

RISK ASSESSMENT FOR BLUETONGUE VIRUS VECTOR OCCURRENCE BASED ON GEOGRAPHICAL INFORMATION SYSTEMS AND STATISTICAL MODELLING

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Bluetongue (BT) is among the World Animal Health Organization (OIE) listed diseases due to its potential for rapid spread and serious economic impact on livestock. Because of its epidemiology, in Europe, only Southern countries were affected by the disease in the past. However in the latter half of 2006, an unprecedented outbreak of bluetongue virus (BTV) serotype 8 occurred in North-Western European countries. To define potential regions that are at risk for BT epidemics it is essential to study vector distribution and abundance. This study focused on BT vector spread, mostly in Austria. The objective was to produce risk maps with the more likely areas for vector occurrence and thus to support BT prevention and control. The introductory review gives an overview of the epidemiology of the disease with a focus on the vectors, the recent outbreaks in North-Western Europe, and the importance of statistical modelling and geographical information systems (GIS) in predicting, preventing and controlling BT.

The statistical analysis was mainly based on data from the Austrian entomological surveillance system, weather stations and topographical information. A multiple linear regression model was fitted to the data to predict the occurrence of BTV vectors and subsequently to create risk maps for the whole country. Despite the fact that the limited nature of the data does not allow precise estimation, in general the models indicated that vectors occurred in preferential areas where they could be very abundant. A more detailed analysis should be carried out with a multidisciplinary team including epidemiologists, biologists, meteorologists, entomologists, and statisticians, so that the complexity of BT epidemiology may be better understood, and a more efficient process of prevention and control of the disease may be set up.

KEYWORDS: BLUETONGUE VIRUS – VECTOR – DISEASE SURVEILLANCE – RISK – GEOGRAPHICAL INFORMATION SYSTEM – MODEL – AUSTRIA.

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