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Climate change and the equine infectious anemia virus epidemic

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Equine Infectious Anemia Virus (EIAV), a retrovirus that establishes a persistent lifelong infection in horses and ponies, and which can be transmitted by vectors (biting flies), is endemic in regions with warm climates. With the advent of global warming, research have shown that vector-borne diseases may be on the rise. This study seeks to understand how climate change will affect the EIAV epidemic, especially in endemic regions. We developed two vector-host mathematical epidemic models of EIAV infection that describe the direct transmission of EIAV between wild and domestic horses, and also through vectors: a basic model and a patch model. The models are rigorously analysed mathematically. The effects of variability in the model parameters are also investigated. Results of disease thresholds give conditions necessary for the control of the infection. We hypothesise that climate change to warmer temperatures may increases the time that the virus can thrive in the vector. Model results, which are underway, could be significant for the control of any or all fly-borne pathogens.

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