Department for Environment, Food and Rural Affairs
Animal and Plant Health Agency
Advice Services - International Disease Monitoring

Preliminary Outbreak Assessment

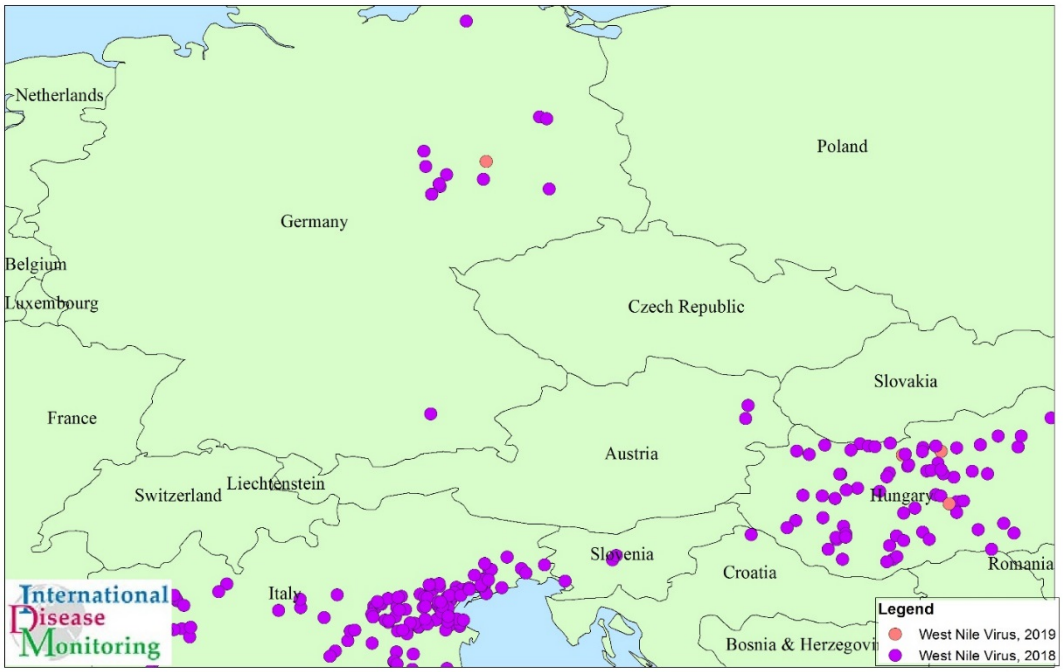
West Nile virus in Germany and Southern Europe

12 July 2019 Ref: VITT/1200 WNV in Germany and Southern Europe

Disease report

The first case this year of West Nile virus (WNV) in birds in northern Germany was reported on the 3 July 2019. As with many of the avian cases last year, this involved a large captive northern owl species, namely a snowy owl (*Bubo scandiacus*) in a collection of five birds in a wildlife park. Similar species associations have been observed previously in captive owls infected with WNV in Canada (Gancz et al. 2004). It was proposed that large body size and thick feathering contributed to their exposure to WNV.

Our previous outbreak assessment for West Nile virus (WNV) in October 2018 reported the first widespread detection of avian cases in Germany, not only in captive birds but also in wild birds including both raptors and unusually for Europe, passerines. In particular, a dead wild thrush (now identified as a common blackbird (*Turdus merula*) according to Ziegler et al. (2019)) in the Mecklenburg-Vorpommern region of northern Germany (26 September 2018) was believed to represent the most northerly report in Europe of this virus. In addition last year, the first case of WNV was reported in equines in Germany with an outbreak in a farm of 12 horses in Brandenburg on the 21 September 2018.



