

## Trends Of Malaria Situation In Jamnagar District

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**Abstract** : Introduction: Five out of eight districts of Saurashtra region are declared hyper endemic for malaria in the year 2011-12 & 2012-13 and given priority by World Bank Project for Malaria control activity in these districts. Burden of malaria contributed by these districts is more than 40% of total burden of Gujarat state, and Jamnagar is one of those districts. By Studying trend of Malaria in Jamnagar district will give an opportunity to identify particular seasonal trends and thus by effective surveillance mechanism, future outbreaks can be prevented. Aim & Objectives: 1) To study the trend of malaria situation in various Talukas of Jamnagar District. 2) To compare the trends for last four years. Materials & Method: Present record base study was carried out in 10 Talukas of Jamnagar district to analyzed the trend of malaria situation in the Jamnagar district by department of community medicine, Shri M.P.Shah Medical College, Jamnagar during the month of September 2012 to analyze the trend from the year 2009 to 2012 (up to September month). This was based on the monthly and progressive data format (monthly reports) was collected form District Malaria Officer of Jamnagar district and analyzed by using Microsoft excel 2007 and the result was presented in Table and graph. Results: Total numbers of cases were decreasing over the period of last 3 years. ABER is >10% in most of the Talukas which is indicated the surveillance activity is done properly over the period of years. Conclusion: In the year 2012 all parasitological indicators showing decreasing trend of malaria in comparison with previous years i.e. API, ABER, SPR, PF, and no malarial deaths at all. Continuous surveillance is effective in reduce the morbidity and mortality of vector borne disease like malaria. Seasonal trend of malaria follows the same pattern of distribution showing peak in months of Jun-July. [Makwana N et al NJIRM 2013; 4(4) : 27-31]

**Key Words**: Malaria, Trend of Disease, API, ABER, SPR

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**Introduction**: Malaria is one of the major public health problems of the country. Around 1.5 million confirmed cases are reported annually by the National Vector Borne Disease Control Programme (NVBDCP), of which about 50% are due to Plasmodium falciparum<sup>1</sup>. One of the reasons attributed to rise in proportion of *P.falciparum* cases is resistance to chloroquine, which was used for a long time as the first line of treatment of malaria cases. *P.falciparum* infections are known to lead to severe malaria, if timely treatment with effective drugs is not administered. The National Drug Policy on Malaria was first formulated in 1982 and has subsequently been reviewed and revised periodically. The latest National Drug Policy for Malaria (2010) has been drafted keeping in view the availability of more effective antimalarial drugs and drug resistance status in the country<sup>2</sup>. In India, 27 percent population lives in malaria high transmission ( $\geq 1$  case/1000 population) areas and about 58 percent in low transmission (0-1 case/1000 population) areas. About 88 percent of malaria cases and 97 percent of deaths due to malaria is reported

from North-eastern states, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, West Bengal and Karnataka<sup>3</sup>. India is predominantly characterized by unstable malaria transmission. Transmission is seasonal with increased intensity related to rains. Due to the low and unstable transmission dynamics, most of the population has no or little immunity toward malaria. As a result, the majority of Indians living in malarious areas are at risk of infection with all age groups affected. Taking into consideration the highly focal distribution of malaria and the size of the country, the accurate estimation of the national malaria mortality and morbidity burdens is inherently very difficult. There are also very few studies on estimation of the malaria morbidity, mortality and burden of malaria in pregnancy in the country. The NVBDCP intends to arrive at better estimates of severe malaria cases and mortality by establishment of a sentinel surveillance system in all high endemic areas. Non governmental health care providers are also increasingly involved for reporting of malaria cases and deaths. Collaboration with

research institutions is also enhanced for conducting studies to assess the true malaria burden in the country<sup>4</sup>. Malaria surveillance connotes the maintenance of an on going watch/vigil over the status of malaria in group or community. The main purpose of surveillance is to detect changes in trends or distribution in malaria and other vector borne disease in order to initiate investigative or control measures. It provides the basis for the measuring the effectiveness of anti malaria programme. Malaria surveillance includes laboratory confirmation of presumptive diagnosis, finding out the sources of infection and identification of all cases and susceptible contacts and still others who are at risk in order to prevent further spread of the disease<sup>5</sup>, keeping the above facts and figures in mind, we had done the record based study the trend of malaria situation in Jamnagar district and also identify the high risk areas of the district, so that necessary steps can be taken by local authority after recognizing the problem in the area and also help the state and national authority to understand the needs to correct the problem.

