STOC free
Surveillance analysis Tool for
Outcome-based Comparison
of the confidence of FREEdom

efsa
European Food Safety Authority

Comparison of the confidence in freedom from infection based on different control programmes between EU member states: STOC free

Interim technical report

10 March 2017 – 9 March 2019

March 2019

SRUC
UCD DUBLIN
SVA NATIONAL VETERINARY INSTITUTE
Oniris — Nantes-Atlantic National College of Veterinary Medicine, Food Science and Engineering
Universiteit Utrecht
FRIEDRICH-LOEFFLER-INSTITUT | FLI | Bundesforschungsinstitut für Tiergesundheit — Federal Research Institute for Animal Health
GD
AHI Animal Health Ireland.ie

Overview STOC free year 1 and 2

The STOC free project aims to construct a generic framework that will allow a standardised and harmonised comparison of the output of different control programmes of cattle diseases that are not regulated by the EU.

The project is subdivided into five work packages (WP) and for each WP the progress in the first 2 years of the project (March 2017 – March 2019) is described.

WP5, Management

WP leader and co-leader: G. van Schaik and I. Santman-Berends (Utrecht University, the Netherlands)

The project started with the kick-off meeting at EFSA premises. In the first year, two PhD students were employed in France and the Netherlands. Monthly Skype meetings were held to discuss the challenges and to monitor the progress of the project. Face-to-face meetings were held in September 2017 (between PhD supervisory groups), November 2017 (whole consortium), March and October 2018 (whole consortium), June 2018 (between PhD students) and February 2019 (between PhD supervisory groups). The first annual newsletter was delivered in September 2018 in which the progress of the first year was described and the development of the interim report (including the financial statement) was coordinated. Additionally, in 2018 the COST Action project SOUND control, which is closely related to STOC free, received a grant and started in October 2018 (https://www.cost.eu/actions/CA17110). The COST action aims to coordinate, stimulate and assist initiatives to explore and implement a widely adaptable output-based framework. The project is in support of STOC free and provides an excellent platform to maximise the probability that the STOC free model will be implemented and used by a wide range of stakeholders. In the SOUND control network, 30 countries participate in support of output-based surveillance.

Deliverables WP5 during the reporting period

- 5.1 Annual progress report year 1	*September 2018*
- 5.2 Interim report (technical and financial)	*March 2019*

WP1, Development of STOC free model

WP leader and co-leader: C. Fourichon and A. Madouasse, PhD student M. Mercat (ONIRIS, France)

In year 1 of the STOC free project, the conceptual model of BVDV was developed which described the infection process at 3 levels i.e. animal, herd and territory. The model connected the biological processes of BVDV infection with information about control programmes and demographic context information. The aim of the conceptual model is to support the selection of the most appropriate statistical models that will integrate different pieces of information (data) for the estimation of probabilities of being in each single state of interest (outcome) at different levels. The conceptual model was deliverable number 1.1.

In year 2, guidelines for the identification and sources of data were developed. The aim of these guidelines was to indicate the availability and the quality of data for parameters that could potentially be used as input parameter in STOC free model. The assessment criteria included availability of quantitative or qualitative data, the sources of the data and the strengths and limitations of the data (deliverable number 1.2). Each of the partner countries filled this table for

their specific situation. The statistical model being explored for its applicability within STOC free is a type of Bayesian network model called a Hidden Markov model that was originally developed for modelling Q-fever. It is a herd-level model in which the probability of being infected is the result of either getting infected ($\tau1$) or of not clearing an existing infection ($\tau2$). The probability of getting infected is influenced by the occurrence of risk factors for the introduction of the infection. The probability of clearing an infection is, amongst others factors, dependent on the control programme in place. Currently, simulated data are being used to develop the model and the results look promising. We will proceed to test and validate the model using French data. Subsequently, the model will be tested on subsets of data from NL and DE. The results will be reported as deliverable 1.3 and 1.4 and will be delivered to EFSA in 2019 and 2020.

Deliverables WP1 during the reporting period

- 1.1 Guidelines for the design of conceptual models   *April 2018*
- 1.2 Guidelines for the identification and sources of data   *July 2018*

WP2, Development of STOC free data
WP leader: S. More (UCD, Ireland), PhD student A. van Roon (Utrecht University, the Netherlands)

In the first year, an approach to describe non-EU regulated control programmes implemented in EU member states was developed by tailoring a previously developed tool (RISKSUR) to the needs of STOC free. The information required by the tool was filled in by all partner countries and resulted in a first version of a questionnaire (deliverable 2.1), which will ultimately evolve into the data-collection tool (STOC free data).

In year 2, the PhD student combined the results from the RISKSUR tools (deliverable 2.3) and analysed the data resulting from the filled tools. The PhD student started writing a paper in which an approach is proposed to qualitatively compare elements that influence the likelihood and uncertainty that cattle from a herd categorized as BVDV-free are truly free from infection. The relevant context and control programme characteristics are relatively ranked between each of the six participating countries. Together with the consortium partners, the first version of the questionnaire was transformed in a second version (deliverable 2.2). Ongoing discussions are taking place on the development of this questionnaire tailored to the needs and progress of the statistical model (WP1). Additionally, a literature review/ meta-analysis was initiated in close collaboration with WP1 to obtain default values for risk factors for BVDV infection to be included in the statistical model. Currently, the two PhD students are conducting the second selection round in which full-text screening of 259 peer-reviewed papers is being applied.

Deliverables WP2 during the reporting period

- 2.1 First version questionnaire   *April 2018*
- 2.2 Second version questionnaire   *July 2018*
- 2.3 Description of BVDV control programmes   *July 2018*

WP3, Case studies
WP leader and co-leader: A. Lindberg and J. Frössling (SVA, Sweden)

The case studies will be conducted from year three onwards. In the case studies, STOC free DATA and STOC free MODEL will be applied to determine confidence of freedom from BVDV on animal, herd, sector, regional and national level. All partners will do this for their country and will capture their experiences when applying the tools to give feedback to WP1 and WP2, allowing comparisons of confidence of freedom between programmes to be examined. First ideas were discussed during the annual meeting in October 2018. The case studies have two aims: (1) Application of STOC free MODEL and STOC free DATA to validate and optimise the framework and (2) evaluate the generalizability of STOC free to other diseases.

Deliverables WP3 during the reporting period

- None

WP4, Dissemination
WP leader: J. Gethmann (FLI, Germany)

During the first project year, the STOC free website was developed (www.stocfree.eu) and STOC free discussion groups were created on LinkedIn and Research Gate. The global aim of the project was presented to EFSA, FESASS and national stakeholder organisations and a general article was submitted for publication in the FESASS journal. During the second year, the STOC free project was presented at the SVEPM conference (2 posters), InnovSur conference (oral presentation) and ISVEE 15 conference (2 oral presentations). A general article was submitted for publication in the special issue for InnovSur in Frontiers of Veterinary Science at the end of October 2018. Additionally, the project was presented and discussed by each of the partners on national stakeholder and decision maker meetings.

- 4.1 Website is developed and online   *June, 2017*
- 4.2 Presentations at international conferences   *On-going*
-4.3 Publications in international journals   *On-going*