Independent Evaluation of Artemisinin Monotherapy Replacement in the Private Sector to Support the Containment of Artemisinin Resistant Malaria in Burma

Burma AMTR Evaluation

DFID Global Evaluation Framework
PO 6073

Inception Report and Evaluation Framework

Final Version

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Montrose

Tropical Health

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CONTENTS

1 EXECUTIVE SUMMARY

As part of the Global Evaluation Framework Agreement (GEFA PO 6073) The UK Department for International Development has contracted an independent evaluation of the project "Replacement of malaria monotherapy drugs in the private sector to support the containment of drug resistant malaria in eastern Burma" in short called "Artemisinin monotherapy replacement" project. Initial visits of the evaluation team took place in June and July with the following objectives:

- Introduce the evaluation and team to DFID-Burma, PSI and stakeholders
- Finalize the evaluation framework
- Assess the current situation with a focus on requirements for the evaluation
- Develop – jointly with PSI – a Value For Money plan that will ensure all relevant costing data for an effective VFM assessment will be available

The **evaluation framework** starts out with the theory of change underlying the PSI project. The core problem is the existence and potential spread in the Greater Mekong Sub-region of artemisinin resistant malaria parasites of the species *Plasmodium falciparum*. The agreed strategy for containment of this threat is ideally the elimination of malaria caused by *P. falciparum* in the area, and short of that, the reduction of the parasite pool and prevention of spread to unaffected areas. A significant contributor to the emergence and spread of resistance is the treatment of malaria cases with incomplete courses of oral Artemisinin monotherapy. Based on the initial assessment that most (approximately 80%) malaria in Burma is caused by *P. falciparum*; >70% of treatments are obtained from the private sector; and approximately 70% of these treatments are Artemisinin monotherapy (AMT) (often in partial doses), the replacement of AMT with quality assured artemisinin combination therapy (ACT) in the private sector, combined with improved access to diagnosis and use of complete treatment courses by the consumers is thought to significantly contribute to resistance containment.

Given that the evaluation relies on data collected by PSI and other partners, the **evaluation questions** need to take this data availability into account. The evaluation questions are summarized in the table below and organized into three levels. Firstly, the immediate outcomes that can be mainly controlled by PSI, secondly, the impact level to which the PSI project contributes but which needs significant other interventions (such as vector control) to be achieved, and finally the long-term perspective of the Burmese private sector in malaria treatments which will extend beyond the actual PSI project.

Level	Evaluation questions
1. Outputs, outcomes and effects at outlet and consumer level where PSI has a significant influence on results	1a. Has the replacement of oral Artemisinin monotherapy with quality-assured ACT in the private sector and particularly in the primary target outlets (pharmacies, itinerant drug vendors and general shops) been achieved? Comparing outputs and outcomes to targets.
	1b. Has the proportion of people with fever who are treated with full course of QA-ACT increased? 1c. Conversely, has the proportion treated with AMT declined or even disappeared?
	1d. Has the need for a diagnostic test prior to malaria treatment been established amongst providers (outlets) and amongst clients, and are RDT available in the private sector and used?
	1e. What influence did the BCC activities of PSI have on consumer behaviour?

Level	Evaluation questions
2. Impact level where external factors and additional interventions are needed to achieve results	2a. Has the pool of potentially artemisinin-resistant *P.falciparum* strains in tier 1 of the MARC project been reduced? 2b. Has a spread to other areas been prevented? 2c. What is the contribution of the AMTR project?
	2d. How many DALYs have been averted by the PSI project and what proportion can be attributed to the DFID contribution to the project?
3. Long-term perspective beyond the PSI project	3a. What is the anticipated development of the private sector malaria treatments after the PSI project in the medium and long-term? 3b.What will be the potential role of the private sector in malaria control in general?

These evaluation questions based on PSI data and triangulated with data from other sources will be complemented by work undertaken by the evaluation team itself in the form of case studies and working papers. These have the objective to present lessons learnt from the PSI activities to a broader audience and also to highlight specific problems and present possible strategies for their solution. The topics for these complementary studies include:

- The challenges and possible solutions for the establishment of a market of rapid diagnostic tests (RDT) in the different outlets within the private sector
- The limitations and perceptions of different actors for the introduction of an additional dose of primaquine to the standard treatment with ACT in the private sector
- A long-term outlook regarding the potential market for anti-malaria and/or RDT for the private sector, and a general supporting role for business in malaria control in the country
- An overall summary of the experience gained by PSI in the replacement project and how this could be applied in other settings

Given the design of the three major surveys – outlet, household and mystery client – undertaken by PSI at baseline, midterm and at the end of the project, the **evaluation design** is primarily a **before-after** comparison, with a plausibility argument with respect to the PSI contribution to observed changes based on input-process and output data. In addition, for the activities of the PSI product promoters who support the establishment of QA ACT in the private market, there is a control group from outside the PSI project area that will allow a **counterfactual** for this specific aspect of the intervention.

The **initial situation analysis** finds that as more data becomes available, some of the assumptions made initially have to be revised: malaria incidence is rapidly declining, the relative proportion of *P. falciparum* as compared to *P. vivax* is decreasing and the relative proportion of AMT in the private sector is not quite as high as expected as there are still many non-artemisinin treatments available. This implies that the overall output (number of ACT treatments etc.) of the project, and its impact on transmission and resistance will be less than anticipated. However, this does not change the relevance of the theory of change and the importance of the PSI project contribution. These observations also increase the importance of rolling out RDT use in the private sector as quickly as possible in order to avoid wastage of ACT, and also to provide adequate treatment for *P. vivax* cases. These two aspects will be the major challenges in the near future.

In spite of some delays, all major interventions are in place so that a positive result is very likely. Similarly, the survey design and implementation is of sufficient quality, with overall adequate questionnaire tools and analysis procedures to provide the data necessary for this evaluation.

2 ACRONYMS

ACT	Artemisinin Combination Therapy
AMT	Artemisinin Monotherapy
AMTR	Artemisinin Monotherapy Replacement
ATL	Above-the-line
BCC	Behavioural Change Communication
BMGF	Bill & Melinda Gates Foundation
BTL	Below-the-line
DAC	Development Assistance Committee
DALY	Disability-adjusted Life Year
DFID	(UK) Department for International Development
GEFA	Global Evaluation Framework Agreement
FGD	Focus Group Discussion
IDV	Itinerant Drug Vendor
IRS	Indoor Residual Spraying
IPC	Inter-personal Communicator
KAP	Knowledge, Attitudes, Beliefs
LLIN	Long-Lasting Insecticidal Nets
LLP	Limited Liability Partnership
M&E	Monitoring & Evaluation
MARC	Myanmar Artemisinin Resistance Containment
MoH	Ministry of Health
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PAR	Participatory Action Research
P.f.	Plasmodium falciparum
PSI	Population Services International
QA-ACT	Quality-assured ACT
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RMP	Risk Management Plan
TES	Therapeutic Effectiveness Study
VFM	Value for Money
WHO	Wold Health Organization
WHOPES	WHO Pesticide Evaluation Scheme

3 INTRODUCTION

In May 2013 the UK Department for International Development contracted an independent evaluation of the project "Replacement of malaria monotherapy drugs in the private sector to support the containment of drug resistant malaria in eastern Burma" (in short called "Artemisinin monotherapy replacement" project) as part of the Global Evaluation Framework Agreement (GEFA PO 6073). This project is co-funded by DFID and the Bill and Melinda Gates Foundation (BMGF). It started implementation in March 2012 and will end in December 2014.

The first task of the independent evaluation team led by Montrose International LLP was to establish contact with all relevant stakeholders in Burma and develop a draft evaluation framework to be submitted as part of the inception report within the first three months of the evaluation. For this purpose, two visits to Burma were undertaken by the evaluation team. The first visit took place between 9 and 18 June 2013 and included Janice Moore, Programmes and Operations Director of Montrose, Kelly Macdonald, In Country Co-ordinator and David Toomey, economist and Value-For-Money expert. The second visit took place from 14 to 24 July 2013 and included Albert Kilian, technical team leader, Karen Bulsara, private sector specialist, Rubaiyath Sarwar, supply chain expert, and Win Maung, local consultant and health and migration expert.

Building on the findings from these two field visits, and further discussions with members of the evaluation steering committee, this inception report includes three major parts: first we present our draft evaluation framework that – starting from the theory of change – presents the main evaluation questions and indicators as well as data sources and the general evaluation design. Secondly, we provide an initial assessment of the situation on the ground with a focus on whether, and to what extent, initial assumptions underlying the theory of change are still valid and what this means for the relevance of the theory of change. It also looks at the question of whether interventions currently in place are likely to be sufficient to achieve the results expected, and whether data collection systems and tools used by PSI are adequate. The third part of the report presents the proposed case studies and working papers that will be undertaken by the evaluation team, and which are intended to highlight and present specific aspects of the evaluation to broader audiences, and complement the monitoring and evaluation work of PSI.

The evaluations will also factor in additional considerations, including outcomes amongst different social and economic strata, vulnerable groups included in the PSI project, and contextually-specific gender issues.

4 EVALUATION FRAMEWORK

4.1 The Theory of Change

The Division of Evaluation of the UK Department for International Development has recently commissioned a review of the use of the 'Theory of Change' in international development [1] as an attempt to better position this methodology which "is increasingly regarded as an essential tool in designing and appreciating the complex network of factors which influence project outcomes". In this context 'Theory of Change' does not refer simply to the statement of a problem and the rationale for an intervention to impact on that problem, but rather describes a process that accompanies a project from beginning to end.

In the case of the "Artemisinin monotherapy replacement" project such an approach has not yet been applied, and the theory of change is only implicitly stated in the DFID business case for the project and the PSI proposal to DFID and the Bill and Melinda Gates Foundation, with critical assumptions underlying the PSI projections presented in Annex G of that proposal.

The core problem that is being addressed is the emergence in Southeast Asia of malaria parasites of the species *Plasmodium falciparum*– the pathogen causing the potentially more severe form of 'tropical malaria' - that are resistant to Artemisinin derivatives, a group of anti-malarials that form the mainstay of malaria treatment today. Resistance has first been documented in Cambodia and Thailand but more recently also in Vietnam and in Southeast Burma [2, 3]. Based on the history of the spread of anti-malarial resistance in the past, the fear is that, favoured by migration patterns and economic activities in the area, such Artemisinin-resistant parasites could spread via India to Africa and once established there could cause a significant problem for the progress of malaria control towards elimination and eventual eradication[1].

This problem has triggered a very broad and intensive response from countries of the Greater Mekong Sub-region and the international community which is reflected in the WHO Global Plan on Artemisinin Resistance Containment [4], the Regional Framework for Emergency Response to Artemisinin Resistance [3] and specifically for Burma the Myanmar Artemisinin Resistance Containment project (MARC) [2]. The principle interventions and indicators for success of joint efforts of resistance containment are presented in Figure 1 and can be summarized as follows:

- The best 'containment' of resistant *Plasmodium falciparum* is the local elimination of the infection. However, short of achieving this, a significant reduction of the parasite pool must be achieved in combination with measures to minimize or ideally prevent the spread of these parasites to other areas currently not affected (in Burma tiers 2 and 3[2]).
- In order to achieve local elimination or containment, the full repertoire of malaria control must be applied. This includes vector control measures such as long-lasting insecticidal nets (LLIN) and/or indoor residual spraying (IRS) for indoor biting vectors and repellents (local or spatial) and insecticide treated clothing for outdoor biting vectors [6]. The second pillar of interventions refer to case management where all infections, symptomatic or not, are targeted and treated with a complete course of a quality assured ACT in combination with a single, low dose of primaquine which is able to kill gametocytes and, thereby, prevent further transmission. Such ACT treatment – as long as there is compliance with the full

