CLIMOS – Climate Monitoring and Decision Support Framework for Sand Fly-borne Diseases Detection and Mitigation with Cost-benefit and Climate-policy Measures

Aims to assist mitigation of climate – and climate change-induced emergence, **transmission and spread of vector-borne and zoonotic pathogens** based on Eco-health and One Health approaches.

This will be achieved by quantifying climate and environmental-related drivers of sand fly vector populations and the sand fly-borne diseases across Europe.

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climate-health cluster

The six Horizon Europe projects, BlueAdapt, CATALYSE, CLIMOS, HIGH Horizons, IDAlert, and TRIGGER, form the climate change and health cluster

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CLIMOS

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What are SFBDs?

Phlebotomine sand flies (Diptera, Psychodidae, Phlebotomine) are worldwide vectors of an intracellular protozoan group *Leishmania*, bacterial and viral pathogens including the Phleboviruses. In Europe, the 25 known vector species were largely confined to the Mediterranean countries, however northern shifts in their geographical range have been recently documented.

There are several different clinical forms of human leishmaniasis: cutaneous leishmaniasis (CL), which causes skin sores, and visceral leishmaniasis (VL), which affects several internal organs (usually spleen, liver, and bone marrow), and **is fatal if untreated in >95% of cases.**

The Phleboviruses comprise more than 50% of sand fly-vectored viruses known to date. In Europe, the pathogenic Phleboviruses such as *Sicilian phlebovirus*, and *Toscana phlebovirus* that **can lead to febrile illnesses and meningitis / encephalitis respectively circulate actively.** Both viruses are in the countries bordering the Mediterranean.

The clinical spectrum

The clinical spectrum of human and companion animal diseases caused by these infectious agents are widespread and one or more sand fly species may act as the vector. Unlike mosquitoes, whose adults survive winter conditions, phlebotomine sand flies survive the winter period in the larval stage, which makes them more vulnerable to climate change.

Therefore, this group of insects is an excellent indicator of how local or even global climatic and microclimatic changes may affect not only the distribution of certain vector species but also the infection incidence and spread of the diseases they transmit.

Why CLIMOS?

CLIMOS focuses on an important vector-borne diseases transmission system susceptible to climate and environmental changes. **We seek to provide a better understanding of climate and environmental drivers of SFBDs,** to reduce model uncertainties for better prognosis of their current and potential spread, and to relate these to socioeconomics and provide risk assessments for a diversity of stakeholders.

CLIMOS will deliver public access interactive mapping and information services and associated tangible recommendations for public and animal health, to enable and encourage public (social, environmental, and financial) preparedness.

Our overall goal is to **minimise the risk of exposure to SFBDs in Europe, expansion to and from currently non- endemic regions and neighbouring countries, to protect the health and well-being of its citizens from climate and environment-related risks and impacts.** CLIMOS is targeting medical, veterinary, public and occupational health professionals, surveillance organizations, citizens, and all stakeholders that are responsible for monitoring and managing transmission and treatment, or those whose health is impacted or endangered by SFBDs.

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