Geophysical Research Abstracts
Vol. 21, EGU2019-2346, 2019
EGU General Assembly 2019

Present and future distribution of Anopheles vectors and potential malaria transmission stability in Europe and the Mediterranean area

Elke Hertig
University of Augsburg, Physical Geography, Augsburg, Germany (elke.hertig@geo.uni-augsburg.de)

In Europe and the Mediterranean area widespread elimination of malaria could be achieved during the 20th century. The decline of malaria is strongly related to the implementation of national elimination programs, involving for instance draining of wetlands, insecticide spraying, and improvements of health infrastructures. However, in recent years an increasing number of imported malaria cases occurs due to international travel and immigrants from malaria-endemic countries. Together with the occurrence of vector competent Anopheles species and favorable climatic conditions, autochthonous malaria cases may re-emerge in countries where malaria was previously eradicated. In general, malaria transmission in Europe is highly seasonal owing to temperate climatic conditions. The Mediterranean area, with mild and wet winters and hot and dry summers, has been and still is suitable for malaria transmission.
Boosted Regression Trees were applied to relate climate variables and land cover classes to vector occurrences. Changes in future vector distributions and potential malaria transmission stability due to climate change were assessed using state-of-the art regional climate model simulations.
The statistical models showed that occurrences of Anopheles mosquitos are highly related to climate. In this regard, temperature in the transitional seasons as well as rainfall during summer are of particular importance. With respect to the impacts of future climate change, distinct changes in the distributions of the dominant vectors of human malaria are to be expected. Temperature and precipitation changes will lead to a northward spread of the occurrences of Anopheles vectors. Furthermore, for some Mediterranean areas occurrence probabilities may decline, mainly due to projected rainfall decreases. However, the modelled expansions of vector distributions in the future do not automatically imply a concurrent increase of the potential malaria transmission stability. Transmission stability is only increased in areas where the climatic changes favor vector occurrences as well as yield enough temperature rise to significantly impact the vectorial capacity. As a consequence of this, the potential malaria transmission stability shows the highest increases between historical and future periods for the southern and south-eastern European areas.