

**VECTOR BORNE DISEASES CONTROL
DEPARTMENT**



Annual report 2018



Surat Municipal Corporation

Vector Borne Diseases Control Department **Surat Municipal corporation**

GENERAL INFORMATION

Surat city is situated in the southern part of Gujarat state. It lies between 21.112° North latitude & 72.814° East longitudes. It is situated on the bank of river Tapi. The city has flat coastal land. It is divided in to seven zones (Central, West, South, South-East, South-West, North & East,).

It is one of the most dynamic cities of India with one of the fastest growth rate due to immigration from various parts of Gujarat and other states of India. Surat is one of the cleanest cities of India and is also known by several other names like "THE SILK CITY", "THE DIAMOND CITY", "THE GREEN CITY", etc. It has a most vibrant present and an equally varied heritage of the past. It is the city where the British first land in India. The Dutch and the Portuguese also established their business centers in Surat, the remnants of which are still preserved in the modern day Surat. In past this was a glorious port with ships of more than 84 countries anchored in its harbour at any time.

Climate of the city is moderate with maximum temperature 44.5° C & minimum of 9.9° C the average rainfall is 60 inches. The total area of the city is 326.515 sq. k.m. & The total population according to 2011 one census is 44,66,826. The density of population per sq. km. is 13,680. The 10.78% of the population of Surat city lives in slums. The total number of census houses is 13,86,245.

Oldest Municipality	: 1852 AD.
Area	: 326.52 Sq.Km.
Population	: 44,66,826(2011)
Climate	: Humid
Rain	: 60" (Average)
Industries	: Jari, Textile, Silk, Diamond and Plastic.
Density	: 138 persons/ha
Slum pockets	: 334
Number of Zone	: 07
No. of Unit	: 35
UHC	: 43
CHC	: 07
Ward (Election)	: 29
Ward (Health)	: 87
Houses	: 13,86,245
Population	: Above 60 lacs (Year 2018)
Municipal Councillors	: 116
Committee	: 20

METEOROLOGICAL DATA

Temperature with seasonal variations: Maximum – 45° C Minimum - 11° C
Average - 25°– 35° C

Rainfall : Average - 60" Humidity: Average 60 ° & above

SOCIOECONOMIC CONDITION

Literacy : Male - 91 % Female - 83 %

Economic conditions based on some criteria:

Social Economic condition: Good - 75 % Poor - 25 %

Month wise rain fall data of Surat city for last eight Years (FORM NO. – 1)

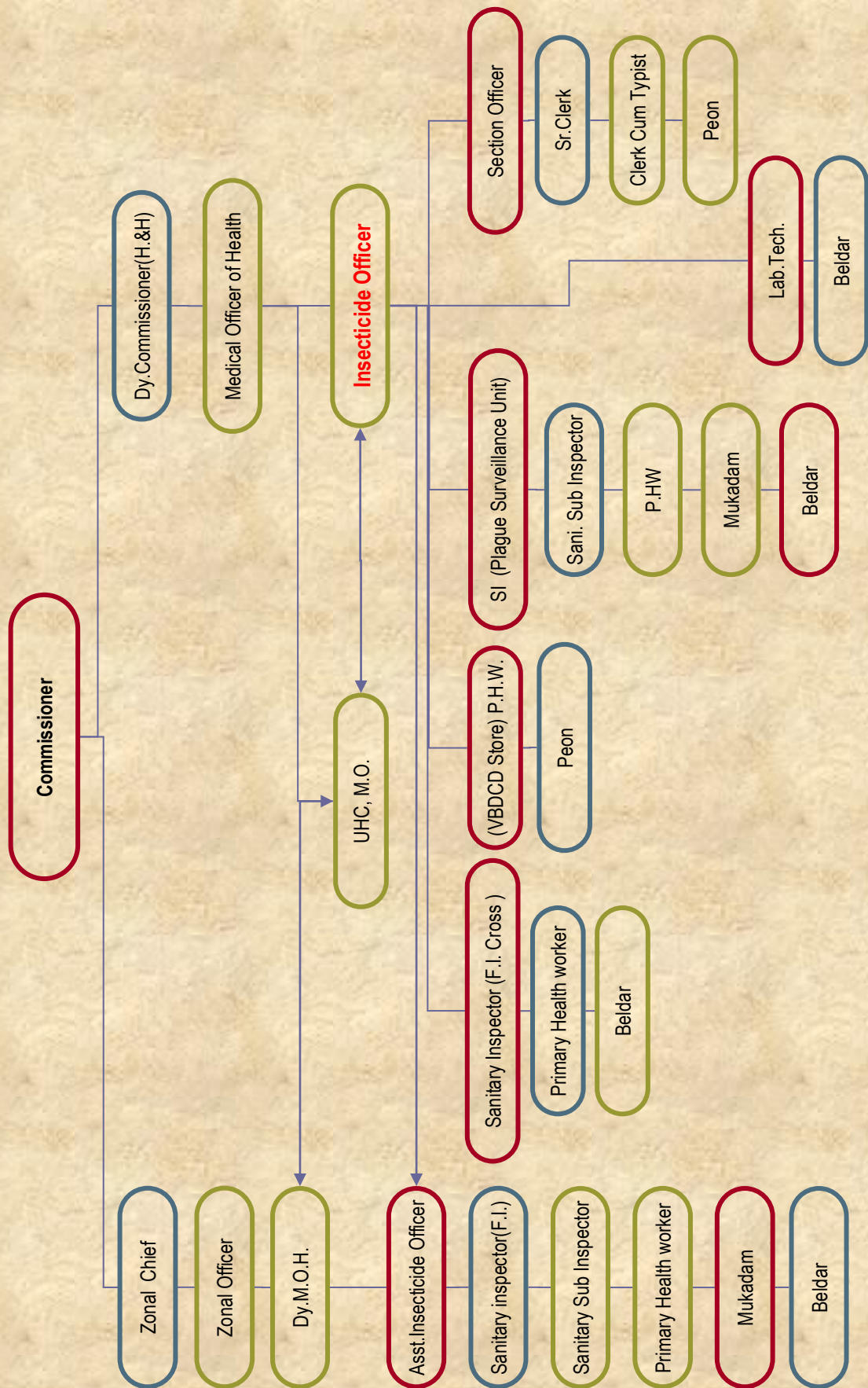
Month	Rainfall - Year 2012		Rainfall - Year 2013		Rainfall - Year 2014		Rainfall - Year 2015		Rainfall - Year 2016		Rainfall - Year 2017		Rainfall - Year 2018	
	Inch	M.M.	Inch	M.M.	Inch	M.M.	Inch	M.M.	Inch	M.M.	Inch	M.M.	Inch	M.M.
Jan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jun	2.50	63.0	25.57	648.0	1.63	41	9.40	238	4.41	112.0	14.30	362.0	8.04	201.0
Jul	12.00	304.0	24.29	614.0	21.89	556	6.60	167	14.37	365.0	16.11	407.0	30.47	753.0
Aug	6.87	174.0	11.47	293.0	6.96	177	1.66	42	8.81	224.0	15.38	390.0	8.44	213.0
Sep	14.77	374.0	20.95	528.0	7.61	192	9.08	230	5.16	131.0	5.65	146.0	4.35	110.0
Oct	0.48	12.0	2.04	52.0	--	--	0.16	4	4.34	110.0	1.06	27.0	0.55	14.0
Nov	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec	--	--	--	--	--	--	--	--	--	--	0.57	16.0	--	--
Total	36.62	927	84.32	2135	38.09	966	27.24	681	37.09	942	53.07	1348	51.85	1291

MEDIA /CULTURALS HABITS:

Use of mass media: There are All India Radio Station (FM), Local T.V. Channels, Local Newspapers, Hoarding, Banners and Handbills.

