

Dengue Fever in Solomon Islands
The Story so Far
April 2013

Solomon Islands

The Solomon Islands is an archipelago comprising a double chain of 992 islands, of which about one-third are populated. It is divided into nine provinces. The population of Solomon Islands was estimated to be 515,870 in 2009 and more than 80% of the population live in rural areas with traditional subsistence lifestyle based on the fishing, forestry and agriculture sector. The capital city, Honiara (pop. 64,609), is located on the island of Guadalcanal.



It is

Solomon Islands Health System

There are eight public hospitals, one each in eight of the nine provinces. Rennel/Bellona Province has a population of approximately 3000 people and does not have a hospital. Guadalcanal Province is served by the National Referral Hospital (NRH) located in Honiara. Additionally there are four private hospitals; one in Guadalcanal (Good Samaritan), one in the Western Province (Helena Goldie), one in Malaita Province (Atoifi) and one in Choiseul Province (Sasamunga).

Rural health centres, area health centres (referred to as clinics) and nurse aid posts are distributed throughout all provinces, based on the size and geographical distribution of their populations. There are no doctors at these facilities, they are staffed by nurses of varying qualifications (for example, a nurse at a Nurse Aid Post has completed a 1 year nursing certificate). Access to these rural health centres is commonly limited by road; access is predominantly by foot or out board motor boat.

Dengue Fever

In January 2013 doctors at National Referral Hospital (NRH), noticed dengue like illness in a number of patients. These first few patients tested NS1 or IgM positive with the Standard Diagnostic's Dengue Duo rapid diagnostic test (RDT). Initial investigations revealed that these patients did not travel abroad in the week previous to the date of onset of symptoms. WHO Collaborating Centre for Arbovirus Reference and Research in Brisbane, Australia confirmed dengue virus serotype-3.

Dengue was last confirmed in Solomon Islands in 2002 with positive cases being identified in Honiara at that time. The cases diagnosed at NRH in 2013 were therefore considered the beginnings of a new dengue fever outbreak in Solomon Islands.

Initial Response

On January 30th, 2013 the Ministry of Health and Medical Services (MHMS) with support from WHO, established a dengue taskforce. The taskforce's initial role was enhancing disease surveillance, case management training, laboratory capacity and implementing control measures in order to reduce the risk of sustained transmission locally and to minimise the impact on the affected population.

The taskforce coordinated clinical detection of suspected cases and initial case management training with nurses working in clinics within Honiara City Council, private doctors in Honiara and NRH. The WHO standard case definition for dengue fever was taught to clinicians, and the WHO 2009 clinical guidelines procedures were employed.

WHO provided an epidemiologist to assist the surveillance team; with this added support they expanded surveillance and clinical training to Guadalcanal Province, Western Province, Malaita Province and Temotu Province.

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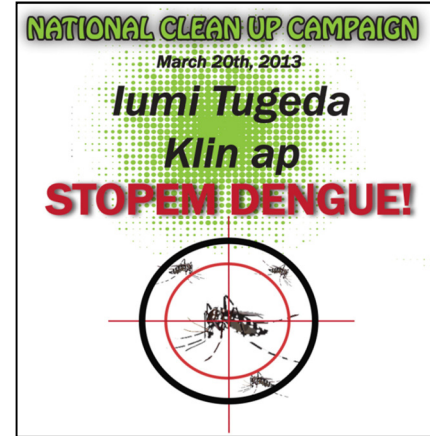
The Ministry of Health held a press conference to officially explain that a dengue fever outbreak was occurring in Solomon Islands, which was followed up by informative articles about dengue for the media to publish for community awareness.

Health Promotion

WHO provided further technical assistance to the Health Promotion team in March, running a strategic health communication workshop, aimed at improving health message delivery at the community level.

The outcome of this meeting was a National Clean up Day – 'Iumi Tugeda Klin ap, Stopem Dengue' (you me together clean up, stop dengue).

