Bugs not bound by borders

TRAVEL MEDICINE

By Dr Salim Parker
SASTM Past President

The late Professor Desowitz famously stated that: 'When I got my PhD in 1951 my supervisor said that malaria is dead and that I'll never make a living out of it.' This view became widespread and the World Health Organisation (WHO) in 1956 officially launched a determined campaign to eradicate the disease. The malaria parasite is however no pushover! It is estimated to have killed nearly half of all humans that have so far graced the earth! It has a complex life cycle and has different stages in the female mosquito that transmits it and the host it infects via the bite of the affected mosquito. Though there are 170 malaria *Plasmodium* parasite species in total which mosquitoes spread between reptiles, birds and mammals, five are associated with disease in humans. These are *P. falciparum, P. ovale, P.vivax, P.malariae* and *P.knowlesi.* About twenty-four species of *Anopheles* mosquito transmit these forms of human malaria. By the end of the 1960's, the WHO realised that eradication was not feasible and switched to attempts to controlling the disease. Even this is not easy.

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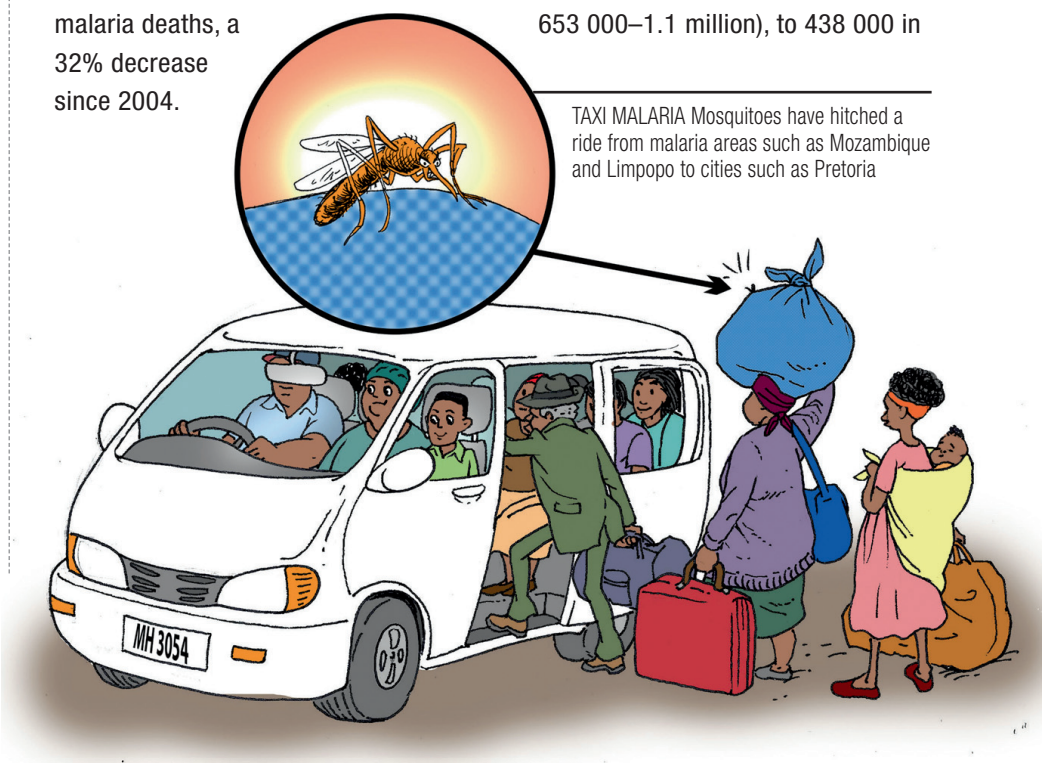
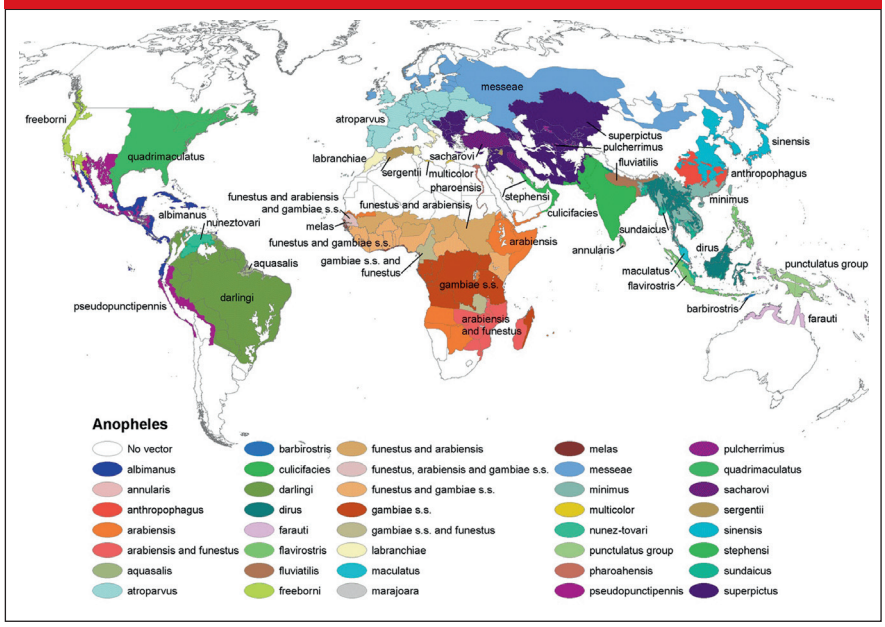
Today there is renewed optimism. The number of deaths due to malaria annually differs depending on the source consulted. One paper published in the Lancet found that global malaria deaths increased from about one million in 1980 to a peak of 1.8 million in 2004. In 2010, there were 1.2 million malaria deaths, a 32% decrease since 2004.

