

What's happening to ACT availability, price and diagnostic testing in Cambodia? Findings from 2009 and 2011 nationally representative outlet surveys

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BACKGROUND

- Continued progress towards global reduction in morbidity and mortality due to malaria requires scale-up of effective case management with artemisinin-combination therapy (ACT). Spread of artemisinin resistance would threaten recent gains in global malaria control.
- Since 2000, co-blastered artesunate+mefloquine (ASMQ) has been the government-recommended first-line treatment of *Pf* malaria and chloroquine (CQ) the first-line treatment for *Pv* malaria. Artemisinin monotherapies are banned. Diagnostic testing prior to anti-malarial treatment is required.
- The Thai-Cambodia border has historically been the site for emergence of anti-malarial-resistant parasites. A national containment program for Cambodia has been instituted to address the emergence and spread of multidrug resistance (MDR) in two zones: zone 1 covering areas where artemisinin tolerance has been detected, and zone 2 covering areas with high risk for resistance development, which mostly buffer zone 1. The first-line drug is expected to switch from ASMQ to dihydroartemisinin+piperazine (DHA-PPQ) in 2012.
- In the public sector, anti-malarial treatment is provided free of charge after confirmation of infection through diagnostic testing. The public sector includes public health facilities and village malaria workers (VMW). In the private sector, socially marketed *Malarine* (ASMQ) and rapid diagnostic tests have been available since 2003. Both public (public health facilities and VMWs) and private sectors have experienced periodic stock-outs of ACTs. In 2011, PSI/Cambodia reported the most severe stock out to date of *Malarine* with zero sales reported since April 2011.
- Multifaceted resistance containment activities are being implemented in Cambodia. As such, monitoring access to good quality ACTs and parasitological diagnosis in Cambodia has global significance.

METHODS

- A nationally representative outlet survey was conducted in Cambodia in 2011.¹ Sampling was conducted using a stratified multi-staged probability proportion to size cluster design.
- The 2011 survey was stratified according to government delineated areas with confirmed multi-drug resistant parasites. A sample of all outlets that could sell or provide anti-malarials to a consumer was taken through a census approach in 113 communes across three zones: 1) confirmed malaria drug resistance (Zone 1); 2) areas with suspected resistance (Zone 2); and 3) areas with no drug resistance (Zone 3 and 'no zone'). To facilitate public/private sector comparisons, oversampling of public health facilities was conducted in districts surrounding the selected communes.
- Results are presented from the 2011 survey alone, and in comparison to a baseline outlet survey from June-July 2009.

RESULTS

Sample: In 2011, 18,584 outlets were censused, 2,615 anti-malarials audited and 1,516 providers interviewed. In the 2009 survey, 7,833 outlets were censused with 1,021 meeting the screening criteria.

Outlets stocking anti-malarials: Mobile providers, VMWs and retail outlets were the most common types of outlets stocking anti-malarials (Figure 1). Overall, the private sector constituted 66% of outlets stocking at least one anti-malarial. The private sector was the most common sector stocking anti-malarials in zones 2 and 3. In zone 1 (confirmed resistance) VMWs and public health facilities (PHFs) constituted 45% and 9% of all outlets stocking anti-malarials respectively.

Availability of ACTs: Over time, ACT availability has decreased in the private sector (Figure 2a). Between 2009 and 2011, there was an increase in non-artemisinin therapy, mostly chloroquine, in both PHF/VMW and private sectors. In 2011, availability of oral AMT was generally low with less than 5% in private and non-existent in public sector. The decrease in ACT availability in the private sector was significant for drug stores and retail outlets (Figure 2b).

Availability of diagnosis: Among outlets stocking anti-malarials, RDTs were more commonly available than microscopy across all outlet types. 44% of private outlets reported availability of any diagnostic testing, with about one-third stocking RDTs (Figure 3).

Price of anti-malarials: Nearly all anti-malarials in public health facilities were available for free, with over 90% of ASMQ distributed free of cost. In the private sector, ACTs were 3 times (\$1.72) more expensive than non-artemisinin therapy (mostly chloroquine).

Anti-malarial market share: the private sector continues to play a larger role than the PHF/VMW sector in the distribution of anti-malarials (Figure 4). In 2009 and 2011, 70% of anti-malarial volumes were delivered through the private sector. However, more ACT were distributed in 2009 compared to 2011 (72 vs. 41% of the market respectively). Market share of non-artemisinin therapy (mostly chloroquine) in the private sector increased from 19% in 2009 to 50% in 2011. The overall market share of oral artemisinin monotherapy reduced from 6.4% in 2009 to less than 1% in 2011.