Traditional / folk dance or idioms: Garba Dance in Navratri, Holi, and Diwali Ganpati Festival, Ponk in winter and Ghari at Chandi Padvo.

HEALTH SERVICES SYSTEM: Organogram



Commissioner

Dy. Commissioner
(Health & Hospital)

Medical Officer of
Health

Dy. Medical Officer of
Health (Zone)

Insecticide Officer

Plague Surveillance
Unit
Cross Check Team
Insect Collectors
Lab. Tech.
(Epidemiological)
(Entomological)

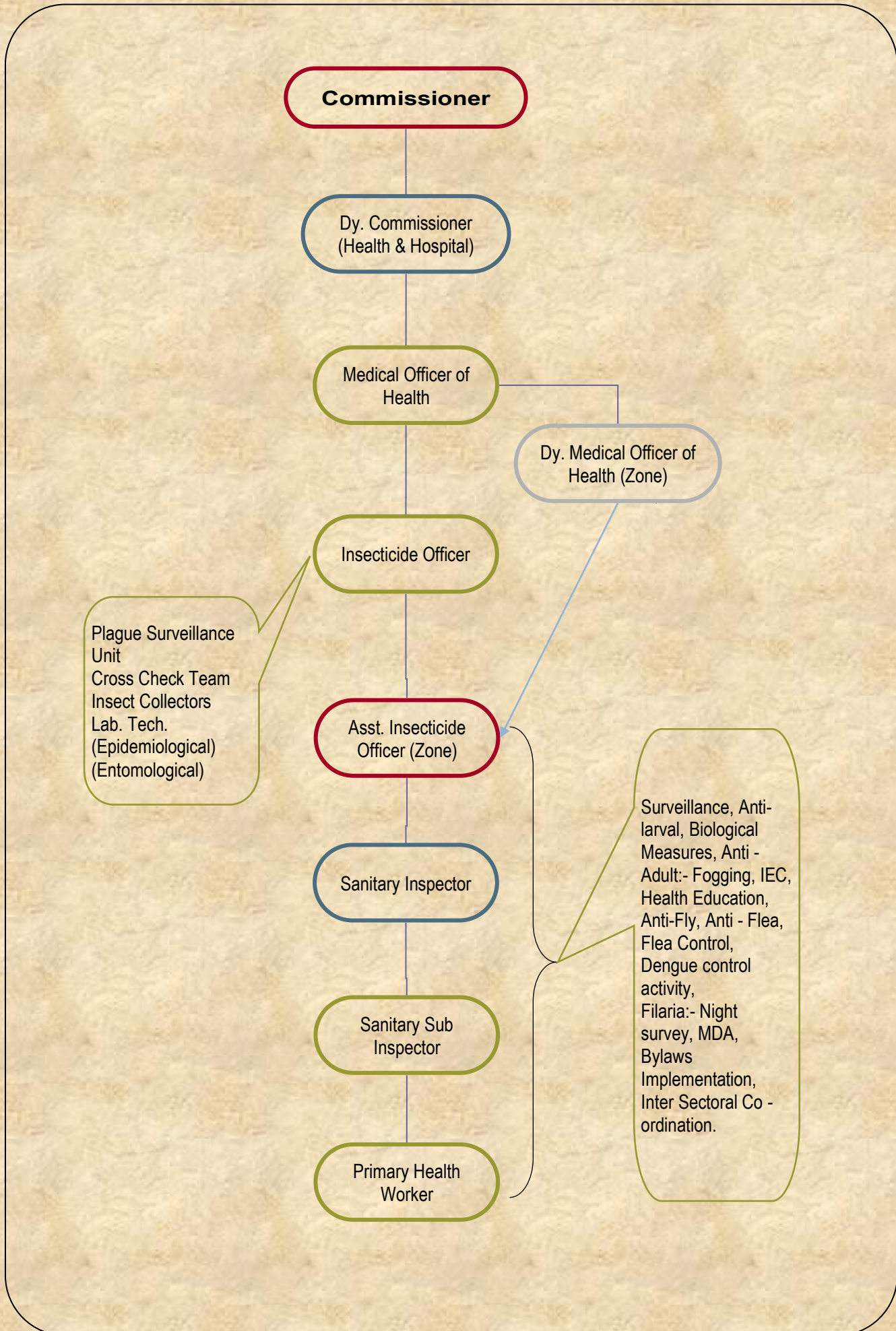
Asst. Insecticide
Officer (Zone)

Surveillance, Anti-
larval, Biological
Measures, Anti -
Adult:- Fogging, IEC,
Health Education,
Anti-Fly, Anti - Flea,
Flea Control,
Dengue control
activity,
Filaria:- Night
survey, MDA,
Bylaws
Implementation,
Inter Sectoral Co -
ordination.

Sanitary Inspector

Sanitary Sub
Inspector

Primary Health
Worker



Health Infrastructure in the Surat City: -

The Health Infrastructure available in the Surat city can be summarized as under

i)	Urban Health Centres (SMC)	: 43
ii)	Community Health Centres (SMC)	: 07
iii)	Govt. Hospital (Including General Hospital)	: 02
	SMC Hospital	: 02
iv)	Ayurvedic Hospital	: 01
v)	Hospital run by charitable trust	: 14
vi)	Other private Hospital	: 537
vii)	Dispensaries:	
	Allopathic	
	Private	: 1515
	Govt.	: 9
	Homeopathic (SMC)	: 1
viii)	ICDS Blocks	: 5
ix)	ICDS Centre	: 1092

Staff Position

Name of the Post	Post Sanctioned	In Position	Vacant	% Vacancy
Insecticide Officer.	1	0	1	100.00
Asstt. Insecticide Officer.	12	8	4	33.33
Section Officer	1	1	0	0.00
Lab. Tech. (H.Q.)	25	22	3	12.00
Lab. Tech. (UHC)	49	38	11	22.45
Malaria Inspector	32	29	3	9.38
Sub Inspector	58	57	1	1.72
Primary Health Worker	548	511	37	6.75
Contractual Surveillance Worker	393	393	0	0.00
Field Worker	927	766	161	17.36

Activities done by Vector Borne Diseases Control Department

(1) Early detection & Complete treatment (EDCT)

- Active & Intradomestic Surveillance - By PHW (288+310)
- Passive Surveillance - By UHC (50)
- Other agencies – FTD

(2) Vector Control Measures.

- ❖ Anti Larval Measures 106 Team, each team have 5-7 field worker
 Peri domestic: - Environment Measures.
 Chemical Spray: - MLO, Temephos 50% EC
 Biological: - Larvivorous Fish & Biolarvicide

(3) Anti Adult Measures.

