



## The AIMS<sub>Surv</sub> Initiative, 2020. Coordinated invasive mosquito surveys across Europe

Four *Aedes* Invasive Mosquito species (AIMs), including *Aedes albopictus*, *Aedes japonicus*, *Aedes koreicus* and *Aedes aegypti* are now spreading through Europe. These insects are disease vectors – and so spread disease pathogens like dengue, yellow fever, chikungunya, and Zika viruses. Although these are primarily tropical diseases, they can be introduced into Europe by travellers or infected mosquitoes arriving in trade containers or planes, and then spread where a local AIM population is established and active. As a result, since 2007 there have been significant numbers of chikungunya cases in Italy, France and Croatia, and dengue cases in France, Croatia and more recently Spain. Even a few locally acquired Zika cases appeared for the first time in Europe in 2019, in southern France. It is therefore essential that these AIMs are surveyed to assess the risk of disease and help target control measures.

The AIM-COST Action (<https://www.aedescost.eu>) is an EU-funded project that organises a transboundary network of partners to identify and fill knowledge gaps, enhance research effectiveness, improve dissemination, and standardise, optimise and promote new country-tailored surveillance and control procedures. The Grant Holder is the Dept. of Public Health & Infectious Diseases, SAPIENZA University, Rome, Italy, Università di Roma SAPIENZA, in Rome.

To date the AIM-COST Action includes academic and public health institutions and private companies from 40 countries in Europe and Neighbouring Countries, as well as from Partner Institutions in US and Cuba. The Action is chaired by Professor Alessandra della Torre and is organised in three working groups: WG1: monitoring & surveillance of AIMs; WG2: conventional and innovative control tools; WG3: dissemination, customisation and communication.

Chair: Alessandra della Torre Deputy: Dusan Petric  
Administration: Silvia Venturini

WG1 Surveillance: Francis Schaffner, Miguel Miranda  
Sampling Protocols, Integrating Surveillance, Data Analysis, Modelling and Mapping

WG2 Control: Antonios Michaelakis; Carla Sousa  
Harmonise control methodologies  
Control evaluation protocols

WG3 Dissemination and Dissemination: William Wint, Kamil Erguler  
Questionnaire for : Surveillance, Control activities and methods; Guidelines.  
Mapping for the Users, Website

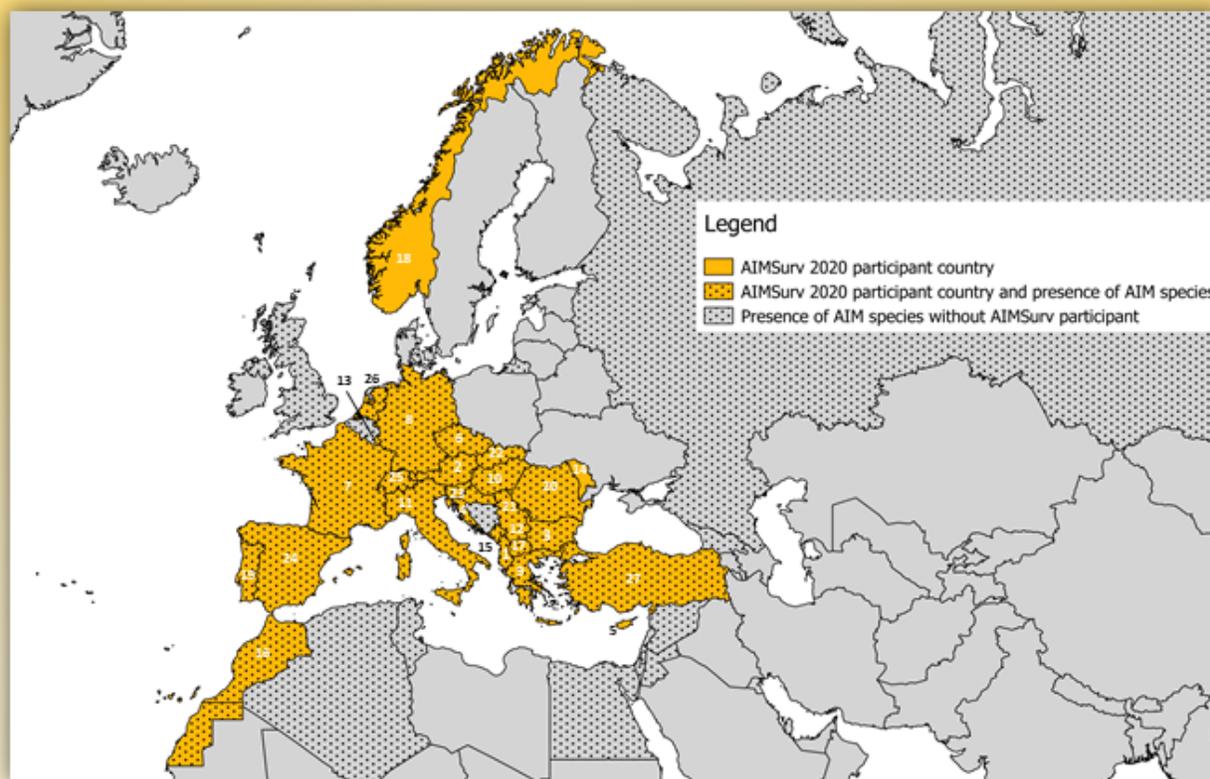
Communication: Filiz Gunay, Silvia Venturini  
Training: Andrei Mihalca

