
Annual Report

Anti Malaria Campaign

2010

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Introduction

The confirmed malaria cases detected during the year 2010, shows an increase when compared with the previous year. In 2010 a total no. of 684 confirmed malaria cases (either by microscopy or RDT) were reported countrywide of which 64% were from the Northern Province. There has been an increase in the incidence of malaria in the Northern Province, Hambantota, Moneragala and Anuradhapura districts.

Out of 684 cases, there were 668 vivax infections and 16 falciparum &/or mixed infections. The highest reported number of cases was from the district of Mulativu. A high number of cases were also reported from the neighboring districts of Kilinochchi, Vavuniya, Mannar and Hambantota, Moneragala, Anuradhapura districts. Majority of cases was reported from security forces who engaged in construction and restoration activities in the Northern Province.

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 reorganization 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 will be 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 a zero mortality of Malaria cases.
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 & 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 1,001,107 blood smears were examined by the departmental staff attached to the medical institutions and the Anti Malaria Campaign including its regional offices during 2010. Figure 1 shows the blood smears examined during 2009 and 2010 district wise. Following this screening, 684 confirmed malaria cases were detected. This included 668 *P.vivax* infections and 16 *P.falciparum* or mixed infections (6- *Pf* and 10 -mixed infection) (Table 1). Majority of cases were reported from the districts of the Northern Province and the districts of Moneragala and Hambanthota. Figure 2 shows the comparison between the number of positive cases reported in the country in year 2009 and 2010 (district –wise). Majority of cases were from security forces who engaged in construction/restoration activities in the Northern Province. When analysis the total number of cases, it was revealed that approximately 50% of cases were relapses during the first half of the year 2010 until the DOTs strategy was implemented among security forces. During the latter half of the year 2010, following this strategy, a marked reduction of relapses was observed in the country.

In addition to the total number of indigenous cases, 34 *P.vivax* infections, 12 *P.falciparum* or mixed infections and 1 *P. malariae* were imported from other countries (figure 3).

Table 1. Parasite formula 2002 - 2010

Year	Proportion of <i>P.vivax</i> infections	Proportion 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

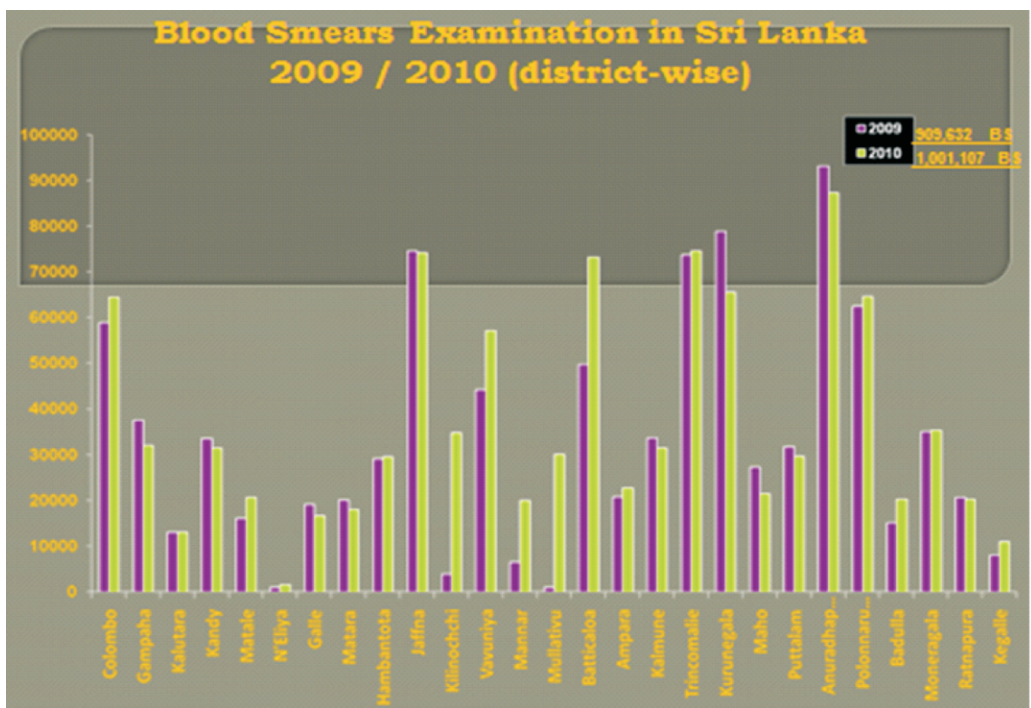


Figure 1 – blood smear examination in Sri Lanka - 2009/2010 (district wise)

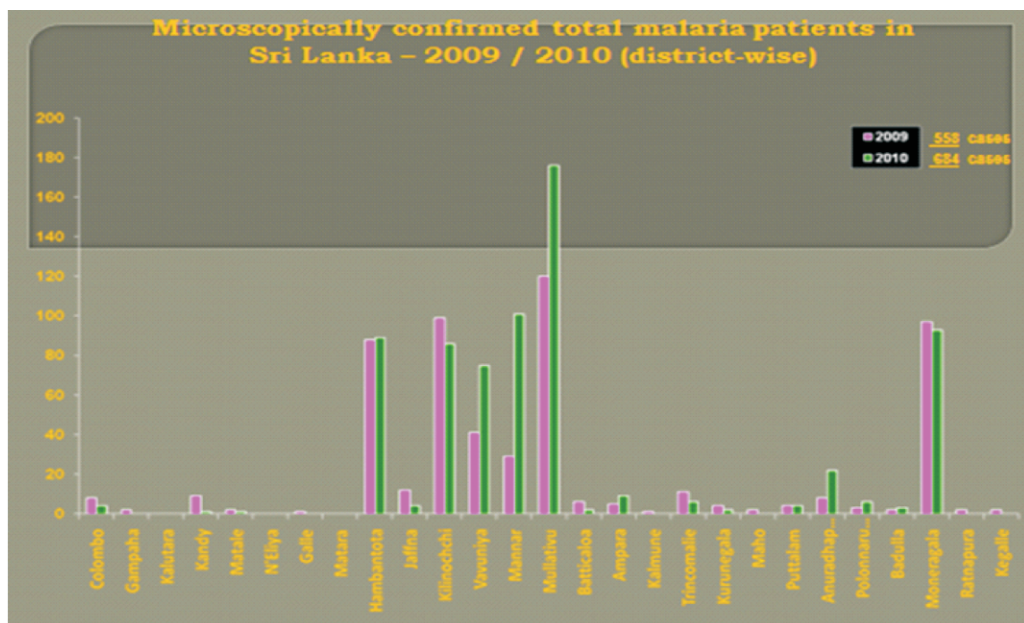


Figure 2 – Microscopically confirmed malaria cases in Sri Lanka - 2009/2010 (district –wise)

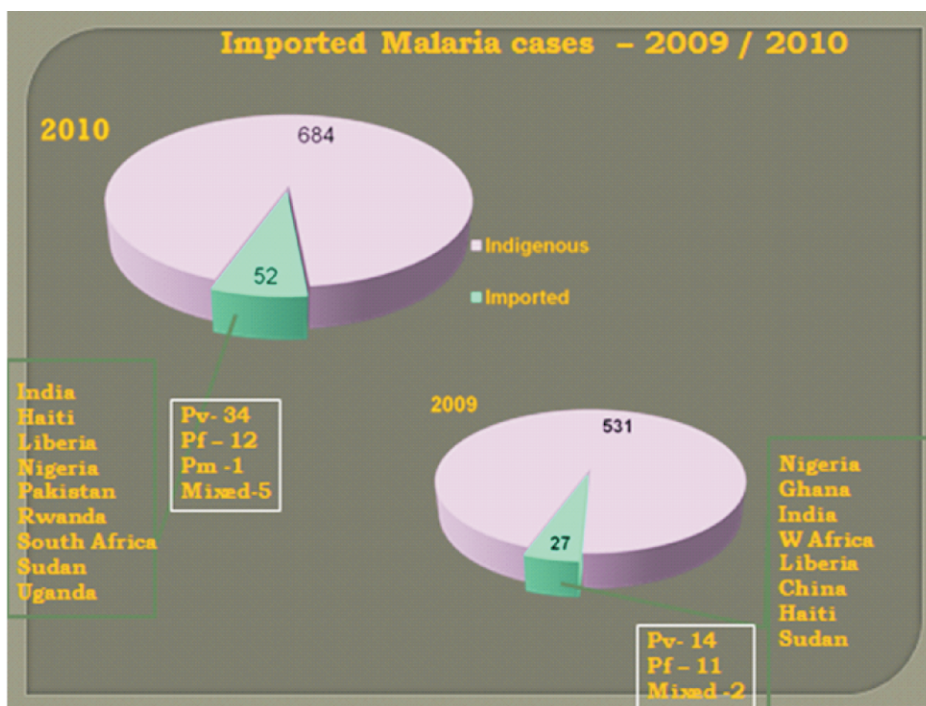


Figure 3 – Imported malaria cases – 2009/2010

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 2010.

