

A CROSS-SECTIONAL SURVEY ON DOG ECOLOGY AND DOG ANTI-RABIES VACCINATION COVERAGE IN SELECTED AREAS IN SRI LANKA

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SUMMARY: Dogs are the main transmitter of rabies virus for humans in Sri Lanka. Therefore, updated information on the dog rabies vaccination coverage and dog ecology are essential for launching an effective rabies elimination program in the country.

A descriptive cross sectional study was conducted in 120 clusters. Counts recorded at the vaccination centres were considered as the capture sample. In the recapture sample, data collected on humans and dogs through the questionnaire survey administered on households were considered. Number of dogs vaccinated against rabies and the total number of people in the dog-owning households that attended the vaccination centres were 2508 and 8690 respectively. The household survey of the study included 2207 households, which includes 8650 family members. Among these households, 774 houses had dogs which included 3382 family members.

From the 2933, free-roaming owned dogs and free-roaming dogs with undetermined ownership counted through the transect line, 1413 had been marked in the study areas. Out of 838 owned confined and owned free-roaming dogs found during the questionnaire survey administered on 2207 households, 579 were recorded as recaptured.

The estimated human population of the area surveyed was 34,901. The tabulated ratio of the total dog population in total human was 1:6.7 and owned dog population to human ratio was 1:9.6. The estimated owned dog population was 3630 and the total dog population was 5205. The total dog vaccination coverage is 48% (2508/5205). Owned (confined and free-roaming) dog vaccination coverage achieved was 69%. Vaccination coverage among owned free-roaming dogs was 54% and significantly low ($P < 0.005$), compared to owned confined dogs which was 77%. Majority of the dogs owned were local breeds (90.5%) aged between 1 and 5 years old. Findings revealed that 34% of the owned dogs were allowed to roam freely during the day.

During annual mass vaccination campaigns, there should be a method to include dogs in all three categories i.e. Owned confined, owned free-roaming and dogs with undetermined ownership status. Considering confinement status practiced, allowing dogs to roam freely should be discouraged. This could potentially be acquired through implementing educational programs and new legislations bound with legal means.

INTRODUCTION

Rabies is a fatal and neglected zoonotic disease that causes nearly 60,000 human deaths worldwide annually (Hampson *et al.*, 2015). During the last century, several countries have demonstrated that controlling rabies through annual mass vaccination campaigns for domestic dogs is the most reliable and effective way for elimination of rabies (Coleman *et al.*, 1996; Touihri *et al.*, 2011).

Dogs are the main transmitter of rabies for humans in Africa and Asia, including Sri Lanka where rabies is endemic. Out of reported rabies cases in animals, over 96% are among dogs and 95% of the human rabies deaths are due to rabid dog bites (Nanayakkara *et al.*, 2003; WHO, 2014). Vaccination of dogs has been identified as an important control measure. The World Health Organization (WHO) recommends that at least 70% of the domestic dog population should be vaccinated during annual mass vaccination campaigns to achieve and

maintain herd immunity among animal reservoirs (Malerczyk, 2012; WHO, 2013; Rupprecht *et al.*, 2008). A study conducted in Sri Lanka in 1997 to evaluate the progress of rabies control measures revealed that the vaccination coverage reached by parental mass vaccination campaigns was 57.6% (Matter *et al.*, 2000). Studies conducted in Abia State of Nigeria and Thangsong district of Thailand have estimated anti-rabies vaccine coverage of household dogs as 47.9% and 44% respectively (Awoyomi *et al.*, 2007; Kongkaew *et al.*, 2004). It is mentioned that vaccination coverage against rabies varies according to demography which includes dog: human ratio, confinement status, the size of the total dog population and free-roaming dog population with undetermined ownership status (Knobel *et al.*, 2008; Wild *et al.*, 2005). Further, an understanding dog ecology has been recognised as a key factor in designing an effective rabies control programme in rabies endemic countries (Gbeminiyi *et al.*, 2014; Coleman *et al.*, 1996; Bearn *et*