Thailand ACTwatch Outlet Survey Findings, 2016
Presentation outline

Background
ACTwatch project
Outlet survey methods

Results
Antimalarial availability
Antimalarial and diagnostic market composition
Antimalarial availability by class of drug
Diagnostic blood testing availability
Frequency of diagnostic blood testing and antimalarial distribution/provision
Diagnostic market share
Provider knowledge

Conclusions
Background
Thailand context
Timeline of events 2000-2016

- **2000**: 2-day ASMQ becomes first-line treatment for Pf malaria nationwide.
- **2001**: Presumptive treatment of malaria phased out.
- **2001**: Universal Care Scheme (UCS) implemented: health care free of charge for registered citizens in the public and private sectors.
- **2008**: Artemisinin resistance first detected along Thai-Cambodia border.
- **2008**: Electronic malaria information system (e-MIS) implemented to help identify and control resistance.
- **2008**: ASMQ first-line treatment changed from 2-day to 3-day course.
- **2009**: Artemisinin-resistance containment project begins in seven provinces along Thai-Cambodia border.
- **2008**: National guidelines stipulate that quinine and doxycycline should be used as treatment for severe malaria.
- **2008**: National guidelines stipulate that treatment of Pf malaria is chloroquine and primaquine (14 days).
- **2015**: Dihydropyrimidine (DHA PPQ) introduced as first-line treatment in eight of 29 malaria-endemic provinces (four from each border area).
- **2016**: DHA PPQ officially implemented as first-line treatment for Pf malaria nationwide.
National Strategic Plan for Malaria Control and Elimination in Thailand, 2011 - 2016

Targets:

1. Annual Parasite Incidence (API) (all species) per 1000 mid-year population among Thai + non Thai M1 migrants reduced from 0.4 per 1000 (baseline 2010) to 0.2 per 1000 population (2016)

2. Malaria Mortality Rate reduced from 0.14 per 100,000 (baseline 2010) to 0.05 per 100,000 population (2016)

3. Percent of districts achieving interruption of malaria transmission (no indigenous cases of malaria for three years) increased to 60% by 2016 and 80% by 2020
ACTwatch countries

Standardized malaria medicine & diagnostic evidence across 13 countries
ACTwatch relevancy in Thailand

- Various strategies have been implemented over the years to improve malaria case management in Thailand

- Future strategies are focused on the country’s efforts to eliminate malaria in 80% of the country by 2020

- ACTwatch evidence can help to monitor these strategies & identify where adjustments to policy, strategy and funding decisions may be needed.
Outlet Survey
Methods
Study population

Outlets with antimalarials or with malaria blood testing

or

Outlets that stocked an antimalarial in the past three months
What is an outlet?

Public Health Facility
Migrant Health Volunteer
Private Not For- Profit Facility

Private For- Profit Facility
Pharmacy
Drug Store

General Retailer
Itinerant Drug Vendor
What areas were selected?

- Stratification
  - Thai-Myanmar Domain
  - Thai-Cambodia Domain

- Representative sample of sub-districts
  - 97 sub-districts per domain (194 total)

- Booster for pharmacies in districts bordering Myanmar or Cambodia
How was the survey implemented?

- MOU signed with BVBD
- Stakeholder meeting to engage local government
- All study materials translated into Thai
  - Paper questionnaires back-translated for quality assurance
- 1-week training-of-trainers and 2-week fieldworker training
- Data collection from 9 February – 22 March 2016
How were outlets selected?
1) Complete census of all potentially eligible outlets
2) Screen for antimalarials in stock or malaria blood testing availability
3) When products are in stock: product audit
4) Product audit

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 = Yes 0 = No 8 = Don't know</td>
<td>1 = Tablet 2 = Suppository 3 = Granule</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Manufacturer

6. Country of manufacture

7. Package size
There are a total of [____] tablets/ suppositories/ granule sachets in each:
   1 = Package
   2 = Pot/tin
   3 = Spray
   4 = Sachet
   5 = Blisters
   6 = Wedges
   7 = Lozenges
   8 = Don’t know