West Nile Virus in Europe from 2018 and 2019

Our last outbreak assessment proposed that the 2018 cases of WNV in both wild birds and captive raptors suggested autochthontous (i.e. spread within the same place) transmission of WNV in birds within Germany. The avian case this year is in Wittenberg and is close to the locations of the avian cases of WNV last year (see map). This suggests that WNV has over-wintered, presumably in the avian population in this region of Germany. Indeed, Ziegler et al. (2019) concluded from phylogeographic analysis that a single introduction event of WNV into Germany had occurred, most likely in 2016 from the Czech Republic where it has existed since at least 2011. A second re-introduction in the same place in Germany would seem less likely. Ziegler et al. (2019) suggested that the WNV occurrence in Germany in 2018 and its geographical northward spread were most likely a consequence of unusual climatic conditions in Europe, which were characterized by an early start of a hot and rainless season in April/May 2018 that persisted at least until the beginning of September. Indeed, the summer of 2018 in Germany was the second hottest and driest on record.

Situation assessment

The causative WNV strains in Germany in 2018 (and presumably 2019) belong to central European subclade II (Ziegler et al. 2019). West Nile virus is one of the vector-borne viral diseases causing equine encephalitis. The virus circulates between wild birds transmitted by ornithophilic mosquitos (the most common is *Culex pipiens*) in Southern and Eastern Europe, North America, East and West Africa. Horses and humans are rare accidental spill-over events, and can be infected through the bite of a bridging species of mosquito,

such as *Culex modestus and Cx pipiens molestus* or very rarely, through surgical interventions, such as blood transfusion, organ transplant or injecting blood products.

During the 2018 transmission season, 285 West Nile fever outbreaks among equids were reported by EU Member States (ECDC 2018): 149 in Italy, 91 in Hungary, 15 in Greece, 13 in France, 9 in Spain, 2 in Austria, 2 in Romania, 2 in Germany, 1 in Slovenia and 1 in Portugal. This is a 30% increase compared to number of outbreaks in 2017. To date this year, three outbreaks of WNV in horses have been confirmed in 2019 in Europe, two in Hungary (see map) (one confirmed in March and one confirmed in May) and the third in horses in Greece in early July. To date no human cases of West Nile virus have been reported in EU Member States and EU neighbouring countries (ECDC 2019). In the 2018 transmission season, a higher number of human cases were reported compared with transmission seasons in previous years (ECDC 2018) with the highest increase compared to the previous transmission season observed in Bulgaria (15-fold) followed by France (13.5-fold) and Italy (10.9).

British mosquitos would be capable of transmitting WNV (given viraemic birds entered) and recent surveillance by PHE has found established populations of *Culex modestus* in southern England (Phipps *et al*, 2018; Cull, *et al.,* 2016). Mosquito activity declines from October and WNV transmission would not occur in autumn and winter.

It is likely that WNV enters the UK through WNV-infected wild birds from Europe from time to time. However, the timing may restrict the number of WNV transmission events within the UK because there needs to be synchrony between WNV entering the UK in birds and a high mosquito abundance for onward transmission to UK birds. For this reason, the risk of WNV incursion into the UK has to be assessed separately for each of the seasons.

Spring

Most bird migrants entering the UK from southern Europe do so through Spain and France in the early spring. However, the WNV prevalence and viraemia levels in the birds at this time of year may be lower than at the end of the vector season. Also at this time of year, mosquito numbers are relatively low, and WNV transmission as evidenced by cases in equines in southern Europe is low. Indeed, WNV cases in equines in southern Europe do not generally occur until August/September although the first human cases in 2018 were reported in late June (ECDC 2018) by which the spring migration to the UK is over. Thus the risk to the UK of autochthonous WNV transmission to horses in spring is assessed to be **negligible**. Although WNV is endemic in wild birds in southern Spain and France, no cases of autochthonous WNV infection in birds, humans or horses have ever been reported in the UK to date, despite large numbers of birds migrating up to the UK through France and Spain every spring.

Summer

Very few wild birds migrate from central Europe to the UK in the summer months when both mosquito numbers peak and the WNV vector transmission season has started (ECDC 2019) and for this reason and the risk to the UK horses of WNV incursion in summer is assessed to be **negligible**.