These results were mostly a reflection of the pattern seen in sub-Saharan Africa, where deaths increased from 493,000 in 1980 to 1.6 million in 2004 and then decreased by about 30% to 1.1 million in 2010. Outside of Africa, the trend is completely different, with deaths steadily decreasing from 502,000 in 1980 to 104,000 in 2010. The statistics of the World Health Organisation (WHO) reflect lower figures but with the recognition that the numbers may be underreported. The WHO estimates that the number of malaria deaths globally fell from an estimated 839 000 in 2000 (range: 653 000–1.1 million), to 438 000 in



TAXI MALARIA Mosquitoes have hitched a ride from malaria areas such as Mozambique and Limpopo to cities such as Pretoria

ABOUT 24 SPECIES OF ANOPHELES ARE KNOWN



2015 (range: 236 000–635 000), a decline of 48%. At the height of the Ebola epidemic in West Africa 13 people succumbed daily to the disease whilst over 950 died daily due to malaria in the same region.

Most deaths in 2015 were in the WHO African Region (90%), followed by the WHO South-East Asia Region (7%) and the WHO Eastern Mediterranean Region (2%). The malaria mortality rate, which takes into account population growth, is estimated to have decreased by 60% globally between 2000 and 2015. Significant progress has been made towards the World Health Assembly target of reducing the malaria burden by 75% by 2015, and the Roll Back Malaria (RBM) Partnership target of reducing deaths to as close to zero as possible. Newer vaccines are showing promise and insect control measures is giving impetus to this initiative. There are other issues involved though. Global warming is increasing areas where the mosquitoes can thrive, such as the eastern highlands of Africa. The insect also seems to be able to makes it way around with some ease utilising any means of transport.

Two Pretoria residents presented in March 2017 with flu-like symptoms. They did not travel to a malaria area. Both died. Of malaria. Swartruggens close to Rustenburg in the North West Province is a malaria free area. Yet at the same time one person died and another was hospitalised. Again due to malaria. Again, both did not leave their area which is free of the anopheles mosquito that transmits the disease. The mosquitoes that infected them probably was transported from an endemic area such as Limpopo via a taxi, mini bus or other vehicle, leading to terms such as 'taxi malaria' or min bus malaria.' In 1999 there were cases of malaria in non-travellers in the surroundings of the main airport in Paris which is a malaria free area. Mosquitoes most likely hitched a ride on an aircraft and then bit the victims. The term 'airport malaria' is used for such events. Collectively these cases caused by the translocation of mosquitoes are termed Odyssean malaria after the poem penned by Homer describing the ten-year homeward wanderings of Odysseus after the fall of Troy.

