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LANDSCAPE ANALYSIS OF INCENTIVE STRUCTURES OF VILLAGE AND MOBILE MALARIA WORKERS IN CAMBODIA

February 2018

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The Health Finance and Governance Project

USAID's Health Finance and Governance (HFG) project helps to improve health in developing countries by expanding people's access to health care. Led by Abt Associates, the project team works with partner countries to increase their domestic resources for health, manage those precious resources more effectively, and make wise purchasing decisions. As a result, this six-year, \$209 million global project increases the use of both primary and priority health services, including HIV/AIDS, tuberculosis, malaria, and reproductive health services. Designed to fundamentally strengthen health systems, HFG supports countries as they navigate the economic transitions needed to achieve universal health care.

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Abt Associates Inc. | 4550 Montgomery Avenue, Suite 800 North | Bethesda, Maryland 20814
T: 301.347.5000 | F: 301.652.3916 | www.abtassociates.com

Avenir Health | Broad Branch Associates | Development Alternatives Inc. (DAI) |
| Johns Hopkins Bloomberg School of Public Health (JHSPH) | Results for Development Institute (R4D)
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ACRONYMS

BCC	behavior change communication
BMGF	Bill and Melinda Gates Foundation
CHW	community health worker
CMEP	Cambodia Malaria Elimination project
CNM	National Programme for Parasitology, Entomology, and Malaria Control
DOT	directly observed treatment
FGD	focus group discussion
HFG	Health Finance and Governance project
IDI	in-depth interview
LLIN	long-lasting insecticide-treated net
MMW	mobile malaria worker
MOH	Ministry of Health
PMI	President's Malaria Initiative
RDT	Rapid Diagnostic Test
USAID	United States Agency for International Development
VMW	village malaria worker

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EXECUTIVE SUMMARY

Village and mobile malaria workers are a key component of the national effort to eliminate malaria in Cambodia, which remains a public health challenge in the country despite recent progress reducing its burden. Malaria workers provide health promotion, disease prevention, and treatment and referral services in remote areas without health facilities nearby. This includes health education and behavior change communication, distribution of insecticide-treated nets, malaria diagnosis and treatment, and referrals to health centers for complicated cases. While the malaria program in the country is led by the National Programme for Parasitology, Entomology, and Malaria Control (CNM), there are multiple actors involved in its funding and implementation. As a result, there is notable variation in the types and design of financial and non-financial incentives provided to malaria workers.

This landscape analysis was commissioned by the United States Agency for International Development (USAID) to clarify the range of incentive mechanisms used, and identify ways to improve the program's effectiveness, sustainability, and alignment with other community health worker (CHW) programs in Cambodia. To this end, the Health Finance and Governance (HFG) project conducted a literature review, complemented by qualitative data collection in three of Cambodia's provinces where malaria workers are active.

Based on the results of this analysis, HFG offers the following topics for further discussion:

1. **Importance of incorporating existing malaria workers into a government-managed CHW cadre tasked with delivering a specified package of services:** Although malaria workers primarily serve the vertical malaria control program, these same workers are often tapped by other health programs to perform non-malaria-related tasks. This situation suggests an opportunity to consider a workforce of CHWs that horizontally support multiple public health programs under a central coordinating mechanism. The malaria control program could benefit from such an arrangement for several reasons. First, it would reduce the risk that malaria services were neglected when village malaria workers split their time and effort across multiple health programs with no coordination. Second, it would improve income security for these workers when malaria incidence and thus the volume of malaria-related tasks were in decline. Third, a national CHW workforce could leverage economies of scale and multiple funding streams, enabling a rapid scale-up of the CHW workforce.
2. **Realistic and costed roadmap for transitioning management functions of donor-funded CHWs under the MOH:** Managing a national CHW workforce requires several operational functions be in place which in turn necessitate detailed planning processes to ensure all functions are operational. If considering a new CHW cadre, for example, HFG recommends development of a roadmap and time frame for launching and scaling such a workforce. This might include transitioning existing malaria workers into CHWs and aligning goals and objectives for them across programs. If shifting functions for a cadre to Government responsibility, shifts should be appropriately sequenced to ensure a smooth transition.
3. **Barriers to workers' timely access to electronic payments:** The landscape analysis identified several barriers to the prompt receipt of financial payments by malaria workers through electronic systems—barriers that make malaria workers prefer cash payments. At the same time, the advantages of electronic payments, and the potential for them to be better in the future for workers as well as programs, are strong. Fully shifting to electronic systems would

align with the broader trajectory of economic development in Cambodia. Programs could find ways to resolve, or at least reduce, these barriers as they continue towards a future with electronic payments.

4. **Consideration of an output-based model for CHWs, with a working group to develop the initial model and adjust it on a predetermined schedule:** HFG recommends exploring hybrid models that pay CHWs a small flat rate plus a fee per service provided. A primarily output-based model would ensure workers were incentivized to deliver services. A technical working group could support the design of a fee-for-service model and regular updating of the model using timely information and feedback on program performance by geographic area.
5. **Importance of relative rates for tasks in an output-based model, based on the estimated effort to complete a task and its relative priority:** The fee for each task could reflect both the relative *priority* of that task and the *amount of time and effort* it takes a worker to complete it. Setting a fee schedule to account for the level of effort required mitigate perverse incentives for workers to focus on tasks that require less effort for similar financial payoff. Level of effort is also critical to strategically setting relative rates. For example, a malaria worker would need to expend more effort to identify and treat cases of malaria in low endemicity areas than in areas with a generalized epidemic. Fees for malaria-related tasks in areas of low endemicity could therefore reflect a higher level of effort.
6. **Setting fee schedules so that an average worker would earn sufficient wages to perform their role full time:** If the assumption is that a CHW works approximately full-time, the fees earned in a given month should reflect a reasonable monthly wage for the worker, and reasonable relative to other professions. The appropriate average monthly wage for a malaria worker would need to be sufficient to cover the cost of living in the worker's geographic area, but less than the wage of a highly-trained nurse stationed in the local health center, for example. It may be necessary to include a cost-of-living adjustor in the payment model, given that costs differ widely across the country.
7. **Critical role of non-financial incentives:** The landscape analysis demonstrates that addressing non-financial motivators within program design is an important complement to providing financial incentives. FGD participants and global literature on community health workers offer myriad suggestions for non-financial incentives (see Section 4.3.2). These suggestions offer potential for use in the Cambodian context, if adapted appropriately. Options vary to the extent in which they require resources to implement. One area for consideration might be to involve the community in the supervision of the workers, as this promotes a positive relationship between communities and workers and actively solicits feedback—both of which this analysis found to be strong non-financial motivators for Cambodia's malaria workers.
8. **Equipping CHWs with the supplies needed to succeed:** CHWs in Cambodia and elsewhere can become demoralized when they do not have materials needed to fulfill their roles. Such materials can be medical (e.g. rapid diagnostic tests) or operational (e.g. bags, training materials). Ensuring that the needs of CHWs are met can help lower the risk that insufficient materials pose to the productivity of the workers and the overall success of the program. This could be facilitated by actions such as strengthening forecasting and monitoring in the supply chain or budgeting for sufficient operational expenses.

