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**Modeling and analyzing the transmission dynamics of visceral leishmaniasis.** (English)

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**Summary:** In this paper, we develop a mathematical model to study the transmission dynamics of visceral leishmaniasis. Three populations: dogs, sandflies and humans, are considered in the model. Based on recent studies, we include vertical transmission of dogs in the spread of the disease. We also investigate the impact of asymptomatic humans and dogs as secondary reservoirs of the parasites. The basic reproduction number and sensitivity analysis show that the control of dog-sandfly transmission is more important for the elimination of the disease. Vaccination of susceptible dogs, treatment of infective dogs, as well as control of vertical transmission in dogs are effective prevention and control measures for visceral leishmaniasis.

**MSC:**

92D30 Epidemiology

**Keywords:**

visceral leishmaniasis; mathematical modeling; reservoir; vertical transmission; basic reproduction number

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