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### MediLabSecure: A virology and entomology laboratories network for a One Health approach of vector-borne and emerging viruses in the Mediterranean and Black Sea regions



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**Purpose:** As vector-borne viruses and other emerging viruses are threatening global health, the EU-funded MediLabSecure project aims at enhancing the preparedness to viral threats by establishing a One Health network of Public Health institutions, medical entomology and virology laboratories in 19 non-EU countries of the Mediterranean and Black Sea areas. The 4-year project (2014–2017) aims to enhance the level of integration for the surveillance of relevant emerging arboviral diseases between laboratories and central national surveillance systems.

**Methods & Materials:** To achieve this, MediLabSecure incorporates 19 public health institutions and 55 laboratories with expertise in animal virology, human virology or medical entomology representing a network with one laboratory per field of study in each country. The program is coordinated by 4 research and public health institutes based in France, Spain and Italy. Capacities and needs regarding biosafety management, diagnostics and integration of surveillance for vector-borne viruses were assessed in each laboratory and institution of the network. Joint meetings are allowing the network partners and coordinating institutions to meet and exchange on the objectives and future steps of the project, their experiences, needs and expectations.

**Results:** Thanks to these assessments and exchanges, tailored training curricula were elaborated and the activities foreseen in the program were fine-tuned. Two types of actions have been implemented in the frame of the program: training sessions in each scientific field and transversal workshops and meetings. These training activities enabled the network to (1) implement harmonized and up-to-date diagnostic techniques for vector-borne viruses such as West Nile, Rift Valley fever, Crimean-Congo haemorrhagic fever, chikungunya and Zika viruses; (2) develop capacity building in medical entomology and vector surveillance and (3) foster interdisciplinary collaboration for surveillance integration in the framework of One Health.

**Conclusion:** By enhancing regional inter-sectorial cooperation and by reinforcing diagnostic and surveillance capacities, the MediLabSecure network is paving the way for an integrated surveillance of vector-borne diseases and creates new capabilities for a corporate preparedness and response to viral threats in the Mediterranean and Black Sea regions based on a One Health approach.

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### Arboviral encephalitis in Costa Rican horses: 2009–2016



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**Purpose:** Arbovirus of the genus Alphavirus and Flavivirus can cause febrile illness and sometimes neurological disease in both humans and animals. West Nile Virus (WNV), Eastern Equine Encephalitis Virus (EEEV), Western Equine Encephalitis Virus (WEEV) and Venezuelan Equine Encephalitis Virus (VEEV) are endemic in the Mesoamerican region and the local appearance of these viruses is regulated by the amount of vectors and reservoirs.

The objective of this research was to establish the etiologic agents associated with the presentation of arboviral neurological disease in Costa Rican horses from 2009–2016.

**Methods & Materials:** The clinical cases were attended mainly by official veterinarians and technicians from the Costa Rican National Animal Health Service (SENASA) as part of the surveillance program for infectious diseases. Blood samples from diseased horses were collected. The serums were centrifuged, cooled and sent to the laboratory. Information about the horses, owner, and GPS location of the farm were recorded. All serums were assessed by IgM capture ELISA, using a 1:400 dilution. Reagents and reference serums were purchased from NVLS, Ames Iowa, or donated by CDC, Fort Collins, USA or by Gorgas Institute, Panamá. The peroxidase conjugates were MAbs: 2A2C-3 /6B6C-1. The substrate was TMB (Sigma). A serum was considered positive when the OD of the test serum was twice the mean OD value over the negative serum with viral antigen.

**Results:** Between 2009 and 2016, 181 outbreaks of neurological disease in horses were studied and a total of 284 serum samples were analyzed by IgM capture ELISA, resulting in the diagnosis of 4 cases of EEEV, 131 cases of VEEV and 35 cases of WNV. Most of the positive cases were located in the Northwestern region of Costa Rica in the low lands, in the provinces of Guanacaste, Alajuela and Puntarenas. In addition, all of the positive cases occurred during the rainy season (May to January). Most of the positive cases were unvaccinated horses.

**Conclusion:** Our results clearly demonstrate that the arboviral encephalitis affecting horses in Costa Rica show a defined seasonal and geographical pattern, representing a valuable clue for the prevention and implementation of a vaccination program to reduce their incidence.

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