- Space Spray (Fogging)
- Selective IRS

(4) Implementation of BPMC Act

- Notices
- Prosecution
- Collection of Administrative Charges

(5) Information, Education and Communication (IEC)

- ❖ Display of posters, Banners, hand bills.
- ❖ Advertisement in local News Papers & T.V. Channels
- ❖ Demonstration of Mosquitoes life cycle in schools & Fair.
- ❖ Essay Competition & Quiz Competition in Schools.
- ❖ Puppet Shows & Street play & Hut-cycle.
 Holding workshop & Seminars

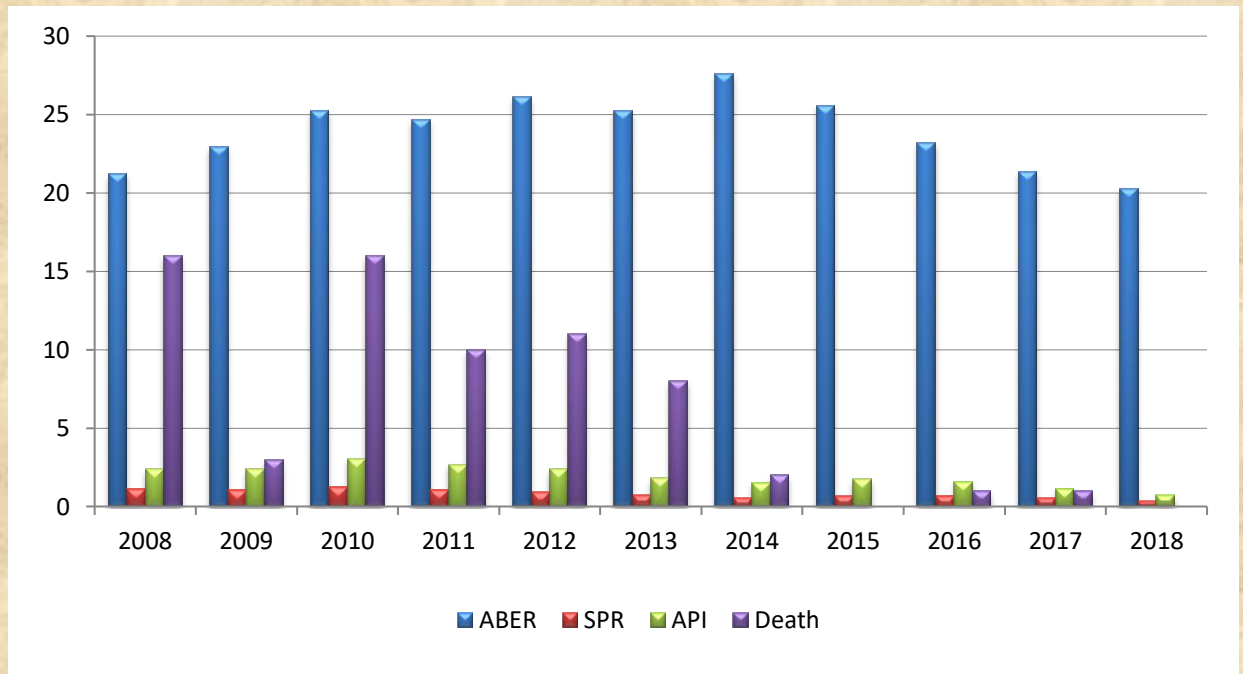
Epidemiological Situation of Malaria - 2001 to 2018

Year	BSC / Exam	Total + ve	PF	Death	ABER	API	SPR	SFR	% of PF	Increase / Decrease		
										Surveillance	+Ve Cases	PF
2001	510592	11363	4781	0	20.98	4.67	2.23	0.94	42.08		33.51	33.47
2002	530650	8274	2926	0	20.77	3.24	1.56	0.55	35.36	3.93	-27.18	-38.80
2003	573635	6984	2739	0	21.39	2.60	1.22	0.48	39.22	8.10	-15.59	-6.39
2004	625460	8227	2793	0	22.22	2.92	1.32	0.45	33.95	9.03	17.80	1.97
2005	606281	8292	2669	0	19.74	2.70	1.37	0.44	32.19	-3.07	0.79	-4.44
2006	737308	12617	4895	0	21.49	3.97	1.71	0.66	38.80	21.61	52.16	83.40
2007	769569	9765	4387	0	19.05	2.42	1.27	0.57	44.93	4.37	-22.60	-10.38
2008	908425	10141	4649	16	21.25	2.37	1.12	0.51	45.84	18.03	3.85	5.97
2009	974756	10250	3609	3	22.10	2.56	1.16	0.36	31.07	10.21	14.53	-22.37
2010	1114752	13593	4147	16	25.25	3.08	1.22	0.37	30.51	14.36	32.61	14.91
2011	1131175	12369	3545	10	24.67	2.70	1.09	0.31	28.66	1.47	-9.00	-14.52
2012	1273932	11641	2345	11	27.07	2.47	0.91	0.18	20.14	12.62	-5.89	-33.85
2013	1342046	9209	1834	8	27.43	1.88	0.69	0.14	19.92	5.35	-20.89	-21.79
2014	1378113	7606	1246	2	27.10	1.50	0.55	0.09	16.38	2.69	-17.41	-32.06
2015	1349800	9098	1536	0	25.54	1.72	0.67	0.11	16.88	-3.73	17.59	17.79
2016	1346225	9331	1385	1	23.21	1.61	0.69	0.10	14.84	-0.26	2.56	-9.83
2017	1317036	7099	883	1	21.38	1.15	0.54	0.07	12.44	-2.17	-23.92	-36.25
2018	1318342	4582	449	0	20.28	0.70	0.35	0.03	9.80	0.10	-35.46	-49.15

Zone wise Epidemiological Situation of Malaria

Sr. No.	Name of Zone	Year	Population	BSE	Total + Ve	PF	SPR	PF%	Death	
									Confirmed	Clinically
1	Central	2014	413683	159650	804	172	0.50	21.39	0	1
		2015	413683	147332	770	199	0.52	25.84	0	0
		2016	406348	139963	840	211	0.60	25.12	0	1
		2017	406348	123946	602	116	0.49	19.27	0	0
		2018	406348	113630	235	27	0.21	11.49	0	0
2	West	2014	464740	99813	391	60	0.39	15.35	0	1
		2015	483020	85598	424	106	0.50	25.00	0	0
		2016	526983	79352	427	67	0.54	15.69	0	0
		2017	552278	79026	256	25	0.32	9.77	0	1
		2018	575487	79884	88	6	0.11	6.82	0	0
3	South	2014	978294	280638	496	63	0.18	12.70	0	2
		2015	1016774	280894	545	79	0.19	14.50	0	3
		2016	938288	279648	569	55	0.20	9.67	1	7
		2017	1004239	276039	511	48	0.19	9.39	0	3
		2018	1065847	284098	338	36	0.12	10.65	0	1
4	S - East	2014	807448	271173	1923	328	0.71	17.06	0	6
		2015	839208	275805	1858	283	0.67	15.23	0	8
		2016	1078680	294070	2506	355	0.85	14.17	0	3
		2017	1174036	302771	1915	214	0.63	11.17	0	1
		2018	1266821	300145	1346	118	0.45	8.77	0	4
5	S - West	2014	407283	81696	374	65	0.46	17.38	1	5
		2015	423303	81672	371	81	0.45	21.83	0	0
		2016	422669	81399	344	38	0.42	11.05	0	0
		2017	440970	80000	211	13	0.26	6.16	0	0
		2018	458363	79078	97	9	0.12	9.28	0	0
6	North	2014	740838	207543	1521	254	0.73	16.70	1	2
		2015	776163	210955	1940	332	0.92	17.11	0	2
		2016	949855	202527	1816	321	0.90	17.68	0	2
		2017	1015774	201317	1270	187	0.63	14.72	1	0
		2018	1078268	195081	717	109	0.37	15.20	0	1
7	East	2014	1272402	277600	2097	304	0.76	14.50	0	2
		2015	1332537	267544	3190	456	1.19	14.29	0	3
		2016	1477142	269266	2829	338	1.05	11.95	0	1
		2017	1565474	253937	2334	280	0.92	12.00	0	1
		2018	1648589	266426	1761	144	0.66	8.18	0	1
8	Total	2014	5084688	1378113	7606	1246	0.55	16.38	2	19
		2015	5284688	1349800	9098	1536	0.67	16.88	0	16
		2016	5799965	1346225	9331	1385	0.69	14.84	1	14
		2017	6159129	1317036	7099	883	0.54	12.44	1	6
		2018	6499723	1318342	4582	449	0.35	9.80	0	7