The Action helps to harmonise surveillance and control of AIM species and promotes the use of modern citizen science approaches. For this, AIM-COST is reviewing the current methodologies and practices for sampling, monitoring and identifying AIMs, as well as finding ways to improve knowledge transfer to stakeholders and young researchers. To this end, training courses in surveillance, control and modelling and mapping are central to the Action strategy. The first of these, on “Harmonising *Aedes* invasive mosquito (AIM) surveillance across Europe” has been held in Akrotiri, Cyprus, where a programme of coordinated surveillance of AIMs in Europe and beyond (“AIMS<sub>Surv</sub>”) was designed for Summer 2020.

Teams from 27 countries and 47 institutions across Europe and the Mediterranean Basin (see map) are taking part in AIMS<sub>Surv</sub>. All are using the harmonised protocol<sup>1</sup>, so that all the data are comparable and can provide much more reliable information about the AIM populations in our environmental context.

<sup>1</sup> <https://www.aedescost.eu/ProtocolFieldAIM-COST>

# Countries and institutions participating in AIMSURV 2020



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| <ol style="list-style-type: none"> <li>1. <b>Albania</b><br/>Institute of Public Health from Albania</li> <li>2. <b>Austria</b><br/>University of Veterinary Medicine, Institute of Parasitology, Vienna<br/>University of Vienna, Department of Functional and Evolutionary Ecology</li> <li>3. <b>Bulgaria</b><br/>National Centre of Infectious and Parasitic Diseases</li> <li>4. <b>Croatia</b><br/>Andrija Stampar Teaching Institute of Public Health<br/>Institute of Public Health for the Osijek Baranya County<br/>Public Health Institute of Split and Dalmatia County</li> <li>5. <b>Cyprus</b><br/>Cyprus Institute, Nicosia<br/>Cyprus University of Technology, Limassol<br/>Joint Services Health Unit, British Forces Cyprus</li> <li>6. <b>Czech Republic</b><br/>Institute of Vertebrate Biology, Czech Academy of Sciences, Brno</li> <li>7. <b>France</b><br/>Francis Schaffner Consultancy</li> <li>8. <b>Germany</b><br/>Friedrich-Loeffler-Institut, Greifswald</li> <li>9. <b>Greece</b><br/>Benaki Phytopathological Institute<br/>Ecodevelopment S.A.</li> <li>10. <b>Hungary</b><br/>University of Pécs</li> <li>11. <b>Italy</b><br/>Fondazione Edmund Mach, Trentino<br/>Istituto Zooprofilattico Sperimentale delle Venezie<br/>University Sapienza Roma, Dep. Public Health and Infectious diseases</li> <li>12. <b>Kosovo</b><br/>University of Prishtina</li> <li>13. <b>Luxembourg</b><br/>Luxembourg National Museum of Natural History</li> <li>14. <b>Moldova</b><br/>Institute of Zoology of Academy of Sciences</li> <li>15. <b>Montenegro</b><br/>Biotechnical Faculty of Montenegro University</li> <li>16. <b>Morocco</b><br/>Institut Agronomique et Vétérinaire Hassan II</li> </ol> | <ol style="list-style-type: none"> <li>17. <b>North Macedonia</b><br/>Faculty of Veterinary Medicine, Skopje<br/>Institute for Public Health of the Republic of North Macedonia</li> <li>18. <b>Norway</b><br/>University of south-Eastern Norway</li> <li>19. <b>Portugal</b><br/>National Health Institute Dr. Ricardo Jorge</li> <li>20. <b>Romania</b><br/>University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca</li> <li>21. <b>Serbia</b><br/>University of Novi Sad, Faculty of Agriculture, Laboratory for Medical and Veterinary Entomology</li> <li>22. <b>Slovakia</b><br/>Biomedical Research Center of Slovak Academy of Sciences<br/>Technical University in Zvolen</li> <li>23. <b>Slovenia</b><br/>University of Primorska</li> <li>24. <b>Spain</b><br/>Center for Rickettsiosis and Arthropod-Borne Diseases, Hospital San Pedro-CIBIR<br/>Consell Comarcal del Baix Llobregat<br/>Consultoria Moscard Tigre<br/>Faculty of Veterinary Medicine of Zaragoza, Animal Health Department<br/>NEIKER- Instituto Vasco de Investigación y Desarrollo Agrario<br/>UNIBE, Universidad Iberoamericana<br/>Universidad de Extremadura<br/>Universidad de Murcia, Dep. Zoología y Antropología Física<br/>University Balearic Islands, Applied Zoology Research Group<br/>Universitat Pompeu Fabra<br/>Agencia de Salud Pública de Barcelona</li> <li>25. <b>Switzerland</b><br/>University of Applied Sciences and Arts of Southern Switzerland, Laboratory of Applied Microbiology</li> <li>26. <b>The Netherlands</b><br/>Centre for Monitoring of Vectors, National Reference Centre, Netherlands Food and Consumer Product Safety Authority</li> <li>27. <b>Turkey</b><br/>Istanbul University, Faculty of Veterinary Medicine, Department of Parasitology</li> </ol> |
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#AIMSurv  
@aedescost

