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# Introduction

In the past decade from 2000 to 2010, there has been a dramatic reduction in case load from 210,039 to 684s (99.6% reduction). With the enhancement of surveillance and control activities, number of reported cases has significantly reduced in year 2011 and the total number of microscopically confirmed malaria cases reported countrywide was 124. Majority of the cases (83%) were from the Northern Province.

Out of 124 cases, there were 119 *P. vivax* (*Pv*) infections and 5 *P. falciparum* (*Pf*) &/or mixed infections. The highest reported number of cases was from the district of Mulativu (35%) and most were security forces personnel who engaged in construction and restoration activities in the Northern Province.

A total number of 994546 blood smears were examined for the purpose of detection of malaria parasite, by the departmental staff attached to the medical institutions and the Anti Malaria Campaign including its regional offices during 2011.

Considering the present favourable malaria situation in the country, the Anti Malaria Campaign revised the existing Strategic Plan for Elimination of Malaria 2008-2012 which was written in year 2007. This re-organization was done in accordance with the current favourable epidemiological and political situation in the country. In the revised strategic plan of the Anti Malaria Campaign, the elimination of malaria is planned from the whole country and not in phase-wise as planned in the previous strategic plan. The objectives of this revision is to achieve malaria elimination from the whole country by end of 2014.

The revised objectives and strategies of the Anti Malaria Campaign are as follows;

## **Objectives of the Anti Malaria campaign**

1. To eliminate indigenous *P. falciparum* Malaria by 2012.
2. To eliminate indigenous *P. vivax* Malaria by 2014.
3. To maintain zero mortality from Malaria.
4. To prevent the re-introduction of malaria into the country.

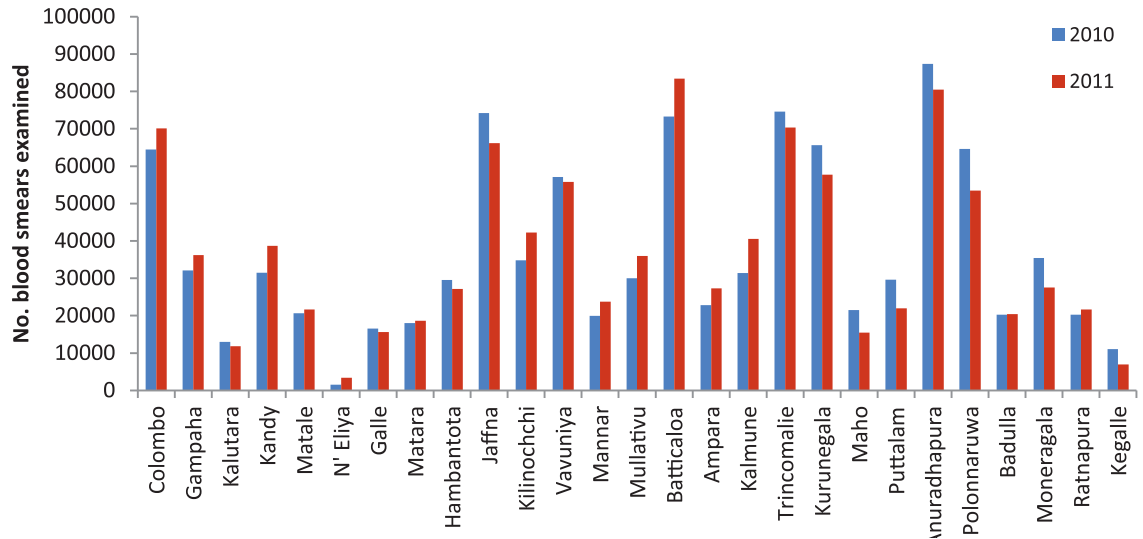
## **Strategies of the Anti Malaria campaign**

- To provide early diagnosis and prompt treatment of malaria patients and asymptomatic parasite carriers.
- To plan and implement selective and sustainable vector control measures based on the principles of IVM.
- Forecasting, early detection & prevention of outbreaks, and the rapid & effective containment of outbreaks.
- To reassess regularly the country's malaria situation, in particular the ecological, social and economic determinants of the disease and evaluation of malaria control activities.
- Enhance community participation and partnership building for effective and sustainable malaria control.
- Promotion of human resource development and capacity building
- Promotion of operational research.

# Epidemiology

Sri Lanka has reached the pre elimination status and currently in the path of elimination of malaria from Sri Lanka.

A total no. of 994546 blood smears were examined by the departmental staff attached to the medical institutions and the Anti Malaria Campaign including its regional offices during 2011. Figure 1 shows the blood smears examined during 2010 and 2011 district wise.



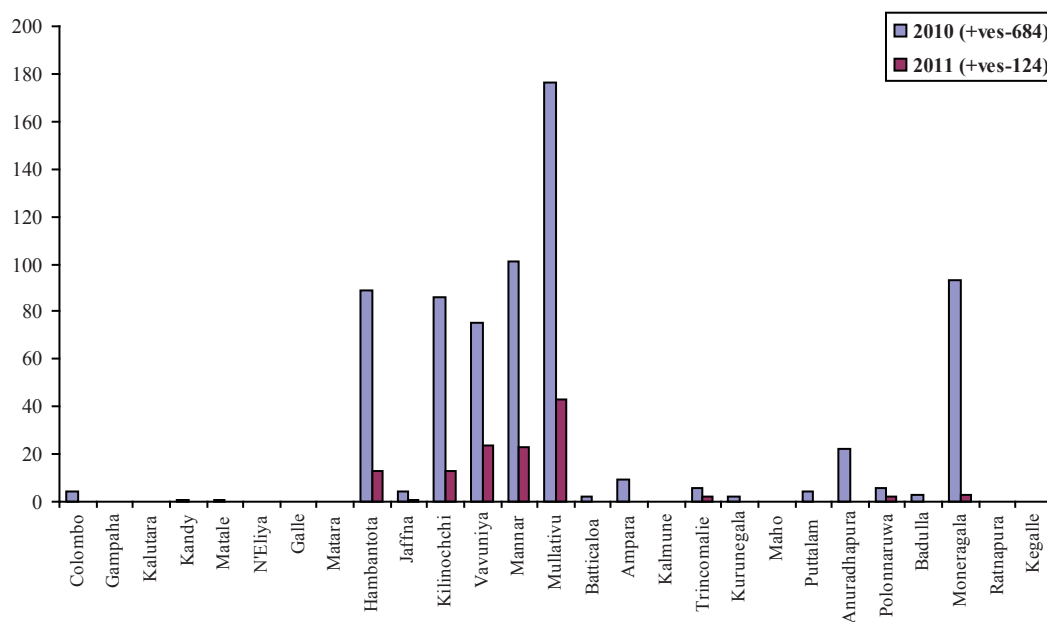
**Figure 1 : Blood smear examination in Sri Lanka -2010/2011 (district-wise)**

Following this screening, 124 confirmed malaria cases were detected. This included 119 *P.vivax* infections and 5 *P.falciparum* or mixed infections (3- *Pf* and 2 -mixed infections). The Table 1 shows the percentage of *Pf* and *Pv* for the past nine years.