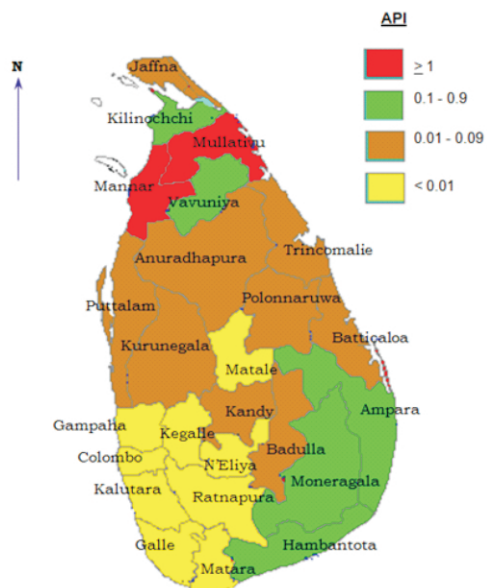


Figure 4. Intensity of malaria Transmission in Sri Lanka (represented district-wise) 2010

Information Management

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

To enhance the case surveillance from the private sector, it was planned to establish a communication cell at the AMC Headquarters with the assistance of GF funds.

Epidemics/outbreaks

The following parameters 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 2010.

Status of drug resistance and drug policy

All the *P. falciparum* and *P. vivax* positive patients were followed up for one month to detect resistance strain of the parasite to artemether-lumefantrin and chloroquine respectively. There were no resistance *Pf* and *Pv* cases detected during year 2010.

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 and Eastern provinces, and in the bordering provinces, were also considered as programme priorities during the year 2010.

Surveillance

Surveillance mechanism of the malaria control programme is implemented mainly through Activated Passive Case Detection (APCD). All 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 (egs. 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 medical institutions (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 2010, there were 684 confirmed malaria cases in the country. In addition to the cases reported by Laboratory Technicians 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 6 *Plasmodium falciparum* infections and 668 *P. vivax* infections while the number of *P. vivax* and *P. falciparum* mixed infections were 10. Majority of these confirmed malaria cases were reported from Army personnel in the North and East districts. The total number of blood smears examined by Public Health Laboratory Technicians attached to the Anti Malaria Campaign in each district/RMO region is given in table 1, while the percentage wise data are shown in figures 5 and 6 respectively.

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 2010 are given in table 2.

Table 2 Laboratory items distributed - 2010

District	Lancets	Giemsa stain (L)	Slides	Methanol (L)	Anisole (L)	Ethanol (L)	Microscopes	RDT
Ampara	30,000		17200	2.5	1.9			600
Anuradhapura	30,000	8	25200	2.5	2	2		1800
Baddulla	20,000	3	10800	1	2	5	4	1200
Batticaloa	30,000	2	17200		2	1		600
Colombo							1	
Embilipitiya		2	10,000	2.5		2.5	4	660
Galle								
Gampaha	2,000	2	3,600	2.5			1	
Hambantota	10,000	3	28,800	2.5	3	2.5	4	1560
Kalmune		3	10800					600
Kalutara								
Kandy							2	600
Kegalle			2,500				1	600
Kilinochchi	30,000	5	15,800	3.5	4	3.5	2	3540
Kurunegala	12,000	4	35500	5			6	2280
Jaffna	50,000	4	20700	2.5	5		3	1500
Maho	10,000	1	10,000	2.5			2	600
Mannar	20,000	1	6100		1	1		3300
Matale	10,000	1	20,840	2.5	3			600

Matara								
Moneragala	30,000	2	27,200					960
Mullaitivu	10,000		2500	2.5			1	
Nuwaraeliya								
Polonnaruwa		3	20,800					1200
Puttalam	33,000	3	23,640	5	1		1	1800
Trincomalee	60,000	9	38,000		2			1800
Vavuniya	40,000		11,800	2.5	2	2.5		2100
TOTAL	477,000	56	358,980	39.5	28.9	20	32	27900

In-service Training programmes for PHLTT

During the year 2010, the Anti Malaria Campaign conducted 15 GFATM funded in-service training programmes for Public Health Laboratory Technicians in Jaffna, Kilinochchi, Mullaitivu, Vavuniya, Mannar, Anuradhapura, Kurunegala (a & b), Maho, Puttalam, Matale, Embilipitiya, Kegalle, Badulla, Moneragala and Hambantota RMO regions.

Special activities

Following screening activities were done by the PHLTT attached to the AMC Directorate .

3.02.2010 -Screening of 100 Indian Laborourers working in Jae la

14.06.2010 -Screening of 170 Indian laborourers working in Colombo Dockyard

13.09.2010-Screening of 72 Indian laborourers working in Colombo Dockyard

05.10.2010-Screening of 270 Army Soldiers attached to the Army Camp in Pelawatte, Matugama (they have returned to that Army Camp after serving in Jaffna).

02.11.2010-Screening of 300 Army Soldiers returned from Jaffna attached to the Army Camp in Yatiyana, Matara

04.11.2010-Screening of 150 Army Soldiers returned from Jaffna attached to the Army Camp in Boosa, Galle.

24.12.2010-Screening of 200 Army Soldiers returned from Haiti (after serving there under a UN Mission)

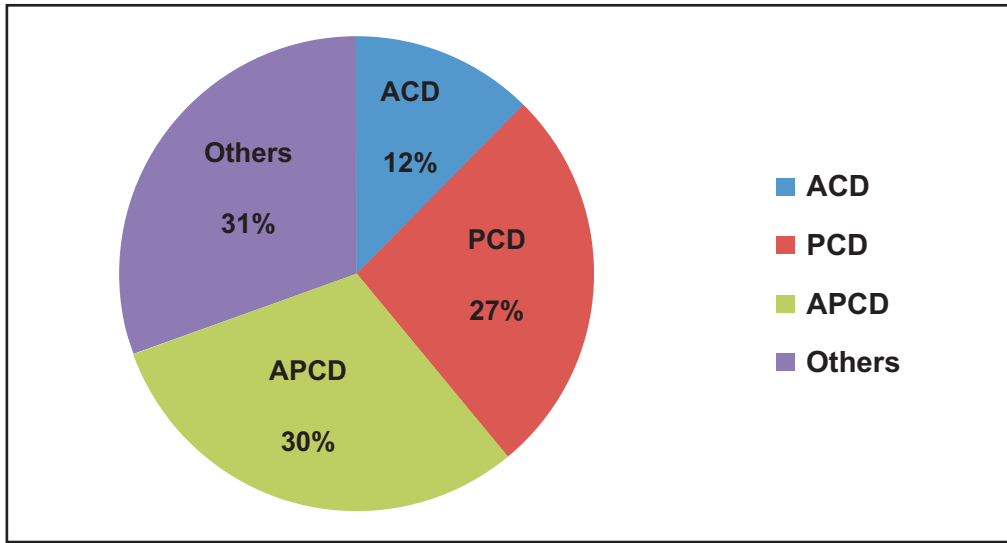


Figure 5 Category wise percentages of individuals screened by the Anti Malaria Campaign in the country.

