

A PLUGIN APPLICATION FOR ESTIMATING VULNERABILITY TO *FOOT-AND-MOUTH* DISEASE USING STOCHASTIC DISEASE SIMULATION MODELS IN FARMS AND ANIMAL MOVEMENT RECORDS IN BRAZIL

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- **ABSTRACT:** The movement of live animals throughout the Brazilian territory is documented in electronic form through the issuance of *animal movement permit*. Geographical information about the location of farms, the number of transported animals and the date of issue of the GTAs are available and comprise our dataset. From these records, we propose an application that simulates the spread of the foot-and-mouth disease, and compares the results to network statistics. Three epidemiological stochastic models of SIR (Susceptible-Infected-Recovered) type are evaluated in this work. Using simulated results and network theory, measures of vulnerability are assigned to each farm. From these measures, trajectories within the network that are most likely to spread the disease are found.
- **KEYWORDS:** Stochastic disease simulation models; network analysis; *foot-and-mouth* disease.

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