**Table 1. Parasite formula 2002- 2011**

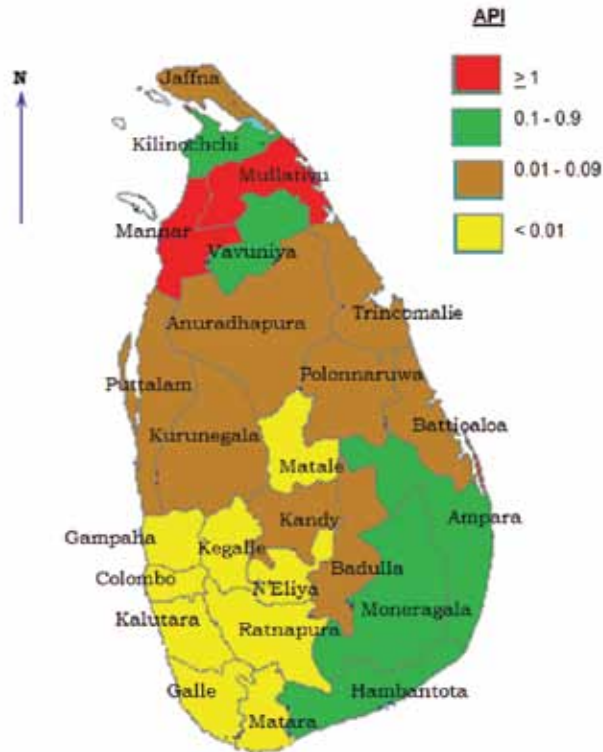
Year	Percentage of <i>P.vivax</i> infections	Percentage of <i>P.falciparum</i> infections
2002	88	12
2003	88	12
2004	85	15
2005	92	8
2006	95	5
2007	97	3
2008	93	7
2009	95	5
2010	98	2
2011	96	4

Majority of cases were reported from the districts of the Northern Province. Figure 2 shows the district wise comparison between the number of positive cases reported in the country in year 2010 and 2011. Majority of cases were from security forces who engaged in construction/restoration activities in the Northern Province. It is also important to notice the marked reduction of relapses due to the DOTS strategy adopted by the Anti Malaria Campaign in late 2010.



**Figure 2 : Microscopically confirmed malaria cases in Sri Lanka- 2010/2011 (district-wise)**

The Figure 3 shows the intensity of malaria transmission in year 2011 in Sri Lanka.

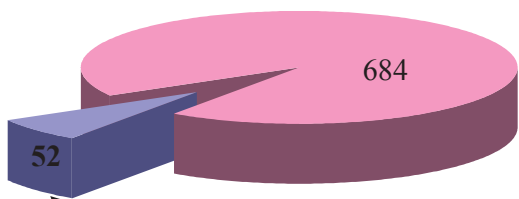


**Figure 3 : Intensity of malaria Transmission in Sri Lanka (district-wise) 2011**

### Imported Malaria

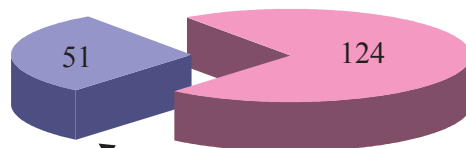
In addition to the total number of indigenous cases, 39 *P. vivax* infections, 12 *P. falciparum* or mixed infections were imported from other countries (Figure 4). While, out of the total cases reported in Sri Lanka, approximately 7% were imported in year 2010 and 29% in year 2011. Majority of cases were imported from India and were *P. vivax* infections.

2010



	Country	+ves
Pv- 34	India	42
Pf- 12	Liberia	1
Pm- 1	Haiti	2
Mixed- 5	Uganda	2
	Sudan	1
	Africa	1
	Nigeria	1
	Ruwanda	1
	Pakistan	1

2011



	Country	+ves	
Pv- 39	India	37	
Pf- 9	Liberia	1	
Mixed- 3	Angola	1	
	Uganda	3	
	Kenya	1	
	Africa	3	
	Ghana	1	
	Papua New Guinea	1	
	Pakistan	3	

**Figure 4 : Imported malaria cases – 2010/2011**

The Anti Malaria Campaign provided chemoprophylaxis to travellers to other countries based on WHO guidelines. AMC headquarters has provided chemoprophylaxis for 889 persons during the year 2011. Mefloquine (8412 tablets) and Chloroquine (504 tablets) were issued to them depending on the country they visited. The countries visited by these travellers are indicated above. Majority of these travelers were males (78%) and above 18 years old (94%).

**Mortality**

When compared with other South-East Asian countries, mortality due to malaria in Sri Lanka is extremely low. There were no deaths reported in the year 2011.



## **Information Management**

Network facilities were already established between the Anti Malaria Campaign Headquarters and the Regional Malaria Offices with the assistance of the Global Fund. Information regarding positive cases shall transmit to AMC Headquarters through a web based system established at AMC Headquarters. Furthermore, mapping of all cases and potential vector breeding sites were initiated with the GIS.

To enhance the case surveillance from the private sector, communication cell at the AMC Headquarters was established with the assistance of Global Fund

## **Prevention and control of epidemics/outbreaks**

The following strategies are used to forecast epidemics.

- (a) Regular observation of fever incidence/ and malaria morbidity in Medical Institutions.
- (b) Monitoring of adult vector densities in sentinel stations, and by random spot checks.
- (c) Monitoring of larval densities in sentinel stations.

There were no major epidemics reported in the year 2011.

## **Status of drug resistance and drug policy**

All the *P. falciparum* and *P. vivax* positive patients were followed up for one month to detect resistant strains of the parasite to artemether-lumefantrin and chloroquine respectively. There were no resistant *Pf* and *Pv* cases detected during year 2011.

