# Adherence of Private General Practitioners to National Guidelines for Diagnosis and Treatment of Uncomplicated Malaria in Myanmar

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# BACKGROUND

# Myanmar: Malaria & Private Health Sector

- Malaria morbidity and mortality could have decreased by 50 % as an achievement for malaria target of MDG6 since 2007

- One of "the five countries of Greater Mekong Subregion (GMS) facing multidrug resistance which include *Plasmodium falciparum* (*P. falciparum*) resistance to artemisinin and partner drug"

- 60-75 % of total population receive health care from the private health sector

- In 2012 and 2015, Less than half of private health facilities had diagnostic services and first-line antimalarials while over 90% of public health facilities had those.

# Private Health Sector

General Practitioners in the private health sector

➢ less likely to adhere to the national malaria treatment guidelines, compared to those in the public sector

➢ Facing various constraints to provide quality care

➢ Responding patient demand and concerned popularity in competitive health delivery areas

❑ Public-Private Mix (PPM) has become a prerequisite to empower private health sector and to scale up sustainable health program by utilizing resources from both public and private sectors.

# PPM for malaria control and elimination

- In Myanmar, two NGOs have been contributing to national malaria priorities by empowering private general practitioners (GPs):

  - Population Services International Myanmar
  - Myanmar Medical Association

# National Guidelines for Diagnosis and Treatment of Uncomplicated Malaria in Myanmar

- Mainly in line with WHO recommendation

**Diagnosis**

- Parasitological diagnosis (microscopy or RDT) to confirm suspected malaria cases

**Treatment of uncomplicated *Plasmodium falciparum* malaria**

- Artemisinin-based combination therapy (ACT) and
- Single-dose primaquine treatment

**Treatment of uncomplicated non-*P. falciparum* malaria**

- Chloroquine  and
- Primaquine treatment for 14 days for *Plasmodium vivax (P. vivax)* and *Plasmodium ovale (P. ovale)* malaria.

# Justification

1. Crucial to **understand specific barriers and assistance needed** for better adherence to treatment guidelines

2. Few studies have been conducted to **assess adherence of dosing treatment guidelines**

3. **Studies on primaquine guidelines are still limited**, particularly after single-dose primaquine guideline was introduced.

4. Limited studies have been done to assess guideline adherence after PPM programs for private GPs started in Myanmar
   **GPs:**
   **- who participate in PPM (member GPs) v.s.**
   **- who don't participate in PPM (non-member GPs)**

# Objective

❖ To identify the **extent** of and **factors** associated with private general practitioners' adherence to the national guidelines for diagnosis and treatment of uncomplicated malaria

# METHODS

**Study design:** a facility-based cross-sectional study

**Study area**

- Mon State (10 townships) and Tanintharyi Region (10 townships)

- Registered private health facilities
  - 236 in Mon State
  - 65 in Tanintharyi Region

- All townships are classified as Tier 1 areas
  - ❖ strong evidence of artemisinin resistance

**Study period**: August to September 2015

# Participants

**Inclusion criteria**

- **member and non-member GPs**
- holding medical license and practicing for-profit health care services in **private outpatient health facilities**
- treated **malaria cases within the last two years**

**Exclusion criteria**

- private GPs (project staff) who were practicing health care in project clinics of NGOs and International NGOs

**Sampling procedure**

- aimed at recruiting all registered GPs (301) in study areas
- difficult access to health facilities and absence of malaria cases in some parts of the study area

  → Interviewed **189** general practitioners

# Measures

Face-to-face interview, using semi-structured questionnaire

**Dependent variables = Adherence to national guidelines of**

1. Diagnosis
   - Routine use of parasitogical diagnosis (RDT or microscopy) and avoidance of presumptive treatment
     - *Avoidance of antimalarial treatment to negative test results*

2. Treatment of uncomplicated *P. falciparum* malaria
   - Use of recommended ACT in correct regimen
   - Use of single-dose primaquine in correct regimen

3. Treatment of uncomplicated *P. vivax* malaria
   - Use of chloroquine in correct regimen
   - Use of primaquine in correct regimen

# Independent variables

- Socio-demographic characteristics: Age, Sex, residence, Year of practice

- Knowledge on treatment guidelines for uncomplicated malaria

- Availability of resources for diagnosis and treatment: Standard treatment guideline, RDT, antimalarials

- Organizational factor: Participation in PPM

- Technical support: Trainings, Supervision, Feedback

# Data analysis

- Descriptive analysis

- Bivariate analysis

- Multiple logistic regression analysis was used to find out the factors associated with dependent variables

- Significant level was set at p-value of $<0.05$.