8. Is product a fixed-dose combination (FDC)
1 = Yes
0 = No
8 = Don’t know

9. Does product have the Green leaf logo?
1 = Yes
0 = No
8 = Don’t know

10. Amount sold/distributed in the last 7 days to individual consumers
   (Record # packages / tins described in Q7 OR record the total # of tablets / suppositories / granule packs sold)
   This outlet sold [____] packages/ tins in the last 7 days
   OR
   This outlet sold [____] tablets/ suppositories or granule sachets in the last 7 days
   Not applicable = 995; Refused = 999; Don’t know = 998

11. Stocked out at any point in the past 3 months?
1 = Yes
0 = No
8 = Don’t know

12. Retail selling price
   [____] tablets, suppositories or granule sachets cost an individual customer
   1 = Yes
   0 = No
   8 = Don’t know
   Baht

13. Wholesale purchase price
   For the outlet’s most recent wholesale purchase
   [____] tablets, suppositories or granule sachets cost
   1 = Yes
   0 = No
   8 = Don’t know
   Baht

14. Why do you stock this medicine?
   Do not read list.
   Circle ALL responses given
   - Free supply
   - Profitable
   - Recommended by the government
   - Low price
   - Customer demand or preference
   - Positive brand reputation
   - Often prescribed by doctors
   - Most effective for treating malaria
   - Don’t know
   - Other
   - specify [____]

15. Comments

16. Is this a public health facility?
1 = Yes
0 = No
8 = Don’t know
If Yes then continue to the next audit sheet.

16a. Is this medicine a tablet?
1 = Yes
0 = No
8 = Don’t know
If No then continue to the next audit sheet.

16b. Does this medicine have only 1 active ingredient?
1 = Yes
0 = No
8 = Don’t know
If No then continue to the next audit sheet.

16c. Is the active ingredient one of the following?
- ARTEMETHER
- ARTESUNATE
- DIHYDROARTESININ
1 = Yes
0 = No
8 = Don’t know
If Yes then complete oral AMT module after “Antimalarial stock out section” completed.
Antimalarial product in stock

<table>
<thead>
<tr>
<th>Formulation (tablet, syrup, injection, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand/generic names</td>
</tr>
<tr>
<td>Strength</td>
</tr>
<tr>
<td>Manufacturer</td>
</tr>
<tr>
<td>Country of manufacture</td>
</tr>
<tr>
<td>Amount distributed in the past week</td>
</tr>
<tr>
<td>Retail &amp; wholesale price</td>
</tr>
</tbody>
</table>

mRDT product in stock
What kinds of products did interviewers audit?
Outlet survey sample

13,952 outlets enumerated

13,651 outlets screened

104 outlets met eligibility criteria

13,547 outlets did not meet eligibility criteria

104 outlets interviewed

301 outlets not screened

0 outlets not interviewed
Outlet categories for analysis

Public Sector (N=79)

Malaria Case Management (MCM)
Public Health Facility:
• Provincial Hospital
• District Hospital
• Malaria Clinic
• Malaria Post / Border Malaria Post
Sub-District Hospital

Private Sector (N=25)

Private For-Profit Health Facility
• Private hospital
• Private clinic
• Private diagnostic laboratory

Pharmacy

Drug Store

General Retailer
• Grocery store
• Village shop

Itinerant Drug Vendor

None eligible
### Outlet screening & eligibility by outlet type

#### Main sample

<table>
<thead>
<tr>
<th>Outlet Type</th>
<th>N</th>
<th>Outlets Screened</th>
<th>Met eligibility criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM Public Health Facility</td>
<td>71</td>
<td>68</td>
<td>66</td>
</tr>
<tr>
<td>Sub-District Hospital</td>
<td>287</td>
<td>222</td>
<td>13</td>
</tr>
<tr>
<td>Private for-Profit Health Facility</td>
<td>241</td>
<td>438</td>
<td>14</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>482</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Drug Store</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>General Retailer</td>
<td>12,718</td>
<td>12,505</td>
<td>0</td>
</tr>
<tr>
<td>Itinerant Drug Vendor</td>
<td>11</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Booster sample