## **Programme priorities**

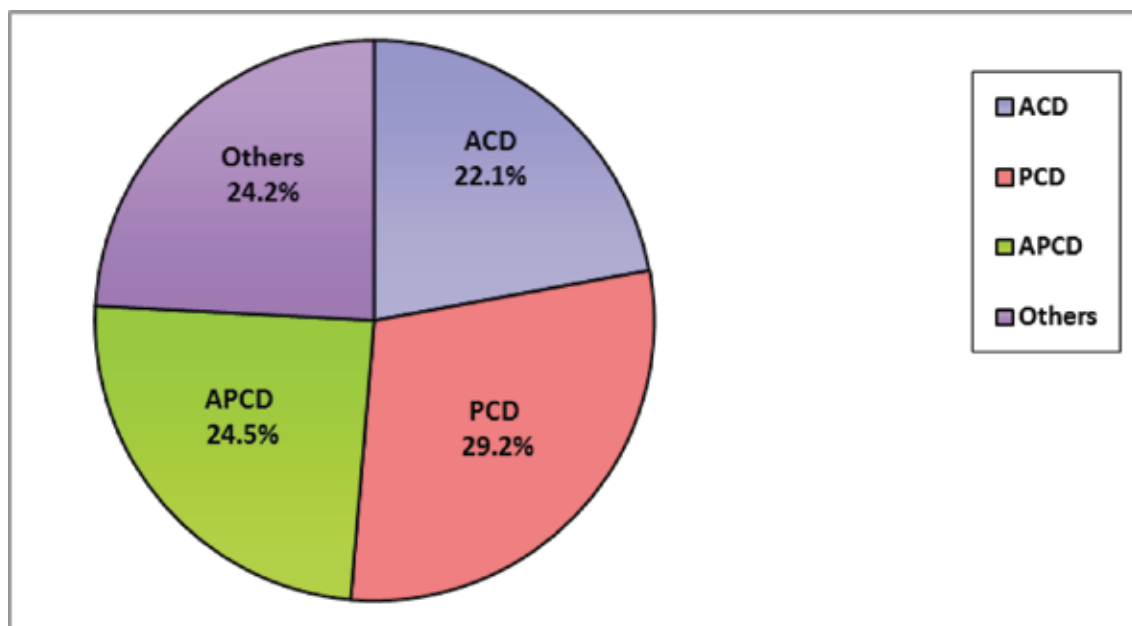
Elimination of *P.falciparum* infections, and management of vector resistance to some insecticides have been identified as priorities. Malaria control among security forces, internally displaced populations in the conflict-affected Northern province, and in the bordering provinces, were also considered as programme priorities during the year 2011.

## **Surveillance**

Surveillance mechanism of the malaria control programme is implemented mainly through Activated Passive Case Detection (APCD). Majority of fever patients attending State Medical Institutions located in malarious areas are screened for malaria parasites by examination of a blood smear. In-addition Passive Case Detection (PCD) is carried out in the other State Medical Institutions by screening suspected malaria patients. Active Case Detection (ACD) is carried out through Mobile Malaria Clinics which operate in malarious localities situated far away from Medical Institutions. Detection of cases by home visits is done under special circumstances (eg. local outbreaks ). The Anti Malaria Campaign recommends screening all fever patients that come to an APCD institution for malaria. However, the number of blood smears taken in such institutions has decreased over the years, as the malaria disease burden has fallen down drastically. In spite of that, during this year, as in the previous years, screening suspected malaria patients that come to activated passive case detection centers (APCD) is the most important method of detection of malaria cases, accounting for 83% of the cases detected. Active case detection (ACD) and Mobile clinics (Other methods) are done as a measure to detect malaria cases early (including asymptomatic parasite carriers) thereby preventing transmission.

# Parasitological surveillance

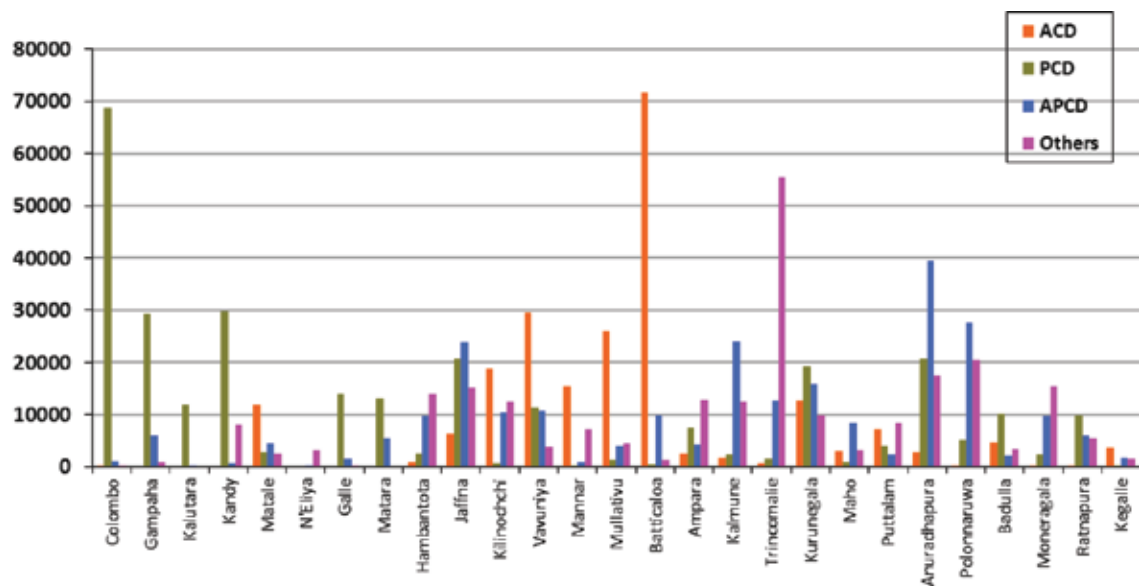
For the year 2011, there were 124 confirmed malaria cases in the country. In addition to the cases reported by Public Health Laboratory Technicians (PHLTT) attached to the Anti Malaria Campaign, these include the cases reported from the armed forces, other government medical institutions and the private sector. Of these, there were 3 *P. falciparum* infections and 119 *P. vivax* infections, while the number of *P. vivax* and *P. falciparum* mixed infections were 2. Majority of these confirmed malaria cases were reported from Army personnel in the Northern province. The total number of blood smears examined by PHLTT attached to the Anti Malaria Campaign in each district/RMO region is given in Table 2, while the percentage wise data are shown in Figures 5 and 6 respectively.



