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Deviance and resistance: Malaria elimination in the greater Mekong subregion

Chris Lyttleton

Anthropology Department, Macquarie University, Sydney, Australia

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ABSTRACT

Malaria elimination rather than control is increasingly globally endorsed, requiring new approaches wherein success is not measured by timely treatment of presenting cases but eradicating all presence of infection. This shift has gained urgency as resistance to artemisinin-combination therapies spreads in the Greater Mekong Sub-region (GMS) posing a threat to global health security. In the GMS, endemic malaria persists in forested border areas and elimination will require calibrated approaches to remove remaining pockets of residual infection. A new public health strategy called 'positive deviance' is being used to improve health promotion and community outreach in some of these zones. However, outbreaks sparked by alternative understandings of appropriate behaviour expose the unpredictable nature of 'border malaria' and difficulties eradication faces. Using a recent spike in infections allegedly linked to luxury timber trade in Thai borderlands, this article suggests that opportunities for market engagement can cause people to see 'deviance' as a means to material advancement in ways that increase disease vulnerability. A malaria outbreak in Ubon Ratchathani was investigated during two-week field-visit in November 2014 as part of longer project researching border malaria in Thai provinces. Qualitative data were collected in four villages in Ubon's three most-affected districts. Discussions with villagers focused primarily on changing livelihoods, experience with malaria, and rosewood cutting. Informants included ten men and two women who had recently overnighted in the nearby forest. Data from health officials and villagers are used to frame Ubon's rise in malaria transmission within moral and behavioural responses to expanding commodity supply-chains. The article argues that elimination strategies in the GMS must contend with volatile outbreaks among border populations wherein 'infectiousness' and 'resistance' are not simply pathogen characteristics but also behavioural dimensions born of insistent market aspirations.

1. Introduction

Moving from containment to elimination is increasingly accepted as a necessary strategy to remove malaria's threat to global health security (Whitaker et al., 2014). To do so requires radical reconfiguration wherein success is not measured by timely treatment of presenting cases but eradicating all presence of infection (Williams et al., 2013: 3). Emerging artemisinin-resistant malaria in Southeast Asia has escalated urgency for this transition as potential spread to Africa raises grave concerns. Consequently, a 2025 deadline for elimination of *falciparum* malaria (and 2030 for *vivax*) has been endorsed by national governments across the Greater Mekong Sub-region (GMS - comprising Thailand, Vietnam, Laos, Cambodia, Myanmar and SW China) (Kazadi, 2015).

Unlike much of Sub-Saharan Africa, Southeast Asia is a hyper-endemic rather than holoendemic region for malaria infection. Morbidity and mortality has improved markedly since the 1990s. Average incidence across GMS dropped to 2.04/1000 by 2010 (Hewitt et al., 2013: 54). As such, it is at a logical stage to target elimination (WHO, 2015). However, malaria shows tremendous regional variation and regular outbreaks occur in forested border areas where poor accessibility and constant mobility hamper control efforts (Ciu et al., 2012). More than 120 million GMS residents remain at risk; in 2012 there were approximately 1.8 million malaria cases (58% *Plasmodium falciparum*) (Kazadi, 2015). In Thailand, incidence declined to 0.37/1000 by 2014 but pockets of endemicity persist, largely attributed to migration and mobility in border zones adjoining Myanmar, which bears the highest regional burden (Christophel et al., 2012; MOPH, 2011). In contrast, malaria in the

E-mail address: Chris.Lyttleton@mq.edu.au.

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Northeast Thai border province of Ubon Ratchathani was thought to be well-controlled with cases averaging less than 700 per year over the past decade. But in 2014, infections jumped nine-fold as Ubon recorded the highest provincial caseload accounting for nearly one-third of 24,100 infections nationwide.

The dramatic rise is explained by provincial and national-level health officials as being due to increased numbers of villagers overnighting in a national park adjoining Laos and Cambodia in search of endangered timber. The logic underlying this conclusion is two-fold. In China, Siamese rosewood (*Dalbergia cochinchinensis)* currently fetches massive prices – one ornate bed carved from this fragrant hardwood recently retailed for $1million in Shanghai (EIA, 2014: 2). Spurred by potential profits, poor villagers in Ubon risk injury, capture and disease to surreptitiously fell some of the region's last remaining stocks. If correct, the inference that rosewood smuggling has driven Ubon's rise in infections foregrounds specific challenges facing malaria's removal in the GMS: the volatility of outbreaks lies in inadequate preparedness for behavioural risk; the basis for unanticipated risk can be linked to larger distal forces; and elimination strategies will require community engagement that addresses circumstances where avoiding infection is sidelined by market-driven ambitions.