<table>
<thead>
<tr>
<th>Outlet Type</th>
<th>N</th>
<th>Met eligibility criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>123</td>
<td>101</td>
</tr>
</tbody>
</table>

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No eligible drug stores, general retailers, or itinerant drug vendors
Outlets in the sample

104 outlets in the sample

91 outlets with antimalarials in stock on the day of the survey

1 outlet with antimalarials stocked in the last three months but not on the day of survey

12 outlets with malaria diagnostic tests but not antimalarials
What is the availability of antimalarials among the outlets?
Are antimalarials available in the public sector?
Availability of any antimalarial: public sector

Among all screened outlets

95% Antimalarial availability among MCM Public Health Facilities

4% Antimalarial availability among Sub-District Hospitals
How does antimalarial availability in the public sector compare with the private sector?
Availability of any antimalarial: public vs. private sector

Antimalarials only found in Private for-Profit Health Facilities and pharmacies

Private sector availability is much lower than public sector
Are there differences in antimalarial availability between domains?
Availability of any antimalarial: by domain

Slightly higher antimalarial availability in Thai-Myanmar Domain
insights

availability of any antimalarial in Thailand
Most MCM Public Health Facilities have antimalarials available

Very few Sub-District Hospitals have antimalarials

Most private sector outlets do not have antimalarials

Antimalarial availability is the same across Private for-Profit Health Facilities and Pharmacies (3%)

Availability of antimalarials is slightly higher in the Thai-Myanmar Domain
Antimalarial and malaria diagnostic market composition
Antimalarial market composition

Outlets with antimalarials

N=91
Antimalarial market composition

Among all outlets with at least one antimalarial in stock

N=91

88% public sector market composition

- MCM Public Health Facility
- Sub-District Hospital
Antimalarial market composition

12% private facilities & pharmacies

88% public sector market composition

N=91

Among all outlets with at least one antimalarial in stock
How does the market composition differ between domains?
Antimalarial market composition across domains

Pharmacies only contribute to the antimalarial market composition in the Thai-Myanmar Domain
How does the market composition differ between antimalarials and malaria diagnostics?
Among all outlets with ≥ 1 antimalarial and/or malaria test in stock

Antimalarial & malaria diagnostic market composition

- **Antimalarial**
  - N=91
  - MCM Public Health Facility
  - Sub-District Hospital
  - Private for-Profit Health Facility
  - Pharmacy

- **Blood Testing (RDT or microscopy)**
  - N=88

No pharmacies with malaria blood testing available
4 insights
antimalarial and diagnostic market composition in Thailand
Pharmacies only contribute to the antimalarial market composition in the Thai-Myanmar Domain.

The antimalarial and malaria diagnostic market compositions differ in that pharmacies do not contribute to the malaria diagnostic market composition.

Most of the market composition of antimalarial-stocking outlets is comprised of the public sector.

Pharmacies comprise a larger portion of the antimalarial market composition than Private for-Profit Health Facilities.
Among outlets with an antimalarial, what types of antimalarials were found?
Is the first-line treatment available?
Among all outlets with ≥ 1 antimalarial in stock

<table>
<thead>
<tr>
<th>Outlet Type</th>
<th>Percentage of Outlets</th>
<th>ASMQ Stocking</th>
<th>ASMQ &amp; Primaquine Stocking</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM Public Health Facility</td>
<td>67%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>Sub-District Hospital</td>
<td>80%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>Total Public Sector</td>
<td>70%</td>
<td>60%</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Availability of ASMQ/ASMQ + primaquine in the public sector**
(first line treatment for pf malaria)

67% of antimalarial-stocking public sector outlets had ASMQ

All ASMQ-stocking MCM Public Health Facilities also stocked primaquine
Among all outlets with ≥ 1 antimalarial in stock

Availability of ASMQ/ASMQ + primaquine in the private sector

3% of antimalarial-stocking private sector outlets had ASMQ

No antimalarial-stocking pharmacies stocked ASMQ
Availability of DHA PPQ/DHA PPQ + primaquine (first line treatment for pf malaria)