**Figure 5 : Categorywise percentages of individuals screened by the Anti Malaria Campaign in the country - 2011.**

**Table 2. Total number of blood smears screened by the Anti malaria Campaign during the year 2011**

District	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colombo	5326	6032	5608	4913	9478	8543	3932	5271	3360	5873	5071	6702	70109
Gampaha	1963	4551	3612	1388	2868	2460	2971	3064	3052	3734	3534	3001	36198
Kalutara	627	711	738	414	1443	1134	1083	1413	979	1395	612	1293	11842
Kandy	3187	2743	3020	2821	3781	2910	2889	3161	3277	3353	4182	3326	38650
Matale	1728	1622	1988	1520	1854	1537	1909	1778	1881	2019	1794	1998	21628
N' Eliya	195	49	19	150	194	518	205	354	471	848	12	395	3410
Galle	1259	1394	1240	861	1783	1203	1278	1557	1041	1417	1268	1344	15645
Matara	1041	1761	1202	904	1835	1304	1334	1753	1909	1647	2306	1623	18619
Hambantota	2402	1745	1904	1975	2206	2176	1998	2385	2631	2420	2483	2795	27120
Jaffna	6142	5563	5733	5459	5249	4518	4398	4831	5729	6431	6139	5945	66137
Kilinochchi	3623	2445	3248	1404	2683	4166	7469	3665	3647	3279	2738	3893	42260
Vavuniya	6737	6241	5930	3705	5994	5425	4063	3723	3957	2851	3496	3699	55821
Mannar	2497	1740	1769	2044	2278	1971	2321	2164	2518	1434	1520	1460	23716
Mullativu	3745	3459	2307	3160	2389	4231	2723	2260	3152	2703	2393	3486	36008
Batticaloa	7327	8038	8076	5740	6353	5703	5225	7998	7957	7967	6737	6337	83458
Ampara	1817	1882	2077	1985	2621	2384	2878	2084	2433	2755	2209	2218	27343
Kalmune	3310	2951	3104	3010	3247	3345	3512	3145	3384	3751	3657	4149	40565
Trincomalie	6315	4411	5761	5149	6041	5651	7315	6241	6617	6347	5143	5339	70330
Kurunegala	5014	5091	4698	4368	5096	4578	4401	3935	5028	4658	5461	5406	57734
Maho	1589	1219	1423	1224	1341	1428	1250	1345	1263	1201	1142	1072	15497
Puttalam	2252	2230	1824	1550	2235	1929	2059	1962	1659	1436	1448	1380	21964
Anuradhapura	7808	6256	6507	6085	7126	7022	6673	6672	7214	6591	6106	6388	80448
Polonnaruwa	5682	4843	5545	5118	3940	4158	4672	3981	3807	3757	3990	3988	53481
Badulla	1195	1436	1423	1595	2279	1737	1708	1630	1190	2118	1897	2179	20387
Moneragala	2106	1470	2248	1631	2037	2023	5589	1928	1641	1946	2527	2422	27568
Ratnapura	1655	1495	1535	1354	2340	1837	1936	1687	1991	2168	1883	1740	21621
Kegalle	740	541	456	357	664	597	564	614	527	608	762	557	6987
<b>Total</b>	<b>87282</b>	<b>81919</b>	<b>82995</b>	<b>69884</b>	<b>89355</b>	<b>84488</b>	<b>86355</b>	<b>80601</b>	<b>82315</b>	<b>84707</b>	<b>80510</b>	<b>84135</b>	<b>994546</b>



**Figure 6: Category wise percentages of individuals screened by the Anti Malaria Campaign in each district/RMO region**

## Provision of Laboratory Items

The Central laboratory distributes laboratory items required for malaria microscopy to regional malaria offices. Some laboratory items (required for microscopy) issued during the year 2011 are given in Table 3.

District	Lancets	Giemsa stain (L)	Slides	Ethanol (L)	RDT
Ampara	25000	3	19440		960
Anuradhapura	30000	9	17568		600
Baddulla	20000	6	7200	5	
Batticaloa	50000	6	7200	2.5	1500
Colombo					120
Embilipitiya					
Gampaha					
Hambantota	20000	3	10800		2280
Jaffna	80000	6	7200		600
Kalmune	20000		10800		1200
Kalutara					
Kandy	20000	3	10800	2.5	1200
Kegalle	10000		3600		600
Kilinochchi	60000	8	21600	2.5	3300
Kurunegala	50000	5	18000		
Maho	10000	2	3600		600
Mannar	24000		10800		
Matale	10000		7200		300
Moneragala	20000	3	12960		300
Mullaitivu	20000		3600		900
Polonnaruwa	20000	3	7200		
Puttalam	10000	2	14400	2.5	
Trincomalee	50000	11	18000		1800
Vavuniya	30000	2	7200		1380
<b>TOTAL</b>	<b>579000</b>	<b>72</b>	<b>219168</b>	<b>15</b>	<b>17640</b>

### **Screening of suspected malaria patients**

During the year 2011, PHLTT attached to the central laboratory have screened 355 suspected malaria cases and detected 38 positives. Majority of these patients were patients admitted to Government and Private Hospitals in the Colombo District and referred to the Anti Malaria Campaign for laboratory confirmation.

### **Special screening programmes conducted to screen Armed forces**

The Anti Malaria Campaign has conducted 10 special screening programmes and screened 2126 military personnel who have worked in the North and East Provinces and have been transferred to other regions in the country.

### **In-service Training programmes**

The Anti Malaria Campaign conducted 13 in-service training programmes (funded by GFATM) for Laboratory Technicians at regional level:-

11 training programmes for PHLTT; 1 programme for MLTT;

1 programme for private sector laboratory technicians.

# Vector Surveillance

Malaria entomological surveillance was carried out in all 22 RMO regions during the year 2011 by central and regional entomological teams of Anti Malaria Campaign. A total of 36 malaria entomological investigations were conducted in 208 days by central entomology teams in 13 Districts during the year 2011. Districts covered were Kurunegala (6 times), Mullaitivu (5 times), Mannar (4 times), Killinochchi, Anuradhapura and Puttalam (3 times each), Moneragala, Polonnaruwa, Trincomalee and Batticaloe (two times each), Vauniya, Rathnapura, Matale and Hambanthota (once each). The total entomological days worked by the central and regional teams during 2011 were 3663.

Dengue vector surveillance in two sentinel sites in Colombo and Gampaha districts was started by Anti Malaria Campaign Headquarters in 2011 and continued. Colonization of mosquito species in the insectory of the Entomology Unit was started in parallel.

A research project to evaluate the efficacy of larvivorous fish to control malaria vectors was started in mid 2011 in collaboration with Wayamba university of Sri Lanka. The field work is still continuing and the baseline data survey has been completed during 2011.

One of the Entomologists at Anti Malaria Campaign Headquarters was on study leave to complete her Masters theses during the year 2011. Six entomological Assistants carried out field investigations under the supervision of one Entomologist. They also assisted in summarizing the entomological surveillance data sent by regional teams.

