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Abstract

What motivates community-based health workers to provide care in rural and remote areas, often on a voluntary or casual basis, is a key question for program managers and public health officials. This paper examines how a range of incentives offered as part of the *Marasin Stoa Kipa* program, a community-based malaria diagnosis and treatment program that has been implemented since 2007 within a major oil and gas development area in Papua New Guinea, are perceived and critiqued by community-based health workers. Nineteen interviews and seven focus group discussions with the workers who deliver services and members of the communities served by the program, conducted between November 4 and 25, 2015, reveal a pattern of mixed motivations and changes in motivation over time. This can be attributed partly to the unique social and economic circumstances in which the program is operating. Changes in the burden of disease as well as in global and national health services policy with implications for local level program operations also had an impact, as did the nature of relationships between program managers, community-based health workers, and program beneficiaries. Overall, the findings suggest that while financial and in-kind incentives can be a useful tool to motivate voluntary or minimally-compensated community-based health workers, they must be carefully structured to align with local social, economic, and epidemiological realities over the long-term.

Keywords

Papua New Guinea; community health workers; community-based care; incentives; corporate community development; malaria

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Introduction

Background

Community-based health workers (CHWs) are frequently called upon to fill the gap where access to formal health services is poor. Numerous factors that contribute to CHW motivation have been identified, including altruism and a sense of duty (Dil, Strachan, Cairncross, Korkor, & Hill, 2012; Greenspan et al., 2013), previous experience and knowledge (Zulu, Kinsman, Michelo, & Hurtig, 2014), the desire for social recognition (Gopalan, Mohanty, & Das, 2012), the opportunity for future training and career opportunities (Haile, Yemane, & Gebreselassie, 2014) and financial remuneration (Takasugi & Lee, 2012). Indeed, researchers have typically found that CHWs' motivations are multiple and mixed (see, e.g., Akintola, 2011; Mpembeni et al., 2015). But because the discussion and promotion of community-based health programs is frequently framed by notions of voluntarism, altruism, and community unity (Brunie et al., 2014; Cataldo, Kielmann, Kielmann, Mburu, & Musheke, 2015; Swartz & Colvin, 2014), the use of monetary and material incentives as a mechanism for recruiting and motivating CHWs is of particular interest. These incentives, which may include a regular salary, allowances, per diems, gifts, and target- or performance-based remuneration schemes, raise potentially thorny ethical and sustainability questions.

Researchers have previously found that the opportunity to earn money can serve as a key source of motivation among CHWs, and (where payments are found wanting) contribute significantly to attrition (Brunie et al., 2014; Kironde & Klaasen, 2001; Topp et al., 2015). However, others argue that the desire to receive monetary compensation in exchange for service can sit comfortably alongside altruistic motivations (Mpembeni et al., 2015), and emphasise that it is important to contextualise monetary incentives with other forms of incentives and CHWs' broader conditions of work (Singh, Negin, Otim, Orach, & Cumming, 2015). Researchers and program implementers increasingly acknowledge the need to better understand the social complexity of the environments in which CHWs work, and how they

negotiate various motives and incentives in resource-limited settings (Maes, 2015; Maes, Closser, & Kalofonos, 2014; Swartz & Colvin, 2014).

These issues have particular salience in the context of the *Marasin Stoa Kipa* (MSK) program, a community-based malaria diagnosis and treatment program that has been operating since 2007 in a major oil and liquefied natural gas (LNG) development area in the Southern Highlands Province of Papua New Guinea (PNG). This paper describes how a variety of incentives offered as part of the MSK program were perceived and critiqued by CHWs and members of the communities served by them. In so doing, it responds to calls for further research on community-based workers' perspectives on their work (Maes, Kohrt, & Closser, 2010; Oliver, Geniets, Winters, Rega, & Mbae, 2015) as well as the design and implementation of incentives in community-based health programs (Singh et al., 2015) and their impact on motivation and retention (Akintola, 2011; Global Health Workforce Alliance, 2010; Mpembeni et al., 2015).

The MSK model

One of the factors that makes the MSK program unique among CHW programs – and affects the way in which incentives offered by the program are perceived – is its location in the context of PNG's largest and most economically significant oil and gas operations. The Kutubu oil fields were discovered in 1986 and production commenced in 1992, representing PNG's first commercial production of oil. In addition, large reserves of LNG were developed from 2008, with production and export commencing in 2014. The impact of 30 years of resource extraction on the economic and social status of communities in the region has been mixed. Though incomes have increased significantly due to the equity and royalty payments paid to landowners, much of this wealth is reportedly expended as bridewealth and compensation payments, purchase of prestige goods such as 4WD vehicles and generators, and acts of conspicuous

consumption such as travel to the capital, Port Moresby (Gilberthorpe, 2007). While the presence of resource companies has contributed to a small increase in formal employment associated with the operations, entrepreneurial ventures, and access to corporate social responsibility initiatives, in general social, health, educational and economic indicators in the region have remained low, particularly among women.

