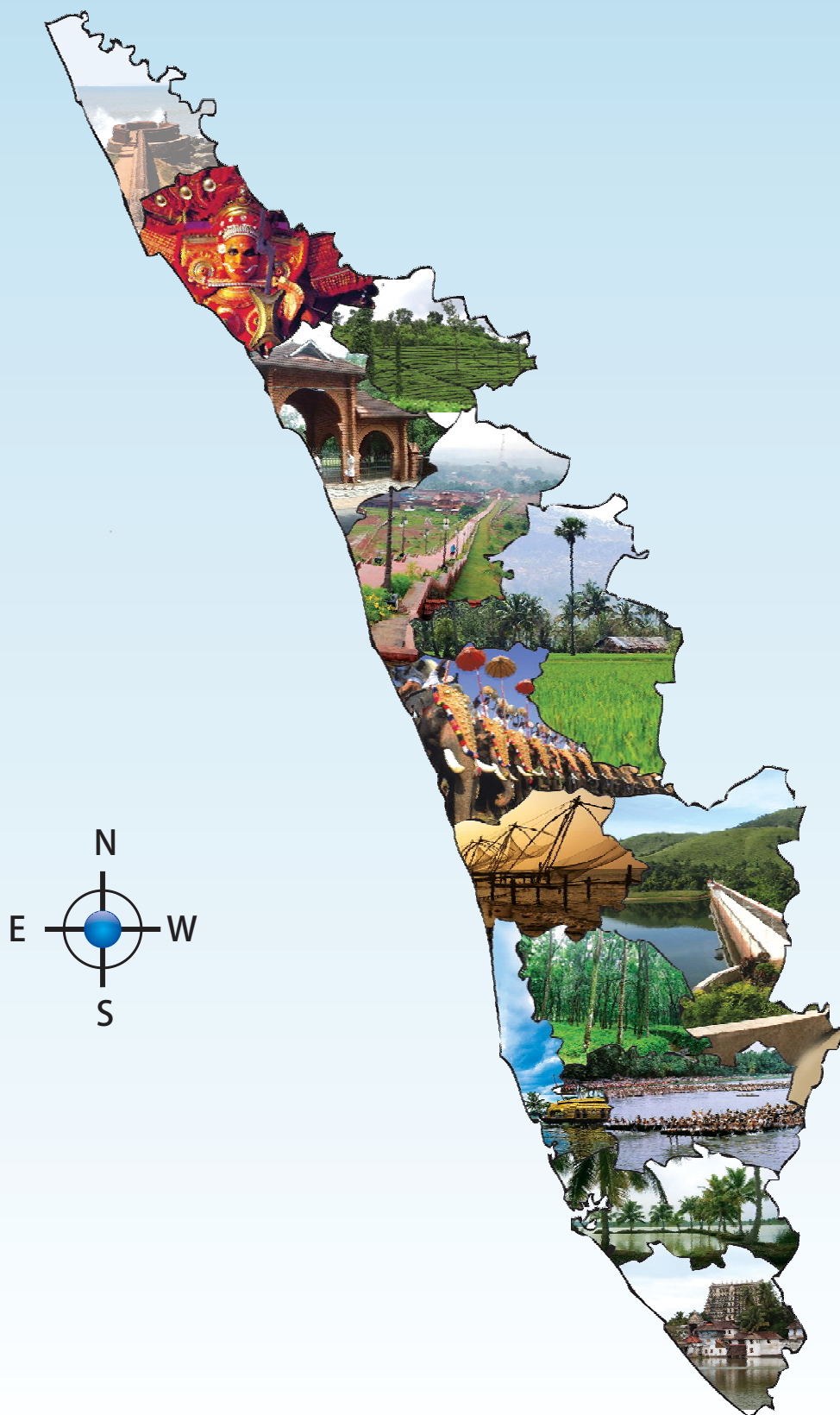


District wise Situational Analysis of Communicable Diseases (2006-2010)



THIRUVANANTHAPURAM

Communicable Diseases (2006-2010) THIRUVANANTHAPURAM												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	99	1	145	0	81	0	188	0	138	1	651	2
Dengue	656	0	290	0	503	2	805	2	1145	1	3399	5
CG-Sus	8311	0	1208	0	9	0	1453	0	330	0	11311	0
CG- Conf	0	0	133	0	20	0	93	0	55	0	301	0
JE/AES	0	0	0	0	9	0	20	6	3	3	32	9
Lepto	196	0	113	2	358	3	483	14	312	1	1462	20
Hepatitis-A	674	0	146	0	105	0	185	3	75	1	1185	4
Typhoid	1260	0	182	0	88	0	298	0	257	0	2085	0
Cholera	0	0	0	0	0	0	1	1	0	0	1	1
ADD	21913	0	14454	0	16148	0	19299	0	18759	1	90573	1
Hepatitis-B	154	0	11	0	101	2	313	7	181	3	760	12
H1N1	0	0	0	0	0	0	336	3	303	22	639	25

KOLLAM

Communicable Diseases (2006-2010) KOLLAM												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	150	0	134	1	89	0	72	0	118	1	563	2
Dengue	81	1	70	5	12	0	21	0	66	3	250	9
CG-Sus	164	0	918	0	1	0	0	0	0	0	1083	0
CG- Conf	0	0	90	0	1	0	0	0	0	0	91	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	97	13	61	14	38	4	29	2	29	6	254	39
Hepatitis-A	765	1	385	0	250	0	278	0	145	0	1823	1
Typhoid	71	0	42	0	24	0	26	0	28	0	191	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
ADD	20509	0	18755	0	7655	0	6637	0	7717	0	61273	0
Hepatitis-B	154	1	102	5	112	0	133	0	54	0	555	6
H1N1	0	0	0	0	0	0	54	3	89	15	143	18

PATHANAMTHITTA

Communicable Diseases (2006-2010) PATHANAMTHITTA												
	2006		2007		2008		2009		2010		Total	
DISEASE	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	156	0	155	0	140	0	130	0	154	0	735	0
Dengue	19	0	28	0	4	0	34	1	144	0	229	1
CG-Sus	697	0	3456	0	0	0	2	0	0	0	4155	0
CG- Conf	0	0	85	0	0	0	1	0	0	0	86	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	78	3	38	13	15	4	16	5	11	1	158	26
Hepatitis-A	415	1	437	0	985	3	563	2	169	1	2569	7
Typhoid	53	0	66	0	20	0	55	0	34	1	228	1
Cholera	0	0	0	0	0	0	1	0	0	0	1	0
ADD	11099	0	10747	0	4464	1	6464	0	5588	0	38362	1
Hepatitis-B	135	0	160	4	229	4	341	4	163	0	1028	12
H1N1	0	0	0	0	0	0	48	3	12	1	60	4

ALAPPUZA

Communicable Diseases (2006-2010) ALAPPUZA												
	2006		2007		2008		2009		2010		Total	
DISEASE	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	220	0	152	0	136	0	118	0	115	0	741	0
Dengue	28	0	13	1	10	0	18	0	68	1	137	2
CG-Sus	58308	0	1848	0	2	0	0	0	11	0	60169	0
CG- Conf	16	0	110	0	2	0	0	0	3	0	131	0
JE/AES	14	1	1	0	0	0	0	0	0	0	15	1
Lepto	360	20	90	19	271	24	70	8	130	12	921	83
Hepatitis-A	199	0	279	0	441	0	446	1	368	0	1733	1
Typhoid	98	0	35	0	52	0	82	0	152	0	419	0
Cholera	1	0	0	0	0	0	20	1	1	0	22	1
ADD	23239	0	23822	0	25945	0	31111	1	22670	0	126787	1
Hepatitis-B	48	0	7	1	9	0	23	1	23	0	110	2
H1N1	0	0	0	0	0	0	83	3	37	3	120	6