Autumn

The 2018/19 cases in birds in Germany together with the first occurrence of WNV in horses in Germany in 2018 suggest an expansion northwards in the range of autochthonous WNV distribution rather than a series of "imported" non-autochthonous cases. This northward expansion may present a change in risk to the UK in the autumn. Indeed, the presence of WNV in wild passerine birds in northern Germany raises the possibility of entry of WNV into the UK through the autumn migration (see previous outbreak assessment) and the infected common blackbird in September 2018 was found in Mecklenburg-Vorpommern which is virtually on the Baltic which is a major migration route to the UK. Large numbers of thrushes (including Fieldfare (*Turdus pilaris*) and Redwing (*Turdus iliacus*)) migrate from Scandinavia to the UK in the autumn together with other passerines from north-eastern Europe. Direct bird-to-bird transmission of WNV does not occur, and thus the probability of a WNV-infected thrush in Germany directly infecting a migrant thrush on its way to the UK is negligible. Vector-borne transmission could occur depending on mosquito activity and whether the migrating thrushes stop-off in northern Germany. However, this would seem unlikely. Waterfowl wintering in the UK generally come from more northerly latitudes than Germany although a small proportion of ducks such as Eurasian wigeon (*Anas penelope*) may come through northern-central Europe (EURING 2012). However, the passerines and waterfowl returning to the UK for the winter tend to arrive in October when UK mosquito abundance is falling. Migrating juvenile white storks (*Ciconia ciconia*), presumably infected in central Europe are believed to have brought WNV into Israel in 1998 (Malkinson et al. 2002). However, birds breeding in central Europe do not migrate north-west into the UK. Taking into account both the lack of synchrony with UK mosquito abundance in autumn and the large number of pathway steps (infection of migrant passerine/waterbird in Germany in autumn, migration of passerine/waterbird to UK, infection of UK mosquito) together with the relatively small number of wild bird cases in Germany, it was considered in the previous outbreak assessment (October 2018) that the risk of autochthonous infection of an equine in the UK through entry of WNV in wild birds in the autumn was **very low,** although this will need to re-evaluated in the light of further information on cases in Germany and northern Europe over the coming months.

Winter

The risk is assumed to be **negligible** for the UK in the winter due to very low mosquito numbers in northern Europe and the UK and greatly diminished WNV prevalence in Europe (ECDC 2018).

Conclusion

The current risk of autochthonous WNV transmission to horses in the UK as a result of the re-emergence of WNV in birds in north Germany is **negligible**, but there is a level of uncertainty around the current WNV situation in Germany and the lack of wild bird surveillance data across Europe. However, this would need to be reviewed for the autumn in the light of any further northward expansion in range of WNV in birds in Germany and perhaps even into Belgium and France. The human-assisted movement of WNV-infected adult stage mosquitos (e.g. in containers, vehicles and aircraft) from Germany or indeed southern Europe could occur and should be reviewed later in the summer when more information on WNV prevalence in mosquitoes in southern Europe and Germany is available.

The majority of infected horses will not show any clinical signs, but some horses may develop a fever, and rarely, central nervous signs, such as tremors, staggering and death. WNV is a notifiable disease in horses and suspicion of disease must be reported to APHA. The movement of WNV-infected people or horses would not be a risk pathway for establishing disease in the UK in terms of mosquito transmission, although it should be emphasised that disease in humans can result from exposure to equine tissues at necropsy (Venter et al. 2010). Similarly it is noteworthy that the veterinarian who performed the necropsy of a captive, WNV-infected great grey owl (*Strix nebulosa*) in Germany in 2018, developed flu-like symptoms 3 days after and revealed one month after the necropsy specific WNV-IgM antibodies (see Ziegler et al. 2019).

We would like to remind veterinarians and operators of equine establishments of the requirement to report suspect disease to APHA and that there is a “testing to exclude” programme to rule out infection in horses showing clinical signs where WNV is a differential diagnosis. Veterinarians should discuss this option with APHA. (https://www.gov.uk/government/organisations/animal-and-plant-health-agency/about/access-and-opening).

We will continue to monitor the situation.

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