- All data analysis was done using STATA 13

# Ethical consideration

- Ethical approval was obtained from Research Ethics Committee of the Graduate School of Medicine, the University of Tokyo and Ethics Review Committee, Department of Medical Research, Myanmar.

- Approval from the Department of Medical Services, MOHS was requested for conducting the study on private GPs.

- Written informed consent was obtained from all participants

- After conducting survey, guideline reference books were provided to participants who were unable to access it.

# RESULTS

## Table1. Socio-demographic characteristics and technical support received by GPs

| Variables | Total (n=189) | | Member GPs (n=84) | | Non-member GPs (n=105) | | p-value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| **Gender** | | | | | | | |
| Male | 127 | 67.2 | 58 | 69.1 | 69 | 65.7 | 0.628 |
| Female | 62 | 32.8 | 26 | 30.9 | 36 | 34.3 | |
| **State/ Region** | | | | | | | |
| Tanintharyi Region | 40 | 21.2 | 22 | 26.2 | 18 | 17.1 | 0.130 |
| Mon State | 149 | 78.8 | 62 | 73.8 | 87 | 82.9 | |
| **Experience as general practitioners (year)** | | | | | | | |
| ≤ 6 years | 59 | 31.2 | 21 | 25.0 | 38 | 36.2 | 0.073 |
| 7-29 years | 65 | 34.4 | 27 | 32.1 | 38 | 36.2 | |
| ≥ 30 years | 65 | 34.4 | 36 | 42.9 | 29 | 27.6 | |
| **Participation of seminars or trainings in 2011 or more recently** | | | | | | | |
| Yes | 140 | 74.1 | 78 | 92.9 | 62 | 59.1 | <0.001 |
| No | 49 | 25.9 | 6 | 7.1 | 43 | 40.9 | |
| **Supervision visit within 6 months** | | | | | | | |
| Yes | 71 | 37.6 | 69 | 82.1 | 2 | 1.9 | <0.001* |
| No | 118 | 62.4 | 15 | 17.9 | 103 | 98.1 | |

*Fisher's exact test p-value

## Table 2. Availability of resources for diagnosis and treatment of malaria

| Variables | Total (n=189) | | Member GPs (n=84) | | Non-member GPs (n=105) | | p-value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | | % | |
| **Availability of RDT** | | | | | | | |
| Yes | 112 | 59.3 | 82 | 97.6 | 30 | 28.6 | <0.001* |
| No | 77 | 40.7 | 2 | 2.4 | 75 | 71.4 | |
| **Availability of ACT** | | | | | | | |
| Yes | 124 | 65.6 | 78 | 92.9 | 46 | 43.8 | <0.001 |
| No | 65 | 34.4 | 6 | 7.1 | 59 | 56.2 | |
| **Availability of chloroquine** | | | | | | | |
| Yes | 105 | 55.6 | 80 | 95.2 | 25 | 23.8 | <0.001* |
| No | 84 | 44.4 | 4 | 4.8 | 80 | 76.2 | |
| **Availability of oral artemisinin-based monotherapy** | | | | | | | |
| Yes | 15 | 7.9 | 4 | 4.8 | 11 | 10.5 | 0.182* |
| No | 174 | 92.1 | 80 | 95.2 | 94 | 89.5 | |
| **Availability of primaquine** | | | | | | | |
| Yes | 96 | 50.8 | 77 | 91.7 | 19 | 18.1 | <0.001 |
| No | 93 | 49.2 | 7 | 8.3 | 86 | 81.9 | |
| **Availability of standard treatment guideline** | | | | | | | |
| Yes | 135 | 74.2 | 83 | 98.8 | 52 | 53.1 | <0.001* |
| No | 47 | 25.8 | 1 | 1.2 | 46 | 46.9 | |