The above factors are hardly new to malaria's history as a public health scourge, but they remain unresolved in a number of GMS border zones. WHO recently suggested that malaria elimination in the GMS needs “smarter and better organized programs to deal with migrants and mobile populations” coupled with concerted attention “on the most remote static minority populations; though their numbers may be small, they are likely to be a critical residual source for malaria resurgence” (2014: 49). Villagers in Ubon are not minority groups per se, and there are relatively few migrants compared to Myanmar border areas, but a significant number are mobile, marginalised labourers who join global timber supply-chains regardless of health or punitive consequences.

Using data from Ubon Ratchathani (forthwith Ubon), this article addresses the need for close-hand studies within affected communities to understand context-specific malaria vulnerability (Stratton et al., 2008; Christophel et al., 2012; Durnez et al., 2013). It examines three related issues raised by Ubon's recent resurgence: First, the posited correlation between rosewood smuggling and increased malaria in districts near the national park. In this context, the key variable is increased entry to the forest. Second, if the lure of specific commodity markets exacerbates malaria risks it follows that to lessen vulnerability successful prevention should consider ‘infectious’ aspirations alongside parasite-based vector transmission. Finally, while multi-drug resistance is the priority concern (and, to a far lesser extent, mosquito behavioural resistance (Chareonviriyaphap et al., 2013), so too human ‘resistance’ becomes relevant when cautionary messages and vector-blocking mechanisms are rendered less effective by more persuasive drawcards to material gain. Hence, global health security that intends to delimit (transnational) disease transmission, eradication that aims to address faltering pharmaceutical controls and health promotion that seeks to change behaviour must collectively contend with abrupt examples, such as the Ubon case, thrown up by problematic articulations of modernisation and disease risk.

2. Methods

In collaboration with Chiang Mai University (CMU), research into migrant health and malaria vulnerability in Thai border provinces was conducted between August and December 2014. While the larger study provides background to malaria transmission and control strategies in the region, this article only discusses data from Ubon province which was collected during two-week field-visit in November 2014. Qualitative data collection took place in four villages in Ubon's three most-affected districts - Buntharik, Nam Yeun and Na Chaluai. Villages were selected with assistance from an NGO which implements Global Fund malaria prevention programs in Ubon. Informants with a history of malaria infection were initially introduced to us by NGO staff (themselves local residents), who in turn connected us with other villagers. Qualitative interviews were jointly conducted by a Western medical anthropologist (fluent in Thai and Lao) and a Thai researcher trained at CMU. Discussions covered past and present livelihoods, experience with malaria and programs to alleviate this, and rosewood cutting. Of those taking part in these conversations, ten men and two women had recently overnighted in the forest. We also interviewed provincial and district health authorities, NGO staff, village health volunteers and community members who do not go into the forest, and observed health promotion and mobile malaria screening activities in local communities. Data on regional policies and planning are informed by author's part-time engagement by Asian Development Bank between 2008 and 2014 as a technical advisor for GMS health and infrastructure programs. Ethical approval was provided by Macquarie University. Pseudonyms have been used throughout.

Longer-term research into seasonal patterns, transmission intensities, disease burden, treatment adherence and outreach strategies in the Ubon border zone would contribute valuable insights (Moss et al., 2015; Bourdier, 2016). In this article, I focus more narrowly on connections between market ambitions, forest entry and malaria vulnerability. Open-ended conversations, coupled with observations of village lifeways and health outreach activities, provide an ethnographic basis for examining participation in rosewood extraction and risk behaviours this entails. Annotated villager narratives are analysed within a framework that foregrounds affective engagement with supply-chain capitalism. This conceptual approach builds on author's long-term research into health and social change in GMS border areas (Lyttleton, 2014) and frames risk within moral and behavioural responses to expanding access to commodity markets.

Despite evidence of increase in malaria in Ubon and increase in rosewood's bench-price, there are no empirical data to verify smuggling as the causal factor behind the jump in infections, primarily because villagers avoid surveillance when in the forest. Instead, we use qualitative data from Ubon public health officers and village narratives to advance plausible connections. While they remain hypothetical, foregrounding emic perspectives directs our attention to another level of analysis. Villagers embed cause and effect of malaria infection in a larger framework than vector-driven transmission. In turn, these forms of local knowledge allow a grounded examination of distal forces impacting on health conditions, motivations and decision-making that underpin the unpredictability of malaria outbreaks.

3. Border malaria

Anticipated eradication of malaria is not new to the GMS, nor to most of the malarial world. Even though malaria decreased dramatically during early years of Global Malaria Elimination Program (GMEP) in the 1950s and 60s, eradication was not so easily achieved. Parasite and mosquito resistance to chemical interventions became widespread and by mid-1970s malaria incidence worldwide was far greater than in early 1960s. Criticism reverberated around new iatrogenic forms: “In its well-meaning zeal to treat the world's malaria scourge, humanity had created a new epidemic” (Garrett, 1995: 52). Control rather than eradication became the more pragmatic option as by the 1990s malaria infected over 300 million people worldwide. Confidence has cautiously returned following substantial advances due to Millennium