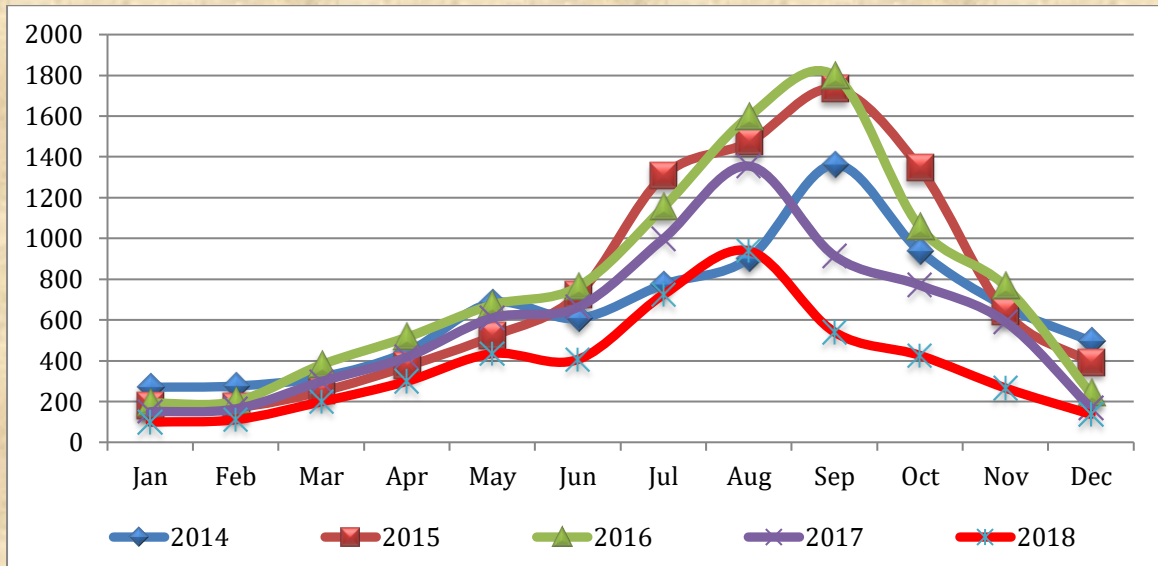
Malaria Parameters



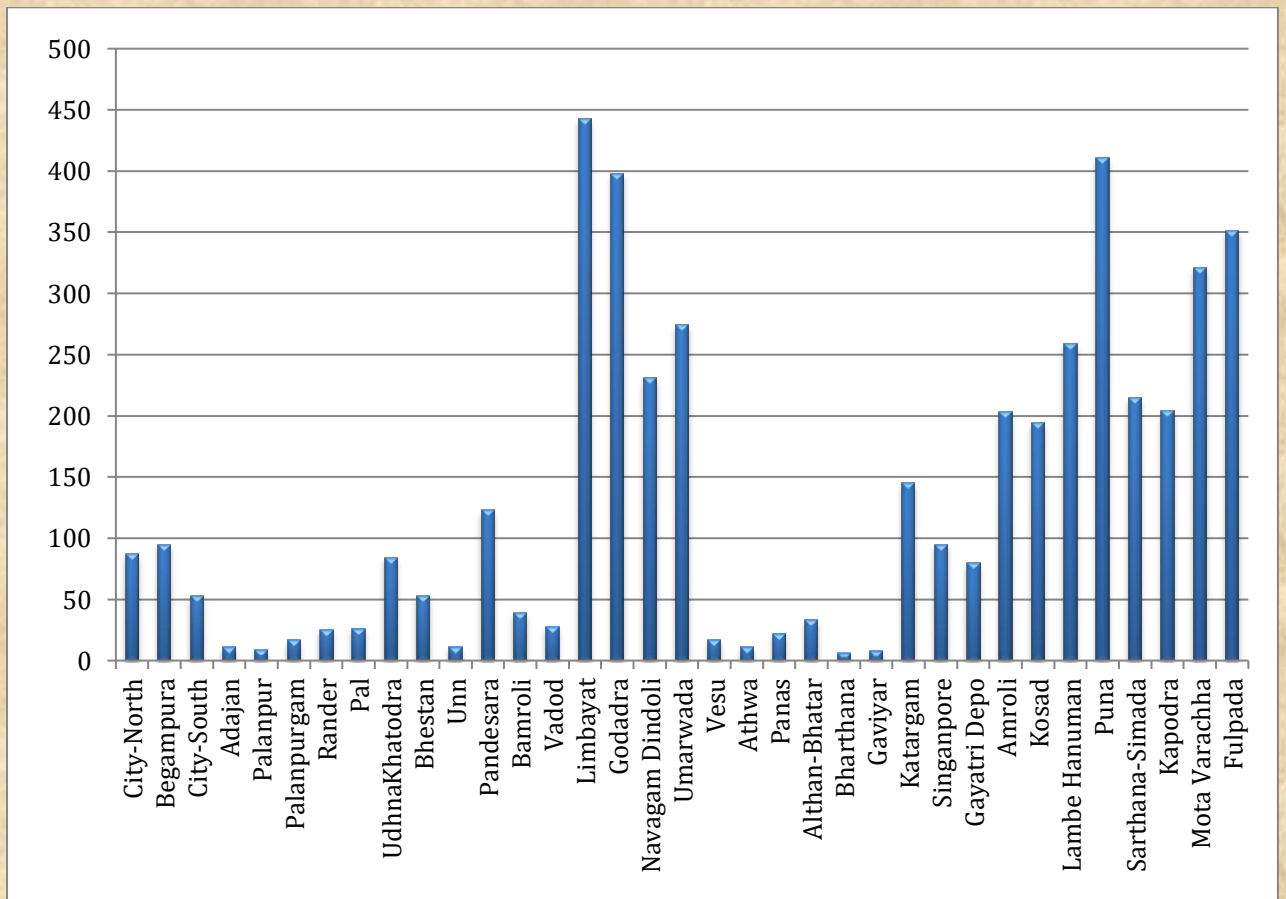
Month -Wise Malaria Cases In Surat

Month/Year	2011	2012	2013	2014	2015	2016	2017	2018
January	491	418	233	270	178	192	150	99
February	333	326	273	276	171	201	164	111
March	385	398	363	320	249	380	298	199
April	624	665	658	442	373	515	418	299
May	744	781	706	684	520	674	610	435
June	875	886	820	607	723	762	662	406
July	1300	1376	1114	774	1306	1152	998	724
August	1793	1703	1489	902	1472	1598	1355	939
September	2538	2048	1430	1362	1733	1799	915	541
October	1883	1696	895	937	1344	1055	770	426
November	819	959	813	667	639	765	591	266
December	584	385	415	496	390	238	168	137
Total	12369	11641	9209	7737	9098	9331	7099	4582

Month-Wise Malaria (Cases in Surat city)



