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## Schistosomiasis reaches Europe

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An outbreak of urogenital schistosomiasis has been detected in Europe, with patients affected in France,<sup>1,2</sup> Germany,<sup>1,2</sup> and Italy. The infection originated in Corsica, in a river north of Porto-Vecchio, a popular tourist destination (figure). The introduction of schistosomiasis is believed to be associated with infected people arriving from a region endemic for the exclusively African parasite, *Schistosoma haematobium* and disseminating parasite eggs through their urine into snail breeding sites along the river. Subsequent infection of freshwater planorbid snails, *Bulinus truncatus*, which are present throughout Corsica,<sup>3</sup> then occurred, showing the compatibility of the imported parasite with the local snail.

Transmission seems to have occurred since 2011. The late discovery of this situation in May, 2014, was related to misdiagnosis of haematuria in patients infected in previous years who had never been to Africa and thus the absence of trips to Africa being listed in their case histories. This outbreak is unexpected; the last recorded case of *S haematobium* transmission in Europe was in southern Portugal where the final patient was cured in 1967. Urogenital schistosomiasis was then declared eliminated in Europe and not viewed as an infection that presented a risk of introduction into the continent.

This outbreak raises several questions. Did people who were initially infected return and urinate in the same river every year, contributing to the maintenance of the focus? Analyses suggest that both tourists and local residents have become infected. Has climate change in southern Europe allowed an overwintering transmission to proceed uninterrupted in recent years? Will changes in temperature and rainfall in the Mediterranean affect freshwater snail-borne diseases?<sup>4</sup> Snail-borne infections have not been considered in a survey mapping climate change vulnerabilities to infectious diseases in Europe.<sup>5</sup>

Molecular studies on the Corsican schistosome strain have shown that, in addition to pure *S haematobium*, most of the eggs collected from patients are hybrids of *S haematobium* and the livestock species *Schistosoma bovis*. This unexpected finding suggests that either several introductions from human beings infected with the different strains of *S haematobium* occurred, or that hybridisation has occurred in Corsica. Furthermore, the involvement of such a hybrid form has many repercussions. It increases the range of potential vectors, since the widespread *Planorbis metidjensis* snail transmits *S bovis*, thus increasing the risk of dissemination to Portugal, Spain, and Italy.

**Figure: Focus of freshwater transmission of urogenital schistosomiasis frequented by tourists in Corsica** This river is visited by 3000–5000 people every day during the summer season.



### COMMENT

Additionally, the potential role of other livestock species should be assessed in Corsica, where goat, sheep, and cattle husbandry is a largely uncontrolled farming activity. Foci of *S bovis* are known in Corsica,<sup>6</sup> Sardinia,<sup>7</sup> Portugal,<sup>8</sup> and Spain.<sup>8</sup> The adaptation of a human infective African hybrid schistosome to local European livestock represents a serious threat. Little is known about the pathology of *S haematobium*–*S bovis* hybrids in human beings. The fact that hybrid eggs were found in the urine of patients infected in Corsica, and molluscs were successfully infected by larval stages obtained from these eggs (Boissier J, unpublished), suggests these hybrids can perpetuate the parasite cycle. However, we do not yet know their virulence or the epidemiological consequences.

A European initiative is being launched, coordinated by the Parasitic Disease Threat Quick Response Committee of the European Federation of Parasitologists, to assess the questions posed by this outbreak; evaluate the potential risk in Portugal, Spain, and Italy; and establish a European Network of specialists on snail vectors and snail-borne diseases to assist the European Centre for Disease Control and Prevention in its preparedness activities.

There is much to learn from this outbreak. In the WHO Roadmap 2015–20 to overcome the global consequences of neglected tropical diseases, in addition to schistosomiasis, other snail-borne helminthiasis are included within the food-borne trematodiasis: worldwide fascioliasis is an emerging threat as a result of climate and global changes,<sup>9</sup> and *Opisthorchis felinus* is also emerging in Europe.<sup>10</sup> At the WHO World Health Day on April 7, 2014, the WHO Director General Dr Margaret Chan emphasised the increasing concern about the effect of climate change on these vector-borne infections. This schistosomiasis outbreak, together with the emergence of fascioliasis and *O felinus* in Europe, draw attention to the need to recognise that, in addition to mosquito-borne infections, snail vectors and snail-borne diseases are a new public health threat in Europe.

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