



ICLB

16TH INTERNATIONAL CONFERENCE
ON LYME BORRELIOSIS AND OTHER
TICK-BORNE DISEASES

Abstract book ICLB 2022

Introduction

We are proud to present the abstract book of ICLB2022, the 16th edition of the International Conference on Lyme borreliosis and other tick-borne diseases, in Amsterdam, The Netherlands. This edition is co-organized by ESGBOR and NorthTick.

We are grateful for all the abstracts on a great variety of topics ranging from ecology to pathogenesis and from diagnostics to prevention of Lyme borreliosis as well as other tick-borne diseases.

The abstracts are included in the abstract book in an unedited form, i.e. how they were submitted through the online portal. Of note, the abstract book is intended for those who have registered for the meeting only and should not be published, copied, edited or shared with others in any form.

Kind regards,

The conference chairs,

Hein Sprong (WUR) and Joppe Hovius (Amsterdam UMC)

P031 - Assessing the ecological covariates related to tick-borne encephalitis emergence in Europe

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Introduction

Tick borne encephalitis (TBE) is a disease which can lead to severe neurological symptoms caused by the TBE virus (TBEv), a flavivirus transmitted in Europe mainly by ticks of the Ixodes complex. In nature, TBEv circulation is maintained in the environment by the co-occurrence of three major components: the virus, the vector and competent hosts, namely rodents. TBEv is typically found in hotspots (foci of infection) and so does not mirror the vector and host distributions. In recent decades, the incidence of TBE human cases in Europe has been rising both in endemic and new regions, with altitudinal and latitudinal shifts, posing an increasing threat to public health. Therefore, the early detection of new TBE foci represents a sanitary priority at community level.

Methods

We systematically reviewed the existing literature including data on covariates associated with the circulation of TBEv in Europe. We then validated our results by means of multiple linear regression, using as response variable TBE incidence (provided by the European Surveillance System:TESSy), averaged between 2017 and 2020, at the regional spatial level for ten different countries that represent the spatial variability of TBEv across the European continent. Explanatory variables, including climatic, environmental and ecological factors, were selected according to the literature review findings.

Results

We retrieved and analyzed data from sixty-three full text papers considering both biotic and abiotic factors. Our statistical findings highlight the predominant role of temperature-dependent variables, such as mean temperature in winter, autumnal cooling rate and mean diurnal temperature range, in explaining the variation of TBE incidence across European Countries, at the regional level. Variables linked to the ecology of the hosts and the vegetation cover, namely the probability of presence of competent hosts (*Apodemus flavicollis*, *Myodes glareolus*), of other suitable hosts (*Cervus elaphus*, *Capreolus capreolus*, *Dama dama*) and forest cover indexes (Enhanced Vegetation Index, % of forest areas), are also shown to play a significant role in TBEv circulation.

Conclusion

The existing literature is very heterogeneous, both in study design and variable types, and lacks information concerning thresholds of disease emergence. We therefore identified, summarized and

validated the covariates with the highest predictive power for TBE incidence at the regional spatial level and aimed to provide useful recommendations of consistent approaches for future work. Our results can support forthcoming modeling efforts to estimate the risk of TBEv infections and help decision-makers to identify emerging risk areas.