Unit-Wise Malaria Positive Case-2018



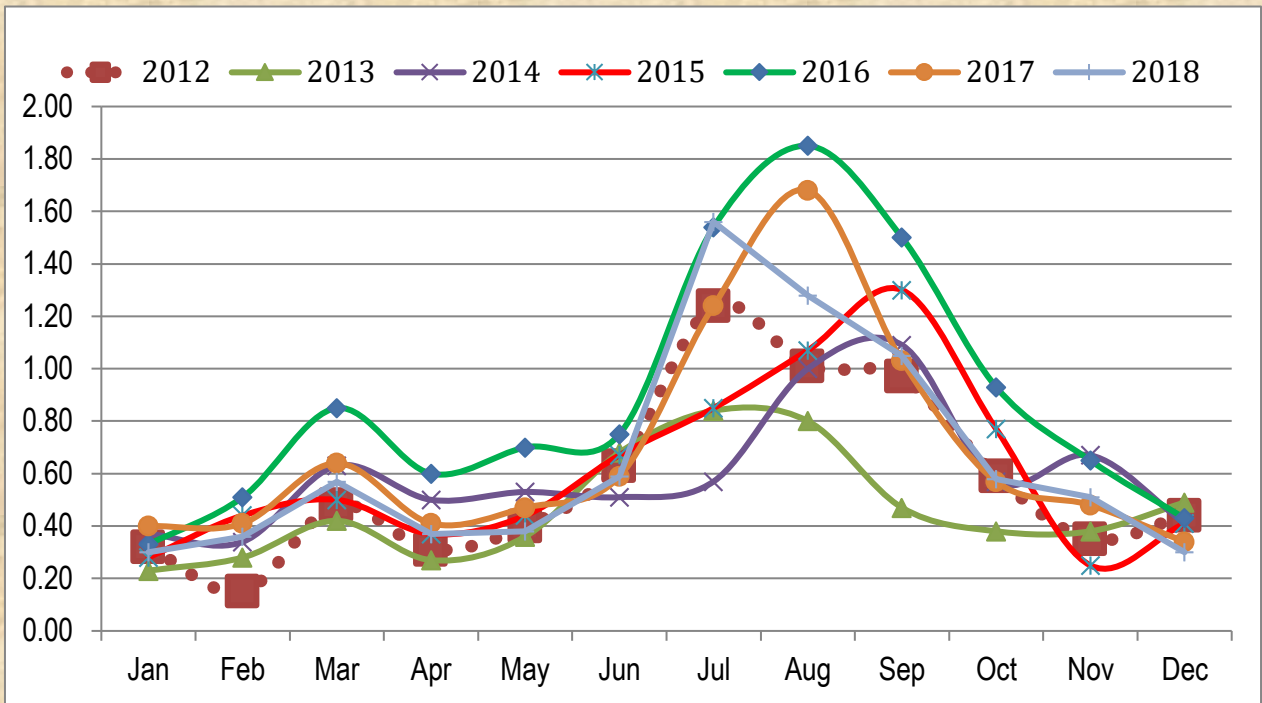
Zone wise Dengue Cases in Surat City

Name of Zone	Sample taken /Confirm case	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Central Zone	SST	57	107	201	266	240	256	295	340	473	1358	565	1533
	CC	20	44	93	70	5	6	23	39	38	61	28	24
West Zone	SST	31	14	73	144	177	310	344	347	692	1368	348	1040
	CC	10	5	39	40	8	34	35	37	69	103	29	20
South Zone	SST	44	125	202	334	368	564	582	944	1341	1541	2147	3077
	CC	22	21	90	72	18	41	125	106	114	102	66	66
S-East Zone	SST	20	100	155	328	297	375	479	613	1106	1648	1928	3081
	CC	1	38	67	95	14	48	100	105	135	158	62	64
S-West Zone	SST	53	59	117	123	128	287	244	303	581	654	295	1121
	CC	25	17	61	29	6	25	18	35	48	43	13	11
North Zone	SST	39	55	130	208	200	227	406	343	558	600	432	1220
	CC	11	16	72	73	12	8	26	29	46	65	24	22
East Zone	SST	30	49	99	158	176	170	210	143	279	507	748	2378
	CC	8	16	53	47	6	4	17	12	51	73	50	41
Total	SST	264	509	977	1561	1583	2189	2560	3033	5030	7676	6463	13450
	CC	97	157	475	426	69	166	344	363	501	605	272	248

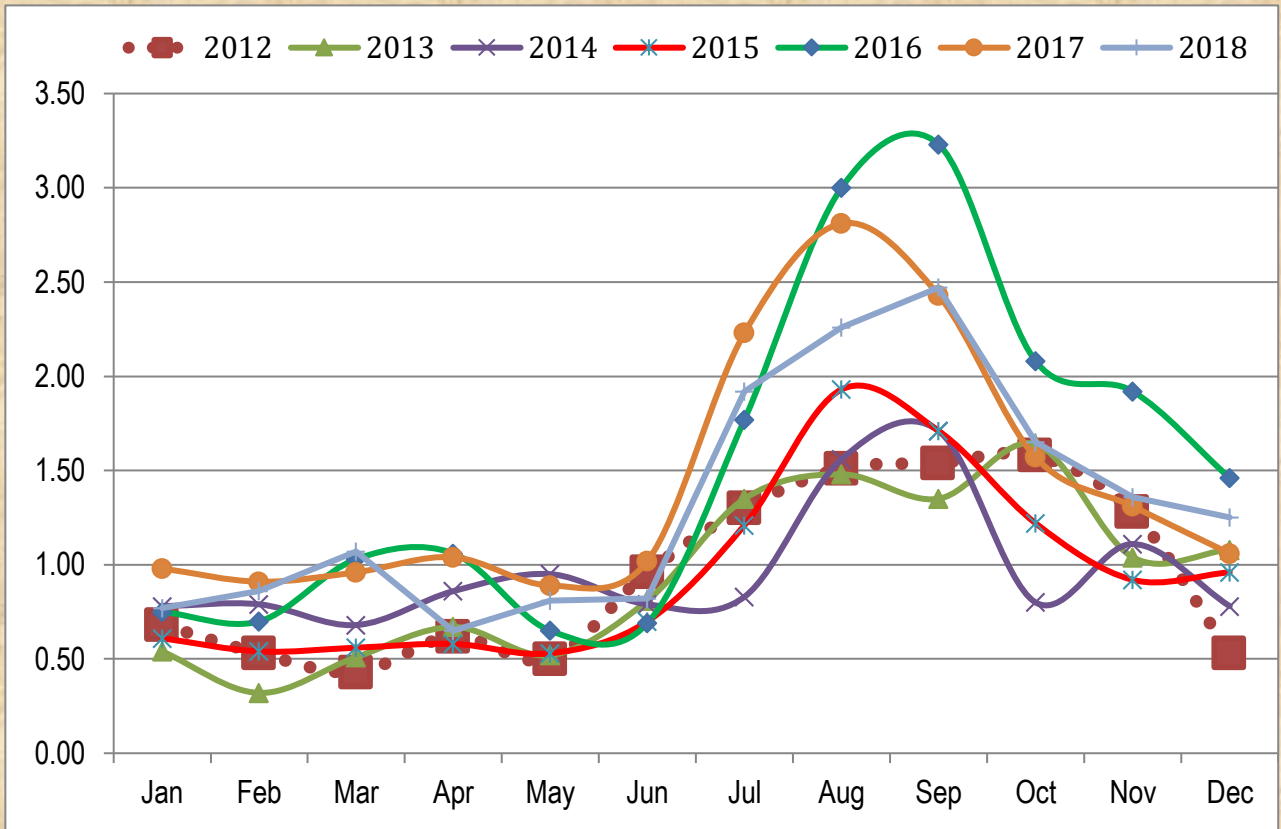
Zone wise Chikungunya Cases in Surat City

Name of Zone	Sample taken /Confirm case	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Central Zone	SST	0	51	24	1	30	20	1	1	0	1	191	29
	CC	0	19	14	0	10	2	0	1	0	0	12	1
West Zone	SST	0	4	14	15	27	48	4	2	0	7	18	19
	CC	0	2	11	3	11	1	1	0	0	0	5	1
South Zone	SST	0	2	8	8	101	41	9	6	1	8	128	218
	CC	0	0	2	4	36	7	0	0	0	1	20	25
S-East Zone	SST	0	19	2	6	35	33	0	4	1	10	129	120
	CC	0	10	1	2	12	6	0	2	0	2	24	13
S-West Zone	SST	4	12	0	4	16	14	4	1	0	1	9	25
	CC	0	5	0	0	3	0	1	0	0	0	0	0
North Zone	SST	0	5	1	0	41	6	2	0	1	1	112	26
	CC	0	2	0	0	11	1	1	0	1	0	5	2
East Zone	SST	1	0	1	0	8	9	3	0	1	0	68	175
	CC	0	0	0	0	2	0	0	0	0	0	0	1
Total	SST	5	93	50	34	258	171	23	14	4	28	655	612
	CC	0	38	28	9	85	17	3	3	1	3	66	43

