

## **Geographic and ethnic distribution of Plasmodium knowlesi infection in Sabah, Malaysia**

### **ABSTRACT**

Background: Plasmodium knowlesi, an originally zoonotic malaria parasite is now increasingly recognized as a potentially virulent type of human malaria, particularly in South East Asia. The initial diagnosis based on light microscopy would not differentiate P knowlesi from P malaria and the nested PCR (Polymerase Chain Reaction) assay is the only reliable diagnostic method to correctly differentiate the two species. Sabah State Public Health Laboratory has launched its PCR service in 2007 for all government hospitals of Sabah to get accurate verification of malaria species. Sabah state is famous for its significant tourist attraction sites, of which Mount Kinabalu and Tip of Borneo are the most unique and mostly visited. A large variety of ethnic groups reside in Sabah with Kadazan-Dusun forming the largest indigenous group followed by Bajau and Murut. Aim & Objectives: To determine the geographic and ethnic distribution of zoonotic malaria among Sabah population so as to recommend effective preventive and control measures at popular tourist sites of Sabah. Methods/Study Design: A record review of all nested PCR assays done during 2009 at Sabah State Public Health Laboratory was made. SPSS version 16 and Microsoft excel 2007 softwares were used in analysis. Results/Findings: 445 cases were referred in 2009 for PCR assay from various hospitals of Sabah. Age range was 1 to 89 years ( $33\pm 18$  years) and about 12 % were symptomatic cases while the rest were confirmed malaria by microscopy. 343 cases (253 males and 90 females) were positive for Plasmodium knowlesi single infection or mixed with other species. Mixed infection with vivax was common (65 males and 18 females). Only two cases each for mixed infection with falciparum and malarie were detected. P knowlesi infection was confirmed in all age groups (under five as well as over 80). Among the positive cases, about 32% were Rungus, 28% Dunsun and 15% Murut. 41.7% were from Kudat which is close to the Tip of Borneo and 16.3% came from Ranau area in which Mount Kinabalu is situated. Keningau and Tenom areas contributed 15% each. Study Limitations: The PCR assay was done only on hospital referred cases that the study results would not reflect the actual community prevalence. Conclusion: Major tourist attraction sites showed high number of P Knowlesi infection calling for establishment of effective preventive measures against this monkey related malaria in Sabah.