

## **Spatial analysis and prevalence estimation of bluetongue in Switzerland prior to and following the vaccination campaign**

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Bluetongue, a vector-borne viral disease of ruminants, has a seasonal occurrence and geographical distribution which until 1998 was restricted to tropical and sub-tropical areas. The largest European epidemic, involving serotype 8 (BTV-8), occurred in 2006 and reached Switzerland in 2007. A national vaccination scheme for the disease was then initiated in the summer of 2008. This study aims to compare BTV-8 prevalence estimates prior to and following the vaccination campaign. Therefore, data collected from BTV-8 surveillance until the summer of 2008 and a national study initiated for about 2'000 calves born in the autumn of 2008 will be used.

Swiss Bluetongue surveillance from mid 2007 to mid 2008 was a combination of monthly bulk milk testing of 208 cattle herds in zones of higher risk for vector presence and intensification of passive clinical surveillance. As such, the Swiss Federal Veterinary Office and the Cantonal Veterinary Service launched an information campaign in August 2007 based on freely distributed leaflets, a documentary video and presentation at agricultural meetings and fairs.

The national survey is currently being conducted on calves born in autumn 2008 (after the vaccination campaign) to look for the spatial distribution of BT prevalence.

As it is important to analyse any surveillance system and determine regional differences that may occur when estimating spatial prevalence, the 2007-2008 surveillance scheme was assessed using a combination of geographical information system (GIS) and cluster analysis techniques. These provided a descriptive and spatial analysis of the BT (BTV-8) surveillance schemes that were in place prior to the vaccination campaign and aimed to determine regional prevalence estimates of BTV-8 infection for the end of the 2007 vector period based on the results.

The same will be undertaken for the data collected by the national survey that is currently ongoing, with prevalence estimates then compared to those established from the previous study. Therefore, this study will provide benefits in understanding the effectiveness of the vaccination campaign.

Results from the surveillance scheme assessment, where SaTScan's spatial scan statistic and GeoDa's Moran's I statistic were used to determine clustering of surveillance data show a high level of surveillance intensity for BT in Switzerland in 2007. In the region where cases were detected in 2007, encompassing the Cantons of Aargau, Basel-Landschaft, Basel-Stadt and Solothurn, the surveillance was significantly higher than in the rest of Switzerland. Six cases of Bluetongue were detected within the Surveillance system. The prevalence estimates 9.62% (95% CI = 3.25%-18.85% versus 0.88%

(95% CI = 0.2%-2.22%) were also significantly higher in the area with higher surveillance intensity.

Spatial variation in surveillance data should be considered if a disease event is to be analysed on a national scale and also when planning measures to combat the disease.