Barriers to malaria control in rural south-west Timor-Leste: a qualitative analysis

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ABSTRACT

Background: Malaria is an important health problem in Timor-Leste. Although funding has been provided to reduce the burden of this disease, few studies have investigated whether this has improved malaria-related knowledge, management of symptoms, and treatment in rural communities. The aim of this study was to explore the perceptions and practices undertaken in relation to all aspects of malaria control by members of two rural communities in Timor-Leste.

Methods: A qualitative study was undertaken in two rural hamlets in Timor-Leste. Research methods included transect walks, focus groups and semi-structured interviews. Content analysis was used to identify themes.

Results: The location of the hamlets near rice fields, leaking taps, inadequate water supplies and dumping of waste from the local hospital provided opportunities for mosquitoes to breed. Most participants were aware of the link between mosquitoes and malaria, but a lack of control over their environment was a major barrier to preventing malaria. The distribution of bed nets had occurred once, and was the only intervention undertaken by the National Malaria Control Programme. However, limiting the distribution of bed nets to pregnant women and children aged under 5 years had resulted in some focus group respondents believing that only those in these groups could be affected by malaria. Self-diagnosis and home treatment were common. Treatment for unresolved infections depended on access to transport funds, and belief in the power of traditional healers.

Conclusion: Improvements in infrastructure, empowerment of rural communities, and better access to treatment are recommended if the incidence of malaria is to be reduced throughout the country.

Key words: Access to treatment, empowerment, malaria, sanitation, Timor-Leste.

INTRODUCTION

Malaria is endemic throughout Timor-Leste, and over three quarters of the population live in areas of high transmission.¹ The majority (81%) of infections are caused by Plasmodium falciparum and 19% by Plasmodium vivax.¹ Although the parasite prevalence may be in the range of 19%,² there are local and seasonal variations.³ Underreporting of cases, particularly in rural areas, makes an accurate estimation of the incidence of this disease problematic.²

There are nine species of anopheles mosquito that can transmit malaria to humans in Timor-Leste. The two most common are Anopheles barbirostris and Anopheles vagus genotype B. The former breeds in large permanent bodies of water with permanent vegetation.³ The preferred breeding habitats of the latter are fresh and brackish swamps, and small plastic containers, tyres and concrete drains.⁴

With the help of international funding, Timor-Leste’s Ministry of Health established the National Malaria Control Programme in 2003. Interventions undertaken were both “top-down” (led by government agencies) and “bottom up” (community led). Among the former interventions, one priority was to establish and strengthen health services that had suffered significant disruption during the war with Indonesia. Others included the wide distribution of bed nets to pregnant women and children aged under 5 years, and providing school- and community-based education about malaria.
As part of its “bottom up” approach, the Ministry of Health “Integrated Community Health Services” (SISCa) was introduced throughout Timor-Leste. With a slogan of “from, with and to the community”, the aim was “to mobilise community members to access basic healthcare services, with the help of health volunteers working in the community.”

Only two previous studies have investigated how malaria is managed in Timor-Leste following the implementation of the National Malaria Control Programme. One of these focused predominately on the use of bed nets, and the other discussed the implementation of the grant given by the Global Fund to Combat AIDS, Tuberculosis and Malaria. The latter study reported that there had been an increase in knowledge about malaria transmission in the country, and greater awareness of the need for maintaining high levels of sanitation. However, it is not known whether these improvements have been experienced throughout the country. The aim of this study was to explore the perceptions and practices undertaken in relation to all aspects of malaria control by members of two rural communities in Timor-Leste.

**METHODS**

Ethical approval to carry out the study was obtained from the Auckland University of Technology Ethics Committee, and accepted by the District Health Service Ethics Committee in the area of Timor-Leste in which the study was conducted. All study participants gave written informed consent before participating.