I. INTRODUCTION

Malaria remains a public health challenge in Cambodia, despite recent progress reducing its burden. Between 2009 and 2015, deaths due to malaria decreased from 219 to 10, while treated malaria cases halved between 2011 and 2015 (PMI 2017; CNM 2016). However, the burden of malaria remains higher than in other countries in the region (Alva et al. 2012). Moreover, resistance to first-line treatments has emerged as a threat, making the challenge to the country's overall health more acute and urgent to address (Duru et al. 2016).

The government of Cambodia is working closely with numerous partners to respond to this challenge. Its 2011–2025 National Strategic Plan for Elimination of Malaria identifies the goal of achieving “phased elimination of all forms of malaria” by 2025 (CNM 2011). Coordinating the development and implementation of the plan is the National Programme for Parasitology, Entomology, and Malaria Control (CNM), which sits within the Ministry of Health (MOH).

Village and mobile malaria workers (VMWs and MMWs) are a key component of the plan. The VMW program was piloted in 2001 and scaled up in 2004 with support from The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund). Like other community health workers (CHWs), malaria workers primarily engage in health promotion, disease prevention, and treatment and referral in remote areas without health facilities nearby. In 2009, the program expanded to include MMWs, who target mobile populations in areas where malaria endemicity is particularly high (Canavati 2012). Since the program's inception, more development partners have joined the Global Fund in providing supplementary resources to the CNM's malaria worker program. As of 2017, there are at least eight organizations—governmental and nongovernmental, Cambodian and foreign—that play a role in supporting this program.

In this multi-faceted and multi-actor environment, stakeholders have expressed interest in gaining clarity on the range of incentive mechanisms used among the implementers. In the midst of an uncertain landscape for future funding, there is also a heightened attention among stakeholders to learn about how to make the malaria worker program more effective and sustainable, and to better align it with other community health programs in Cambodia.

To this end, the United States Agency for International Development (USAID) commissioned the Health Finance and Governance (HFG) project to prepare a landscape analysis that intended to answer the following research questions:

1. What incentive mechanisms (financial and non-financial) motivate CHWs, including malaria workers, in Cambodia, the region, and globally? Are these mechanisms appropriate for Cambodia, cost-effective, and sustainable?
2. What factors affect the level and sustainability of malaria worker engagement in Cambodia?
3. What modality for delivering financial incentives (e.g., cash vs. electronic payment) is most effective and efficient in the Cambodian context?



This landscape analysis presents the synthesis of a literature review and qualitative data collection and analysis effort conducted to answer these questions. The document begins with a brief summary of the study methods, followed by a logic model that links program design features to malaria program objectives through leveraging workers' motivations. The results section first describes the malaria worker program in Cambodia. Following, it details financial and non-financial incentives for malaria workers and stakeholders' perspectives on their design. In the last section, HFG suggests a set of discussion topics for stakeholders of Cambodia's malaria response and malaria worker program.

2. METHODOLOGY

The landscape analysis consisted of a literature review and qualitative data collection and analysis.

2.1 Literature Review

The purpose of the literature review was to gather relevant global learnings about community-level health programs, with particular emphasis on financial and non-financial incentives provided to workers. The literature review also served to inform the development of a logic model (Figure 1 in the next section). HFG searched the online indexing services PubMed and Web of Science, as well as the reference lists of peer-reviewed articles published in English, French, Spanish, and Portuguese. Search terms included *malaria*, *community health workers*, *payments*, *incentives*, *motivations*, *retention*, and *performance*, and a variety of terms related to these.

2.2 Qualitative Data Collection

The qualitative data collection and analysis was conducted to explore malaria workers' experiences with, and stakeholders' perspectives on, incentives for malaria workers. Between July and August 2017, researchers conducted six focus group discussions (FGDs) with a total of 53 malaria workers in three of provinces of Cambodia where malaria workers are active. The results section cites relevant quotations from the FGDs (see Table A1 in Annex A for details on FGD composition). Citations emanating from the FGDs are generically tagged as 'FGD participant' to preserve the anonymity of participants.

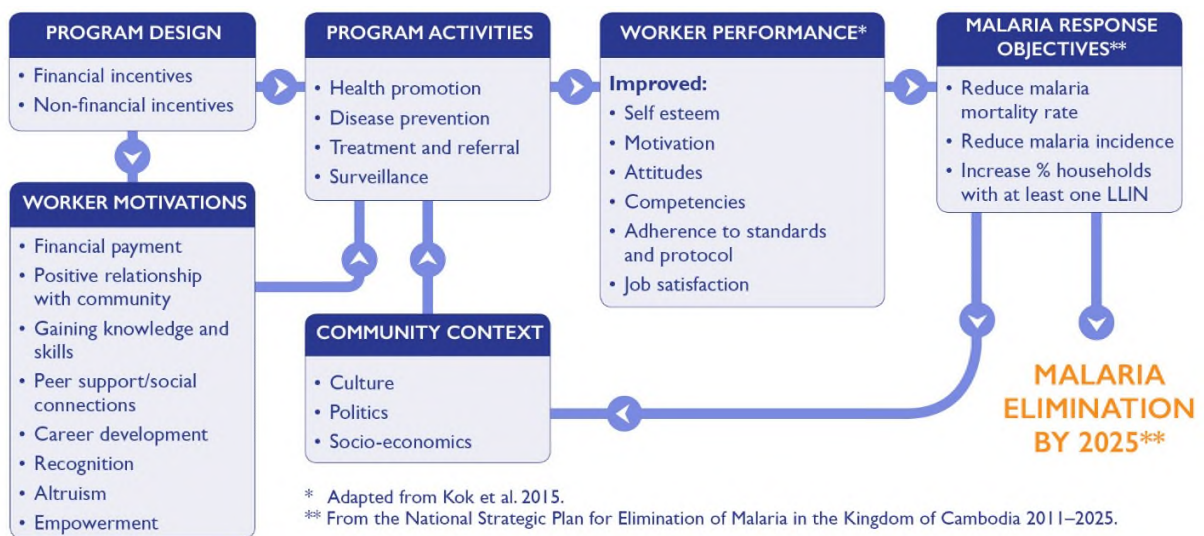
During the same period, researchers conducted 11 in-depth interviews (IDIs) with key informants who have been involved in the design, development, and implementation of malaria programs in Cambodia. These key informants included three senior program managers from implementing partner organizations, four senior managers from donor organizations, and four senior officials from Cambodian governmental entities. The results section cites relevant quotations from the IDIs and FGDs. To preserve participant confidentiality, the authors do not include potentially identifiable information about specific respondents.