The origins of the MSK program can be located in the recognition of these poor health indicators by resource developers. When a health assessment and risk analysis conducted in 1990-91 as part of preparations for the development of British Petroleum's (BP) Hides Gas Field Project indicated a high malaria risk (Hii, Dyke, Dagoro, & Sanders, 1997), BP began to implement a range of occupational and community-based malaria control activities with the dual objective of protecting its workforce and maintaining its social license to operate. These activities were maintained and expanded under the Oil Search Limited (OSL) Public Health Unit as part of the company's corporate social sustainability strategy from 2003, when OSL became the operator and majority shareholder of the Kutubu oil fields.

Between 2005 and 2007, the OSL Public Health Unit sought to reduce malaria morbidity and mortality by pursuing a strategy of strengthening local health facilities. While infrastructure upgrades and enhanced supervision resulted in improvements in church-run facilities, service delivery in government-run facilities remained substandard. Because health workers in these facilities were typically recruited from outside the region and worked in relative isolation, many facilities opened on an erratic schedule or were closed for extended periods.

In order to increase access to early diagnosis and treatment for malaria in the face of high health worker absenteeism, the MSK program was introduced to communities in the Lake Kutubu region in 2007. The

basic program design was adapted from an earlier program developed in West Papua, Indonesia. Under this model, local women are recruited to operate '*marasin stoas'* (medicine stores in Tok Pisin, the lingua franca of PNG) in their villages – hence becoming '*Marasin Stoa Kipas*' (Medicine Storekeepers, or MSKs). MSKs are recruited on the basis of key selection criteria, chiefly that they be respected permanent residents of their villages who meet a basic literacy standard. Married women are preferred as candidates, reflecting the fact that women in this region customarily move to their husband's village after marriage, and community concerns about unmarried women interacting with male patients.

Once recruited, MSKs are trained by program field officers (full-time, locally-engaged staff with responsibility for quality assurance of the malaria diagnosis and treatment services being delivered by the MSKs) and are issued with kits containing all the supplies and equipment required for diagnosing and treating malaria. While rapid diagnostic tests (RDTs) are provided to enable immediate diagnosis, MSKs also collect blood smears for confirmatory microscopy. These slides are collected by program staff during routine support visits and delivered to the OSL laboratory where technicians analyse and score them based on quality. This extra step enables identifying any false negative RDT results (and subsequent follow-up to ensure these patients receive treatment) and generates surveillance data. To promote the MSKs and their services, program staff pursued a range of strategies, including convening community meetings to explain and discuss the program, engaging church pastors to support the MSK, and producing promotional posters. In the early years of the program, attempts were also made to develop the *marasin stoas* as a community-owned enterprises by encouraging the formation of village committees to oversee the MSK stores and share in the profits. Ongoing technical support, training, and replenishment of supplies is provided during monthly routine visits by program staff.

120 The program was piloted from 2007 to 2010, and by 2011 had expanded from six villages to 13. The
121 expansion of the program from 2010 was driven in part by an increase in migrants to the program area,
122 seeking employment opportunities in connection with the construction of the PNG LNG pipeline and
123 resulting economic development. MSK testing and treatment records show a marked increase in
124 confirmed malaria cases during this period, particularly in the Huli-Foi sub-region which was the centre of
125 the pipeline construction at the time (Feterl et al., 2017).
126
127 In 2011, the management of the MSK program was absorbed into the Oil Search Health Foundation (now
128 the Oil Search Foundation), an affiliated non-profit foundation. The Foundation formally partnered with
129 the Evangelical Church of Papua New Guinea (ECPNG) to manage the day-to-day implementation of the
130 program in the same year. ECPNG is the dominant denomination in the region and operates a number of
131 health facilities under the government's Christian Church Partnership Policy Framework. OSL, and
132 subsequently the Oil Search Foundation, have a long history of supporting infrastructure enhancements,
133 logistical support, and clinical training in ECPNG health facilities. As one of the few functioning non-
134 governmental organisations in the region, ECPNG was the obvious partner to engage, particularly with a
135 view to developing the sustainability of the program.
136
137 From the outset, the MSK model focused specifically on the use of incentives based on the belief that a
138 fully voluntary (unremunerated) model was unlikely to be feasible due to the relatively high potential for
139 earning from other sources (e.g., vending at local markets, employment at company camps). It was the
140 first program in PNG, recognised and endorsed by WHO and the National Department of Health, to trial
141 incentivising communities for access to malaria diagnosis and treatment. The nature of incentives
142 provided under the program, particularly the financial incentives, has changed over time. When the
143 program commenced in 2007, MSKs were provided with a fixed monthly allowance of 40 Kina (approx.