Only MCM Public Health Facilities were stocking DHA PPQ

Among all outlets with ≥ 1 antimalarial in stock, 6% of antimalarial-stocking MCM Public Health Facilities had DHA PPQ
Availability of chloroquine/chloroquine + primaquine in the public sector (first line treatment for pv malaria)

89% of antimalarial-stocking public sector outlets had chloroquine

CQ + primaquine availability higher in MCM Public Health Facilities
Among all outlets with ≥ 1 antimalarial in stock

Availability of chloroquine/chloroquine + primaquine in the private sector

73% of antimalarial-stocking private sector outlets had chloroquine

No pharmacies were stocking primaquine
Are there differences in first-line treatment availability between domains?
Availability of ASMQ: by domain

Among all outlets with ≥ 1 antimalarial in stock
Higher availability of ASMQ in Thai-Myanmar Domain among all public sector outlets
Availability of DHA PPQ: by domain

DHA PPQ only found in Thai-Cambodia Domain
Availability of chloroquine: by domain

Among all outlets with ≥ 1 antimalarial in stock
Availability of chloroquine: by domain

Chloroquine availability slightly higher in Thai-Cambodia Domain across both sectors.
To what extent is any antimalarial that is not on the national treatment guidelines in stock?
Availability of any antimalarial not in the national treatment guidelines

Mostly artemisinin tablets without mefloquine, doxycycline, or clindamycin or mefloquine tablets without artemisinin. Also hydroxychloroquine, chloroquine 150mg, and atovaquone-proguanil
Availability of any antimalarial not in the national treatment guidelines: by domain

Among all outlets with $\geq 1$ antimalarial in stock

Similar in public sector, but slightly higher in Thai-Cambodia Domain in private sector
What is the availability of treatment for severe malaria?
Availability of treatment for severe malaria

Among all outlets with ≥ 1 antimalarial in stock

21% of MCM Public Health Facilities stock first-line treatment for severe malaria

39% of Private for-Profit Health Facilities stock first-line treatment for severe malaria
5 insights

availability of different classes of antimalarials in Thailand
1. ASMQ is available in 67% of antimalarial-stocking public sector outlets, but only 3% of the antimalarial-stocking private sector. Availability is higher in the Thai-Myanmar Domain.

2. Availability of DHA PPQ is low, available at only 6% of MCM Public Health Facilities and only in the Thai-Cambodia Domain.

3. Chloroquine availability is relatively high across all outlets types in both sectors, but chloroquine + primaquine availability is more variable.

4. One in five MCM Public Health Facilities and nearly half of Private for-Profit Health Facilities were stocking an antimalarial not indicated in the national treatment guidelines (mostly AS without MQ, doxycycline, or clindamycin, or MQ without AS).

5. Availability of treatment for severe malaria was found in 21% of MCM Public Health Facilities and 39% of Private for-Profit Health Facilities.
What is the availability of malaria diagnostics among all outlets?
Availability of any malaria blood testing

Among all outlets with \( \geq 1 \) antimalarial in stock or in the past 3 months

95% of antimalarial-stocking public sector outlets had a malaria blood test available

Zero antimalarial-stocking pharmacies had a malaria blood test available
Availability of any malaria blood testing: by domain

Among all outlets with ≥ 1 antimalarial in stock or in the past 3 months

Malaria blood testing availability slightly higher in the Thai-Myanmar Domain among public sector outlets
What is the availability of malaria microscopy?
Availiability of malaria microscopy

Among all outlets with ≥ 1 antimalarial in stock or in the past 3 months

Malaria microscopy availability highest among Private for-Profit Health Facilities and MCM Public Health Facilities
What is the availability of malaria RDTs?
Availability of malaria RDTs

Among all outlets with ≥ 1 antimalarial in stock or in the past 3 months

Malaria RDT availability highest among antimalarial-stocking **Sub-District Hospitals** and Private for-Profit Health Facilities
What is the public and private sector readiness to manage malaria according to national treatment guidelines?
Percentage of antimalarial-stockling outlets with malaria blood testing, ASMQ or DHA PPQ, chloroquine, and primaquine in stock

Among all outlets with ≥ 1 antimalarial in stock

62% of antimalarial-stockling public sector outlets demonstrated readiness to manage both Pf and Pv malaria
How frequently are malaria tests provided/performed?
Outlets that provided a malaria test in the previous week

Among all outlets with ≥1 malaria test in stock

70% of MCM Public Health Facilities & 20% of Sub-District Hospitals with malaria blood testing available reported providing a malaria test in the previous week.