Annex A provides more detail on the methodology for the qualitative data collection and analysis.

3. LOGIC MODEL

HFG developed a logic model (Figure 1) to guide the discussion of results. The bottom-left of the diagram presents the **Motivations** of malaria workers to participate in the program. These motivations include both financial and non-financial (Willis-Shattuck et al. 2008; Glenton et al. 2013).

Figure 1: Logic Model for Incentivizing Malaria Workers to Achieve Malaria Program Objectives



The degree to which **Community Context** and **Program Design** leverage these motivations influences the workers’ effectiveness at carrying out **Program Activities** and in achieving the objectives of the malaria response (Okanurak and Sornmani 1992; Lunze et al. 2015). Program design may also shape the nature of workers’ motivations.

This model assumes that motivated workers will be more effective at delivering the **Malaria Response Objectives**. Thus, **Worker Performance** in terms of their “self-esteem, motivation, attitudes, competencies, adherence to standards and protocol, and job satisfaction” is a key modality for malaria program effectiveness (Kok et al. 2015).

The success of the malaria response, as perceived by community members, can be expected to make communities more welcoming to malaria workers, supporting a positive relationship between these parties and facilitating productive performance on program activities by malaria workers (Bhattacharyya et al. 2001).

4. RESULTS

4.1 Description of Malaria Worker Programs in Cambodia

This section provides an overview of the basic features of the programs for malaria workers in Cambodia. Program-specific details for active programs are presented in Table 1. Figure 2 displays malaria worker programs by province, funder, manager, and implementer. See Annex B for detailed information on the number of workers per province by implementer in 2016.

4.1.1 Funding and management landscape

Since 2004, the VMW program has mostly been funded through donor support, particularly the Global Fund. Other major funders include the Bill and Melinda Gates Foundation (BMGF) and PMI/USAID. It is unclear how long and to what extent the Global Fund, as well as other donors, will continue support of malaria worker programs. Despite this uncertainty, there is currently no plan in place to transition workers funded by external donors to CNM, as the primary overseer of the malaria response, which outlines what will happen if donor support diminishes in the coming years.

CNM has the primary responsibility for establishing a vision for the malaria worker program and overseeing activities. The PMI/USAID-funded Cambodia Malaria Elimination project (CMEP), implemented by University Research Co. (URC) provides direct management over malaria workers in six selected operational districts in two provinces in the western part of the country. Other donors, such as the Global Fund, contribute resources for VMWs in other malaria-affected areas.

4.1.2 Malaria worker activities

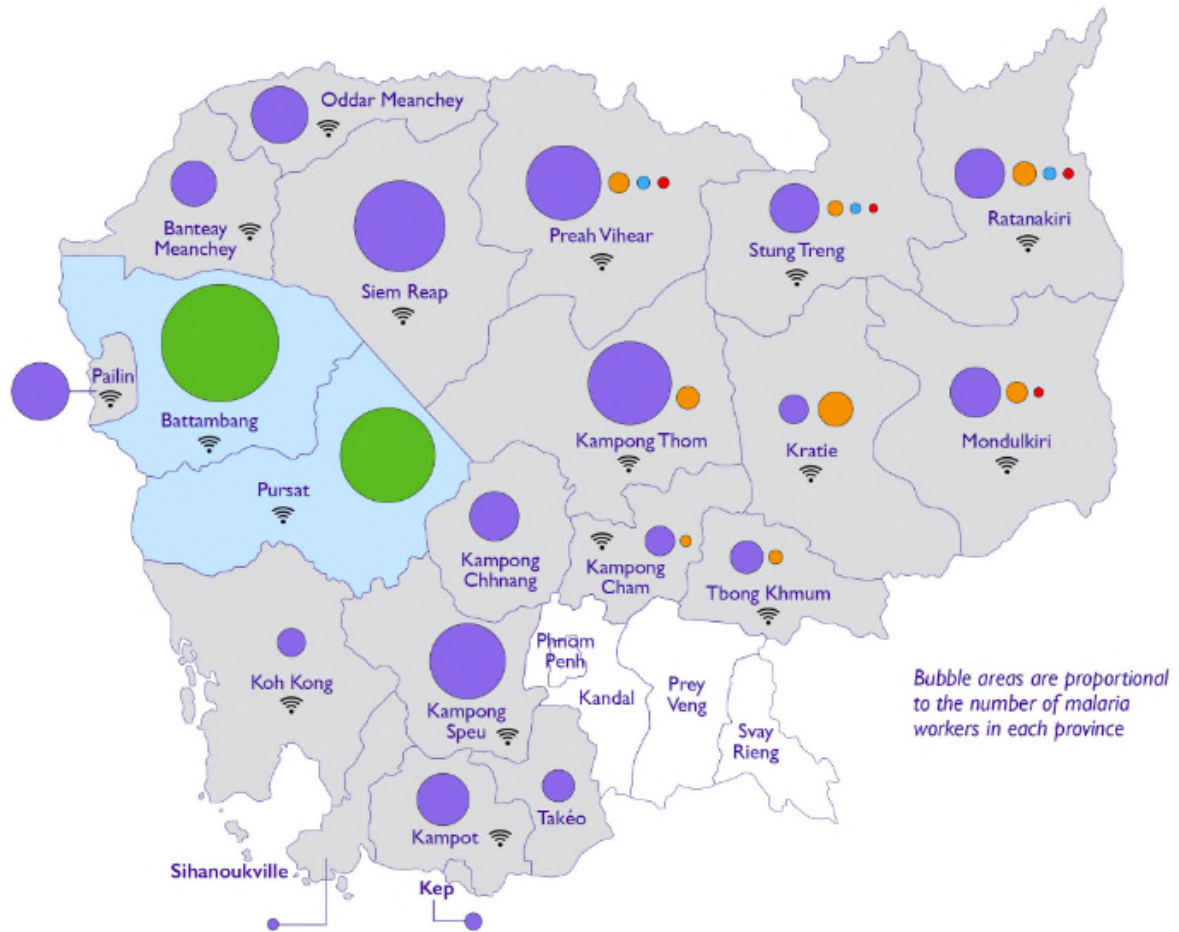
As reported through FGDs, malaria workers are involved in a wide range of health promotion, disease prevention, and treatment and referral activities. Much of their work is intended to prevent malaria infection by providing malaria health education and behavior change communication (BCC) activities and by distributing and monitoring the use of long-lasting insecticide-treated nets (LLINs). Malaria workers are also involved in treatment. They provide free malaria diagnosis, prescribe and distribute free anti-malaria drugs, refer complicated cases to the nearest health center, and use directly observed treatment (DOT) to support patients in adhering to treatment regimens.

