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RESEARCH PAPER

When 'substandard' is the standard, who decides what is appropriate? Exploring healthcare provision in Cambodia

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ABSTRACT

Cambodia has experienced an impressive economic growth in the last two decades that has not been matched by equal investments in public health care. In combination with other historical and sociocultural factors, this has led to a set of private and public health care practices that divert from standards of clinical good practice. Based on qualitative data collected in malaria and (para)typhoid fever projects, we will describe falsified laboratory test results, dubious diagnostic practices of both unlicensed and licensed doctors, the sales of substandard preparations and combinations of medicines, and even surgeries for commercial interest instead of patient well-being. Patients navigate this complex medical landscape by circumventing costly clinical care – by self-diagnosing and self-medicating, using medicines bought from drug sellers – and by actively seeking out clinical interventions when the required financial investment is perceived to match the illness severity. We will explore what practices constitute healthcare in urban and rural Cambodian settings; what differentiates these practices from clinical 'good practice' guidelines in conventional medicine; and which mechanisms patients, drug sellers and medical doctors have developed to navigate a health care system that at the same time enables, encourages, and sanctions such unregulated practices.

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Pseudo global health; Cambodia; substandard medicine; public-private mix

Introduction

In the past decades, the range of healthcare practices available and delivered in Cambodia have been the focus of considerable attention (Clarke et al., 2016; Dondorp et al., 2004; Lon et al., 2006; Noedl et al., 2008; Om, Daily, Vlieghe, Mclaughlin, & Mclaws, 2017, 2016; Rozendaal, 2001; Schantz, Sim, Petit, & Rany, 2016; Yeung et al., 2015). Much of this attention has centred on so-called 'fake' antimalarial drugs – medicines that fail to pass disintegration tests, lack active pharmaceutical ingredients and show major physical deficiencies such as having the wrong colour or label (Lon et al., 2006) – circulating formal and informal markets in Cambodia and Southeast Asia more generally (Dondorp et al., 2004; Rozendaal, 2001). In Cambodia, however, more detailed investigations have revealed that 'substandard' antimalarial drugs – drugs once deemed authentic or genuine but that have depreciated in efficacy – are much more pervasive and their presence should warrant greater international attention than those deemed fake (Yeung et al., 2015). This more recent and nuanced finding is significant and provides insight into contemporary Cambodian healthcare in ways that draw attention to the blurry areas operating between real and fake, which

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we understand as being indicative of pseudo global health. These blurry areas are not only spaces where 'pharmaceutical anarchy' (Gollogly, 2002) thrives, but also where practices of medical standardization maneuver their way through a non-standardized social system.

Although Cambodian healthcare has now re-emerged from the ashes of its past, it has been shaped by events starting in the 1970s, when under Pol Pot's rule the Khmer Rouge turned Cambodia into a 'killing field' with nearly two million deaths (Kiernan, 1996). Moreover, Pol Pot's regime targeted and exterminated most of Cambodia's professional classes, including doctors, nurses and Ministry of Health staff who previously formed its medical infrastructure (Heng, 1995; Kiernan, 1996). Within the ideological corset of the Khmer Rouge, there was little room for maintaining or producing biomedical healthcare for the population not belonging to the higher ranks in the political regime (Guillou, 2004; Ovesen & Trankell, 2010). In 1979, the Vietnamese army ended Pol Pot's rule but installed a socialist regime which fuelled more unrest, civil disturbance and conflict (Kiernan, 1996). During both regimes, the health care system was substituted by hastily trained people providing health care to the masses without the availability of modern medicines (Gollogly, 2002; Kelsall & Heng, 2016).

In 1991, the UN helped to reinstall peace and assured a transition to a democratic system with the signing of the Paris Peace Accord, which also allowed donors and international agencies to return to Cambodia (Kelsall & Heng, 2016). During the 1991–1993 United Nations Transitional Authority in Cambodia (UNTAC), the first WHO office was established, but attempts to rebuild the health system were challenged by a lack of drugs and equipment, competing donor interests, unsuccessful coordination of all national and international actors in the transition period, and a patronage system where technical competence did not, and in fact could not, factor in recruitment processes in the health sector (Brinkley, 2012; Gollogly, 2002; Hill & Eang, 2007; Kelsall & Heng, 2016; Lanjouw, Macrae, & Zwi, 1999). Nevertheless, during the transition the WHO and UNICEF did establish a basic 'emergency' health infrastructure (Hill & Eang, 2007; Lanjouw et al., 1999), which involved an organisational structure that seemingly conformed to the principles of Primary Health Care (van de Put, 1992).