Table 3 Number of Individuals screened by the Anti malaria Campaign during the year 2010

District/Region	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Ampara	2028	2312	1995	1261	1991	2164	2094	1703	1522	1827	1568	2319	22784
Anuradhapura	7616	7573	6839	6679	8012	7825	7728	6753	6533	7210	7724	7004	87496
Baddulla	1685	1692	1817	1431	1353	1868	1941	1737	1838	1763	1567	1545	20237
Batticaloa	4491	3661	4464	4909	8136	6998	6929	5465	4797	5209	7638	11152	73849
Colombo	5559	3933	3595	3827	7191	5307	5224	5613	4798	6966	6169	6402	64584
Embilitiya	1870	721	844	1242	2193	1971	2110	2144	1875	1483	2169	1608	20230
Galle	1260	1524	1462	1050	1111	1464	1549	1208	945	1200	1987	1821	16581
Gampaha	2055	3539	2419	1765	2797	2981	3476	2091	2601	3250	2537	2571	32082
Hambantota	2321	2286	2458	1192	1950	2332	3100	1912	1875	4030	2785	3287	29528
Kalmune	9384	6663	5659	3907	5331	5539	5766	5797	5586	6530	6816	7261	74239
Kalutara	3200	2687	3048	1149	2824	2953	3183	3034	2818	1140	2867	3519	32422
Kandy	749	1005	993	392	1325	1074	698	992	1368	2465	841	1123	13025
Kegalle	3229	2697	2170	2806	3634	3034	3342	2965	566	640	3152	3230	31465
Kilinochchi	867	1093	940	482	1133	925	983	863	950	981	872	886	10975
Kurunegala	2403	4328	2356	1776	2409	3666	2994	3570	2925	2529	2754	3137	34847
Jaffna	5616	5362	6015	4788	5681	6330	6013	5106	5122	5428	5156	5108	65725
Mah	2008	2125	1914	1688	1993	2291	2082	1784	1866	1517	824	1389	21481
Mannar	1109	2030	1878	1173	1561	1703	1346	549	1675	2063	2351	3046	20484
Matale	1354	1763	1585	1327	1656	2049	1850	1584	1806	2097	1961	1619	20651
Matara	1244	1320	1320	1154	1722	1583	1702	1694	1606	1698	1344	1176	17563
Moneragala	3401	3246	3668	2870	1998	2993	5875	1790	2370	2056	2914	2359	35540
Mullaitivu	693	1332	1256	1784	3386	2752	3880	4907	2416	1987	2782	2907	30082
Nuwaraeliya	142	88	48	132	122	319	71	61	214	133	128	78	1536
Polonnaruwa	5542	6354	5757	4932	5736	5933	6967	5589	5603	5734	6204	5857	70208
Puttalam	1889	2882	2338	2150	2561	2806	2808	2417	1973	2764	2693	2493	29774
Trincomalee	7785	6774	7785	6774	6495	6728	6047	4953	4950	5099	5594	6551	75535
Vavuniya	3145	4663	5792	4248	4287	4502	4352	2094	4206	6923	5793	7086	57091
Total	82645	83653	80415	66888	88588	90090	94110	78375	74804	84722	89190	96534	1010014

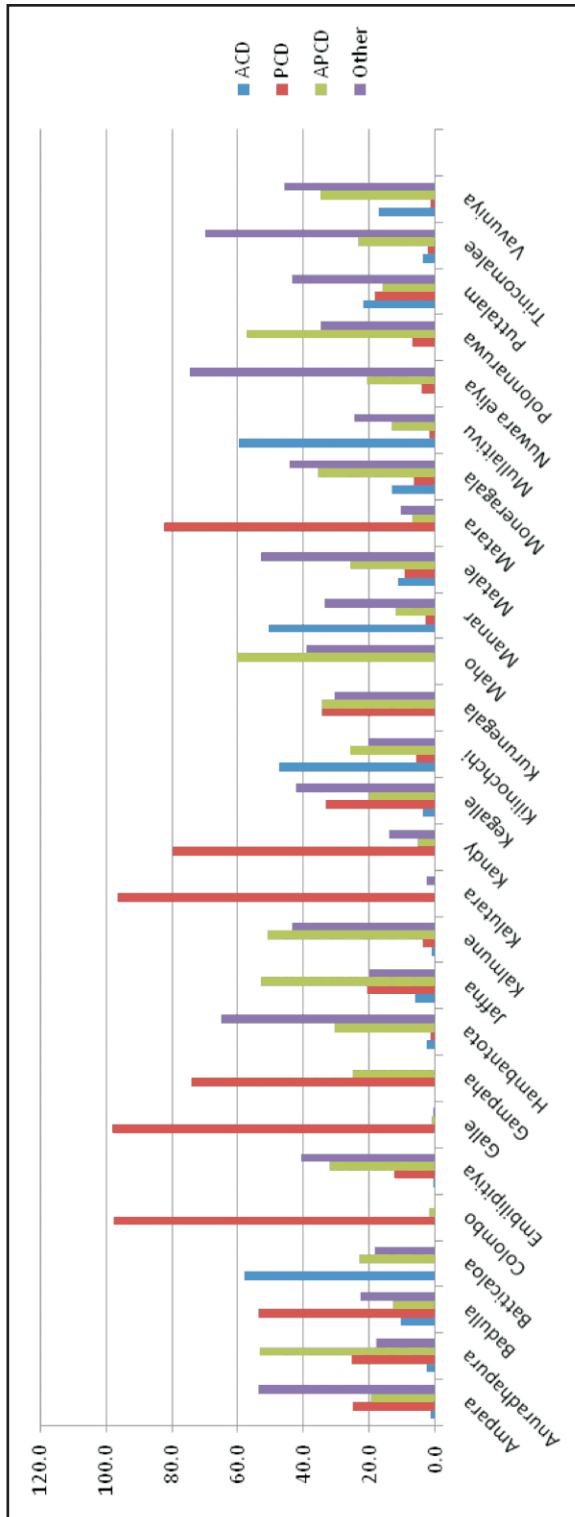


Figure 6 Category wise percentages of individuals screened by the Anti Malaria Campaign in each district/RMO region

Vector surveillance

Malaria vector surveillance was carried out in 22 RMO regions during the year 2010 by regional and central entomological teams of Anti Malaria Campaign. This included sentinel monitoring, focal investigations and spot checks. Central entomological teams conducted 34 surveys during the year 2010. That included sentinel surveys in Mannar, Mullaitivu and Killinochchi Districts in Northern Province.

The results of the surveys of regional and central teams are pooled together, summarized and presented here.

Anopheline Larval surveys were carried out to determine the most productive breeding places and to monitor density of malaria vector mosquitoes in all the districts of the island.

Table 4: Results of larval surveys carried out during 2010

Type of breeding place	No. of dips	No. of I & II instar larvae	No. of III & IV instar larvae	<i>An. culicifacies</i> per 100 dips	<i>An. subpictus</i> per 100 dips	<i>An. annularis</i> per 100 dips	<i>An. varunaper</i> 100 dips
Abandoned well	335	148	111	5.373	5.373	0	5.373
Bricks pits	7633	685	540	0	4.153	0	0.248
Built well	32389	5866	2846	2.825	2.615	1.938	0.262
Built Agricultural well	8933	1941	1231	0.884	3.459	2.742	0.391
Burrow pits	20520	8744	4998	1.193	18.713	0.453	0.175
Cement tank	1271	90	110	1.652	5.979	0	0.078
Coconut husk pits	350	68	38	0	0	0	0
Connected pools	8617	1876	1034	3.237	1.787	0.081	3.771
Culvert	386	88	70	0.777	12.176	1.295	0
Drop tanks	247	26	54	0	0	4.048	0
Ela margin	20840	2695	1989	0.191	0.738	1.789	0.023
Gempits	974	199	199	4.209	0.205	0	5.03
Ground pools	10378	2336	2071	1.512	9.433	1.368	0.115
Hoof prints	2606	1228	853	2.225	19.646	2.494	0
Irrigation canal	34368	2676	2011	0.075	1.579	0.011	0.622
Lagoon margin	480	31	54	0	11.25	0	0
Marshy land	4523	799	853	0	5.46	0.221	1.105
Mud pits	1546	639	155	0	4.786	0	0
Oya margin	46314	4318	2768	0.464	0.364	1.951	0.036
Paddy field	50862	5368	4468	0.009	1.252	0.009	0.133
Ponds	1693	443	184	0.354	3.13	0.236	0.531
Quarry pits	8106	2692	1142	0.456	2.652	0.407	0.727

