Vector-borne disease in Timor-Leste

Mosquito-borne diseases are common in Timor-Leste. Approximately 20-25% of consultations in Timor-Leste’s health facilities are either directly related to, or are compounded by mosquito-borne disease (dengue, malaria, Japanese encephalitis, filariasis and chikungunya). Reducing the incidence of mosquito-borne disease in Timor-Leste will require a significant improvement in the training of vector control staff in vector control, and the planning and implementation of vector control programs to specifically target the mosquito species responsible for disease transmission.

A brief outline of the project

Since September 2006 the Northern Territory (NT) Department of Health and Community Services (DHCS) has been involved in an AusAID funded project in collaboration with the Timor-Leste Ministry of Health (MoH) in the area of mosquito surveillance and control. The aim of the project is to increase the capacity of the MoH to carry out effective mosquito surveillance and control programs so that the incidence of mosquito-borne disease in Timor-Leste can be reduced. This collaborative effort involves DHCS officers from both the Medical Entomology Branch (MEB) and the Health Policy Branch. Initially the Timor-Leste AusAID Mosquito Project will focus on the development and implementation of vector control programs to reduce the incidence of dengue in Timor-Leste.

The key outputs of the 3-year project will be to:

- ensure that essential equipment and chemicals are available for training purposes;
- increase the skills of mosquito control and surveillance officers in Timor-Leste;
- provide assistance to develop and implement effective operational protocols for mosquito surveillance and control;
- provide assistance to improve community education on prevention of mosquito-borne disease; and
- provide assistance to improve the collection and analysis of data in relation to mosquito surveillance and mosquito borne disease.

Effect of civil unrest on project outcomes

Since the people of Timor-Leste formally gained independence from Indonesia in 2002 there have been intermittent periods of violent civil unrest, and several of these have been prominently reported in Australian media. Civil unrest in Timor-Leste (especially Dili) during the last 12 months has had a negative impact on the ability of the AusAID Mosquito Project to undertake regular training activities with MoH staff in Timor-Leste. It has also adversely affected the ability of senior MoH management to consider and implement DHCS proposed activities to improve the MoH dengue vector control program. Despite these difficulties there have been several positive outcomes from project activities that were carried out during the last year.

Procurement of appropriate insecticides and equipment for use in vector control

At the commencement of the AusAID Mosquito Project in September 2006 the MoH possessed very limited quantities of insecticides and functional insecticide application equipment with which to carry out dengue vector control activities. On the advice of DHCS, the MoH has since procured reasonable quantities of a range of insecticides for use in its Dengue Control Program (enough for Dili during one wet season), and PPE (Personal Protective Equipment) for 30 vector control field workers. The MoH is in the process of purchasing up to 65 hand-held pressure sprayers and 40kg of S-methoprene pellets (insect growth regulator). It is hoped that this equipment and insecticide will arrive in Timor-Leste before the onset of the build-up rains at the end of this year. The MoH will then have enough insecticides and application equipment to carry out an extensive receptacle treatment program in Dili during the next build-up and wet season. All vector control activities carried out in Dili will be evaluated.
and used in dengue control programs in all districts where dengue is prevalent in following years.

The procurement process within the MoH can be lengthy. After the MoH receives quotes from local companies in Timor-Leste for the supply of goods it can take up to three months to receive the goods in Dili. Despite the length of the procurement process, DHCS is encouraging MoH vector control officers to use the MoH procurement process so that they:

1. gain experience in the procurement of essential vector control insecticides and equipment;
2. learn what information (product specifications, product reseller contact information) needs to be provided to local companies in order to ensure the supply of the specified goods to MoH;
3. build a good working relationship with the MoH Purchasing Department; and
4. gain an understanding of how the MoH procurement process works and how to use it most efficiently.

Vector control equipment and insecticide inventories in the districts of Timor-Leste are either very limited or non-existent. The MoH will need to make provision in its future budgets to purchase equipment and insecticide so these can be distributed to the districts and used to carry out appropriate vector control as required.

**Mosquito surveillance and control training of MoH staff**

In September 2006, 2 MoH officers (Ivo Guterres and Bernadino da Silva) travelled to Mandurah, WA, to participate in a 5-day mosquito surveillance and control course. The course introduced the MoH officers to mosquito surveillance and control training and theory, and also gave them a chance to spend time and exchange information with officers that implement vector surveillance and control programs in Australia.

The knowledge gained by the 2 MoH officers at the mosquito surveillance and control course in Mandurah was quickly put to use when they assisted DHCS officers to deliver a 3-day vector surveillance and control workshop for Dili-based vector control officers and volunteer staff in Dili in October 2006. Ivo and Bernadino capably coordinated the logistics support for the workshop and also acted as interpreters for the sessions that were presented in English. The workshop was hosted by the MoH, while the lectures and practical sessions were produced and presented by MEB officers Peter Whelan and Bill Pettit. The subjects covered in the workshop included mosquito biology and identification, field surveys for larvae and adults, insecticide and application equipment handling and use, and the insecticide treatment of receptacles for the control of breeding mosquitoes (ie dengue mosquitoes). The practical sessions of the course provided participants with an opportunity to handle and use insecticide application equipment, identify actual and potential dengue mosquito breeding sites, and to view mosquito larvae and adults under the microscope.

