

Updated Outbreak Assessment #4

Bluetongue virus (BTV-8) in Germany and Belgium

16 July 2019

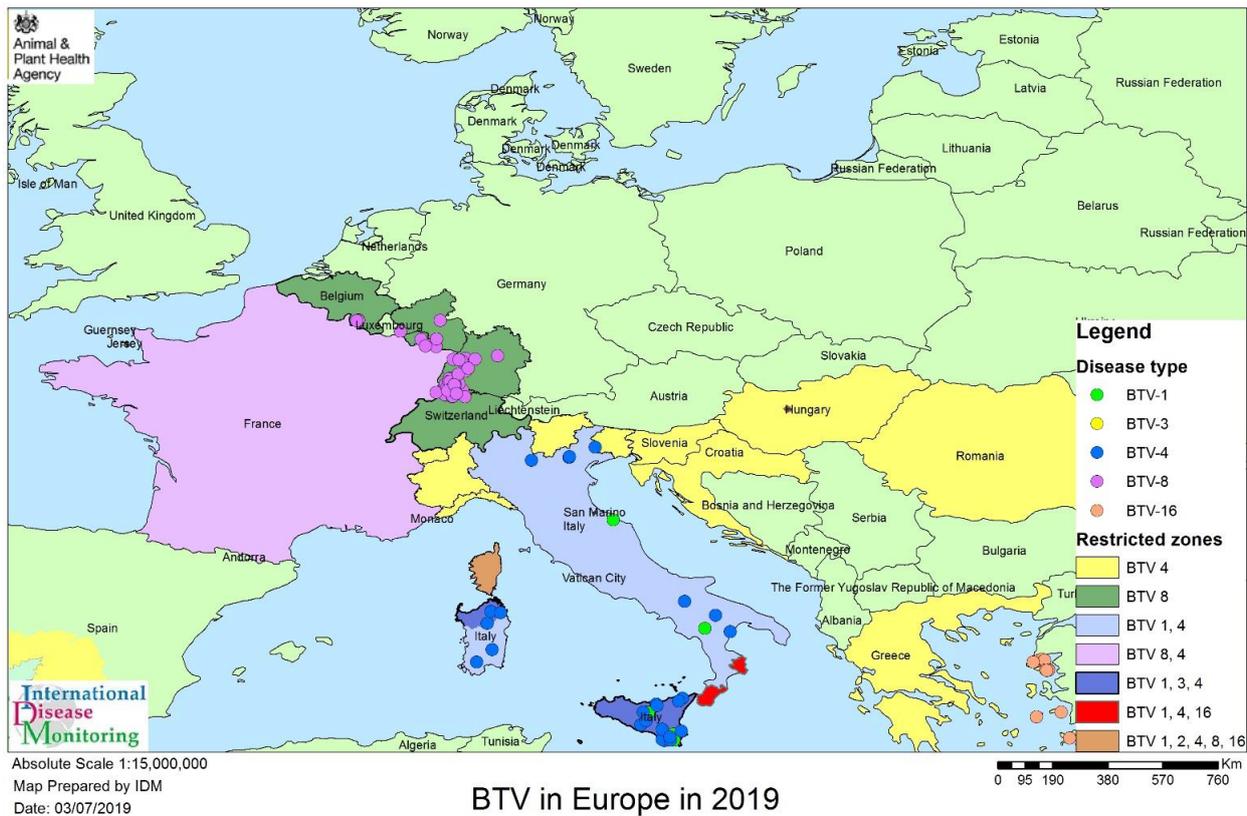
Ref: VITT/1200 BTV-8 in Germany and Belgium

Disease report

This outbreak assessment serves primarily to provide an update on bluetongue virus serotype 8 strain (BTV-8) in France, Germany and Belgium although other serotypes in Europe are also briefly mentioned. This is timely because the vector free period for adult *Culicoides* biting midge activity has ended and midges have been active in large numbers since April. Current warm conditions in the UK and northern Europe are favourable for both adult *Culicoides* activity and bluetongue virus replication within the midge vectors, thus promoting vector-borne transmission from animal to animal. This outbreak assessment also describes the risks of BTV-8 entry to the UK through the two main routes, namely, importation of infected livestock and windborne entry of infected midges from continental Europe.