Type of breeding place	No. of dips	No. of I& II instar larvae	No. of III & IV instar larvae	<i>An.culicifacies</i> per 100 dips	<i>An. subpictus</i> per 100 dips	<i>An. annularis</i> per 100 dips	<i>An. varunaper</i> 100 dips
Rain water pools	23136	5286	3366	0.103	6.094	0.108	1.27
River bed pools	235	13	5	0	1.702	0.851	0
River margin	19331	3789	2308	0.237	0.237	0.02	7.112
Rock pools	22737	4567	3901	3.769	1.913	0.074	3.091
Saltern outer canal	306	18	32	0	10.457	0	0
Sand Pools	19068	5431	3264	4.662	4.594	0	3.314
Seepage pools	887	325	267	6.989	9.244	0.45	8.68
Stagnant water	778	72	83	2.827	4.755	0	1.799
Stream margin	6887	1487	1166	0.217	0.232	0.29	8.857
Tank bed pools	960	726	54	0	1.77	0	1.354
Tank margin	42375	4105	3683	0.134	0.5	0.573	0.53
Tank spill	500	155	119	15.4	4.2	0	0.4
Trench	153	29	56	0	9.803	0	0
Tire Prints	2064	606	856	2.47	36.773	0	0.096
Unbuilt Agrowell	1522	172	112	0.197	1.248	0.131	1.051
Unbuilt wells	4110	475	383	0.486	0.851	0	3.99
water pools	6315	2272	901	0.015	3.721	0.047	1.377

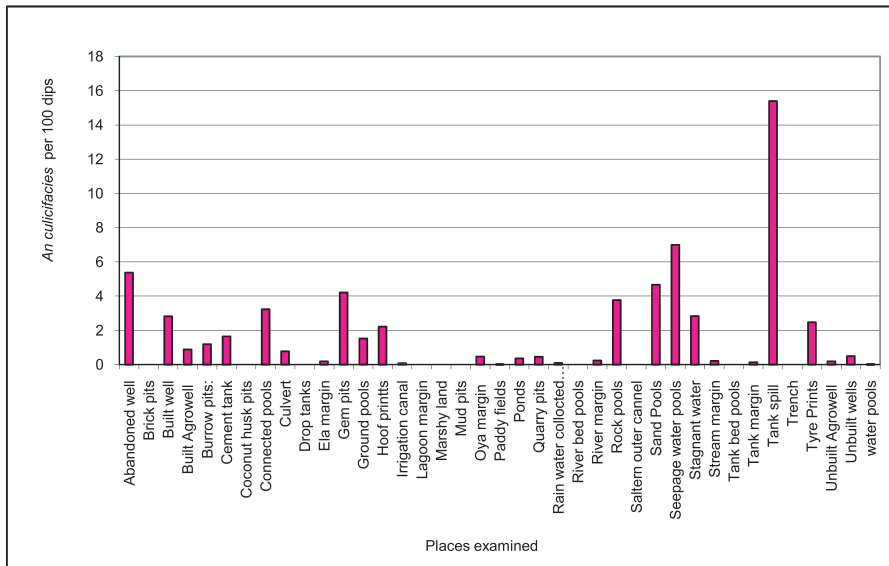


Figure 7: Breeding places of main malaria vector *Anopheles culicifacies*

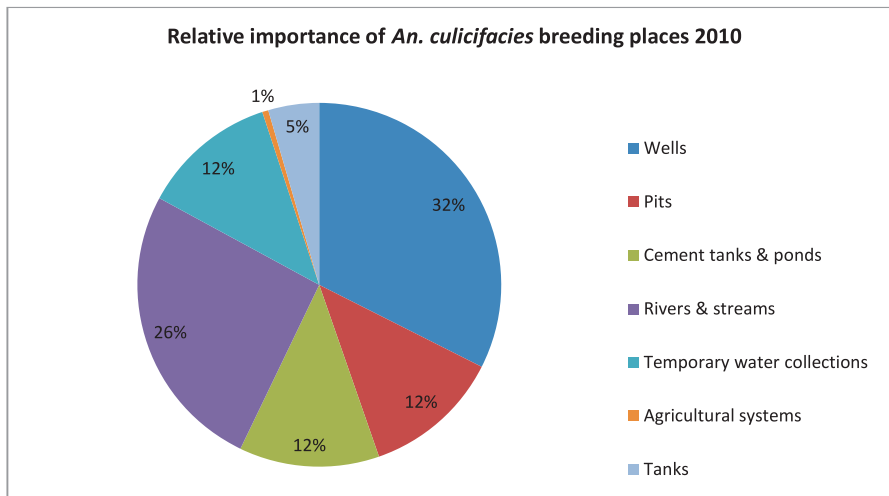


Figure 8: Relative importance of *An. culicifacies* breeding places

The larval collection data obtained for major vector species *Anopheles culicifacies* and other three potential vector species are summarized in the Table 4. Figure 7 shows the number of larvae per 100 dips in different potential breeding places sampled. Tank spills claimed for the highest larval density which is around 15 per 100 dips. Seepage pools, abandoned wells, gem pits were the main habitats for breeding of the major vector *Anopheles culicifacies*.

When breeding places are categorized into 7 groups, wells out of all the types showed the highest production of larvae which is 32% followed by rivers and streams accounting for 26%. Different types of pits and Agriculture systems contributed 12% each (figure 8).

The indoor resting densities of major vector *Anopheles culicifacies* and secondary vector *Anopheles subpictus* were determined by the Indoor Hand Collections and Pyrethrum spray sheet collections in households sprayed with indoor residual insecticides and in unsprayed areas. The results of the Pyrethrum spray Sheet Collections are summarized in Table 5. *Anopheles subpictus* was found in the houses after 2-3 months of spraying with Cyfluthrin. Unsprayed areas have higher indoor resting densities compared to areas sprayed with insecticides.

Table 5: Results of Pyrethrum Spray Collections carried out during 2010

Insecticide used for IRS	Days after spraying	No. of houses sprayed	No. of houses examined	No. of houses positive	Anopheline species	No. of Anophelines collected				total	
						male	female				
							UF	BF	SG		G
Bifenthrin	01-30	40	40		Negative						
	61-90	50	50	6	An.sub	6	2	2	7	1	12
	91-120	10	10	2	An.sub	1				2	2
Cyfluthrin	01-30	266	280	15	An.sub	3	2	9	4	7	22
	31-60	85	100	28	An.cul			1			1
					An.sub	167	45	32	232	44	353
					An.var			1			1
	61-90	90	90	43	An.cul				4		4
					An.sub	12		19	7		26
					An.vag			1			1
	91-120	90	90	42	An.cul				1	5	6
					An.sub	38	39	15	92	124	270
					An.ann				1		1
121-150	122	130	46	An.cul			2			2	
				An.sub	36	10	39	58	11	122	
				An.sub	74	2	67	29	6	104	
151-180	110	110	58	An.var			5			5	
				An.sub	9	19		8	16	43	
				An.sub	4	1	3	7	4	15	
Lambda Cyhalothrin	01.30	80	92	3	An.sub	3	2		2		4
	31-60	50	50	1	An.sub	4	1	3	7	4	15
	61-90	10	10	2	An.sub	3	2		2		4
	91-120	50	50	8	An.sub	2	2		7	1	10
	121-150	50	50	23	An.sub	4	9		8	17	34
Unsprayed	151-180	40	40	22	An.sub	49	27		17	21	65
			5884	1263	An.ann			2	1		3
					An.cul	6	8	68	23	23	122
					An.pal			1			1
					An.sub	510	22	532	550	480	1584
					An.tess			1			1
					An.vag	1	2	9	3		14
				an.var	1	2	10	2		14	

Results of the Human Landing collections (partial night) are shown in Table 6. The results showed low rates of indoor human biting compared to outdoor biting of *Anopheles culicifacies* in sprayed areas. Outdoor biting of the potential vectors was common in sprayed and unsprayed areas. However, indoor biting of anopheles was seen occasionally in low rates.