41% of the private sector reported providing a malaria test in the previous week.
More than half of public sector outlets with malaria diagnostic tests reported selling or providing a malaria test in the previous week.
How frequently are antimalarials distributed?
Outlets that distributed antimalarials in the previous week

Only 6% of antimalarial-stockling MCM Public Health Facilities reported distributing an antimalarial in the previous week.

19% of the private sector reported distributing an antimalarial in the previous week.
Less than 10% of public outlets with antimalarials reported distributing them in the previous week.
Provision of malaria blood testing & distribution of antimalarials

Provision of malaria blood testing was nine times higher than distribution of antimalarials, across all outlet types.
What is the malaria diagnostic market share between the public and private sectors?
Malaria Diagnostic Market Share

Relative sale/distribution of malaria tests in the last week

98% of malaria tests were distributed through the public sector.
Relative sale/distribution of malaria tests in the last week

Malaria Diagnostic Market Share

- 98% of malaria tests were distributed through the public sector.
- 97% of malaria tests were distributed through MCM Public Health Facilities.
Malaria Diagnostic Market Share

Relative sale/distribution of malaria tests in the last week

95% of malaria tests performed were microscopy
Relative sale/distribution of malaria tests in the last week

**Malaria Diagnostic Market Share**

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard Diagnostics</th>
<th>Asan</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCM Public Health Facility</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Sub-District Hospital</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Total Public</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Total Private</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Blood Test Total</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

91% of malaria RDTs performed were manufactured by Standard Diagnostics Inc.
insights
malaria diagnostics in Thailand
1. Most antimalarial-stocking public sector outlets & Private for-Profit Health Facilities have malaria blood testing available.

2. Malaria microscopy is available in 68% of MCM Public Health Facilities and 91% of Private for-Profit Health Facilities.

3. Malaria RDT availability was highest among Sub-District Hospitals (74%) and Private for-Profit Health Facilities (73%).

4. More than half of outlets with malaria diagnostics available reported providing a malaria diagnostic tests in the week prior to the survey.

5. Less than 10% of antimalarial-stocking outlets reported selling/distributing an antimalarial in the week prior to the survey.

6. Most of the diagnostic tests provided are microscopy, and 98% of the market share is through the public sector.
Do the providers working in antimalarial-stockling outlets know the correct first-line treatment for uncomplicated malaria?
Providers who correctly state the first-line treatment (ASMQ or DHA PPQ) for uncomplicated *Pf* malaria

Among all outlets with $\geq 1$ antimalarial or test in stock

73% of providers in antimalarial-stocking public sector outlets cited ASMQ

Almost zero in the private sector
Providers who correctly state the first-line treatment (ASMQ or DHA PPQ) for uncomplicated Pf malaria: by domain

Among all outlets with ≥ 1 antimalarial or test in stock

Provider knowledge higher in Thai-Myanmar Domain
Providers who correctly state the first-line treatment (chloroquine) for uncomplicated *Pv* malaria

Among all outlets with $\geq 1$ antimalarial or test in stock

82% of providers in antimalarial-stocking public sector outlets cited CQ
Providers who correctly state the first-line treatment (chloroquine) for uncomplicated \textit{Pv} malaria: by domain

Among all outlets with $\geq 1$ antimalarial or test in stock

Provider knowledge higher in Thai-Myanmar Domain
insights
provider knowledge
Provider knowledge of the first-line treatment for both \textit{Pf} and \textit{Pv} malaria was high in the public sector and low in the private sector.