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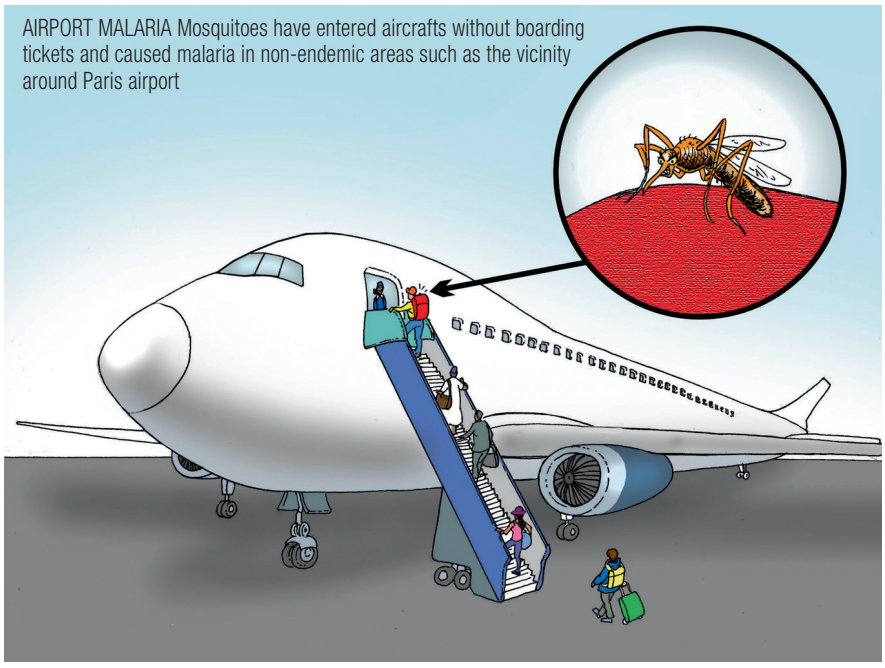
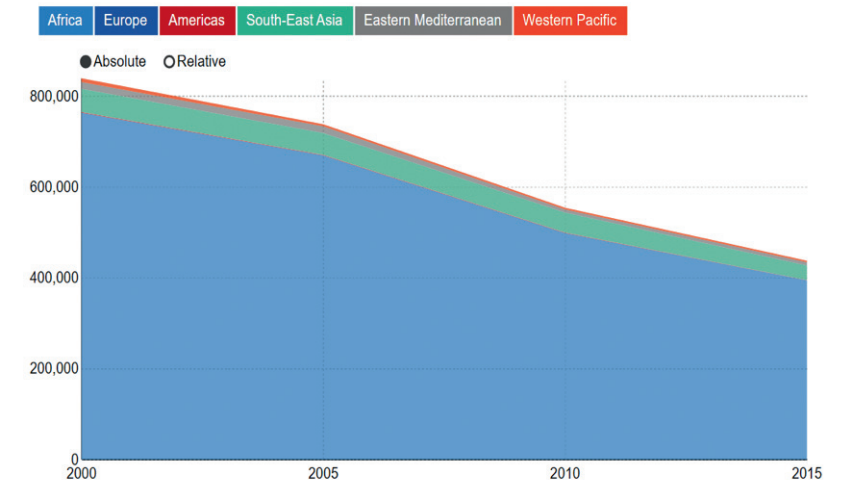


AIRPORT MALARIA Mosquitoes have entered aircrafts without boarding tickets and caused malaria in non-endemic areas such as the vicinity around Paris airport

her would be virtually impossible if a case of Odyssean malaria is encountered! Anophelines that can transmit malaria are found not only in malaria-endemic areas, but also in areas where malaria has been eliminated. The latter areas are thus constantly at risk of re-introduction of the disease. Greece has experienced a surge in migrants in 2016 and some of them presented with malaria at local health clinics. They acquired the disease somewhere before entering Greece and thus had 'imported malaria.' However there are competent Anopheles vectors who can bite these infected migrants and transmit it amongst the locals and this autochthonous spread was indeed documented. Greece eliminated malaria in the 1970's but the mosquitoes capable of transmitting it still prevail.

