PhD defence Melanie Bannister-Tyrrell

Micro-epidemiology of malaria in pre-elimination settings

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Dit is de omschrijving

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Abstract

The World Health Organization has set targets for malaria elimination in 35 countries by 2030, including in the Greater Mekong Subregion (GMS). Malaria incidence in the GMS has declined substantially but persists in densely forested, relatively remote parts of each country, where the presence of forest-dwelling Anopheles vectors supports ongoing malaria transmission in populations living or working in or near the forest. It has been observed that as malaria incidence decreases, fine-scale heterogeneity in risk becomes more apparent, including that malaria may persist in 'hotspots' or in specific population groups despite application of standard control measures, even when malaria incidence in the surrounding region decreases. A better understanding of this 'micro-epidemiological' variation in malaria risk is therefore crucial to improve future interventions for malaria elimination. This thesis addresses this research gap by providing empirical evidence about the determinants of variation in malaria risk at fine spatial scales, through a systematic review and five field-based studies in three distinct forest malaria settings in Vietnam and Cambodia. The operational relevance of the micro-epidemiological approach is demonstrated by highlighting how effective targeted approaches for malaria elimination require identification of the most appropriate unit of intervention (individual, household, hotspot or village), which is shown to vary within and between regions. This thesis also critically reflects on the role of different methodologies for understanding micro-epidemiological variation in malaria risk, making use of qualitative, quantitative and mixed methodologies in the field research, and formalising the mixing of methodologies in epidemiology.