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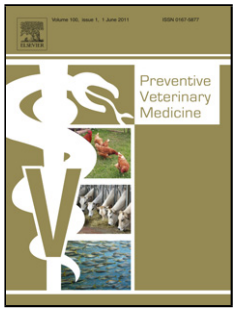

Title: Reconciling surveillance systems with limited resources: an evaluation of passive surveillance for rabies in an endemic setting

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Title: Reconciling surveillance systems with limited resources: an evaluation of passive surveillance for rabies in an endemic setting

Article Type: Research Paper

Keywords: Canine Rabies, Surveillance, Scenario Tree Model, System sensitivity, Endemic region

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Abstract: Surveillance systems for rabies in endemic regions are often subject to severe constraints in terms of resources. The World Organisation for Animal Health (OIE) and the World Health Organisation (WHO) propose the use of an active surveillance system to substantiate claims of disease freedom, including rabies. However, many countries do not have the resources to establish active surveillance systems for rabies and the testing of dead dogs poses logistical challenges. This paper explores the potential of using a scenario tree model parameterised with data collected via questionnaires and interviews to estimate the sensitivity of passive surveillance, assessing its potential as a viable low-cost alternative to active surveillance systems. The results of this explorative study illustrated that given a large enough sample size, in this case the entire population of Colombo City, the sensitivity of passive surveillance can be 100% even at low disease prevalence (0.1%), despite the low sensitivity of individual surveillance components (mean values in the range 4.077x10-5 - 1.834x10-3 at 1% prevalence). In addition, logistic regression was used to identify factors associated with increased recognition of rabies in dogs and reporting of rabies suspect dogs. Increased recognition was observed amongst dog owners (OR 3.8 (1.3 -10.8)), people previously bitten by dogs(OR 5.9 (2.2 -15.9)) and people who believed they had seen suspect dogs in the past (OR 4.7 (1.8 - 12.9)). Increased likelihood of reporting suspect dogs was observed amongst dog owners (OR 5.3 (1.1 -25)). Further work is required to validate the data collection tool and the assumptions made in the model with respect to sample size in order to develop a robust methodology for evaluating passive rabies surveillance.

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