Leading up to this clean up day, the Health Promotion department created and distributed dengue information leaflets, explaining ways in which people could protect themselves from the dengue mosquito. Posters were made with information about the clean up day and letters explaining the clean up day were distributed to schools, businesses, NGOs, Government Ministries and Churches.



An important factor at this point with respect to community awareness was the long term health information Solomon Islanders have received about malaria. Malaria is endemic in Solomon Islands, thus people are very aware of the threat of vector borne diseases. While this is a help when it comes to the provision of dengue information, there needed to be clear messages about the dengue mosquitoes varied breeding site of choice compared to the malaria mosquito. The rubbish, boats, equipment and drinking/washing water storage containers found around homes and businesses in Honiara had never been associated with mosquitoes before, thus this information was a big campaign focus.

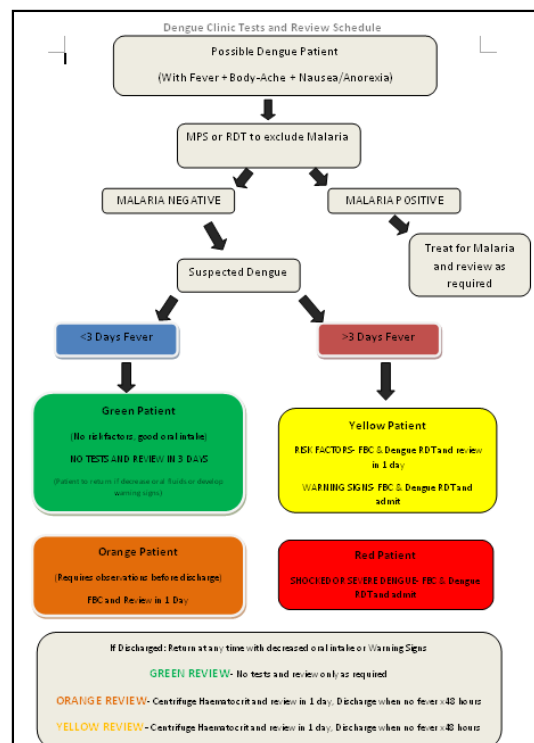
Health Promotion department continue to provide information for members of the public on dengue. Information leaflets for travellers arriving / leaving Solomon Islands were created and distributed to MHMS Quarantine Department. Management of Dengue in the Home information sheets have been made for NRH and clinics to give to those not admitted, encouraging fluid intake and fever reduction. As the initial phase of the outbreak is coming to an end, Health Promotion are focussing on provision of long term information through partnerships with the media and Honiara City Council with respect to rubbish clean up and patient detection of early warning signs.

Health Care Facilities

As information about dengue fever spread around the country, patients presenting with dengue like symptoms increased, especially at the clinics in Honiara.

Surveillance numbers proved that the numbers of suspected and confirmed cases were increasing, thus so too was the pressure on the health facilities.

Without a hospital for the residents of Honiara, the Accident and Emergency (A&E) department of the National Referral Hospital was being overrun with patients, impacting on its ability to act as a Referral Hospital. This was due in part to patients going straight to the hospital for treatment instead of first presenting to a clinic, and inappropriate referrals from the clinics.



The Hospital Emergency Operation Centre (HEOC) was activated to assess the capacity of NRH to deal with the patient overload. The NRH Mass Casualty Plan was activated, to enable redirections of resources and priorities to manage and control the dengue outbreak.

Medical officers were rostered on to shifts at 3 key clinics in Honiara to alleviate some of the pressure at NRH.

Dengue fever triage at NRH / Outpatient Depts.

The NRH triage system proved inadequate for the patient surge the dengue outbreak brought on. This system was reviewed and a new process implemented, with the introduction of three dengue triage desks to improve patient flow. Solomon Islands College of Higher Education (SICHE) nursing school graduates who are awaiting probation placements have been recruited to help at NRH with the triage process.

Outpatient clinics were ceased at NRH so staff could concentrate on dengue cases. As chronic patients are unable to attend outpatient clinics, in some cases their condition has deteriorated, leading to increased ward admissions (in particular on the paediatric ward). Those who should attend outpatient clinics at NRH are being referred to Honiara City Council clinics, overloading their already busy clinic schedules.