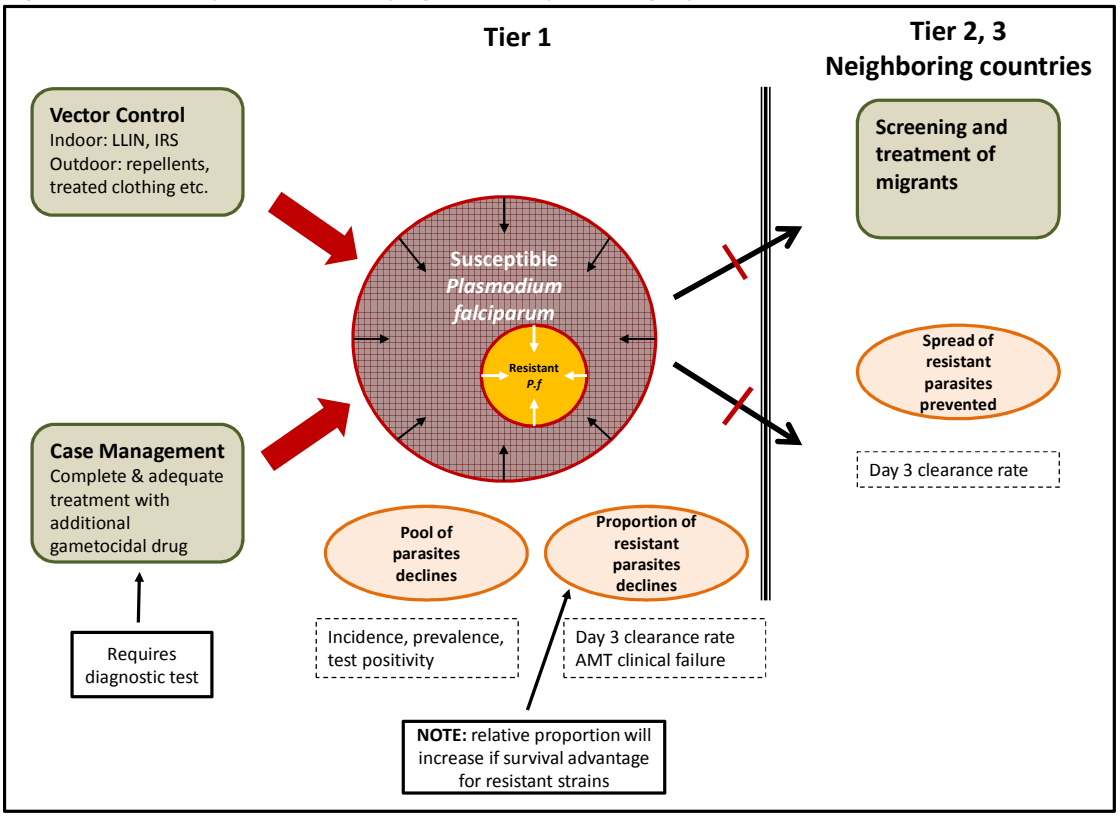
[1] This does not imply that there is not also a danger of emergence of resistance to Artemisinin derivatives in Africa through mutations in local parasites.

[2] Tiers refer to the stratification of resistance risk areas as defined by MARC [2]

course of treatment - will be able to kill even Artemisinin resistant strains of *P. falciparum* as long as parasites are still sensitive to the partner drug within the ACT combination [3].

- Classical indicators of drug resistance such as therapeutic effectiveness studies (TES)for Artemisinin monotherapy, or day-3 parasite clearance rates which are a proxy for emerging resistance or tolerance in an ACT combination, only measure the relative occurrence of resistant parasite strains within the parasite population. However, since resistant parasites have a survival advantage compared to the wild type in the presence of ACT [8], the relative proportion of ACT resistant parasites will increase even if the overall parasite pool is dramatically declining. For that reason the evaluation of the success of resistance "containment" efforts must always also consider measures of malaria burden such as incidence, prevalence and test positivity, keeping in mind that absence of spread to new areas may be the only hard evidence of containment. Conversely, detection of resistance or increased tolerance in areas outside tier 1 does not necessarily mean that resistance has spread as it also could have emerged locally doe to existing drug pressure.

Figure 1: The core problem underlying the theory of change, possible interventions and indicators



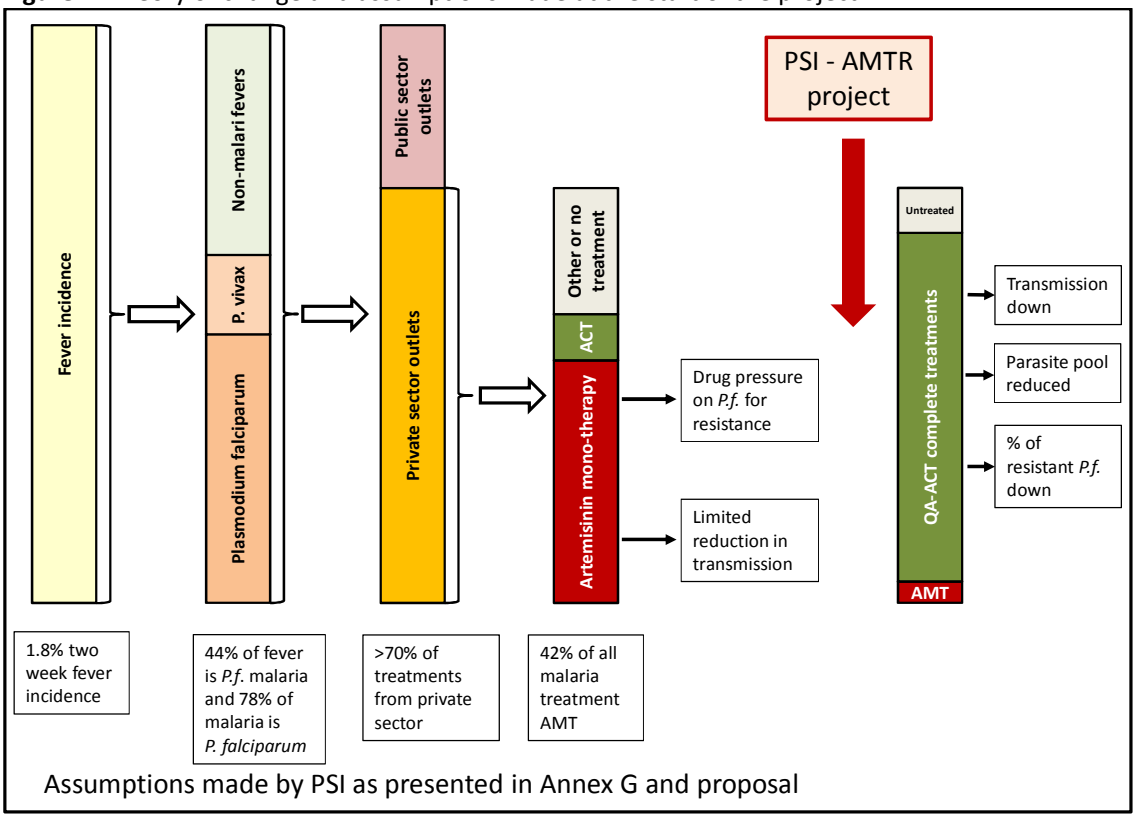
The rationale for the "Artemisinin monotherapy replacement" project is then based on the situation analysis for case management in Burma. At the time of project design, information on treatment practices and the structure of the market for anti-malarials was very limited, therefore a rapid assessment undertaken by PSI together with case estimates from MoH records and the various World Malaria Reports, formed the core information input.

Based on the limited information available at the time the following situation was described (see also Figure 2):

- There are approximately 5 million fever cases in the population of the PSI target area equivalent to a two-week fever prevalence of 1.8% amongst the general population

- Of these fever cases,44% test positive for *P. falciparum* malaria and 78% of all malaria cases are infections with *P. falciparum*
- The majority of all cases (>70%) is treated in the private sector
- Of malaria treatments from the private sector, the majority of treatments given are Artemisinin monotherapy and most patients only take a partial dose
- This low dose Artemisinin monotherapy is limited in its effects on malaria transmission and represents a tremendous drug pressure on the malaria parasites enhancing the likelihood of selecting resistant strains
- Reversing this situation by replacing oral Artemisinin monotherapy in the private sector with full treatment courses of QA-ACT in combination with increased use of diagnostic tests through the PSI project then significantly contributes to the resistance containment efforts.

Figure 2: Theory of change and assumptions made at the start of the project



4.2 Evaluation Questions and Indicators

The evaluation questions are derived from the theory of change and the "inputs to impact" continuum as presented in Figure 3, and represent the best approach in the given situation. However, as the situation and circumstances change, they may have to be adjusted and the evaluation team will handle this with a high level of flexibility and will also include in its consideration potential negative or otherwise unintended effects of the project. It should be noted that in this context the term "output" and "outcome" are used in the monitoring and evaluation context which is slightly different from the log-frame of the PSI project where the purpose level is called "outcome" and the majority of indicators at "output" level are actually outcome indicators in the M&E sense.

The evaluation will be conducted at three levels:

a) Outcomes and outputs
b) Impacts
c) Long-term perspective

Figure 3: Input-to-impact structure of the AMTR project as the basis for evaluation

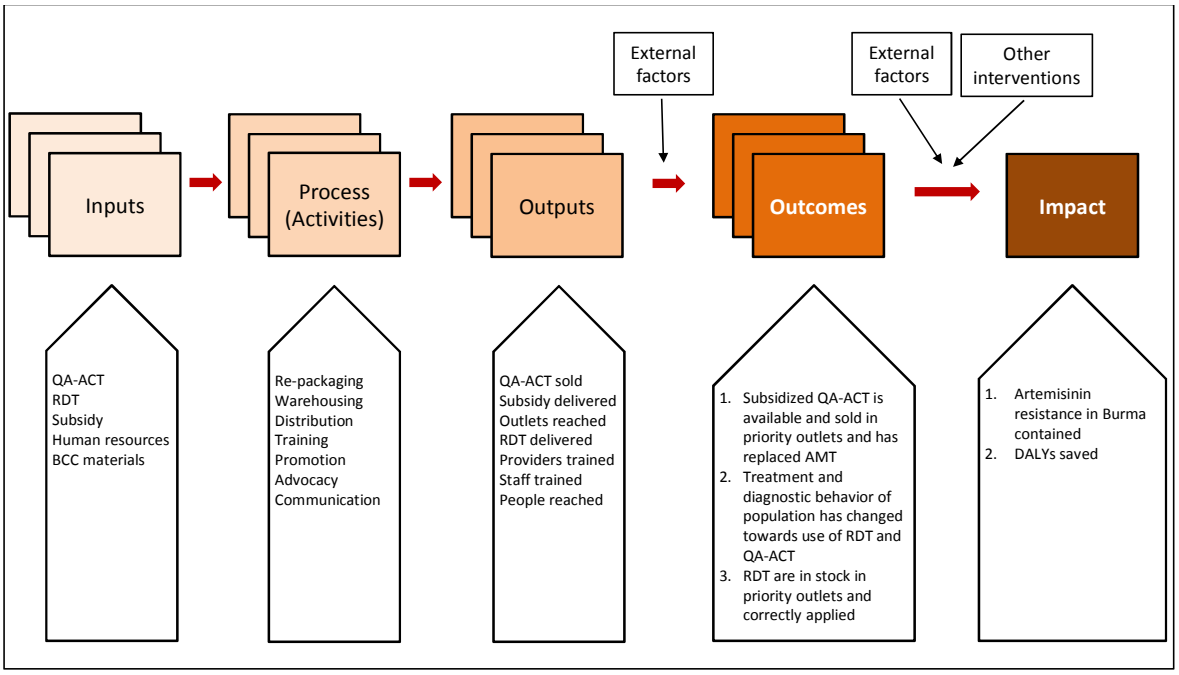


Table 1 gives an overview over the proposed evaluation questions which are then discussed in more detail below.

Table 1: Summary of the evaluation questions at the three main levels

Level	Evaluation questions
1. Outputs, outcomes and effects at outlet and consumer level where PSI has a significant influence on results	1a. Has the replacement of oral Artemisinin monotherapy with quality-assured ACT in the private sector and particularly in the primary target outlets (pharmacies, itinerant drug vendors and general shops) been achieved? Comparing outputs and outcomes to targets
	1b. Has the proportion of people with fever who are treated with full course of QA-ACT increased? 1c. Conversely, has the proportion treated with AMT declined or even disappeared?
	1d. Has the need for a diagnostic test prior to malaria treatment been established amongst providers (outlets) and amongst clients, and are RDT available in the private sector and used?
	1e. What influence did the BCC activities of PSI have on consumer behaviour?
2. Impact level where external factors and additional interventions are needed to achieve results	2a. Has the pool of potentially Artemisinin-resistant *P.falciparum* strains in tier 1 of the MARC project been reduced? 2b. Has a spread to other areas been prevented? 2c. What is the contribution of the AMTR project?
	2d. How many DALYs have been averted by the PSI project and what

Level	Evaluation questions
	proportion can be attributed to the DFID contribution to the project?
3. Long-term perspective beyond the PSI project	3a. What is the anticipated development of the private sector malaria treatments after the PSI project in the medium and long-term? 3b. What will be the potential role of the private sector in malaria control in general?

