

5. POST TSUNAMI RELIEF AND SURVEILLANCE ACTIVITIES

5.1. The earthquake and tsunami in Andaman and Nicobar island December 2005

An earthquake of magnitude above 8 on Richter scale rocked the islands around 6.30 am on 26 December 2004. It was followed soon by a series of tsunami waves that washed away many villages, particularly in the southern islands. Thousands of people died and many more are still missing. The Centre's building also sustained damages in the earthquake. Cracks were formed on almost all the walls. However, no major damage occurred to the equipment.

On 28 December 2004, the Director visited the affected areas of Car Nicobar and had discussions with the Medical Supdt., Bishop John Richardson Hospital, Car Nicobar and the Deputy Commissioner, Car Nicobar. They requested the assistance of the Centre in public health activities including disease surveillance. Accordingly a team was constituted and was deputed to undertake relief activities at Car Nicobar. The team started its activities on 1 January 2005 at Car Nicobar.

The people evacuated from Car Nicobar and other islands of the



Damages sustained by the Centre's building due to the earthquake

One of the most-powerful earthquakes recorded in the history struck the islands on 26 December 2004. The quake with its epicenter under-sea off the coast of Sumatra created a series of tsunami waves that devastated the Nicobar Islands



Creaks on the walls of the Centre's building



Damage due to tsunami at Car Nicobar

Teams from the Centre actively participated in the relief and surveillance activities both at Port Blair and at Car Nicobar. The team from the Centre detected an outbreak of diarrhoeal disease in a relief camp at Mus Village, which was later proved to be due to rotaviral infection. The outbreak was contained after initiating public health measures in collaboration with DHS.



Centre's vehicle, which was washed away in tsunami

Nicobar district are sheltered in several temporary relief camps at Port Blair. The Centre constituted two other teams to provide health care to the displaced people camping at these relief camps.

5.2. Activities of the team deputed to Car Nicobar

The team deputed to Car Nicobar camped at the Island during the period 1 January 2005 to 28 February 2005. A vehicle of the Centre was positioned at Car Nicobar for carrying out field work as part of a project on antenatal screening of hepatitis B and prevention of vertical transmission through the use of immune-globulin. This vehicle was thought to be washed away by the tsunami. During the first two weeks, the team visited the relief camps of *Kakana*, *Kimius*, *Tamaloo*, *Kinyukia*, *Tapoming*, and *Chukchukya* villages and rendered health care to a total of 561 patients. The common ailments were upper respiratory infection, infected wounds and various traumatic injuries. As there was no vehicle available during this period, the field visits were done by walk. Later it was found out that vehicle had escaped the impact of tsunami and this vehicle could be used for further field work.

The village of *Mus* was cut-off from the headquarters due to badly damaged roads. For about ten days after the tsunami, medical relief was provided to the residents of the relief camp at *Mus* exclusively by the doctors of defense services. On 10 January a temporary track was opened by the army for approaching the village. The team from the Centre visited the camp on the same day. It was a large camp of several small tents built on a football ground and housed more than 1,500 people. The team from the Centre studied the records kept at the medical tent of the camp and found out that a large number of diarrhea cases had attended the medical tent since 7 January onwards. Stool samples were collected from the patients who attended the medical tent on that day. Public health intervention measures were taken in collaboration with the public health personnel of the Health Services and the outbreak was contained. The outbreak was later confirmed to be due to rotaviral infection.

During the period 7 – 10 January 2005, a mass measles immunization and Vit. A prophylaxis campaign for children aged 6 – 59 months was organized with support from UNICEF. The team from the Centre



A medical camp at Tapoming Village's relief camp

A mass measles vaccination and vitamin A prophylaxis campaign was launched in Car Nicobar by UNICEF. Under the programme all children aged between 6 months and 59 months were vaccinated with measles vaccine and were administered vitamin A solution. About 27% of all vaccination done under the programme was done by the team from the Centre



Mass measles immunization camp at a relief camp

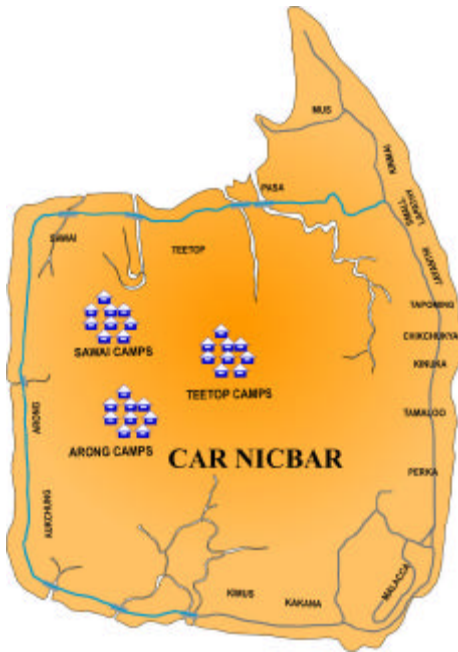


Fig 5.1 Map of Car Nicobar showing Arong, Tee-top and Sawai camps where the team worked

actively participated in the campaign. During the four day period the team administered measles vaccinations to 273 under-fives residing in several camps of six villages. This constituted about 27% of the total vaccines administered during the campaign at Car Nicobar. The team was also entrusted with the responsibility of administering vaccine to the under-fives of *Arong* camp, which was totally cut-off from the remaining parts of Car Nicobar. The team was air-lifted by an Air Force Helicopter to *Arong* camp, where 66 children were immunized and were administered Vit. A.

