Deviance and resistance: Malaria elimination in the greater Mekong subregion

Chris Lyttleton

Anthropology Department, Macquarie University, Sydney, Australia

A R T I C L E   I N F O

Article history:
Received 29 June 2015
Received in revised form 21 December 2015
Accepted 21 December 2015
Available online 23 December 2015

Keywords:
Malaria elimination
GMS borders
Thailand
Rosewood
Global health security

A B S T R A C T

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.

© 2015 Elsevier Ltd. All rights reserved.

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
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 and disease burden, new vector control 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 permissions as being due to increased numbers of villagers and forest entry 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 unpredictable nature 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...
Development Goals (MDGs). Globally incidence decreased by 29% and mortality reduced by 45% between 2000 and 2012 (Slydts et al., 2014: 1). Such gains notwithstanding, malaria remains endemic in 100 countries (Williams et al., 2013: 2) and its persistence in GMS borders highlights stubborn opposition to current interventions. Not unlike WHO teams who spent decades tracking down last cases of smallpox, or those currently pursuing pockets of polio in Afghanistan, eliminating GMS malaria will require detection and treatment sensitively attuned to these volatile foci of transmission.

Ubon lies surrounded by Tier 1 provinces where artemisinin-resistance has been detected (see Fig. 1). In Thai-Cambodia borderlands *P. falciparum* became resistant to chloroquine in late 1950s and subsequently sulphadoxine-pyrimethane and mefloquine. By late 1970s, resistance had spread from Southeast Asia across South Asia ultimately causing millions of deaths in Sub-Saharan Africa. Since 2001, artemisinin-combination therapies (ACTs) have become the most effective first-line treatment for uncomplicated malaria. But in 2006 multi-drug resistant parasites were again identified, first in the Thai-Cambodia borders (Noedl et al., 2008), and then in Southern Lao and Thai-Myanmar border regions (Ashley et al., 2014). Drug-resistant malaria in populations with high mobility carries high risk of spread. If ACTs lose their effectiveness, global impact of multi-drug resistance has been estimated to include 150,000 additional deaths annually (WHO, 2014). Hence, with no new drug class yet available, major donors have rallied under WHO’s Emergency Response to Artemisinin Resistance (ERAR). But, to date, programmes aiming to identify ‘hotzones’ and curtail spread of resistance by monitoring treatment efficacy at sentinel sites “have been small in scale and difficult to implement” (Smith Gueye et al., 2014: 2). Ongoing mobility, coupled with possibly random mutation of parasites, makes containment fraught. Elimination is the logical answer: it negates the need for identifying sites where resistance is or might appear “because transmission everywhere is reduced” (ibid).

Specific populations most affected by border malaria in the GMS are those living in or near forest areas including ethnic minority groups, mobile workers and people displaced by political upheaval (Hewitt et al., 2013). The most efficient mosquito vectors are *Anopheles dirus*, requiring dense shade and high humidity, and *Anopheles minimus*, found in forests and also in less shady fringes and bamboo thickets associated with deforestation and plantations.

Fig. 1. GMS sites of artemisinin-resistance (Source Kazadi, 2015).
(Hewitt et al., 2013). Control interventions throughout the GMS stress accurate rapid diagnostic testing and referral (complicated by co-presence of *P. falciparum* and *P. vivax*), prompt, effective treatment, and vector control measures emphasising consistent use of long-lasting insecticide-treated nets (LLNs) and indoor residual spraying (IRS) (Suwonkerd et al., 2013). *A. minimus* and *A. dirus* are exophagic and exophilic (outside-biters and dwellers) lessening effectiveness of indoor net use and household spraying (Duranez et al., 2013); meanwhile outdoor transmission remains inadequately understood and addressed across the region (Ciou et al., 2012: 242).

Ubon is a case in point where scale and rapidity of outdoor transmission in 2014 was unexpected. It had not registered in the top ten Thai provinces for malaria incidence over the preceding decade; annual caseload in Ubon was relatively steady, averaging 645 cases/year between 2003 and 2013 (see Fig. 2), and incidence hovered between 0.11 and 0.44/1000 for same period. But in 2014, incidence rose to 3.94/1000 and recorded infections totalled 7169 (41% *falciparum*). Neighbouring Thai provinces bordering Cambodia and Laos: Sisaket (770), Surin (241) Buriram (25), Amnat Charoen (2) showed much lower caseload in the same year. In other words, something particular was happening in Ubon.