The primary focus for the evaluation will be at the outcome level. Only if targets at these levels are not, or not fully, achieved will inputs, process and outputs be considered in the discussion of "why were targets not reached" attempting to distinguish between internal and external factors. The second level of evaluation questions refers to the impact of the project on the overall goal, while the third level addresses the outlook beyond the project implementation period. A number of **sub-questions** will be asked **for each main question** such as "**what was the DFID contribution to this?**" and "**were 'value for money' principles reflected in this achievement**?"

Level 1:

The first evaluation question addresses the outcome that can be seen as the primary objective of the project and the outcome that is the most under control of PSI including a critical look at the outputs on which these outcomes are based:

- **Evaluation question 1a: Has the replacement of oral Artemisinin monotherapy with quality-assured ACT in the private sector and particularly in the primary target outlets (pharmacies, itinerant drug vendors and general shops) been achieved?**

  Indicators:
  1. Proportion of adult-equivalent doses of anti-malaria medicines sold in the past week (7 days) in the primary target outlets being AMT
  2. Proportion of adult-equivalent doses of anti-malaria medicines sold in the past week (7 days) in the primary target outlets being QA-ACT
  3. Number of annual total doses of QA-ACT sold to distributors and by distributors to outlets

  Source: PSI outlet surveys at baseline, midterm and endline (see also Figure 4); PSI routine monitoring data.

  The next evaluation questions address the outcome at population level where contributions of both, public and private sectors are captured, and the PSI contribution can only be established by disaggregation between the main sources of treatment of the fever cases:

- **Evaluation question 1b: Has the proportion of people with fever who are treated with a full course of QA-ACT increased?**

- **Evaluation question 1c: Conversely, has the proportion treated with AMT declined or even disappeared?**

  Indicators:
  4. Proportion of people with a fever episode in the last two weeks who received AMT as treatment (disaggregated by public and private sector as primary source)

5. Proportion of people with a fever episode in the last two weeks who received a full course of QA-ACT as treatment (disaggregated by public and private sector as primary source and if possible by the result of the diagnostic test if done)

Source: PSI household surveys at baseline, midterm and endline (see also Figure 4).

The fourth evaluation question addresses the issues around diagnosis:

- **Evaluation question 1d: Has the need for a diagnostic test prior to malaria treatment been established amongst providers (outlets) and amongst clients and are RDT available in the private sector and used?**

Indicators:

6. Proportion of priority outlets that have an RDT available
7. Proportion of priority outlets that offer or recommend a diagnostic test for fever patients
8. Proportion of people with a fever episode in the last two weeks who had a diagnostic test done prior to treatment (disaggregated by public and private sector as primary source)

Source: PSI outlet, mystery client and household surveys at baseline, midterm and endline (see also Figure 4).

The fifth evaluation question looks at the PSI Behaviour Change Communication (BCC) strategy and implementation:

- **Evaluation question 1e: What influence did the BCC activities of PSI have on consumer behaviour?**

Indicators:

9. Proportion of people with a fever episode in the last two weeks who were exposed to any messages regarding QA-ACT (Padonmar quality seal) and RDT
10. Proportion of people with a fever episode in the last two weeks who can recall any messages regarding QA-ACT (Padonmar quality seal) and RDT
11. Difference in use of diagnostic test and QA-ACT by people exposed and not exposed to BCC messages based on propensity score matching (details see section 4.4).

Source: PSI household surveys at baseline, midterm and endline (see also Figure 4).

Level 2:

The second level of evaluation questions addresses the impact of the project, or rather the contribution to impact, taking into account the two inherent goals:

a) Containment of resistance of *Plasmodium falciparum* to Artemisinin derivatives (see Figure 1)
b) Reduction in the number of malaria cases and consequent improvement in the health status of the population

- **Evaluation question 2a: Has the pool of potentially Artemisinin-resistant *P.falciparum* strains in tier 1 of the MARC project been reduced?**

- **Evaluation question 2b: Has a spread to other areas been prevented?**

- **Evaluation question 2c: What is the contribution of the AMTR project?**

  Indicators:
  12. Trend in malaria infection and morbidity indicators such as reported cases per 1,000 population and test positivity rate (disaggregated by tier or region within country)[3]
  13. Proportion of patients with uncomplicated *Plasmodium falciparum* infection that have **not** cleared parasites by day three following treatment with QA-ACT (disaggregated by tier 1 and tier2/3)
  14. Proportion of patients with uncomplicated *Plasmodium falciparum* infection that show clinical treatment failure following treatment with Artemisinin-derivative monotherapy (disaggregated by tier 1 and tier 2/3)
  15. Proportion of estimated overall malaria cases per annum in the PSI project region (*P.falciparum* and *P.vivax*) that have been adequately treated (compliance with full course according to national treatment guidelines) in the private sector

  Source: MoH surveillance of day three clearance times in tier 1, tier 2 and tier 3 and results from therapeutic efficacy studies, MoH malaria HMIS data, resistance surveillance data from neighbouring countries as part of the regional containment efforts, and PSI and AA Medical Products sales data in conjunction with modelling output of expected cases.

- **Evaluation question 2d: How many DALYs have been averted by the PSI project and what proportion can be attributed to the DFID contribution to the project?**

  Indicator:
  16. DALYs averted

  Source: PSI calculations and sensitivity analysis based on variation in assumptions undertaken by evaluation team (see also working papers in section 6).

Level 3:

The third and final level of evaluation questions concerns the situation and potential development of the private sector after the PSI project has ended.

- **Evaluation question 3a: What is the anticipated development of the private sector malaria treatments after the PSI project in the medium and long-term?**

- **Evaluation question 3b: What will be the potential role of the private sector in malaria control in general?**

No specific indicators can be assigned to this evaluation question as this will be a more qualitative assessment, although some projections and modelling will serve as inputs. The issue will also be presented as one of the working papers and details of the approach are described in section 6.

4.3 Evaluation Design

Options for the evaluation design are limited for two major reasons:

[3] This indicator measures overall trends in malaria epidemiology without a claim that such changes were effected by case management interventions alone

a) The evaluation project itself will not be able to undertake any significant data collections,
b) The PSI project was already at the mid-point of its implementation phase when the external evaluation was contracted by DFID, and all systems for data collection were already in place making a variation of the design impossible.

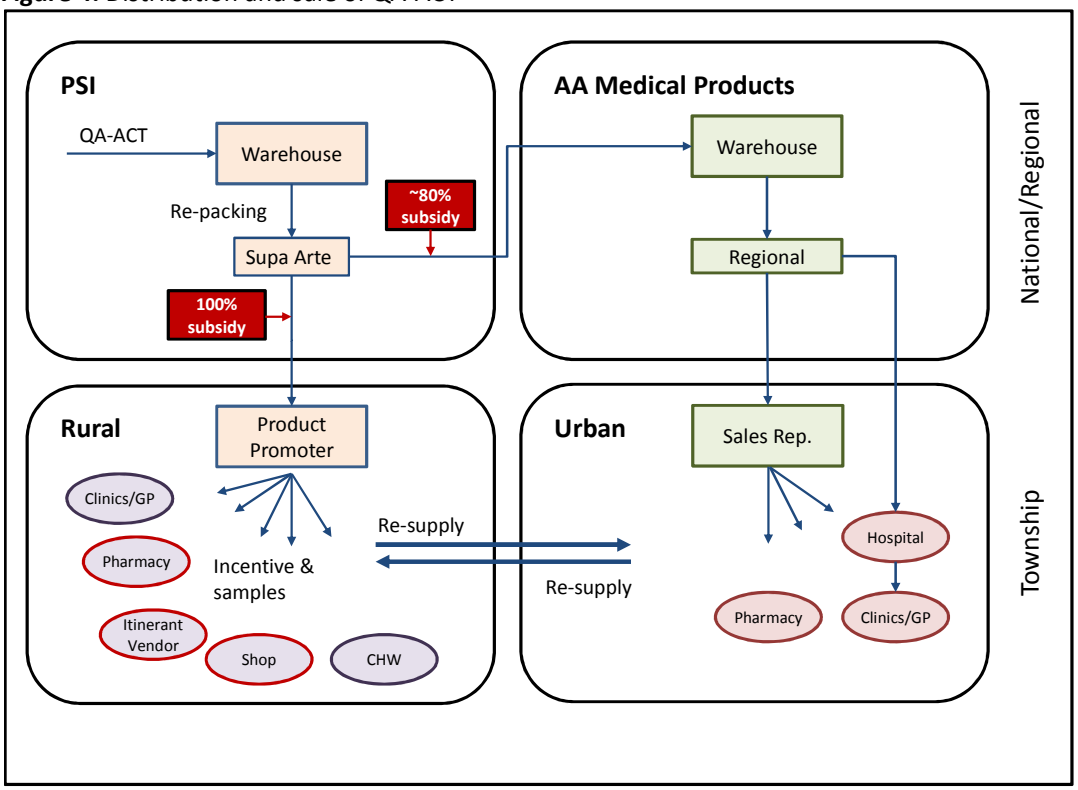
However, the existing design appears to be sufficient to provide answers to the evaluation questions presented above. The principal evaluation design will be a **before-after** comparison or rather baseline-midterm-endline, where the changes over time are observed, compared with anticipated targets and milestones, and a **plausibility argument** is made as to attribution of effects to the PSI project based on the input-process-output data. In order to explore specifically the effects of the PSI project on Artemisinin resistance, the results from the outlet, household and mystery client surveys of PSI will be disaggregated by tier 1 and tiers 2/3.The contribution made by DFID within the co-funded project will be assessed by assigning observed effects based on relative financial contributions to the project.

A **counterfactual** will be directly available for the promotional activities of PSI at outlet levels as the design of the outlet survey includes **intervention** (PSI project area) and **comparison** sites (sample of outlets from tier 3 outside the PSI project area). This comparison will be between outlets that are supplied with QA-ACT by AA Medical Products and any other distributor PSI may enter an agreement with during the project, but without the promotional activities of the PSI product promoters (see Figure 4), and those outlets that have been "primed" by PSI to stimulate the uptake of QA-ACT and later RDT. This design, therefore, allows the assessment of trends over time, as well as the effects of the promotional PSI activities, but must take into account as one of the potential confounders that the actual level of malaria transmission, and hence demand for malaria treatments may be lower in some of the comparison areas.

Internal validity of results i.e. the question of whether results represent a true picture of the situation on the ground and the cause and effect of project interventions. Internal validity will be assessed on one hand by a thorough scrutiny of the sampling design of the PSI surveys (see section 5.4.2), and on the other by triangulating PSI results with independent data sources such as the MARC baseline and follow-up survey (anticipated for October 2013),and any other relevant data from research groups such as the Shoklo Malaria Research Unit and others.

Contextual analysis will be used in the evaluation for **external validity**, i.e. addressing the question of to what extent successful approaches can be generalized and applied in other situations such as in South-East Asia or in Africa South of the Sahara. Any available information on the structure of pharmaceutical markets in Burma as compared to other countries will be used, as will contextual analysis highlighting other factors contributing to observed changes in malaria epidemiology, such as eco-geographic or socio-demographic developments, vector control measures or activities of regulatory bodies such as the Federal Drug Authority.

Figure 4: Distribution and sale of QA-ACT



4.4 Data Sources, Timing and Analysis Approach

Primary data source for the evaluation will be the **quantitative data** collected by PSI. This includes routine data on ACT and RDT sales, as well as additional routine data from the Sun Quality Health Franchising Clinics with respect to RDT test positivity in various parts of the country. Quantitative survey data will be available from three rounds of surveys at baseline, midterm and endline and at each round for three different surveys: a) the outlet survey, b) the household fever survey and c) the mystery client survey. Baseline surveys have all been completed and mid-term surveys are ongoing. Household survey data at a smaller scale will also be available from the RDT phase 1 activities with one survey before, and one after, the implementation of the RDT pilot. Anticipated timing of these surveys is shown in Figure 5.

In addition to the projections of PSI regarding expected number of treatments over the course of the project, the evaluation team will run its own projections of expected treatments, during the project and beyond, based on adjusted assumptions using the case-management module of the RBM needs assessment tool [5].

The quantitative data will be complemented by **qualitative data** collected by the evaluation team itself during the proposed case studies and working papers (see section 6), and by key informant interviews and field observations during the evaluation field visits planned during Q4 of 2014.