Malaria workers are also involved in activities other than those specifically related to malaria control and prevention. In FGDs, malaria workers reported that they participated in vaccination campaigns (where they helped gather children) and other maternal and child health programs.

KEY FINDINGS

- Multiple donors fund malaria worker programs. Sustainability of funding and operations for these programs is unclear, given the potential for a significant reduction in donor funding in the future.
- Malaria workers are primarily involved in the prevention and treatment of malaria, but many workers also support other health programs.
- Malaria workers effectively implement a key component of Cambodia's strategy to eliminate malaria.
- Malaria workers become demoralized when they do not have the medical and operational materials they need (Canavati 2016).

Figure 2: Map of Active Malaria Worker Programs by Province, Funder, and Implementer in 2016



IMPLEMENTERS

FUNDED BY CNM:

CNM National Malaria Program

FUNDED BY PMI/USAID:

CMEP Cambodia Malaria Elimination Project

FUNDED BY BILL & MELINDA GATES FOUNDATION:

PSK Population Services Khmer

FUNDED BY GLOBAL FUND:

HPA Health Poverty Action

MC Malaria Consortium

PROGRAM MANAGEMENT

CNM

CMEP

No Active Programs

ACTIVE MMW (Mobile malaria workers)

4.1.3 Malaria worker program assessment

Studies have found Cambodia's malaria worker programs effective in supporting the more formal health system in malaria elimination efforts (Lim et al. 2012; Canavati 2012), and statements by IDI key informants and FGD participants reflected this positive assessment. The scope of their influence can be seen in several relevant statistics (CNM 2016):

- Nearly 3,400 malaria workers operating nationwide in 2016 reached people at risk in more than 2,100 villages across 21 of Cambodia's 25 provinces.
- Of 23,627 malaria cases diagnosed in 2016, 5,041 (21 percent) were diagnosed by VMWs.

That said, a 2012 evaluation of malaria workers in Cambodia identified some gaps in their performance. In particular, malaria workers often did not observe all treatment doses, as recommended under the DOT approach to support patient adherence. Causes of this failure were reported as lack of transportation and difficulties finding patients. The study also reported stock-outs of medical supplies due to supply chain failures and insufficient operational supplies, both of which demotivated workers and made them less effective. Overall, the study noted that there are still some villages without malaria workers where such support would be helpful to malaria elimination efforts (Canavati 2012).

4.1.4 Amounts and rates of payments to malaria workers

All malaria workers in Cambodia are offered some type of financial payment. As shown in Table I, some payments are provided per time period—typically per month; in one case, per day. Other payments are provided Table I per activity—by event (e.g., monthly meeting, educational event), by case (e.g., research follow-up), or by place (village). Some of these payments are made as a per diem and others as reimbursement for specific travel expenses incurred by the malaria workers.

In the qualitative data collection for this landscape analysis, representing three Cambodian provinces, FGD participants reported that malaria workers received approximately US\$30-50 per month in compensation for all health activities. This amount should be considered a lump sum that corresponds to total monthly compensation received on average for malaria and non-malaria work. As indicated in Table I, VMWs funded by the BMGF and the Global Fund receive US\$10-20 per month of salary, with some payments made per activity/case and to cover travel. In FGDs, participating malaria workers said they considered the payments they received for non-malaria health activities as similar to those they received for malaria activities. There is no exact breakdown by program, and workers' incomes may change month to month given the seasonality of malaria.

4.1.5 Payment modality

In 2017, the Global Fund switched from a cash-based to an electronic payment (e-payment) system where malaria workers can bring a code provided by health center staff along with their phone to a money transfer stall to collect their payment. Multiple companies run money-transferring businesses. Villagers can apply to open a stall in their area, as long as there are no other stalls already established nearby. For example, Wing, established in 2009, is the largest provider and has stalls in all of Cambodia's districts (wingmoney.com 2017). Other donors continue to make payments in cash, but are considering employing e-payments in the future.

Table I. Summary of Active Malaria Worker Programs and Payment Structures in Cambodia, 2016
(Source: CNM, 2016)

Note: table only includes programs with diagnosis, treatment, and education activities.

Funder	Implementer	Activities	Provinces	No. of workers	Payment Rates		
					Per time period	Per activity	Transport
Managed by CNM							
CNM	CNM	<ul style="list-style-type: none"> Malaria early diagnosis and treatment Malaria education Patient follow-up BCC integration (health education) LLIN distribution Tracking cases among mobile migrant workers Active case detection and surveillance and response 	19	2,386		\$20 per village and \$5 for per diem/monthly meeting	Based on actual distances
Global Fund	MC	<ul style="list-style-type: none"> Malaria education Malaria diagnosis and treatment 	3	21	<ul style="list-style-type: none"> MMWs: \$20/month plus \$3 for per diem (half-day meeting) plus travel cost VMWs: \$5/VMW for per diem and actual travel cost during the community event 		Based on actual travel costs during community events
	HPA	<ul style="list-style-type: none"> Malaria education Tracking malaria cases among mobile migrant workers Mapping 	4	8	<ul style="list-style-type: none"> \$10/month Additional \$15/day for training, meeting, sending report, etc. 	<ul style="list-style-type: none"> Additional \$5/activity (2–3 times/month) 	\$8–15 for transportation
BMGF	PSK	<ul style="list-style-type: none"> Malaria education Malaria diagnosis and treatment 	9	244	15/month		

Funder	Implementer	Activities	Provinces	No. of workers	Payment Rates		
					Per time period	Per activity	Transport
Managed by URC							
USAID	URC	<ul style="list-style-type: none"> • Diagnosis and treatment • Malaria DOT • Research follow-up • LLIN monitoring and malaria education 	2	713		<ul style="list-style-type: none"> • \$5/monthly meeting • \$4/case (malaria DOT) • \$7/case (research follow-up), including transportation • \$7/day including transportation (LLIN monitoring & malaria education) 	<ul style="list-style-type: none"> • \$2–3 for transportation



4.2 Financial Incentives

This section presents findings from a global literature review and perspectives from stakeholders on specific questions about the design and implementation of financial incentives.