Prior predictions of potential malaria outbreaks in Ubon ear-marked expansion of rubber (Petney et al., 2009) and new roads linking Laos, Cambodia and Thailand (Nigoon, 2013) as possible triggers. Yet, according to provincial malaria staff, Ubon's spike is not about deforestation, rubber expansion, improved surveillance, or lack of access to resources, but because: “the market for rosewood boomed in 2013–14 and we have no control over the number of villagers now going into the forest — it is probably in the thousands.” Ninety five percent of 2014 infections were recorded in three districts that adjoin the large Phu Chong Na Yoi national park (686 km2). Ubon health officials suggest the primary cause of park entry is a combination of high price of forest products’ coupled with no fear of the law or malaria. In Bangkok, in mid-2014, senior officials at the Ministry of Public Health similarly explained that Ubon's outbreak was due to expansion of ‘organised’ timber-smuggling and exacerbated by low local awareness and limited prior malaria experience (Manager Online 15/7/14). For their part, villagers note the incentive to increasingly overnight in the forest was spurred by government endorsement of rosewood as a protected species in 2013. Prior to this timber extraction from the forest at night to a border crossing with Laos. While districts close to the forest have historically registered the bulk of provincial infections (Gaewphitun and Gaewphitun, 2009), more villagers now overnight due to growing urgency to locate remaining rosewood stocks, which locals estimate will last a year or two at most.

Villagers point to rosewood’s impact readily seen in new houses and cars in villages near the forest. Local explanations of the link between rosewood and malaria are given credence by expose’s of the luxury timber trade.

### 4. Rosewood markets and malaria control

In 2012, the UK-based Environmental Impact Agency noted “Thailand’s rosewood loggers are incentivised by extremely lucrative prices offered by international traders for the prized wood — up to US$6000 per cubic meter [equivalent to 1 tonne]”, and that illegal rosewood logging in Thailand boomed because “demand surged in China in 2007 and in the aftermath of Thailand’s 2008 proposal to list rosewood on CITES being rejected by Laos and Cambodia” (EIA, 2012: 1). Rosewood belatedly became a protected species throughout the GMS in 2013, but this has not removed its commercial appeal; if anything it hastened it. *Dalbergia cochinchinense* has now largely disappeared from its native habitat in Cambodia, Laos, and Vietnam. A recent EIA report cites studies conducted in 2012 that show natural populations in Laos under severe threat with no existing mature trees in surveyed provinces. It adds that in 2014, “traders were claiming there was no Siamese rosewood left in Vietnam. In Cambodia, mature trees are now considered rare outside of strictly protected area”. Meanwhile in Thailand, “its presence is highly fragmented and mainly concentrated in protected areas in the country’s lower northeast provinces, including Ubon Ratchathani” (EIA, 2014: 3).

Rosewood’s demise is driven almost entirely by thriving investment in ornate reproductions of Qing- and Ming-dynasty furniture (*hongmu*) in China. In turn, increasing scarcity means the price of Siamese rosewood, the most prized timber used in *hongmu*, has risen accordingly: “While trade has boomed, prices for the rarer *hongmu* species have also spiked - by March 2014, Siamese rosewood was retailing for RMB109,500 (US$17,633) per tonne, a 37 percent price increase compared to exactly a year earlier” (EIA, 2014: 2). In Ubon, dwindling stocks of the hardwood are found in the montane semi-evergreen forests of Phu Chong national park. From there, cross-border syndicates smooth the hardwood’s passage to Vietnam and China through Laos where historically “corruption, a lack of trained forest rangers, and the country’s porous borders make it relatively easy to smuggle wood out of the country” (Mansfield, 2005: 285).

Linkages between forest malaria and rosewood cutting, and its parallels to disease transmission in other extractive zones such as mines and logging sites (Suwonkerd et al., 2013), direct attention to the role of predictive strategies to remove drug-related resistance in the GMS. Recognising difficulties in pre-emptive control, WHO has conducted emergency response drills with health staff in border districts neighbouring Ubon. Prompted by spreading resistance in Tier 1 provinces (shown in Fig. 1), their focus is malaria outbreaks. But such trials are in a sense generic: they aim to buttress global health security, defined as “reduction in vulnerability of people around the world to new, acute or rapidly spreading risks to health, particularly those that threaten to cross international borders” (CDC, 2012: 5).