46% of all dengue admissions to NRH were receiving blood transfusions and IV fluid use across the country was rapidly increasing, depleting National Medical Stores stock. By the 15th of March, two deaths from dengue had been reported. These issues highlighted the need for clear dengue clinical management guidelines.

WHO engaged Dr Lucy Lum Chai See to provide clinical management training to NRH doctors. Through the provision of clinical management training, and doctors becoming more familiar with dengue as they have more experience in treating it, by April 4th it was reported that blood transfusions had reduced significantly over the last three weeks.

The current hospitalisation rate of dengue patients is around 10% and the mean length of stay is 4 days.

The NRH laboratory has been performing RDTs on dengue patient blood samples taken at clinics and NRH. Among the samples tested, approximately 40% are positive. Currently, dengue RDTs are not procured by the National Medical Stores, thus all RDT supply has been through WHO. As of April 12th, there were 2,713 suspected dengue cases reported, 720 of which tested RDT positive.

AusAID together with New Zealand Aid deployed a support team to the Solomon Islands in early April to assess the provincial dengue situation. Doctors, nurses, lab support and a logistician all arrived to support capacity at NRH, after months of hard work for all staff the relief support was welcomed.

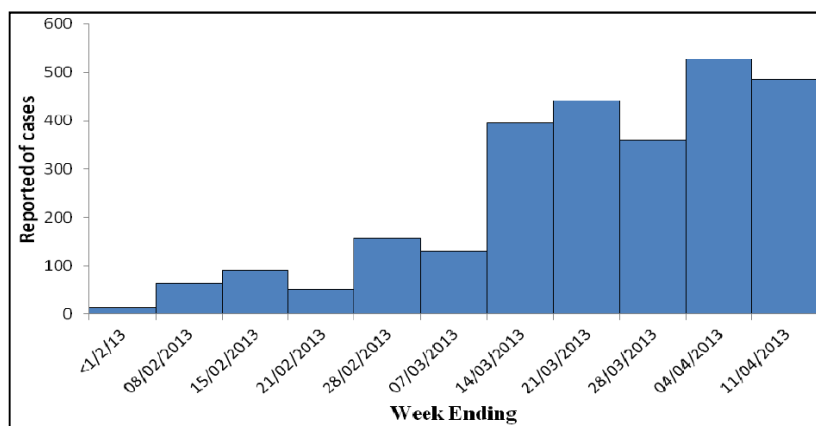
Dr Malcolm Johnston-Leek of the AusAID deployment said "We are seeing good results from the new triage system; patient flow is starting to work well. The long term challenge for the Ministry now will be mosquito control". Many of the staff in this team mentioned how impressed they are with the local capacity at NRH, especially given how hard everyone has worked over the last few weeks of the outbreak. "The focus now is to look at re-opening the outpatient clinics, while effectively managing the dengue triage load" said Dr Johnston-Leek.

Surveillance

The surveillance team, with WHO support are monitoring dengue fever across the country.

Dengue syndromic surveillance was also introduced at NRH A&E, capturing the numbers of referrals and suspected presentations.

Surveillance data allows the team to monitor the magnitude and spread



Total number of suspected cases by week within Solomon Islands

World Health Organization Solomon Islands

of the outbreak and assist the Dengue Taskforce and partners to anticipate future needs. The vector control team also use surveillance data to determine 'hot spots' for vector control. Dengue surveillance is implemented in any province where a suspected case is reported; currently that includes 6 of the 9 provinces and Honiara.

NRH inpatient statistics are being analysed; length of stay, bed usage, fluid usage, blood transfusion rates are examples of the information being collated. WHO is assisting to review this information in light of the impact the new triage system is having on admissions and patient flow at NRH.