A variation on this 'emergency' medical landscape (Feierman, 2011) still exists, progressively shaped by a continued lack of resources in the public health sector to formally pay medical staff, a critical shortage of trained and registered healthcare professionals, and more lucrative opportunities in the private sector. From such 'emergency' public health a healthcare system emerged that, without the full capacity to begin with, could not and never *intended* to fully function in line with 'good practice' guidelines for drug regulations, clinical training and care imported from the global North (Wendland, 2010). Against the backdrop of a socio-political system of patronage and rent extraction from clientele (Brinkley, 2012; Kelsall & Heng, 2016; van de Put, 1992), Cambodia's healthcare infrastructure evolved in ways that vary from what would be considered 'standard'. This paper explores how medical standards transpire and unfold in Cambodia and, through this exploration, sheds light on the everyday contextual features which shape healthcare provision.

Methods

Study site and population

The material we present in this paper originates from qualitative research undertaken between 2010 and 2017 in different mixed-methods studies on (para)typhoid fever in the capital Phnom Penh and on malaria in Ratanakiri province.

Phnom Penh, the capital of Cambodia, is a rapidly economically expanding city, although poverty and communicable diseases remain important issues (Clarke et al., 2016). In 2012–2015 a community outbreak of *Salmonella* Paratyphi A infections occurred in Phnom Penh, affecting large numbers of local residents and international travelers (Kuijpers et al., 2016). As an estimated 1.55 million people live in Phnom Penh, of whom approximately 82% have access to improved sanitation facilities such as a piped sewer system and a septic tank (Davies et al., 2015), a qualitative

study was warranted to investigate potential social and environmental drivers of this outbreak (Kuijpers et al., 2018, 2016).

Ratanakiri is a remote rural province and is largely populated by indigenous peoples among which the largest groups are Jarai, Tompuon and Kreung. What characterizes the indigenous groups is their subsistence slash-and-burn farming in the quickly disappearing forests on the border with Vietnam. Both in terms of population and prevalence of endemic diseases, this province is not representative for the rest of rural Cambodia. Although in many provinces malaria has already been eliminated, Ratanakiri represents a 'hot spot' of forest-based malaria transmission (Sluydts et al., 2014, Gryseels et al., 2015).

Data collection and analysis

The qualitative strands of these mixed methods studies made use of in-depth interviews and participant observation (including informal conversations) as main data collection techniques. Data from different techniques was triangulated to assess the extent of bias introduced in self-reports of sensitive topics and behaviour. Sampling of informants was theoretical (i.e. purposively selected based on emerging results) and access to respondents was often granted through snowball-sampling techniques, where certain key-informants introduce the researcher to other potential participants.

In Phnom Penh we interviewed Khmer and expatriate medical staff and private practitioners (n = 19), pharmacists and drug vendors (n = 14); laboratory staff (n = 5), hospital patients and their relatives (n = 24); traditional Khmer medicine specialists and sellers (n = 8), farmers (n = 4) and food vendors (n = 2). Although across the malaria studies in Ratanakiri our informants mainly included indigenous and Khmer farmers, for this paper we rely more on our observations of and interviews with private practitioners and drug vendors (n = 20), public health centre staff (n = 35), traditional medicine practitioners (n = 6) and repeated interviews with volunteering village malaria workers (n = 140) in rural Ratanakiri.

Abductive analysis (Tavory & Timmermans, 2014) of all interview and observation data was done during fieldwork; in the final qualitative databases axial and selective coding was done using Nvivo 11 qualitative analysis software.

All study protocols were approved by the Institutional Review Board of the Institute of Tropical Medicine, Belgium, and the National Ethics Committee for Health Research in Cambodia.