Table 6: Results of Human Landing collections carried out during 2010

Insecticide	days after spraying	Health Area	No. of baits			In door				Tot	No. Of <i>An. cul</i> per man hour	Outdoor				Tot	No. Of <i>An. cul</i> per man hour
			In door	out door	Anopheline species	No. of Anophelines						No. of Anophelines					
						1 hr	2 hr	3 hr	4 hr			1 hr	2 hr	3 hr	4 hr		
Cyfluthrin	0-30	5	17	29	<i>An. acc</i> <i>An. ann</i> <i>An. cul</i> <i>An. sub</i>							3	5	3		40	0.344
Cyfluthrin	31-60	3	6	36	<i>An. ann</i> <i>An. cul</i> <i>An. sub</i> <i>An. var</i>							3	4			5	0.03
Cyfluthrin	61-90	3	8	9	<i>An. cul</i> <i>An. sub</i>	1				1	0.03	1	1			2	0.05
Cyfluthrin	91-120	2	4	10	<i>An. cul</i> <i>An. sub</i>			1				21	5	3	2	1	0.025
Cyfluthrin	121-150	3	9	9	<i>An. cul</i> <i>An. sub</i>	1	1			1	0.02	18	7	5	2	3	0.08
Cyfluthrin	151-180	2	3	8	<i>An. cul</i> <i>An. sub</i>							1	2	1		4	0.125
Cyfluthrin	Date not known	8	23	43	<i>An. ann</i> <i>An. ann</i> <i>An. cul</i> <i>An. sub</i>							5	6	4			
Bifenthrin	0-30	3	4	6	<i>An. cul</i> <i>An. sub</i>	1				1	0.01	9	6	10	2	27	0.156
Bifenthrin	61-90	1	4	8	Neg							1	2	2	2	5	0.208
Bifenthrin	Date not known	7	23	28	<i>An. sub</i>							1					

Insecticide	days after spraying	Health Area	No. of baits			In door				Tot	No. Of An. cul. per man hr	Out door				Tot	No. Of An. Cul. per man hr		
			In door	out door	Anopheline species	No. of Anophelines						No. of Anophelines							
						1 hr	2 hr	3 hr	4 hr			1 hr	2 hr	3 hr	4 hr				
Del	dnk	4	17	18	<i>An.cul</i>	1	1			1	0.01	5	19	15	39	0.541			
					<i>An.sub</i>														
					<i>An.var</i>	1	1							5			9	10	
Eto	dnk	1	3	3	<i>An.sub</i>			2				2	1						
Fen	dnk	6	32	21	<i>An.cul</i>	1				1	0.008		3	1	4	0.047			
					<i>An.sub</i>		2						1						
					<i>An.var</i>								5						
L/cyh	,0-30	4	16	17	<i>An.cul</i>					1	0.008	2			2	0.02			
					<i>An.sub</i>			1					2				2		
L/cyh	31-60	1	4	4	<i>An.sub</i>								2	2					
L/Cy	61-90	1	2	2	<i>An.sub</i>	1	3					2							
L/cy	121-150	1	3	4	<i>An.cul</i>							3	2	2	7	0.437			
L/CY	151-180	1	3	5	<i>An.cul</i>							2		4	6	0.3			
L/cy	dnk	3	10	16	<i>An.cul</i>							3	6	5	13	0.203			
					<i>An.vag</i>						1								
Mal	dnk	3	12	12	<i>Neg</i>														
Uns	88	1350	1490	<i>An.acc</i>	1							1	3						
				<i>An,ann</i>	2	5	3							12	16	17			
				<i>An.cul</i>	8	10	7							55	99	83	5	238	
				<i>An.sub</i>	18	60	31	7		25				0.005	76	99	74	21	500
				<i>An.tess</i>											1				
				<i>An.var</i>							1				4	6	1		

The susceptibility status of major malaria vector *Anopheles culicifacies* and other potential vectors to different insecticides was tested using standard WHO procedures. Results are given in Table 7.

Table 7: Results of Insecticide susceptibility test 2010

Health area	No. of tests	D.D.T. 4%	Dieldrin 0.4%	Deltamethrin 0.05%	Lambdacyhalothrin 0.1%	Permethrin 0.75%	Fethion 1%	Malathion 5%
<i>An. subpictus</i>								
Paddipalai	4	80 (40%)						
Tissa	1	20 (65%)						
Vavunathvu	4	80 (13.75%)						
Anamaduwa	4			40 (93%)				
Kalpitiya	2			40 (100%)				
Buttala	5			100 (100%)				
Chenkalady	4			60 (97%)				
Damana	3			60 (86.66%)				
Paddipalai	4			80 (93.75%)				
Palai	5			100 (100%)				
Poonagary	9			180 (100%)				
Sewanagala	3			50 (100%)				
Uhana	1			10 (100%)				
Tissa	2		40 (63.19%)					
Ipalogama	6						120 (27.5%)	
Katharagama	2						40 (95%)	
Maho	2						40 (90%)	
Paddipalai	3						45 (95.55%)	
Addalachchena	3				40 (100%)			
Baticaloa	6				120 (100%)			
Ganewatta	2				40 (100%)			
Hambanthota	8				160 (99.37%)			
Mallavi	3				58 (87.93%)			
Poonagary	5				100 (100%)			
Sooriyawewa	9				180 (96.11%)			
Ipalogama	3							60 (0%)
Murukkan	5							94 (94%)
Thambuththegama	6							120 (10%)
Ambanpola	4							80 (70%)
Galgamuwa	3							60 (76.66%)
Ganewatta	8							160 (35%)
Hambanthota	5							100 (40%)
Kobeigane	6							120 (80%)
Maho	12							240 (78.75%)
Nikaweratiya	9							175 (73.14%)
Paddipalai	6							100 (54%)
Tissa	5							100 (58%)
Vavunathivu	4							80 (33.75%)
Buttala	3					60 (61.66%)		
Hambanthota	1					20 (100%)		

Table 7 Contd.

Health area	No of tests	Cyfluthrin 0.15%	D.D.T. 4%	Deltamethrin 0.05%	Lambdacyhalothrin 0.1%	Propoxur 0.1%	Fenitrothion 1%	Malathion 5%
<i>An. subpictus</i>								
Arachchikattuwa	1	15 (66%)						
Ganewatta	10	200 (97%)						
Paddipalai	5	80 (63.75%)						
Poonagary	5	99 (85%)						
Sooriyawewa	2	40 (78%)						
Vavunathivu	3	45 (64.44%)						
Vellavelly	1	15 (100%)						
Maho	6					120 (100%)		
Muthur	3					60 (81.33%)		
Tissa	8					160 (53.85%)		
<i>An. varuna</i>								
Chettikulam	3	55(95%)						
Laggalallegama	2	20(100%)						
Higuraggoda	1		15 (100%)					
Chettikulam	1			20 (100%)				
Giradurukotte	4			22 (100%)				
Kandeketiya	1			10 (100%)				
Mahaoya	2			40 (100%)				
Uhana	1			20 (100%)				
Buttala	3						40 (100%)	
Embilipitiya	2						20 (95%)	
Sooriyawewa	3				60 (91.66%)			
Buttala	2							40 (100%)
Monaragala	1							20 (100%)
Girandurukotte	1							10 (60%)
Haldummulla	2							20 (90%)
Giribawa	2					40(100%)		

Anopheles culicifacies population in Vavunathivu has shown resistance to Cyfluthrin 0.15%. *An. Culicifacies* population in Sewanagala showed high resistance to Deltamethrin 0.05%, however the number of tests are not sufficient to confirm this observation.

An. Subpictus showed possible resistance to Cyfluthrin in Ganewtta, Paddipalai, Poonakary, Sooriyawewa and Vavunathivu. *An. Subpictus* populations in Ipologama and Thambuththegama in Anuradhapura District were highly resistant to Bendiocarb 0.1%. This species showed resistance to Malathion 5%, Fenitrothion 1% and DDT 4% as well.

An. Varuna population in Sooriyawewa showed reduced susceptibility to Lamdacyhalothrin 0.1%. *An. Annularis* population in Mallawi showed slightly reduced susceptibility to DDT 4%.

Table 7 Contd.

