

Roaming behaviour of domestic dogs in Aboriginal and Torres Strait Islander communities in northern Australia

Salome Dürr¹, **Michael P. Ward**², ¹Veterinary Public Health Institute, Liebefeld, Switzerland; ²The University of Sydney, Camden, Australia. Contact: Michael.ward@sydney.edu.au

Background:

Rabies is probably the most severe zoonosis transmitted by dogs, which serve as the main reservoir population of this disease. Rabies is absent from Australia but the risk of incursion from neighbouring, rabies endemic Indonesia is possible. Large populations of free-roaming domestic dogs in Aboriginal communities in remote Northern Australia would enable establishment of rabies after incursion. Knowledge on roaming behaviour of these dogs would inform preparedness plans, but such information was lacking.

Objectives:

The objectives of this study were to estimate home range (HR) and utilization distribution (UD) of 69 domestic dogs in six indigenous communities in northern Australia applying four different methods: the minimum convex polygon, the location-based kernel density estimation, the biased random bridge (BRB), and Time Local Convex Hull (T-LoCoH).

Methods:

GPS collars were attached to dogs for a period of 1-3 days and positions were recorded every minute. Data were cleaned and HR and UD calculated using the four indicated methods using R software.

Results:

Median core HRs (50% isopleth) were estimated to range from 0.2 to 0.4 ha and the more extended HR (95% isopleth) from 2.5 to 5.3 ha, depending on the method used. The HR and UD shapes were found to be generally circular around the dog owner's house. Some individuals roamed much more with a HR size of 40-104 ha and covered large areas of their community or occasionally beyond.

Conclusions:

Only BRB and T-LoCoH methods integrate the consecutiveness of GPS locations into the analysis, a substantial advantage. Advantages of the BRB method include a more realistic analytical approach (kernel density estimation based on movements rather than on locations), the ability to deal with irregular time periods between consecutive GPS fixes and parameter specification which respects the characteristics of the GPS unit used. The BRB method was therefore the most suitable method for UD estimation in this dataset.

Relevance:

These results can further be used to inform transmission parameters for canine infectious disease models, such as a rabies spread model in Australia.