12.62 USD) in exchange for collecting quality blood smears and recording data on surveillance forms. In an effort to match workload with appropriate compensation, the fixed allowance was withdrawn in 2009 and a fee-for-service model was introduced in its place. The decision to implement a fee-for-service model related to the desire to signal the high quality and convenience of the MSK service (as compared to the free but unreliable service available in local health facilities). However, the costs of delivering the service were subsidised by OSL to ensure that it was not prohibitive for the majority of community members. Under the fee-for-service model, MSKs were initially permitted to charge clients two types of fees: for service and for medication (paracetamol and an antimalarial, when the RDT returned a positive result). However, after national policy changes in 2012 dictated that artemisinin combination therapies (ACTs) were to be made available free of charge and ACTs for the program were procured through the national drug supply, MSKs were advised from that point that they should only charge a service fee, the amount of which was set individually by each MSK for her store. Since the fee-for-service policy was introduced, MSKs have also been eligible to receive a performance-based payment of 1 Kina (approx. USD 0.33 at time of research) for each quality blood smear they produce, as determined by OSL laboratory technicians.

To respond in part to the reduced income streams and encourage MSKs to remain engaged as providers of community health services as the burden of malaria decreased, a social franchise component called *Marasin Stoa 3T* (MS3T) was introduced in 2012. Participation in the MS3T permits MSKs to sell over-the-counter health and wellness products such as basic painkillers, toothpaste, baby nappies, soap, skin treatments, feminine hygiene products, and haircare products in their villages. The *3T* stands for '*klostu tru, gudpela tru, strongpela tru*' – signifying that the products are available close to home, high quality, and effective. The products are procured wholesale by the program from a pharmacy in Port Moresby, and then shipped to the project area. While MSKs purchase MS3T products from the program at cost

price, each then sets her own retail prices and retains the profit earned on that mark-up. Almost all MSKs (12 of the 13 active at the time of data collection) were participating in the MS3T, and the one who was not had expressed interest in joining them once she accumulated sufficient savings to purchase MS3T stock.

Over the life of the program, the number of active MSKs has fluctuated, but has not exceeded 16 and has averaged about 12 operating at any one time. Some MSKs have temporarily halted work due to changes in personal circumstances (e.g., observing an extended period of mourning), while others have elected to step down after several years and been replaced by new MSKs. Only one MSK has operated continuously since 2007. At time of data collection in November 2015, 13 MSKs were active in 11 villages, primarily in the area around Lake Kutubu in Southern Highlands Province but also extending into neighbouring Hela and Gulf Provinces along the LNG pipeline. This equates to program coverage of a static population of approximately 10,850; however, high levels of population mobility means that at times up to 24,000 people may be present in the project area (Feterl et al., 2017).

Research objective

This paper presents a subset of findings from a larger, mixed methods study which sought to identify factors which support the MSK program's functioning as well as challenges or barriers that might be limiting its success. The qualitative component of this study sought to answer the following research questions: how do MSKs conceptualise their role and the value of their work; and what is the meaning and practical function of 'community' in relation to the MSK program? Given the centrality of incentives to the program design, in this paper we focus on findings related to how the various incentives offered were perceived and critiqued by current and former MSKs, their families, and members of their communities.

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Methods

Recruitment, consent, and ethics

The study employed qualitative data collection methods, including semi-structured in-depth interviews and focus group discussions (FGDs). Ethical approval to conduct the study was granted by the PNG Institute of Medical Research Institutional Review Board and the PNG Medical Research Advisory Council. Prospective study participants were given a verbal explanation of the research objectives in the language they were most comfortable in (usually Tok Pisin) and offered an information sheet as well as the opportunity to ask any questions. Individual interviewees provided written informed consent, while verbal informed consent was obtained from FGD participants, including specific consent to audiorecord. At the conclusion of the interview/FGD each participant was provided with a soft drink and packet of biscuits as a token of appreciation for their participation.

Data collection

A total of 19 semi-structured interviews and seven FGDs, involving 61 participants across 13 villages in Southern Highlands, Hela, and Gulf Provinces of PNG, were conducted between November 4 and 25, 2015. In addition to the 11 villages where the program was active at the time of research, former MSKs were interviewed in two further villages where the MSK program is no longer operating, bringing the total to 13 villages.

Nineteen interviews were conducted with current and former MSKs and their husbands. All 13 MSKs who were active at the time of data collection, as well as their husbands, were approached (either in person or by telephone) by staff from the Oil Search Foundation, ECPNG, or the OSL Community Affairs division for interview. Of those 13 current MSKs, 11 were available at the time of research and consented to

participate, as did 7 of their husbands. Four of the current MSKs work in pairs and so were interviewed jointly. Three of five former MSKs (i.e., women who had previously worked as MSKs but were no longer active at the time of the study) were also interviewed. One of these resided in a village where another woman had since taken over as the current MSK, while the other two resided in villages where the program is no longer active. To the extent that time and communication permitted, interviews were scheduled in advance, at a time and place convenient to the interviewee.