KOTTAYAM

Communicable Diseases (2006-2010) KOTTAYAM												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	65	0	52	0	51	0	47	1	52	0	267	1
Dengue	8	0	7	1	20	0	160	2	330	3	525	6
CG-Sus	149	0	10662	0	1	0	8	0	179	0	10999	0
CG- Conf	0	0	0	0	0	0	7	0	12	0	19	0
JE/AES	0	0	0	0	0	0	0	0	16	2	16	2
Lepto	89	7	81	22	48	7	75	10	56	2	349	48
Hepatitis-A	690	4	318	1	591	5	642	7	383	1	2624	18
Typhoid	38	0	11	0	44	0	61	0	43	0	197	0
Cholera	0	0	0	0	0	0	1	0	2	0	3	0
ADD	4785	0	5408	0	7428	0	7643	0	7139	0	32403	0
Hepatitis-B	12	1	9	1	20	3	34	4	13	1	88	10
H1N1	0	0	0	0	0	0	59	0	41	3	100	3

IDUKKI

Communicable Diseases (2006-2010) IDUKKI												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	72	0	91	0	66	0	62	0	54	0	345	0
Dengue	17	1	22	1	5	0	20	0	169	1	233	3
CG-Sus	43	0	538	0	0	0	0	0	0	0	581	0
CG- Conf	0	0	28	0	0	0	0	0	0	0	28	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	138	4	121	8	49	4	32	1	54	5	394	22
Hepatitis-A	501	2	525	1	490	1	299	1	98	1	1913	6
Typhoid	293	0	212	0	79	0	116	0	134	0	834	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
ADD	27805	0	14342	0	7979	0	15833	0	13721	0	79680	0
Hepatitis-B	23	0	9	1	19	0	31	0	31	1	113	2
H1N1	0	0	0	0	0	0	55	2	6	3	61	5

ERNAKULAM

Communicable Diseases (2006-2010) ERNAKULAM												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	148	3	113	0	171	1	172	2	157	2	761	8
Dengue	59	0	24	1	100	1	85	0	114	2	382	4
CG-Sus	1840	0	1882	0	4	0	0	0	7	0	3733	0
CG-Conf	0	0	65	0	0	0	3	0	4	0	72	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	207	20	111	25	153	12	111	5	107	4	689	66
Hepatitis-A	281	0	594	1	427	1	47	1	36	0	1385	3
Typhoid	657	0	279	0	245	0	192	0	77	0	1450	0
Cholera	9	0	0	0	0	0	0	0	0	0	9	0
ADD	17615	0	16993	0	14608	0	21677	0	25448	0	96341	0
Hepatitis-B	5	0	4	0	2	0	8	0	0	0	19	0
H1N1	0	0	0	0	0	0	160	3	255	5	415	8

THRISSUR

Communicable Diseases (2006-2010) THRISSUR												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	222	0	177	0	214	0	162	0	219	1	994	1
Dengue	72	0	89	0	10	0	152	0	74	0	397	0
CG-Sus	93	0	333	0	36	0	74	0	45	0	581	0
CG-Conf	0	0	48	0	11	0	29	0	23	0	111	0
JE/AES	0	0	1	1	0	0	3	3	1	0	5	4
Lepto	247	11	202	47	75	20	97	11	31	1	652	90
Hepatitis-A	32	0	51	0	166	4	616	4	174	0	1039	8
Typhoid	18	0	51	0	53	0	112	0	91	0	325	0
Cholera	0	0	0	0	0	0	1	0	0	0	1	0
ADD	11862	0	21560	2	22164	0	35025	2	39023	1	129634	5
Hepatitis-B	1	0	5	0	2	1	13	1	14	1	35	3
H1N1	0	0	0	0	0	0	128	3	237	10	365	13

PALAKKAD

Communicable Diseases (2006-2010) PALAKKAD												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	87	0	68	0	95	0	87	0	110	0	447	0
Dengue	26	2	6	0	7	0	19	0	14	0	72	2
CG-Sus	765	0	269	0	109	0	93	0	9	0	1245	0
CG- Conf	0	0	271	0	50	0	36	0	3	0	360	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	41	7	48	5	23	4	13	1	38	8	163	25
Hepatitis-A	243	1	281	0	282	0	377	2	204	0	1387	3
Typhoid	850	9	591	0	584	0	526	0	669	0	3220	9
Cholera	2	0	5	0	4	0	0	0	0	0	11	0
ADD	59354	1	65002	3	50226	0	45215	0	48425	0	268222	4
Hepatitis-B	0	0	0	0	0	0	0	0	19	0	19	0
H1N1	0	0	0	0	0	0	56	2	29	7	85	9

MALAPPURAM

Communicable Diseases (2006-2010) MALAPPURAM												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	191	0	184	1	246	1	161	0	347	0	1129	2
Dengue	5	0	8	0	7	0	13	1	18	0	51	1
CG-Sus	12	0	1886	0	421	0	3930	0	1	0	6250	0
CG- Conf	11	0	16	0	23	0	142	0	1	0	193	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	68	2	124	17	50	6	40	11	29	5	311	41
Hepatitis-A	1092	0	1216	0	1623	2	1791	0	1404	1	7126	3
Typhoid	1544	0	1356	0	268	0	500	0	337	0	4005	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
ADD	90232	1	77028	1	60212	0	80653	0	69010	1	377135	3
Hepatitis-B	7	0	9	0	5	1	17	3	6	0	44	4
H1N1	0	0	0	0	0	0	283	7	158	9	441	16

KOZHIKODE

Communicable Diseases (2006-2010) KOZHIKODE

DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	182	2	161	1	143	0	125	1	228	2	839	6
Dengue	13	1	44	2	25	0	11	0	47	2	140	5
CG-Sus	307	0	840	0	562	0	3339	0	15	0	5063	0
CG- Conf	24	0	54	0	69	0	64	0	10	0	221	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	102	6	171	38	80	18	24	1	48	3	425	66
Hepatitis-A	1060	2	982	1	1398	0	1965	0	1713	1	7118	4
Typhoid	202	0	211	0	232	0	183	0	199	0	1027	0
Cholera	0	0	0	0	2	0	0	0	0	0	2	0
ADD	30396	1	35902	0	41716	0	47664	0	42153	0	197831	1
Hepatitis-B	0	0	0	0	0	0	8	0	9	1	17	1
H1N1	0	0	0	0	0	0	150	1	181	8	331	9