4.2.1 Role of financial incentives

Much of the literature on CHW payments argue for providing workers with some type of financial incentive. One argument is that payments allow community workers to focus on bettering their communities instead of seeking other paid employment or engaging in income-generating activities. Another is that financial incentives can increase workers' motivation to participate in, and their satisfaction with, the program (Greenspan et al. 2013; Kauffman and Myers 1997). However, the literature is mixed: some note that that CHWs are hesitant to accept financial compensation for their work. In these cases, workers prefer preserving their reputations as dedicated volunteers to their communities over receiving financial support (Singh et al. 2015; Glenton et al. 2010).

When payment is provided, the payment scheme design can be expected to influence CHWs' behavior. Yet recent systematic reviews highlight few studies that evaluate or compare different CHW payment designs (Kok et al. 2015). In this context, there is a limited basis from which to identify best practices in certain aspects of payment design (e.g. stipend-based versus outcome-based payments). In literature on provider payment systems for health workers more broadly, experts argue that strategic payment systems should be consistent, transparent, and appropriate and reflect the realities of local context including the capacity of supporting systems and the desired incentives (Cashin et al. 2015).

Applying this lens to CHWs implies that CHW programs should pay CHWs rates that are consistent (across disease programs) and appropriate (relative to comparable workers) for services they provide.

FGD participants were universally in favor of receiving financial payments. They emphasized the importance of payments, combined with and in addition to non-financial incentives, to motivate their performance, reduce their need to find other income sources, and cover expenses, particularly travel:

“[Are you satisfied with your incentives?] Yes, because we are poor. It helps us to reduce our daily expenditure. We are volunteers, so whatever they give us, we [are] still happy to work in this position. [How much should you receive as fair payment?] The more we receive, the [more] we are happy to perform our work. Without incentive, we can still continue our work as VMW/MMW... But some activities may be limited due to our livelihood is not so good as well. We have to feed our families. And if we have such incentive sometime, we use this money to hire somebody to work for us at the farm while we are busy with malaria activities.”

- FGD participant

KEY FINDINGS

- Consensus among FGD participants was that financial payments—for per diems, travel costs, and compensation for their work—were important incentives.
- VMWs and MMWs represented in this landscape analysis were generally satisfied with financial incentives provided to them.
- Malaria workers prefer flat payment to activity- or case-based payments, though some key informants believe the latter might work better in the context of diminishing malaria prevalence.
- Donors and implementing partners find advantages in the speed, transparency, and lower overhead costs of an electronic payment (e-payment) system. Malaria workers and Government representatives remain frustrated with delays in e-payments and a lack of money transfer stalls in some areas.

Key informants in IDIs shared this perspective. They emphasized that even as volunteers and with high intrinsic motivation, VMWs should still be paid to carry out their activities and cover their expenses:

“Without financial incentive, they could not perform their activities well. They could not go to the far household or remote household to provide services. At least the transportation fee should be compensated. They are poor or very poor. Incentive is playing important role for their livelihood. With financial incentive, their commitment will be increase.”

- IDI key informant

4.2.2 Perspectives on payment rates

Most FGD participants emphasized that they were satisfied with the financial compensation, noting their essential contribution to supporting their livelihoods while conducting their malaria activities. One IDI key informant found payments too low and not sufficient to cover actual expenses:

“The incentive is too small. More is better. In Thailand, VMWs get around \$100 per month... The payment for transportation fee is not reflective of the actual expenditures... No incentive to compensate VMW who has not come for a monthly meeting. Not fair for them since they have also worked during a month and could only not come for a meeting, but they still did send a report to health center.”

- IDI key informant

Differences among FGD participants may reflect variation in the purchasing power in different areas of US\$30–50, the amount FGD participants indicated they received for malaria and other health activities. For example, in more rural areas, this amount could contribute significantly to family income; in more urban settings, it would likely be less meaningful.

A consistent VMW suggestion for incentives, brought up in every FGD, was to provide monthly payments as a flat rate. Likely, these workers appreciate the consistency and predictability of flat rate payments. Such payments can smooth their income in months when the number of activities and malaria cases vary, given the seasonality of malaria transmission.

In contrast, a key informant suggested a transition to case-based payments as programs' progress towards malaria elimination moved towards active case detection:

“The only thing I can see for the incentives to help improve their performance is to pay case by case—not by monthly payment, in particular when moving to the active case detection. The more they can detect, the more they can [receive] incentives.”

- IDI key informant

Given the uncertain financial sustainability of the malaria worker program (discussed in Section 4.1), several key informants suggested integrating the provision of incentives at the level of the communes (“in the Commune Development Plan”) to make them more sustainable. Suggestions to pool donor funding for several programs was controversial: some participants embraced the approach as effective for all health areas, whereas others rejected the idea as not feasible to implement.

4.2.3 Perspectives on payment modality (cash vs. e-payment)

On this design question, too, malaria workers and donor representatives, implementing partners, and government agencies had differing perspectives. For key informants representing donors or implementing partner organizations, e-payments have clear advantages:

“Benefits of electronic payment [are that it] is faster, much more secure, financial security, tracking how the money goes when and where. This payment system is much better than others.”

- IDI key informant

In addition to better accountability and speed, e-payments may also reduce manual labor and overhead costs for programs which ultimately saves time and money.

At the same time, malaria workers in FGDs expressed frustration with e-payments, notably delays in payments, time and cost to travel to money transfer stalls, and embarrassment at the often small amount they seek to collect.

“For electronic payment, it is too late, we are not getting money at the time of finishing activity. We have to spend time to go to money transfer facility. We have to spend money on travelling. ... It’s too far from home.”

- FGD Participant

“The e-payment is difficult. After the meeting, we have to go to the money transfer facility to get money, and this will take time and spend on petrol for transportation. On the other hand, we feel shy to go to the money transfer facility for a small amount of money.”

- FGD Participant

Some IDI participants voiced sympathy for the VMWs facing these hurdles and suggested offering cash payments, at least to those for whom e-payments imposed undue burdens and might demotivate them. Government program administrators tended to oppose e-payments due to the burdens they presented for some VMWs.

“The [Global Fund] has changed their policy from “Cash Payment” to “Zero Cash Payment.” This makes it difficult to withdraw money. Why? They need to travel a long distance to get money from electronic money transfer such as Wing or e-money. For instance, they go to get only \$20 but they have already spent \$10 for traveling cost. Not familiar with the electronic payment process. They have no phone, frequently change their phone number, no phone service coverage, etc.”

- IDI key informant

“For a place where is no money transfer facility, VMW could not come for the meeting and could not perform their work. And this reflects to their motivation of being VMW. They may drop out from VMW and do another work for their livelihood.”