Seven FGDs with community members were held in villages where MSKs were active at the time of the study. FGDs were single gender (4 women-only FGDs, 3 men-only) and each included between five and seven participants, for a total of 40 FGD participants. To maximise the diversity of the sample, the locations for FGDs were purposively sampled to include several characteristics that might influence the community's use of the MSK (e.g., presence of a health facility in the village; whether the village was directly accessible by road). Recruitment of participants to FGDs was primarily achieved through convenience sampling upon arrival in those villages.

All interviews and FGDs were held in a private location (e.g., homes, MSK store buildings, or other available community buildings) and audiorecorded using handheld digital audiorecorders. The majority of interviews were conducted primarily in Tok Pisin. Where an interpreter was required (in the few cases where interviewees did not speak Tok Pisin or English), s/he also signed a confidentiality agreement. Interview schedules, which were tailored to each type of interview/FGD, were piloted in the first village visited and underwent minor revisions. These interview schedules covered a range of relevant issues based on existing literature, including recruitment, motivation, support and training, job satisfaction, and perceived community health impact. All interviews and FGDs were conducted by the first and second authors (an expatriate and a Papua New Guinean). Because introductions to study participants were

necessarily made through representatives of the Oil Search Foundation and ECPNG, which may have provoked uncertainty regarding the interviewers' affiliation, as part of the informed consent process interviewers specifically explained their role as independent researchers and assured participants that their responses would be anonymised in all reporting and publications. Reflecting on the fact that unequal power dynamics between the interviewers and participants might have led participants to withhold information or to privilege what they believed to be the 'correct' response rather than their honest perceptions, the interviewers also took time to reassure participants that all perceptions were valid, and ended all interviews/FGDs by inviting participants to share any further comments or concerns they might have.

Analytical strategy

All interview and focus group audiorecordings were transcribed and translated by two research assistants fluent in Tok Pisin, English, and one of the local languages spoken by research participants. The transcripts were checked by the lead author and any questions or discrepancies resolved prior to the commencement of coding. Both the verbatim transcriptions and English translations were left in the transcripts, which allowed the researchers to cross-check translations and revisit participants' verbatim phrasing during analysis.

A thematic analysis drawing on Grounded Theory techniques was conducted (Hennink, Hutter & Bailey, 2011). To develop a preliminary codebook, the first and second authors independently undertook an initial round of coding of four transcripts (representing one of each type of interview/FGD), followed by a joint review to compare codes and assess validity. A small number of codes were determined deductively based on the interview/FGD questionnaires, but the majority emerged inductively in the analysis process and included a number of *in-vivo* codes (key recurring expressions used by study participants; e.g., '*meri lo ples*' ['village women']) (Glaser & Strauss, 1967). Constant comparison (Glaser, 1965) was used to

264 further develop the preliminary codebook, apply codes across the entire dataset, and group codes into
265 categories and themes. The dataset was managed using NVivo (version 10, QSR International Pty Ltd). To
266 ensure the credibility of the analysis, as the coding was conducted by the first author alone, reflective
267 memos were drafted and emerging themes were triangulated through discussions with co-authors.
268 However, discussions with those co-authors affiliated with Oil Search Foundation were limited to
269 confirming technical, historical, and operational elements of the MSK program, such as timelines,
270 payment schedules, and program pathways, in order to better contextualise the information provided in
271 interviews and FGDs.

272

273 **Findings**

274 This section assesses the major themes which emerged from the analysis, beginning with a discussion of
275 how MSKs positioned themselves and their contribution to malaria outcomes in relation to the program.
276 It then examines the impacts of various financial and in-kind incentives, and lastly addresses the role of
277 community support vis-à-vis perceptions of MSKs' relationships with the program and broader resource
278 context.

279 ***MSKs' positionality***

280 To understand how the financial and material incentives offered in the MSK program were perceived, it is
281 helpful to preface this with an examination of the way in which the MSKs, as well as their families and
282 supportive community members, positioned themselves and their abilities relative to the health impacts
283 of their work and the source of the incentives.

284 This framing was anchored in the characterisation of MSKs (both by MSKs themselves as well as husbands
285 and community members) as *meri lo ples* or *mama lo village* – 'village women' or 'village mothers'.

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Though MSKs are in fact well-educated relative to their peers – all were formally educated at least through grade 4, and passed a basic literacy and numeracy test as part of their recruitment – by downplaying their skills or capacities by characterising themselves as 'simple' village women, they present an even greater contrast between what might be expected of them and the health outcome they believe they are responsible for delivering: a significant reduction in malaria.