In the second year of the project DHCS and MoH are planning to conduct another mosquito surveillance and control workshop in Dili for MoH vector control staff and volunteers (November 2007), and DHCS plans to host a number of study tours to Darwin for MoH staff to learn about the planning, implementation and management support of vector control programs. Lecture notes and general information handouts will be translated to Tetum (the native language of Timor-Leste) when possible.

**DHCS role in planning mosquito control activities in Timor-Leste (2006/2007)**

A major aim of the AusAID Mosquito Project is to assist the MoH in the development and implementation of effective operational protocols for mosquito surveillance and control. The initial focus of the project is on dengue vector surveillance and control and a document, *Operational Plan and Protocols for Dengue Outbreak Control in Dili*, has been developed and presented to the Vice-Minister of Health Timor-Leste for consideration (May 2007). A complementary document, *Operational Plan and Protocols for Routine Dengue Mosquito Surveillance and Control in Dili*, is being finalised and will soon be presented to the Vice-Minister of Health for consideration. These 2 documents contain DHCS recommendations and protocols for the control of dengue vectors on a
year round basis. They are based on DHCS operational protocols, on world best practice (mosquito control literature and WHO recommendations), and have been tailored for use by MoH staff and volunteers.

Adoption and implementation of DHCS recommendations by MoH (2006/2007)

A number of the DHCS recommendations and protocols for MoH have already been tested in the field by MoH staff and volunteers in Dili during the 2006/2007 build-up and wet season. A 3-day Pilot Project for Dengue Outbreak Control in Dili (Pilot Project) in December 2006 trialled the use of some of the DHCS recommendations for property inspections and insecticide treatment of receptacles. During the Pilot Project, Bill Pettit (DHCS) provided demonstrations and guidance to 8 MoH staff and volunteers on how properties should be surveyed for dengue mosquito larvae and how receptacles should be treated with insecticide to prevent colonisation by mosquitoes (Figure 1). The project took place in the Dili suburb of Motael, and in a 3-day period the group (in 3 teams) surveyed and treated 54 houses. The project gave MoH staff and volunteers practice in the handling and use of insecticides and application equipment, and demonstrated to them that the DHCS protocols can be applied in the field in Timor-Leste.

A dengue outbreak started in Dili in January 2007 and provided an opportunity for MoH staff to implement some of the DHCS recommendations for dengue outbreak control that were included in the Operational Plan and Protocols for the Pilot Project (December 2006). During a 1-week period while Bill Pettit (DHCS) was in Dili 2 dengue case houses were identified and all houses within a 50m radius were inspected for mosquito larvae and treated with insecticide. A total of 77 houses in 2 separate urban areas of Dili were inspected and insecticide treated in a 3-day period by 8 MoH staff and volunteers. This dengue intervention activity was very limited in extent and did not cover all of the dengue case houses in Dili that were known to the MoH. It was a valuable training exercise for MoH staff and volunteers, but it was not a realistic attempt to limit the spread of dengue in Dili at that time.

Although the MoH has not formally accepted and adopted any of the DHCS formal recommendations for the dengue control program, the trial use of some of the recommendations on several occasions during the 2006/2007 wet season indicate that the MoH has been willing to accept DHCS assistance and test DHCS recommendations in the field. The MoH has also made purchases of insecticide and equipment based on DHCS recommendations.

Implementation of dengue control programs in Timor-Leste

Periodic civil unrest in Timor-Leste during the last 5 years since independence has caused the displacement of up to 10% of the country’s 923,000 people from their homes. As a direct result of civil unrest no DHCS project officer has travelled to Timor-Leste since the end of February 2007. This has made it difficult for DHCS staff to work through the DHCS proposals with MoH senior management and vector control staff, and trial aspects of the proposals on the ground. Since the last visit communications between DHCS and their MoH counterparts has continued by phone, email and fax. A visit by the Project’s Medical Entomologist/Technical Advisor, Bill Pettit was carried out in the first week in October 2007.

In June 2007 Timor-Leste had parliamentary elections, and the new government was sworn in to parliament in early August 2007. The Timor-Leste Mosquito Project has enjoyed a high level of support from the outgoing Minister of Health, Dr Rui Araujo, and the outgoing Vice-Minister of Health, Mr Luis Lobato. This high level of support looks set to continue under the leadership of the new Minister of Health, Dr Nelson Martins. Dr Martins recently completed his PhD, Operational research on tuberculosis control program in Timor-Leste, with the Menzies School of Health Research in Darwin.

Future for AusAID Mosquito Project in Timor-Leste

AusAID has agreed to fund the Timor-Leste Mosquito Project for a period of 3 years to September 2009, conditional on the achievement of agreed outcomes. While current conditions in
Timor-Leste make it unlikely that all agreed project outcomes will be achieved, progress is being made towards the establishment of practical vector control programs. A continuation of AusAID funding in the second and third years of the project will give DHCS many opportunities to work with the MoH to implement effective vector control programs at both national and district levels.

Figure 1. MoH staff surveying for dengue mosquito larvae in an area of dengue transmission in Dili.

References