Drug-resistant malaria fits precisely the type of imminent peril global health security seeks to avert. If uncontrolled it is predicted to cost US$4 billion in the GMS alone, thereby motivating huge
donor investment in eradication. Genomic modification of mosquitoes and parasites is sometimes signalled as the ultimate solution (Vernick and Waters, 2004), but public health-based vector-control through bednets (LLNs) and insecticide spraying (IRS) in affected communities remains paramount. In addition, to improve and sustain effective outreach to vulnerable populations a new behavioural intervention, ‘positive deviance’, is being enlisted. While not yet part of programs in Ubon it is currently utilised as part of elimination strategies in border areas of Myanmar, Laos and Cambodia. As such, it foregrounds the powerful but ambiguous role of ‘part of elimination strategies in border areas of Myanmar, Laos and Cambodia. As such, it foregrounds the powerful but ambiguous role of environmental or social interventions, ignores the context in which particular trajectories of development process may conflict with health priorities including reduction of malaria risk” (Stratton et al., 2008: 855–6).

Poverty is widespread in Ubon and, insofar as malaria and rosewood extraction are connected, the 2014 outbreak demonstrates that development processes have, in fact, very close links to disease transmission. Northeastern Thailand (Isan) remains the poorest region with 17.37 percent of its population below the national poverty line compared with 10.94 percent for Thailand overall (2013 figures). Ubon ranks third poorest out of 20 Isan provinces with 24.2 percent living below the poverty line (NESDB, 2015). In other words, villagers living in Ubon border districts where malaria is most prevalent are amongst the poorest in Thailand. While this causes many Ubon villagers to out-migrate, primarily to Bangkok, there has also been an influx of migrants from Laos dating back to the Vietnam War. Many border villages have long-term residents still without documentation, further limiting income options. Across the border, Laos and Cambodia are significantly poorer at both national and local level (AEC, 2013). In this context, clandestine timber cutting becomes a transitory livelihood strategy for a significant number of disenfranchised villagers. As in many historical circumstances, the fact that a large number of them become malaria-infected indicates that volatility of disease spread can be linked to expanding commodity markets. From a contemporary vantage point, pre-emptive interventions that form part of an aspirational health security targeting world-wide reduction of malaria to zero incidence must therefore confront dynamics that encourage a countervailing health ‘insecurity’. In this case, rather than the macro-parasite being off-shore landlords and wage-labour relations that drain more energy than the malarial parasite, as Brown (1987) famously argued, it is both the lure and the predations of frontier supply-chains that make Ubon villagers ideal hosts for increased malarial infection.

5. Poverty and vulnerability

Specific connections between malaria and material disadvantage are well-documented as low income countries bear a disproportionately high burden (Sachs and Malaney, 2002). However, optimal points of intervention are blurred by the fact that “lines of causation between poverty and malaria run both ways” (Packard, 2009: 75) and ‘conjunctures of vulnerability’ have ecological, temporal and socio-economic dimensions that collectively ratchet up consequences (Ribera and Hausmann-Muela, 2011). Attempts to control malaria morbidity and mortality through prevention (lessening exposure) or treatment (improving access) rather than targeting broader determinants of structural vulnerability are arguably a pragmatic response due to difficulties in creating radical reform. But, as Stratton et al. (2008: 855) warn, “given prevalent poverty in most endemic regions such efforts will be less effective in the long run in reducing total disease burden than approaches aimed at underlying causes of differential vulnerability”.

Despite the recognised role of distal determinants, development-related causality is often not a priority within global malaria control programs (Cueto, 2013). Brown et al., (2011: 255) suggest comprehensive analysis of disease ecology should integrate microbiological (biomedical), social and economic (public health) as well as political and ecological dimensions. But this synthesis is seldom achieved in malaria programming; “global efforts to deal with malaria have achieved limited success because malaria is increasingly being cast as a bureaucratic, managerial problem and the core of the problem systematically depoliticised” due to “hegemonic global discourses on malaria that are increasingly becoming biomedicine-based technological fixes” (Kamat, 2013: xi–xii). This tightened perspective emerged in sync with heightened focus on MDG targets which, according to Vandemoortele (2011), were sanitized to fit conventional development paradigms and thereby excluded a broader human-centred perspective of sustainable and equitable well-being. In this light, the “current focus on the basic science of malaria prevention, to the neglect of environmental or social interventions, ignores the context in which particular trajectories of development process may conflict with health priorities including reduction of malaria risk” (Stratton et al., 2008: 855–6).