Positionality

As anthropologists and medical doctors working in these different studies, we witnessed and participated in the Cambodian health system. Authors CG, KPG and LK experienced this through ethnographic fieldwork in Ratanakiri and Phnom Penh; LK and JJ as medical doctors working with and training medical and laboratory staff in a Phnom Penh hospital. Although our studies concentrated mainly on malaria in the rural provinces and on *Salmonella* Paratyphi A infections in Phnom Penh, our experiences provided insights beyond a disease-specific focus.

Results

The biomedical landscape

Lower cadre public sector medical staff generally earn below living wages in Cambodia, so they often generate supplementary income in the parallel private sector. This dual practice system (Ferrinho, Lerberghe, Fronteira, Hipólito, & Biscaia, 2004) characterizes Cambodia's current health-care landscape, both in urban Phnom Penh as in rural Ratanakiri. In tandem with Cambodia's rapid economic growth, its private health sector has flourished since the 2000s (Schantz et al., 2016), yet

the economic dividends reaped from this growth have not significantly increased the quality of care in its public health sector. Here, sparse resources alongside alternatives in the private sector have been accompanied by accusations of a political elite that monopolizes access to resources through competitive patron-client networks (Brinkley, 2012; Kelsall & Heng, 2016).

Among our informants, mistrust in public health facilities was widespread. Many report staff to be unfriendly, not patient-oriented, delivering poor quality services for under-the-table payments, and operating with long waiting times and scarce equipment. We observed that people from remote villages in Ratanakiri seldom travelled to the health centre to receive free malaria medication and preferred to purchase treatments at local pharmacies. For informants not being able to miss a day's work, going straight to the private sector was an attractive alternative to public health facilities where staff often sent patients to purchase treatments in their privately-owned pharmacies anyway. The distinction between the private and the public sector is a blurry line; although informants made a clear distinction between both, and expressed their reasons for preferring the private option, this apparent dichotomy fades when the same people behind the counters of the private pharmacies appear behind the public health centre's desk. However, the different roles that they were embodying to provide public versus private sector care produced such different experiences that the local population referred to these as non-overlapping categories of health provision.

Cambodia's rural and urban healthcare providers thus combine and alternate economic strategies in public and private health sectors, often making use of medicines and diagnostics that WHO would classify as substandard. According to WHO's new categorization of poor quality medical products (WHO, 2017), substandard medical products are those 'authorized by national regulatory authorities' but which still 'fail to meet either national or international quality standards or specifications' (WHO, 2017). This definition relies on a regulatory infrastructure and internationally accredited standards that aim to travel in the same way across diverse contexts. The Cambodian health care system, however, operates according to its own internal logic, attributing new meanings to both the 'sub' and the 'standard'. This coinciding functionality and dysfunctionality creates an ambiguous space where certain practices emerge to cope with this apparent dualism. These practices aim to compensate for the lack of economic, educational and social support required to enable healthcare providers to enact their imaginations, shaped by international markers of the best possible clinical care. Moreover, they offer a pragmatic means to maintain a 'functional' health system for patients and providers presented with the very real burden of numerous endemic diseases present in Cambodia.

Multiplicity of standards

In Cambodia, healthcare practitioners often imagine medicine 'elsewhere' to be of a certain higher standard that cannot be replicated in Cambodia due to the absence of the socio-economic conditions needed to sustain such a standard. In the absence of regulations enforcing standards of evidence-based medicine, 'standards' of medicine are aspired to through the adoption of, for example, WHO clinical guidelines for tropical diseases. WHO provides written guidelines for Ministries of Health, Medical Councils, health departments and hospitals in tropical settings on 'good practice' for the diagnosis and treatment of tropical diseases, based on and updated to the available scientific evidence. Such imported medical standards have many faces, however, and lead different social lives through research protocols, national and international curricula of medical schools, accreditation bodies for laboratories to obtain the ISO15189 standard, WHO field guides for various tropical diseases, etc. Concretely standardized and enforced are the legal instruments that set a 'code of ethics' and 'core competencies' for licensed health professions in Cambodia (Clarke et al., 2016). These legal instruments are implemented through various national councils that health providers have to register with to be licensed. Provincial health departments and provincial governors can further decide to license private health facilities based on registration with national councils.