The exact location of the study is not provided, to ensure anonymity of the respondents. It was set in two hamlets in a rural area of south-west Timor-Leste. One was approximately 8 km, and the other 12 km away from the nearest health clinic, where individuals with suspected malaria could be tested and receive treatment. One researcher chose the area in which to carry out the study, based on her familiarity with this district. This researcher was native to Timor-Leste, spoke Tetum (the national language) fluently, was familiar with local customs and had previously worked on malaria-control campaigns in the country. Previous work undertaken by this researcher in this region had suggested that knowledge of malaria in the community was poor, but regional reported malaria data suggested that the incidence rate was lower in this area than in other districts in the country.

Before data collection commenced, meetings were arranged with national, regional and local government officials, to gain support for the study. They provided details of local health volunteers, and the head of each hamlet, who would be asked to facilitate the research.

**Transect walks**

To evaluate the potential for mosquito breeding in the community, transect walks were carried out with the assistance of a guide, who also answered questions. Transect walks are journeys taken through a community, and can be used to explore local sanitation conditions. During the walk, photographs were taken of the local environment and the bedrooms of some houses, to demonstrate how bed nets were hung and their state of repair. Maps of each hamlet were drawn, showing potential mosquito breeding sites.

**Focus group discussions**

Focus groups were organized in each hamlet. Health volunteers informed community members about the study and encouraged participation. Interested participants contacted the hamlet leader or health volunteer, and their contact details were passed to the researcher. Each was given a week to decide whether they wished to take part.

**Semi-structured interviews**

The hamlet leaders (one from each hamlet) and the traditional healer from one hamlet were invited to take part in semi-structured interviews. The other hamlet did not have a traditional healer working there.

Topics covered in the interviews and focus groups comprised: knowledge about malaria transmission and symptoms; actions taken to diagnose and treat malaria; and knowledge about the national malaria-control programme.

Interviews were recorded using a digital recorder, with the exception of the interview with one head of hamlet, who requested written notes to be taken instead. Focus groups and interviews were carried out in Tetum, transcribed verbatim and translated into English by one of the authors.

For the analysis, the data from the transect walks, focus groups and semi-structured interviews were categorised into five main themes, using content analysis: malaria transmission sites in each hamlet; knowledge of malaria transmission; prevention of mosquito bites; symptoms of malaria; and appropriate treatment. All responses that corresponded to one of these themes were collated by one author, and reviewed by the other to ensure agreement.

**RESULTS**

Transect walks, focus groups and semi-structured interviews were carried out in July 2012 and each lasted about an hour. One focus group was conducted in the local school, and the other in the home of the hamlet head. One was attended by three women and four men and the other was attended by five women and two men. Study participants were subsistence farmers, or individuals who gained an income from selling firewood or from making and selling traditional clothes. Three semi-structured interviews were conducted and these were carried out in respondent’s homes.

The age of the participants of this study ranged from 20 to 70 years. One village had approximately 60 households, and the other about 80 households. Most family houses consisted of three bedrooms. The average number of occupants per household in the first hamlet was 4.5 and in the second hamlet was 5.3.
Sites suitable for malaria transmission

Rice fields
From the transect walks, it was observed that, in both hamlets, rice fields were located close to households. Slow-moving water, algae and small irrigation channels connecting river water to these channels provided sites for mosquitoes to breed. The village guide explained that some farmers irrigated their rice field during the night, when many mosquitoes were prevalent.

Lack of suitable water supply and drainage systems
In the first hamlet, water provided for the community ran from a communal tap continuously, as it could not be turned off, although the head of one hamlet explained he had made repeated requests for the tap to be mended. In the second hamlet, one well served nearly 400 people. Many individuals from both hamlets used the river, a distance of several kilometres away, to wash clothes or collect water. The transect walks revealed that irrigation channels along the river path provided sites for mosquitoes to breed, and on the banks of the river there were pools of stagnant water.

Some houses lacked toilets, necessitating the use of outdoor areas near to mosquito-breeding sites.

Disposal of rubbish
In the first hamlet, some households used a nearby rubbish tip. Others buried their rubbish or burned it. However some non-combustible items, such as cans and bottles, provided sites for mosquitoes to breed. Rubbish was scattered along the side of the road, by community members and by residents of other hamlets, as well as by the local hospital, which used an area near to one of the hamlets as a dumping site for hospital waste.