During the third week of January a malaria outbreak was detected at the relief camp of *Sawai* village, which was cut-off due to the collapse of a bridge at *Passa* village. A total of 64 fever cases were detected and 14 of them were confirmed as malaria. An entomological survey showed presence of *Anopheles* breeding sites. The camps and surrounding areas were sprayed with DDT. Anti-larval measures were also carried out. Bed nets were also distributed. Radical treatment was given to all suspected cases.

By the end of January 2005, the medical relief and surveillance activities became more organized.



Mass measles vaccination and vitamin A prophylaxis in progress

Several teams were constituted and each team was assigned the responsibility of providing health care and carrying out public health activities at specific camps. The team from the Centre was assigned three villages viz *Sawai*, *Teetop* and *Arong*. These camps are the most difficult to access as these are located deep inside the jungles whereas the other camps are located on the side of the main circular road. The main activities of the team was surveillance against malaria and diarrhoeal diseases, monitoring of environment for mosquito breeding, checking drinking water samples for residual chlorine, routine health care and evacuation of seriously ill patients to BJR hospital for indoor treatment. Besides, the team was also assigned the duty of surveying children in these villages for child spleen rate and infant parasite rate by National Institute of Communicable Diseases.

Till second week of February a total of 154 slides were examined and out of this 21 were positive (PV 8 and PF 13). Seven seriously ill patients were evacuated to BJR hospital by the team. Child spleen rate was 20% and 15% respectively in *Arong* and *Sawai* villages. Water sources in *Arong* and *Sawai* were found to have adequate



Disinfecting drinking water at a relief camp in Car Nicobar

Because of the seawater inundation into the land due to tsunami, several brackish water collections were created in various parts in Car Nicobar. A mosquito larval survey was conducted to map the breeding sites of Anopheline mosquitoes. Several water collection were found to have prolific breeding of Anopheles mosquitoes. Anti-larval measures were instituted with the help of Health Services



Mosquito larval survey in Car Nicobar



Temporary laboratory set up at BJR Hospital, Car Nicobar

A study on risk of vector proliferation and subsequent increase in the number of cases of malaria is under way. The ecological changes brought about by the inundation of sea water into land as a consequence the geo-meteorological changes following the earthquake and tsunami has created many water collection that are potential breeding sites for malaria vector.

These sites are being continuously monitored.



Trekking in the jungles of Car Nicobar for relief work

quantity of residual chlorine. However, the people at *Teetop* camp were consuming water from a fresh water stream, which could not be chlorinated. They were using halogen tablets to chlorinate water collected from the stream. Adequate quantity of halogen tablets were stored at the camps. A few samples kept at the camps were tested for residual chlorine and were found to have about 2.0 ppm of residual chlorine. On 10 February, some of the water sources in *Sawai* village were found to be devoid of chlorine and on the same day, the number of diarrhoeal cases also showed a slight increase. The water sources were chlorinated by the team. The people of the camp, who were trusted with the duty of chlorinating discontinued it because people were complaining of the unacceptable smell and taste of the super-chlorinated water. However, they were made aware of the need to chlorinate to prevent epidemics of water-borne diseases.

A larval survey was conducted at the three villages assigned to the team and along the route to these villages. Besides water bodies around the headquarters were also screened. Brackish water collections below the broken *Passa* bridge and all along the

road from Headquarters to *Lapathy* village (Fig. 5.1) and the fresh water stream at *Teetop* camp were found to have heavy breeding of anopheles mosquitoes. With the help of the Health Dept. anti-larval measures were carried out at these sites. These water bodies were rechecked a few days later and were found to have significant reduction in breeding density.

5.3. Activities of the relief teams at Port Blair

As per the request of the Director of Health Services (DHS), a team was constituted to provide health care to the residents of the relief camps set up at various places in Port Blair for people evacuated mainly from the Nicobar group of islands. Health care services were initiated at camps at Haddo, Port Blair. Samples of drinking water at the camps were taken for bacteriological analysis and the stored water was chlorinated. The team visited these camps regularly and provided health care to the residents till 7 January, when the camp was closed. The residents were shifted to other camps.



Submerged rice fields in South Andaman



Brackish water collections created by the tsunami in South Andaman

5.4. Monitoring of mosquito breeding at rural areas of Andaman District

An extensive survey was carried out on the risk of vector proliferation and consequent risk of malaria outbreak in the tsunami affected areas in the Andaman district of the Andaman and Nicobar Islands. Environmental damage with altered ecological factors was observed in South Andaman, covering Port Blair and Ferragunj *tehsils*. With the evidence of land subsidence, this area with a population of approximately 208,000 is still suffering the recurring phenomenon of sea water intrusion either directly from the sea or through the network of creeks. Both daily cycles of high tides and periodical spring tides continue to cause flooding. Low lying fields, which used to be rice fields before tsunami, and fallow land habitats with fresh water, hitherto considered the least potential sites for *An. sundaicus*, are now a major breeding source due to saline water, with salinity ranging from 3,000 to 42,505 ppm. The extent

of these tsunami influenced breeding grounds and the likelihood of them becoming permanent due to continued flooding are indicative of vector abundance. Both vivax and falciparum malaria occurred in this area but the incidence was low. Proximity of houses to flooded paddy fields and paucity of cattle may lead higher degree of man/vector contact causing a threat of malaria outbreak in this densely populated and low endemic area. Temporal analysis of malaria cases in Andaman has shown an increasing trend following tsunami. In view of this there is an urgent need for a long term and systematic monitoring of environmental risk and vector surveillance. Considering the human-biting and diurnal resting behavior of *An. sundaicus*, promotion of the use of personal protection measures with insecticide impregnated bed nets and intensifying Early Detection and Prompt treatment (EDPT) of malaria cases are needed to prevent the possible outbreak of malaria. Further, monitoring of the situation is in progress.