MALARIA TESTING AND TREATMENT MARKETS ON THE THAI-MYANMAR AND THAI-CAMBODIA BORDERS
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BACKGROUND
Malaria burden in Thailand has declined since 2000 and is concentrated along borders with Myanmar and Cambodia. According to national policy, malaria should be managed exclusively in the public sector. The first-line treatment for P. falciparum has been non-fixed dose combination artesunate and mefloquine (ASMQ) and primaquine (PQ), but treatment guidelines changed in 2016 to dihydroartemisinin piperaquine (DHA-PPQ). P. vivax is treated with chloroquine (CQ) and PQ. The purpose of this study was to investigate the antimalarial and diagnostic markets.

METHODS
A 2016 outlet survey was conducted in Thailand with 2 study domains: Thai-Myanmar and Thai-Cambodia border areas (Figure 1). In total, 3,651 public and private outlets were screened for availability of malaria testing and treatment, and an audit was completed for all antimalarials, malaria rapid diagnostic tests (RDT) and microscopy.

RESULTS
Where are antimalarials and malaria blood tests available? In total, 104 outlets were stocking antimalarials, and nearly 90% were public health facilities. Antimalarials were found in pharmacies and private health facilities but not in drug stores, general retailers or mobile vendors. Almost one in five (21%) of public facilities had antimalarials, including 95% of malaria clinics/posts and hospitals. Malaria testing was available in 22% of screened public outlets, including 96% of malaria clinics/posts and hospitals and 4% of sub-district hospitals. Very little malaria testing was available in the private sector, with blood tests available in only 3.8% of private for-profit health facility screened (Figure 2).

Where antimalarials are available, are the first-line treatments available? CQ was the most widely available antimalarial among antimalarial-stocking public (89%) and private (73%) outlets, and PQ was available in 90% of public and 20% of private antimalarial-stocking outlets. ASMQ was available in 67% of public and 3% of private antimalarial-stocking outlets. DHA-PPQ was only available in malaria clinics/posts & hospitals and only in 6% of these outlets (Figure 3).

Where antimalarials are available, is confirmatory testing available? Testing was available in 95% of public and 22% of private antimalarial-stocking outlets, with microscopy more commonly available than RDT. No antimalarial-stocking pharmacies were stocking a malaria blood test (Figure 4).

Are antimalarial-stocking outlets prepared to manage malaria according to national treatment guidelines? Among malaria clinics/posts and hospitals stocking antimalarials, only 62% demonstrated readiness to appropriately manage malaria by stocking first-line treatments for both P. falciparum and P. vivax and blood testing. Only 12% of antimalarial-stocking private for-profit health facilities demonstrated readiness to manage malaria (Figure 5).

CONCLUSION
Availability of malaria blood testing was high in the public sector, but antimalarial availability was variable. Only two in three malaria clinics/posts and hospitals had ASMQ available, while nearly nine in ten were stocking CQ. Very few outlets had DHA PQ available, reflecting the recent change in guidelines and thus only a partial implementation at the time of the survey. PQ availability was high in all antimalarial-stocking outlet types except pharmacies. In line with national policy, very few options for malaria testing and treatment exist outside of the public sector in Thailand. The few pharmacies and private health facilities stocking malaria commodities primarily stock CQ, which could potentially be stocked for treatment of other illnesses, such as gout. Overall, over half of malaria clinics/posts and hospitals had ASMQ or DHA PQ, CQ, PQ and malaria blood testing available, indicating moderate readiness to test for and treat both P. falciparum and P. vivax malaria. The gap in readiness in the public sector suggests that patients may need to be referred to a different facility to receive appropriate care.

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