Many participants explained that an initiative to clean the local environment must be made directly from the hamlet head. Without this, no action would be taken. This was confirmed by the heads of each hamlet.

Knowledge about malaria transmission
Some focus group members referred to their lack of education to justify why they did not know in detail how malaria was transmitted, but all respondents recognized the importance of avoiding mosquitoes and were aware of the link between stagnant water and malaria.

The traditional healer attributed spiritual reasons for malaria infections, which he said resulted from current or past misdeeds, or not caring for an ancestor. He considered pregnant women as being particularly susceptible because they had stopped menstruating.

Prevention of mosquito bites
Common measures to prevent mosquito bites were killing them by hand, covering of the body in the evening, or burning tyres, dry cassava and cow dung to create smoke. Some people who could afford to do so would also purchase anti-mosquito creams and mosquito coils, although the sporadic income that many received meant that creams and mosquito coils could not be used throughout the year.

Nets had been given free of charge to pregnant women and children aged under 5 years, in both hamlets, 2 or 3 years previously, and the hamlet heads had played a role in their distribution. Some families who received more nets than others had shared them with others.

The distribution of bed nets was the only awareness participants had of the National Malaria Control Programme. All participants understood that sleeping under nets would help to protect against being bitten by mosquitoes. However, limiting the distribution of bed nets to pregnant women and children under 5 years of age had, unintentionally, resulted in some focus group respondents believing that only those in these groups could be affected by malaria. Others, as well as the head of one hamlet, recognized that other family members could also become ill with malaria, and argued that nets should have been distributed more widely.

Despite wanting more nets, there was an acknowledgement among participants that there was a lack of space to hang them. Most houses contained three bedrooms but were occupied by four to seven people.

There was some confusion about whether and how often nets should be washed. Some repaired holes in nets, but others threw them away if they became torn or damaged.

Symptoms and diagnosis
Most participants could name some common symptoms of malaria. Others, including one of the hamlet heads, claimed not to know the symptoms, as they did not believe they had personal experience of these.

There were some discussions among participants about whether it was possible to self-diagnose malaria from clinical symptoms. Some believed they could self-diagnose, while others recognized that a blood test was necessary for an accurate diagnosis:

We got this disease but we don’t know, therefore we go to the hospital to get it tested . . . if we stayed at home then we didn’t know, so go to hospital to get blood tested then we will know . . . if it’s malaria disease (focus group respondent).

Treatment seeking
Initial treatment of malaria-type symptoms would most typically be carried out by the individual. Eating boiled papaya leaves with noodles was popular, as it was believed that the bitter taste would be effective. Some would purchase analgesics or antibiotics from the nearby shop (within walking distance) if they could afford it. No participant mentioned a hospital visit as a first course of action.
If symptoms persisted, the options available were either to visit the local hospital (where treatment was provided free of charge) or to seek help from a traditional healer. A lack of available cash for transport (the cost ranged from between US$ 2 and US$ 4) was the reason voiced by many, including hamlet heads, to explain why the latter action might be taken. Access to money was described as particularly difficult at times of the year when there were few crops to sell. The heads of the hamlets had made unsuccessful requests to regional health officers for a mobile clinic to make regular visits, and/or for a local hospital to be built.

Not all respondents believed that traditional healers had a role to play in the treatment of malaria. However, a few said that some hospital doctors they had received treatment from did believe in the power of traditional healers. They might advise patients to visit one if their symptoms did not resolve in a few days after treatment had started, so that spiritual barriers that might be preventing its success could be overcome. The spiritual healer confirmed he had been asked by a male nurse to treat his wife, who had been admitted to hospital but had not recovered. He also explained that people might come from other hamlets to be treated by him, and that they might pay him between US$ 2 and US$ 5.

Treatment by the traditional healer involved carrying out a ceremony while sharing food and cigarettes, or killing animals:

Malaria can be treated through bringing betel nuts and giving them to the spirit of the dead, then it will get healed. Kill a chicken and feed the spirit of the dead people, then we will not get it again (traditional healer).