*Fisher's exact test p-value

## Table 3. Knowledge of GPs on national guideline for treatment of uncomplicated malaria

| Variables | Total (n=189) | | Member GPs (n=84) | | Non-member GPs (n=105) | | p-value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| Knowing at least one of first-line drugs for uncomplicated *P.falciparium* malaria | | | | | | | |
| Yes | 123 | 65.1 | 71 | 84.5 | 52 | 49.5 | <0.001 |
| No | 66 | 34.9 | 13 | 15.5 | 53 | 50.5 | |
| Knowing first-line drug for uncomplicated *P.vivax* malaria | | | | | | | |
| Yes | 121 | 64 | 75 | 89.3 | 46 | 43.8 | <0.001 |
| No | 68 | 36 | 9 | 10.7 | 59 | 56.2 | |
| Knowing that primaquine is recommended in *P.falciparum* malaria | | | | | | | |
| Yes | 130 | 68.8 | 80 | 95.2 | 50 | 47.6 | <0.001* |
| No | 59 | 31.2 | 4 | 4.8 | 55 | 52.4 | |
| Knowing that primaquine is recommended in *P.vivax* malaria | | | | | | | |
| Yes | 157 | 83.1 | 80 | 95.2 | 77 | 73.3 | <0.001* |
| No | 32 | 16.9 | 4 | 4.8 | 28 | 26.7 | |

*Fisher's exact test p-value

# Fig 1 Adherence to diagnostic guidelines
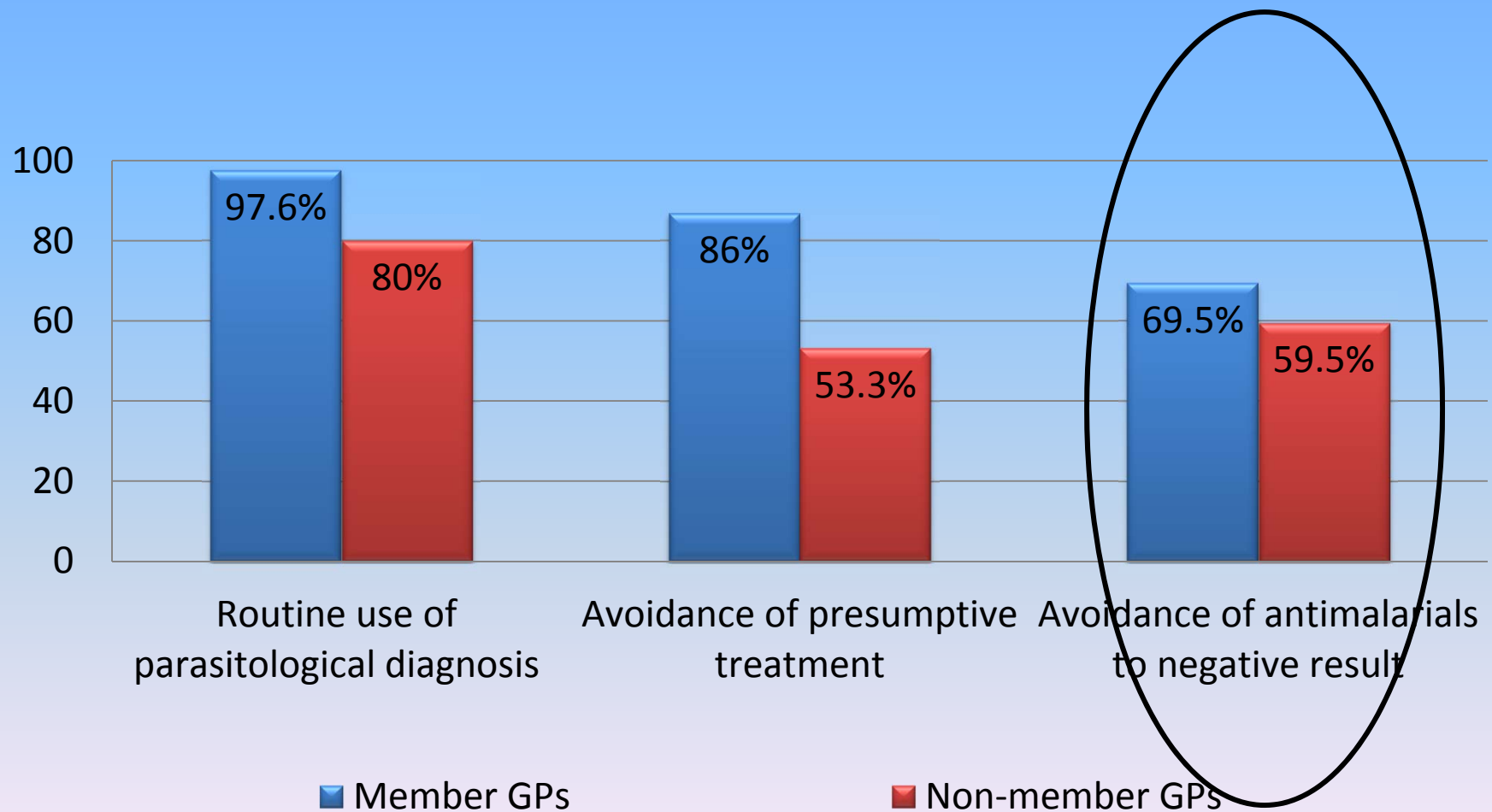
Routine use of parasitological diagnosis — Member GPs: 97.6%, Non-member GPs: 80%