Pragmatically, clinical 'good practice' seems to be what health providers measure their own practices against. For example, health providers used the term 'real typhoid' to indicate cases with a microbiologically confirmed diagnosis, as opposed to cases with a diagnosis based on clinical symptoms. For many skilled Cambodian health providers, ideas about what constitutes clinical 'good practice' are formed through their exposure to medical education, WHO clinical guidelines and National Treatment Guidelines for specific diseases, drug regulations, and research protocols. 'Substandard' thus relates to the tension between their incapacity – in Cambodian conditions – to adhere to an imagined medical 'standard' as outlined in various international guidelines, and their providing quality healthcare following a local standard and a different logic. The divergences we observed in Cambodia from so-called standardized medicine(s) result both in what the WHO would classify as 'substandard' medicine(s), and crucially in altogether different localized standards of quality healthcare, based on very different markers and outcomes. We argue that reconciling these different perspectives requires active strategies from patients and providers. In what follows, we present the views of some of the healthcare actors with regards to their perceived 'capacities' and motivations to deliver (sub)standard medicine and healthcare.

How medical standards unfold

One of the policies of the Khmer Rouge regime was to assign certain hastily trained individuals to the role of 'doctors'. In the following quote, we learn that the legacy of the practice has led to some 'doctors' continuing to practice without having any of the certificates and markers of authentication usually associated with a medical doctor. A volunteer Village Malaria Worker in the remote province of Ratanakiri, who was such an uncertified doctor during the Khmer Rouge regime, reflects on his past experience and how this has shaped his current work:

A: I learned during the Pol Pot Regime [to cure sickness] [...].
Q: Now you do not only treat general illnesses, but you have another skill, to treat malaria, right?
A: Yes, now it's only malaria I can treat. For those [other] kinds of treatment, in all honesty, I treat them unofficially because I do not have a certificate.
Q: You do not have any certificate, but the villagers trust you, and visit you to get treatment?
A: Yes, sure. But I can [only] treat them if I am clear about the illness. I have to be careful. Previously, I used to go to [...] villages to give injections to villagers. If you do not believe me, you can ask the villagers there. Nobody got crippled or disabled due to my injections, because I have learnt clearly how to give injections [during the Pol Pot regime].

As the Khmer Rouge reserved the little remaining health care for the new political elite, the rest of the Cambodian population were under the care of such health providers without formal medical or pharmaceutical training, with detrimental health outcomes for the masses (Ovesen & Trankell, 2010, p. 14). This informal medical system continues to exist in rural areas where formal health care is still difficult to access, such as Ratanakiri.

Drug sellers – both licensed and unlicensed, urban and rural – combine drugs based on their experiential knowledge, package inserts and former patient feedback of effective medicines. Diagnosis and treatment are thus partially based on perceived treatment effects in patients, which is then key to further diagnoses and treatments. Drug sellers' interests are primarily commercial, and besides their experiential knowledge, their services depend on what clients ask for, usually 'medicines with immediate effect' and preferably in affordable quantities. These informal health providers provide care that, from a perspective of WHO guidelines, significantly diverges from biomedical standards, yet imitates them by providing pharmaceuticals, which from a patient perspective often signifies appropriate medical care.

In contrast to Ratanakiri, Phnom Penh also hosts many fully licensed doctors, in public hospitals and/or private clinics, with the required educational track and registered with the necessary medical councils serving as markers of authentication for medical doctors and pharmacists.

Having a license, however, does not mean that their peers or clients view them as better trained or more capable. A private practitioner in the capital explained that 'real capacity doctors' – in her words – are those who did part of their training abroad and who are thought to stay up-to-date with the latest medical progressions:

> Some are ok, the real capacity doctors, the doctors who trained abroad, in France. For the local doctors, some are ok, some other doctors don't care about following-up the progression of medicine. The local doctors don't always update their capacity.

Similarly, pharmacists with licenses are not necessarily thought to be more skilled than other drug sellers. This medical doctor from Phnom Penh explains that licenses to have a pharmacy can easily be bought without the necessary educational background or pharmaceutical competencies:

> Pharmacists in Cambodia sometimes are not real pharmacists. They just rent a certificate from somebody [. . .]. In Cambodia we can open a pharmacy easily. Pharmacists [. . .] don't know typhoid fever or other infections, they just know like 'oh abdomen', so they give ciprofloxacin.