- IDI key informant

4.3 Non-Financial Incentives

This section identifies the key non-financial motivations driving malaria workers' involvement in the program, highlighting findings from the qualitative data collection for this analysis. These motivators include:

- Community appreciation, feedback, and social recognition
- Altruism (the opportunity to make a social contribution), social responsibility
- Gaining knowledge and skills
- Peer support / social connections
- Career development
- Empowerment

(IDIs and FGDs; Trivedi 2015; Kasteng et al. 2016; Dieleman et al. 2003; Mathauer and Imhoff 2006; Canavati et al. 2016)

The section also highlights ideas from the literature on leveraging workers' motivations through non-financial incentives.

4.3.1 Non-financial motivations

A recent study of malaria worker performance found Cambodian malaria workers have deep intrinsic motivation to support the malaria response through their community-level health-promotion, prevention, and treatment-related activities (Canavati et al. 2016). Other literature and the FGDs conducted for this landscape analysis support this conclusion.

The bulleted list in section 4.3 summarizes the top non-financial motivators emphasized in FGDs and the literature. Community appreciation, feedback, and social recognition and altruism and social responsibility are listed first because these two emerged most prominently in the FGDs.

4.3.2 Potential non-financial incentives

Programs can be designed to foster an enabling community environment for malaria workers—in particular, a positive relationship between them and the community. One formal way to encourage a close relationship and frequent communication is to give communities a role in monitoring the workers. In this setup, health community committees monitor some aspects of worker performance, leaving clinical oversight to qualified medical personnel at health centers. The “barefoot doctors”—community-level health workers in China in the Mao era—used similar oversight structures (Bhattacharyya et al. 2001).

A review of the literature finds several other suggestions, including monitoring through local leaders, citizen report cards (“participatory surveys that provide quantitative feedback on user perceptions on the quality, adequacy and efficiency of public services,” i.e., the services of health workers participating in financial incentive programs), or community score cards (“qualitative monitoring tools that are used for local-level monitoring and performance evaluation of services”). (Barnighausen and Bloom 2009)

KEY FINDINGS

- Malaria workers emphasized the importance of having a positive relationship with their community, an altruistic desire to help community members, and the opportunities to grow professionally and be recognized for their work.
- Literature offers a large number of suggestions for ways community-level health programs can leverage worker motivations to encourage productive, sustainable work.

Another way to encourage good relations between malaria workers and their community might be to involve communities in the selection of the workers who will cover their area (Bhattacharyya et al. 2001).

To promote peer relationships, programs can also create forums for communities to gather and organize, and for peers to learn from one another and build social connections. They can also pair workers, provide frequent refresher training, or even support the creation of malaria worker associations (Bhattacharyya 2001). Other programs have systematically paired CHWs with mentors to provide support (Barnighausen and Bloom 2009).

Additionally, programs can set up the requisite systems to ensure that malaria workers have the supplies they need to perform their job responsibilities. For instance, without a sufficient supply of Rapid Diagnostic Tests (RDTs) and antimalarial drugs, malaria workers cannot complete their work, maintain positive relationships with the community, and feel motivated to continue their involvement in the program.

“People came for blood tests, but we didn’t have RDTs to do blood test for them. They were angry at us and said ‘VMW/MMW signboard should be removed if you cannot provide malaria service for us!’”

- FGD Participant

Other equipment and commodities that community-level health workers need to carry out their job responsibilities, such as counseling cards and informational, educational, and communication materials, are also important (Bhattacharyya et al. 2001). Items such as identification badges, head caps, t-shirts, and other uniform items can fuel “a sense of pride in their work” and make workers visible in their communities (Glenton et al. 2013).

Another set of non-financial incentives involves promoting workers’ status and privileges. One key informant suggested providing VMWs with the possibility to transition to higher-level cadres of health care workers, to keep them active as malaria incidence decreased in the country. Other key informants suggested giving malaria workers privileges in the medical sector, public recognition in the form of awards, and celebrations to recognize their achievements:

“What they want is that when they go to health center to seek for medical treatment, they want health center staff to respect or consider them as one of the health professionals and receiving a kind of special offering such as lowering a price of medical service for them and special attention.”

- IDI key informant

“Community recognition or motivation should be considered to motivate VMWs/MMWs. For example, community should manage a yearly celebration event for them at their village.”

- IDI key informant

“They should organize a yearly event to motivate VMWs/MMWs; for example, during Khmer Year celebration.”

- IDI key informant

5. OVERALL FINDINGS & DISCUSSION

5.1 Overall Findings

This landscape analysis highlights the important role that village and mobile malaria workers play in Cambodia's national malaria response. Similar to other community health workers, malaria workers are "first-line responders," and are primarily engaged in up-stream, cost-effective prevention activities, or helping patients adhere to treatment regimens, which make investments in curative treatments all the more valuable.

Like all humans, malaria workers are individuals with complex motivations for deciding to engage in this work. HFG's logic model predicts that programs designed with these complexities in mind will be better suited to create a satisfied work force who, in turn, will produce better results for the malaria response. In practical terms, this implies that motivated workers will respond to both financial and non-financial incentives. Findings from the FGDs strongly support this conclusion. In addition to the importance of satisfying their financial needs (which includes reimbursement for travel expenses and per diems), FGD participants highlighted a positive relationship with their community, career development, gaining knowledge and skills, and altruism (wanting their work to make a difference in their communities), among their most important motivators.

The landscape analysis also finds that the changing epidemiological and financial context for the malaria worker program is critical for program designers to consider. Epidemiological change in this context is the reduction of malaria prevalence, which can in part be attributed to the strong malaria response in Cambodia to date. As prevalence declines, leaders need to make careful decisions about how to structure the response without losing ground. At the same time, donor support remains as important as ever, but is unassured in the medium to long term. Leaders need to think ahead and adapt programs to new realities on the horizon.

This analysis has some limitations. Most importantly, FGD participants came from only three of 25 Cambodian provinces. Cambodia's regions differ in their malaria burden, geography, socio-economic landscape, and cultural traditions, which in turn influence the process of understanding motivations and determining purchasing power. The perspectives shared by participants still highlight important realities on the ground, some of which may have been imperceptible to managers and leaders of the malaria response. It is, however, important not to overstate the representativeness of FGD participants' opinions. With that said, IDI key informants provided a perspective that corresponded to a broader swath of the country.

Other limitations are:

- The potential for FGD participants to have tailored their statements to be pleasing to the HFG audience, perceiving HFG as a donor representative; and
- The lack of interviews with recipients of malaria workers' services, limiting authors' knowledge of the quality of services provided and beneficiaries' view on potential needed improvements.

The rest of this section offers several topics for further discussion by stakeholders of Cambodia's malaria response as they strive to make their programs more effective and sustainable.

5.2 Topics for Further Discussion

Topic 1: Importance of incorporating existing malaria workers into a government-managed CHW cadre tasked with delivering a specified package of services.