6. Harvesting Siamese rosewood

The bulk of rosewood sold in China is sourced “by teams of skilled men from rural villages who will spend weeks at a time in remote forests tracking down the last stands” (EIA, 2014: 4). Jaek replayed his recent trip to the Ubon forest as one of these ‘skilled men’ for us:

*He is in the hills. It is dark and silent. He and six others spread out and stalk over haphazard foot trails in search of prized rosewood (Thai: mai pha-yung). Trees up to seven metres tall can still be found but they are increasingly rare. In late 2014, two metres of 10 cm thick rosewood were cut trees worth big baht (up to US$3000). If they find wood, loggers can each make as much as US$1000 (30,000B) per trip. They spend up to a week in the forest moving by night and resting by day. The search for luxury timber is similar to wildlife poaching in that it requires clandestine pursuit and expert knowledge. Each rag-tag team (sometimes kin, usually buddies, occasionally husband and wife) must have a leader who knows the forest, has links with traders on the Lao side and (hopefully) effective connections with local authorities that offer a degree of forewarning of ranger surveillance. To preserve silence they use only previously stashed handsaws. If/when they find rosewood, they cut it into two-three metre lengths and fashion a small cart by strapping bags onto motorcycle wheels. Sometimes they cut new trails as they press forward to the Lao border. Jaek is aware of his pounding heart as they push onwards lit by small lamps on their caps knowing that, even with kick-backs, authorities are an ever-present threat. He is anxious, driven purely by intoxicating fantasies of a huge payout. They don’t talk to each other. One person sometimes scouts ahead if they hear sounds. The trails are
littered with junk-food wrappers; items chosen for sugar and speed with which they can be consumed. They scramble up steep, slippery slopes: timber is heavy, carts cumbersome and bone-tired, they sweat profusely - no breath for words, panting like a sports team - as they push on to a long escarpment, the bottom edge of which marks Lao territory.

Other informants described how sometimes they almost fall from exhaustion but for incessant pressure to ‘man’ up and not be seen as weak or they will never be asked to join another mission. This is not just gendered rhetoric. Provincial health data show that male-female differences in malaria infection in Ubon are 15:1. Frontiers are sometimes depicted as sites of potent conjuring acts seen as weak or they will never be asked to join another mission. Alcohol and drugs dwindling stock, enticements from traders have become more elaborate to foragers. They angle to establish loyal suppliers by offering solace these out in fistsfuls, as both respite and enticement. Depending on their stamina and exuberance, villagers will sometimes undertake another search. Already they have been there for three-four days, a second round means a week or more in the forest. Chance of capture or injury escalates. Sometimes they musters collective energy; other times they pocket their gains and hightail for home. Once money changes hands, logs are thrown over the cliff to pickups waiting below.

Some Lao traders erect tents on the cliff-top as a welcoming haven to foragers. They angle to establish loyal suppliers by offering solace after the gruelling search. As trade becomes more urgent given dwindling stock, enticements from traders have become more elaborate. Alcohol and drugs flow freely: cooked food for the first time in days. Sex workers congregate, some seasoned in commercial sex, some working other forms of enterprise (food and drink) who offer sex to chosen partners as well. The workers relax for the first time in days in these liminal encampments. Relief is palpable: the wood is gone - they are no longer criminals.

Injuries are common — falling logs, backsliding carts, misplaced footing. So too arrests and sometimes violence when Cambodian smugglers, also ferreting out the prized wood, end up in shoot-outs with Thai rangers. Ubon villagers carry no guns: this is a trade-off into huge sums of money in ways unimaginable to Jaek and his cohorts a year or two earlier.

Traders from the Lao side hide out in small caves along the escarpment awaiting their arrival. Jaek whistles a code signal when he gets close. Up to 20 traders each have designated drop-off spots along the cliff-edge. They scrutinise the catch and reward the exhausted seller. Five item of exchange is amphetamines (yaba); traders hand these out in fistsfuls, as both respite and enticement. Depending on their stamina and exuberance, villagers will sometimes undertake another search. Already they have been there for three-four days, a second round means a week or more in the forest. Chance of capture or injury escalates. Sometimes they musters collective energy; other times they pocket their gains and hightail for home. Once money changes hands, logs are thrown over the cliff to pickups waiting below.

Some Lao traders erect tents on the cliff-top as a welcoming haven to foragers. They angle to establish loyal suppliers by offering solace after the gruelling search. As trade becomes more urgent given dwindling stock, enticements from traders have become more elaborate. Alcohol and drugs flow freely: cooked food for the first time in days. Sex workers congregate, some seasoned in commercial sex, some working other forms of enterprise (food and drink) who offer sex to chosen partners as well. The workers relax for the first time in days in these liminal encampments. Relief is palpable: the wood is gone - they are no longer criminals.

