



VECTOR-BORNE PATHOGENS

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Vector-Borne zoonoses surveillance in Piedmont region, northwestern Italy (2011 - 2014)

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Vector-Borne Diseases (VBDs) are infections that affect humans and animals and are transmitted by infected arthropod. Climate change, international trade and travel increased their distribution during the last years. To control VBDs spread an integrated surveillance system between human, veterinary and entomological activities has to be established. This work reports the surveillance system enforced in Piedmont region (northwestern Italy), on mosquito and tick borne diseases.

An information network was activated between veterinary services and local human health authority, to connect the surveillance of human clinical cases with entomological surveillance and veterinary monitoring in order to implement control measures in case of outbreak. Since 2011 a systematic entomological surveillance was carried out during the vector season. Mosquitoes were collected by traps located in representative sites of the whole region and identified. Moreover a risk based virological surveillance to detect viruses belonging to the *Flaviviridae* family was enforced on mosquitoes pooled by species and analyzed by PCR assays. Ticks collected from bitten humans of different regional areas were identified and tested for the detection of pathogens [*Borrelia burgdorferi* sl; *Rickettsia* spp., *Anaplasma* spp and Tick Borne Encephalitis Virus (TBEV)].

Mosquito surveillance allowed to detect in 2014 the introduction in Piedmont of West Nile Virus (WNV) lineage 2, found in 2 pools of *Culex pipiens* on more than 1960 mosquitoes pools tested since 2011. This finding represents the first WNV detection in Piedmont, where neither human nor animal clinical cases have been reported so far. Control and preventive measures were quickly applied, according to the national legislation and in collaboration with local veterinary and human health services. Since 2011, 557 ticks were collected from humans, mainly identified as *I. ricinus* (75.4%). Preliminary biomolecular tests performed on 364 ticks showed an infection prevalence of 6.6% for *Borrelia burgdorferi* sl, 14.8% for *Rickettsia* spp. and 1.9%, *Anaplasma* spp. No TBEV was detected.

Interactions between multiple disciplines are needed for an effective early warning, surveillance and control of VBDs, according to the One Health concept. The present study shows that in Piedmont the entomological surveillance allowed to early detect the presence of WNV even in absence of clinical cases in humans and animals, and provided useful information to public authorities, in order to apply control measures in collaboration with local veterinary and human health services. Moreover the study of ticks from bitten patients represents a valuable tool for medical centres to address the diagnosis and therapy.