DISCUSSION

The data confirm a lower market share for ACT in 2011 than in 2009. This may be a consequence of significantly lower ACT availability in certain private sector outlets (pharmacies/private clinics, drug stores and retail outlets), due to the reported stock out of *Malarine* in 2011. Maintaining a consistent supply of ACTs in Cambodia should improve access to ACTs.

LIMITATIONS

Providers may have misreported certain information, such as whether they stocked any anti-malarials or specific anti-malarial categories, given recent regulatory measures. Although interviewers stressed that they were not connected with any regulatory body, anti-malarial availability and stocks may have been under-reported.

Fig 1. Relative distribution of all outlets that had at least one anti-malarial in stock (2011)

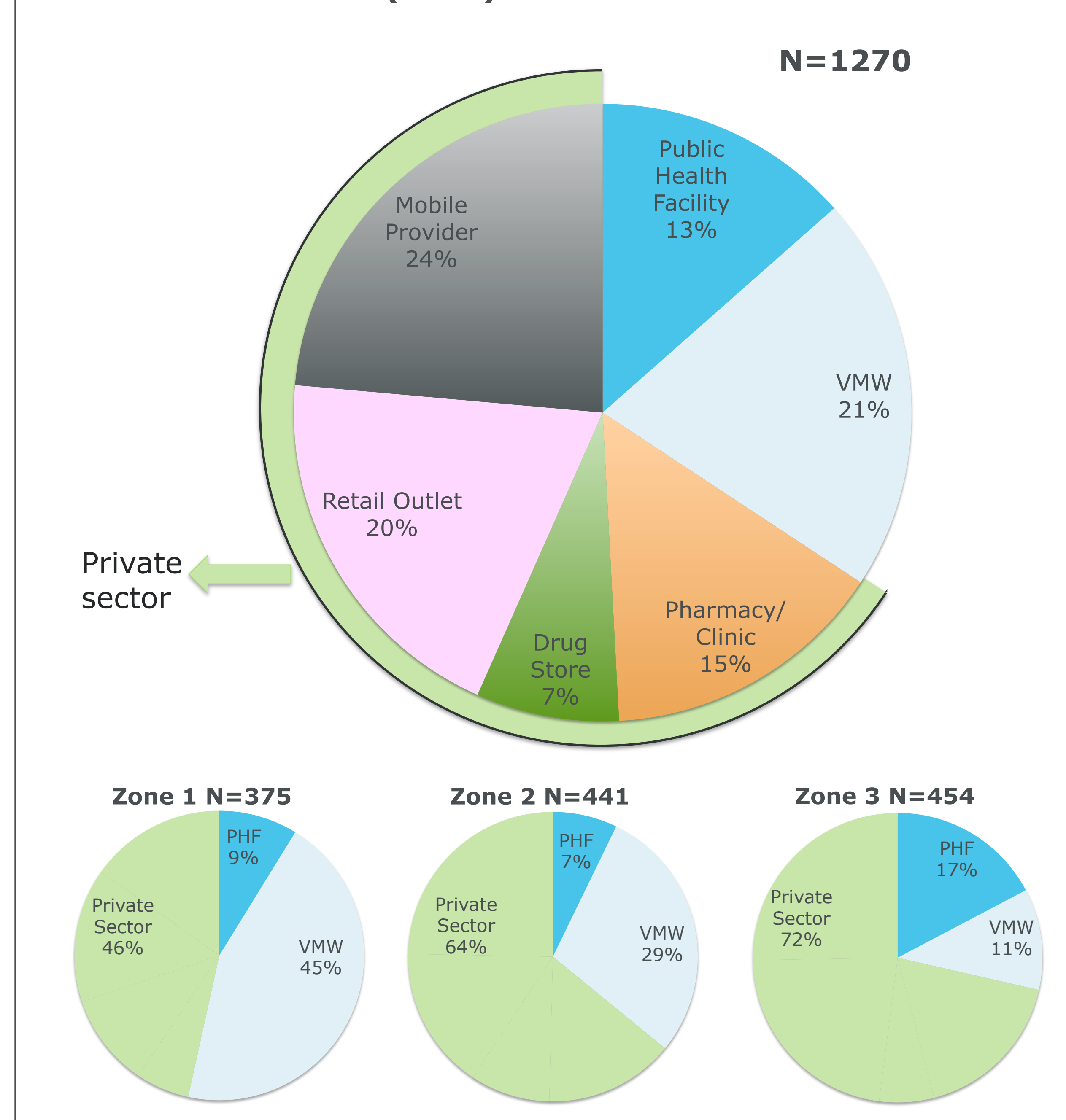


Fig 2a. Trends in availability, among outlets stocking anti-malarials

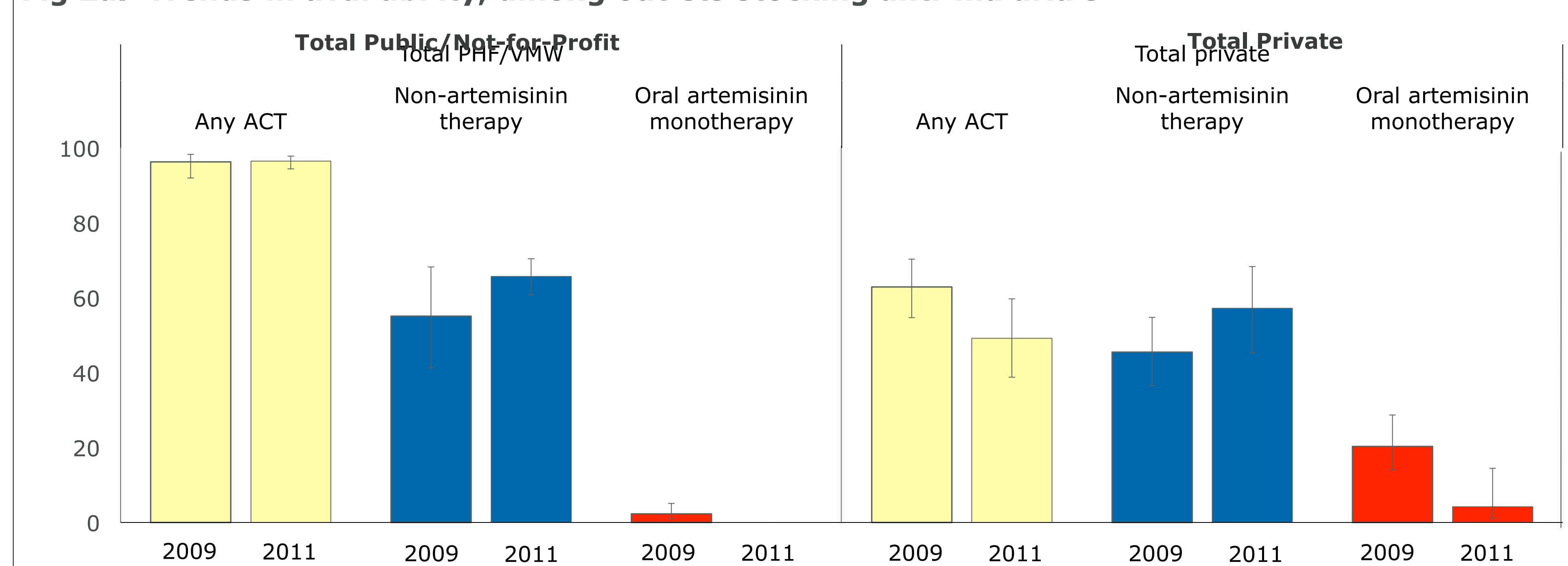


Fig 2b. Trends in availability of ACT, by outlet type among outlets stocking anti-malarials

