

## West Nile virus integrated surveillance in Emilia-Romagna: an example of One Health approach in Italy

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### **Purpose:**

West Nile virus (WNV) circulates in nature between mosquitoes and birds, and can cause neuroinvasive disease in humans. As iatrogenic transmission via blood transfusion is possible, the National Blood Centre has established that WNV Nucleic Acid Test (NAT-PCR) on blood donations shall be timely introduced in a province after the notification of West Nile neuroinvasive disease in humans (WNND). Testing shall be then continued until 30 November and repeated from 1 July to 30 November in the following year. In 2014, NAT-PCR testing started after the notification of WNV circulation detected by the integrated surveillance system for WNV in place in the Emilia Romagna region (ER), Italy. This work describes how the results of the integrated surveillance could be used to establish also the end of the testing period for blood donations.

### **Methods:**

The ER integrated surveillance system includes: entomological monitoring; active and syndromic surveillance of wild birds; syndromic surveillance of horses; active surveillance on patients with neuroinvasive disease. Mosquitoes, birds and humans are tested by Real Time RT-PCR, while horses are tested by a commercial IgM ELISA. Positive samples are sent to the National Reference Centres for confirmation, sequencing and lineage determination.

### **Results:**

In 2009 and 2010, the surveillance system detected the circulation of a lineage 1 WNV strain. In 2009, nine WNND human cases occurred in three out of the nine ER provinces, while none was notified in 2010. In 2011 and 2012, neither virus circulation nor WNND cases were detected. In 2013, WNV lineage 2 circulation was detected and 20 WNND cases occurred in five provinces. In 2014, lineage 2 WNV was again detected and seven WNND cases occurred in five provinces. The entomological and veterinary surveillance have always detected virus circulation before the occurrence of WNND cases (average: 34.3 days; median: 30; range 20-54) and no WNND cases occurred more than 30 days after the last WNV detection in mosquitoes, horses or birds.

### **Conclusions:**

Therefore also the end of testing could be adapted to the results of the integrated surveillance.

### **Relevance:**

This approach could be cost saving in terms of avoided NAT-PCR.