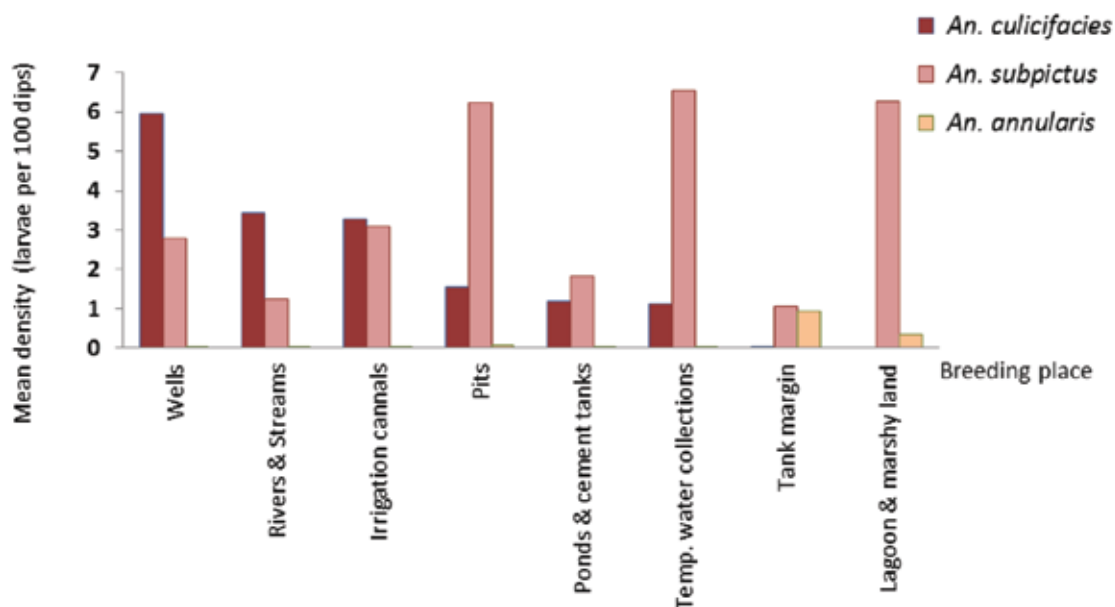
The summarized data are shown below according to each sampling method employed in surveillance.

Larval surveys during 2011 indicates that the highest density of Anopheles culicifacies was found in wells. Trincomalee district is the main contributor and districts of Anuradhapura, Ampara, Mullaitivu and Mannar also contributed. Rivers/ streams and irrigation canals are the 2nd and 3rd important breeding places for the malaria vector. Different types of pits including abandoned gravel, clay, quarry and gem pits are contributing as habitats for immature stages of malaria vector. The responsible districts are Mullaitivu, Batticaloe, Moneragala and Trincomalee. (Table 4 & Figure 1)

Common breeding places for *Anopheles subpictus* are Temporary water collections, lagoon and marshy lands and pits. Reservoir/ Tank margins are the preferred breeding habitat for *Anopheles annularis*.

**Table 4 : Results of Larval surveys 2011**

Breeding Place	No. of <i>A. culicifacies</i> per 100 dips	No. of <i>A. subpictus</i> per 100 dips	No. of <i>A. annularis</i> per 100 dips
Wells	5.95	2.77	0.02
Rivers & Streams	3.42	1.24	0.05
Irrigation Canals	3.29	3.1	0.04
Pits	1.56	6.25	0.08
Ponds & cement tanks	1.18	1.83	0.04
Temp. water collections	1.13	6.55	0.05
Tank margin	0.05	1.06	0.92
Lagoon & marshy land	0.0	6.26	0.36



**Figure 7: Results of Larval surveys showing the relative density of major malaria vector and secondary malaria vectors in different larval habitats - 2011**



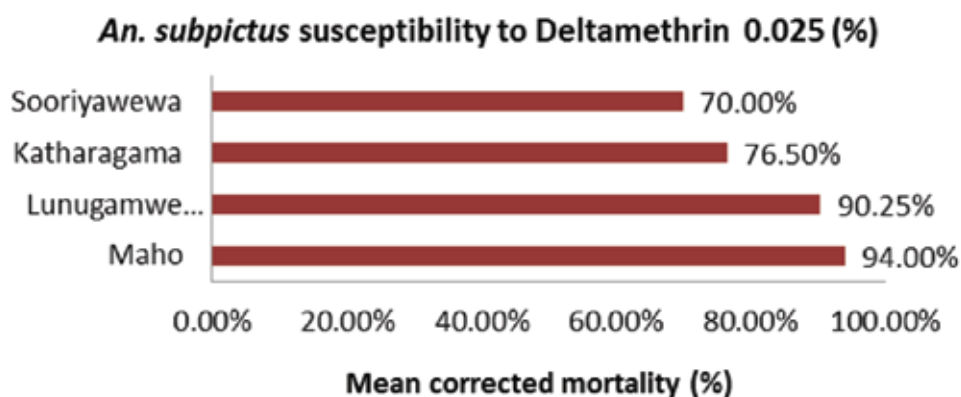
Monitoring of insecticide susceptibility in malaria vectors is an important component of malaria elimination programme in order to detect emergence of resistance individuals in vector population at an early stage before resistance is widely established. For this it is necessary to expose the vector populations to discriminative dosage of each insecticide at periodic intervals to detect resistant individuals and to monitor the changes in susceptibility levels.

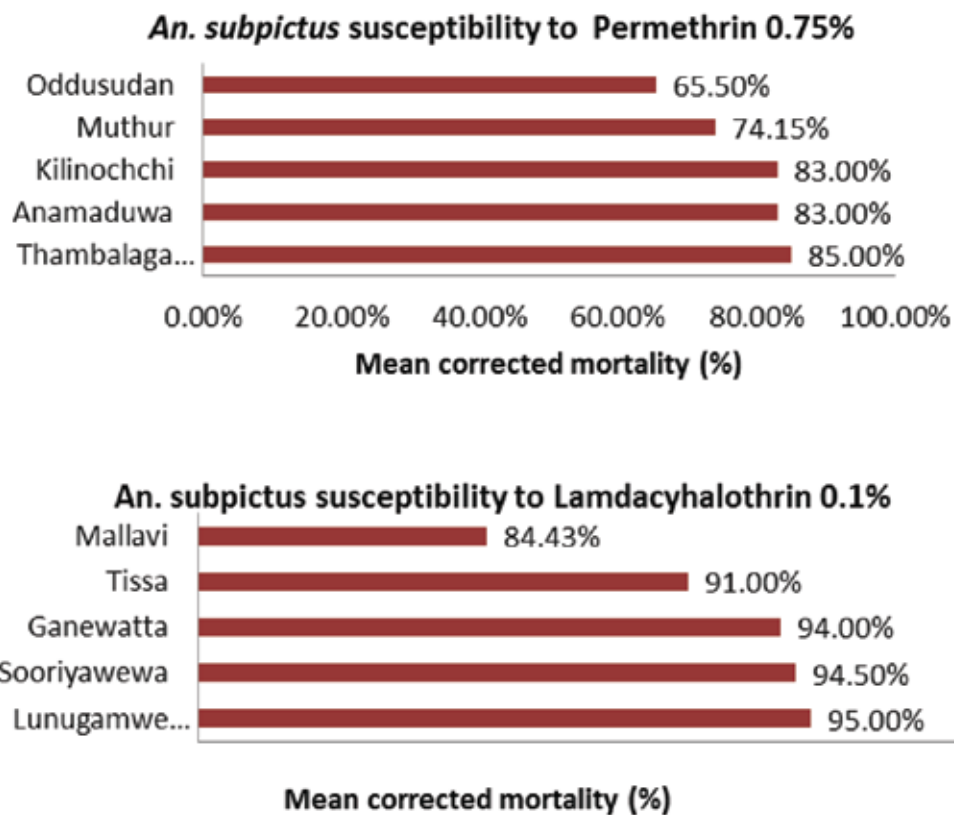
This testing was carried out using WHO standard test kits with insecticide papers impregnated with the discriminating concentrations of the insecticides and the control papers.