WAYANAD

Communicable Diseases (2006-2010) WAYANAD

DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	21	0	27	0	24	0	38	0	44	0	154	0
Dengue	2	0	29	0	8	0	25	0	29	0	93	0
CG-Sus	3	0	60	0	37	0	245	0	378	0	723	0
CG- Conf	0	0	13	0	11	0	60	0	55	0	139	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	76	0	97	6	52	12	96	12	69	21	390	51
Hepatitis-A	253	0	90	0	100	0	278	1	199	0	920	1
Typhoid	270	0	50	0	104	0	114	0	218	1	756	1
Cholera	0	0	1	1	0	0	0	0	0	0	1	1
ADD	15135	0	14544	0	13580	0	12571	0	11221	2	67051	2
Hepatitis-B	0	0	16	0	1	0	2	2	83	1	102	3
H1N1	0	0	0	0	0	0	53	1	47	1	100	2

KANNUR

Communicable Diseases (2006-2010) KANNUR												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	237	0	225	3	211	1	222	0	235	0	1130	4
Dengue	20	0	19	0	16	0	14	0	37	0	106	0
CG-Sus	21	0	77	0	90	0	3246	0	541	0	3975	0
CG- Conf	0	0	37	0	23	0	79	0	19	0	158	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	85	9	72	11	55	6	62	7	42	6	316	39
Hepatitis-A	56	0	38	0	90	0	247	0	186	0	617	0
Typhoid	40	0	23	0	58	0	123	0	126	0	370	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
ADD	28284	0	30902	0	25130	0	28529	0	33066	0	145911	0
Hepatitis-B	2	0	3	0	12	0	27	0	25	0	69	0
H1N1	0	0	0	0	0	0	103	0	64	1	167	1

KASARAGOD

Communicable Diseases (2006-2010) KASARAGOD												
DISEASE	2006		2007		2008		2009		2010		Total	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Malaria	280	0	243	0	137	0	462	2	328	0	1450	2
Dengue	13	0	8	0	6	0	48	0	342	4	417	4
CG-Sus	18	0	75	0	23413	0	959	0	192	0	24657	0
CG- Conf	3	0	31	0	260	0	83	0	25	0	402	0
JE/AES	0	0	0	0	0	0	0	0	0	0	0	0
Lepto	37	2	30	2	38	12	89	19	60	10	254	45
Hepatitis-A	24	0	8	0	15	0	110	0	27	0	184	0
Typhoid	23	0	51	0	39	0	244	0	164	0	521	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0
ADD	8258	0	12423	0	13327	0	20757	0	22359	0	77124	0
Hepatitis-B	0	0	1	0	0	0	3	0	9	0	13	0
H1N1	0	0	0	0	0	0	10	0	75	2	85	2

Situation Analysis of Vector Borne Diseases in Kerala

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Epidemic Situation of Vector Borne Diseases in Kerala

In the past, Kerala state was mainly endemic for malaria and lymphatic filariasis. Malaria was prevalent in the hills and foothills of the state whereas lymphatic filariasis was predominant in the coastal belt. Now there has been an unprecedented upsurge of vector-borne viral diseases since 1996. Japanese encephalitis (JE) first appeared in the state in Kuttanadu area in Alapuzha

district in the year 1996. Dengue fever, which surfaced as a new problem in the state in 1997, assumed epidemic proportions in 2003 and resulted in 3546 cases and 35 deaths. Dengue fever is now seen in all districts of the state. Chikungunya fever, appeared in epidemic form during 2006, added a new dimension to the entire scenario of vector borne diseases in Kerala. A few cases of coetaneous leishmaniasis were also reported from Kuttichal PHC area in Thiruvananthapuram district in 2009. More details are given in Table 1 and Graph 1.

Table 1. Situation of Vector Borne Diseases at a Glance

Disease	2005		2006		2007		2008		2009		2010	
	C	D	C	D	C	D	C	D	C	D	C	D
Malaria	2554	6	2130	6	1927	6	1804	4	2046	5	2299	6
Dengue	1028	7	1019	5	657	11	733	3	1425	6	2597	17
Suspected Chikungunya	0	0	70731	0	24052	0	24685	0	13349	0	1708	0
Confirmed Chikungunya			54	0	1092	0	470	0	597	0	210	0
JE / AES	6	4	3	3	2	0	2	1	23	9	20	5
Leishmaniasis (Cutaneous)	0	0	0	0	0	0	0	0	4	0	0	0