> The main thing is – malaria is still going, but the big thing is we've already lowered it; the mothers in the village, we've already lowered it. *[MSK, Village J]*

However, conversations which tended to emerge later in the course of interviews suggested that MSKs and their supporters appraise incentives not only relative to village-level expectations, but take into account a much broader context. This context incorporates not just the health benefits reaped by the communities, but also public relations and publicity benefits that they perceive accruing to the organisations which manage the MSK program. Reflections on their experiences of being involved in events such as OSL World Malaria Day celebrations, and witnessing the program's positive public appraisal, led some MSKs to feel not proud of the scope of their achievement, but rather that they had been undercut:

> They can give, like, 10 toea [USD 0.04] or something. We did the hard work for them, they get a lot of money in our name. *[MSK, Village C]*

In this way, interviewees tended to frame the nature of the relationship between themselves and the program management less as one driven by altruism (i.e., MSKs provide a service; incentives provide a reward for doing it well) or exchange (i.e., MSKs provide a service; incentives compensate for time lost) but one where the MSKs see themselves as doing all the 'hard work' on the ground while management reaps most of the credit, which has included recognition at the national and international level. While this

public recognition of the program was seized upon by some MSKs as a point of pride, it was more often called upon to substantiate requests for greater 'appreciation' from the program, chiefly in the form of regular salaried payments.

Financial incentives

One of the signature financial incentives implemented by the MSK program was performance-based payments, which were intended to encourage consistent, high quality blood smears. Though these performance-based incentives were a backbone of the program design, by the time this research took place they were little remarked upon by most interviewees. They were however a point of contention for those MSKs who had been working for several years, and so had seen significant changes in their income stream over time. One such MSK characterised K1 as minimal reward for the amount of work involved in producing a blood smear:

> We worked for free, zero, without pay. Not a K1 payment, only for the blood slides we made – for two it was K2 only, each month. K3 for three, K4 for four, through the blood slides. They didn't give it to us for nothing. It was through our hard work that they sent us the K4. *[MSK, Village A]*

Whereas in the first years of program implementation MSKs (including the one quoted above) routinely served 20 or more suspected malaria cases per week, as access to diagnosis and treatment improved the numbers of suspected cases declined significantly. Over the long term, though the task of producing a blood smear remained consistent, the perception of its value shifted. While interviewees were uniformly positive about the fact that malaria had reduced, and attributed this outcome to the MSKs' skill and dedication, some MSKs and their husbands indicated that the quantity of performance-based pay on offer was no longer commensurate with the time and opportunity costs of maintaining the service as the number of patients who present for testing dwindled. As one MSK's husband explained,

> We do spend a lot of our time to earn K1 and in that time our children are growing so fast. Years, days and hours have passed and it is hard for the K1 that we earn to support our 7 children. *[MSK husband, Village H]*

However, this gradual decline in both malaria and income, and the risk that MSKs might decide to cease operating in order to pursue other opportunities, was not unanticipated. The MS3T component was specifically introduced to help compensate for reductions in the number of suspected malaria cases, and thus the income from service fees and performance-based payments received. As described above, the opportunity to sell over-the-counter health products was intended to generate additional profit and thereby keep MSKs engaged and available to deliver malaria diagnosis and treatment in their communities.

For some women, the theory underpinning the MS3T appeared to have been borne out in practice. Several MSKs and their husbands described the positive impact of the small profits earned from MS3T sales; for example:

> Before, I didn't have money, I didn't sleep in a good house, I didn't have soap, cooking oil, I didn't have any good food. But once I got this MS3T, then my children had clothes, had soap, we got a little cooking oil and meat and these things. So MS3T, it helps me to make a little profit money. *[MSK, Village A]*

However, in other cases the MS3T appears to have reduced community support by complicating community members' impression of the MSKs' true motivations. While the MSKs were no longer being 'paid' in the sense of receiving a regular salary, money is nevertheless still flowing to them – so in the eyes of community members, while the MSKs might not be 'paid' neither are they 'unpaid'. The following experience of a pair of MSKs is instructive, as it suggests that the introduction of the MS3T in some cases had the counterintuitive effect of reducing community support for the entire enterprise:

MSK 1: The community supported us too, like cleaning near the house, they come visit, like that.

MSK 2: They did that, but when [the program] sent that MS3T here, then they left it. 'They are making their money', they said and they left it. *[MSKs, Village C]*

In this instance, the goodwill that the MSKs enjoyed when they were understood to be selflessly providing a community service evidently dissipated when they were perceived to be attempting to be 'making money'. In effect, an incentive that was intended to stabilise the supply of a service reduced the demand for it – the MSKs quoted above went on to suggest that the associated jealousy and social animosity was leading them to contemplate leaving the program altogether.

