

Modelling the spread of foot-and-mouth disease in endemic settings



A PhD scholarship is available to develop epidemiological models aimed to improve our understanding of the epidemiology and evaluate the effectiveness of vaccination protocols mitigating the transmission of infectious disease of livestock in endemic setting.

Foot-and-mouth disease (FMD) is a highly contagious transboundary animal disease that is caused by a virus and spread across multiple countries. FMD is currently listed as notifiable terrestrial animal diseases by the OIE and is regarded as a major challenge for livestock industry and economic growth globally due to its associated production losses and trade restrictions to disease free markets. In Africa, and Uganda particularly, FMD is endemic with regular outbreaks. Improving knowledge on the spread of FMD in this setting and on the constraints to mitigation of identified risks will help to support the local livestock industry to make evidence-based decisions and allow it to increase its resilience, ensuring food security and economic growth in this area of the world.

FMD is caused by a multi-host virus, not only infecting cattle but also affecting pigs, sheep, goats and wildlife ungulates. In Africa, little has been done to investigate and quantify the role of these population on the transmission of FMDV. However, this knowledge is essential in designing and implementing effective vaccination campaigns. In this project, the student will develop a simulation model to explore how different livestock populations may drive disease spread and persistence, and evaluate the benefit of various strategies of vaccination against FMD.

The person recruited will join the newly created Veterinary Public Health (VPH) Team of the Biometry and Evolutionary Biology Laboratory which is supported by the CNRS, Claude Bernard Lyon 1 University (UCBL), VetAgro Sup and Boehringer Ingelheim. This PhD project will build on existing partnerships between VetAgro Sup - UCBL, the University of Edinburgh and Makerere University. This project has the potential to directly influence policy in Uganda and inform decisions of industry stakeholders to support sustainable economic growth, and to involve the student in the research policy interface and knowledge exchange.

Funding body	IDEX university de Lyon
Duration and start date	3 years from the starting date Expected start date: April/May 2021
Job environment	The successful candidate will be recruited by the Biometry and Evolutionary Biology Laboratory (https://lbbe.univ-lyon1.fr/) under the supervision of CNRS, UCBL and VetAgro Sup. Built around three pillars consisting of biometry (understood as the set of informatic, statistical and mathematical formalisation tools of biological problems), evolutionary biology and health, this laboratory offers an ideal environment for the



	<p>development of interdisciplinary projects at the methodology/biology interface in eco-infectiology. The laboratory is also co-holder of the Labex Ecofect.</p> <p>The candidate will work in the newly created Veterinary Public Health Team within the Department of Evolutionary Ecology, one of the unit's four departments. As such, he/she will be able to rely as much on calculation and technical resources available in the unit as those available at the BioEnviS research federation (Pôle Rhône Alpin de Bioinformatique...) or at partners institutions in France and Great Britain.</p>
Application criteria	<p>Masters in Mathematics/Statistics/Epidemiology or related degree</p> <p>Knowledge on disease modelling code bases, python and/or R would be appreciated but not mandatory.</p> <p>Knowledge on parameters inference techniques, MCMC algorithm would be appreciated but not mandatory</p> <p>Ability to write and speak English to a high standard. A B2 level¹ of English is required.</p> <p>Must be comfortable and motivated to work in a predominantly French-speaking environment.</p>
Application date	15 March 2021
How to apply	<p>Please submit current CV, academic qualification certificates and cover letter addressing the requirements above, by email to:</p> <p>thibaud.porphyre@vetagro-sup.fr</p>
Contacts for more information	<p>Dr. Thibaud Porphyre (VPH Team lead)</p> <p>thibaud.porphyre@vetagro-sup.fr</p> <p>Dr Dennis Muhanguzi (Makerere University) luckydenno@gmail.com</p> <p>Dr Mark Bronsvort (University of Edinburgh) mark.bronsvort@roslin.ed.ac.uk</p>

¹ Common European Framework of Reference [<https://europa.eu/europass/en/common-european-framework-reference>]