**Material and Methods:** The present study was record based study, conducted to analyze the trend of the malaria situation in all the ten (10) Talukas of Jamnagar district. Study was done by collecting data based records up to month of September 2012 to analyze the trend from the year 2009 to 2012 (up to September month). This was based on the monthly and progressively data format (monthly reports). The data was collected from the District Malaria Office (DMO) of the Jamnagar district. The collected data were being fed up in the Microsoft excel 2007 programme and was analyzed. Tables and Charts were prepared for showing trend of situation of malaria cases in Talukas/District.

**Results & Discussion:** Table – 1 shows Taluka-wise total number of malaria cases in the Jamnagar district. Maximum number of cases was found in Lalpur Taluka (747 cases) and Kalawad Taluka (578 cases) during the year 2011. Again the highest number of cases was reported in Lalpur Taluka (1009 cases) and Kalawad Taluka (692 cases) during the year 2010. During the year 2012 up to September month more than 480 cases was registered by two

Talukas of the Jamnagar district, namely Kalawad (214 cases) and Lalpur (266 cases).

**Table 1: Taluka wise total number of cases of Malaria in the Jamnagar district.**

Taluka	2009	2010	2011	2012-(sept.12)
Dwarka	111	159	150	103
Kalyanpur	100	135	109	52
Khambhalia	252	372	263	145
Jamnagar	318	278	319	128
Kalawad	497	692	578	214
Lalpur	517	1009	747	266
Bhanvad	193	166	194	105
Dhrol	69	58	65	38
Jodiya	181	138	93	43
Jamjodhpur	113	108	106	43
<b>Total</b>	<b>2349</b>	<b>3115</b>	<b>2624</b>	<b>1137</b>

Table–2 shows the trend of malaria surveillance indicator i.e. Annual Blood Examination Rate (ABER) in all Talukas of Jamnagar district. As per guideline, value of ABER should be 10% of the total population. This table shows the value of ABER range from a minimum 4.76 in Kalyanpur Taluka in 2009 to a maximum of 23.80 in Kalawad in year 2010. All the Talukas in Jamnagar district were reported >10% ABER from the year 2009 to 2011 except Kalyanpur, Jamjodhpur and Dwarka. In the year 2011, none of the Talukas were reporting below 10%. Kalyanpur and Jamjodhpur were reported <10 % in year 2012 up to September month.

**Table: 2 Taluka wise ABER in the Jamnagar district.**

Taluka	2009	2010	2011	2012 (sept.12)
Dwarka	9.4	11.81	13.91	10.8
Kalyanpur	4.76	7.9	10.16	9.55
Khambhalia	11.67	15.27	14.26	11.3
Jamnagar	14.04	15.23	17.03	11.95
Kalawad	13.88	23.38	18.09	12.33
Lalpur	16.1	22.55	21.21	15.53
Bhanvad	13.1	16.5	14.8	11.48
Dhrol	11.24	16.54	15.08	12.03
Jodiya	12.4	15.33	14.82	10.81
Jamjodhpur	9.77	8.96	12.16	9.84

**Table: 3 Taluka wise API in the Jamnagar district.**

Taluka	2009	2010	2011	2012 (sept.12)
Dwarka	0.6	0.93	0.87	0.6
Kalyanpur	0.39	0.54	0.66	0.32
Khambhalia	1.15	2.1	1.24	0.68
Jamnagar	0.9	1.02	1.32	0.53
Kalawad	2.84	4.4	3.52	1.3
Lalpur	3.9	7.45	5.81	2.07
Bhanvad	1.8	1.41	1.52	0.82
Dhrol	0.78	0.87	0.73	0.43
Jodiya	1.7	1.6	0.95	0.44
Jamjodhpur	0.84	0.69	0.79	0.32

Table – 3 indicates that Annual Parasite Incidence (API) was consistently more than two in two of the ten Talukas, namely Kalawad and Lalpur during 2009 to 2011. Only Lalpur reported more than 2 API during the year 2012 up to September. This shows endemicity of the disease as well as mosquito vector in this areas, which may pose threat to the local population and may give rise to epidemic situation in favourable environment.