Injuries are common — falling logs, backsliding carts, misplaced footing. So too arrests and sometimes violence when Cambodian smugglers, also ferreting out the prized wood, end up in shoot-outs with Thai rangers. Ubon villagers carry no guns: this is a trade-off agreed with local authorities. In turn, they get the chance to flee. Not so cross-border Cambodians who are picked off regularly. Malaria fevers are also common, either during or after the trade-runs. Mosquitoes are a trivial annoyance. Sleep comes at point of exhaustion, protection irrelevant. Sweat makes repellent useless and the removal of cloying clothing exposes skin as ready target through the nighting toll; mosquito nets for hammocks are purely an encumbrance. Some burn leaves as a deterrent when they camp by small streams but it is not effective. Drugs and alcohol add to wilful avoidance of disease prevention. Jaek notes that in the forest he thinks only of things he will purchase to make him feel pleasure.

Until they get home. Then, wives worry and men fret and talk with their comrades to see if anyone has a budding fever. If fever takes hold while in the forest it is immediately assumed all members of the team are infected. Some weeks later, they will make another trip.

Since parasite resistance was found along these borders, interventions have been ramped up and outreach campaigns have reached all local communities. With significant donor funding border districts have village malaria posts and volunteers targeting both locals and mobile groups. Throughout Thailand, migrants are classified as M1 (resident more than 6 months —registered) or M2 (less than 6 months — unregistered/illegal) in malaria reporting to isolate the more transitory human vectors as a means to allocate resources and target activities (MOPH, 2011). District public health officials have a budget for village visits and mass screening. These overlays intended to make vector-driven transmission legible and predictable did not prevent the 2014 outbreak. Villagers who go to the forest say they know of no-one pursuing rosewood who hasn’t had malaria. Officials we spoke with estimate close to 90% return infected. Significantly, those who go into the forest seldom attend mass screenings organised by public health staff. Some villagers tell us they are scared to check: they fear any indication of infection will mean only one thing to state medics — that they are criminals who trade in contraband - and that they will therefore be reported to the police. Furthermore, they worry that anyone under surveillance will not be asked to join upcoming foraging teams. Health officials suggest that this is paranoia on the part of villagers who see any civil servant as part of state control. Villagers and NGO staff say reality is different and police have harassed those whose fever becomes so intense as to make them seek medical help.

7. Susceptibility, marginality and local deviance

Conventional strategies increasing use of LLINs and IRS have had a major impact in village contexts, but they offer limited protection for those overnighting in the national park. This is recognised by Ubon health staff who began targeting outdoor transmission in 2014, distributing insecticide-soaked clothing and forest nets/hammocks while acknowledging that behavioural compliance is a significant challenge and, furthermore, health promotion needs to address “psychological pressures” (jit wikit) behind forest smuggling. Earmarking desires and stresses of village life as necessary intervention targets brings attention to broader dimensions of risk. From this perspective, vulnerability to infection in Ubon is not just lodged in proximate behaviours or limited resources (although both are relevant) but emerges as a product of economic imperatives and moral disjunctions born of entrenched poverty. The increase in malaria cases in Ubon is significant not only because nearby forested borders are once again sources of drug resistance (fertile breeding area, high mobility, low degrees of immunity) but it also shows how low levels of infection can overnight become hotbeds of transmission, and illustrates how ‘ruthless fantasies’ prompted by consumer consciousness (Berlant, 2007: 278) can act as a trigger to diminished containment.

In a control programme, the key objective is to reduce disease burden at a population level by building a ‘firewall’ around intense transmission foci through prevention, testing and treatment. Elimination aims for zero incidence of locally contracted cases including ongoing interventions to remove imported cases. Indeed some countries, such as Morocco and Turkmenistan, have achieved this status in recent years. But, so too, revamped eradication programmes, such as the global ‘Roll-Back Malaria’ (RBM) initiated in 1998 have generated substantial critiques based, in part, on sub-optimal implementation structures. For example, the Lancet noted “Five years on … it is clear that not only has RBM failed in its aims but it may also have caused harm” (2005: 1439). Indeed, in many areas of the world, comprehensive reductions have not been forthcoming. Stubborn low-transmission areas acting as reservoirs and persistent, underestimated presence of asymptomatic malaria combine to subvert successful control within the GMS and elsewhere (White et al., 2014: 732). Inappropriate drug use including counterfeit drugs, artemisinin mono-therapies and substandard ACTs contribute to rising resistance. Mass drug administration (MDA) is now being trialled in some sites along the Thai-Myanmar border. Historically, examples of community-level chloroquine treatment inadvertently triggered further resistance, and cognizant
of potential pitfalls WHO has convened an evidence review group to assess current results of this approach (WHO, 2015: 107). In other instances, it is recognised that elimination strategies must, of necessity, involve deeper community engagement at a behavioural level, beginning with most affected marginalised populations (Smith and Whittaker, 2014: 1). Further challenging a shift to elimination, and health security in general, is the fact that across the GMS movement is increasing, in particular in border zones where diverse populations are encouraged to interact within new social and physical landscapes. For marginal populations with little social or economic capital and little in the way of marketable skills, livelihood change in these zones often involves accepting work and living conditions that pose threats to physical and mental well-being as they form part of a growing global ‘precariat’. In border areas, changing land-use practices and/or increased forest access as natural resources become part of commodity chains create conditions suited to malaria transmission.

