Expert interview about the spread of West Nile virus in Germany - part 2

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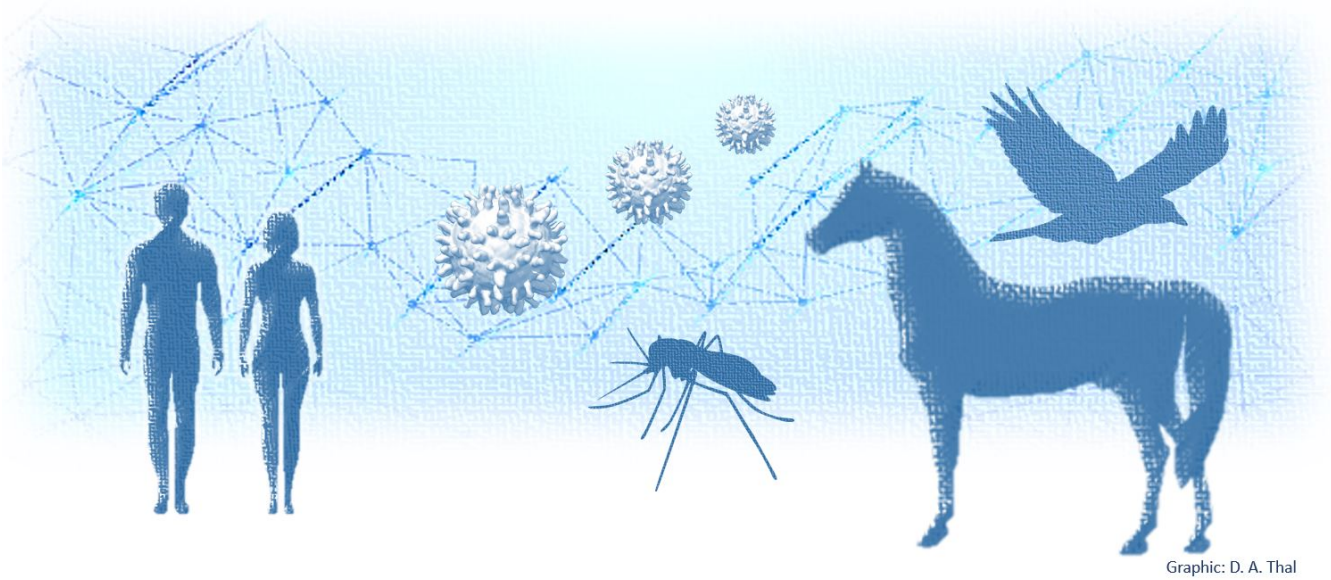

Graphic: D. A. Thal

Teil 2: The West Nile Virus – also a threat to animal health

The West Nile virus is a mosquito-transmitted zoonotic pathogen, which was first isolated in Africa in the 1930s. In recent decades, the virus has spread to many regions of the world. By now, it has also reached Germany. Since 2018 there have been the first confirmed cases of West Nile virus in Germany. In 2019 the first infections were confirmed in humans in Germany.

In the first part of our interview series we spoke to Prof. Jonas Schmidt-Chanasit of the Bernhard-Nocht-Institute for Tropical Medicine in Hamburg, who answered important questions related to human infections.

The second part is dedicated to the risk the West Nile virus poses to animals. Before the first human cases were reported there had been several confirmed cases in birds and horses. Dr. Ute Ziegler is a veterinarian specialised in virology at the Institute of Novel and Emerging Infectious Diseases at the Friedrich-Loeffler-Institute. As head of the national reference laboratory for West Nile virus she witnesses the spread of the virus in Germany mirrored in the increasing number of suspect cases that are send to her laboratory.

Note: the interview was translated from German. See original German version

ZOOP: Which animal species are mainly affected by the spread of the West Nile virus in Germany?

Ziegler: At the end of August 2018, the first bird infected with West Nile virus was found in Germany, a Great Grey Owl from an aviary in Halle an der Saale. By the end of the year, there were a total of twelve cases in birds and two cases in horses.