More providers knew the first-line treatment for \textit{Pv} malaria compared to \textit{Pf} malaria.

Provider knowledge for both \textit{Pf} and \textit{Pv} malaria was higher in the Thai-Myanmar Domain.

Very few providers cited DHA PPQ as the first-line treatment for \textit{Pf} malaria.
Conclusions
Limitations

- If private sector providers were stocking antimalarials illicitly, they may have hidden them from interviewers.

- Timing of survey coincided with beginning of transition from ASMQ to DHA PPQ as first-line treatment – was not fully implemented in all study areas.

- Survey methods do not account for antimalarials that are used for treating other diseases (e.g. CQ and hydroxychloroquine) – leads to inclusion of some outlets that do not provide malaria case management.

- Some challenges with local languages/dialects (e.g. in Buriram, and some Karen villages in Tak province).
Summary of results

1. High availability of malaria diagnosis in public sector
   ✓ Almost all screened MCM Public Health Facilities were stocking at least one malaria blood test (microscopy or RDT)
   ✓ Two thirds of MCM Public Health Facilities had malaria microscopy available
   ✓ Among Sub-District Hospitals stocking an antimalarial, 74% were stocking malaria RDTs
Summary of results

2. Antimalarial availability is variable in the public sector

✓ Although almost all screened MCM Public Health Facilities were stocking at least one antimalarial, the type of antimalarials available in the public sector were variable:
  ➢ 67% stocking ASMQ
  ➢ 5% stocking DHA PPQ
  ➢ 89% stocking chloroquine

✓ Implication that patients testing positive for Pf malaria may need to be referred to a different public health facility to receive appropriate treatment.

Areas of note:

➢ One in five antimalarial-stocking MCM Public Health Facilities were stocking an antimalarial not in the national treatment guidelines (mostly artemisinin without mefloquine, clindamycin, or doxycycline, or mefloquine without artemisinin)

➢ 60% of MCM Public Health Facilities demonstrated readiness to treat both Pf and Pv malaria according to national treatment guidelines
3. **High provision of malaria blood tests, and (not but) low distribution of antimalarials**

- More than half of outlets stocking malaria blood testing reported administering a malaria blood test in the week prior to the survey
- Almost all of these tests were microscopy and in the public sector
- Less than 10% of antimalarial-stocking outlets reported distributing an antimalarial in the week prior to the survey

*Areas of note:*

- No antimalarial-stocking pharmacies had malaria blood testing available
Summary of results, cont’d

4. Provider knowledge of first-line treatment higher in the public sector

✓ 73% of public sector providers in antimalarial-stocking outlets correctly cited the first-line treatment for *Pf* malaria, and over 80% correctly cited the treatment for *Pv* malaria. However, first-line treatment that included mention of primaquine was lower.

✓ Almost no providers in antimalarial-stocking private sector outlets correctly stated the first-line treatment for *Pf* malaria, and only one third correctly stated the treatment for *Pv* malaria.
Summary of results, cont’d

4. The role of the private sector is limited, and for malaria case management mainly includes private for profit facilities:

Private for profit facilities:
- Over 70% stock both primaquine and CQ, but availability of first-line treatment for pf malaria was very low (10%).
- Availability of diagnosis was higher
- Due to low availability of ASMQ, only 10% of these facilities had readiness for malaria case management according to national guidelines.
- ADD SOMETHING ON KNOWLEDGE

Pharmacies
- These outlets only stock CQ (70%), but no primaquine.
- Malaria diagnosis was not available in pharmacies.
- It is postulated that these pharmacies may be stocking CQ for treatment of other diseases.
Summary of results, cont’d

5. Some differences between domains

✓ Antimalarial availability among all screened outlets slightly higher across all outlet types in Thai-Myanmar Domain

✓ Pharmacies comprise 12% of the antimalarial market composition in the Thai-Myanmar Domain but do not contribute to the Thai-Cambodia Domain

✓ Public sector provider knowledge of first-line treatments were higher in the Thai-Myanmar Domain for both Pf and Pv malaria
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