Secondary data sources will be surveillance and survey data collected by the Ministry of Health and the MARC project partners and will include:

a) MARC baseline and follow up household, outlet and facility surveys
b) Day-3 clearance surveillance of patients with uncomplicated *Plasmodium falciparum* malaria treated with an QA-ACT disaggregated by data from tier 1, tier 2 and tier 3

c) Treatment failure data from therapeutic effectiveness studies (TES) using AMT in tier 1, tier 2 and tier 3

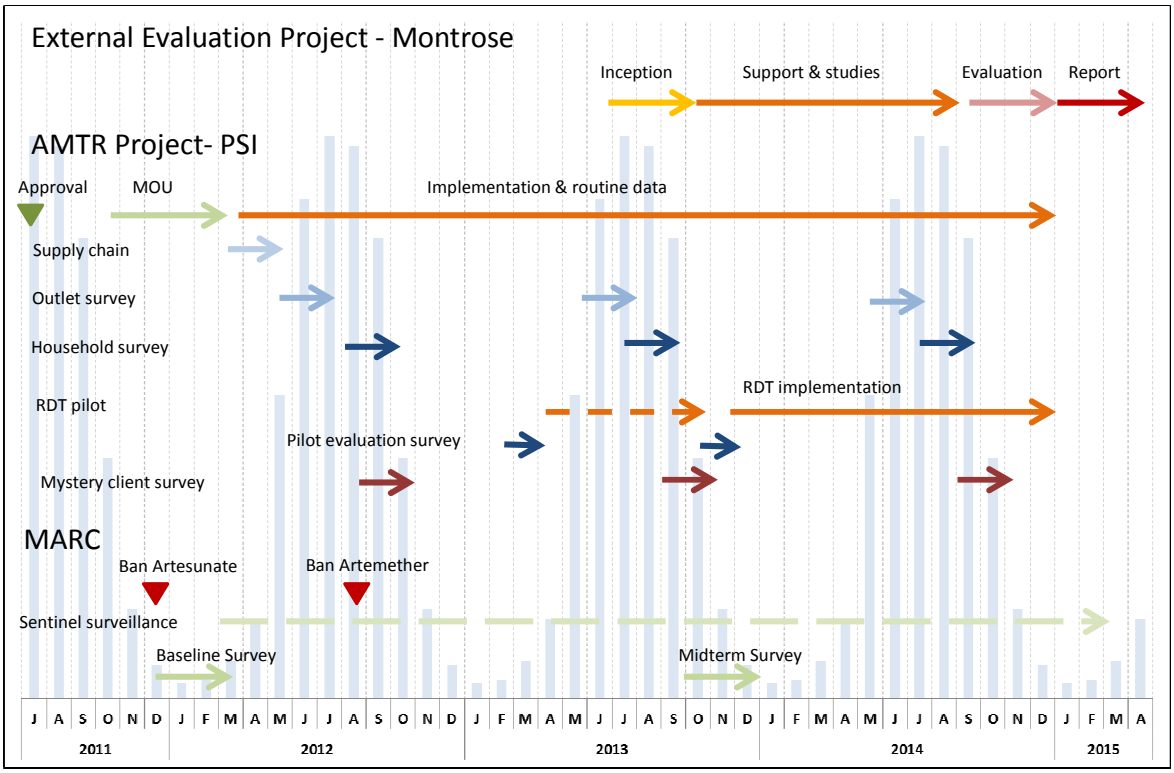
Other sources will include any surveys or studies undertaken by other groups in Burma, or neighbouring countries, such as the recent papers on drug effectiveness [5] and trends of morbidity and resistance in the Burma-Thai border region [8].

Statistical analysis will be primarily undertaken by PSI, and supported where needed by the evaluation team in secondary data analyses. For all statistical evaluations, appropriate sampling weights will be applied to reflect the sampling strategy of the survey, and estimates of precision (confidence intervals) will be adjusted for cluster sampling and any resulting design effects (ratio of between and within cluster variation).

As described in section 4.2, the impact of PSI's BCC activities on actual consumer behaviour will be evaluated using propensity score matching [9, 10]. In short, this methodology uses exposure to BCC messages as a starting point, and explores factors determining the likelihood of exposure using logistic regression and all relevant covariates such as age, gender, wealth quintiles etc. The probability of exposure is then used as the propensity score and all respondents are matched by their likelihood of exposure into an intervention group (exposure) and control group (same likelihood of exposure but not exposed). A comparison of outcomes of interest (use of diagnostic test or knowledge of Padonmar quality seal) between intervention and control groups, then provides an unbiased assessment of BCC impact. This methodology does not work well if exposure is either very low or very high. Data from the baseline survey of PSI showed a very low exposure level of only 8% of respondents recalling the QA-ACT quality seal Pandonmar. However, this rate can be expected to increase to around 50% in the endline which would result in approximately 350-400 respondents each in the intervention and control groups, sufficient to detect a 10-15 percentage points impact of BCC activities.

For analysis of results by household socio-economic status, wealth quintiles will be used as calculated by PSI based on a principal component analysis of household assets [11]. In addition, any effects of such wealth on outcomes such as use of QA-ACT or RDT will be visualized using concentration curves and quantified using the concentration index [12].

Figure 5: Timing of evaluation and PSI activities and the anticipated data collection surveys. Blue, vertical bars represent average monthly rainfall



4.5 Cross Cutting Issues

4.5.1 Poverty

Effective malaria control does not always require that the poorest of the poor are specifically targeted, as many interventions depend on a critical mass of coverage to achieve maximum impact, which is then able to provide a "community effect" that can also protect those who are not themselves covered. However, for the containment of artemisinin resistant *P. falciparum* it is critical that those most vulnerable to infection and migration are reached, and in the Burmese context these are generally the less well-off sections of the population. Applying the methods described in section 4.4, the evaluation will carefully describe outcomes by level of wealth and explore to what extent interventions have been equitable in their coverage and if not, implications for project success.

4.5.2 Gender

Though Burma is recognized by the Committee on the Elimination of Discrimination Against Women as a country in which "women enjoy social, political, economic, and judicial equality with men", it is also acknowledged that there are longstanding cultural and social norms promoting beliefs that men

are innately superior to women. These assumptions are reinforced at both community and household levels.

Throughout the course of the PSI evaluation, the key gender issues considered at each stage of the process will focus on the following: the vendors selling the drugs; who in the household is buying medications; and who in the household is most likely to contract malaria. Informing each of the variables will be the question of profiling access and control within the family unit or household: who in the household controls decisions about health, and who has access to care and treatment. An adult male member of the family, perhaps considered integral to the livelihood of a rural-based household, might be able to access both testing and treatment faster than an adolescent girl in the same household. Female headed households, which typically fall into lower income brackets, may be less inclined to spend income on testing and treatment of malaria, regardless of accessibility and cost.

Although rates of males attending schools in rural areas of Burma are lower than those of girls in school (due in large part to the role males play in livelihoods activities), literacy rates amongst females in Burma are lower than amongst males in all 17 states. This disparity may further compromise females' understanding of health issues, including the importance of testing, an understanding of, and access to BCC interventions, and availability of and access to medications.

4.5.3 Value for Money

Value for Money (VFM) monitoring and assessment illustrates the roadmap of financial and other inputs to activities, outputs, outcomes and impacts (see also Figure 3) that are generated by programmes over the project lifespan. VFM assessments generate insights, supported by programme data, which can lead to process modifications to increase the economy, efficiency, effectiveness and equity of programme operations and strategy, both during and after a project. Whilst a common trail is used in VFM assessments, each VFM analysis is comprised of unique factors and focal areas dependent on the individual context. The required VFM plan for the AMTR project has been developed in conjunction with PSI staff during the inception phase visit of our VFM expert (see section 5.3.2. and Annex C).

While progress and trends in data collected in accordance with the VFM plan will be followed-up separately and reported in the six-monthly reports of the evaluation project, the contribution of VFM is seen as an integral part of the evaluation and hence will be integrated into the final evaluation report.

4.5.4 Ethical issues

Adherence to the principles of Human Rights, the Helsinki Declaration on Ethical Principles for Medical Research involving Human Subjects and the DFID Ethics Principles for Research and Evaluations will be a priority throughout the evaluation.

All research activities of PSI are subject to ethical clearance by local authorities as well as internal review committees. Similarly, any qualitative research undertaken by the evaluation team as part of the case studies and working papers will seek ethical clearance from appropriate authorities. During the evaluation key informant interviews, key ethical principles such as privacy, confidentiality and right to withdraw will be observed.

4.6 Quality Assurance

Quality assurance will follow the evaluation quality standards of the Development Assistance Committee (DAC) of OECD, in order to ensure quality of the evaluation process and help facilitate comparability and sharing of results. Special emphasis will be given to capacity building of local partners.

Within the evaluation activities quality assurance will be applied at two levels, firstly at the level of PSI data collections to assess whether the PSI data is of sufficient quality. As presented in section 5.4 this will include the PSI QA systems as well as the results. In addition, the evaluation team will undertake field visits during the final rounds of surveys to observe independently the quality of the data collection, entry and management.

Secondly, at the level of evaluation team work, technical quality assurance will be provided by Patricia Graves (malaria epidemiology), Kevin Palmer (drug resistance) and Graham Root (private sector). These experts are recognised as leaders in their respective fields and do not comprise members of the core evaluation team

Technical quality assurance will be achieved as follows:

1. The evaluation work plan will have defined deliverables and related milestones set against a defined timeline.
2. The Technical Team Leader, Albert Kilian, will have first line responsibility for oversight of the work of the Evaluation Team.
3. Each deliverable, including the detailed evaluation framework, will subsequently be technically reviewed by the external Quality Assurance Team comprising independent malaria experts Kevin Palmer and Patricia Graves, prior to submission to DFID.

4.7 Communication and Dissemination Strategy

Our communication strategy can be divided into two major components:

Communication with DFID and the PSI project: Regular contact with and updates to DFID-Burma and the evaluation Steering committee will be led by the Montrose management team in close collaboration with the technical team lead as required. In contrast, the technical team will take the lead in communication with the PSI team which will comprise quarterly updates by tele-communication, and feed-back and support for specific questions and problems regarding indicators or data analysis.

Communication with stakeholders: Regular, formal in person stakeholder contact by our visiting and resident team members will ensure that all key partners are kept up to date on evaluation processes and progress, and their inputs into the further evaluation process considered.

Before finalization of the evaluation results the team will consult the steering committee and key stakeholders through adequate means presenting the initial results and allowing their comments to be considered. This interaction will take place in the form of a workshop or – if this is impossible due to conflicts of availability – through multiple smaller meetings.

Dissemination of products: In total, we envisage that there will be 11 products of this evaluation with value in disseminating; i.e. the evaluation inception report, the evaluation final report, a summary version of the evaluation report (for wider dissemination), four case studies (see section 6) and four working papers (see section 6). These products – once approved by DFID – will be widely

shared with stakeholders in-country, in the Greater Mekong Sub-region and internationally as appropriate, using a variety of relevant channels. All case studies and working papers will be made available to a broader audience via the internet, and to the extent possible, working papers will be considered for peer reviewed publication. All presentation of results will be made in close cooperation with PSI, and with full acknowledgement of their contribution. Dissemination of documents will be complemented by a broader dissemination workshop or meeting in Q1 of 2015 to present overall evaluation findings to a wider audience. Annex D presents a dissemination plan that will evolve during the course of the evaluation based on a regular review of dissemination products, key audiences and channels.

4.8 Stakeholder Engagement Strategy

With the assistance of DFID and the PSI-Myanmar office, the evaluation team began mapping key stakeholders immediately upon commencing the contract. As part of the inception visits in June and July almost all of these stakeholders have been contacted (see lists in annexes A and B), the purpose of the evaluation explained, opinions on potential questions of interest explored and collaboration for data and information sharing secured. Groups not yet adequately contacted are organisations of civil society, private health care providers and national organisations such as the Myanmar Medical Association. These organizations will be contacted and engaged by our local team members Kelly Macdonald and Win Maung early in the implementation phase to ensure they have adequate opportunity to engage with the evaluation in its early stages, and will be kept involved throughout the evaluation project jointly with the other stakeholders.

As part of the communication and dissemination strategy outlined above all stakeholders will be regularly contacted to ensure that they are kept informed of evaluation purpose, progress and findings, and that any potential concerns or suggestion they may have can be given relevant consideration within the evaluation.