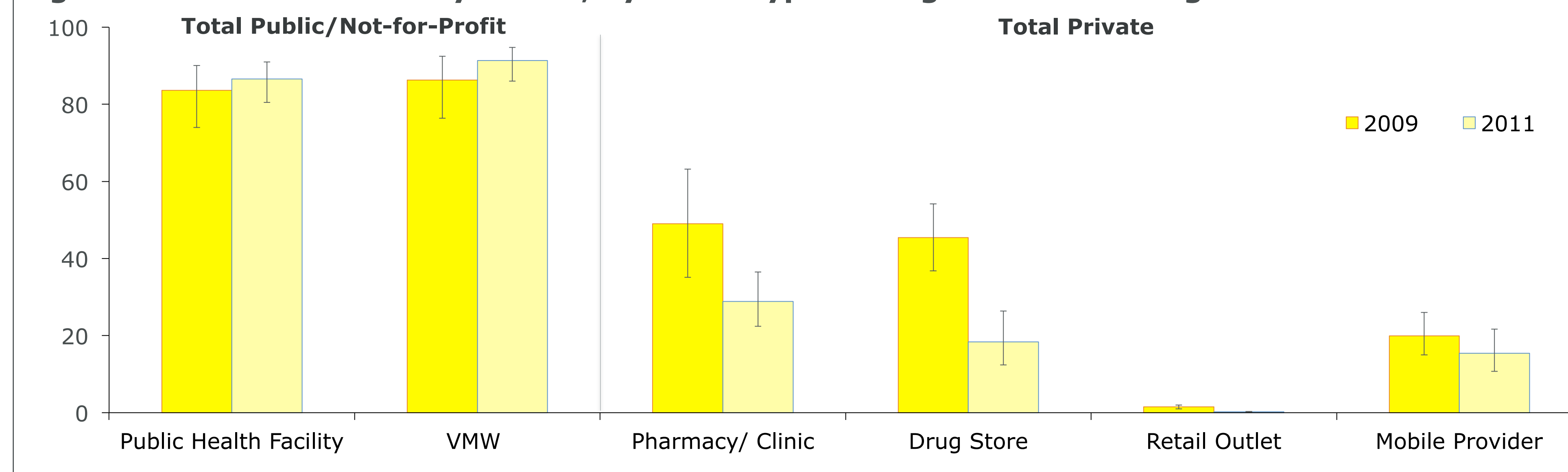


Fig 3. Availability of malaria diagnostic tests (2011)

