

Airport malaria in Europe (1969-2023): a systematic review

Daniela Balzli¹, Nadja Hedrich¹, Nejla Gültekin², Andreas Stettbacher², Zeno Stanga², Jan Fehr³, Patricia Schlägenhauf³

¹ 1. University of Zürich, Department of Public & Global Health, Epidemiology, Biostatistics and Prevention Institute, Hirschengraben 84, 8001, Zürich Switzerland, ² 2. Medical Services, Swiss Armed Forces, Bern, Switzerland, ³ 3. WHO Collaborating Centre for Travellers' Health, Department of Global and Public Health, MilMedBiol Competence Centre, Hirschengraben 84, 8001, Zürich, Switzerland

Background: "Airport malaria" denotes the accidental relocation, by plane, of a malaria infected mosquito to a non-endemic area, the survival of the transported mosquito and subsequent blood meal and infection of a local person.

Methods: This systematic review was conducted according to PRISMA guidelines and was registered (PROSPERO CRD42023444243). The selection process was based on database searches (PubMed, Ovid MEDLINE, EMBASE, Scopus, CINAHL) using keywords which included «airport malaria» and "Europe".

Results: After a final screening, we included a total of 19 papers describing 37 cases of airport and 3 cases of seaport malaria between 1969 and 2020. The main airports involved were Roissy-Charles-de-Gaulle (France), Brussels International Airport (Belgium), Gatwick Airport (UK), Airport of Luxembourg and Frankfurt am Main (Germany). *Plasmodium falciparum* was responsible for almost all infections (39 out of 40), with one case of *Plasmodium ovale*. 34 of 40 persons made a full recovery or no outcome was described. The other 6 patients had a fatal outcome (case fatality rate 15%) with diagnosis only made post-mortem in 2 cases.

Conclusions: The importance of airport malaria is related to the frequent delayed or missed diagnosis leading to a high case fatality rate. Often diagnosis is only made at autopsy. Rising temperatures in Europe and increased travel may facilitate the importation of competent *Anopheles* vectors, particularly *Anopheles gambiae* from Africa, some of which will be malaria infected. Models using air traffic volume and seasonality may predict the risk of stow away mosquitoes on air routes arriving from malaria endemic areas.