



TRAINING SCHOOL

„Finding, using and interpreting maps and models of invasive mosquitoes”

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***Aedes koreicus* in the region of Slovenia, Hungary and Croatia**

and risk assessment for ***Dirofilaria repens*** infections

Slovenia:

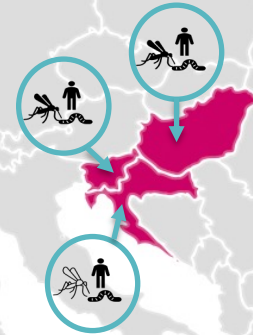
- *Ae. koreicus* is present since 2013
- *Dirofilaria* nematodes circulate among dogs, 5 human cases since 2010

Hungary:

- *Ae. koreicus* is present since 2016
- *Dirofilaria* nematodes circulate among dogs, 3 human cases in the last year, observed close to a dog shelter, where *Ae. koreicus* is dominant

Croatia:

- *Ae. koreicus* did not emerge yet, but in SI and HU it was found close to the country's border
- *Dirofilaria* infections in both dogs and humans are common!



Modelling of the mosquito species distribution would be useful!



Overview of data and information on vector species/disease system, and priority mitigation strategy objectives

Data sources on *Ae. koreicus* and *D. repens*:

- Our own research work (regionally oriented)
- Other groups' research work in the countries
- AIMSurv protocol (by AIM-COST)
- Mosquito alert – citizen science
- Publicly available distribution maps (ECDC, GBIF, iNaturalist...)
- Scientific papers available on Web of Science, PubMed, ResearchGate, GoogleScholar, ...




Data sources on mitigation strategy:

- EU and national legislation, national/regional regulations on mosquito control
- Practices of municipalities in our region





Existing data in nutshell ... what we could find

	SLOVENIA	HUNGARY	CROATIA
 MONITORING OF MOSQUITOES	<ul style="list-style-type: none"> - Limited to projects; national “monitoring” (3 year project) finishes soon 	<ul style="list-style-type: none"> - No nationwide program (only citizen science) - Limited to scientific projects 	<ul style="list-style-type: none"> - National (but not mandatory) program - It is implemented by regional institutes
 MONITORING OF DIROFILARIASIS	<ul style="list-style-type: none"> - There are proven human cases - National monitoring, scientific works - The report of illness is mandatory - No common database for dog infections - Public awareness: dog owners are informed only at visits at veterinarians to take preventive measures; no education campaign going on 	<ul style="list-style-type: none"> - There are proven human cases - The report of illness is not mandatory - Scientific works - No common database - Public awareness: dog owners are informed only 	<ul style="list-style-type: none"> - There are proven human cases - The report of illness is not mandatory - Croatian Veterinary Institute, Parasitology Laboratory, carries out morphological and molecular proof of the mentioned parasites in animals and humans - No common database
 MOSQUITO CONTROL	<ul style="list-style-type: none"> - No general control program - Preparedness plan for disease control in case of VBDS - Not obligated to take control measures - Some municipalities with Aquatrain 	<ul style="list-style-type: none"> - Nuisance control - Chemical and biological in the whole country - Centralized by the Ministry of the Interior, National Directorate General for Disaster Management 	<ul style="list-style-type: none"> - Control of nuisance, diseases, and spread of vectors - Carried out on the territory of the entire Republic of Croatia - DDD measures (chemical and biological), larvicidal and adulticidal

There are aggregated and small-scale data, no general monitoring, no targeted control!



What is missing to provide a realistic VBD risk assessment

- There are **aggregated and small-scale data** only
- Both the pathogen and the vector species are present in the region, but **the role of *Ae. koreicus* in the local circulation of *D. repens* is not investigated**
- **The risk of exposure is not measured:** the prevalence of *D. repens* in dogs and/or in mosquitoes is not measured



Suggestions for better input data

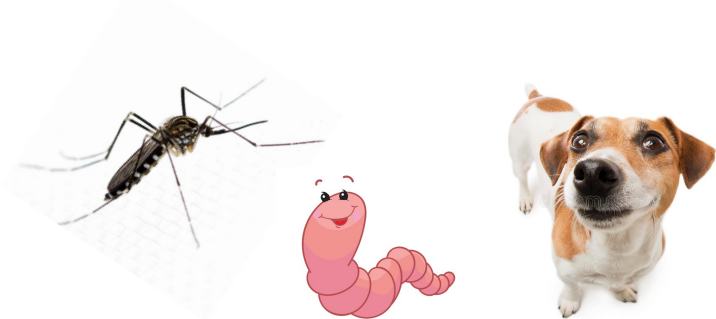
- **Monitoring** of mosquitoes and *Dirofilaria* infections (in dogs, humans and also mosquitoes) should be a **compulsory**
- **Harmonized surveillance** protocols (such as AIMSURV) and **common database** (national / European) - **exchange of data**
- **Interdisciplinary approach:** exchange of data between different specialists (e.g. entomologists, veterinarians, medical doctors, sanitary engineers, decision-makers in epidemics, and stakeholders in VBD control management)
- **More studies** on *Ae. koreicus* populations in the region: e.g. habitat preferences, dispersal patterns, feeding behaviour, biting rates, vector competence for further human diseases...





Suggestions to decrease the risk of transmission

- **Control of infected dogs** should be mandatory (dogs are reservoirs)
- **Education!**
 - Particularly in dog breeding sites and shelters
 - More attention to increasing the knowledge on *Dirofilariosis* and the vector role of mosquitoes, mosquito biology, diagnostics of VBDs, prophylaxis...
- **Cooperation of citizens**
 - Allow experts to enter private areas (gardens, houses etc.) for surveillance
 - Highlight the role of preventive measures should be done by citizens
- Clarifying what are limitations, what are regulations



Thank you
for your attention!