

Did wild birds cause the 2010 deadly West Nile virus outbreak in Greece?

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In 2010, 35 people in Greece died from a West Nile virus (WNV) outbreak, with a further 262 laboratory-confirmed human cases. A new article published in BioMedCentral's open access journal *Virology Journal* examines whether wild or migratory birds could have been responsible for importing and amplifying the deadly virus.

WNV is a flavivirus of major public health concern, spread through the bite of infected mosquitoes. Discovered in Uganda in 1937, it was only sporadically reported up until the 1990s, after which [disease outbreaks](#) were reported world-over, leading to WNV being given epidemic status. Studies have shown that humans infected with WNV do not have viremia levels high enough to infect new mosquitoes and hence pass on the virus. Birds, however, do develop viremia levels sufficient to infect mosquitoes, hence serving as amplifying hosts for WNV.

In order to investigate whether wild birds were exposed to WNV prior to the 2010 outbreak in Greece, Charalambos Billinis and his co-authors tested serum and tissue samples from 295 resident and migratory wild birds harvested by hunters prior to and during the outbreak. These samples were collected for the purposes of the authors' participation in an FP7 EU wildlife diseases research project ("WildTech"). All sampling sites were in flying distance for avian species. Using immunofluorescence assays and virus neutralization tests to analyze samples for the presence of WNV-specific antibodies, the authors found 53 avian samples with WNV neutralizing antibodies. Importantly, 14 positive serum samples were obtained from birds up to 8 months prior to

the human outbreak, and [genetic determinants](#) of increased virulence were present in these samples.

These results provide evidence to implicate that [wild birds](#) could have allowed WNV maintenance and amplification before and during the 2010 [virus outbreak](#). Lead author Billinis commented, "The finding that [migratory birds](#) were previously exposed to WNV prior to their arrival in Greece during autumn migration suggests that avian species with similar migration traits could have introduced the virus into Greece."

The newly appointed editor in chief of the journal, Professor Linfa Wang, said, "This study shows the importance of wild bird surveillance for zoonotic diseases such as [West Nile virus](#). It also demonstrates that pre-emergence surveillance in wildlife can be a powerful tool as part of an effective pre-warning system to prevent and/or reduce the impact of emerging zoonotic diseases. It is a great example of the need for a One Health approach to combat emerging infectious diseases."

Wildlife surveillance systems put in place could possibly provide timely information regarding virus introduction and circulation, further dispersion or introduction of new strains.

More information: Serological and Molecular Investigation into the Role of Wild Birds in the Epidemiology of West Nile Virus in Greece, George Valiakos, Antonia Touloudi, Labrini V Athanasiou, Alexios Giannakopoulos, Christos Iacovakis, Periklis Birtsas, Vassiliki Spyrou, Zisis Dalabiras, Liljana Petrovska and Charalambos Billinis, *Virology Journal* (in press)

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