Our last outbreak assessment on 29th March 2019 reported the identification of outbreaks of BTV-8 in south-western and western Germany as part of a surveillance programme in this region, with the first outbreak detected in December 2018. Outbreaks in these regions of Germany along the borders with France were not unexpected, given the disease status of France. Since our last outbreak assessment, the reporting of outbreaks in Germany has fallen with no further spread identified. Furthermore, although there were four outbreaks in cattle in Belgium in February/March no new outbreaks have been reported in Belgium.

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BTV in Europe in 2019

The origins of the BTV-8 outbreaks in Germany are reported as unknown in the European Animal Disease Notification System (ADNS) and OIE. The cases in February/March in Belgium are reported in ADNS as due to vectors, although it is not clear if this is supported by evidence, or when infection is likely to have occurred, particularly with the vector-free season in January and February.

Identifying definitively the vector season in which animals were infected (2018 or 2019) in this time period is difficult. Adequate viraemia to make onward transmission possible may be unclear, as can be the certainty that a positive result is due to virus infection as opposed to vaccination. The detection method is RT-PCR which detects the presence of BTV RNA in the animal and gives an indication of RNA load according to the CT value. Zientara et al. (2012) highlighted the difficulties in the interpretation of bluetongue RT-PCR results in France in 2009/10 particularly when vaccination and surveillance are carried out contemporaneously and concluded that it is difficult to determine whether the positive RT-PCR results (in France 2010) arose from a low level of viral circulation, by persistence of viral RNA or from some other cause such as the detection of the BTV genome in the inactivated vaccine. Moreover, if an animal was infected at the end of the vector transmission season (i.e. November 2018), it can still be PCR positive 60 days later, but that animal may not be that infectious to midges due to declining viral titres.

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However, in late April and May there is the chance that PCR-positive animals have been infected in the 2019 vector season in north-west continental Europe and are viraemic. A recent risk assessment for entry of BTV-8 infected cattle from Europe (Gale et al. 2019) assumed that livestock imported from Belgium and Germany in January, February and March 2019 were infected in 2018 while those imported in April and May 2019 would have been infected in 2019.

Germany, Belgium and Switzerland have in place BTV-8 restriction zones (see map). France's restriction zone is for BTV-8 and BTV-4. Live ruminants (in particular cattle, sheep and goats) may only be moved from these restriction zones to free areas (not under restriction for BTV-8) if the animals have been vaccinated against BTV-8 at least 60 days prior to movement or vaccinated and tested for bluetongue virus with a negative result in accordance with Annex III of European Commission Regulation 1266/2007/EC.

Situation assessment

Germany

Since the beginning of April there have been four outbreaks of BTV-8 confirmed in Germany, all in the south-west and all reported to OIE as sub-clinical infection. These may have arisen from transmission during this vector season, although it is not known. This compares with over 50 outbreaks between January and March, some of which were further north and west near to the Netherlands, Luxembourg and Belgium (see map). It is understood that all were detected through surveillance activity. The most recent detection of infection (outbreak) of BTV-8 in Germany was confirmed on 29th May with one PCR-positive bovine on a farm with 166 cattle in Waldshut, Baden-Wurtemberg on the southern border with Switzerland. This followed sub-clinical infection confirmed in single bovines in three cattle farms in Baden-Wurtemberg in April.

The outbreaks since the previous outbreak assessment in January are all within Baden-Wurtemberg in the south-west and in this respect the virus does not appear to have spread further north or east within Germany since January i.e. within the last vector season. Post import testing is in place for consignments of ruminants entering the UK from the restriction zones.

Belgium

Belgium had been declared officially free of BTV-8 after the 2006-2009 epizootic in northern Europe in February 2012. The first outbreak of BTV-8 (since December 2008) was detected on the 14th February 2019 in a cattle holding (in 2 out of 111 cattle) in the Luxembourg region of southern Belgium, as a result of winter surveillance. Following intensified surveillance in a 5km area around the premises, BTV-8 was confirmed in three more holdings (AFSCA, 2019) in early March. All four outbreaks were reported as sub-

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clinical infection to OIE. Since then no further outbreaks of BTV-8 in Belgium have been reported as confirmed by the OIE in early July. All of Belgium is now covered by a restriction zone for BTV-8.