This analysis found that other public health programs have leveraged the existing malaria worker workforce, compensating them to complete non-malaria health tasks. In 2008, Cambodia partly widened the malaria worker program's scope with pilot programs to also cover pneumonia and diarrhea in children under age five, further increasing the program's impact and its cost-effectiveness in reducing childhood mortality (Brenden and Jitthai 2012). In speaking with key informants and malaria workers themselves, this analysis found evidence that other programs were paying malaria workers to complete non-malaria tasks. However, there was little coordination between different programs that were paying the same workers, presenting a potential risk to the malaria response. As other programs compensate malaria workers to complete tasks, workers' time and focus may be diverted from malaria-related tasks.

Given other public health programs' demonstrated need for community workers, the government of Cambodia may consider a CHW workforce that can horizontally support multiple public health programs under a central coordinating mechanism. Such a structure could enable the government to strategically use limited resources for community-based service delivery. The malaria control program could benefit from central coordination of such workers and help secure the sustainability of the malaria response. First, it would reduce the risk that malaria services were neglected when a lack of coordination between programs caused village malaria workers to divide their time and effort. Second, it would improve income security for such workers when malaria incidence and thus the volume of malaria work were in decline (as can be expected with Cambodia's success at malaria control). And finally, a national CHW workforce could leverage economies of scale and multiple funding streams, enabling a rapid scale-up of the CHW workforce.

Topic 2: Realistic and costed roadmap for transitioning management functions of donor-funded CHWs under the MOH.

Managing a national CHW workforce requires several operational functions be in place which in turn necessitate detailed planning processes to ensure all functions are operational. If considering a new CHW cadre, for example, HFG would recommend the development of a roadmap and timeframe for launching and scaling such a workforce. This might include transitioning existing malaria workers into CHWs and aligning goals and objectives for them across programs. If shifting functions for a cadre to Government responsibility, shifts should be appropriately sequenced to ensure a smooth transition. The following is a list of critical rules and processes to consider for operation of the program:

1. **Human resources management:** how the government would identify, train, distribute, and supervise workers, and how the government would handle performance management, particularly of underperforming workers.
2. **Financial management:** how the government would forecast and budget for program funding requirements, pay workers and supervisors, validate workers' invoices, and set fee schedules.
3. **Supply chain management:** how supplies would get to the workers, and what rules would be used to handle stock-outs or expiration situations.
4. **Disease surveillance and program monitoring:** how and how often the government would collect data, ensure the data is of high quality, and use the data for adaptive management of the program.

Sources of funding could also be scheduled to transition over time to reduce shocks on a government's budget. To achieve this, the program would need to be costed, with a plan developed for financial contributions by government and partners over time. A Ministry of Finance would sign off on the financial transition aspect of the plan and commit to funding the program according to the schedule. Before full financial transition, the plan can consider creating a pool of funds that would be managed by the MOH with support by development partners. The structure and management of these funds could be similar to the existing Health Equity Fund in Cambodia, which has expanded health coverage for the poor. Though some key informants voiced concern—likely given political difficulties involved—this structure could greatly help the Government of Cambodia with a transition.

Topic 3: Barriers to workers' timely access to e-payments.

Findings from the FGDs in the study sample identified several barriers to the timely and smooth receipt of financial payments by malaria workers through electronic systems:

- Lack of money transfer stalls in rural areas, forcing workers to travel long distances on their own time and money.
- Some workers have trouble using the stalls.
- Some workers are embarrassed at requesting small disbursements.

Workers' concerns regarding e-payments are important to consider and could be reviewed and addressed as appropriate by existing programs. At the same time, the advantages of e-payments, and the potential for such payments to be better in the future for workers as well as programs, should not be understated. Fully shifting to electronic systems would also align with the broader trajectory of economic development in Cambodia. HFG proposes that programs explore ways to resolve, or at least reduce, the barriers listed above and voiced by malaria workers. Examples include:

- The program can create incentives to open stalls in areas where there are not yet stalls and where they have workers to pay; until new stalls are open, the program can provide cash payments.
- The program can have health center staff or peer programs support workers who are unfamiliar with the process.

Topic 4: Consideration of an output-based model for CHWs, with a working group to develop the initial model and adjust it on a predetermined schedule.

The payment model is a critical design component of a CHW program that affects: people's decision to join and remain in the CHW workforce; how they allocate their time during their day; their performance and productivity; and more. Community health worker programs in other countries often pay a predetermined fee for tasks completed. HFG recommends exploring hybrid models that pay CHWs a small flat rate plus a fee per service provided. A primarily output-based payment model would ensure workers were appropriately incentivized to deliver services. However, fee-for-service designs vary, and what may seem like a small variation can make a large difference in the performance of the worker (see topics 5 and 6 below).

If the Government were to take ownership over the program, it might consider establishing a technical working group to support an initial fee-for-service design. The group could then revisit the payment model regularly, such as once per year, or an interval that makes sense in the Cambodian context, to modify it using timely information and feedback on program performance by geographic area. One option could be to align the timing of a review with the Poverty Assessment that takes place every three years.

Topic 5: Importance of relative rates for tasks in an output-based model, based on the estimated effort to complete a task and its relative priority.

Within output-based models, workers are likely to direct their time to complete tasks that yield the highest payout. This behavior is both rational and expected, and is thus important to carefully consider if determining a fee schedule. The fee for each task could reflect both the relative *priority* of a task and the *amount of time and effort* it would take to complete it. For example, say all malaria worker tasks have the same fee but three of the malaria worker's services can be provided in one visit to most households in a small geographic area. The worker would not need to spend a lot of time traveling between remote households in order to complete a large number of tasks that day. A rational worker would likely allocate more time to completing these tasks than to tasks that require more time and effort for the same payoff. A fee schedule could account for the nuances of effort required and mitigate perverse incentives for workers to focus on the easiest tasks.

Level of effort is also critical to strategically setting relative rates for the malaria response. A worker would need to spend more effort to identify and treat cases of malaria in areas with low-level epidemics than in areas with a generalized epidemic. The fees for malaria-related tasks in low-level epidemics could therefore reflect that higher level of effort.

Topic 6: Setting fee schedules so that an average worker would earn sufficient wages to perform their role full time.

If the assumption is that a CHW works approximately full-time, the fees earned in a given month should reflect a reasonable monthly wage for the worker, and reasonable relative to other professions. The appropriate average monthly wage for a malaria worker would need to be sufficient to cover the cost of living in the worker's geographic area, but less than the wage of a highly-trained nurse stationed in the local health center, for example. It may be necessary to include a cost-of-living adjustor in the payment model, given that costs differ widely across the country.

Topic 7: Critical role of non-financial incentives.