4.9 Governance

The internal governance structure of the evaluation is comprised as follows:

- The evaluation team is led by Team Leader Albert Kilian who has oversight of all technical inputs and activities,
- Evaluation team activities and the production of deliverables are project managed by Madeleine Duke (Montrose), and Caroline Vanderick(Tropical Health),
- Financial and accounting management and oversight is provided by Vinit Khosla and Meltem Yasar, Montrose Finance Manager and Finance Director,
- Janice Moore, Montrose Director of Programmes and Operations, has ultimate oversight over the delivery of all work to the client.

External governance is provided as follows:

- Day-to-day oversight and management of the evaluation is provided by the DFID Evaluation Advisor, Hoa Ngo Thi Quynh, Results and Evaluation Advisor, DFID Burma and Vietnam, supported by the DFID Project Officer Louise Mellor, Health Advisor, DFID Burma.
- An evaluation Steering Committee has also been established to oversee the evaluation process and evaluation products, and comprises the following members:
    - Hoa Ngo Thi Quynh, Results and Evaluation Advisor, DFID Burma and Vietnam
    - Louise Mellor, Health Advisor, DFID Burma

- Nichola Cadge, Health Advisor, DFID UK
- Thomas Kanyok, Bill and Melinda Gates Foundation
- Dr Saw Lwin, DFID Professor, University Research Cooperation

- The evaluation team remain in regular contact with the Evaluation Advisor , Project Officer and broader Steering Committee members via mail and telephone communication and face to face meetings as required, and are scheduled to report formally to these bodies through the DFID Evaluation Advisor on a six-monthly basis throughout the implementation phase. Steering Committee members and also representatives of PSI, are given opportunities to comment on draft deliverables prior to finalisation.

5 INITIAL ASSESSMENT

5.1 Do the Assumptions Underlying the Theory of Change Still Hold?

Since the time when the AMTR project was developed in 2011 a number of data items have become available that allow a more detailed assessment of the changing malaria epidemiology in Burma in recent years.

Major emerging trends can be summarized as follows:

a) Incidence and prevalence of malaria have been dramatically declining in the last 5-6 years:
   - Data from the Health Management and Information System (HMIS) of the Ministry of Health presented at the 2nd Annual Review Meeting of MARC in June 2013 [13] shows a decline of malaria morbidity from 13.8 malaria cases/1,000 population per year in 2002 to 7.4 in 2012
   - Similar declines are reported by the health services of the National Defence Services where the number of reported malaria cases declined from 50,000 per year in 2003 to 25,000 in 2008, and 10,000 in 2012, a 80% reduction (Col. Tin Maung Hlaing, personal communication)
   - Carrara and co-workers [8] recently published results from over 10 years of malaria surveillance from health clinics in the Burma-Thai border region (tier 1 of MARC) demonstrating a decline of malaria infections amongst pregnant women from 1.75/woman/year in 2001 to 1.0 in 2006, and 0.25 in 2011. At the same time slide positivity of these women decreased from 35% in 2001 to 7% in 2011.
   - PSI's routine data from their Sun Quality Health franchise clinics shows a decline of the RDT positivity rate from 46% in 2006 to 29% in 2010, and 18% in 2012, with a further decline to 8% in the first quarter of 2013. Disaggregating these data by tier 1+2 in comparison to tier 3 of MARC shows consistently lower *P. falciparum* positivity rates in tiers 1 and 2 (declining from 13% to 7%) compared to tier 3 (24% to 13%) since July 2012.

b) The relative proportion of *P. falciparum* is declining and *P. vivax* is becoming the dominant species in some areas of tier 1:
   - Previously quoted data from the MoH HMIS shows the relative proportion of *P. falciparum* declining from 80% in 2000 to 75% in 2006, and 70% in 2012. In addition, recent data from tier 1 suggests that in tier 1 areas the proportion of *P. vivax* is now above 50% (Dr. Myat Phone Kyaw, personal communication)

- Carrara et al. [8] report from the Burma-Thai border region a relative *P.f.* prevalence of 55% to 70% between 2000 and 2002, which declined to around 30% between 2007 to 2010
- PSI's data from RDT testing at their Sun Quality Health franchise clinics using combo tests show a relative contribution of *P. falciparum* of 50%-60% between January 2012 and March 2013

c) The proportion of fever cases who seek treatment from the private sector appears lower than originally anticipated:
   - The PSI baseline household survey from September/October 2012 [14] shows that amongst persons with a fever episode in the last two weeks, only 21% obtained treatment from retail outlets, and an additional 15% from private clinics whilst 47% sought treatment from the public sector and 17% were treated at home or not at all
   - These findings are in keeping with the MARC baseline survey [15] from early 2012 in tier 1 and tier 2, showing 58% of fever patients seeking treatment from the public sector, and only 37% from the private sector.

d) While AMT are highly present in the private sector outlets, their contribution to malaria treatments is not as high as anticipated with non-artemisinin treatments still playing a significant role:
   - The PSI outlet baseline survey from June/July 2012 [17] confirmed that a vast majority (approximately 80%) of pharmacies and general retailers that carried any anti-malarials also offered oral AMT, with itinerant vendors being the only exception with only 30% stocking AMT. However, the relative market share of oral AMT amongst anti-malarials sold in the last week was only 30% to 35% amongst these outlets with non-artemisinin anti-malarials comprising 50% to 70%. Unfortunately, the PSI household survey report only shows the proportion of fever cases treated with an ACT, but does not distinguish between AMT and other anti-malarials, although the data does allow for such disaggregation.
   - The MARC baseline survey report showed that 81% of fever cases were treated with non-anti-malarial medicines and amongst those few who received an anti-malarial, 31% took an AMT (2% of all fever cases).

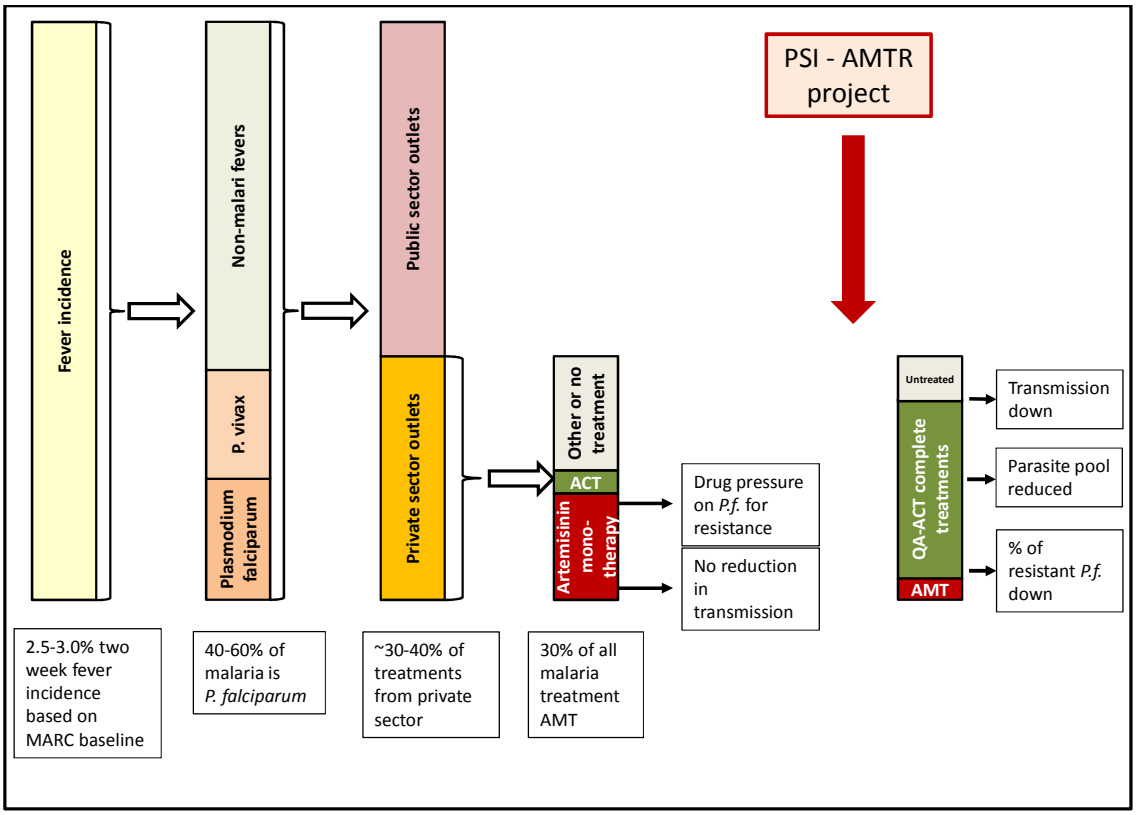
e) The rate of diagnostic confirmation of malaria cases is slowly increasing in the public sector:
   - In the MARC baseline survey the proportion of fever cases that received a diagnostic test for malaria was 23% with similar rates in tier 1 and tier 2, and 68% of tests performed in the public sector
   - In the PSI baseline household survey, 8% of fever patients reported having had a diagnostic test, but this includes all of the PSI project area, i.e. parts of tier 3 where less emphasis has been put to date on the need for testing. Disaggregation of the data by tier would most likely show a higher rate of testing in tier 1.

f) There is to date no evidence of a spread of artemisinin resistance in *P. falciparum* beyond tier 1 in Burma:
   - Ongoing surveillance of day-3 clearance times by the MoH has not to date shown an increase in failure to clear cases above 10% in tier 3 (Dr. Myat Phone Kyaw, personal communication)
   - The findings of Carrara et al. [8] suggest that although there is a relative increase of potentially resistant parasites at the Burma-Thai border with day 3 non-clearance rates of 27% in 2011, the overall parasite pool is rapidly shrinking which is still in keeping with the theory of change (see Figure 1)

The impact of these trends on the assumptions underlying the theory of change are shown in Figure 6 and imply that the overall numeric targets of number of QA-ACT doses sold during the project, and DALYs averted, will be significantly less than expected. Similarly, with declining malaria incidence, decline of the relative proportion of *P. falciparum* and increasing diagnostic testing, the targeted outcome of "73% of fever cases being treated with ACT" can no longer be reached and nor is such a target desirable (see also log-frame indicators below).

However, the potential threat of incomplete AMT treatments of *P. falciparum* cases for the increase and spread of artemisinin resistance in Burma does not depend on the relative share of the private sector but only on the presence of such inadequate treatments. The evaluation team therefore concludes that the theory of change remains relevant and the objective of the project unchanged, even if the magnitude of its contribution to resistance containment can be expected to be lower than anticipated. The major challenges resulting from this development in the immediate future will be the necessary scale-up of diagnostic capacities (RDT) in the private sector and the provision of adequate treatment for *P.vivax* malaria. The long-term challenges will be evaluated during the evaluation project in the form of the working papers and case studies.

Figure 6: Theory of change and assumptions as they present themselves in mid-2013



5.2 Is the Log-frame Adequate?

The project log-frame was revised following the Annual Project Review of October 2012. It currently has one indicator at impact level, four at purpose level (which is here called "outcome"), six

indicators for output 1 (outlets), two for output 2 (consumers) and two for output 3 (RDT availability).

Keeping in mind that a log-frame is a selection of indicators suitable for demonstrating that the project is on track to achieve its anticipated outputs and outcomes (see also Figure 3), and does not replace a comprehensive M&E plan, the log-frame can be considered as adequate for that purpose. However, some indicators could use more precision or clarity in their definition, and project targets and milestones would also benefit from review. .

Impact level: The indicator of "parasite clearance rates (meaning day 3 following ACT treatment of *P.falciparum* infections) in eastern Myanmar" is in itself correct but as we have outlined in our evaluation framework, not enough to demonstrate success at impact level. This requires disaggregation by tier, with no increase beyond 10% non-clearance in tiers 2 and 3, while the rates in tier 3 may continue to increase. However, in conjunction with a decrease in incidence, prevalence and test positivity rate can still be interpreted with respect to "resistance containment".

Outcome (purpose) level: Here reside the most significant problems with indicators and milestones. There is a cascade of three indicators that refer to treatment of fever cases receiving any ACT within 24 hours, receiving a full course of ACT and completing a full course of ACT. The denominator for all indicators is "suspected malaria cases" which should better be called "fever cases", as from the survey data only fever episodes are identified and not "suspicion of malaria". The targets are set to a very high level of 73% to 83%. These indicators are in keeping with what has been recommended in the past by the Roll Back Malaria Monitoring and Evaluation Reference Group (MERG) but have since been revised. The main problem is that with the shift to universal access to diagnosis as the target of case management, and declining incidence rates, treatment of as many fever cases as possible with ACT is no longer desirable, nor can targets of 70% or higher ever be achieved under such policy. Instead, MERG now recommends the following three indicators for case management [16]:

- The proportion of fever cases who seek treatment within 24 hours
- The proportion of fever cases that obtained a diagnostic test for malaria
- The proportion of all malaria treatments being QA-ACT

These indicators – adapted to the public/private sector setting – have been suggested in our evaluation framework and should also be considered by the PSI project.