In 2019 the national reference laboratory for West Nile virus infections confirmed the first case, a snowy owl from the animal park Lutherstadt-Wittenberg, already at the beginning of July. This first outbreak was followed by a wave of diseases starting at the beginning of July until the end of October 2019, which affected a large number of wild and zoo bird species (currently 73 dead birds and 2 surviving hawks, as at 31.10.19). Among the species of wild birds affected so far are blue and great tit, goshawk, sparrow and eagle owl. In addition, various zoo birds have been affected (e.g. Andean flamingo, Great Grey Owl, Mountain Lory, Inca Tern, Japanese Gull, Canary, Pelican, Great Heron, Snowy Owl, Swift parrot, Scaly-sided merganser). Compared to the previous year more bird species are affected. The number of confirmed cases in horses also increased significantly with 35 cases currently confirmed (as at 30.10.19).

ZOOP: How does the infection with the West Nile virus progress in birds?

Ziegler: Actually, birds are the natural virus reservoir. Whereas most birds don not get ill, some are highly sensitive to the West Nile virus and develop severe clinical symptoms sometimes up to death. These include a large number of passerine birds (Passeriformes), especially ravens (Corvidae), but also some species of Accipitriformes and owls. In infected birds, that fall sick, death is often peracute without any clinical symptoms. If birds develop clinical symptoms they are often neurological (e.g. Apathy, nystagmus, head tremor, blepharospasm) and a large number of them die from it.

ZOOP: Do horses show similar symptoms?

Ziegler: Most of West Nile virus infected horses do not develop any disease symptoms similar to humans. However, if they disease often a meningitis with clear signs of central nervous failure develops. Wenn sie aber erkranken dann treten oft Hirn- oder Hirnhautentzündungen mit deutlichen zentralnervösen Ausfallerscheinungen auf. These include stumbling, after-hand paralysis, ataxias, general weakness, muscle tremors and paralysis up to the point where the animals become immobilised. The disease horses seldom show febrile general illnesses, the neurological symptoms dominate. Horses with clinical symptoms can survive the disease. However, in 20 % of the cases livelong neurological damages remain. There is no specific treatment only a therapy of symptoms.

ZOOP: Is there an established monitoring system for West Nile virus in Germany? Is it possible that the virus has been circulating undetected in bird populations in Germany for some time?

Ziegler: The National Reference Laboratory (NRL) has been monitoring the possible introduction and spread of West Nile virus along with the Usutu virus (a related flavivirus) for years. It is unlikely that the virus has been circulating between birds and mosquitoes in Germany over a longer period unnoticed. For several years, the FLI coordinates a German-wide wildbird monitoring program in which more than 20 motivated partners (private and university bird clinics, ornitologist and ornitological reseach stations), the federal food and veterinary inspection offices, the Bernhard-Nocht-Institute for Tropical Medicine (BNITM) in Hamburg as well as the NABU are engaged. No indications of a West Nile virus infection were found in birds tested before 2018. Since all samples from wild or zoo birds send to the FLI are always tested for both viruses, the first West Nile virus infection in a bird in Germany could be detected on 28th August 2018 in cooperation with the State Office for Consumer Protection in Stendal.

ZOOP: Are all cases in Germany attributable to the same pathogen strain?

Ziegler: Phylogenetic data indicate a hibernation of the isolate from 2018 coupled with new entries into Germany, but detailed phylogenetic analysis are currently underway.

ZOOP: Is the virus spread throughout Germany? Are there certain regions that are particularly affected?

Ziegler: Last year, the cases occurred mainly in eastern Germany, as well as sporadically in the areas of Munich and Rostock. This year we record a significant increase of cases in birds and horses, currently 110 cases (as at 30.10.19). Hotspots 2019 are in Saxony, Saxony-Anhalt, Berlin, in some regions in Brandenburg, and for the first time in Hamburg and a region in Thuringia. Further cases in animals and humans are likely to come. However, we are still seeing only the tip of the iceberg. Many diseased birds remain undetected in sparsely populated areas, just like infected horses that are asymptomatic.