Malaria Vector Density in Surat City



Aedes Vector Density in Surat City



Entomological Surveillance Virus Isolation By NIV, Pune

Year	No of Mosquito send for Virus Isolation By NIV, Pune			No of Female Mosquitos positive for Virus		Remarks
	Male	Female	Total	Dengue	Chikun gunya	
2007	30	80	110	5	0	In Surat city since 1967 only Dengue DEN-2 strain prevalence. However in 2010 in West zone of Surat DEN-3 & DEN-4 also isolated by NIV,Pune.
2008	140	409	549	0	0	
2009	212	750	962	10	0	
2010	170	276	446	7	0	
2011	119	277	396	0	0	
2012	265	693	958	2	1	
2013	305	517	822	1	0	
2014	99	253	352	1	0	
2015	137	591	728	4	0	
2016	149	816	965	0	0	
2017	95	217	312	0	0	

Entomological Surveillance Virus Isolation By Molecular Laboratory, VBDCD of SMC

Year	No of Mosquito examined for Virus Isolation By Molecular lab. of SMC			No of Female Mosquitos positive for Virus		Remarks
	Male	Female	Total	Dengue	Chikun gunya	
2018	577	1003	1570	10	02	Under the Smart City Project, SMC has established a Molecular lab. for identification of circulating serotypes of different VBDs in 2018. In next year it will be more upgraded for isolation of serotypes of DEN virus.

Filaria Cases in Surat City

Year	Slide Examined	No. of +Ve for MF	No. of +Ve for Disease	M.F. Rate (%)	Disease Rate (%)	RT Given	Consumption of DEC
2002	36691	63	3	0.17	0.01	65	6992
2003	40686	103	2	0.25	0.05	105	12588
2004	33157	91	0	0.27	0.05	277	17142
2005	51682	263	169	0.51	0.33	293	14924
2006	55373	258	138	0.47	0.25	270	13463
2007	50115	254	105	0.51	0.21	291	14140
2008	18814	63	35	0.33	0.19	157	10148
2009	16705	45	17	0.27	0.10	62	6993
2010	15322	33	34	0.22	0.22	77	8657
2011	32964	67	87	0.20	0.26	154	6516
2012	47787	33	54	0.07	0.01	115	3243
2013	49281	23	33	0.05	0.004	109	4652
2014	40107	43	47	0.11	0.008	43	3582
2015	45479	23	40	0.05	0.006	23	3102
2016	39717	23	20	0.06	0.000	104	3061
2017	38201	16	17	0.04	0.000	67	2548
2018	40541	41	29	0.10	0.02	70	6351

Vector Control Measures

Year	Anti larval activity											
	Intra domestic Survey						Peri domestic Survey					
	No. of Houses Survey	Ano.	Aedes	Culex	Mix	Total	Check ed Constr uction	Ano.	Aedes	Culex	Mix	Total
2007	12745881	41760	51712	1579	7743	102794	67395	10285	2512	26343	9890	49030
2008	12239012	34063	42747	1571	7270	85651	62335	14081	3037	26604	11342	55064
2009	15385595	49052	71528	818	9019	130417	55565	13381	2887	28560	11345	56173
2010	19612589	54644	90599	1032	12493	158768	67574	21805	3501	33428	15112	73846
2011	14971336	48888	64969	782	11216	125855	70609	20995	3368	31893	14875	71131
2012	17373742	41859	66509	615	10670	119653	86082	17708	3930	27747	12565	61950
2013	18457546	43375	62999	643	10982	117999	88757	20290	4119	27338	10924	62671
2014	18401559	35141	55777	504	8980	100402	93158	14085	3187	23484	7965	48721
2015	18552683	34446	59221	439	7650	101756	92139	12657	3893	21377	7915	45842
2016	20744951	40231	81415	710	9937	132293	88306	14372	4830	22642	8487	50331
2017	20468851	45636	133521	1316	19291	199764	87314	11326	4550	20708	6522	43106
2018	27103934	39171	142936	1072	19882	203061	92053	10470	5605	18223	6014	40312

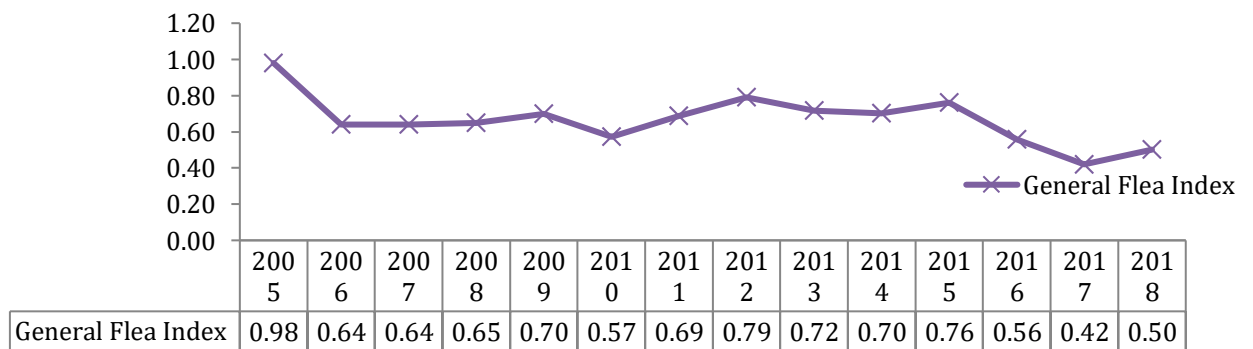
Biological Measures and Implementation of BPMP Act

Year	Fish Released (Biological control)	Notice Issued	Adm. Charge recovered (Rs.)	Case Disposed by Honourable Court	Fines by Honourable Court	Source Reduction	No. of Fogging Machine Utilized (Round)	
							Jeep Mounted	Handy Set
2007	12675	23133	1886250	1295	22945	114449	1883	27973
2008	13525	30405	2716600	2352	55090	77079	1949	30328
2009	12430	33122	2475410	1102	108680	72454	1234	30314
2010	14047	41060	3986675	3646	211255	135118	1453	31967
2011	13044	48814	4851049	2479	198800	165933	1471	31513
2012	9181	45263	4476925	895	173050	120792	2249	38180
2013	8964	50065	7739342	1247	212600	141570	2654	42419
2014	8797	46497	5955952	1136	130150	126794	2251	45530
2015	7302	45719	6638600	380	40150	134356	3480	51928
2016	5594	50672	8823976	455	30600	128764	3706	66393
2017	5767	60364	12814707	499	22885	129746	5068	75281
2018	4968	55020	12246665	173	23900	149948	3882	86938

Plague Surveillance in Surat City Flea Index Monitoring (1995 to 2018)