[www.aedescost.eu](http://www.aedescost.eu)

**AIMSurv** 2020 combines conventional field surveillance and the use of the open access Citizen Science App **Mosquito Alert** ([www.mosquitoalert.com](http://www.mosquitoalert.com)). The conventional surveys use oviposition traps to count the eggs laid by AIM females and BG-Sentinel traps to collect mosquito adults. Sampling will be implemented weekly by each participant team in a minimum of three sites until the end of the mosquito season. The participants are also using the tool VECMAP® (Avia-GIS) to record data directly in the files, making make sure that information is standardised and can be used for detailed analysis, modelling and mapping.

**Mosquito Alert App** is free and open source is application which allows citizen to personally contribute to mosquito monitoring efforts, by using their mobile phones to notify, by means of a photo, the possible discovery of one of the mosquitoes studied. Along with the photo the location of the observation and other necessary information to help in the identification of the species are collected. A team of 50 expert entomologists is in charge of validating the photos received and notifying the participant of the result. The App can also be used to report possible breeding sites, as well as simple biting activity.

**Mosquito Alert** is led by Professor Frederic Bartumeus of the Theoretical and Computational Ecology Lab at the Centre for Advanced Studies of Blanes and Professor John Palmer at Pompeu Fabra University and was initially implemented in Spain. It has received more than 19,000 photos of mosquitoes since 2015. In Spain, the App has allowed experts to monitor the expansion of the tiger mosquito, and to discover new invasive species. The first evidence of *Aedes japonicus* in Spain was from a photo reported to Mosquito Alert. In five years, the initiative has managed to scientifically prove that citizen collaboration is useful and reliable for studying invasive mosquitoes and is an effective partnership for administrations and managers.

The App has now been updated to be exploited at a pan-European level and is being translated into the languages of the countries that are part of the AIM-COST Action, so that citizen from any European and neighbouring country can report observations of all four AIMS included in **AIMSurv**. **Mosquito Alert** can be downloaded from Goole Play and other App stores.

Results from this effort of coordinated surveillance at international level will provide more reliable information about the distribution and abundance of AIMS throughout Europe. This will help to improve the assessment of disease risk, and to identify where they are abundant enough to pose a biting nuisance.

The AIM Surveillance field activities are coordinated by Miguel A. Miranda (University Balearic Islands, Spain), Dr. Dusan Petrić (Faculty of Agriculture Novi Sad, Serbia) and Dr. Francis Schaffner (FSConsultancy, Switzerland). The Mosquito Alert App surveillance is coordinated by Dr. Frederic Bartumeus (Centre for Advanced Studies of Blanes, Spain).

You can follow the **AIMSurv** activities in our social networks using the hashtag **#AIMSurv**.