Avoidance of presumptive treatment — Member GPs: 86%, Non-member GPs: 53.3%

Avoidance of antimalarials to negative result — Member GPs: 69.5%, Non-member GPs: 59.5%

■ Member GPs   ■ Non-member GPs

Fig 2 Adherence to treatment guideline for uncomplicated *P. falciparum* malaria

| | ACT | Single-dose primaquine | P. falciparum treatment |
|---|---|---|---|
| Member GPs | 95% | 82.5% | 78.7% |
| Non-member GPs | 58.7% | 8.7% | 8.7% |
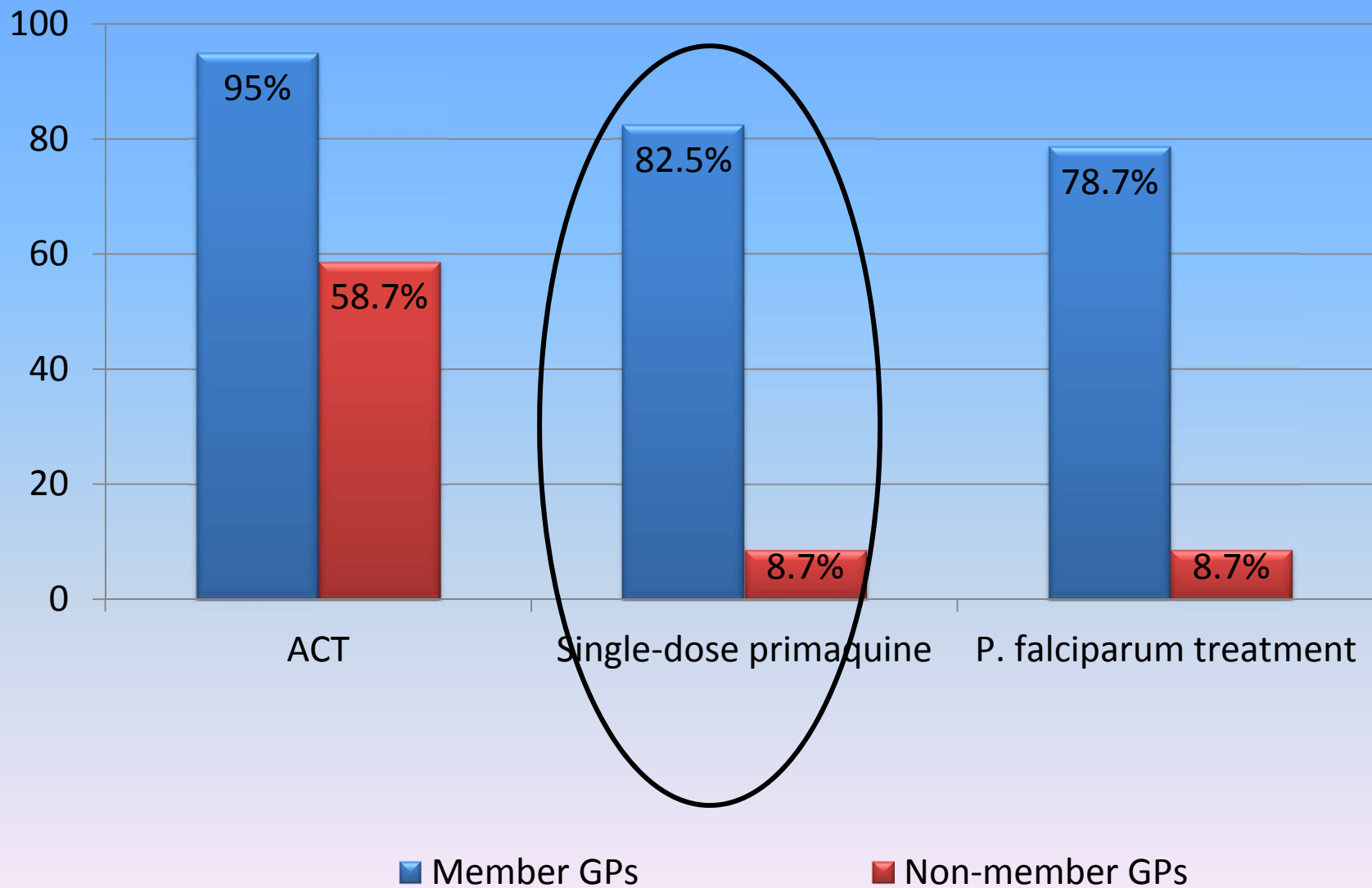
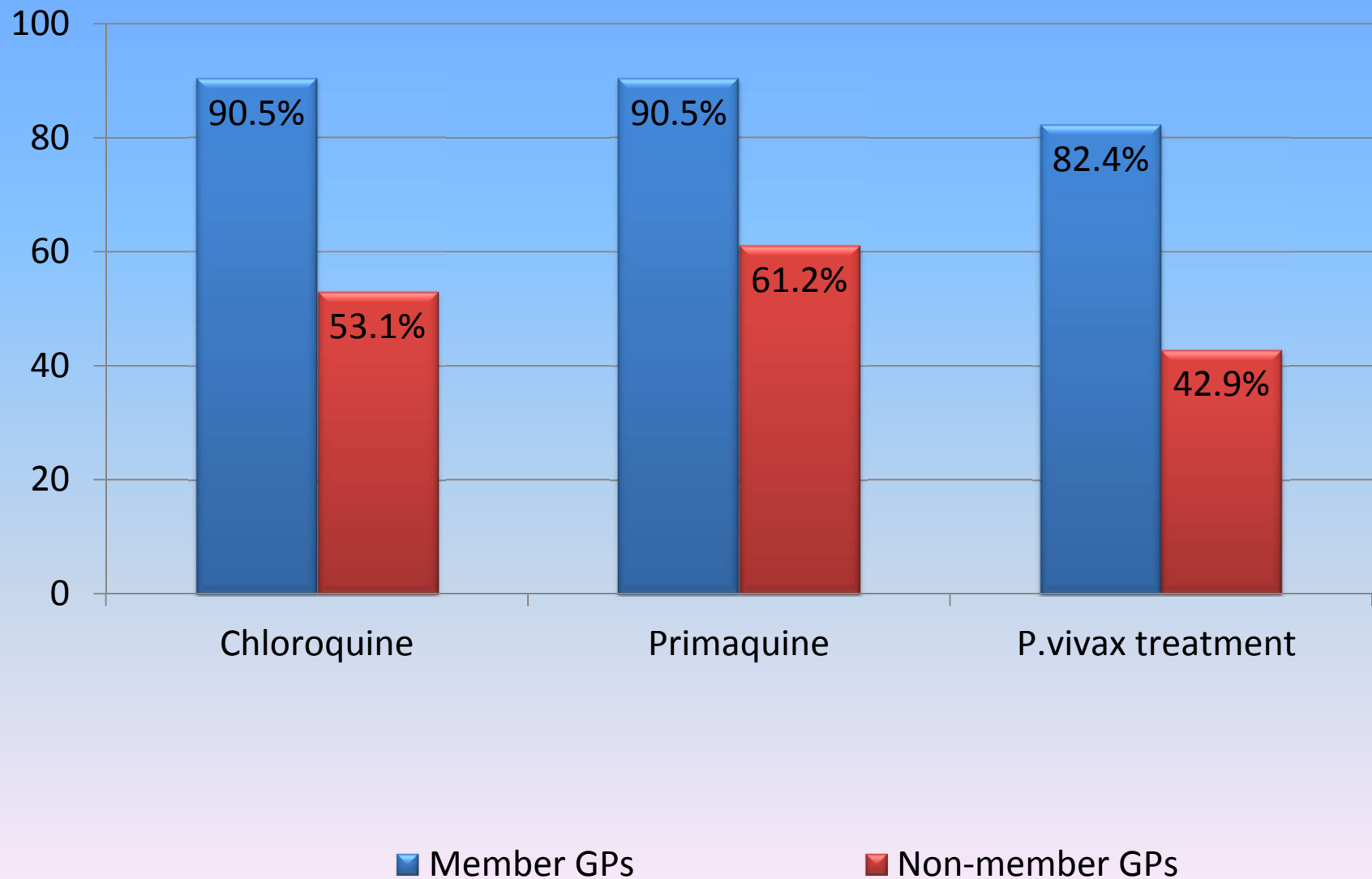Fig 3 Adherence to treatment guideline for uncomplicated *P. vivax* malaria