**Table 5 : Insecticide susceptibility test showing the resistance and possible resistance for *Anopheles culicifacies* - 2011**

MOH area	Insecticide	No. of tests	No. of female mosquitoes exposed	Mean corrected mortality
Arachchikattuwa	Malathion 5%	5	90	59.00%
Lunugamwehera	Cyfluthrin 0.15%	4	48	96.00%
Rikillagaskada	Malathion 5%	5	100	21.00%
Vavunathivu	Cyfluthrin 0.15%	1	10	60.00%

In Arachchikattuwa and Rikillagaskada *An. culicifacies* populations have shown resistance to Malathion 5% showing the persistence of malathion resistance in the country. Vector population in Lunugamwehera showed reduced susceptibility to Cyfluthrin 0.15% while Vavunathivu population showed resistance to the same insecticide. Insecticide susceptibility of *An. subpictus* is shown in Figure 8.

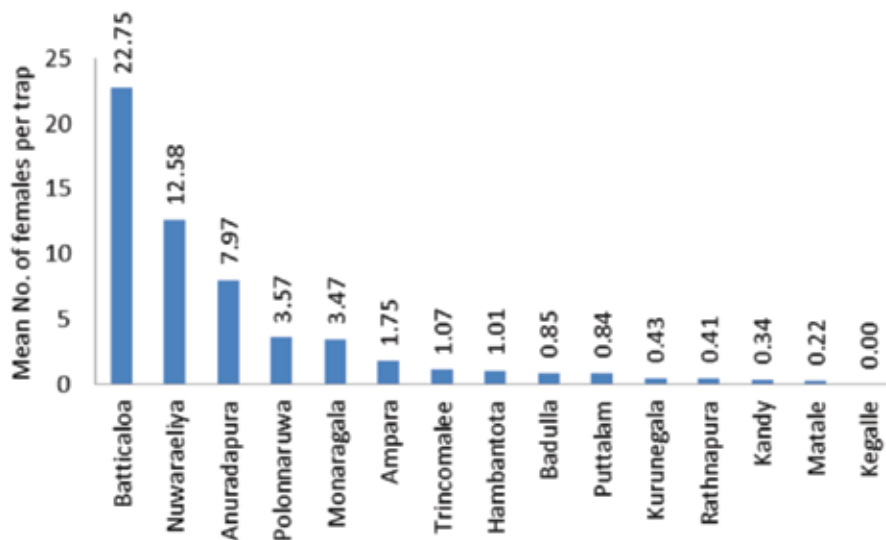




**Figure 8 : Insecticide susceptibility test showing the resistance and possible resistance for *An. Subpictus* - 2011**

Ganewatta and Vavunathivu populations of *An. subpictus* showed resistance to Cyfluthrin whereas *A. subpictus* in Sooriyawewa and Kataragama was resistant to Deltamethrin. *A. subpictus* resistance to Permethrin was reported from Oddusudan and Muthur while only reduced susceptibility was present in several other areas for Lamdacyhalothrin. *A. annularis* and *A. varuna* were 100% susceptible for tested insecticides.

Adult mosquito collections were carried out using Cattle baited hut trap to study the relative prevalence of vector species in various sentinel sites and the locations of those huts were mapped. The highest mean density of *An. culicifacies* (22.75 females per hut collection) was recorded from Vavunathivu in Batticaloe district. Rikillagaskada in Nuwaraeliya district also had high densities and followed by Anuradhapura, Polonnaruwa and Moneragala districts (Fig. 9). *An. culicifacies* was not recorded from this technique in Kegalle District. However the density fluctuated during the year.

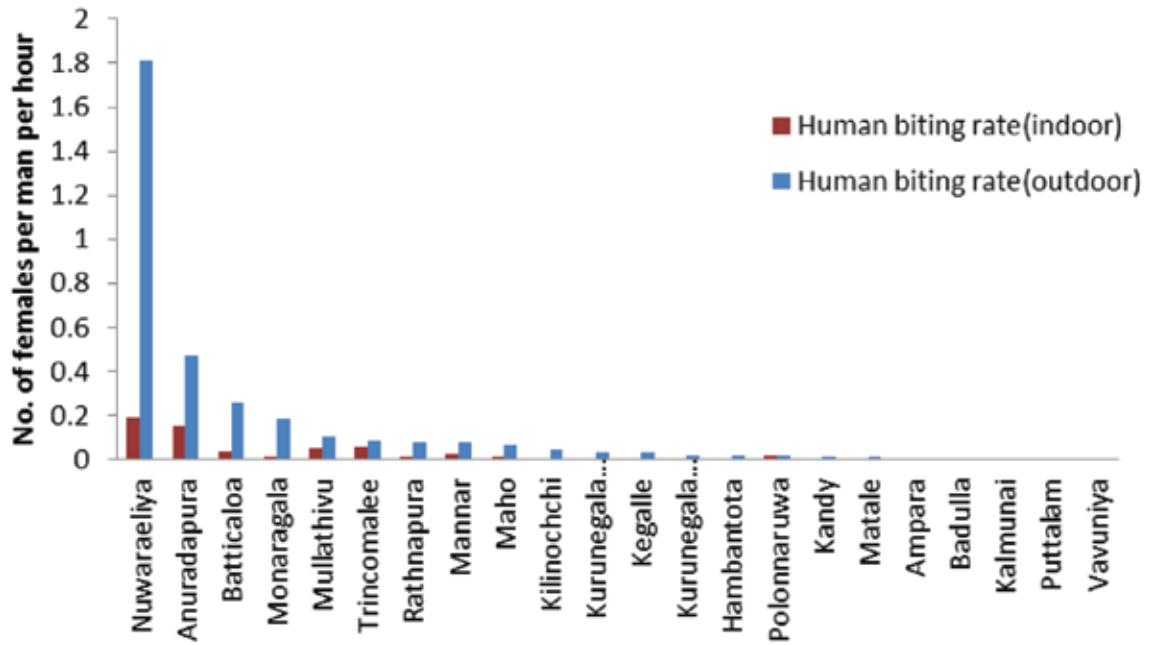


**Figure 9 : Density of *Anopheles culicifacies* in Cattle baited hut collections - 2011**

Cattle baited net trap showed low density of malaria vector compared to Cattle baited hut trap collections. Trincomalee and Nuwaraeliya were the districts with high density of *A. culicifacies*.

