

Pattern of imported malaria in Italy: 2000-2010 analysis

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Although the total number of imported malaria cases has been decreasing in Italy since 2000, malaria still represents the main health threat for people visiting tropical countries. The Ministry of Health and the Istituto Superiore di Sanità are in charge of the malaria surveillance system monitoring the epidemiological situation. This information is essential to orientate appropriate malaria prevention measures and recommendations for international travelers (Romi R et al, 2009, *Travel Med Infect Dis*, 8: 144-154; Romi et al, 2010, *G It Med Trop*, 15: 35-38).

AIM: The purpose of this study is to up-to-date the main epidemiological features of the imported malaria cases in Italy in the 2000-2010 period and to assess the trends over time.

MATERIALS AND METHODS: Using a dedicated database, all imported malaria cases notified by Local Health Authorities to the Ministry of Health and microscopically confirmed by the Istituto Superiore di Sanità, were analyzed.

RESULTS: In the 2000-2010 decade, Lombardy, Veneto, Emilia Romagna and Piedmont were confirmed to be the Regions with the highest number of malaria notifications. In Central Italy the highest number of cases was notified in Latium (7.1%). No significant increase in the number of notifications was observed in the Southern peninsular and island Regions. In the 2000-2010 period a total of 7,695 malaria cases were recorded; 13 cases were autochthonous, 9 arising from accidental events (transfusion, transplantation, nosocomial infections, "malaria" luggage) and 4 classified as cryptic cases, two of which suspected to be transmitted by indigenous vectors (Romi et al, 2012, this volume); 7,682 cases were imported, 2,019 (26.3%) involving Italian citizens and 5,663 (73.7%) foreigners, most of them (80%) were settled immigrants visiting relatives and friends (VFRs). From 2000 to 2010, cases of imported malaria have steadily decreased from 977 to 677, respectively, corresponding to an overall 31% reduction. In particular, a reduction in cases was reported both among Italian travelers (-42%) and foreigners (-27%). The majority of malaria cases were contracted in Africa (93%), most originated from West Africa, resulting Nigeria, Ghana, Senegal, Ivory Coast, Burkina Faso, and Cameroun the

countries mainly involved. *Plasmodium falciparum* was the most frequently parasite found (83.6% of total cases), with 82% of infections acquired in Africa. *P. vivax* was responsible for 8.5% of the reported cases, predominant in Asia (80%), Latin America (85%) and Papua New Guinea (85%). *P. ovale* was responsible for 6.0% of total infections, 99% of them acquired in West Africa. *P. malariae* accounted for 1.6% of total cases, 95% of them contracted in Africa. A few numbers of mixed infections was observed (0.3%). Thirty fatal cases were reported in the study period, all being *P. falciparum* infections acquired in Africa. Cumulative fatality rate was 0.5%, with a highly significant difference in fatality rate between Italians (1.5%) and foreigners (0.2%) ($p < 0.001$).

CONCLUSIONS: The number of malaria imported cases in Italy is known to be underestimated because of considerable underreporting that we estimated to be around 20% in whole country with a dramatic disproportion in the Southern Italy, in spite of a massive immigration from malaria endemic countries in that area. Efforts are needed by the Local Health Services to increase reporting of malaria cases; improving the accuracy of the annual data improves the surveillance of malaria in Italy. Anyway, considering the results reported above, despite the apparent decrease in number of imported malaria cases in 2000-2010 both among Italians and settled-immigrant groups, malaria remains the tropical disease most frequently imported in Italy, with a small but constant contribution of deaths due to *P. falciparum*. The level of alert for travelers visiting countries with endemic malaria must remain high in particular for VFRs that continue to be a population difficult to reach by effective malaria recommendations. Most of the VFRs still tend to ignore or underestimate the risk of contracting malaria by returning to their home countries. Therefore, as the lack of prophylaxis compliance is, in general, the major source of concern, new prevention strategies, in particular targeted at VFRs, should be implemented in order to have a substantial impact on the magnitude of imported malaria in Italy.