In addition to 'real-capacity doctors', there are those referred to as 'commercial doctors', who are regarded to be involved in healthcare for money rather than to help people. Commercial doctors are common both in the private and public health sector and are not restricted to the more resource-constrained healthcare centres but are perceived to work in 'quality clinics' as well. Informants explain that commercial doctors make money with unnecessary diagnostics and surgeries that serve a commercial interest rather than patients' wellbeing. Examples of such medically unnecessary but financially lucrative procedures are reported to be unnecessary appendectomies and caesarean sections, the over-utilization of ultrasound examinations and bronchoalveoloar lavages for the diagnosis of tuberculosis. Such lavages consist of collecting lower respiratory tract samples with a bronchoscope and are invasive procedures that, according to clinical practice guidelines, are only used if patients are unable to cough up the sputum needed for the test.

Commercial doctors commonly make deals with pharmacy shopkeepers, offering to direct their patients to a particular pharmacy in exchange for a percentage of the fees charged (Ovesen & Trankell, 2010). Similar deals are made with laboratories: doctors request not only those laboratory tests that they think are necessary to make an informed diagnosis, but all additional tests that belong to a certain package in exchange for a commission. These procedures and tests are lucrative for the various formally underpaid actors in this health system and therefore often substantiate the predominance of commercial interests over health benefits.

Patients perceive 'high-tech' procedures, elaborate tests and treatments to equal quality healthcare while *not* getting them is a sign of bad quality. Seemingly technologically sophisticated tests may represent a level of biomedical development that is imagined to be superior to the symptomatic diagnostic skills of informal health providers. Patients appreciate such financially and medically unwarranted treatments as these *appear* to make the healthcare system functional. Nevertheless, medical doctors continually have to earn people's trust by producing immediately observable improvements in the patient's condition, requiring the complex navigation of patient demands, medical requirements and commercial costs and benefits. Providing perceived efficacious treatments confirm the biomedical provider's diagnostic skills and builds up trust.

How treatment guidelines unfold

Many informants in our work were worried about fake drugs and were well aware of their presence in Cambodia – not least because of frequent newspaper articles and government health promotion poster campaigns. However, campaigns warning against fake drugs reveal a tension between how patients and practitioners are told to act and what they *do* when seeking and providing healthcare.

Current standard malaria therapies are 'combination therapies', combining different drugs to decrease the likelihood of emerging parasite resistance to one particular drug. At the time of our fieldwork, the first-line antimalarials prescribed by the National Treatment Guidelines were pre-packaged artemisinin with mefloquine. Private practitioners, pharmacists, and health center staff, however, commonly assemble different drugs into drug 'cocktails' themselves, for all types of illnesses, in contrast to pre-packaged blister packs. Our observations indicate that one cocktail usually consists of vitamin C, paracetamol, an antibiotic and a pill of chloroquine or artesunate, in the form of pills cut off from a blister pack or taken from a jar, provided in a little plastic bag (Figure 1).

Such cocktails can be considered 'substandard' medicines according to the WHO definition, as their joint packaging does not follow any recognized regulations. Yet the relief patients report to feel when taking unregulated cocktails sits in stark contrast to the discomfort reported from the side-effects of the regulated first-line antimalarial treatment. This difference relays the different shades of meaning that 'substandard' holds for different stakeholders. Expecting every symptom to be addressed with different pills, the mix is what patients consider most effective and affordable. When people in malaria endemic Ratanakiri suspect they may have malaria, the choice between the expected side effects of the first-line antimalarials and a bag of mixed medicines is easily made. This pharmaceutical practice *appears* to align with biomedical principles; however, it better fits a Cambodian nosology where different symptoms are often interpreted as separate illnesses (Verschuere et al., 2017). In the lived reality of poverty, felt through vitamin deficiency, general pains and aches from hard farm work, worms, and lack of clean water, people look for 'a cure in one', and this bag generates an overall improved feeling in the body for only 2000 Cambodian riel (US$0.50). As most people are indeed poor, they usually buy only 2 to 3 bags. However, although the 2–3 pills of chloroquine or artesunate in these bags will likely make the patient feel better for a while, they will not kill all the malaria parasites in the patient's blood, even if the individual pills are of good quality.