Table -4 shows the year wise trend of Slide Positivity Rate (SPR) of all Talukas of Jamnagar district. This figure shows that Lalpur Taluka shows persistent higher rate of SPR from 2009 to 2011.

**Table: 4 Taluka wise SPR in the Jamnagar district.**

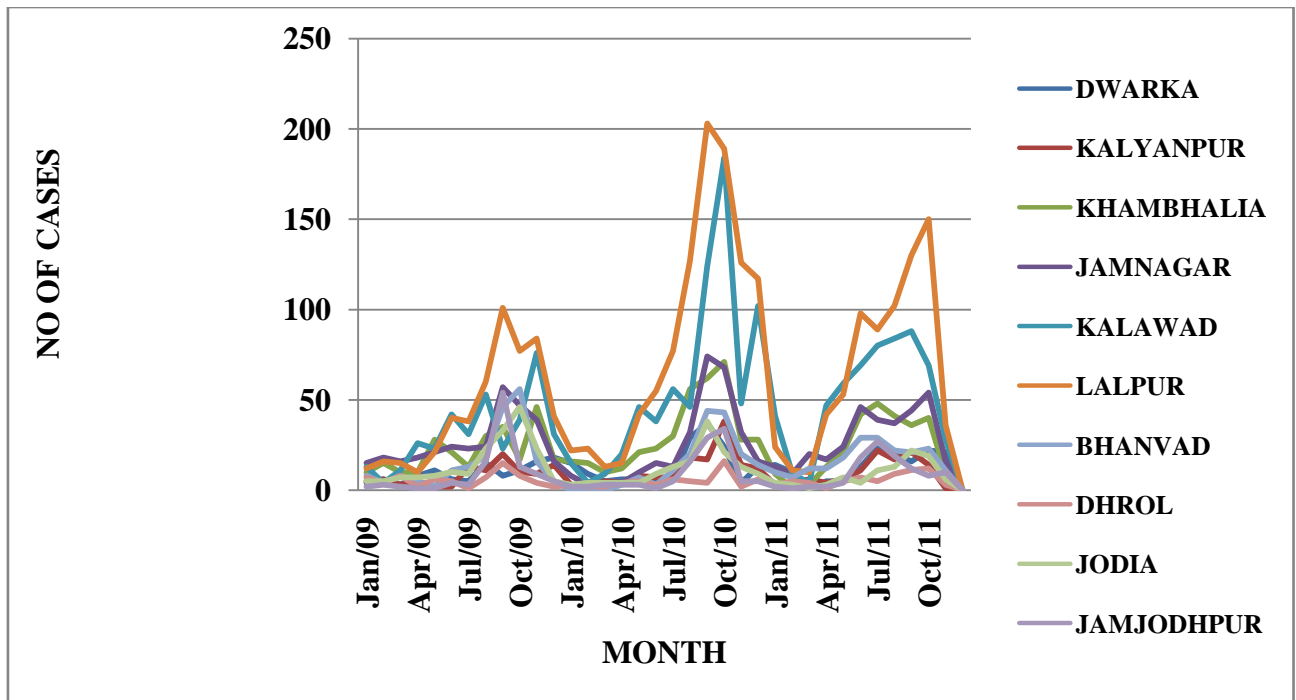
Taluka	2009	2010	2011	2012(sept.12)
Dwarka	0.6	0.79	0.62	0.55
Kalyanpur	0.59	0.95	0.65	0.33
Khambhalia	1.0	1.38	0.87	0.6
Jamnagar	0.57	0.67	0.78	0.44
Kalawad	1.99	1.88	1.95	1.06
Lalpur	2.4	3.3	2.74	1.33
Bhanvad	1.3	0.85	1.03	0.72
Dhrol	0.85	0.53	0.48	0.35
Jodiya	1.4	1.03	0.64	0.41
Jamjodhpur	0.98	0.77	0.65	0.33