Health area	No of tests	Cyfluthrin 0.15%	D.D.T. 4%	Dieldrin 0.4%	Deltamethrin 0.05%	Lambda cyhalothrin 0.1%	Permethrin 0.75%	Bendiocarb 0.1%	Bifenthrin 2.0%	Etofenprox 0.5%	Fenitrothion 1%	Malathion 3%
<i>An. annularis</i>												
Trincomalee	1							25 (95%)				
Galewela	1	10 (100%)										
Mallawi	6	115 (97%)				20 (100%)						
Tissa	1											
<i>An. culicifacies</i>												
Madu	1	4 (100%)										
Vavunathivu	5	95 (71.57%)			40 (35%)							
Sevanagala	2			40 (100%)								
Rikillagaskada	2											
Thamankaduwa	2									17 (100%)		
Buttala	1										8 (100%)	
Ipalogama	1										1 (100%)	
Horowpothana	1					5 (100%)						
Katharagama	3											
Buttala	3											16 (100%)
Sewanagala	2											31 (87.09%)
Buttal	2						15 (100%)					20 (95%)
<i>An. subpictus</i>												
Arachchikattuwa	1											
Ipalogama	8							15 (100%)				
Thambutthegama	4							15 (100%)				
Trincomalee	1							15 (100%)				
Uppuveli	2							15 (100%)				
Variyapola	2							15 (100%)				
Arachchikattuwa	1	15 (66%)							50 (100%)			
									20 (100%)			

Table 8. Cattle baited Cadjan hut collection - 2010

Districts	Ampara			Anuradapura			Badulla			Batticaloa			Hambantota			Kalmunai			Kandy			Kegall			
	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	
<i>Anopheles</i> species																									
<i>An. cul</i>	1	0.09	0.68	71	1.3	4.814	17	1.4	8.63	20	2.5	3.57	186	0.87	3.282	0	0	0	0	0	0	0	0	0	0
<i>An. sub</i>	146	13.3	99.3	1379	25	93.49	17	1.4	8.63	533	66.6	95.2	5430	25.5	95.82	230	7.93	100	1	0.042	100	9	0.56	100	
<i>An. var</i>	0	0	0	25	0.4	1.695	163	14	82.7	5	0.63	0.89	43	0.2	0.759	0	0	0	0	0	0	0	0	0	
<i>An. ann</i>	0	0	0	0	0	0	0	0	0	2	0.25	0.36	8	0.04	0.141	0	0	0	0	0	0	0	0	0	
Total	147			1475			197			560			5667			230			1		24		9		
No. of Hut collections	11			56			12			8			213			29			24		16				

Table 8 contd.

Districts	Kurunegala			Matale			Monaragala			Nuwareliya			Polonnaruwa			Puttalam			Rathnapura			Trincomalee			
	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	No. of females	No per bait	%of total catch	
<i>Anopheles</i> species																									
<i>An. cul</i>	86	0.91	3.56	1	0	0.224	316	5.7	19.3	14	0.4	100	14	0.61	29.79	48	1.55	21.7	0	0	0	44	0.69	4.13	
<i>An. sub</i>	2286	24.3	94.6	380	8.3	85.01	1086	20	66.3	0	0	0	11	0.48	23.4	166	5.35	75.1	5	0.1	45.45	955	14.9	89.7	
<i>An. var</i>	44	0.47	1.82	57	1.2	12.75	236	4.3	14.4	0	0	0	22	0.96	46.81	5	0.16	2.26	0	0	0	5	0.08	0.47	
<i>An. ann</i>	0	0	0	9	0.2	2.013	1	0	0.06	0	0	0	0	0	0	2	0.06	0.9	6	0.12	54.55	61	0.95	5.73	
Total	2416			447			1639			14			47			221			11		50		1065		
No. of Hut collections	94			46			55			30			23			31			50		64				

Table 9. Cattle baited net trap collection – 2010

Districts	Ampara			Anuradapura			Badulla			Batticaloa			Hambantota			Jaffna			Kalmunai			
	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	
<i>An. cul</i>	1	0.01	0.15	14	0.1	1.144	8	0.1	0.6	32	0.42	0.53	26	0.12	0.464	0	0	0	0	0	0	0
<i>An. sub</i>	146	2.06	22.4	496	4.1	40.52	164	1.4	12.3	5896	77.6	98.2	4865	22.3	86.75	12	100	100	475	4.439	99.58	
<i>An. var</i>	438	6.17	67.1	426	3.5	34.8	1162	10	87	48	0.63	0.8	338	1.55	6.027	0	0	0	2	0.019	0.419	
<i>An. ann</i>	68	0.96	10.4	288	2.4	23.53	2	0	0.15	31	0.41	0.52	379	1.74	6.758	0	0	0	0	0	0	
Total	653			1224			1336			6007			5608			12			477			
No. of Trap collections	71			122			116			76			218			1			107			

Table 9. Contd.

	Kandy			Kegalle			Kilinochchi			Kurunegala			Mannar			Matale			Monaragala		
	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch	No. of females	No per bait	% of total catch
Anopheline species	5	0.14	1.13	7	0.1	21.88	0	0	0	15	0.03	0.2	9	0.6	4.569	0	0	0	344	1.686	2.531
<i>An. cul</i>	0	0	0	7	0.1	21.88	1128	42	95.2	6530	14.8	86.8	122	8.13	61.93	71	0.23	5.96	1344	6.588	9.89
<i>An. sub</i>	439	12.2	98.9	18	0.3	56.25	28	1	2.36	784	1.78	10.4	52	3.47	26.4	690	2.28	57.9	11177	54.79	82.24
<i>An. var</i>	0	0	0	0	0	0	29	1.1	2.45	194	0.44	2.58	14	0.93	7.107	431	1.42	36.2	725	3.554	5.335
<i>An. ann</i>	444			32			1185			7523			197			1192			13590		
Total	36			68			27			440			15			303			204		

Table 9. Contd.

Districts	Mulathiuvu		Nuweraeliya		Polonnaruwa		Puttalam		Rathnapura		Trincomalee		Vavuniya	
	No. of females	% of total catch	No. of females	% of total catch	No. of females	% of total catch	No. of females	% of total catch	No. of females	% of total catch	No. of females	% of total catch	No. of females	% of total catch
<i>An. cul</i>	1	0.04	1	0	0	0	0	0	0	0	0	0	0	0
<i>An. sub</i>	201	8.04	10	0.2	36	0.6	24	459	2.28	75.4	2.28	75.4	140	94.8
<i>An. var</i>	37	1.48	42	0.7	83	1.3	55.3	74	0.37	12.2	1881	12.8	149.3	70
<i>An. ann</i>	396	15.8	0	0	31	0.5	20.7	75	0.37	12.3	588	6.18	4.2	101
Total	635		53		150		609		2360		12819		653	
No. of Traps	25		60		63		201		147		87		73	

Table 10. Results of window trap collections (Exit)

Insecticide	Days After Spraying	No. Of Traps	No. Of Traps +ve	Number collected										Number surviving after 24 hrs.										
				An.sp	male	uf	bf	sg	g	Total	male	uf	bf	sg	g	Total								
Bifenthrin	01-30	7	1	<i>An.var</i>	1																			
	61-90	9	1	<i>An.sub</i>	1	1				2	4													
	91-120	4	1	<i>An.sub</i>	1				1		1													
	121-150	4	2	<i>An.sub</i>	2	1	1				2													
	151-180	55	3	<i>An.sub</i>	6	7		2			4					11	1	4		3				7
Cyfluthrin	01-30	62	8	<i>An.sub</i>																				
	31-60	58	24	<i>An.cul</i>						2					2				1					1
	61-90	32	11	<i>An.sub</i>	10					17					20	1			6					7
	91-120	13	9	<i>An.sub</i>	6	5	2			2					9	2	4		1					6
	121-150	299	2	<i>An.sub</i>	16	14	3			4					25	6	13		3					23
Lambdacyhalothrin	01-31	18	9	<i>An.cul</i>						2					2				0					0
	31-60	6		<i>An.sub</i>	8					2					12	7			1					7
	61-90	10		<i>An.cul</i>																				
	151-180	8	5	<i>An.cul</i>						1					1									
	Unsprayed		1611	274	<i>An.sub</i>	3	8			1					9									
Unsprayed	01-30			<i>An.cul</i>	605	865	140	268	158	1431	181	451	20	99	114	684								
	31-60			<i>An.jam</i>			1	2		3														
	61-90			<i>An.ann</i>			1			1					1									
	121-150			<i>An.var</i>	5	3	2			5					2				2					4
	151-180			<i>An.fess</i>	96	23	38	1		62	24	6	26	1										33

