Supporting information 1: Study area (including dog rabies vaccination campaigns process and common canine diseases in the study area)

Approximately 40,000 people live in 8,500 households in the community (Statistics South Africa, 2012). The unemployment rate in this area in 2011 was 52.6%, substantially higher than the national rate of 29.8% (Statistics South Africa, 2012). Over two-third of the population aged 20 years and older had not completed secondary school, and the majority of the population (96%) lives in formal housing with a mean household size of 4.0 persons (Conan et al., 2015).

Following the diagnosis of canine rabies in the area, a dog population census and door-to-door free vaccination campaign was conducted in two of the villages (Athol and Clare) in the study area in September 2009 (G. Simpson, personal communication). These data were collected from all households in the villages, identified from aerial survey photographs. A total of 848 households were identified in the two villages. Of these, 219 (26%) owned dogs, with an average of two dogs per dog-owning household. The total owned dog population in the two villages was 430, of which 46% were under one year old. Vaccination coverage prior to the campaign was only 36%. Retrospective interviews revealed a high estimated dog-bite incidence rate of 500 bites/100,000 people/year (G. Simpson, personal communication). In the study area, there are no private veterinary practices, but there are state veterinary services. The animal health needs of the Mnisi area and the surroundings are also met at a subsidised rate by the HAHC (Figure 1) run by the Faculty of Veterinary Science of the University of Pretoria (UP) (Conan et al, 2015). The provincial state veterinary services have strengthened regular dog rabies vaccination campaigns since the disease re-emerged in Bushbuckridge in 2008 (Mkhize et al., 2010).

The following process is used by the provincial state veterinary services for the dog rabies vaccination campaigns: (1) Identify the area that needs vaccination looking at where rabies cases are in animals and previous vaccination campaign records; (2) Draw maps of the area; (3) Divide the area into sections; (4) Assign each section to a team composed of 2 to 5 people which is made up of at least one animal health technician and assistants; (5) Go down each road in the section and ask the owners if they have dogs and vaccinate them; (6) Give vaccination certificates to the owners; (7) Go back to follow up on houses that had no one at home at the time of first visit. Rabies vaccination for dogs is and has been free of charge in the Mnisi study area.

According to the local regulation, the correct procedure for dog bite is to immediately wash the wound with a disinfectant, go to a health centre as soon as possible where post exposure prophylaxis is given by administering 5 doses of rabies vaccine over a 28 day period, and injecting rabies immunoglobulin at the wound site. Additionally, the nurse treating a dog bite victim should call the HAHC or veterinary services, to initiate an investigation into the circumstances of the bite and the health and rabies vaccination status of the biting dog. The regulations are that suspected rabies cases are to be investigated by veterinary services and if animals are showing signs of rabies, they will be euthanised, but if not they can be quarantined and observed for 10 days. If euthanised the brain is sent for rabies testing (Bishop et al., 2010).

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The majority of dogs in the community have the morphological appearance of the Africanis landrace (Gallant, 2002), although there is some phenotypic evidence of interbreeding with western breeds (Conan et al., 2015). From July to December 2011, the common canine diseases registered by HAHC are presented in Table S1. Out of 286 dogs seen during this period, mainly diagnosed with external parasites, one dog was suspected with rabies and two dogs had bitten humans and therefore underwent rabies investigation.

Table S1. Canine diseases registered at Hluvukani Animal Health Centre per month from July until December 2011.

Month 2011	**Canine diseases and infections**
July	Mange, babesiosis, malnutrition
August	Gastroenteritis, babesiosis, mange
September	Ehrlichiosis, fractures, mites
October	Ectoparasites (including mange), helminthiasis
November	Babesiosis, demodicosis, malnutrition
December	Ehrlichiosis, helminthiasis, mango fly

References

Bishop, G. C. (George C. ., Durrheim, D. N., Kloeck, P. E., Godlonton, J. D., Bingham, J., Speare, R., & Rabies Advisory Group, 2000. (2010). *Rabies : guide for the medical, veterinary and allied professions (2nd edition)*. Dept. of Agriculture.

Conan, A., Akerele, O., Simpson, G., Reininghaus, B., van Rooyen, J., & Knobel, D. (2015). Population Dynamics of Owned, Free-Roaming Dogs: Implications for Rabies Control. *PLoS Neglected Tropical Diseases*, 9(11), 1–19. https://doi.org/10.1371/journal.pntd.0004177

Gallant, J. (2002). *The story of the African dog*. University of KwaZulu-Natal Press.

Mkhize, G. C., Ngoepe, E. C., Du Plessis, B. J., Reininghaus, B., & Sabeta, C. T. (2010). Re-emergence of dog rabies in Mpumalanga province, South Africa. *Vector.Borne.Zoonotic Dis*, *10*(1557-7759 (Electronic)), 921–926

Statistics South Africa. (2012). *Census 2011 Municipal Report—Mpumalanga*. Statistics South Africa, Pretoria.