In the public sector the first-line antimalarials are theoretically made available for free, however, the mefloquine in these combination therapies can produce strong side-effects (Price et al., 1999). To reduce the impact of these side-effects, patients sought intravenous perfusion or drug cocktails from the private sector. Although private providers also openly

Figure 1. Antimalarial cocktail.

advertised the first-line antimalarial combination therapy, they offered patients 'a way out' in the form of the above-mentioned cocktails, or of an artemether injection, which is more expensive but does not require nauseous patients to swallow anything. Although National Treatment Guidelines restrict the use of this potent monotherapy to hospitals and severe malaria cases, these injections were easily available from roadside pharmacies in Ratanakiri. Not only are the private practitioners who administer these injections untrained, they offer clients the possibility to buy 'take-away injections', which clients themselves administer at home, to reduce the costs of treatment. For health providers in Ratanakiri, an additional reason for the perceived superiority of this route of administration is the financial benefit of selling and/or administering injections. In turn, the increased cost of injections fuels the perceived superiority of this administration route among patients. If private practitioners or drug sellers refuse to give the more affluent patients an injection, they will simply go to the next practitioner. Through such bargaining, the patient wields agency and power in this therapeutic encounter (Reeler, 1990; Van Staa & Hardon, 1996).

As in most other settings, in Cambodia a healthcare provider's popularity is associated with trust. Trust, as a dynamic and negotiable concept, travels through the patient's social network as experiences with different providers are continuously shared. Cambodian families will seldom lose trust in indigenous healers, bonesetters and even biomedically untrained village health providers in case of treatment failure, as these providers co-operate with and respond to their clientele within a framework of local illness perceptions (Ovesen & Trankell, 2010; Ozawa & Walker, 2011), while treatment from a biomedical practitioner or institution is depersonalized, making the doctor 'replaceable' (Ovesen & Trankell, 2010).

How diagnostic standards unfold

In urban areas licensed doctors can rely on laboratories for diagnostics. Despite their appeal as providing high-tech science, laboratories are often driven by the same problems as elsewhere in the Cambodian healthcare system: the quality of diagnostics is often poor, reflecting scarce skilled laboratory personnel, insufficient equipment, poor quality assurance and weak regulatory oversight. Moreover, stock shortages also often redefine what 'standard operating procedures' (SOP) come to mean in laboratories, as do the usefulness of outdated machines frequently 'donated' or unburdened by institutions from the global north (Howie et al., 2008).

Although laboratory personnel reportedly forge results for financial gain (e.g. sales of subsequently prescribed medication from collaborating doctors), other reports reflect the blurred lines between client satisfaction and proper care. To avoid the bad reputation of not giving good quality care and thereby reducing income, laboratory personnel carry out unnecessary tests or falsify results to meet expectations:

> If your lab results keep coming back negative, doctors will not send you their samples anymore. The doctor will think it's either a bad test, or a bad quality lab rather than thinking the problem is with his diagnosing. (Expatriate medical doctor, Phnom Penh)

Trying to meet clinical standards of good practice, the Widal test is used in Phnom Penh laboratories for the detection of *Salmonella* Typhi and *Salmonella* Paratyphi A antibodies in the blood, which helps to diagnose (para)typhoid fever, a life-threatening systemic infection common in Cambodia. For a correct interpretation, a second blood sample should be taken at least 5 days after the first. A fourfold rise of antibodies between the two samples is considered diagnostic for typhoid fever. However, it is difficult to obtain two samples from patients as doctors report they seldom return for follow-up. Hence, doctors often start antibiotic therapy on the first consultation. Consequently, only one sample is tested and interpreted. However, in (para)typhoid fever endemic settings, a single Widal test result only makes sense if a local baseline is established, as humans in such endemic regions are previously and repeatedly exposed to *Salmonella* Typhi and other