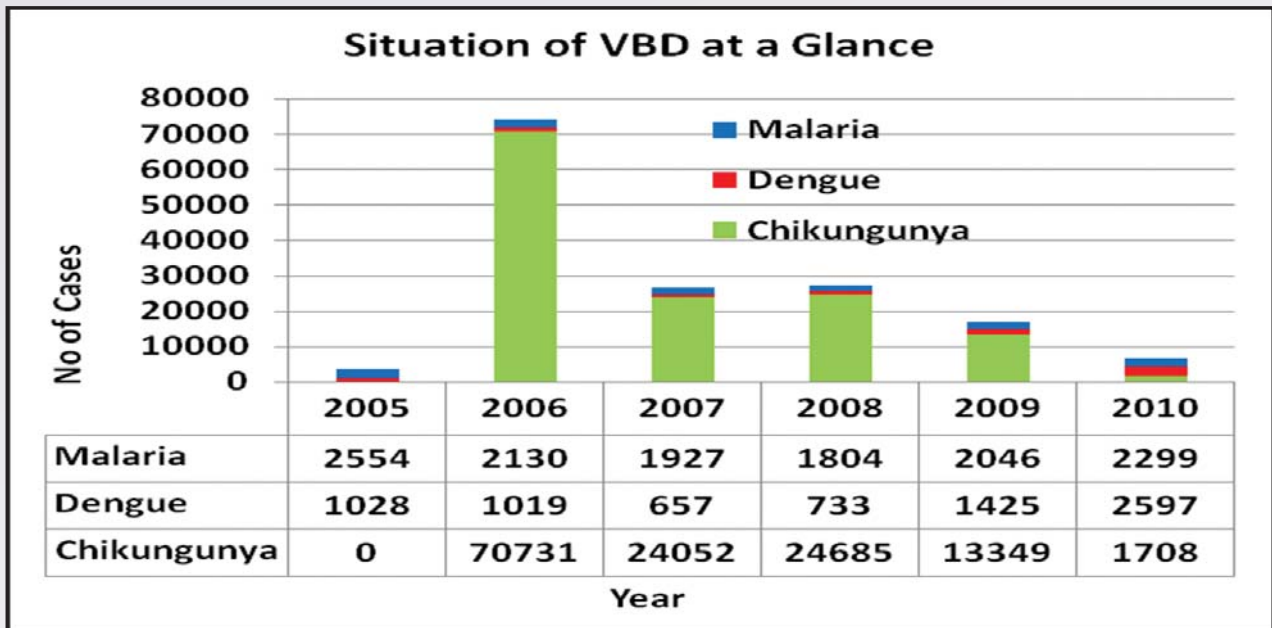
1. Malaria

Epidemic Situation

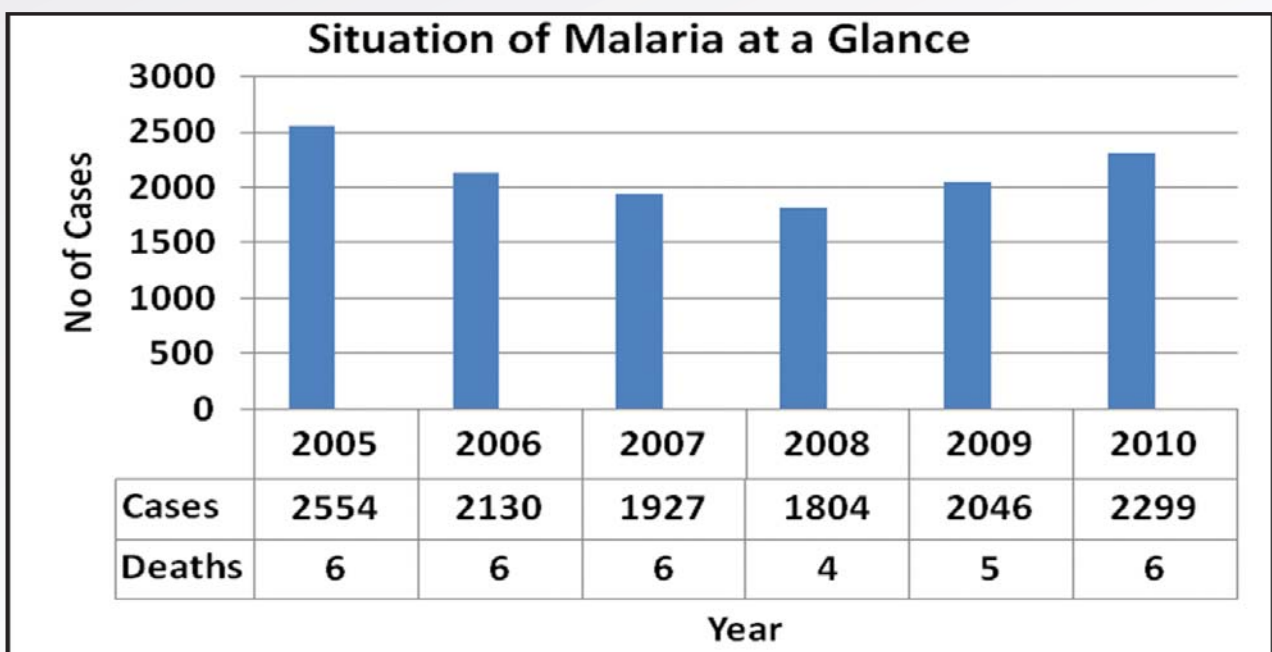
Malaria was successfully eradicated from the state in 1965. But resurgence occurred in the state after a few years following the

importation of cases from other endemic states coupled with the slow and gradual build up of vector population in the absence of complete and regular rounds of indoor residual spray. The number of cases of malaria decreased till 2008 and then increased by about

Graph 1. Situation of VBD at a Glance



Graph 2. Situation of Malaria at a Glance



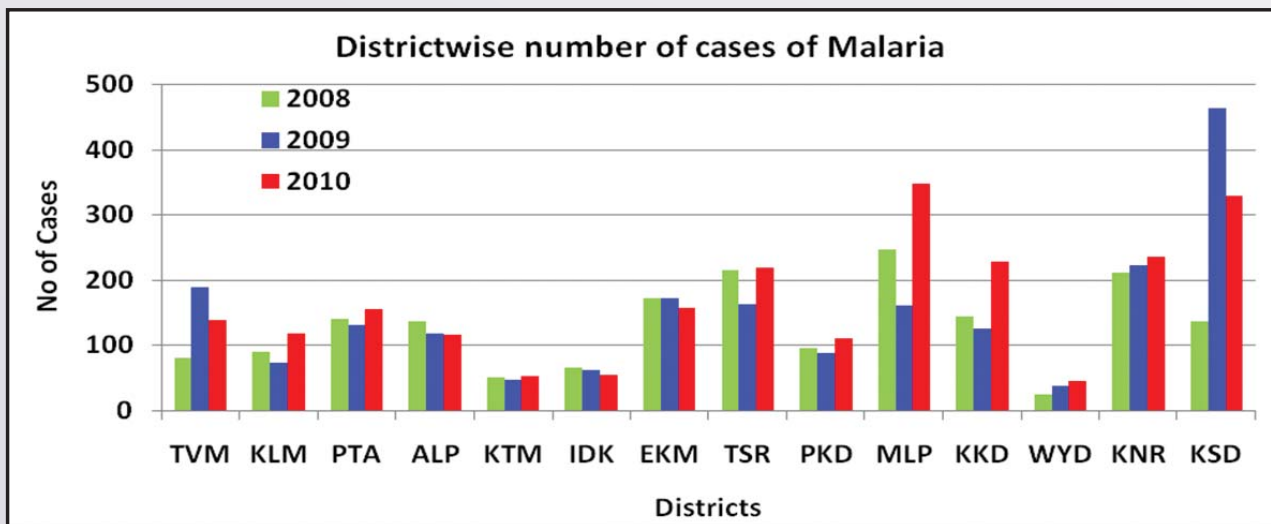
250 cases per year (Graph. 2). In 2010 highest number of cases was reported from Malappuram district. Earlier, Trivandrum, Kannur and Kasaragod districts reported more number of cases than other districts. In the State, about 90% of affected people were males and less than 5%

were children. The prevalence among women and children were very low. API is well below the target of GOI and proportion of Pf cases is within the safe levels. Details are given in Table 2, Graph 3, 4 and 5. In all districts API is well below 1 but above 0.1 in 2 districts (Trivandrum and Kasaragod). In Idukki district, Pf% is 20% and in all other districts it is less than 20% (Graph 6).

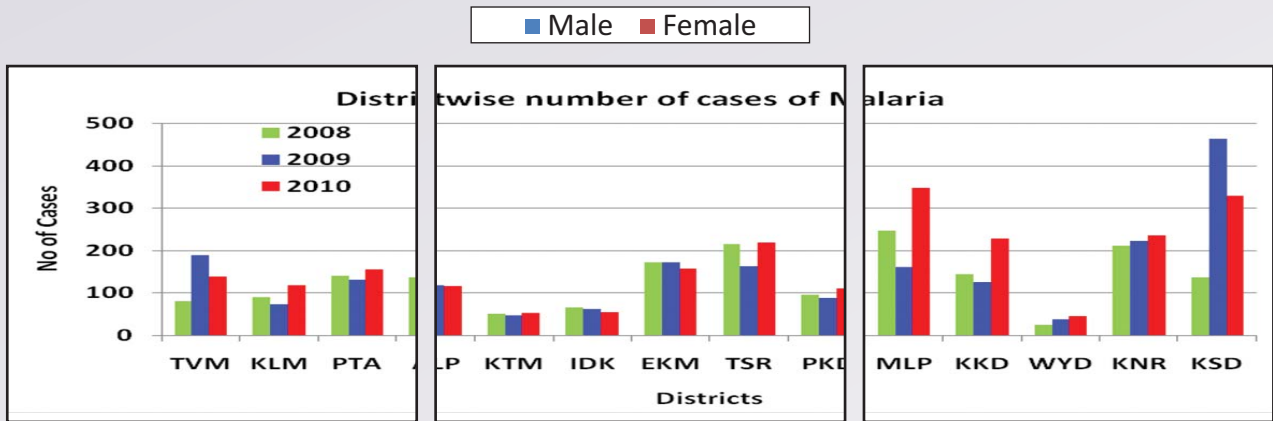
Table 2. Indices of Malaria in the State

