

Vector-Borne Diseases: Impact of Climate Change on Vectors and Rodent Reservoirs
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Circulation of West Nile Virus in Germany?

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The natural reservoir for *West Nile virus* (WNV), a mosquito-borne *Flavivirus*, are birds. Humans and a variety of other vertebrates can be infected by mosquitoes which are blood feeding on birds and mammals. WNV gained world wide attention when the first cases of WNV infections were reported in 1999 in North America, a region where WNV was not present before. The infection spreads rapidly all over the USA and also to Canada and to Middle and South America. WNV was most probably imported by migrating birds from WNV-endemic regions (Israel or Africa).

Although the viremic phase in humans is short with comparatively low virus titers transmission of WNV by transfusions, transplantation and from mother-to-child in the United States were observed. Taking these observations into account the question arose, whether WNV is prevalent in Germany.

To estimate the risk to acquire an infection with *West Nile virus* (WNV) in Germany, studies on the prevalence and incidence of WNV infections in migrating birds were initiated. In addition human patients with neurological symptoms compatible with WNV induced diseases as well as horses with clinical signs of an encephalitis/meningoencephalitis were included. Serological (immune fluorescence assay, ELISA, neutralisation assay) as well as molecular methods (species specific and lineage 1 and 2 specific) were established for the detection and differentiation. Between 2000 and 2005 blood samples from birds (n= 3399) belonging to 87 species were collected and analysed for WNV specific antibodies and for WNV genomes. Only 53 birds belonging to 5 species had WNV specific antibodies.

None of the birds investigated by WNV specific PCR was positive. Humans (n = 144) or horses (n=169) with neurological symptoms showed no markers of a WNV infection (negative for antibodies and in PCR).

In addition to the investigation of humans with neurological symptoms bird ringers from Germany and Austria who have a close contact to birds during bird-ringing were included as risk group. Several serological test systems were used to study WNV the antibody prevalence among 137 bird ringers. Neutralizing antibodies were detected in three of the bird ringers. This seropositivity could be explained by alternative factors such as traveling to endemic areas. The application of different serological methods showed that WNV IgG ELISAs were less specific than WNV IgG immunofluorescence tests (IFT). The neutralization test (NT) appears to be the gold standard for *flavivirus* differentiation. From these data it was concluded that at present no evidence for the circulation of WNV could be found.