**DISCUSSION**

The aim of this study was to investigate knowledge, attitudes and practices relating to malaria transmission, symptoms and treatment in one small rural area of Timor-Leste after the implementation of malaria programmes carried out in this country to reduce the burden of this disease. The qualitative methodology employed allowed exploration of concepts that might be a barrier to malaria control. Further research using quantitative methodologies would be necessary to determine whether the results could be extrapolated to other rural populations. Interviewing a range of respondents enabled a diversity of views to be included, while the use of a transect walk by a research team member with malaria expertise meant that an independent evaluation could be made of the potential for mosquitoes to breed in the vicinity.

Rather than poor knowledge about malaria transmission, a lack of control over managing the sanitation in their local environment appeared to be the predominant factor that limited the ability of respondents to protect themselves against mosquito bites. Specific problems mentioned were the dumping of rubbish by the local hospital, for example of receptacles in which mosquitoes could breed, and the lack of response to repeated requests for improved water supplies. The poor sanitary conditions were confirmed during the transect walks. While Martins and colleagues have noted that some success has been made by the first Global Fund grant to reduce malaria-related morbidity and mortality in Timor-Leste, the results of the research presented here suggest that a priority for the country is still the strengthening of infrastructure, the provision of waste disposal services and improved water supply, including to remote rural areas. Interventions focusing on increasing malaria-related knowledge without providing the means to prevent mosquito bites are unlikely to be effective.

Only bed net distribution was mentioned as an intervention by the National Malaria Control Programme, as well as the fact that this had taken place on one occasion with no follow-up. Many respondents recognized the usefulness of bed nets, and this is in line with the findings of Lover and colleagues. The confusion about who malaria could affect, an unintended consequence of targeting pregnant women and children aged under 5 years, was also noted by Lover et al. Ongoing educational sessions with local communities may overcome this confusion, and could also be used to provide information about the requirements for washing nets. A lack of trust of outsiders may make this difficult. Although the researcher who carried out the fieldwork was born in Timor-Leste, she noted that several respondents described her amongst themselves as an “outsider” or “foreigner”, and were reluctant to discuss issues freely. The heads of hamlets could be a useful interface between community members and health workers from outside these areas, to ensure that information is understood and trusted. There is also a need to involve community members more in efforts to reduce malaria. Despite being aware of the risks within their local environment, respondents appeared to be reliant on interventions from outside, and no respondent mentioned any “bottom-up” approaches to malaria control, despite these being a specific aim of the National Malaria Control Programme. Efforts to reduce the incidence of malaria in other areas of the same region have shown that full community engagement and commitment is a key component to success, and could be replicated in Timor-Leste.

Responses to questions about the most effective diagnosis and treatment of malaria also suggested perceptions of powerlessness among some respondents. Some could not seek a parasitological diagnosis and drug treatment because of a lack of funds. Thus, the provision of free diagnostic tests and treatment for malaria, implemented in Timor-Leste in 2007, remains outside the scope of people who are not able to access it. However, the traditional healer mentioned that some people would access his treatments by paying similar sums of money to those they would spend on biomedical treatment. Thus, financial difficulties alone could not explain why some people resorted to supernatural treatments for malaria, and two parallel beliefs in malaria etiology appeared to be common. The finding that a belief in supernatural causes of malaria was reported to be held by some medically trained staff highlights the need to reinforce the importance of medical treatment with these individuals, and, in particular, the need for laboratory confirmation of suspected malaria. This is in order that other causes of presenting symptoms can be ruled out, or treated.

Timor-Leste is still in the malaria “control” phase. Thus, the priority is to reduce the morbidity and mortality caused by this disease, by preventive measures, accurate diagnostic testing and treatment. The results of this study suggest that
there is still much progress to be made in rural areas. With respect to prevention, “bottom-up” approaches could focus more on enabling the community to take control of improving sanitation within their local environment, ensuring they understand the rationale for targeting particular groups with bed nets, and explaining how nets can be maintained correctly. Preventing rubbish entering the hamlets from other areas, and providing access to accurate diagnostic tests and treatment, as well as ongoing training of clinicians are important “top-down” priorities.

REFERENCES


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