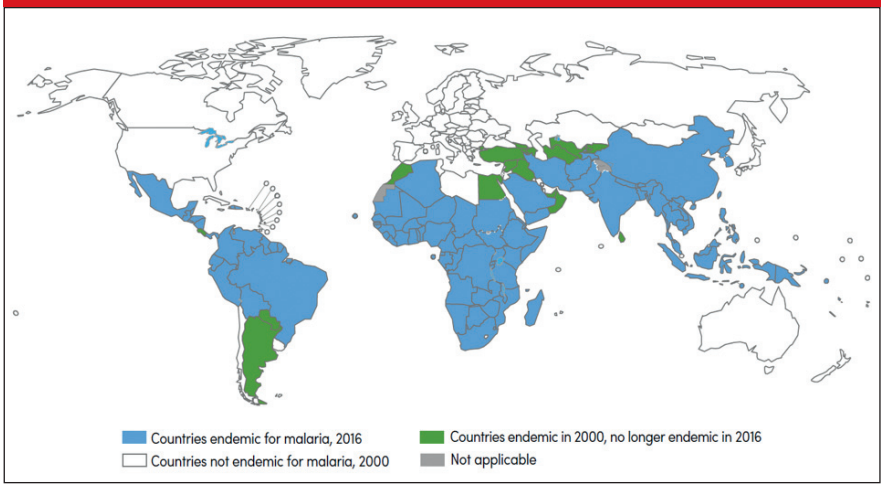
Sri Lanka has reached zero indigenous malaria cases in November 2012, two years before its targeted deadline for elimination. Currently, the biggest threat to the elimination efforts are the risk of resurgence of malaria due to imported cases as the anopheles mosquitoes are still around. A cluster of cases was reported in 2013 imported by a group of Pakistani asylum-seekers. Another cluster was caused by local fishermen returning from the endemic Sierra Leone in 2014. Luckily these clusters were controlled before the disease was reintroduced. It is known that immunity against malaria rapidly wanes when the disease is absent from an area and the reintroduction of the parasite can lead to severe disease.

GLOBAL MALARIA DEATHS BY WORLD REGION, 2000 TO 2015



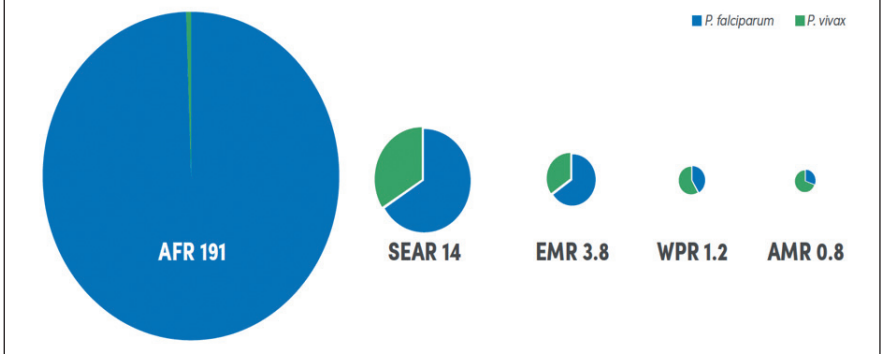
Travellers visit a number of malaria endemic areas and the insects can give vent to their wanderlust as well! Mosquito bite avoidance and using appropriate chemoprophylaxis when visiting an endemic area is the most rationale way of avoiding the disease. Though we seem to be making headway in confronting the disease, history cautions us to be extremely wary of probably the ultimate serial killer ever known to mankind.

MALARIA ENDEMIC COUNTRIES



MALARIA CASES ARE STILL HIGH!

Estimated malaria cases (millions) by WHO region, 2015. The area of the circles is proportional to the estimated number of cases in each region. Source: WHO estimates



AFR, WHO African Region; AMR, WHO Region of the Americas; EMR, WHO Eastern Mediterranean Region; SEAR, WHO South-East Asia Region; WPR, WHO Western Pacific Region