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The Epidemiology of Rabies in Thailand

A thesis presented in partial fulfilment of the requirement for
the degree of
Master of Veterinary Studies

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This thesis is inspired by, and dedicated to, rabies victims.

May there be no more.

Abstract

This study was designed to investigate the epidemiology of rabies in Thailand and to evaluate the rabies control programme. The study involved retrospective analysis of seven years data (1993 to 1999), concerning rabies incidence and control activity. Five datasets from four different organisations responsible for rabies control in Thailand were collected between March and June, 2000.

Control activity data were found to be incomplete due mainly to problems associated with the data collection form and with methods of data storage and retrieval in provincial offices. Recommendations are made in this thesis to modify the data collection form and data storage methods to improve data collection and the usefulness of information collected in the future.

The annual cumulative incidence of rabies in both animals and humans has declined considerably between 1993 to 1999 as a result of the control programme implemented under the Rabies Act B.E. 2535 (1992). Rabies in humans is more common in males than females and is more common in young children (less than 10 years of age) than any other age group. Dogs were the most commonly submitted animal for rabies diagnosis as part of the surveillance programme, accounting for 87% of the total of 40,649 submissions. Cows were more likely to return a positive rabies diagnosis than any other animal (57% of a total of 409 animals submitted) while dogs returned more cases than any other animal species (43% of a total of 35,338 animals submitted). Detailed investigations were confined to dogs. Rabies was more common in non-owned dogs, non-vaccinated dogs, dogs showing signs consistent with furious rabies, and dogs with a history of having attacked or bitten either other animals or both animals and people.

The spatio-temporal pattern of rabies in both dogs and people, showed changes in the distribution of rabies cases during the seven year period of the study. Mixed effect Poisson regression models incorporating spatial and non-spatial random effect terms were used to investigate risk factors associated with rabies. Factors associated with increasing risk of rabies in people at the province level included: increasing dog density, increasing incidence of rabies in dogs, and reduction in human population density. In the 1999 dataset, there was evidence of spatial clustering of rabies risk. In addition a cluster of provinces showed an elevation in rabies risk that was unexplained by the explanatory variables included in the model. The reason for this cluster of elevated risk remains to be elucidated.

Factors associated with an increasing risk of rabies in dogs at the province level included increasing dog population density and increasing proportion of dogs vaccinated against rabies. Relative risk estimates were close to one suggesting the strength of the association for both terms was weak. Increased dog vaccination against rabies is likely to occur in provinces with a higher risk of both animal and human rabies.

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I never expected that without any computer skills and no basic knowledge in epidemiology and statistics, I could become an epidemiologist and create a major piece of work, which will be beneficial to the Rabies Control Programme in Thailand.

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