France

Between October and December 2018, France has reported just ten outbreaks of BTV-8 to ADNS with none this year to date. These were in the regions of Vosges, Rhone, Cote d'Or, Puy de Dome and Loire. Eight were reported in cattle and two in sheep. Five of the outbreaks were reported as clinical cases. No cases of BTV-4 have been reported in this period in France or neighbouring Switzerland. It should be noted that France only reports to ADNS or OIE on an ad hoc basis, and it is not known how many BTV outbreaks have occurred this year and are yet to be reported. A key point of interest in the previous outbreak assessment was the report from France of increased trans-placental transmission of the re-emerging strain of BTV-8 in cattle (compared to the 2006/9 BTV-8 strain) with cases of calves being born blind, small, and dying at a few days of age (Zientara et al, 2019).

Trans-placental transmission is of interest as a possible mechanism of over-wintering of the virus in the absence of midges in northern Europe, but this increase also means the economic impact of the re-emerging BTV-8 strain may be underestimated. There has been some further information on the clinical implications. Thus healthy calves which are PCR positive have been detected (Stephan Zientara, ANSES, France, pers. Comm. July 2019). Furthermore, a recent modelling study estimated a probability of vertical transmission of 56% (55.8%, 95% credible interval 41.7–70.6) in unvaccinated heifers infected late in gestation for the re-emerging BTV-8 strain based on PCR pre-export test data obtained from June to December 2016 in France (Courtejoie, et al. 2019). There is some evidence that vector competence by *Culicoides sonorensis* biting midges is reduced for the re-emerging BTV-8 strain compared to that in the 2006/9 strain (Flannery et al. 2019), although how much this could reduce transmission through midges in the UK is not known as the main midge species in the UK include *Culicoides scoticus* and *Culicoides obsoletus*.

Other BTV strains in Europe

Greece reported a case of BTV-16 in Samos in April. Italy reported 16 cases of BTV-4 in April, three in May and two in June, with a case of BTV-1 in April.

Conclusion

The *Culicoides* biting midge vector season in northern Europe and the UK is now underway and the recent very high temperatures particularly in France will have increased the risk of BTV-8 transmission by midges. Based on viral clearance rates from cattle, it is reasonable to assume that the cases in Germany in April/May have been infected this vector season, while those in Belgium/Germany in January to March were infected last

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year. In this respect, the entry of BTV-8-infected livestock into the UK would currently present a risk of spread to resident UK cattle through transmission by resident UK *Culicoides* biting midges. However, the restriction zones currently in place across the whole of Belgium and France and parts of Germany (see map), and vaccination and testing requirements when moving out of these zones, will minimise the risk of importation of BTV-8-infected cattle to the UK. Furthermore, there is no evidence yet for an increase in the number of outbreaks in Belgium or Germany, and, the Netherlands and Luxembourg are yet to report any cases in 2019. The risk of entry of BTV-8-infected midges being carried on the wind into southern England is currently assessed as very low. This risk is continually being reviewed in the light of any forth-coming information on case numbers in cattle in continental Europe, direction of the winds from France, temperature, and midge activity. Thus, the overall risk of infection of UK cattle with BTV-8 is still considered to be **LOW** (no change).

Livestock owners and field vets in the UK should note that the re-emerging BTV-8 strain in northern Europe may cause trans-placental transmission and infection of foetuses in cattle, and should consider BTV-8 as a possible cause of abortion or malformed calves. The weaker pathogenicity of the re-emerging strain of BTV-8 in adult sheep and cattle may also result in fewer clinical signs (compared to the 2007 strain), so that infection may be missed. Not all calves infected trans-placentally show clinical signs and some may be healthy.

We would like to remind all livestock owners that they should source animals responsibly by working with their private veterinarians and livestock dealers to make sure animals are correctly vaccinated and protected prior to travel. This means that animals must be correctly vaccinated against BTV-4 and BTV-8 or be naturally immune to both virus serotypes, prior to leaving the Restriction Zone.

We would also like to remind keepers that if they wish to take animals for show purposes to a restriction zone and then return to a free area, they will need to make sure the animals are vaccinated *against both virus serotypes* (BTV-4 and BTV-8) prior to travelling into the Restriction Zone.

We will continue to monitor the current situation in Germany, Belgium and France and will report any further updates from the relevant Authorities.

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