It is certainly no coincidence that malaria in the GMS is most serious amongst migrants and other marginal populations (Nigoon, 2013; MOPH, 2011). The ready-made explanation is that mobile and displaced people are more likely to encounter malarial mosquitoes and have less resources to seek treatment, and furthermore “migrants are the engines of malaria epidemics amongst non-immune” (Singhanetra-Renard, 1993: 1147). However, there remain insufficient insights informing optimal avenues of assistance (Christophel et al., 2012). In October 2014, led by Bill and Melinda Gates Foundation (BMGF), major donors met in Myanmar stressing that anti-malarial drug resistance in the GMS is an ‘emergency situation’ that will require a regional elimination strategy and to achieve this needs a ‘paradigm shift’ including flexibility, attention to local context and strengthened surveillance. Significantly, it concluded that “stakeholders will need a better understanding of human movement throughout the region” (BMGF, 2014: 5). This inadequately understood movement takes diverse forms and is prompted, in part, by the shift from subsistence to wage-labour, particularly in border areas. Ubon rosewood cutters are not predominantly migrants but they offer a clear example of a transient mobile workforce made vulnerable to unanticipated health consequences as economic corridors and frontier politics assist commodity capitalism infiltrate local communities.

While major donors host anti-malaria think-tanks, concrete exercises to engage affected populations also take place. In mid-2014, the global NGO Malaria Consortium introduced an innovative strategy in Cambodia (also employed in Myanmar and Laos). Noting that to move from control to elimination would require ‘more effective community engagement approaches to maintain the participation and enthusiasm of communities in the wake of disappearing disease’ and “local and focused approaches are required to engage and target the high risk mobile and migrant populations, ethnic groups and hotspots” (https://www.youtube.com/watch?v=iZd6qsG_myE). To do this Consortium proposed a new (for malaria) approach called ‘positive deviance’. Championed by sociologists and increasingly used in applied health programs, positive deviance operates on the assumption that one can always find local examples, albeit not the norm, that go against a stream of negative outcomes (Pascale et al., 2010). In child nutrition programs it is the family that manages to have well-nourished children despite suffering the same poverty as their neighbours; in HIV programs it is the sex worker who is able to make all her clients use condoms when her co-workers cannot. In this thinking, everyday people can be enlisted into malaria work as advocates in order to change the world’. For example, a positive deviant might be a female migrant worker, who never got malaria, always slept under an insecticide treated net. In the evening, she always covered her arms and legs with a krama (local scarf) when watching TV or cooking meals to avoid mosquito bites” (Shafique and George, 2014: 5). In short, ‘deviance’ becomes something to aspire to in the battle to eliminate malaria.

Non-normative but successful examples may well help highlight and motivate other villagers to internalise malaria prevention practices more intensely. But there is more to malaria vulnerability than recalcitrant individuals in need of galvanising role models. How people perceive malaria risk and how this ranks against values inspired by spreading consumer consciousness is central. In numerous circumstances neoliberal market expansion has multiple and contradictory impacts (Comaroff and Comaroff, 2001); in this instance, village ‘entrepreneurs’ in Ubon are following the call of fast money rather than heeding health warnings. Prevention discourses find little credence when balanced against social inequities created by typical wage-labour conditions for these villagers (construction or rubber tapping). In this light, there is more to be said about deviance and localised moral adjudication. How deviance is internalised as a form of motivation is the pressing issue.

