

Establishment of an endemic West Nile virus maintenance cycle in Berlin

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West Nile virus (WNV) is a mosquito-borne arbovirus that can cause West Nile fever (WNF) or neuroinvasive disease (WNND) in humans. Human WNV cases have been reported in Berlin since 2019, but due to reliance on passive surveillance and detection, WNV infections are likely underdiagnosed.

Here, we traced acute WNV cases transmitted to the State Office for Health and Social Affairs Berlin (SOHSA) in 2021, and analysed cerebrospinal fluid (CSF) samples from patients with encephalitis of unknown aetiology for WNV. Mosquitoes were trapped at identified exposure sites and examined for WNV. We characterized two acute WNV cases without travel history in Berlin in 2021, a blood donor with WNF and a patient with WNND, and identified one WNND case retrospectively from CSF material. WNV was also identified in two *Culex pipiens* mosquitoes collected at one exposure site. In 2022, monitoring at the same site confirmed presence of WNV in five *Culex pipiens* mosquitoes. Phylogenetic analysis of WNV genomes from our study and other WNV sequences show that the sequences from Berlin form a monophyletic clade containing two unique single nucleotide variants (SNVs). The WNV sequences from one patient and a mosquito shared an additional SNV.

Overall, our study provides evidence WNV has established an endemic maintenance cycle in Berlin with autochthonous human WNV lineage 2 infections. Since cases are expected to increase, enhanced surveillance, vector management and public awareness are needed.

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West Nile Virus, Berlin, mosquitoes

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No, I am not a Junior Scientist.

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