This case, however, was the exception rather than the rule. More commonly, interviewees described situations in which the market in their particular village resulted in the MS3T functioning but not flourishing. This market is shaped not only by the physical geography of the village (which determines whether its residents are entitled to oil and gas-related royalty and equity payments), but also by its human geography, including the number of 'professionals' – largely government- or church-employed teachers and health workers – posted there. As one MSK explained, such professionals are important determinants of MS3T success not only because they have access to regular income but also because such "educated" people are more inclined to purchase the kinds of "town goods" that are available for sale through the MS3T.

In addition to demand-side constraints, study participants reported two kinds of supply-side costs that tend to limit the effectiveness of the MS3T as an incentive to remain in business and thus engaged as a village-based treatment provider.

First, MSKs and community members alike reported varying degrees of dissatisfaction with the relatively high cost of MS3T products. In FGDs and interviews it quickly became clear that although the MSK villages are located in a rural area, there is an active circulation of people between villages and regional urban centres. As such, even if the MS3T is the only outlet for health products physically located in the village (as it reportedly was in nearly all cases), most villagers have regular access to alternative retail sources and will opt to patronise those alternative sources instead of the MS3T if they think they will receive better value for money elsewhere.

Second, several current and former MSKs as well as their husbands expressed reservations about the perceived opportunity costs involved in running the shop. These perceived opportunity costs are a product both of the time spent serving customers as well as waiting for visits from program staff – time spent waiting or working in the shop (for what was characterised as 'minimal' return; "just a few kina") was time not spent in their gardens or attending to other household responsibilities.

In summary, where there is consistent demand, the MS3T component can function effectively as a monetary incentive that helps to keep the MSK engaged and generates a modest profit. However, participants also noted that costs of products as well as the opportunity costs incurred in running the shop limited the MST's earning potential. In the worst cases, where market characteristics are not suitable, the introduction of the MS3T risked generating animosity and diminished community support for the MSK program as a whole by 'muddying' any perceptions of MSKs as altruistic 'volunteers'.

In-kind incentives: gifts and training

In-kind incentives, such as gifts and training sessions, are another category of incentive common to community-based health programs. These too were offered to MSKs and their families in addition to monetary incentives tied to performance and the MS3T component.

Gifts were generally appraised positively by MSKs and their husbands. The kinds of gifts mentioned in interviews included solar panels, bush knives (machetes), and clothing: practical items that were valued in the villages and which appear to have been well-received, though some interviewees noted that they sometimes sold these gifts in order to generate cash. Similarly, some interviewees also suggested alternative, more pragmatic gifts that might be offered, e.g., contributions to their children's school fees. Interviewees described the presentation of gifts at training sessions and Christmas time, as a reward for service, and they appear to have helped to smooth over relationships, or to indicate a good relationship with program management. Hence gifts were more remarkable by their omission; in a couple of instances interviewees mentioned gifts – and their lack thereof – in the context of discussions around the handover of program implementation from the Oil Search Foundation to ECPNG. Several MSKs felt that this transition had further reduced their access to in-kind resources:

> In my experience working with Oil Search they do give us knives or spades or even other things, but after the handover-takeover [from Oil Search Foundation to ECPNG] we got nothing then. *[MSK, Village H]*

Routine refresher training sessions, held on an annual basis, received a more mixed review as a form of in-kind incentive. For these training sessions, MSKs (and occasionally their husbands also) would be collected from their villages and taken to a guesthouse for a day or two where they were provided with room and board during the training. While most MSKs perceived these sessions as a valuable opportunity to expand their skills and to socialise with other women in the same role, a few pushed back against such training. For example, one current MSK opined that the money that goes into booking the guesthouse and catering for the MSKs away from home could be more effectively spent:

> Don't book the guest house, you can train us one by one, at our own houses maybe. With that money, we can get some rice, or some [tinned] fish or something like that, and you can train us. You can give us the money... *[MSK, Village C]*

Training was also perceived by a couple of MSKs as compounding the opportunity costs of the role, as no allowances were given during these training sessions (though all direct costs related to their participation were covered). One MSK's husband, a Seventh Day Adventist pastor, drew a comparison between this and his own experiences of training:

> …when I go out for meetings in Alotau, Kimbe and Rabaul, I am given an allowance. They pay allowance due to uncertainty of accidents along the way, so in her case it is necessary that they should pay her some allowance. Allowances are paid for travelling by plane or by vehicle when they leave their families for cover any unforeseen events, so the allowance should be paid by the association. *[MSK husband, Village H]*

The general preference for cash (or, barring that, gifts that are readily convertible to cash) provides a window into the cash economy that prevails in the area, which was spoken about by numerous participants in both subtle and explicit terms. Several study participants across the interview categories reiterated such notions, remarking that nowadays *'moni em laif'* (money is life) and that 'if you work hard, you get money'.