The landscape analysis demonstrates that addressing non-financial motivators within program design is an important complement to providing financial incentives. FGD participants and global literature on community health workers offer myriad suggestions for non-financial incentives (see Section 4.3.2). These suggestions offer potential for use in the Cambodian context, if adapted appropriately. Options vary to the extent in which they require resources to implement. One area for consideration might be to involve the community in the supervision of the workers, as this promotes a positive relationship between communities and workers and actively solicits feedback—both of which this analysis found to be strong non-financial motivators for Cambodia's malaria workers.

Topic 8: Equipping CHWs with the supplies needed to succeed.

CHWs in Cambodia and elsewhere can become demoralized when they do not have materials needed to fulfill their roles. Such materials can be medical (e.g. rapid diagnostic tests) or operational (e.g. bags, training materials). Ensuring that the needs of CHWs are met can help lower the risk that insufficient materials pose to the productivity of the workers and the overall success of the program. This could be facilitated by actions such as strengthening forecasting and monitoring in the supply chain or budgeting for sufficient operational expenses.

ANNEX A: QUALITATIVE METHODS

The study team conducted qualitative data collection and analysis to complement the literature review with regards to answering the project's three research questions.

Data Collection

Focus group discussions

From July 30 to August 5, 2017, the study team facilitated six focus group discussions (FGDs) at six health centers in three different provinces: two health centers in Battambang, two in Pailin, and two in Oddar Meanchey. The two largest funders of malaria worker programs, the Global Fund and USAID, are active in these those provinces, giving the study team the opportunity to compare funding mechanisms. Village malaria workers (VMWs) were enrolled in all six of the focus groups; three of the focus groups also enrolled mobile malaria workers (MMWs) to explore aspects specific to their incentives.

Of the 53 total participants, 60 percent were female, ranging in age from 22 to 62 years and in experience from one to 15 years. Most participants (74 percent) had a primary school education; the balance had completed high school. Demographic details are provided in Table A1.

Focus group discussions lasted between 90 and 140 minutes each.

Table A1: Demographics of FGD participants (N= 53)

Health Center / Operational District / Province	FGD Participants (N)	Age (yrs)	Gender	Education	Experience as VMW or MMW (in yrs)
Tasanh Battambang OD Battambang Province	MMW = 2 VMW = 7 Total = 9	28–62	3 males 6 females	3 high school 6 primary school	2–9
Chamlong Kouy Battambang OD Battambang Province	MMW = 2 VMW = 7 Total = 9	22–55	3 males 6 females	3 high school 6 primary school	1–9
Krachab Pailin OD Pailin Province	MMW = 3 VMW = 6 Total = 9	23–57	4 males 5 females	2 high school 7 primary school	5–12
Oh Chra Pailin OD Pailin Province	All VMW Total = 11	24–58	4 males 7 females	3 high school 8 primary school	4–15
Bansay Rak Samrong OD	All VMW	22–54	3 males 4 females	1 high school 6 primary school	1–8

Health Center / Operational District / Province	FGD Participants (N)	Age (yrs)	Gender	Education	Experience as VMW or MMW (in yrs)
Oddar Meanchey Province	Total = 7				
Kok Pluk Samrong OD Oddar Meanchey Province	All VMW Total =8	24–58	4 males 4 females	2 high school 6 primary school	1–8
TOTAL	MMW = 7 VMW = 46	22–62	21 males 32 females	14 high school 39 primary school	1–15

In-depth interviews with key informants

In addition, from July 25 to August 12, 2017, the study team conducted 11 in-depth interviews (IDIs), lasting between 1.5 and 2.5 hours each. Key informants were drawn from various governmental and nongovernmental organizations and malaria programs at the provincial level and in Phnom Penh. Interviewees ranged in age from 38 to 58 years. Most were senior officials, with 15 to 20 years of experience in malaria programs. Three were senior program managers in implementing partners, four were senior managers in international development partner organizations, and four were senior officials from governmental organizations. Unlike the FGD participants, the key informants worked throughout Cambodia.

Data collection preparation and protocols

The study team devised a semi-structured questionnaire to cover the three research questions. The questionnaire was vetted by experts at CNM and others with knowledge of malaria elimination efforts in Cambodia. The HFG researchers submitted the study design and data collection instrument to Abt Associates' Institutional Review Board for review. The study was found exempt from full review as non-human subject research.

A Cambodia-based HFG researcher deeply familiar with malaria policy and programs moderated the focus groups, held in Khmer, and was assisted by a note taker. The same researcher identified key informants willing to share their perspectives on malaria worker program incentives; interviews with them were conducted in English or Khmer according to the interviewee's preference.

All participants were informed of the study's purpose and risks of participation; all gave verbal consent before the FGDs/IDIs commenced. All occasions were audio recorded, and written summaries were produced that included verbatim quotes of the most salient points made by participants. Translations from Khmer into English were produced by the data collection team members.

Data Analysis

A U.S.-based researcher, trained in qualitative research and with experience studying incentives to improve health care services, served as the lead study investigator. That researcher led the analysis of all literature and written summaries in collaboration with the Cambodia-based researcher and other members of the HFG Cambodia team.

A content analysis approach was used to initially explore the research questions (Miles et al. 2014). Based on an initial reading of all text data, a coding tree was developed. Following an initial coding round, all data were recoded and analyzed thematically in areas related to VMWs' incentives. All HFG Cambodia team members contributed to the interpretation of the data collected.

ANNEX B: MALARIA WORKERS BY PROVINCE

Table BI: Malaria workers by province and implementer, 2016

Source: CNM, 2016

Province	CNM	URC	PSK	MC	HPA	Total
Banteay Meanchey	102	-	-	-	-	102
Battambang	-	411	-	-	-	411
Kampong Cham	64	-	11	-	-	75
Kampong Chhnang	116	-	-	-	-	116
Kampong Speu	248	-	-	-	-	248
Kampong Thom	272	-	27	-	-	299
Kampot	174	-	-	-	-	174
Kep	18	-	-	-	-	18
Koh Kong	43	-	-	-	-	43
Kratie	50	-	69	-	-	119
Mondulhiri	130	-	20	-	2	152
Oddar Meanchey	145	-	13	-	-	158
Pailin	157	-	-	-	-	157
Preah Vihear	181	-	16	9	2	208
Pursat	-	302	-	-	-	302
Ratanakiri	134	-	51	8	2	195
Siem Reap	280	-	-	-	-	280
Sihanouk Ville	5	-	-	-	-	5
Stung Treng	121	-	16	4	2	143
Takeo	71	-	-	-	-	71
Thbong Khmum	75	-	21	-	-	96
TOTAL	2,386	713	244	21	8	3,372

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BOLD THINKERS DRIVING
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