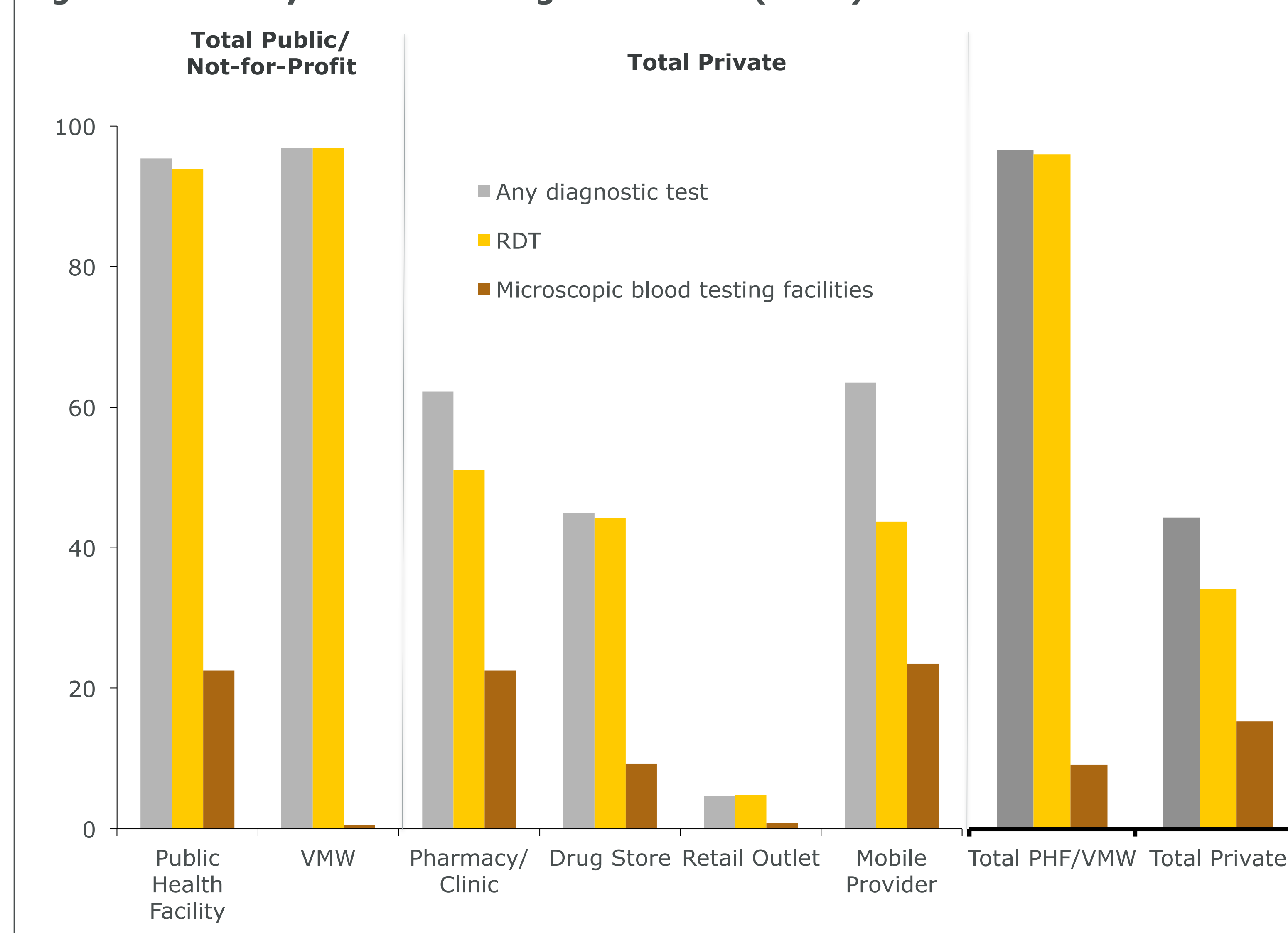
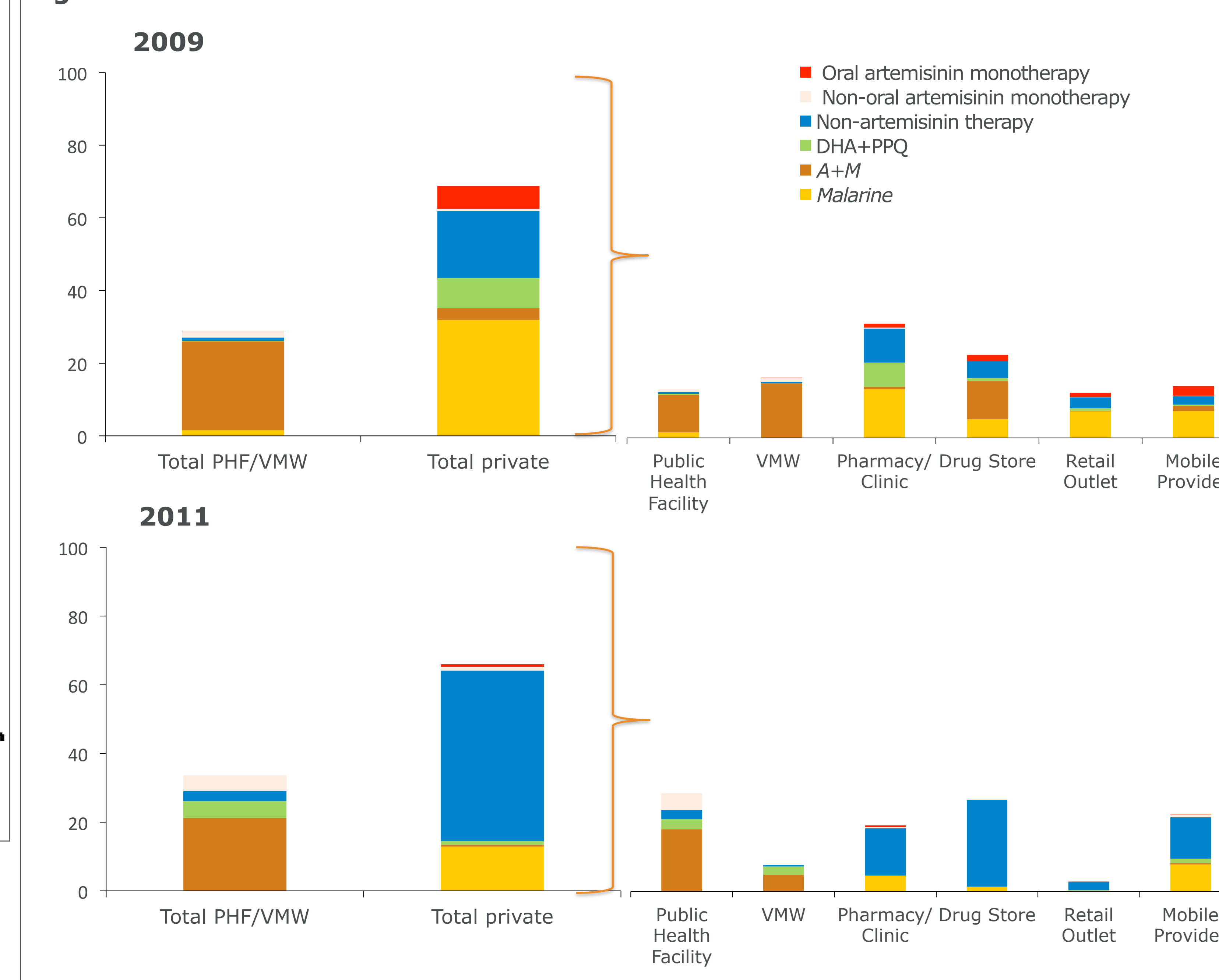


Fig 4. Trends in market share of anti-malarials



¹ Littrell et al., 2011. Case management of malaria fever in Cambodia: results from national anti-malarial outlet and household surveys. *Malaria Journal*, 10:327.