

Publication**A metapopulation model of dog rabies transmission in N'Djamena, Chad****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 4493905**Author(s)** Laager, Mirjam; Léchenne, Monique; Naissengar, Kemdongarti; Mindekem, Rolande; Ousiguere, Assandi; Zinsstag, Jakob; Chitnis, Nakul**Author(s) at UniBasel** [Laager, Mirjam](#) ; [Zinsstag, Jakob](#) ; [Chitnis, Nakul](#) ;**Year** 2019**Title** A metapopulation model of dog rabies transmission in N'Djamena, Chad**Journal** Journal of theoretical biology**Volume** 462**Pages / Article-Number** 408-417

Rabies transmission was interrupted for several months in N'Djamena, the capital city of Chad, after two mass vaccination campaigns of dogs. However, there was a resurgence in cases, which was not predicted by previous models of rabies transmission. We developed a deterministic metapopulation model with importation of latent dogs, calibrated to four years of weekly incidence data from passive surveillance, to investigate possible causes for the early resurgence. Our results indicate that importation of latently infective dogs better explains the data than heterogeneity or underreporting. Stochastic implementations of the model suggest that the two vaccination campaigns averted approximately 67 cases of dog rabies (out of an estimated 74 cases without vaccination) and 124 human exposures (out of an estimated 148 human exposures without vaccination) over two years. Dog rabies vaccination is therefore an effective way of preventing rabies in the dog population and to subsequently reduce human exposure. However, vaccination campaigns have to be repeated to maintain the effect or reintroduction through importation has to be prevented.

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