Kamoon is a Lao migrant — he and his family crossed over into Ubon seven years ago — they have five young children. We sit in the half-completed structure of their large new house, built in stages with rosewood money. With no legal status, they cannot borrow from any lending institution and must pay cash for everything. A neighbour’s house has just installed large aluminium sliding doors. Other neighbours bought a Toyota Vigo. Kamoon and his wife have no labour registration cards. He has worked as a transient labourer in Bangkok and in local rubber plantations making 200/300Baht (US$7-9) per day. Nowadays in his village it is very hard to find anyone to harvest rice as wage-labour. The forest is preferred worksite where he can make 30,000Baht (approx. $1000) per trip. Kamoon’s wife Jiaj also joins him; “it is fun (muang),” she smiles, “if we hear warning shots we just run”. Nor is malaria a deterrent: “we can take treatment drugs so easily”. Having weathered malaria several times, Jiaj is far more concerned about ghosts of dead Cambodian smugglers. For his part, Kamoon wears a potent amulet around his neck that gives him portentous dreams - when to go or not go to the forests: where to look for rosewood trees.

In the next district, Bamlung has Thai citizenship, although his wife does not even though she arrived from Laos 15 years ago. Bamlung is not at all cavalier about malaria. He has had it twice and fears his next bout will be fatal; he thinks it is his destiny and/or, more prosaically, because he didn’t take medication properly. He notes it is easy to dispense with pills once one feels better. Bamlung thinks a lot about deviance, although not in terms used by health initiatives. He worries that karma (moral causality) might incur future infection for anyone going after rosewood. On the other hand, he has experience advocating for stateless migrants in his district and is well aware of structural underpinnings to marginality. He knows rosewood plunder is against the law but also regards normative moral frameworks as ambiguous: “why should the desire to seek well-being for my family penalise me, when all around rich people get richer through breaching legal and moral codes?” He notes he is no less subject to the lure of modernity and desire to accumulate than anyone else - he uses the most obvious market opportunity available to him. Given that all villagers know the Chinese want this wood, they feel “it would be stupid not to go.” Village life has, as Bamlung describes, changed profoundly as one shifts (again) from labourer to forest forager.

All around there is evidence of financial windfall. Locals feel that neighbouring forests are their birthright. We have been using forest resources for years although rosewood was seldom cut. It was primarily kept for carved trays that hold the Buddha in both temples and houses and thereby a sacred wood. But perceptions have changed: now it is a free-floating gift (larg lay) just for us. People spend the profits in particular ways - villagers don’t use rosewood money to pay off long-
newcomers get caught, but more experienced villagers know what to do. The forest is the last place anyone wants to lose. They would be irresponsible not to use this opportunity the market has offered. Sure! newcomers get caught, but more experienced villagers know what to do. Pay off headman, and other officials. If they do get caught they go to trial. Then they have to pay large fines. So they have to return to the forest. Once rosewood is gone, we will turn to other hardwoods. This is our life now.

Vulnerability takes on more complex contours in this reading. Bamlung and his fellows use what strategies they can in a climate of pervasive market expansion. It prompts the question: How is deviance best advocated as a buffer against infection when science and law don’t mesh with local moral adjudications? Care for family and desire to be market players come first: precautionary messages (health or prohibition) lack persuasive weight. To villagers living in one of the poorest parts of Thailand, rosewood is a gift to them and their families. They see it as a birthright given that forests/frontiers next to their villages are outside capitalist enclosures in a formal sense. Rosewood is spiritually ‘special’ and only on offer to the poor who have skills (finding, harvesting, portering) to undertake night-time forest missions. These men feel they are, in fact, under moral obligation to go for their family’s sake even if it means becoming part of a long history of frontier bandits.

Ironically, when WHO notes that “elimination of P. falciparum malaria in the GMS must be seen as a public good that warrants sustained funding” (WHO, 2014: 10) it is thinking of bolstering global health security rather than the quandary that Bamlung, Jaek and their local compatriots face over the contribution of rosewood to their own public goods. Villagers we spoke to in Ubon don’t see the risk of malaria as an impediment. Desires for commodity consumption override anxiety over individual health. As such, they are not concerned about ostentatious wealth as evidence of illicit pursuits, unlike their blood which is undeniable ‘scientific’ proof of transgression. They are reluctant to allow tests that might show malaria or amphetamines— either a direct indication of wrong-doing. There is a fundamental misfit between local aspirations and state modes of control or NGO advocacy of deviance. It is in the gap between village desires to be functioning players within global economies, and thereby access the good life, and subverted discourses of health or legal regulations that malarial mosquitoes prosper. The social and cultural underpinnings of local decisions to transgress, to be deviant, in the name of family security is missed in current endeavours to advance elimination-based health or human security. Links between poverty, individual pursuits to counter this, and malaria are untouched. Initiatives to spread bednets and residual insecticide spraying of houses might control village transmission but they do little to pre-empt forest infection: hammock nets and insecticide-laced clothes fall to the wayside in the rush to material gain.