Community support for MSKs

In addition to offering monetary and material incentives, the MSK program aimed to incentivise MSKs by generating community support. Though communities continued to be engaged in the recruitment of MSKs (several participants described being nominated by their relatives, neighbours, and friends in their church), FGDs as well as interviews with MSKs and their husbands broadly indicated that village MSK

committees were no longer in operation and community members were not, in most cases, actively involved in the operation of their local *marasin stoa*.

Most MSKs reported that they receive support from members of their community in principle and/or in sentiment; community members make use of the service as required to access malaria diagnosis, purchase MS3T products, and occasionally to request assistance with other health problems (e.g., related to first aid or women's health). However, community members rarely provide financial or in-kind support to help compensate for the opportunity costs of running the shop (e.g., by supplying them with food or helping to maintain the store building). In short, while communities generally tended to be *supportive* of the MSKs' work, they were not, in most cases, actively *supporting* their local MSK. Most practical support to MSKs was provided by immediate family members, primarily by husbands.

The perception held by some community members that MSKs receive substantial financial benefits from their participation in the program did little to remedy this situation. Not only is there effectively no tangible financial incentive for communities to become involved, but potential social support from community members that might have emerged was in some cases sullied by the MSKs' association with 'the company' (Oil Search Foundation, and by extension OSL). Despite the fact that at the time of data collection the program was implemented by ECPNG, the legacy of the program as an OSL initiative has endured and contributed to the perception that MSKs are receiving a 'fortnight' (salary) from 'the company', as other employees of OSL do. This perception is reinforced by a degree of opacity among community members regarding the institutional and funding arrangements governing the program, and the precise conditions of MSKs' engagement with it.

Discussion

The study findings illuminate some of the complex ways in which incentives intended to support community-based health care are perceived and contested in response to the particular context in which

they are offered, in this case a corporate community development setting. While the MSK program undoubtedly produced some benefits with respect to MSKs' financial and material well-being, and the health of their communities, in many cases the incentives offered fell short of the high community expectations arising from the involvement of a major resource company in administering the program. The findings further suggest that dissatisfactions must be understood in the context of the pressures of living in an economy in transition – that is, an economy which is largely cash-driven, in a region which has experienced significant inflation following resource development (Weiner, 1998), but which is still grounded in traditional patterns of familial and social obligation. Combined, these place the program model under strain. Accordingly, the incentives offered should balance out against the expectations and social challenges that arise from the MSKs' perceived affiliation with OSL, as well as alternative income generation options available to them, rather than the current focus that centres on the value that MSKs bring to malaria diagnosis and treatment. This contrast has only become starker as malaria prevalence has declined over the life of the program.

Some general lessons for the implementation of community-based health programs can be drawn from this study. First, the findings validate a critique made in earlier research (e.g., Topp et al., 2015), that in order to be effective in a complex environment, programs must plan for and give consideration to the local social and economic circumstances of participants. Conversations in interviews and FGDs continually returned to money as the primary medium structuring the relationships between people and institutions in an area which has seen significant inflows of cash as a consequence of resource development. Though MSKs and community members engaged the moral, altruistic language that often underpins community-based and voluntary health programs, they also played on this, together with perceived obligations of resource development corporations to the communities in which they operate, in order to craft a case for increased support and benefits. (Whether or not such calls on corporations are justified is itself a complex question, and one that cannot be given fuller treatment here.)

Second, as Alam and Oliveras (2014) found, incentives must be planned so that they are reflexively and sustainably managed over the long-term, taking into account the potential not just for underperformance but also for things to go to plan. In the case of the MSK program, offering payments for quality diagnostic blood smears gradually turned what was initially an incentive into a *dis*incentive to continue working; as suspected malaria cases declined, so did an MSK's pay, even if the quality of her work did not. Over the same period, national treatment policy changes enacted to promote the availability of treatment free of charge – while an important and progressive step – eliminated the viability of one aspect of performance-linked remuneration at the local level within the MSK program. This highlights that not only do changes in the immediate context affect the viability of programming, but also that macro-level policy changes (for example, changes in global policy and funding through bodies such as the WHO and the Global Fund to Fight AIDS, Tuberculosis and Malaria, which contributed to changes in national policy and availability of ACTs in PNG) have implications for the implementation of programs at the community level.

Indeed, by the time that the research reported on in this paper took place, suspected malaria cases in the program area were so much in decline (Feterl et al., 2017) that much of the discussion in interviews/FGDs on the benefits and drawbacks of the program revolved specifically around the MS3T component. The reduction in malaria prevalence also offers an explanation for the general ambivalence towards the MSK program expressed in FGDs, whereby the MSK role was perceived first and foremost as shopkeeping rather than providing a health service for the benefit of the community. Thus, the original intent of the program as a community-driven health program appears to have largely faded from view, as the disease profile of the region has shifted but the program failed to keep pace with emerging health needs, notably tuberculosis.