Year	Traps (No.)	Rodent Collected (No.)	General Flea Index	Specific Flea Index	No. of Rat Burrows Treated with Malathion 5%	Consumption of Mal. 5% (Kg)
1995	22627	6056	0.10	0.07	54401	25063
1996	17828	2860	0.97	0.86	74757	23708
1997	17723	3999	0.73	0.63	94514	28664
1998	17607	4091	0.84	0.82	83183	20875
1999	18218	4071	1.00	0.96	134576	34263
2000	15682	2703	1.08	1.08	121656	29332
2001	30445	8940	0.85	0.81	183774	60963
2002	43956	9585	0.91	0.65	117264	34742
2003	45051	11618	0.96	0.68	111638	30481
2004	48049	14000	1.04	0.75	128923	66569
2005	39428	12643	0.98	0.67	109078	53773
2006	36661	14010	0.66	0.50	96900	61204
2007	37920	14578	0.64	0.46	81020	47816
2008	39571	16649	0.65	0.51	68941	40420
2009	38187	14971	0.70	0.43	58183	30907
2010	33942	10689	0.57	0.42	52955	27735
2011	30169	9827	0.69	0.49	43581	21007
2012	20160	7432	0.79	0.54	39104	16689
2013	25525	4175	0.72	0.51	35599	15110
2014	25611	4995	0.70	0.55	37594	14874
2015	23705	3752	0.76	0.38	38021	14092
2016	21797	4616	0.47	0.20	34143	13680
2017	22952	5025	0.42	0.26	38246	15305
2018	22524	5048	0.50	0.32	30953	11844

General Flea Index 2005-2018



Constraints/Problems being faced in the implementation of Vector Borne Diseases Programme

Sr. No.	Activity	Bottlenecks	Solutions
1	EDCT Case detection	Surveillance Staff/Supervisory cadres are on contractual basis.	Creating and Filing of permanent Posts instead of contractual post.
2	Treatment	(1) Insufficient dose of anti malarial given by P.P.	(1) Orientation of Private Practitioners.
		(2) Negligence of community.	(2) BCC
3	Anti larval	Vacancy of the post of P.H.W. / Beldar	Filing of the vacant Posts.
		Poor Engineering work	Training of engineers.
		Resistance of Larvicides	Susceptibility test to be done yearly.
		Poor public awareness	Strengthening of I.E.C. activities.
		Mosquitogenic condition created by other departments	Intersectoral Co-Ordination meetings to be held frequently to seek their support.
4	Anti adult	Mosquitoes resistance	Susceptibility test to be done. Unavailability of test paper.
		Poor acceptance of Indoor fogging by people	I.E.C.
5	Monitoring and Supervision	Since 1998 Programme officer (Insecticide officer) post is vacant	Necessary action should be required for filling up the vacant post of Programme officer in S.M.C.
6	Migrants Labours & ITMNs	Construction sites have three fold more mosquitogenic condition comparative to other sites. Man mosquito contact easily.	Need of periodically screen of migrant's labours and special study of these groups, which are more vulnerable to spread the vector borne diseases in the City.
7	MIS	Unit of VBDCD and Zone have not facility of computer and Internet connectivity.	There is need to computerized Management information system with Internet facility also includes software programme to update the situation of VBDCD.

Technical Highlights of the year 2018

Vector Borne Diseases Control Department

Vector borne diseases have been decreased in Surat Municipal Corporation (SMC) during 2018. Intensified malaria surveillance activities have been carried out during the year and numbers of asymptomatic cases still have been reported. The surveillance was increased by 0.10%, the incidence is found to be decreased by 38.84%. In so far as falciparum cases were concerned, the SFR has decreased at 0.07% to 0.03%. PF% is decreased by 21.22%. In a decade PF% is decreased by 78.62%.

Surat city has a favourable climatic condition to profound its effect on the life cycle of a mosquito and the development of malaria parasites. The important factors are temperature and humidity, which is also ideal to speed up the disease dynamics. The efforts of Surat Municipal Corporation have given the desired result to interrupt active transmission of P. falciparum type of malaria.

Through epidemiological investigation, it is quite evident that the reasons for malaria incidence during July 18 to October 18 were high due to soaring humidity above 60%, mean temperature was 25-30⁰ C along with the high spike with intense rainfall pattern but overall low dense rain fall. In spite of the above situation meticulous actions were taken in a time bound manner with effective supervision and monitoring, SMC was able to control the malaria incidence.

After Pf. resistance study, we have started ACTs anti-malarial drugs in the presence of worker and follow up of each positive malaria case for next domiciliary visit. More over intra domestics/Peri-domestic surveillance of each positive case have to cover with indoor space spray in and around 50 houses. The existing facility has utilized to prevent Vector Borne Diseases in newly added areas, deficient work force that also affects the routine activities of the recent areas.

The sero-positivity rate in Dengue Fever (DF) cases have decreased by 56.29%(4.21% to 1.84%) compared to previous year (2017). Passive surveillance mechanisms is being improved all the way through involvement of 309 private hospitals as well as sentinel Hospitals and taking of all containment measure. The data shows 108.10% increase in suspected

DF cases compared to last year and number of confirmed/positive cases have decreased by 8.82%(272 to 248). VBDCD laboratory was also recognised as NVBDCP SMC Laboratory Sentinel Surveillance centre for dengue testing IgM and NS1 by MAC ELISA basis by NVBDCP, Delhi since Feb. '14.

The sero-positive rate in Chikungunya cases have decreased by 30.26%(10.08% to 7.03%) compared to previous year. The data shows 6.56% decrease in suspected Chikungunya cases compared to last year and number of confirmed/positive cases have decreased by 34.84% (66 to 43). The house index, container index and breteau index have remained at minimal levels.

Health Department of Surat Municipal Corporation has taken meticulous actions on top priority to prevent and control of Vector Borne Diseases (VBD) in Surat city.

Anti larval Measures: -

Peri domestic work: -

Peri domestic activities have carried out approximately 327 Sq. / K.M. areas round the year at weekly interval. There were 106 anti-larval squad who is working Monday to Saturday and covering whole Surat city by larviciding and minor engineering work. Each squad has 5-7 field workers. Ongoing construction sites, outdoor water bodies, underground tanks, overhead tanks, ground tanks, permanent water bodies and seepages of the canals were routinely vigil for breeding of mosquitoes by our health worker throughout the year. Total 2665052 number of breeding spots were inspected and out of them 40312 breeding spots were found positive among them 10470 were *anopheles*, 5605 were *Aedes* , 18223 were *Culex* & 6014 spots found with mixed breedings in the year 2018. All-breeding spots were treated with suitable larvicides like MLO, Biolarvicide, IGR & Temephose 50%.

Intra domestic work:-

During the year-2018 we have strengthen house to house intradomestic breeding search activity. Total 27103934 residential houses were inspected among which 60024864 breeding spots were surveyed, out of them total 203061 were found positive for breeding. Total 39171 were *Anopheles* , 142936 were *Aedes*, 1072 were *Culex* and rest of the 19882 were mixed breeding spots detected. All positive spots have been treated with appropriate insecticides and awareness was created by health education to the community.

Biological Measures:-

The efforts for permanent reduction of breeding sites by adopting biological measures were also undertaken. Around 50 hatcheries in different zones were established and 4968 water bodies were treated with larvivorous fishes during the year.

Anti-Parasitological work:-

(1) Parasitological Measures:-

The active surveillance as well as passive surveillance has carried out on regular basis as per the guidelines of Urban Malaria scheme for early detection and complete treatment (EDCT). During the reporting year, 598 surveillance workers have deployed to do these activities. During the year total 1318342 blood smears were collected among these 4582 smears were positive for malaria. Out of that 4133 *P.vivax* & 449 *P.falciparum* cases were treated with radical treatment. The proportion of *P.falciparum* is 9.80 percent.

(2) Night survey and Post MDA Transmission Assessment Survey-TAS (Filaria):-

Night surveillance activities were strengthening and 40541 persons were examined for Micro Filaria among them 41 blood smears were positive and Microfilaria rate was 0.10%. All positive cases have been fully treated with D.E.C. In clinic, 29 cases of acute filaria patients have been detected. 4 Chronic cases were detected in clinic. During night survey, 5 persons of acute filarial infection and 2 persons with chronic infestation were detected and disease rate was 0.02%. Post MDA Transmission Assessment Survey was carried out between 15-5-18 to 4-6-18.