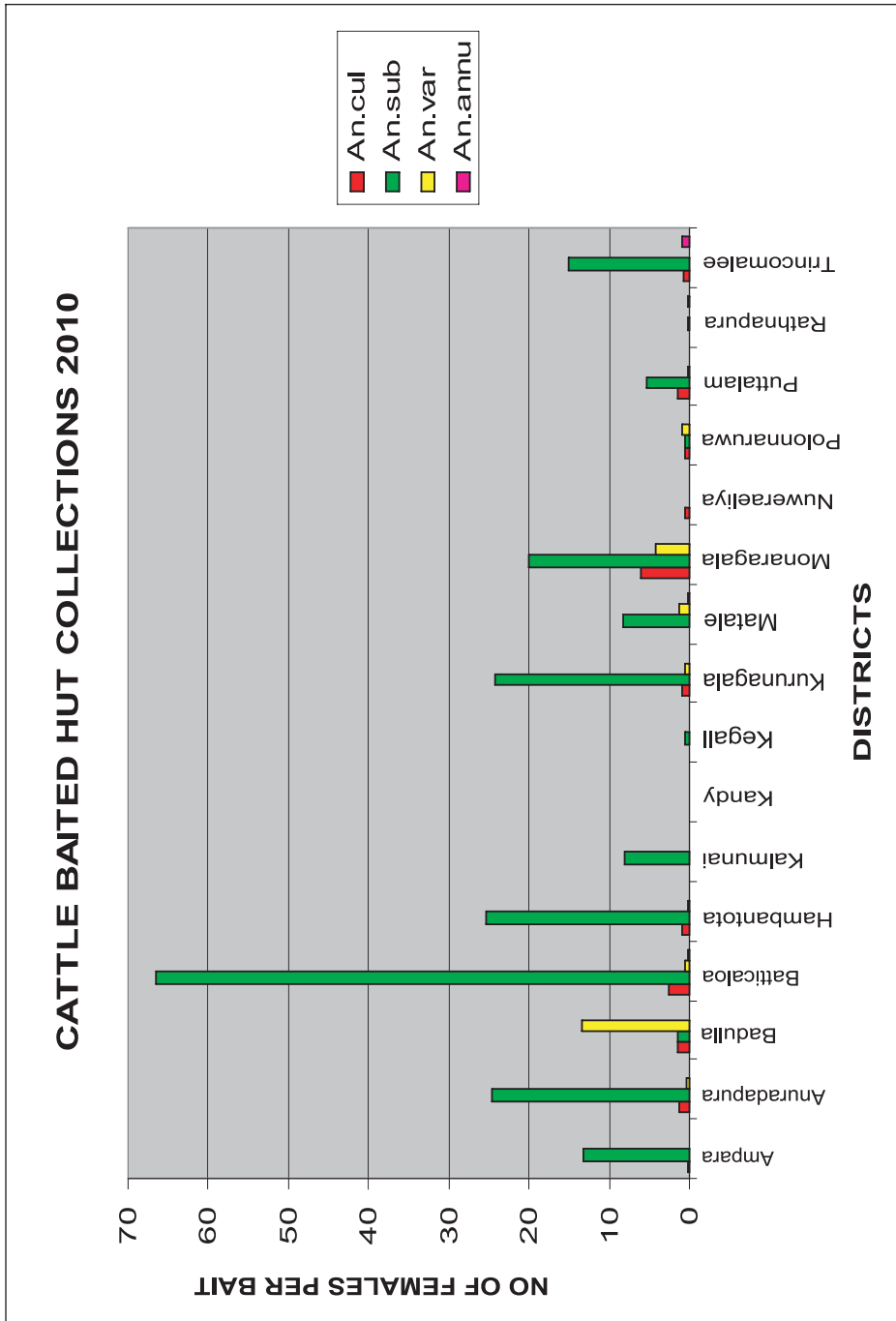
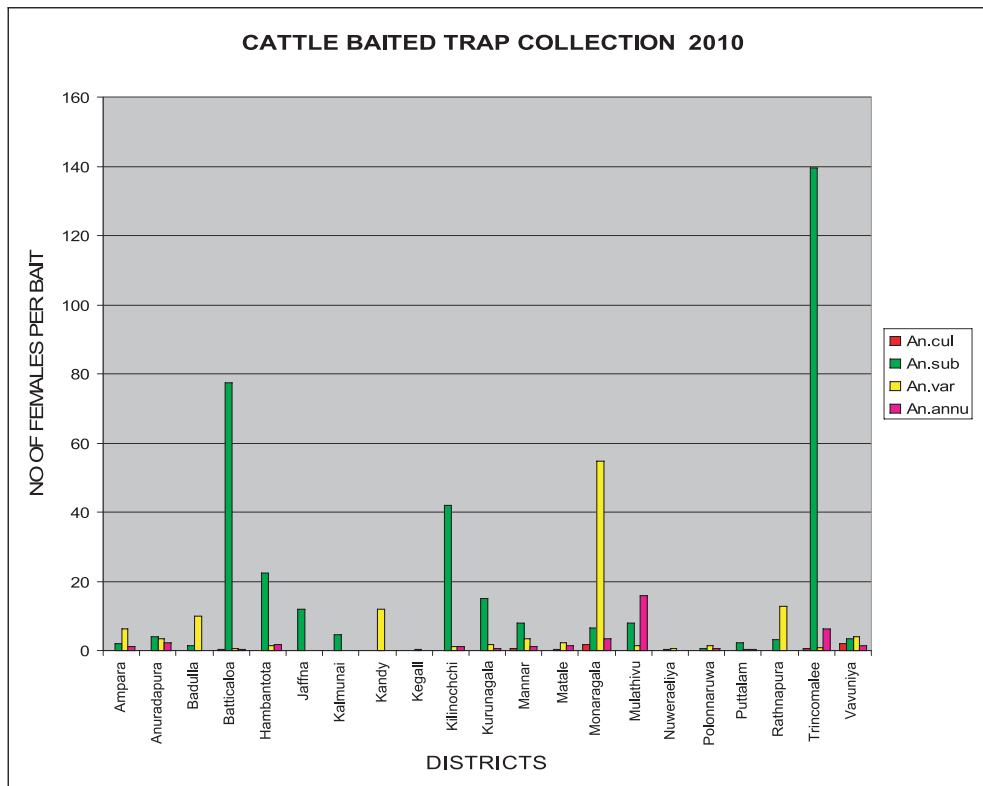


Figure 4. Results of the Cattle baited trap collections -2010



The persistence of the insecticides used for Indoor Residual Spraying on various insecticides was determined using the standard WHO bioassay test procedures for susceptible female mosquitoes of *Anopheles culicifacies* and other three potential vector species.

The bio efficacy of Long Lasting Insecticidal Nets was investigated using the standard cone bio assay test using *Anopheles culicifacies* and other vector mosquito species.

Anti Malaria Campaign distributed equipment and consumables to the regional entomology teams during the year 2010 purchased using GFATM Funds. The list is given in the table 8.

