
Poster Session 2 – Workshop Rodent-Borne Diseases

73 Evaluation of rodent control to fight Lassa fever through mathematical modelling

Joachim Mariën¹, Herwig Leirs¹, N’Faly Magassouba², Elisabeth Fichet-Calvet³

¹University of Antwerp, Antwerp, Belgium, joachim.marien@uantwerpen.be

²Laboratoire des Fievres Hemorragiques, Conakry, Guinea

³Bernhard-Nocht-Institute for Tropical Medicine, Hamburg, Germany

The Natal multimammate mouse (*Mastomys natalensis*) is the reservoir host of Lassa virus, an arenavirus that causes Lassa haemorrhagic fever in humans in West Africa. Because there exists no vaccine for human use and therapeutic options are limited to the broad-spectrum antiviral ribavirin, rodent control and adjusting human behaviour are currently considered the only options for Lassa fever prevention. In order to investigate the efficiency of rodent control performed during a four-year field experiment in Upper Guinea, we developed a mathematical model to test different control strategies (yearly density control, continuous density control and rodent vaccination). For the field study, rodenticide baits were placed each year in three rural villages, while three other villages were used as controls. Rodents were trapped before and after every treatment and their antibody status and age were determined. Data from the field study was used to parameterize the mathematical model. In the field study, we found a significant negative effect on seroprevalence over the years in the treatment villages, but the effect (5% reduction per year) was small given the effort. As the populations also recovered rapidly after the rodenticide treatment, we conclude that a yearly control strategy is unlikely to significantly reduce Lassa virus spillover to humans. In agreement with this finding, the mathematical model supports the use of continuous density control and rodent vaccination to eliminate Lassa virus from the rodent population, but discourages the use of yearly density control. Our model can be used by policymakers as a first indication of how long, frequent and when rodent control should be done in order to eliminate Lassa virus in rural villages.

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Jens Jacob, Jana Eccard (Editors)

6th International Conference of Rodent
Biology and Management
and
16th Rodens et Spatium

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Book of Abstracts



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Editors:

Jens Jacob¹ and Jana Eccard²

¹Julius Kühn Institute, Federal Research Centre for Cultivated Plants,
Institute for Plant Protection in Horticulture and Forests, Vertebrate Research,
Toppeideweg 88, 48161 Münster, Germany

²University of Potsdam, Institute of Biochemistry and Biology,
Animal Ecology Group, Maulbeerallee 1,
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