Human landing collections of Anophelines were carried out from 6.00 pm to 9.00 pm in sentinel sites and malaria risk areas. Both indoor and outdoor human biting rates of *A. culicifacies* were calculated separately for each district for the specified time period which is considered peak biting period of *A. culicifacies*.

The outdoor human biting rate was always higher than indoor biting rate in many districts during 2011. Outdoor human biting rate 1.81 per man hour was recorded in Rikillagaskada in Nuwaraeliya District. Indoor human biting rate was less than 0.2 per man hour in all the districts.



**Figure 11 : Human biting rates of *Anopheles culicifacies* in Human landing collections - 2011**

The items distributed to the Entomology teams by the Anti Malaria Campaign during year 2011 are given in Table 3.

**Table 6 : Entomological items distributed to entomology teams during 2011**

MO REGION/ ITEMS	Comp ou nd Mi cro sco pe	Dis sec tin g Mi cro sco pe	Ins ect icid e lim pre gna ted Pa per s (Bo xes )	Co ntr ol pa pe rs	Su sc ep tib ilit y	Te st Kit [A dul t]	As pir at ors	Di pp ers Wi th Ha ndl e	Pap er Cup s	Lar val Vial s	Ma gni fy ng Le nse s	Col la ps ib le C a g es	Sp eci men Bo x	Chl or of or m (l)	Pet ri Dis hes	En am el Try	Un ifo rm Fo r Fie ld Ac tivi tie s	Th er mo Fla sk	Fol din g Ch air	Dig ital Hy gro me ter	Ha nd sp ray ers	C o v e r S l i p i n	Ins ect p in	F o r c e p i n	P o l y p e r o s S t e r i l i z e d	Dis sec tin g Ne ed l es	M in u t e P i n	
Hambanthota	9	8	2	15													19		4	1	2							
Puttalam	5	3																	4		2							
Trincomalee	7	6	2	4					150	50		18	3			2			8		4							2
Moneragala	1	10	7	40				11		200	2		35	2			14	1		1	2							
Kilinochchi	4	3						4	140	50	4	15							8	1								
Badulla	2	2						6	150	50	4	6	22	2	40				4	2	2	6	10	6	10	2		
Kalmunei	2	2						10	6	100		10		1		6	11	1		12		6	9	10	3	6	10	3
Batticaloa	5	3	2	30	15	4	10	4	50	50		1	11		20			1	4	2								
Kegalle	2	2	2					6	20	250	2	14		1			11	1	4	2								
Ampara	6	5						6	2	50		10							4	2								
Anuradhapur	8	7																										
Mulathivu	4	4																										
Vavuniya	2	2															18			2								
Polonnaruwa	1	3	3	30				6	100	50	1	20			100		1		4		2	1	1	1	1			1
KurunegalaA	6	4													40													
KurunegalaB	11	4	4	50				6	50	50	2	6	2		40		1	1	8		4							
Maho	5	2																	4		2							
Kandy	3	3					15							1					8		4							

# Vector Control Activities

Integrated vector management is the main strategy of malaria vector control in Sri Lanka. Integral components of this strategy are the rational use of insecticides in rotation for indoor residual spraying (IRS), distributing long lasting insecticide treated nets (LLINs), breeding and introduction of larvivorous fish, environmental modulation and modification through the filling of abandoned gem pits, and space spraying for special occasions. Tables 7 and 8 shows the insecticides that had been used for indoor residual spraying in different districts.

Larvivorous fish mainly "Guppi" (*Poecilia reticulata*) were introduced in to wells and abandoned gem-pits as a biological method of vector control.

**Table 7. Insecticides that had been used in different districts for indoor residual spraying**

District	Deltamethrin	Cyfluthrin	Etofenprox	Lambda-cyhalothrin	Bifenthrin
Matale			√		√
Hambantota	√		√	√	
Jaffna			√		√
Mannar			√	√	√
Kilinochchi			√	√	√
Mullativu		√	√		√
Batticaloa					√
Ampara			√	√	√
Trincomalee			√		√
Kurunegala			√	√	
Puttalam			√	√	
Anuradhapura			√	√	
Polonnaruwa			√		
Moneragala		√	√	√	√
Badulla					√

During the year 2011, the total number of houses fully sprayed was 37938, partially sprayed was 1301 and the total population covered was 152551.

**Table 8. Utilization of insecticides for malaria vector control operations in 2011**

Insecticides	Usage during 2011 (kg)
Cyfluthrin 10% wdp(1 barrel = 9 kg)	286.2
Bifenthrin10% wdp(1pkt=112.5g)	981.6
Lambda cyhalothrin 10% wdp (1 barrel = 20kg)	864.6
Etofenprox 20% wdp (1 barrel=9kg)	3693.9

**Table 9 : Distribution of Long Lasting Insecticides Treated Nets (LLIN) for Malaria Control - 2011**

District/ Institution	No. of LLINs distributed
Kandy	54,262
Matale	39,568
Hambantota	24,699
Jaffna	57,589
Kilinochchi	22,878
Vavuniya	131,200
Mannar	258,230
Mullativu	15,500
Batticaloa	68,500
Ampara	50,000
Kalmune	77,000
Trincomalie	43,894
Kurunegala	54,000
Maho	24,000
Puttalam	39,087
Anuradhapura	94,000
Polonnaruwa	6,500
Moneragala	19,800
Badulla	119,000
Ratnapura	64,318
Kegalle	9,975
<b>Total</b>	<b>1,274,000</b>

# Infrastructure and Human Resources

At the end of year 2011, AMC Headquarters had following category of staff. The below Table 10 shows the number of staff in each category as at the end of year 2011.

**Table 10. Staff position at Anti Malaria campaign Headquarters - 2011**

SN	Category of Staff	Approved cadre	In position	
			Male	Female
1	Administrative Grade MOO	2	2	0
2	Community Physicians	2	1	1
3	Parasitologist	1	0	1
4	Entomologist	2	0	2
5	MOO Gr I	5	1	0
6	MOO Gr II		2	3
7	MOO Preliminary		0	0
8	Accountant	1	0	1
9	Development Assistant	0	2	2
10	Data Entry Operator	2	0	1
11	Public Management Assistant Services	14	4	6
12	Store keeper	3	0	0
13	Public Health inspectors	2	0	0
14	Entomological Assistant	5	4	2
15	Public Health Field Assistant	10	2	1
16	Public Health Laboratory Technicians	22	4	8
17	Cinema Operator	1	0	0
18	Driver	19	19	0
19	K.K.S.	1	1	0
20	Roneo Operator	1	1	0
21	Lab Orderly	3	0	3
22	Spray Machine Operator	19	12	0
23	Ordinary Labourer	19	6	4
24	Sanitary Labourer	25	29	2
25	Labourer (Casual)	0	1	1
26	Registered Medical officer	0	0	1
27	Ward Clerk	0	0	1
28	Lift operator	0	02	0
<b>Total</b>		<b>159</b>	<b>96</b>	<b>37</b>

## Vehicles

Adequate number of vehicles in good condition is an important factor in effective malaria control activities throughout the country including the north and east. At present AMC Headquarters has the following number of vehicles.