ZOOP: How can the regional differences in Germany be explained?

Ziegler: First phylogenetic investigations hint towards an entry of the virus via the east European states. It seems that the climatic conditions along with the optimal interactions between virus, vector and host in Saxony-Anhalt, north Saxony and south Brandenburg were especially important for the establishment of the virus in these regions. It is currently not possible to predict to what extent the virus will spread from these regions to the whole of Germany.

ZOOP: Does the virus also occur in other European countries?

Ziegler: The West Nile virus first appeared in Europe in France in the beginning of the 1960s and since then has established itself in the whole mediteranian area, i.e. especially in the south and south-east European countries there have been repeated infections in humans, horses and birds in recent years. Lately it has spread further and further northwards, so that especially in Germany's southern neighbours, more and more cases in humans and horses have been registered (see also the annual data collection in the European Centre for Disease Prevention and Control (ECDC)). Therefore, it was only a matter of time before the virus also entered Germany, because suitable vectors (mosquitoes) and hosts (wild birds) for the virus are also present here.

ZOOP: In part 1 of the interview series Prof. Schmidt-Chanasit explained that there is no vaccine against West Nile virus for humans yet. What about veterinary medicine? Is there a vaccine for animals already available?

Ziegler: In Europe, three West Nile virus vaccines are currently approved by the European Medicines Agency (EMA) for the application on horses. All three vaccines do not protect the horses from a West Nile virus infection. However, they largely protect against clinical symptoms and reduce the duration and manifestation of the viremia significantly.

ZOOP: Should I vaccinate my horse? Is there a vaccination recommendation?

Ziegler: Although it is currently not possible to predict the occurrence and spread of West Nile virus in Germany in the next few years, horses in the "hotspot regions" should be vaccinated until the beginning of the next mosquito season. The Vaccination Commission Veterinary Medicine (StIKo Vet) recommended already in autumn 2018 to include immunisation against West Nile virus in affected areas as a core component in the vaccination of horses. In view of the current development, the StIKo Vet repeats the recommendation to vaccinate horses against West Nile Virus in the already affected areas in Central Germany. As a precautionary measure, horses which are moved into these areas and those which are in neighbouring regions, e.g. in Thuringia, Mecklenburg-Western Pomerania or Lower Saxony, should also be vaccinated with one of the vaccines available in Germany. This also applies to horses that are only moved there for a short time (e.g. for tournaments).

ZOOP: What are control measures against the virus in countries where it occurs already for a longer time?

Ziegler: In other countries different mosquito control programs combined with vaccination of horses are applied. However, some countries do not apply any control measures.

ZOOP: What is expected for the coming years concerning the spread of the West Nile virus in Germany?

Ziegler: This year's West Nile virus spread has not yet been conclusively recorded. If, however, the conditions for virus spread remain favourable, i.e. susceptible birds as reservoir hosts, native mosquitoes as competent vectors and temperatures favourable for the reproduction cycle in the mosquito season and for hibernation, additional West Nile virus cases and further spread of the virus within Germany can be expected in the next few years.

ZOOP: To what extent does the climate change influence the spread of West Nile virus in Germany?

Ziegler: It is assumed that last year's and also this year's above-average warm summer with long periods of heat have favoured virus replication in mosquitoes and probably accelerated the geographical spread of the virus. Certainly, the last warm winter was also beneficial for the hibernation of the virus in the mosquito population.

ZOOP: Dr. Ziegler, thank you very much for the interview.

Interview: Dr. Dana Thal for the German Reserach Platform for Zoonoses (ZOOP)

The interview is part of an interview series with experts on the West Nile virus in Germany. In part onewe take a closer look at health risk for humans. In part three you find answers about the role of the mosquito as transmitter of West Nile virus.