Salmonella serotypes, leading to high levels of background antibodies (Andualem et al., 2014). Furthermore, false positive reactions may occur because of cross-reactivity with other organisms, which make the test unreliable when used by itself. By not taking a second sample or by not establishing appropriate local cut-off values, the Widal test is not done according to the standard set by clinical guidelines. However, even if it *were* done according these guidelines, obtaining a *definitive* diagnosis of typhoid fever actually necessitates the isolation of *Salmonella* Typhi from a microbiology culture that can also establish the appropriate choice of antibiotics through susceptibility testing of obtained isolates. This requires a sophisticated laboratory with trained laboratory staff. Even if these facilities were present, microbiological culture is not attractive as a diagnostic test because results take up to 2–3 days and the cost can be 12–40 times higher than the Widal test. One laboratory supervisor recalled she asked laboratories to stop using the Widal test, but they refused because 'they earn money with it'. Another informant also reported that Widal tests are commonly 'done in offices rather than labs', referring to the practice of writing up results without actually performing the test – an example of outright fabrication. This is financially attractive because 'positive' (para)typhoid fever diagnosis results in increased sales of medications (Figure 2) and follow-up consultations.

As mentioned above, frequent negative results may also damage reputation and credibility of laboratories.

Other laboratory procedures also mimic standardized procedures, semblances that often lead to questionable diagnostic results. A proper blood culture to diagnose (para)typhoid fever requires the causative organisms *Salmonella* Typhi and *Salmonella* Paratyphi to be isolated, which calls for sampling of at least 40 ml blood in adults (CLSI M47-A, 2012). However, informants reported that at their respective healthcare facilities, only 4–5 ml of blood is usually collected. This significantly reduces the chance of accurately diagnosing the infection. Cambodian and expatriate medical doctors report that such practices are usually done because of 'a lack of knowledge' among healthcare practitioners. However, this may also be in response to patient demands. Cambodian patients generally fear large blood withdrawals, enhancing doctors' reluctance to withdraw more blood than considered absolutely necessary.

Another example involving skill are white blood cell counts to indicate infection, which are in low-resource settings often performed with a hemocytometer and microscope whereby the number of blood cells is counted manually. However, for reliable results, laboratory staff need a keen eye and must be highly skilled to differentiate white from red blood cells. As a medical doctor in Phnom Penh explains:

Figure 2. Medicines sold to an enteric fever patient.

> [...] very high count [of white blood cells] and then it turns out that they counted red blood cells as white blood cells. I would not advise people to do tests, the results will point doctors in the wrong direction.

Facing the uncertainty of encountering the limitations of such test results, and the additional unreliability of laboratory practices, has produced a general distrust of Cambodian laboratory results amongst 'real capacity doctors'. Although they aspire to clinical good practice, such contextual issues compel improvisation and divergence from diagnostic standards. Negotiating between uncertain laboratory results and their symptomatic diagnostic skills, even the 'real capacity doctors' build their care on previous experiences with laboratories and detailed knowledge of the context and population. Likewise, in Ratanakiri, we have observed informal private health providers disregarding negative malaria rapid test results and communicating them as positive to patients, although according to National Treatment Guidelines antimalarials can only be sold after a confirmed diagnosis by such a rapid diagnostic test. Selling negative tests as positive can constitute both a way of dealing with diagnostic uncertainty and a means to personal commercial gain. Drug sellers know the test can become unreliable when stored in suboptimal conditions. Moreover, they often *a priori* assume clients have already taken some antimalarials, which may obfuscate the result of the RDT test. This diagnostic uncertainty leads to subsequent reliance on previous experiences with and expectations of clientele. The provider's practice of doing the RDT conforms to the standard set by clinical guidelines, but the interpretation of the results is aligned to a different standard, which considers localized diagnostic uncertainties and treatment seeking avenues.

Discussion

'Every standard needs to be plugged into a physical and cultural infrastructure that allows it to function' (Timmermans & Epstein, 2010, p. 79). Indeed, the Cambodian healthcare infrastructure seemingly allows imagined 'standards' of medicine from the global North to function but does so in two different but hard to distinguish ways. On the one hand, Cambodian healthcare practices only slightly divert from clinical guidelines and drug regulations and as such unnoticeably perpetuate policies relying on international standards; on the other hand these divergences make clinical 'good practices' co-evolve with realities (Lorway & Khan, 2014), thereby producing a different standard which contextual experience and practice has moulded over the years. In Cambodia, we have encountered the pseudo as a tension between a 'standard' that is imagined as the ideal, and the adaptation of that unattainable standard to contextualized practice.