Vector

Vector surveillance results indicate that *Ae albopictus* and *Ae Aegypti* are both present in Honiara. It is likely that the high number of cases reported since mid-February are related to *Ae aegypti* which is the primary vector for dengue fever, and *Ae albopictus* is playing an important role in the spread of the disease.

In the initial period of the dengue outbreak, the vector control teams from the National Vector Borne Disease Control Program, Honiara City Council and Guadalcanal Province completed one round of blanket ULV treatment of the city (30 suburbs, 3489 houses). The vector control methods for all on going treatments in Honiara were then remodelled to come into line with the Dengue Contingency Plan, and to provide a more comprehensive and integrated model for control. These methods are aimed at utilizing the dengue surveillance data to treat recent dengue case houses with residual insecticidal applications, as well as treating all the houses surrounding the identified case house (a cluster of houses around the case house). High risk transmission sites such as the National Referral Hospital, the Good Samaritan Hospital and Mataniko clinic are also targeted for regular ULV treatments (every 2-3 days).

With two active dengue vector species present in Honiara, and each with contrasting feeding and resting habits, adult control efforts need to cover treatment of both indoor and outdoor sites. Indoor residual sprays (IRS) and exterior residual sprays (ERS) have been applied using lambda-cyhalothrin, which studies have shown is effective as an ovicide, larvicide and adulticide when applied to breeding sites. When correct residual chemicals are applied to breeding sites, they can have a three layered control effect. They can kill dormant eggs, kill any larvae in the water and kill gravid female mosquitoes that land at these sites to lay eggs. Upon completion of IRS and ERS treatments to case house cluster, a ULV application is applied to knock down any adult dengue mosquitoes that may have been disturbed by the residual insecticidal applications.

Dengue in the Provinces

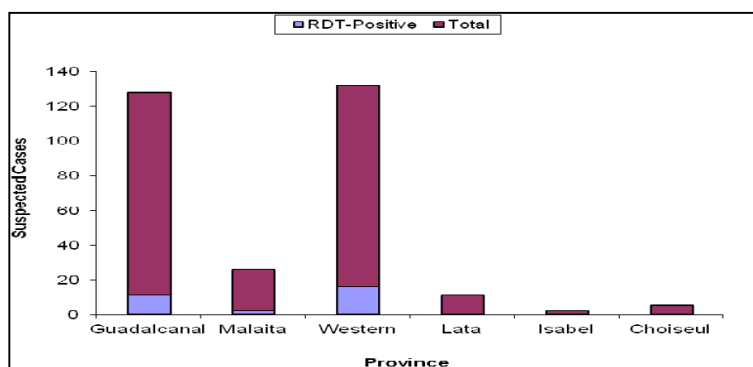
The dengue taskforce coordinated integrated training missions for provincial health staff. The trainings focused on clinical detection and management, surveillance data collection and reporting, laboratory training and health promotion.

Suspected dengue cases in the provinces continue to rise, with two new provinces recently reporting suspected cases, taking the total number of affected provinces to 7, plus Honiara City Council.

As at April 12th, 89.8% of suspected cases were in Honiara, 4.3% were in Guadalcanal province, 4.3% in Western Province, 0.9% in Malaita Province, 0.4% in Temotu Province, 0.2% from Choiseul Province and 0.1% in Isabel Province.

Summing Up

The first patients were diagnosed



The number of suspected dengue cases across the provinces

World Health Organization Solomon Islands

with dengue fever in late January 2013. On February 6th, an 8.0 magnitude earthquake and subsequent tsunami struck Temotu Province, leading to over 5,500 displaced people, deaths and injuries. MHMS was thrown into two disasters almost at once, asking a lot of the manpower and resources available.

Through the support of donor partners and the dedication of many health staff in Solomon Islands the response to the dengue fever outbreak is improving, patient care is improving and hopefully mosquito reduction is now at the forefront of everyone's minds.

The Ministry of Health is well aware of the chance that dengue fever will be an ongoing part of Solomon Islands medical future. Everyone is working towards ensuring health staff and community members are equipped with the knowledge, skills and manpower to minimize the harm an outbreak could cause in the future.