Year	Population	Persons Examined (BSE)	Total cases	Pf cases	Death	ABER	API	Pf %	SPR	SFR
2004	32758608	1747620	2790	510	12	5.33	0.085	18.3	0.150	0.029
2005	33071962	2118032	2554	337	6	6.40	0.077	13.2	0.121	0.016
2006	33388732	2035634	2130	325	6	6.09	0.064	15.3	0.105	0.016
2007	33708959	1962317	1927	291	6	5.82	0.057	15.1	0.090	0.014
2008	33937865	1819294	1804	220	4	5.36	0.053	12.2	0.099	0.012
2009	34249833	2114395	2046	249	5	6.17	0.060	12.2	0.097	0.012
2010	34565029	2143497	2299	271	6	6.20	0.067	11.8	0.109	0.013

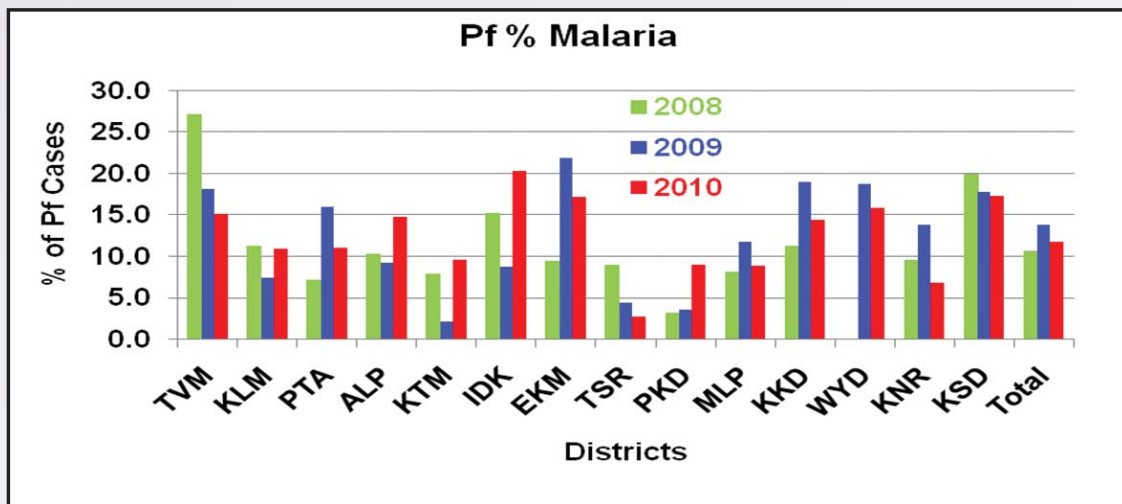
Graph 3. District wise number of cases of Malaria



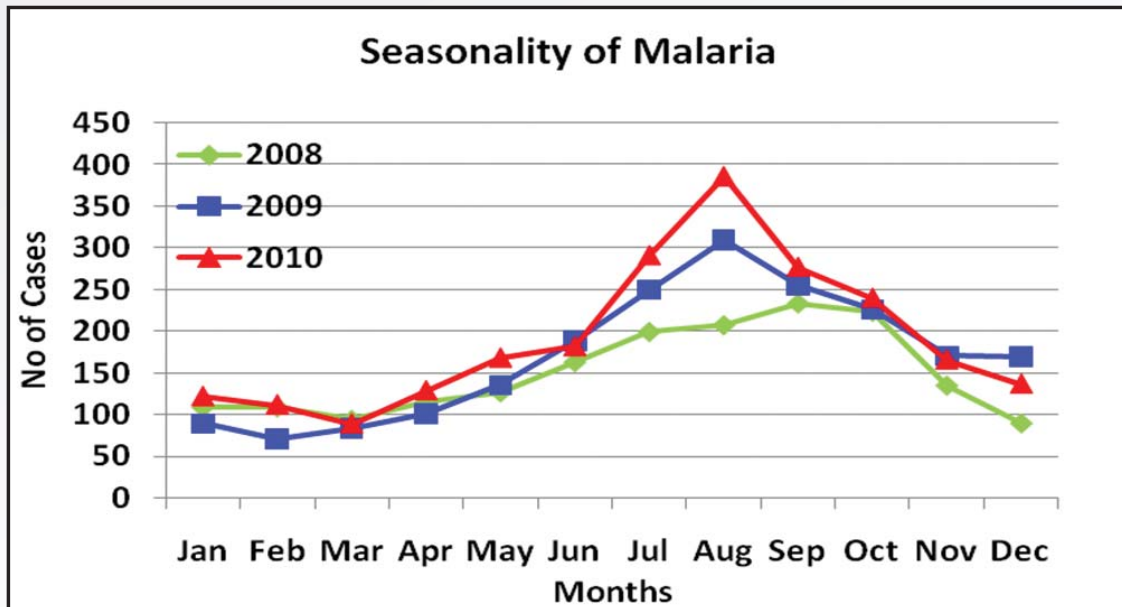
Graph 4. Sex wise incidence of Malaria in 2008



Graph 5. Proportion of Pf cases



Graph 6. Seasonality of Malaria



Problems

1. Increasing incidence of Imported Malaria: About 94% (94.5% in 2009 and 93.8% in 2010) of total malaria cases were imported cases. Nearly one third of them were immigrants who came with malaria, another one third were Keralites residing outside and returned home on contracting malaria and the rest one third were Keralites who visits other states for business or employment or study. All 4 deaths occurred were due to imported malaria.

2. Increasing outbreaks of Indigenous Malaria: Previously Thiruvananthapuram and Kasaragod were the high focus districts for control of outbreaks. In Thiruvananthapuram outbreaks occurred in Valiyathura, Poovar and Pozhiyur. Valiyathura is an outbreak prone area for last few years. Now 2 rounds of regular IRS is planned to avoid any further outbreaks. Poovar and Pozhiyur are border panchayaths with Tamil Nadu and outbreaks were due to cross border travel. In

Table 3. Details of Indigenous cases of Malaria

District	2008	2009	2010
TVM	2	29	52
TSR	9	2	0
PKD	0	0	13
MLP	0	0	48
KKD	0	0	18
WYD	2	0	0
KSD	4	82	2
State	17	113	133

Kasaragod, Kasaba beach and municipality are outbreak prone areas due to cross border travel. In 2010 outbreaks of indigenous malaria occurred in 4 other districts: Malappuram, Thrissur, Palakkad and Kozhikode. Many other towns are also under the threat of imported malaria which may lead to indigenous malaria.

3. Low ABER: The values of ABER were 5.4, 6.0 and 6.2 during the last 3 years. Active BSC was above 5% but passive BSC was about 1.2% only. This is due to low index of suspicion by doctors, due to very low prevalence in the community. This resulted in late detection of the cases and contributed to mortality.

Strategies for control

1. Regular screening of immigrants is required for early detection and prompt treatment. This has already started a few years ago and strengthened in the year 2010. Considering the large number of immigrants and non-availability of sufficient staff a special mechanism is needed for this. **An Immigrant Screening Team (IST)** may be formed for streamlining the activities.

2. Health Card may be issued to all immigrant labourers to ensure screening before registration.

3. Capacity building of doctors, HW and Laboratory Technicians is needed to enhance BSC (blood smear collection), to improve quality of slides and to increase the accuracy of laboratory confirmation. Training of private doctors is also needed to prevent unscientific treatment practice.

4. IEC activities are required to sensitise the immigrants to seek free medical care from the nearest health facility and to motivate Contractors and Supervisors send the immigrant labourers for medical check up as and when needed.