When private and public sectors overlap, and genuine and fake diagnostics and treatments are often indistinguishable, patients build their decisions on trust in particular providers and on lay empiricism based on observations of patient improvement after treatment (Gryseels et al., 2013). This system prevails as long as both client and provider maintain their bargaining power (Van Staa & Hardon, 1996). If clients ask for expensive procedures driven by their expectations of what constitutes 'good care', health providers feel justified to sell these procedures as *being* good care. Whether these procedures comply with WHO clinical guidelines or are clinically necessary is less important than the relationship of trust this mutually generative encounter produces. The different factors that stimulate this logic are manifold and interconnected: (i) the culture of an unregulated dual public-private practice and health providers that are not formally trained to do so, embedded in the emergency context of a war-torn healthcare system with little capacity to enforce regulations; (ii) commercial practices to compensate for unrealistically low salaries; (iii) poor education of medical and laboratory staff, in medicine and the use of medical technologies; (iv) lack of proper medical equipment and guidance on how to use it; (v) difficulty of diagnosing diseases that symptomatically often resemble other diseases endemic to Cambodia, especially in relation to patient expectations. However, this 'substandard' healthcare system cannot be only understood in relation to the frequently cited 'commercial mindedness' or 'predatory behaviour' of Cambodian

healthcare providers, but as a coping strategy to deal with the deep-rooted mechanisms of socio-political life in Cambodia (Ferrinho et al., 2004). Stemming from an emergency situation where little to no healthcare was available, healthcare workers have to essentially compete across sectors with themselves for patients, opting to make a living from altering the international standards designating the 'quality' of health services in the public sector, and diverting patients to their private sector establishments where a sustainable salary can be made. When compared to other countries in the region that perform better in terms of health indicators, it is likely that Cambodia performs worse due to the absence of a well-functioning and trusted public healthcare system, blurred lines between the public and private healthcare sectors and weak enforcement of existing legislation. In addition, practices such as falsifying laboratory results, for example, are not often discussed in relation to the sometimes detrimental health outcomes for patients – neither in discussions between policy makers and researchers, nor at the level of health facility management.

Echoes of such concerns quietly resonate in informants' reflection on the efforts that have been made by the government to address the 'substandard' healthcare practices in Cambodia. In 2010 for example, it became obligatory for all pharmacies to register with the Ministry of Health and a Master Plan for Quality Improvement in Health was developed that proposed to establish a semi-autonomous accreditation agency and make it mandatory from 2018 (Annear et al., 2015). There are also mechanisms in place to check the quality of drugs that are imported into the country via official routes, however, they do not apply to medicines that enter the country unofficially through smuggling routes from neighbouring countries. Indeed, such formalized ideals have little bearing on reality. In combination with the low number of national drug inspectors compared to the number of pharmacies and available medicines, the private sector is in practice still largely unregulated and finds opportunities to flourish further.

Although we understand certain practices such as forging laboratory results as 'fake' rather than 'substandard' – because they imply the conscious intent of misleading the patient and/or health provider -, the majority of the healthcare practices described in this chapter operate in a grey zone, i.e. in between the polarities of fake and real. The discussions that need to be held to address the poor clinical outcomes that they *do* often produce, might lead to misleading conclusions when analysed based on the usual dichotomy of real and fake. Although even 'substandard' is a predefined classification that does not easily cater to all the practices described in this paper, the concept does allow for a closer examination of what is happening in the 'grey zone', a crucial endeavour lest proposed solutions backfire. Embedded within a post-conflict context, other war-torn countries that are in the process of rebuilding their health infrastructure might find the story of Cambodian pseudo healthcare an interesting tale to heed. Describing the substandard medicines circulating private and public markets, untrained health providers who provide potentially harmful medical services, and an unregulated private health sector – all common to many low resource settings with (re-)emerging health infrastructures -, may spark the difficult discussion that needs to be held in order to improve the healthcare provision in settings where the ingredients for quality healthcare are technically already available.

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