

STOC free: An innovative framework to compare probability of freedom from disease in heterogeneous control programmes

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Summary

Trade is an important risk factor for spread of infectious diseases and safe trade should be stimulated. Countries or regions can be at different stages of disease control, from still endemic to complete eradication. Control programmes for infectious diseases can differ between regions and countries. The stage of disease control and the different control efforts lead to varying degrees of certainty about the probability of freedom from the disease. The STOC free framework will facilitate safe trade by providing the probability of freedom from a specific disease given the context and the surveillance efforts in a specific region or country.

Abstract

Countries differ in existence, stage of eradication and design of control programmes for non-regulated diseases. When freedom from infection is reached, safe trade is essential to protect that status. The aim of the STOC free project, a collaboration between six countries, is to develop and validate a framework that enables a transparent and standardized comparison of confidence of disease freedom for control programmes across herds, regions or countries. The STOC free framework consists of a model (STOC free MODEL) combined with a tool to facilitate the collection of the necessary parameters (STOC free DATA). All actions taken in a control programme will be included in a Bayesian model, which needs prior distributions for most parameters. Data for the distributions can be obtained from databases of control programmes, demographic data and contact structures between herds. In addition, frequency of occurrence and risk estimates for factors that influence either the probability of introduction or delayed detection of the infection in an animal or herd will be included in the model. Bovine viral diarrhoea virus (BVDV) is used as an example disease. Many countries have control programmes in place for this complex and detrimental disease. Although some elements of the control programmes are similar, the place of vaccination, the combination of diagnostic tests, frequency and target groups differ widely between countries and regions. Although BVDV will be a thorough test of the initial developed framework, it should be generic enough to be adaptable to control programmes for other diseases. With the introduction of the new Animal Health Law (AHL), it is anticipated that assessments of the performance of control programmes will progressively change towards output-based measures. The STOC free framework will support the AHL by providing a single general framework, adaptable to multiple diseases, which aims to enhance the safety of trade.