**Table 11. Vehicles available at Anti Malaria Campaign Headquarters**

Type	Reg. No.	Road Worthy	Available at HQ
Mitsubishi Fuso Lorry	42-1607	Yes	Yes
Mitsubishi Fuso Lorry	42-9399	Yes	Yes
Mitsubishi Fuso Lorry	LC-0249	Yes	Yes
Mitsubishi Pajero jeep	32-6520	Yes	Yes
Mitsubishi L200	42-1615	Yes	Yes
Mitsubishi L300	GP-2558	Yes	Yes
Mitsubishi L300	GP-2556	Yes	Yes
Mitsubishi Double-cab	JL 8129	Yes	Yes
Toyota D/Cab	GQ-2646	Yes	Yes
Nissan Caravan	NA-3117	Yes	Yes
Ford Ranger D/Cab	PA-4589	Yes	Yes
Micro D/Cab	PB 6537	Yes	Yes
Micro D/Cab	PB 6539	Yes	Yes

## Drugs

A buffer stock of antimalarial drugs to face any emergency is available in the Headquarters. The following table shows the distribution of drugs for districts in the year of 2011.

**Table 12. Distribution of anti malarial drugs from Headquarters by recipient**

Recipient	Chloroquine tablets	Primaquine tablets	Quinine tablets	Quinine injection
<b>Ampara</b>	1000	1000	0	5
<b>Anuradhapura</b>	0	15000	500	35
<b>Badulla</b>	1000	0	250	20
<b>Colombo</b>	6000	2240	500	153
<b>Embilipitiya</b>	0	0	0	5
<b>Galle</b>	0	0	0	0
<b>Hambantota</b>	0	60	0	69
<b>Kandy</b>	2000	2000	1250	25
<b>Kegalle</b>	0	30	0	5
<b>Kilinochchi</b>	0	30	0	5
<b>Kurunegala</b>	2000	2030	250	15

<b>Maho</b>	0	1000	250	0
<b>Mannar</b>	0	0	0	10
<b>Matale</b>	5000	1030	0	5
<b>Moneragala</b>	5000	30	0	5
<b>Puttalam</b>	1000	60	250	5
<b>Trincomalee</b>	0	30	0	5
<b>Vavuniya</b>	1000	1000	0	5
<b>Batticaloa</b>	2000	1000	0	5
<b>Jaffna</b>	1000	60	0	0
<b>Mullativu</b>	0	30	0	0
<b>Polonnaruwa</b>	0	0	500	0
<b>Kalmune</b>	0	0	0	17
<b>Total</b>	<b>27000</b>	<b>26630</b>	<b>3750</b>	<b>394</b>

## Buildings

The Anti Malaria Campaign Headquarters is located at the Public Health Complex at 555/5, Elvitigala Mawatha, Colombo 5. The Director's room, Deputy Director's room, Project Director's room of GFATM, Consultant Community Physicians room, Medical Officers room, GFATM project office, library, computer room, telephone exchange and auditorium are in the 3rd floor. The Administration branch, finance branch, record room and stores are located in the 5th floor. The Central Parasitology Laboratory and Entomology Laboratory are located in the 6th floor.

# **Foreign funded malaria control activities in the year of 2011**

During the year 2011, GFATM and WHO assisted malaria control activities in Sri Lanka.

WHO technical assistance to the Malaria Control Programme in 2011 was under the 2010 / 2011 biennium programme of the country budget and consisted of the following activities.

- Supply of Risograph papers, Ink and Rollers for the risograph machine to print newly developed M & E forms and formats.
- Procurement of Insecticide impregnated papers for Entomological activities.
- Media Seminar - World Malaria Day 2011

## **Assistance from the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM)**

During the year 2011, National Malaria Control Programme continued to receive support from the GFATM in the form of one grant for malaria elimination under the Round 8. The Round 8 project is jointly implemented through a partnership between the Ministry of Health, Tropical Disease Environment Associates (TEDHA) and Lanka Jathika Sarvodaya Shramadana Sangamaya of Sri Lanka.

### **GFATM Round 8 Malaria Elimination Project**

This project aims at scaling up efforts of the National Malaria Control Programme and focus on elimination of *P. falciparum* malaria by end of 2012 and elimination of *P vivax* malaria by end of 2014. Round 8 GFATM Project covers all the districts in the country.

The following activities were carried out during the year 2011 under this project.

- **Conducting malaria mobile clinics in high risk areas.**

Two thousand four hundred and fifty six malaria mobile clinics were conducted (101% of target achieved) to reduce malaria transmission among vulnerable and mobile populations through early detection and treatment. A total of 188,036 blood smears examined from all project districts and no positive cases detected.

In general, the criteria for selection of a site to conduct mobile malaria clinics were:

- malaria case/s reported from the locality
- remote areas with poor access to health care institutions (>10 kms from an institution)
- traditionally malarious areas
- mobile high risk occupational groups - (eg. Chena cultivators, gem miners, people working in quarry pits)
- development areas
- new settlers

- **Distribution of Rapid Diagnostic Test-kits (RDTs) to improve diagnostic facilities.**

A total of 25,000 Rapid Diagnostic Test kits were purchased and distributed among project districts in 2011 to enhance malaria diagnosis. These RDTs were mainly distributed to medical institutions without a Public Health Laboratory Technician to carry out microscopy. In addition other government medical institutions in project districts were also provided with RDTs to strengthen diagnosis and management of malaria patients.

- **Enhanced entomological surveillance.**

Fourteen additional days per month were funded through the project to augment the entomology component of the Provincial Malaria Control Programme with a view to forecasting and preventing malaria outbreaks and epidemics. Accordingly, 2660 additional entomological surveillance days were funded by the project.

- **Strengthening of entomological and parasitological laboratories at district level by providing necessary equipment & consumables**

Hand lenses, digital hygrometers, dissecting sets, forceps, larval vial tubes and chemicals for entomological investigations were purchased during this period for strengthening of regional laboratories.

- **District level in-service training programmes.**

Thousand four hundred and sixty three field staff were (PHII, PHFOO, PHLTs, PHFO & SMOO) trained on environment friendly malaria control methods and new advances of treatment of malaria.

Monthly review meetings were carried out on GFATM activities in project districts with the participation of Regional Malaria Officers, Technical Staff of AMC Headquarters and representatives of Sarvodaya, TEDHA, at Anti Malaria Campaign Headquarters to assess the progress of work qualitatively and quantitatively.