The fourth indicator at outcome level is taken from the DFID-Burma log-frame and reads, "number of women and men who receive **appropriate treatment to contain the spread of drug-resistant malaria** through DFID funding". While one part of the indicator is a simple output of number of QA-ACT sales in the PSI project area funded by DFID, and as such easily measurable, the qualification regarding resistance containment makes the indicator un-measurable. Does "appropriate treatment to contain…" in this context refer to any QA-ACT, or only to QA-ACT plus single dose of primaquine, which can be considered as "stopping further spread" but which is to date only present in the treatment guidelines in Burma and not yet implemented by PSI? Furthermore, to be determined as adequate treatment, one would have to know whether it was a *P. falciparum* infection, *P.vivax* or no malaria at all, and this information is usually not available for routine data systems that provide the number of treatments sold or dispensed. Therefore, this indicator should be either revised or dropped.

Output level: Here, only the indicators for outcome 2 are of concern. They try to measure the success of the PSI consumer BCC campaign but only ask for the recall of the Padonmar quality seal and knowledge of a local outlet that sells QA-ACT. These indicators are useful, but as we have

outlined in our evaluation framework (see evaluation question 1e), not sufficient to assess the success of the BCC campaign.

5.3 Are the Necessary Interventions in Place?

5.3.1 That are effective to achieve the targets

Replacing AMT with ACT in the market: PSI objectives are to increase the supply of ACTs in the Burmese market and increase awareness of providers so they treat malaria patients with a full course of ACT, against a backdrop of a ban on the importation of oral AMT into the Burmese market. Supported by PSI, a ban of oral artesunate was put in place by the government in December 2011 and for oral artemether in August 2012. The PSI market interventions to introduce QA-ACT are being implemented in 93 townships in tier 1, tier 2 and parts of tier 3 areas that are felt to be critical to the containment of artemisinin resistance.

To increase supply of ACTs in the market, PSI has partnered with AA Medical Products, a private sector pharmaceutical product distributor which reportedly had the largest share in the anti-malarial market (70% of total antimalarials sold in the market) at the time the project was designed. PSI is currently negotiating with another distributor Polygold which specializes in anti-malarials.

QA-ACT is being procured directly by PSI from IPCA, a WHO certified manufacturer from India. The imported ACTs are repackaged and rebranded in Myanmar in PSI's own warehouse (Figure 4). The repackaging is done with the aim of deterring health care providers from cutting the blister packets and using ineffective single doses. The Supa Arte brand has been created primarily to distinguish the supply in the private sector under AMTR from the supply provided by PSI to public health providers under the Myanmar Artemisinin Resistance Containment (MARC) Framework. The brand Supa Arte carries the Padonmar quality seal which was created by PSI under the National Malaria Communication Campaign funded by Global Fund round 9. The Supa Arte ACTs are highly subsidized (to the value of 80%) so that patients are motivated to purchase these over AMTs. The subsidy is provided to the extent that the price of a complete dose of Supa Arte could be brought down to the same market level as a single dose of available AMTs.

Furthermore, PSI has recruited and trained around 77 product promoters whose job is to select different types of health care providers and retailers within the market, who are the first point of contact for drugs for malaria patients. The retailers include drug shops, general stores, and Itinerant Drug Vendors (IDV). AA, the private sector distributor for Supa Arte, collects the products from the PSI warehouse and distributes to selected drug shops used as distribution supply points. PSI's product promoters establish the link between the supply point and the health care providers and drug sellers participating in the AMTR project.

The goal of the project, 'containment of artemisinin resistance' does not call for sustainable interventions. It rather calls for sustainable impact. With the decline in the use of AMTs and the increase in use of ACTs (only for cases tested and confirmed through diagnostic tests - microscopy or RDT), the market will enter a stage where the demand for ACTs will decline and settle, while the demand and use for RDTs will increase. In that stage, it might become unfeasible for the private sector to import, stock and distribute ACTs, which will necessitate intervention from the government and NGOs for continued free or subsidized ACT distribution. Even though this need is spelled out in PSI's proposal and working documents, some questions remain to be answered:

- How long will it take to effectively contain the resistance?
- What volume of ACTs will need to be subsidized within that period?
- Should PSI consider a phased out approach for subsidy, since the need for private sector distribution might cease in the future?
- Once the need for private sector distribution ceases, should the market be driven by the government?
- In that case, what would be the most effective way for the government to take control of the marketing of ACTs?
- What capacities will the government need for that?
- Does PSI possess effective interventions to support the market transit from private sector to the public sector?
- Does PSI need to develop a market system to ensure sustainability?
- If not, moving forward, who should be the key determinant of the performance of the market system-PSI, the public sector or the private sector (ie. AA)?'

The evaluation team will seek to answer these questions through the proposed case studies and working papers, but feels that overall the intervention is likely to be sufficient to achieve the goal of artemisinin resistance containment (prevention of increase in proportion of resistant strains and prevention of spread) in the short term (i.e. the life of the project). However, if malaria is not eliminated in Burma and its neighbours, there will always be potential for future development and spread of resistance.

Change consumer's diagnostic and treatment awareness and behaviour: Often, BCC campaigns are taken in isolation of the marketing mix (product, price, place, promotion) even though there is a strong correlation between the effectiveness of the BCC campaign and the marketing mix. But in the case of the AMTR project, the BCC campaign is being effectively built on the marketing mix. PSI is approaching consumer awareness and behaviour from several directions; (i) building on the Padonmar quality seal created under the MARC framework, (ii) training providers on use of ACTs and RDTs, the relevance of the quality seal, the ban of AMT, the importance of not splitting drug blisters and (iii) a mass media behavioural change and communication (BCC) campaign to educate consumers on the same. Furthermore, the ACTs are being over-branded (Supa Arte) and the packaging changed to deter providers as well as consumers from cutting the blisters and using single doses instead of complete dose. These interventions are being supported through the heavy subsidy provided under the AMTR project.

The effectiveness of these interventions on achieving irreversible change on consumer behaviour depends on the sustainability of these interventions, which in turn is dependent on two situations; (i) PSI continues to be the key agent for the import, packaging and branding of the ACTs and RDTs beyond the AMTR project, or, (ii) the capacities are transferred from PSI to the private sector so that they could continue to drive consumer's towards ACTs and RDTs beyond the AMTR project.

For instance, currently the Supa Arte packaging and over-branding is being performed exclusively by PSI. Since use of single incomplete doses is a threat to the containment of artemisinin resistance, the packaging needs to be sustained. Will AA continue to market the Supa-Arte brand and packaging? If yes, how is PSI going to transfer the capacity to AA? Further to that, what will be the impact on consumer behaviour and therefore sales of Supa-Arte if the current subsidy is withdrawn? What market systems change needs to be in place before the current subsidy could be withdrawn? In addition, if PSI is to continue the packaging, over-branding and market promotion activities, what will be the associated milestone to be achieved under the AMTR project? If the private sector needs to take ownership, will there be sufficient market forces to incentivise them to take over?

In addition, the below-the-line communication[4] is heavily branded to date (with Supa-Arte), but will be generic once the new distributor, Polygold, has been signed up for the new ACT product distribution. Currently, the above-the-line (ATL) generic campaign is assisted with the below-the-line (BTL) promotion. Will the shift from a combination ATL and BTL campaign to BTL only have equal effectiveness on the sales of two brands in the market which could potentially compete with each other? Or would the presence of two brands result in wider outreach and therefore wider acceptance of ACTs in the market? Answering these questions will help to refine the Theory of Change model for the AMTR project and will also provide insights to DFID, other donors and projects in malaria endemic territories to design effective interventions on changing consumer behaviour for sustained use of ACTs and RDTs for the containment of malaria.

Introducing diagnostic testing in commercial outlets: PSI is currently implementing the RDT intervention in 6 townships as a pilot. The supply chain is at a rudimentary stage at this point. The RDTs imported by PSI are distributed to selected supply points (usually drug shops) in the townships. The Itinerant Drug Vendors (IDVs) and drug stores that are participating in the RDT pilot are introduced to the supply points by the PSI product promoters and Inter-Personal-Communicators (IPC) and visit the supply points to collect the RDTs. Currently there are around 11 IPCs working in the field to promote use of RDTs amongst providers. IPCs will be disengaged after the pilot and will be replaced with mass media communication when the program is scaled up.

In addition to the IPCs there are around 23 product promoters who support product marketing. The RDT campaign essentially evolves on the ACTs campaign. Therefore, the product promoters currently engaged on the promotion of ACTs will also engaged at the RDT scale up phase. PSI's proposed target was to have approximately 40,000 outlets carrying ACTs by the end of year 2, of which most will carry and conduct RDTs. From discussion with the IPCs and IDVs in the field, it was evident that the kits are available, that the IDVs are knowledgeable about use of RDTs and that they are using these on a regular basis. It is not clear whether PSI could achieve the huge leap from the phase 1 pilot in 6 townships to the phase 2 roll out across 40,000 outlets, leveraging on the ACT channels. Furthermore, unlike the ACT market where PSI is engaged with a private sector distributor and plans to engage an additional one, the distribution of the RDTs is heavily dependent on PSI's own supply chain capacity. PSI could potentially leverage on its Sun Franchise Network for the rapid scale up of RDTs, but it was not verified by the review team whether PSI intends to do so. In brief, there is a need to further investigate PSI's strategy for effective rapid scale-up of RDTs.

5.3.2 That represent good Value for Money

Up to the time of the first visit of the evaluation team the PSI project had not considered a Value for Money approach in detail and had no VFM plan in place. However, our VFM expert introduced the concept to the PSI team and worked in conjunction with them to develop a VFM plan that clearly outlines the types of data to be collected and will be followed up by the PSI staff and the evaluation team in the course of the next 18 months.

The VFM action plan includes three stages.

Stage 1: An assessment of how PSI currently addresses VFM in their operations. This stage includes reviewing and linking budgets, action plans, and actual expenditures to outputs. Functions examined

[4] Above and below the line are marketing terms referring to advertisement to a broad audience using mass media (above the line) or more inter-personal addressing specific "niche" audiences (below the line).

include procurement; delivery chain mechanics; effectiveness of delivery of varied types of retail outlets; BCC costs and evidence of change, etc.

The output for Stage 1 is the creation of a data capture plan and assessment of how PSI currently addresses VFM.

Stage 2: Work with PSI to build focussed VFM action plan around the planned programme activities. Assess effectiveness of primary cost-drivers: procurement; costs of drugs (delivered, through various outlets, to end user, etc.); subsidies; BCC messaging. Proceed to assess data on uptake of ACTs vs. reliance on AMTs, costs per person treated with ACTs who (presumptively) needed treatment, vs. more targeted treatment unit costing, delivery channel efficiency, etc.

The most direct way (along with procurement chain efficiency) to strengthen VFM is to increase the uptake of ACTs by the population. Thus, an assessment of subsidies, BCC messaging, and a comparative assessment of delivery channels including outlets will provide data to enable PSI to focus its programming on increasing efficiency and increasing uptake of ACTs . The effectiveness of marketing campaigns will be assessed as a 'success factor'. To the degree marketing succeeds, use increases, unit costs of treated persons decreases, and VFM is strengthened. Potential efforts/incentives to focus ACT treatment and decrease false self-diagnosis will also be considered in a VFM analysis.

The first output of stage 2 is the creation of an operations performance feedback loop that builds upon Stage 1 data, so that the PSI team gains knowledge about which methods are most effective. The second output of stage 2 is a VFM action plan that uses the performance feedback loop to adjust programming to capture greatest economies, and efficiencies.

Stage 3: Articulating lessons learnt for future programming. In this stage a VFM assessment of the effectiveness of the subsidy and 'market-flooding' strategy will be made to complement broader clinical assessments. A model performance feedback loop will be created, based on the successes and challenges encountered by PSI for potential use in future programming.

The output for Stage 3 is assessment of programme effectiveness, lessons learnt and VFM modelling for future programming.