8. Conclusion

Health security emerged as a clarion call to action in the late 1990s at a time when providing human security became a prominent concern for development institutions charged with protection of vulnerable people against hunger, poverty, disease, and repression. At its most prosaic, human security is imagined to provide a ‘freedom from want’ that constitutes deprivation or insecurity in any of the above circumstances. Health security’s contribution to this ‘freedom’ is typically understood as ensured access to life-saving clinical and public health interventions. This is relevant in border zones (and some urban enclaves) throughout the GMS as access to timely treatment for migrant and other marginal populations (the ability to ‘track and cure’) is often compromised as illegality, prejudice and/or cost prevents many from accessing state health services. But global health security must also anticipate situations when infectious ‘wants’ and the ‘freedoms’ they presuppose themselves precipitate danger. Throughout the GMS, neoliberal enticements spur the dreams of millions of migrants and itinerant travellers in licit and illicit, conventional and unorthodox ways as they seek opportunities not on offer in their home communities. It is here that policies encouraging economic liberalisation and those seeking to provide health security for ‘unruly’ border populations collide. Unfortunately, it is also here that the voices of marginal populations are least likely to be heard. This eclipse shading life in border zones remains an obstacle to global health and its ability to provide a life free from communicable disease, including malaria.

To more effectively buttress human well-being against disparate dimensions of ill-health, forms of risk analysis have attempted to highlight the role values and practices as well as trusted new voices play in decision-making (Zinn, 2010). While such approaches have figured more prominently in some disease control strategies, such as HIV prevention, they are less readily included in malaria campaigns where “currently technological weapons aimed at defeating the threat of the malaria parasite and mosquito appear to be universally endorsed, while associated social, political and cultural factors are downplayed, just as occurred with the overemphasis on DDT in the 1950s” (Cueto, 2013: 60). Nor does a focus on positive deviance as an anti-malaria strategy, as valuable as it might be in terms of raising awareness, touch on values and power. Significantly, in the focus on proximate behaviours, health promotion initiatives sidestep the emotional resonance of future-oriented desire. In this light, attempts to bolster health security by controlling infectious disease run the risk of being compromised unless they can also pre-empt wants-based susceptibility. Back in Ubon, prevention campaigns confront the fact that to local villagers appropriating rosewood is a desirable form of deviance validated in more persuasive ways. As such, one wonders which might be the best example of how ‘ordinary people can change the world’ as the health promotion catch-cry. Rosewood brings unheard of wealth that allows families a house, a car, legal status — in short, entry to a capitalised world and the opportunity to grasp an embodied freedom from want. Hence, the basis for understanding vulnerability, and from whence the next infection might come, takes us, in Ubon at least, to the ambiguous designation of where transgression lies and how best to operationalise a purported entrepreneurial freedom as the mainstay of neoliberal sensibilities.

In this light, conjunctures of vulnerability in the GMS are more than limited access to health resources, coinciding impacts of environmental and seasonal ecologies of risk and ramifying health burdens on household economies. They also emerge from regional politics of migrant labour, frontier imaginaries and their insistent aspirations. Malaria elimination, and the health security it aims to instil, requires that parameters of outreach match dynamics of local vulnerability. In other words, eradication must engage the fine-grained details of malaria’s volatility including contexts where villagers place little value on cautionary practices as they repeatedly enter malarial zones and where science and law mesh awkwardly with local adjudications of the meaning of freedom. Significantly, in instances such as the rosewood gold-rush, risk is embedded in a decision matrix that privileges an ecology of supply-chain consumerism. If predictions are correct that rosewood is...
rapidly disappearing in the national park then infections will in all likelihood decline as less villagers seek its harvest alongside increased donor-driven interventions prompted by the outbreak. Meanwhile, a salient lesson offered by Ubon’s experience is that contours of local risk and construction of health security are readily obscured by shape-changing channels of market desire. Specifics differ, but marginal populations face analogous threats in forested border zones in many other parts of the GMS. “Smarter and better programs” (WHO, 2014:49) must attune proactive approaches to volatile risks linked to market engagement throughout GMS border-zones in order to successfully remove residual outdoor transmission.

Acknowledgements

My enduring gratitude goes to the villagers who generously shared their time to tell me of their lives and assist me understand the health risks they face in malarial border zones. I am very grateful to Professor Patcharanurak at Chiang Mai University and members of Raks Thai malaria program for assistance in facilitating this research, and to Ubon Ratchathani Provincial and District health staff for sharing data and providing valuable insights. Special thanks to Sirichinda Thongchinda for collaborating in data collection. Research was supported by Macquarie University.

References