**Discussion:** The level of ABER depends on the number of fever cases in the community. The fever rate the community fluctuates widely from Month to month and year to year. These fluctuations are due to other viral and bacterial infection prevalent in area. For accurate estimates of malaria

endemicity, the blood examination rate specially the monthly blood examination rate should be equal to fever rate of the month in the community. Therefore it is necessary to ensure that all persons having fever during malaria transmission months are included in the total blood slides examined during the year. The MBER norms of 0.8 percent during non-transmission season and 1.2 to 1.8 percent during transmission were laid down in the NVBDCP. ABER is the cumulative sum of monthly rates during the year. ABER/MBER is an index of operational efficiency of the programme. The Annual Parasite Incidence (API) depends upon the ABER. Sufficient number of blood slide should be systemically obtained and examined for malarial parasite to work out accurate API.

The slide Positivity Rate among the blood smears collected through both active and passive surveillance gives the more accurate information on distribution of malaria infection in the community over a period of time. Monthly SPR can be calculated to find out the seasonal rise and fall in malaria prevalence in the community. Trends in SPR can be utilized for predicting epidemic situations in the area. If monthly SPR exceeds by 2.5 times of the standard deviation observed in SPR of the preceding 3 years or preceding 3 months of the same year, an epidemic build up the area can be suspected. Due Monthly or yearly trends of SPR can be utilized to study the impact of control operations.<sup>5</sup> From the observation of the data we can see that the no. of cases decline in last 2 years as compared to previous 2 years. The ABER in out of 10 Taluka 8 had more than 10% which indicate there is sufficient blood smear were taken by the active and passive surveillance agency in the district.

Graph – 1 shows quarter-wise trend of malaria cases from the year 2009 to 2011 in two high risk Talukas (Kalawad and Lalpur) of Jamnagar district. This figure shows that there was rising trend of new malaria cases that starts in July and fluctuates between July to November, and then after November the trend falls. In Kalawad Taluka, trend shows two large peaks in alternate years whereas in Lalpur Taluka, trend shows continuous rise from the year 2009 to 2011.



Only one Taluka Lalpur reported more than 2 API through out the period of 4 year, which indicates there is need of increase operational efficiency of programme. The SPR in the out of 10, 8 Taluka had below 1.0% which indicate there is low parasite in these area may be due to effective control measure. There more chances of active transmission in Lalpur and Kalawad Taluka .which required more attention and more stringent action should required. The SPR has also shown gradual decline from 3.32 in 1995 to 1.41 in 2010 at national level<sup>4</sup>. Looking at the species specific cases out of total no .of cases, Lalpur reported maximum no. of cases of P.Vivax from all Talukas during 2009 (446), 2010 (874), 2011(680), 2012 (up to September 12)(254) and Kalawad Taluka reported 2009 (411), 2010 (569), 2011(511), 2012 (up to September 12)(204), while regarding P.Falciparum cases Lalpur reported maximum no. of cases of P.Falciparum from all Talukas during except 2009 (69), 2010 (135), 2011(67), 2012 (up to September 12)(12) and Kalawad Taluka reported 2009 (86), 2010 (123), 2011(67), 2012 (up to September 12)(10).

**Conclusion:** it can be concluded from the above recorded based study that continue monitoring of the data is very important in prediction of any

epidemic situation and at early stage of action can reduce the case load in community and the effective early diagnosis and treatment can be done. The effect of the surveillance activity over the period of years will help in proper implementation of the control measure and result will be seen in long run. Area specific measure can be done by finding out the more prone areas and vulnerable populations and least reported areas of the surveillance activity .so overall picture of the any district or Geographic area can changed

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