There are some VFM questions that remain to be resolved:

- Can we acquire benchmark unit-costing from Africa that will be a useful comparator to the PSI effort?
- What is the long term VFM of the use of ACTs vs. AMTs in Burma and its effect on transmission and/or elimination?

These questions will be addressed during stage 2 and partially through the suggested working papers and case studies.

Each of the three stages is identified in the VFM table at Annex C.

5.4 Are Systems to Capture Necessary Data in Place

5.4.1 Routine Data

PSI-Myanmar maintains a comprehensive data base with input-output data which includes areas of interest for the evaluation team:

a) Number of Supa-Arte packs sold to AA Medical Products per month and by age category
b) Number of Supa-Arte packs sold by AA Medical Products to their customers per month and by age category
c) Number of RDT distributed and recovered (currently for the phase 1 RDT distribution)
d) Number of Product Promoter visits to outlets by township and outlet category
e) Number of radio messages aired and consumers reached by various communication channels
f) Number of ACT treatments dispensed in the Sun Quality Health and Sun Primary Health outlets
g) Number of RDT tests done and their results from the Sun Quality Health and Sun Primary Health outlets

Data items a-e will be directly used in the evaluation of the AMTR project, while items f and g will be used in the triangulation of changes in malaria epidemiology for evaluation question 2a (see page 11).

PSI has a number of staff dedicated to data entry and management and uses an MS-Access based data base for all their data. Procedures of data verification and safety of storage are in place and the data base is set up to allow a number of queries, as needed and requested by technical staff. However, to date the output of specific metrics of interest in the form of tables and/or graphs is not automated but rather depends on occasional requests. This is an area where PSI could consider some improvements in order to routinely present monthly updated graphs for improved and timely assessment of trends in sale, test positivity rates and relative prevalence of *P. falciparum* versus *P. vivax* to mention just a few.

5.4.2 Surveys

Overall the survey methodology applied for the AMTR project for outlet, household and mystery client surveys closely follows the methodology of the *ACTwatch* project and have been well established and recognized as "state of the art" [11]. In this respect the evaluation team has no concerns with respect to data reliability and quality. However, there are a few aspects that one should be aware of:

Sampling methodology: In order to achieve a good "representation" of accuracy and internal validity, it is generally advisable in population-based surveys to have as few steps in the sampling design as possible, as with each further step a new layer of potential loss of precision through design effects[5] is introduced. This means that usually only two steps are applied to household cluster surveys. However, because the *ACTwatch* methodology relies on larger administrative sub-units to sample all eligible medicine outlets within that unit (in the Burma context a township), there are four

[5] The design effect is the ratio between the between and within variance of a specific outcome, or in practical terms the factor by which the confidence interval of an estimate needs to be inflated compared to a sampling where the units of observation are selected directly, without clustering.

steps in the sampling process and the number of primary sampling units (townships) is rather low, with 13 compared to the optimum usually recommended to minimize the design effect of about 30. This sampling methodology does not necessarily introduce a bias but is likely to lead to loss of precision in the final estimates due to larger design effect and does imply the assumption that outcomes are reasonably homogeneous between townships within a domain. However, given the need to overlap the sampling domains of outlet and household surveys and using the same design throughout the project to ensure comparability, no changes can be recommended at this point in time. Triangulating the PSI survey data with other survey data such as the MARC baseline and follow-up surveys will allow a determination of whether or not results are comparable across strata or domains and this will be sufficient to make a statement on the reliability of survey results.

Sample size: Sample sizes for the surveys have been calculated based on anticipated outcomes and their changes across the PSI project area. This implies that any disaggregation of data as recommended by tier 1 versus tiers 2 and 3 will results in a loss of precision (larger confidence intervals). It also may result in an inadequate sample size by tier, depending on the geographic size of the different tiers. However, the anticipated change for the core variables such as AMT market share or treatment prevalence is expected to be sufficiently high that they can be shown as statistically significant, even with a lower level of precision difference. The evaluation team, therefore, concludes that no major revisions of sample size need to be considered at this point in time.

Questionnaires: The survey tools used by *ACTwatch* and adopted for the Burmese context are comprehensive enough to allow all analyses that are suggested by the evaluation team in the evaluation framework. It can, however, also be noted that the questionnaires are very long and contain a number of very subjective opinion questions that rarely provide good actionable evidence, but do prolong the interview and may actually contribute to information bias for critical questions due to respondent fatigue. The evaluation team will engage PSI in a discussion on potentially shortening the questionnaires for the endline surveys to address this issue.

Quality assurance during data collection and entry: Quality assurance procedures during data collections reported by PSI follow the general practice of validating at least 5% of interviews by the supervisors and are therefore sufficient. However, it could not be established during the initial visit to which extent these data validation exercises are also documented by the contracted survey firms.

Data entry is performed with a professional data entry software package using state-of-the-art double entry and validation and there are no concerns regarding data quality at these stages.

6 OUTLINE OF SUGGESTED CASE STUDIES AND WORKING PAPERS

There will be two types of “stand-alone” papers produced by the evaluation team which form part and parcel of the overall evaluation, but highlight specific “lessons learnt” for a broader audience (case studies), or analyse specific problems in more depth and present future implications and/or strategic options for consideration to a malaria/public health audience (working papers). Some of these are purely desk based; others will include some field work and qualitative data collections. Should other topics or aspects arise during the project that should be addressed through these mechanisms, the evaluation team will make every attempt to incorporate these.

All case studies and working papers will be conducted in close collaboration with PSI, and with full acknowledgement of PSI’s work as the basis of any paper.

6.1 Case Studies

Case study 1

Title: Lessons learnt from RDT incentives pilot programme for scale-up

In this paper, valuable lessons learnt from the Burma AMTR pilot study for RDT supply in the private sector, will be presented. The issue of accurately diagnosing malaria is particularly important in a rapidly changing environment such as presented by the Burmese context. With artemisinin resistance and rates of *Plasmodium vivax* steadily increasing, and *Plasmodium falciparum* declining, the issue of appropriate malaria treatment becomes essential. Rapid Diagnostic Testing in the informal private sector has not been trialled before; therefore PSI undertook a pilot study in 2 regions with a control area, to identify the level of incentive required for adherence to RDT testing before providing a fever treatment. The incentives tested included a financial discount for additional purchase, and also further information and training to assist in RDT customer sales. The results of this pilot will provide valuable learning for the project and the potential for broader learning regarding sales of RDTs through the private sector, for other countries. The case study is planned to start end of 2013 with field work in Q1 2014 and results presented in Q2 of 2014. Lead: Karen Bulsara.

Case study 2

Title: Role of private sector in containing resistance to artemisinin in Myanmar: The learning from AMTR project

The private sector is at the heart of the AMTR project since they are found to be the major source of anti-malarials to suspected and confirmed malaria patients in Myanmar. The approach to replace AMT with QA ACTs and RDTs in the private sector includes national distributors, regional and township wholesalers, village level informal health workers, drug stores and general stores. Within the supply chain, PSI plays the critical role of importing, branding, packaging, product detailing, and market promotion (BTL and ATL). This case study will seek to analyse the role of the different private sector actors in containing the resistance of artemisinin in Myanmar. The case study will help donors, international NGOs and practitioners working on malaria eradication and containment to define sustainable outcomes for their programs and identify the role of the project, the implementation agency and private sector actors in achieving sustainable outcomes. Although the focus is the private sector, the study will also address the role of the private sector and make an attempt to clarify which aspects are better tackled by the public sector. The case study is planned to start at the end of 2013 with field work Q1 2014 and results presented in Q2 of 2014. Lead: Rubaiyath Sarwar.

Case Study 3

Title: Replacement of artemisinin monotherapy with ACT in the private sector in Burma – what works and what makes it work?

This will be a desk based case study summarizing PSI's overall experience throughout the project, as well as the major results from the evaluation and will present broader lessons learnt which may be applicable to other programmes and countries. Since this case study can only be done after the final evaluation has been completed, it will be presented in Q1 2015. Lead: Karen Bulsara.

Case study 4

Title: Consumer (KAP) Insights into treatment seeking behaviour from AMTR Programme

It is evident that very little is known about the knowledge, attitudes and practices (KAP) toward seeking malaria treatment amongst Myanmar populations. The country is ethnically very diverse; there are areas where entry is restricted due to internal conflict; and there are government restrictions on consumer research. A complete picture of the Myanmar consumer is therefore very difficult to formulate. Rapid Consumer Surveys, using exit interviews were proposed by the PSI programme, but as yet have not been conducted. The evaluation team proposes to conduct a qualitative study into a hard-to-reach community to better understand their issues with regards to health seeking behaviour and malaria. This paper will highlight some of the key findings from such a study to provide information on targeting Burmese communities through behaviour change interventions to wider Burmese stakeholders. Collection of evidence, including field work, will take place in Q4 2014 and results will be presented in Q1 2015. Lead: Karen Bulsara.

6.2 Working Papers

Working paper 1

Title: Sensitivity analysis of the calculation of DALYs averted in the context of the AMTR project

Disability-adjusted life years (DALYs) are a common measure of the impact of an intervention and are being used by DFID to compare cost per DALY averted between different programmes and/or countries. However, a number of assumptions are required to make these calculations, such as which life tables to use, how to estimate the average age at death or disability, whether or not to discount age, which disability weights to use etc. Many of the underlying assumptions or decisions have significant impact on the calculated DALY, and the objective of this work is to provide a measure of uncertainty around the DALY estimations. Based on the assumptions used by PSI in their DALY calculator a series of alternative calculations will be run using the R-software based DALY module, applying reasonable variations of the assumptions used. The working paper will present data on which variables influence the resulting DALY outcome the most, and will discuss potential consequences in the use of DALYs for comparing programme outcomes. This desk based work is planned to start Q4 2013 and results are to be presented in Q2 2014. Lead: Albert Kilian.

Working paper 2

Title: Adding primaquine to the standard treatment of uncomplicated *P. falciparum* malaria – perceptions of various providers and options for implementation strategies

This will be a piece of qualitative work that will be undertaken amongst various categories of clinical service providers, exploring the challenges to a successful introduction of the addition of a single, low dose of primaquine to prevent the transmission of *P. falciparum* by eliminating gametocytes. In light of the findings from this work, the existing FDA regulations, and a thorough review of the literature around this approach (clinical studies and modelling), different strategic options for the rapid role out of this additional treatment will be presented for further discussion in the malaria community, both in-country and beyond. Planning, field work and analysis will be undertaken in Q1 of 2014and presented in Q2 2014. Lead: Karen Bulsara.

Working paper 3

Title: Qualitative analysis of the decision process amongst migrant populations in South East Burma regarding whether to use the public or private sector in the case of febrile illness

To be able to contain the ACT resistant strain of malaria, we need to understand the knowledge, attitudes and decision making processes of mobile and migrant peoples. This includes, their perspectives and actions around combating malaria, where they are choosing to access treatment – whether through the private or public health sector – and how they are making treatment decisions, including the choice of appropriate and proper case management (RDT test and ACT treatment). In this research, qualitative information from migrant workers and also the employers/owners/ managers of workplaces will be collected through appropriate tools such as FGD using structured guidelines. In addition, PAR (Participatory Action Research) will be utilised to gain information beyond the structured guidelines. We would like to propose a scope of research in Shwekyin, KyuneSu, Kawthaung, Launglon and Myeik. In each township, two groups of migrant clusters will be identified based on the presence and absence of a well-structured supporting community. This work will involve field work and commence in Q4 2013 and is expected to present results in Q4 2014. Lead: Win Maung.

Working paper 4

Title: The potential long-term role of the private sector in malaria control and elimination, both in general and in the provision of malaria treatment in Burma and the Greater Mekong Sub-region

This working paper will combine a number of approaches to explore possible developments and strategies for engaging the private sector over the long-term in the containment of artemisinin-resistant malaria, as well as in malaria control and elimination in the Greater Mekong Sub-region. One element will be a modelling exercise to project numbers of diagnostic tests and ACT treatments needed and potentially provided by the private sector, and to discuss probabilities in consideration of existing supply chains, price structures and potentials for subsidies. The second element will be an analysis of the networking potential of a business coalition to support malaria control in the face of increasing economic activities that is currently undertaken by the Myanmar Health Development Consortium. This desk based work will start in Q3 of 2013 and results are expected in Q4 2014. Leads: Rubaiyath Sarwar, Sandii Lwin and Albert Kilian.