5. Inter sectoral co-ordination meetings and Liaison works with Labour Department, PRI, other departments, NGOs, civil society etc. are essential for better vector control measures.

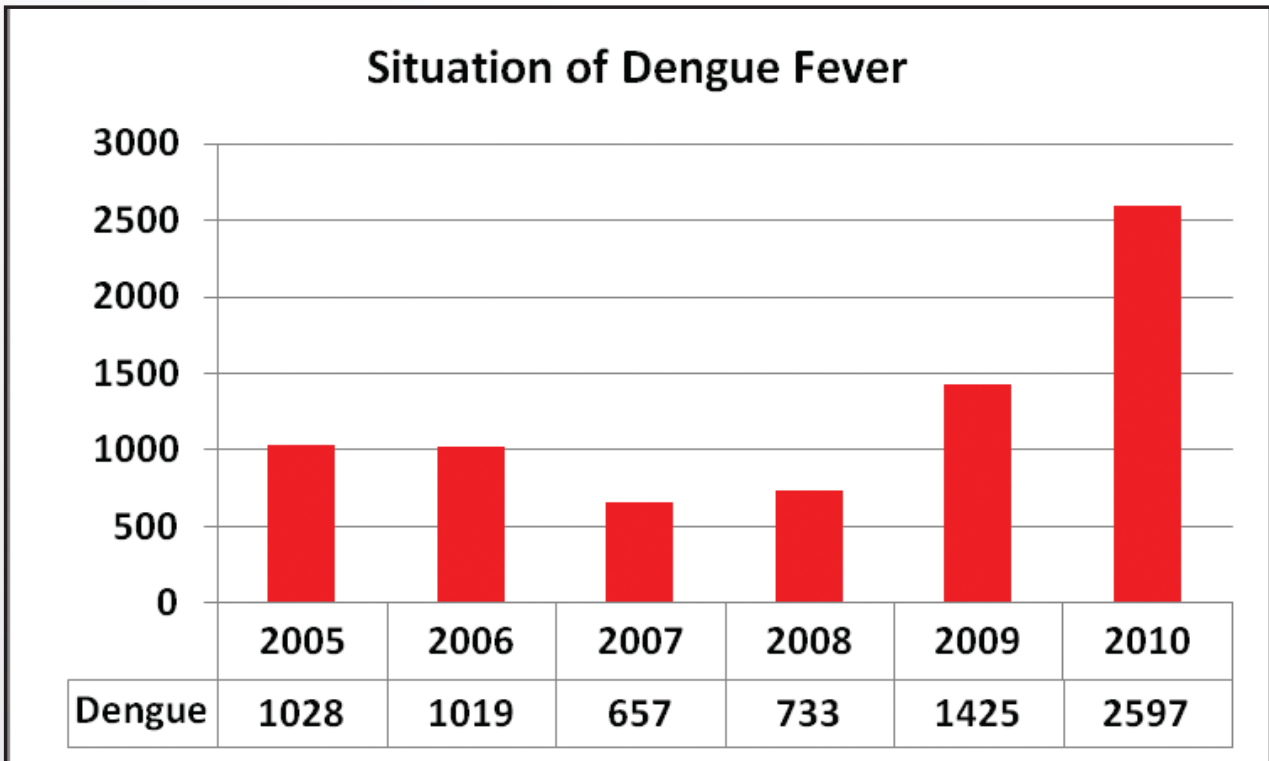
6. Vector control activities need to be strengthened against larvae and adult mosquitoes. The common breeding sources in the outbreak areas of Thiruvananthapuram, Malappuram, Kozhikode and Kasaragod are shallow wells and OHT. Many of them are covered with mosquito nets. Netting of remaining open wells and OHT are needed to be covered. Two rounds of IRS has to be continued in these areas. Larvivorous fishes are present in majority of wells here but close monitoring and replenishing the fishes is needed as and when needed.

7. Monitoring, supervision and reporting have to be further streamlined.

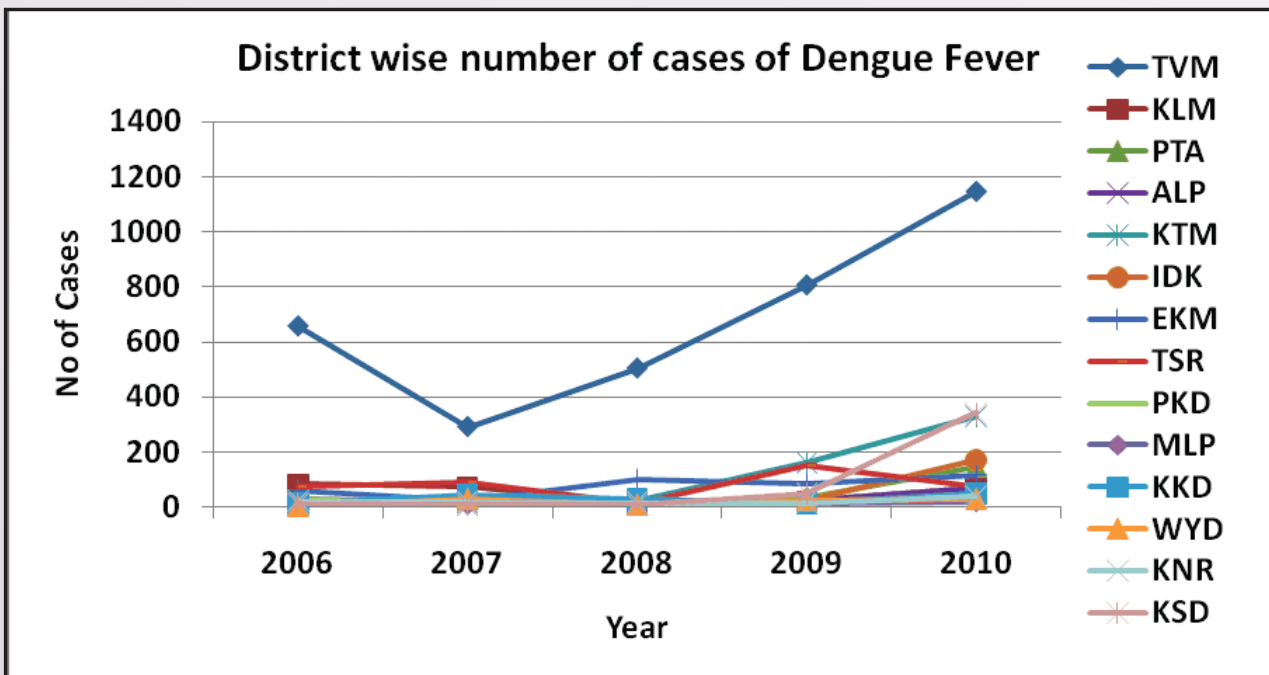
2. Dengue Fever

Dengue fever, which surfaced as a new problem in the state in 1997, assumed epidemic proportions in 2003 and resulted in 3546 cases and 35 deaths. Details of year wise cases are given in Graph 7. Dengue fever has now become almost perennial in some districts of the state. Although Dengue is reported from all districts, it is comparatively higher in Thiruvananthapuram, Kottayam, Idukki, Kannur and Kasaragod (Graph 8). In all districts except Thrissur, Palakkad and Wayanad the incidence of Dengue fever was higher in 2010 than the previous year. In 2010 Dengue fever outbreaks occurred in Thiruvananthapuram, Kottayam, Pathanamthitta, Idukki and Kasaragod.