**Table 4 Determinants for adherence to national guidelines for diagnosis and treatment of uncomplicated malaria**

| Variables | Diagnosis | Treatment for *P. falciparum* | Treatment for *P. vivax* |
|---|---|---|---|
| | AOR (95% CI) | AOR (95% CI) | AOR (95% CI) |
| **Participation in PPM** | **4.58 (1.22-16.97)*** | **9.45 (2.60-34.41)*** | 0.67 (0.16-2.93) |
| **Participation in training and seminars** | 1.73 (0.78-3.86) | 2.85 (0.63-12.81) | **4.13 (1.24-13.68)*** |
| **Knowledge on national malaria treatment guidelines** | 1.67 (0.68-4.10) | 2.37 (0.84-6.63) | **5.37 (1.79-16.10)*** |
| **State/Region** | 0.58 (0.22-1.55) | **0.27 (0.08-0.91)*** | 0.58 (0.18-1.88) |
| Availability of resources for Dx and treatment | 0.60 (0.17-2.14) | 2.13 (0.62-7.30) | 2.25 (0.62-8.13) |
| Availability of standard treatment guideline | 1.32 (0.58-3.02) | 7.56 (0.82-69.86) | 3.48 (0.87-13.92) |

AOR: adjusted odds ratio; CI: Confidence Interval; *p value < 0.05

# DISCUSSIONS

# Challenges in adherence to guidelines

➢ **Only 41% followed *P. falciparum* treatment guideline**

➢ **Only 8% of non-member GPs adhered to single-dose primaquine guideline**

▪ low awareness to guideline

▪ concern about side effects of primaquine

▪ difficulty in accessing primaquine in the market

➢ **About 30-35% practiced presumptive treatment and prescription of antimalarials to negative test results**

▪ Similar to previous studies

<div align="right">Anasah 2010, Chinkhumba 2010, Ezenduka 2014</div>

▪ Possible reasons: supply issue, low trust of providers on reliability of tests and relying clinical judgment

<div align="right">Uzochukwu 2010, Bilal 2015</div>

# Participation in PPM programs

PPM programs associated with adherence to all guidelines

- Availability of diagnostic equipment and antimalarial drugs

- Higher knowledge on treatment guidelines


- In a previous qualitative study conducted in Myanmar, member GPs reported improved clinical skills on diagnosis and treatment after joining these programs

O'Conneal 2011

# Importance of knowledge and knowledge-dissemination training/seminar

- Training was an important factor to adhere to diagnostic and treatment guidelines for uncomplicated *P. vivax* malaria
  - Effectiveness of trainings on guideline adherence was also shown in some previous literature

  Zurovac 2004, Watsierah 2012, Aung 2015

- This study showed much lower knowledge on recommended treatment guideline among non-member GPs (<50%) compared to that reported in previous literature in other countries

  Zurovac 2015, Kalilani-Phiri  2011

# Study limitations

- Generalisability

- Self-reported information

- Recall-bias

- Courtesy bias

# Recommendations

- Malaria case management in the private sector needs to be promoted by **scaling up PPM programs**, which can lead to the improvement of accessibility and affordability of RDTs and recommended antimalarials.

- **Knowledge on treatment guidelines** should be improved among GPs.

- **Training and seminars** need to be conducted to improve awareness of the updated guidelines.

- → These measures could improve general practitioners' adherence to the national malaria treatment guidelines and their effectiveness in diagnosing and treating malaria cases at the community level.

# Acknowledgement

# THANK YOU FOR YOUR ATTENTION