7 RISK MANAGEMENT PLAN

As part of the Inception phase and in line with our Duty of Care responsibilities, we have conducted a thorough risk assessment of the evaluation context and have produced a comprehensive evaluation Risk Management Plan (RMP). The aim of the RMP is to provide a comprehensive picture of potential risks to the health, safety and security of the evaluation team posed by the project environment, and to present appropriate mitigation strategies to reduce risk to acceptable levels. The plan also seeks to address operational risks which may impede the effective completion of the evaluation.

The RMP presents the results of our risk assessment in a detailed project Risk Register, and then presents the protocols and procedures we have developed to both reduce the threat of risk from manifesting, and our vulnerability should risk manifest. Protocols include a series of procedural checklists developed to guide team members through appropriate risk management processes both

before, during a following deployment to the field. Procedures and protocols clearly state who is responsible for conducting specified activities and within what recommended timeframe and detail who is available to provide support when this is required.

The RMP is designed to be an iterative document to be developed throughout the life of the valuation as required in response to a changing risk environment. The primary responsible owner is the evaluation project manager who has responsibility for updating the document and disseminating content across the evaluation team.

The RMP is attached with this document under separate cover due to size.

8 IMPLEMENTATION PHASE WORK PLAN

Table 2. Implementation phase workplan

Implementation phases	Implementation 1				Implementation 2						Implementation 3						Imp 4		
	2013		Q4		2014 Q1			Q2			Q3			Q4			2015 Q1		
Activities, outputs and payment triggers	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Ongoing collection of costing data (stage 1 VFM), routine data from PSI, survey reports and other outputs																			
Ongoing feed back to DFID, PSI and stakeholders																			
Detailed planning for all case studies and working papers																			
Submission of 1st six-monthly report with interim (stage 1) VFM report (payment trigger)																			
Work for case studies 1 and 2 with field trips																			
Write-up and presentation of case studies 1 and 2																			
Desk-based work for working paper 1																			
Field work for working paper 2																			
Write-up and presentation of draft working papers 1 and 2																			
Submission of 2nd six-monthly report with interim (stage 2) VFM report (payment trigger)																			
Analysis for working papers 3 and 4 and field work for working paper 3																			
Write-up and presentation of draft working papers 3 and 4																			
Preparation and implementation of evaluation field visit																			
Submission of 3rd six-monthly report with final VFM report (payment trigger)																			
Draft of final evaluation report																			
Analysis and write-up of draft case studies 3 and 4																			
Consultations with core stakeholders and incorporation of comments on final evaluation report																			
Dissemination workshop for evaluation results including final case studies and working papers																			
Output: End of project evaluation report including VFM findings (payment trigger)																			

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10 ANNEXES

A: KEY INFORMANTS AND STAKEHOLDERS MET DURING VFM VISIT

	Key Informants- AMTR Independent Evaluation VFM Inception Visit 9-18 June, 2013		
	Name	**Title**	**email**
1.	Barry Whittle	PSI Country Director	bwhittle@psimyanmar.org
2.	David Valentine	PSI Deputy Country Director	dvalentine@psimyanmar.org
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18.	Louise Mellor	Health Advisor, DFID	L-mellor@difd.gov.uk

B: STAKEHOLDERS CONTACTED TECHNICAL TEAM VISIT JULY 15-24. 2013

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MHDC	Sandii Lwin	Managing Director	slwin@myanmarhdc.org

C: VFM PLAN

	VFM focus area	AMTR Data, Responsibility, Timing			VFM Analysis	
		Data requirement	**Person responsible**	**PSI report schedule**	**VFM activity**	**VFM Output**
Overall: Performance to target to budget and actual	Performance to budget review- Stage 1 VFM assessment	Initial logframe	Hnin Su Su Khin	One time	Manually align data from logframes, workplans, performance and M&E reports to budgets and actuals	1. Foundational data to assess economy, efficiency, effectiveness and equity. 2. Budget and performance data aligned at detail level permitted by PSI's systems. 3. Planned and actual budget and performance review enables high-level cost-effectiveness analyses. 4. Performance/cost trend input to MTR and Final. 5. Format for ongoing budget/performance monitoring proposed to PSI. 6. Trend AMTR delivery vehicle cost-effectiveness **7.** Trend input to performance efficiency
		Logframe revisions	Hnin Su Su Khin	Semi-annual	Manually align data from logframes, workplans, performance and M&E reports to budgets and actuals Assess performance to targets comparison/trending	
		Workplans and revisions	Hnin Su Su Khin	Semi-annual		
		Performance to targets for logframe targets and activities	Hnin Su Su Khin	Semi-annual		
		Budgets vs. actual	Hnin Su Su Khin	Quarterly	Actual to budget comparison/trending	

	VFM focus area	AMTR Data, Responsibility, Timing			VFM Analysis	
		Data requirement	**Person responsible**	**PSI report schedule**	**VFM activity**	**VFM Output**
Economy	Procurement Stage 1 VFM assessment	Procurement plan	Procurement Office/Paul Masson	Received	Review plan; document adherence	1. Procurement planning, and practice assessment 2. Cost comparison across programmes; leverage for future procurement 3. Ensures robustsystems in place. 4. Unit-costing enables benchmarking 5. Verification of procedures
		Procurement of selected commodities vs. budget	Procurement Office/Paul Masson	Inception to present report forthcoming; subsequent semi-annual	Enables benchmarking, unit-costing	
		Review selected procurement trail	David T.; in-person	In person	Document review	
	Human Resources Stage 1 VFM assessment	AMTR salary and STTA data per salary bands	Paul Masson	Annual	Trend staff use by band to performance	1. Foundational data for analytic uses 2.Staffing trend to budget and performance metrics[6] .
Economy/Efficiency	Cost-Driver Analysis Stage 1&2 VFM assessment	Provided above	Provided above	Provided above	Disaggregate factors that comprise total all in costs of drivers, as possible per PSI data	1. Identifying cost-drivers enables analysis, assessment, of cost and performance 2. Input to MTR; propose recommendations to capture VFM as apropos
	Performance Feedback Loop Stage 1&2 VFM assessment	Data captured above	David Toomey	One time following Stage 1	Create useable plan	Enable PSI team to monitor performance and adjust factors that influence VFM.

[6]Taking account for time between staffing and quantifiable performance

	VFM focus area	AMTR Data, Responsibility, Timing			VFM Analysis	
		Data requirement	**Person responsible**	**PSI report schedule**	**VFM activity**	**VFM Output**
Efficiency	AMTR distribution chain analysis Stage 2 VFM assessment	Distribution map	Hnin Su Su Khin	One time	Analyze components of AMTR distribution/uptake strategy by measureable results	1. Performance to cost analysis of AMTR distribution strategy 2. BCC cost to performance analysis 3. Assess distributor coverage by region, outlet, retail and household survey 4. Using end user data, assess cost vs. AMTR, input to MTR and Final.
	AMTR BCC analysis Stage 2 VFM assessment	BCC strategy	Hnin Su Su Khin	Received	Triangulate strategy with sales, retail outlet, and household survey data	
	ACT sales-to-end user analysis Stage 2 VFM assessment	Existing sales data	Hnin Su Su Khin	Quarterly	Trend distribution; retail outlet surveys	
		Demographic data by region[7]	Hnin Su Su Khin	One time	Baseline to assess AMTR coverage	
		Potential end-user uptake surveys[8]	AMTR? Or Independent Evaluation?	TBD	Use uptake survey data to confirm assumptions.	
Effectiveness	End user uptake Stage 2 VFM assessment	Household surveys	TBD	TBD	Use uptake data to income cost effectiveness/DALY calculations	1. Links end user data to AMTR distribution chain 2. Assesses ACT distribution plan cost-effectiveness 3. Model AMTR vs. other options to continue ACT distribution focus 4. Promote plan for ongoing provision
	Potential [9]comparative cost-effectiveness modeling Stage 2&3 VFM assessment	Internal and external RDT/ACT financial and performance data	Discussion with Matt/David T.	Once in LOP	Assess cost-effectiveness of ACT with and w/out RDT.	

[7]Current demographic estimates extrapolated from old data

[8]Measurement of end user purchase and compliance is not yet planned by PSI; doing so through proxy tools/surveys would strengthen beneficiary evidence.

[9] Not yet planned. PSI currently in discussions with partners to advance modeling assessments of different ACT strategies; VFM collaboration would strengthen independent evaluation.

	VFM focus area	AMTR Data, Responsibility, Timing			VFM Analysis	
		Data requirement	Person responsible	PSI report schedule	VFM activity	VFM Output
	DALY averted cost and economic benefit Stage 2&3 VFM assessment	DALY calculations, internal and external data	Independent evaluation	End of project	Project costs per DALY averted;	of ACT and monotherapy exclusion 5. Captures costs per DALY; economic benefit to beneficiaries
	Dissemination Plan Stage 3 VFM assessment	Existing plan	Chris White	Year 1,2	Review	1. Capture reach of lessons learnt 2. Long term VFM
Equity	AMTR gender, geographic and income reach Stage 3 VFM assessment	Existing distribution/sales data plus household surveys	As above	After household surveys	Triangulate with cost/performance data	1. Input to MTR and Final

D: DISSEMINATION PLAN

Dissemination Products	Purpose of Dissemination	Key Target Audience	Dissemination Channel	Timing
Evaluation inception report	Ensure key stakeholders are on the same page regarding the evaluation questions, methodology, limitations, VFM assessment plan and timings	- DFID - Steering Committee (SC) - PSI	- Mail	– September 2013
Evaluation final report - full version	Comprehensively present the answers to the 11 evaluation questions and the VFM assessment	- DFID - Steering Committee (SC) - PSI	- Mail	– Q1 2015
Evaluation final report – summary version	Share a summary of the answers to the 11 evaluation questions to a relevant wider audience	- DFID - Steering Committee (SC) - PSI - Burma MOH and private sector actors - MARC stakeholders - RBM stakeholders	- End of evaluation dissemination workshop - MARC annual meeting - RBM case management working group meeting - RBM weekly update mailing list - DFID website - BMGF website - 3mdg Fund website - RBM website	- Summary report available Q1 2015 - Evaluation dissemination workshop: March 2015 - Other meetings: timing to be confirmed
Case Studies (CS) 1. Lessons learnt from RDT incentives pilot programme for scale-up 2. Role of private sector in containing resistance to artemisinin in Myanmar: The learning from AMTR project 3. Replacement of artemisinin monotherapy with ACT in the private sector in Burma – what	Share findings on case study topic with a wide non specialist audience with the purpose of sharing lessons learned from the PSI project	- DFID - Steering Committee (SC) - PSI - Burma MOH - Burma private sector actors - MARC stakeholders - RBM stakeholders	- End of evaluation dissemination workshop - MARC annual meeting - RBM weekly update mailing list - DFID website - BMGF website - RBM website - Suitable listservs	- Results presented to DFID, SC and PSI: CS1: Q2 2014 CS2: Q2 2014 CS3: Q1 2015 CS4: Q1 2015 - Evaluation dissemination workshop: March

Dissemination Products	Purpose of Dissemination	Key Target Audience	Dissemination Channel	Timing
works and what makes it work? 4. Consumer (KAP) Insights into treatment seeking behaviour from AMTR Programme				2015 - Other meetings: timing to be confirmed
Working Papers(WP) 1. Sensitivity analysis of the calculation of DALYs averted in the context of the AMTR project 2. Adding primaquine to the standard treatment of uncomplicated *P. falciparum* malaria – perceptions of various providers and options for implementation strategies 3. Qualitative analysis of the decision process amongst migrant populations in South East Burma regarding whether to use the public or private sector in the case of febrile illness 4. The potential long-term role of the private sector in malaria control and elimination, both in general and in the provision of malaria treatment in Burma and the Greater Mekong Sub-region	Share findings on working paper topic with a specialised malaria audience with the purpose of informing future strategies and programmes	- DFID - Steering Committee (SC) - PSI - Burma NMCP - Burma malaria private sector actors - MARC stakeholders - RBM stakeholders, with a focus on those in involved in private sector engagement, case management and M&E	- End of evaluation dissemination workshop - MARC annual meeting - RBM annual meeting of harmonization, case management and M&E working groups - RBM relevant working groups mailing list - Contributions to RBM impact series if possible - DFID website - BMGF website - 3mdg Fund website - RBM website - Possible publications in peer reviewed journals	- Results presented to DFID, SC and PSI: WP1: Q2 2014 WP2: Q2 2014 WP3: Q4 2014 WP4: Q4 2014 - Evaluation dissemination workshop: March 2015 - Other meetings: timing to be confirmed