Graph 7. Situation of Dengue Fever at a Glance

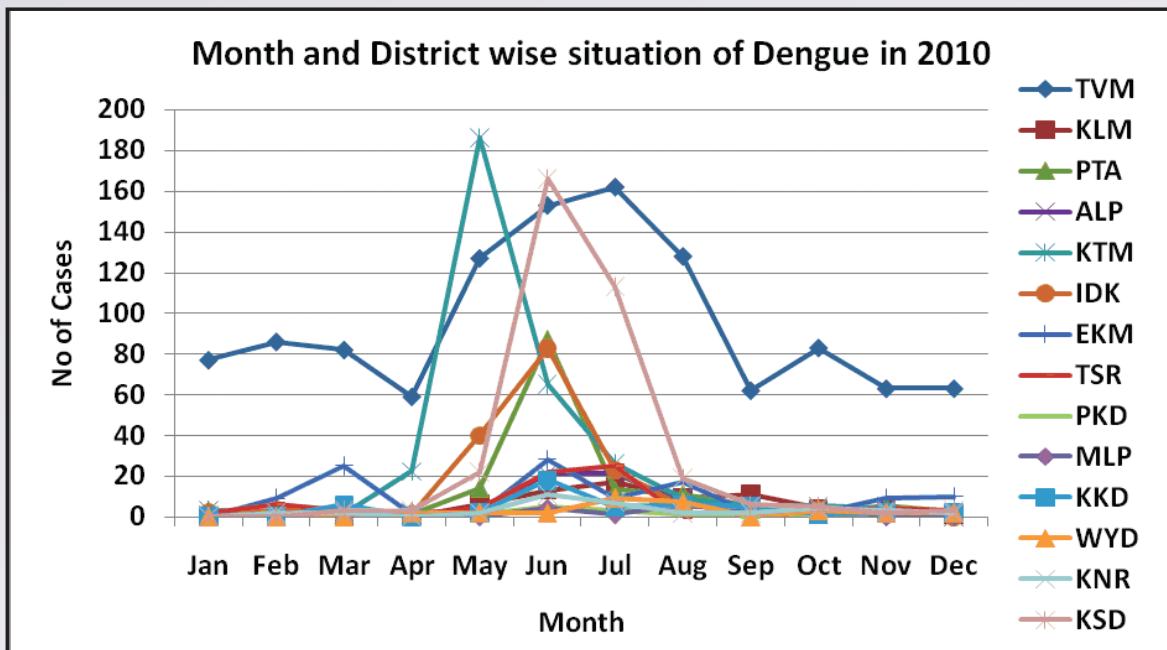


Graph 8. District wise number of cases of Dengue Fever



Seasonality and district wise situation of Dengue fever in 2010 is given in Graph 9.

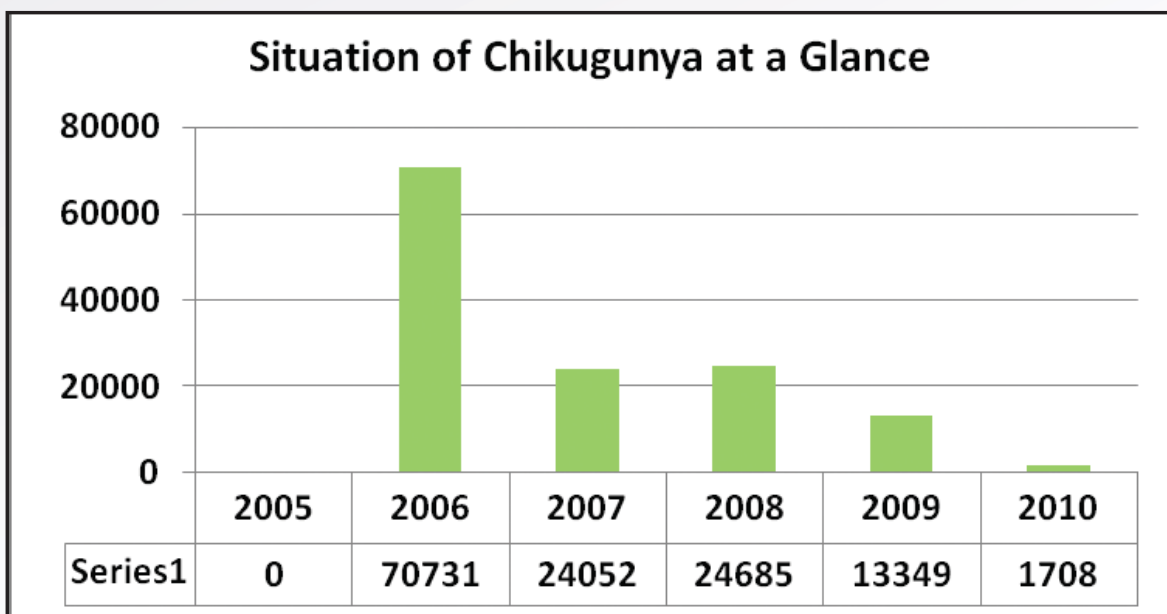
Graph 9. Month and District wise situation of Dengue in 2010



3. Chikungunya Fever

Chikungunya fever, another arboviral disease, which appeared in epidemic form during 2006, added a new dimension to the entire scenario of vector borne diseases in Kerala. This disease was reported largely from south in 2006, middle Kerala in 2007 and northern part in 2008. In 2009 it largely affected Kozhikode, Malappuram, Kannur and Kasaragod. The incidence is decreasing every year. Details are given in Graph 10, 11 and 12.