RMO REGION / ITEMS	Compound Microscope	Dissecting Microscope	Insecticide Impregnated Papers (Boxes)	Susceptibility Test Kit [Adult]	Susceptibility Test Kit [Larval]	Cattle Baited Net Trap	PSC Sheets	Aspirators	Dippers with Handle	Paper Cups	Larval Vials	Insect Pins	Magnifying Lenses	Pyrethrum	Collapsible Cages	Dropping Pipets	Minuten Pins	Specimen Box	Chloroform (l)	Petri Dishes	Enamel Try	Uniform for Field Activities
Hambanthota	1	2	5	4	4	2	40	5													2	
Puttalam	1	1	8	2	2	2	40		5	25	100		2			4						12
Trincomalee	1	1	8	3	2	2	74	10	5	100		5	2	1	2	5	1			20	4	12
Monaragala	1		6	2	2	2	20	6	6	100		10			3	9				20	3	
Kilinochchi	1	2	7	4	2	4	40	13	3	100	30	10	4	1	1	3	4	1	1	40	6	12
Badulla	1	1	5	3	2	2	20	4		50		2		1			2	1				
Kalmunai	2	2	4	3	2	2	60	4		50		10	8	1	1		1	1		40	3	21
Batticaloa	2	1	7	2	2	2	75	6	2	75		2										18
Kegalle	1		5	2	2	2	20					2					1	1	2			
Ampara	1	1	5	2	2	2	40							1					2			21
Anuradhapura	1	1	8	2	2	2	40		5		50		1			5			2			9
Mulathivu	2	2	5	2	2	2	20	10		100		2	1	1	1	1	2	1		25		6
Vavuniya	2	2	5	3	2	2	60	12		100			1	1	2				1	40		
Polonnaruwa	1	1	5	2	2	2	20															12
Kurunegala - A	1	1	6	2	2	2			5	20	50		1			4						12
Kurunegala - B	1	1	7	2	2																	12
Mahaewea	1	1	5	2	2	2	20	8		100		1			2		1	1	1		1	9
Kandy	1	1	4	2	2	2	40	10	5	100	50		1			1						18
Mathale	1	1	6	2	2	2																20
Rathnapura	1	1	5	2	2	2	20					5					1	1				12
Jaffna	1	1	6	2	2																	8
Mannar	3	2	4	2	2	2		6		100	100	10	1		1	5	2	1		40	3	6

Vector Control Activities

In Sri Lanka, malaria vectors are mainly controlled by a strategy of integrated vector management. 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, impregnation of mosquito nets with permethrin and space spraying for special occasions. Table 3 shows the insecticides that had been used for indoor residual spraying in different districts.

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

Table 3. 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					
Kalmune					
Trincomalie					
Kurunegala					
Maho					
Puttalam					
Anuradhapura					
Polonnaruwa					
Moneragala					
Badulla					
Ratnapura					

The total number of houses fully sprayed were 78409, partially sprayed 2592 during the year of 2010, and the total population covered was 314146.

Table 4. Utilization of insecticides for malaria vector control operations in 2010

Insecticides	Usage during 2009
Indoor Residual Spraying	
Deltamethrin 5% wdp (1 barrel = 11.25kg)	287.24 kg
Cyfluthrin 10% wdp(1 barrel = 9 kg)	1142.4 kg
Bifenthrin10% wdp(1pkt=112.5g)	816.9 kg
Lambdacyhalothrin 10% wdp (1 barrel = 20kg)	1862.2 kg
Etofenprox 20% wdp(1 barrel = 9kg)	2.1 kg

Table 5. Distribution of Long Lasting insecticides treated nets for Malaria Control - 2010

District/Institution	No. of LLINs distributed
Moneragala	10,000
Hambantota	10,000
Matale	10,000
Kurunegala A	7,500
Kurunegala B	7,500
Maho	5,000
Puttalam	10,000
Embilipitiya	10,000
Jaffna	7,000
Kilinochchi	7,000
Mulativu	5,000
Mannar	6,000
Vavuniya	5,000
Ampara	6,000
Kalmune	5,900
Batticaloa	7,500
Trincomalie	4,000
Total	123,400

Infrastructure and Human Resources

At the end of year 2010, AMC Headquarters had following category of staff. The below table No 6 shows the number of staff in each category as at the end of year 2010.

Table 6. Staff position at Anti Malaria campaign Headquarters - 2010

Category of Staff	Approved cadre	In position	
		Male	Female
1	Administrative Grade MOO	2	0
2	Community Physicians	2	1
3	Parasitologist	1	0
4	Entomologist	2	0
5	MOO Gr I	0	1
6	MOO Gr II	5	2
7	MOO Preliminary	0	0
8	Accountant	1	0
9	Development Assistant	0	2
10	Management Assistant	14	5
11	Data Entry Operator	2	0
12	Public Management Assistant Services	0	0
13	Store keeper	3	0
14	Public Health inspectors	2	0
15	Entomological Assistant	5	4
16	Public Health Field Assistant	10	3
17	Public Health Laboratory Technicians	22	3
18	Cinema Operator	1	0
19	Driver	19	18
20	K.K.S.	1	1
21	Roneo Operator	1	1
22	Lab Orderly	3	0
23	Spray Machine Operator	19	12
24	Ordinary Labourer	19	6
25	Sanitary Labourer	25	32
26	Labourer (Casual)	0	1
27	Registered Medical officer	0	0
28	Ward Clerk	0	0
	Total	159	97

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 7. 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 number of different types of tablets distributed to the RMO regions in the year of 2010.

Table 16. Stock position of anti malarial drugs during 2010

District	Chloroquine tablets	Primaquine tablets	Quinine tablets	Quinine injection
Amount in stores in January 2010	47,000	32,000	920	60
Amount received in 2010	23,000	37,000	2,500	-
Amount issued in the year 2010	74,000	93,000	3210	251
Amount available at end of 2010				-

Table 17. Distribution of anti malarial drugs from Headquarters by recipient

Recipient	Chloroquine tablets	Primaquine tablets	Quinine tablets	Quinine injection
Ampara		2000		
Anuradhapura	17,000	25,000	710	10
Baddulla		2000	500	
Colombo	8000	4000	250	111
Embilipitiya		1000		
Galle	1000			
Hambantota	10000	11000	250	20
Kandy	2,000	12,000	750	70
Kegalle	1000	1000	750	30
Kilinochchi	5000			
Kurunegala	4000	6000		
Maho		2000		
Mannar	2000	3000		
Matale		2000		
Moneragala	10000	8000		
Puttalam	4000	1000		10
Trincomalee		3000		
Vavuniya	10000	10000		
Total	74,000	93,000	3210	251

Buildings

The Anti Malaria Campaign Headquarters is located at the Public Health Complex at 555/5, ElvitigalaMawatha, Colombo 5. The Director's room, the project director's room of GFATM, Consultant Community Physicians room, Medical officers room, Accounts division of GFATM project, the Public Health Inspectors room, The Library, The Computer room, the telephone exchange and the Auditorium are in the 3rd floor. The Administration branch, finance branch, the Accountants room and stores are located in the 5 th floor. The Central Parasitology Laboratory and Parasitologist's room, Entomology Laboratory and Entomologist's room and Record room are located in the 6th floor.

Foreign funded malaria control activities in the year of 2010

During the year 2010 GFATM and WHO assisted malaria control activities in Sri Lanka.

WHO technical assistance to the Malaria Control Programme in 2010 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.

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

During the year 2010, 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 2012 in non-conflict & transitional areas of the country and elimination of *P. vivax* malaria in 75% of non-conflict & transitional areas of the country by 2013, intensify malaria control activities in conflict affected areas to reduce the API by 2013 to 75% of that reported in 2007 in these areas and strengthening programme management and capacity building. Round 8 GFATM Project covers all the districts in the country.

The following activities were carried out during the year 2010

GFATM Round 8 Malaria Control Project

The following activities were carried out during the year 2010 under this project.

Conducting malaria mobile clinics in high risk areas.

Two thousand Three hundred and forty nine malaria mobile clinics were conducted (98% of target achieved) to reduce malaria transmission among vulnerable and mobile populations through early detection and treatment. A total of 170,427 blood smears examined from all project districts and 27 positive case of *P. vivax* were detected from mobile clinics in Hambantota, Moneragala and Anuradhapura districts.

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 & distributed among project districts in 2010 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.

Four additional days of entomological surveillance 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 2515 additional entomological surveillance days were funded by the project.

Strengthening of entomological & 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.

Eight hundred and forty five field staff were (PHII, PHFOO, PHLTs, PHFO & SMOO) received refresher training for updating knowledge and skills in environment friendly malaria control methods.

Twelve monthly reviews on GFATM activities in project districts with the participation of Regional Malaria Officers, Technical Staff of AMC Headquarters and representatives of Sarvodaya, TEDHA, were conducted at Anti Malaria Campaign Headquarters to assess the progress of work qualitatively and quantitatively.