☐ **1:** J Med Entomol. 2002 Jul;39(4):621-30. Links

A continental risk map for malaria mosquito (Diptera:

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Culicidae) vectors in Europe.

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Although malaria was officially declared eradicated from Europe in 1975, its former vectors, mainly members of the Anopheles maculipennis (Meigen) complex, are still distributed throughout the continent. The present situation of Anophelism without malaria indicates that current socio-economic and environmental conditions maintain the basic case reproduction number, Ro, below 1. Recently, it has been speculated that predicted climate changes may increase anopheline abundance and biting rates (as well as reduce the Plasmodium parasite extrinsic incubation period), allowing the reemergence of malaria transmission in Europe. As a preliminary step toward predicting future scenarios, we have constructed models to test whether the current distribution of the five former European malaria vectors [An. atroparvus (Van Thiel),An. labranchiae (Falleroni), An. messeae (Swellengrebel & De Buck), An. sacharovi (Favr) and An. superpictus (Grassi)] can be explained by environmental parameters, including climate. Multivariate logistic regression models using climate surfaces derived from interpolation of meteorological station data (resolution 0.5 x 0.5 degrees) and remotely sensed land cover (resolution 1 x 1 km) were fitted to 1,833 reported observations of the presence and absence of each species across Europe. These relatively crude statistical models

predicted presence and absence with a sensitivity of 74-85.7% and specificity of 73.4-98.1% (with climate a significantly better predictor than land cover type). A geographically independent validation of the models gave a sensitivity of 72.9-88.5% and a specificity of 72.7-99.6%. This allowed us to generate risk maps for each species across Europe. Assuming that high risk equates with the potential for high abundance, these models should permit the development of risk maps for European mosquitoes under future climate scenarios. These techniques would be equally useful for estimating the risk of reemergence in other nonendemic areas such as the United States and Australia, as well as changes to risk within endemic areas.

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