Graph 10. Situation of Suspected Chikugunya Fever at a Glance



Graph 11. District wise situation of Suspected Chikungunya Fever

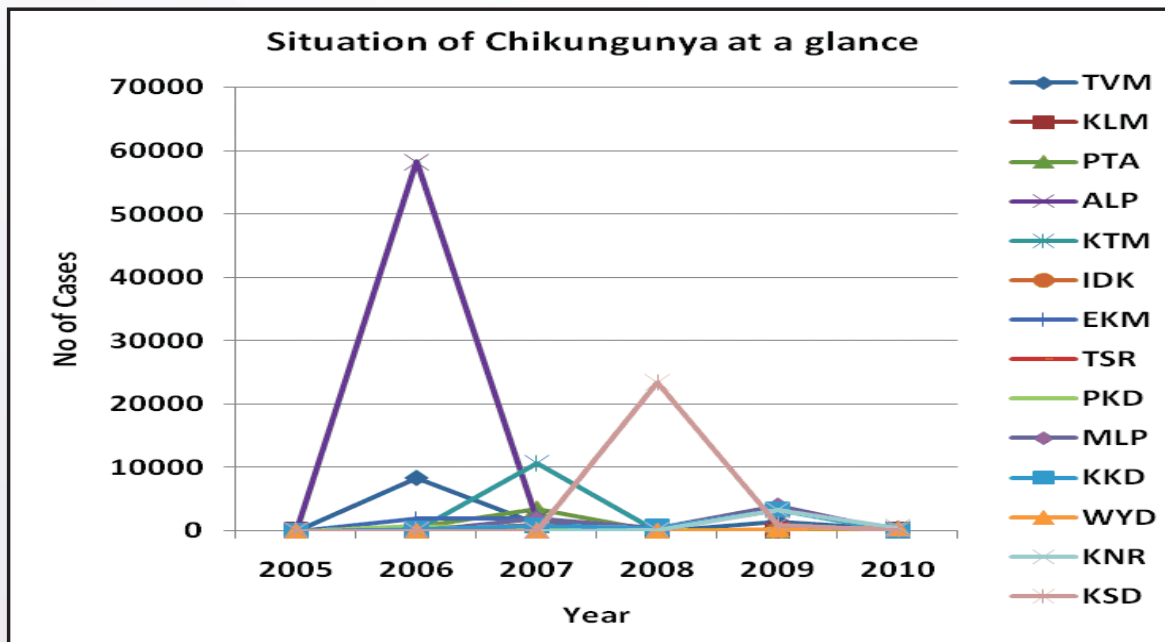
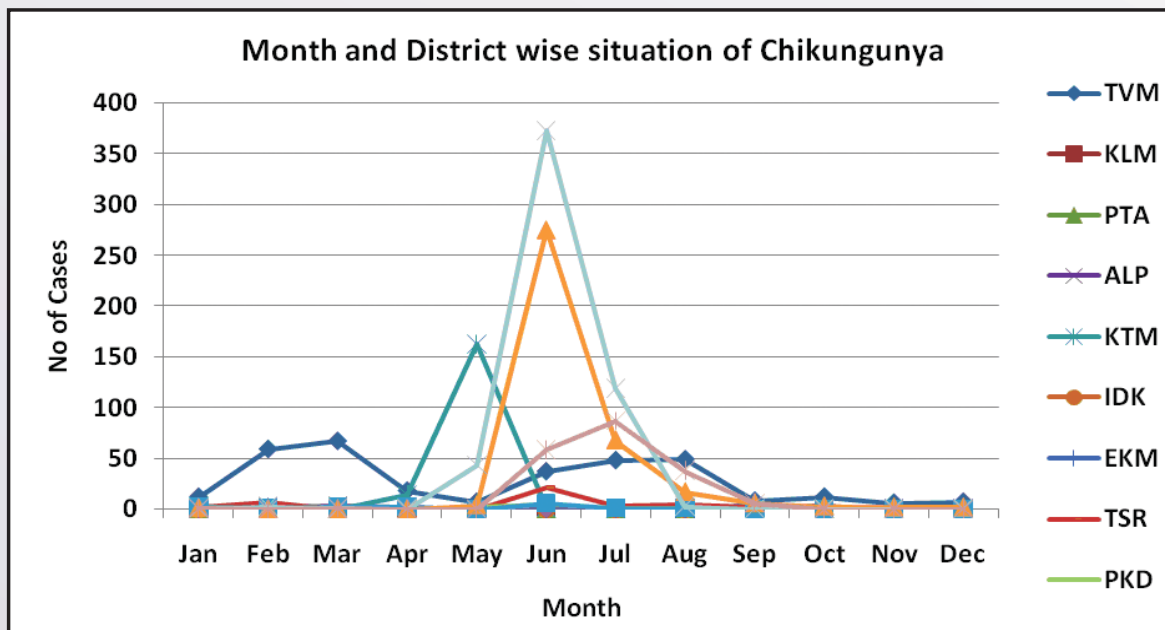


Table 12. Month and District wise situation of Suspected Chikungunya Fever in 2010



Specific Constraints for the control of Dengue and Chikungunya

1. Climatic and Geographical factors: These factors are suitable in Kerala for mosquito breeding. Large plantations of rubber, cocoa, pineapple, bamboo, areca nut etc are seen everywhere. Latex collection cups in rubber estates, hanging hollow cocoa fruits, pineapple

leaf axils, cut bamboo stumps and fallen areca nut leaves are rich breeding sources. Elimination of these breeding sources in estates requires enormous efforts. Rank vegetations seen ubiquitously also serve as breeding sources. Removing all vegetations will harm the environment.

2. Accumulation of solid waste in the street: Solid waste disposal in many towns and cities are not adequate. Domestic wastes are seen in the street in many places. The heaps of waste serve as breeding sources. Frequent rains favour the breeding.

3. Water storage practice: In places where there is water scarcity, people store water for domestic use. People may not take precautions to avoid breeding in these containers.

4. Presence of containers in and around houses: Plenty of containers are seen around the houses since there is some free land around many houses. There are containers inside the house also. People may not take precautions to avoid breeding in these containers. Some of the houses in the urban areas may be kept locked with breeding containers for months.

5. Negligence of people: In both urban and rural areas people is very busy with routine activities and not giving importance to avoid breeding in domestic and peri-domestic containers. They may not allow the strange volunteers to enter into the house to check the breeding.

6. Lack of man power in urban areas: In Corporation and Municipality where there is no PHC/CHC, sufficient man power is not available to coordinate the disease control activities.

7. Less number of SSH: At least one SSH should be established in all districts. Additional SSH may be established in the periphery of the district. The instant communication between SSH, DMO and PHC will help to start the control measures early.

Plan of Action

All districts are high risk areas for dengue and chikungunya. A year long intensive activity is required to prevent outbreaks of these diseases. A coordinated campaign with the help of other departments like LSG, Education, Social Welfare, Agriculture, ISM, Animal Husbandry, Irrigation, Water Authority and Suchitwa Mission is needed in all districts. Extensive repeated source reduction of mosquito breeding sites will be the main activity. This will be done with the help of people's participation. Involvement of NGOs, community leaders, professional groups, religious institutions, ASHA, women groups, residential associations etc will be emphasized. Sensitization meetings to various groups are needed to create awareness. Training programs to health workers, voluntary workers, teachers, leaders are required to motivate the community to participate in the campaigns. All will work together for source reduction and other mosquito control activities. A special health squad with

workers on daily wages may be formed in high risk districts to bring down the vector indices to very low levels even during the pre-monsoon period.

Special Dengue control program is unavoidable for Thiruvananthapuram district since Dengue is a problem throughout the year. Repeated Awareness cum action campaigns are needed with the help of Residence associations and PRI. Co-ordination meetings, source reduction with the involvement of volunteers, street cleansing with the help of labourers will be helpful.

4. AES including Japanese Encephalitis

Situation Analysis

There are no confirmed cases of JE in the state during the period from 2005 to 2009. In 2010 there were 3 confirmed cases. The total number of JE/AES cases reported from the districts is also very low. The report from the districts shows the total cases of AES/JE and there is no separate reporting of confirmed cases of JE. In this context the situation analysis of JE in the state is not of much relevance. However, considering various factors such as the presence of a large number of amplifier hosts (Pigs, migratory birds etc.), profuse breeding of vector mosquitoes and huge influx of people especially immigrant labourers from other states, the occurrence of outbreaks or even epidemics in the state can not be ruled out.

There had been major out breaks of JE in Alappuzha during the period from 1996 to 1998. The entire Kuttanad area was severely affected by the disease during the period. Since then the incidence of JE decreased gradually and now only a few confirmed cases are being reported from the state. It may not necessarily be due to the total absence of cases of JE but may be that cases are not properly diagnosed and confirmed. The current situation warrants improvement in the diagnostic facilities in the Sentinel Surveillance Hospitals and also in