Third and finally, there is a clear (if underlying) tension between the objectives of those who manage a community-based program and those who are engaged to deliver the program in the communities. This

tension would seem to be particularly acute in a corporate community development setting. On the one hand, a program needs to promote itself publicly and effectively to sustain funding and support. However, this can create dissatisfaction or conflict if CHWs feel that program managers receive more credit than they believe is due. Enough weight must be attributed to the role and impact that CHWs have so they sense that they and their work is valued, but not so much that they then feel short-changed by the incentives they receive in return. In the case of the MSK program, as discussed above, the broader resource extraction context seemed to have made achieving this balance especially difficult, as a clear schema into which the MSK role fits is lacking. That is, MSKs are neither unpaid volunteers nor entrepreneurs nor salaried employees, but occupy a somewhat nebulous position between the three. Accordingly, the mix of incentive types provided – which for most MSKs resulted in enough payment and income generation to make them appear as more than volunteers, but less than employees – makes the task of calibrating expectations that much more challenging.

Limitations

The findings presented in this paper are based only on the reported experiences of the MSKs, their families and community members. Other key stakeholders, such as program staff and health workers, were not interviewed or formally engaged in this study. While doing so was neither within the objectives nor the scope of the study protocol – which aimed to gather information solely about participants' experiences and perceptions – it is acknowledged that the absence of these other stakeholder views precluded the possibility of triangulating some of the claims made by MSKs, particularly those regarding the management of the program.

Social desirability bias presents another important potential limitation. Although the two researchers who conducted the interviews/FGDs were not affiliated with the Oil Search Foundation and explicitly communicated this to all study participants as part of the informed consent process, the fact that

introductions and transportation to the study villages was necessarily coordinated by Foundation and ECPNG staff means that some study participants may not have believed the researchers to be fully independent, and therefore may have moderated critical comments out of concern regarding potential ramifications for their continued participation in the program. Alternatively, some participants appear to have used the study as an opportunity to reiterate and communicate claims for increased payments to program managers via the researchers.

Additionally, while the data collection was as broad as possible (covering all but one of the communities in which the MSK program was active at the time of research), logistical constraints permitted only single interviews and FGDs of on average 48 minutes each. Follow-up interviews and/or extended periods for observation and informal conversation would have enabled greater validation and lent further weight to the findings. However, as no new codes emerged after analysing 19 of the 26 interview/FGD transcripts, we are confident that an acceptable level of data saturation was achieved.

Finally, it is recognised that the use of convenience sampling for recruitment to FGDs, again necessitated by logistical constraints, may have prevented obtaining a more diverse community perspective on the MSK program. For this reason, in the analysis FGDs were treated primarily as a source of data for triangulation and confirmation of information provided in individual interviews.

Conclusion

This paper has examined how incentives implemented as part of a community-based malaria diagnosis and treatment program in a rural area of PNG characterised by resource extraction were perceived and critiqued. Broadly, the findings indicate that for programs and incentives to function effectively and sustainably, careful balancing is required between such factors as the support and promotion of CHWs and their capabilities; the support and promotion of the program itself; and a variety of other structural factors, including local economic pressures and the broader availability and cost of healthcare. The

559 variety of variables involved in such programs means that the appropriate structuring of incentives
560 continues to challenge the implementation of community-based health programs, chiefly because of the
561 difficulties in calibrating them effectively to wider social and economic dynamics, opportunities and
562 perceptions. These factors appear to be compounded in a resource extraction setting because questions
563 of financial compensation are brought into sharper relief in discussions at the community level and
564 between CHWs and program managers in such settings, where the relative roles and responsibilities of
565 resource companies and the state in providing for the welfare and social development of local residents
566 can become blurred. This problem is particularly acute in areas where the state is largely absent but
567 resource companies are present and accessible, as is the case where the MSK program operates. The
568 findings presented in this study do not provide a clear answer to the challenging policy question of
569 whether or not resource companies should be directly engaged in delivering health and other social
570 services. However, they do reveal that there are limits to the extent to which improvements in broader
571 development outcomes can be expected to arise from small-scale, community-based programs. Given the
572 social animosity that can emerge under such programs, as demonstrated by our study findings, the
573 challenge for resource companies is not whether or not to support community health and development
574 efforts, but how to do so in a way that balances their need to make visible that support (in order to fulfil
575 legal obligations and maintain a social license to operate), without inadvertently stoking interpersonal
576 conflict, distorting existing health systems, or effectively replacing the role of government in delivering
577 social services. Long-term planning and engagement with communities is key to understanding local
578 concepts of monetary and non-monetary transactions, in order to calibrate and translate these into a
579 variety of effective incentives to ensure the sustainable delivery of community health services in
580 partnership with government.

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- Assesses incentives for malaria diagnosis and treatment in Papua New Guinea
- Reveals the shifting meaning and value tied to monetary and non-monetary incentives
- Unique focus on community health programming in a resource extraction context
- Illuminates tensions underlying corporate community development efforts

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