



ISWAVLD 2023

International Symposium of the World
Association of Veterinary Laboratory
Diagnosticians

29 JUNE-1 JULY
2023
Congress Centre
Lyon

Towards
the veterinary
diagnostics
of the
future

Main topic : Surveillance and control of emerging diseases

Enhancement and extension of WNV and USUV surveillance in France through a national serosurvey conducted in wild captive birds and improvement of molecular diagnostic tools

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West Nile virus (WNV) and Usutu virus (USUV) are emerging vector-borne zoonotic flaviviruses. Both viruses are transmitted through an enzootic cycle involving *Culex* mosquitoes and a range of avian hosts but they occasionally infect mammals such as equines or humans. Vertebrate hosts can develop diseases ranging from mild illness to severe neurological disorder. Humans and horses are accidental hosts and epidemiological dead ends. Since their first introduction through migratory birds from Africa in the 1960's and 1990's respectively, WNV and USUV have been (re)emerging through Europe with a high epidemic year witnessed in 2018, and geographical spread with novel introductions and sometimes conversion to an endemic status in several European countries. Control mainly relies on surveillance and preventive measures in case of detection. Passive surveillance programmes in equids and birds are implemented in most European countries. Where prevalence is high, active surveillance programmes, that involve yearly screening of a significant number of individuals (birds and mosquitoes), are implemented. Strengthening/improving surveillance strategies for WNV and USUV is a key concern for National and European reference laboratories. In France, circulation of both viruses are currently monitored through passive surveillance that encompasses (i) serological testing of clinically symptomatic horses or captive birds manifesting neurological signs and (ii) molecular detection of viral genome in targeted organs by RT-qPCR. We aim to reinforce and extend the integrated surveillance system in place. As an initial approach, we conducted a serosurvey in captive birds from zoos distributed across the country. In order to strengthen the surveillance of these two viruses, we have extended our surveillance network throughout the country and optimised molecular diagnostic tools that can be adapted according to epidemiological criteria (region, period, samples). Thus, we will use wild birds as sentinel and propose an efficient, simple, and cost-effective strategy that is adaptable depending on the intensity of circulation of WNV and USUV. During the transmission season, from June to November, when viruses prevalence is high, we will use a multiplex RT-qPCR assay for the simultaneous detection of these two viruses as well as the house keeping gene β -actin. Apart from this season we will screen bird samples using a Panflavi RT-qPCR as first intention diagnostic test.

The development of a low cost active surveillance system should allow earlier detection of WNV and USUV infections and guide policy makers to adapt prevention and control measures.