(3) Dengue/Chikungunya Survey:-

For scrutiny of Dengue cases, 13450 Sera samples were collected from three recognized sentinel sites and 409 private hospital and had been tested for serological investigation of IgM antibodies, out of them 248 sera were found positive for Dengue. During the year, 612 Chikungunya suspected cases have been noticed, after investigation 743 cases were found positive for the same. Containment measures like intradomestic breeding search, space spray around areas of 200 mts. radius of positive dengue cases, IEC, BCC etc. were taken at the peripheral areas of both suspected and dengue positive cases.

Plague Surveillance Activity: -

An outbreak of pneumonic plague was reported from Surat Municipal Corporation area during September 1994. After that incidence SMC has established their own Plague Surveillance Unit(PSU) to undertake the rodent eco-parasite survey for the study on prevalence and population density of different rodent species and flea especially *Xenopsylla.cheopis* and *Xenopsylla.astia*.

Activities done at PSU

1. Rodents are routinely trapped from slums, domestic & peridomestic collection centers like warehouses, godown, railway tracks etc.
2. Defleaed by combing and their indices are being computed.
3. Samples of different organs of rodents, blood sera samples are also being taken and sent to Central Plague laboratory, NCDC, Delhi on monthly basis for further laboratory investigations.
4. Areas showing high flea indices are subjected to insecticide treatment by SMC teams for flea control.

Due to routine follow up activities and monitoring since 1995 suspected rodent epizootics(rat flea) *Y.pestis* infection were not reported from Surat urban areas. During the year 2018 total 22524 traps were laid and among them 5048 rodents were collected. General flea index was 0.50 & Specific flea index was 0.32 during year 2018. 30953 rate burrows in High flea index areas were treated by Malathion 5 % dust.

Anti-adult Measures:-

Entomological Activities: - (Mosquito Collection)

- a. Annual vector density for malaria, dengue and filaria were reported 0.67, 1.34, & 48.21 respectively.

Zonewise Density has been reported as below mentioned.

No.	Zone	MVD	AVD	FVD
1	Central	0.13	0.95	40.81
2	West	0.87	1.44	61.10
3	South	0.84	1.85	66.88
4	South East	0.63	1.54	42.00
5	South West	0.46	0.88	43.01
6	North	0.78	1.28	41.68
7	East	0.97	1.39	41.58
Total		0.67	1.34	48.21

- b. Regular different entomological indices are being monitored. During 2018, total 63679 filaria vector *Culex quinquefasciatus* were collected, out of them 35784 parous female vector were dissected & examined for identification of microfilarial stages. The infection rate was 0.00% and 0.00% infectivity rate was observed.
- c. Under the Smart City Project, SMC has established a Molecular lab. for identification of circulating serotypes of different VBDs. Our aim is to catch different causative organisms/agents in window period to inhibit further circulation & spreading. During the year total 1570 Aedes mosquitoes were collected for virus isolation at molecular laboratory of VBDCD, among them 577 were male and 1003 were female. Out of them 10 mosquitoes were positive for Dengue and 02 mosquitoes were positive for chikungunya virus and containment measures taken in the affected areas.
- d. Cone Bio-assay tests are performed on the both surfaces in all zone after completion of 1st & 2nd round of Indoor residual spraying.

Space Spray:-

The space spray is being done at all the places of positive malaria and dengue suspected and positive cases, & also at the places of vectors detected, in the slum & slum like areas and as on receiving complaints from the complainers. Fumigation is being done at every places where density of *Anopheles* and *Aedes* were high. SMC has enough machinery for fumigation.

Indoor Residual Spraying(IRS):-

Two rounds of IRS has been done every year. IRS has been done in high risk areas where API has reported greater than 5 during 2018. 1st round was started in June & 2nd round was started in the 2nd week of August. Total coverage was 75% in 1st round & 77% in 2nd round. 179741 houses, 325922 rooms and 1085475 populations of high risk areas for malaria have been covered by Indoor Residual Spraying during year 2018.

Training Programme:-

82 Sanitary Inspectors and Sub-Sanitary Inspectors have been trained for vector borne diseases control between 09-01-2018 to 12-01-2018. 78 Laboratory Technicians were trained for vector borne diseases control between 18-01-2018 to 19-01-2018. 477 Asha workers have taken training for vector borne diseases control between 05-03-2018 to 17-03-2018. Information about activity of department like malaria surveillance with intradomestic survey, antilarval, entomological surveillance vector borne diseases and their control methods, antimalarial drug, Insecticides and

reporting system were given to all of them. Insecticide officer and four laboratory technicians have taken training on PCR techniques for molecular laboratory at National Institute of Virology(NIV),Pune during 30-05-2018 to 01-06-2018. Insecticide officer has taken training on Lymphatic Filariasis Elimination(LFE) at Varansi during 10-09-18 to 14-09-18. Three Laboratory technicians have taken malaria microscopy refreshment training between 22-10-2018 to 26-10-2018. Four laboratory technicians have taken training for Filariology at National Center for Disease Control(NCDC) Kozhikode,Kerala during 03-12-18 to 14-12-18.

Health Education:-

To provide health education to the community has remained of prime importance for us throughout the year. It has imparted with keen interest to seek optimal participation from the community regarding awareness of malaria & other mosquitoes borne diseases. A rally presided by Hon. Health Minister Govt. of Gujarat, Hon. Mayor SMC, Commissioner SMC and other delegates of Surat Municipal Corporation were organized from Godadara Health Centre to Aaspas Dada mandir, Godadara for awareness of malaria on the 1st June of anti malaria month (June). The slum communities at their residence have shown of life cycle of Mosquito. The causes of Malaria & the message of its prevention have displayed on TV with the use of local channels.

For the motivation of the communities, Essays, Quiz and drawing competitions were organized for awareness of mosquito borne diseases to school students. All contestants are given complimentary prizes with special prizes given to the top three contestants in each competition. SMC held Special campaigns organized with the involvement of mass media including local channels, newspapers, radio and TV as well as outdoor publicity like hoarding, banners, rallies etc. The health education materials were prepared and widely disseminated in the form of posters, pamphlets and handbills. The slogans have created about awareness of Malaria along with hundred fifty flex banners made up and display in the community. The advertisement in local dailies used at every week throughout the antimalaria month. Interpersonal communication through Indian Medical Association (IMA), GPA and Private practitioners, group meetings, puppet-shows along with malaria slogan, antimalarial activities and preventive measures prepared and wandering during the month in seven of the SMC were optimally utilized.

Court prosecution & Administration charges:-

Total 118 complain were filed before Honorable Court and 173 cases were disposed during the reporting year and penalty of Rs.23900 was imposed as fine. 55020 notice were issued & Administrative charges Rs.122.46 lakhs were collected from the defaulters, who created the breeding potential sites in & around of their own premises. Containment measures were taken against the breeding sites by spraying of appropriate larvicides.

Dryday campaign:-

Department is carried out "Dry Day" campaign on every Saturday for control of Dengue cases. During the year-2018, 10845488 breeding spots were inspected along with 4656138 residential houses, in which 30771 positive breeding spots were eliminated, 189292 containers were dried, 54591 containers were disposed. 9324 notices were issued to people & Administrative charges of Rs. 34.68 Lakh were collected against mosquitogenic issues. 3320097 containers were treated with Temephos and 924177 Pamphlets were distributed in community.

Shri J P Vagadia
I/C Insecticide officer
Surat Municipal Corporation