

# Progress Achieved in Gandhinagar District of Gujarat State for Elimination of Malaria, 2007 to 2015—A Case Study

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## Abstract

**Background:** Government of India has lunched the frame work for eliminating malaria from the country by 2030 [1] [2]. But progressive States like Gujarat has to achieve the target by 2024. The first step in this direction is to bring down the Annual Parasitic Incidence less than 1.0. Under National Vector Borne Disease Control Programme (NVBDCP) various activities for Vector control coupled with complete treatment to confirm malaria cases within 24 hours were given more focus and implemented diligently and effectively. **Aim:** To evaluate the progress of the efforts being undertaken for malaria elimination in Gandhinagar district. **Design:** Impact of malaria control efforts in Gandhinagar district covering all areas were studied in detail. **Setting:** Malaria prone villages of Gandhinagar district where preventive actions were undertaken in an integrated manner during the period of 2005 to 2015. **Exploratory:** Data pertaining to rural and urban areas of the district covering all PHCs, UHCs and Towns were analyzed and interpreted. **Outcome:** Reduction in malaria incidence and scaling up of non chemical methods for control of malaria. **Analysis:** Percentage and proportions. **Results:** Area specific approach adopted in rural areas of Gandhinagar district by putting more emphasis on good surveillance, ensuring complete treatment to malaria cases within 24 hours and effective strategy for vector control mainly non chemical methods resulted in reducing Annual Parasitic Incidence (API) from 1.96 in 2005 to 0.17 in 2015 in Gandhinagar district. 226 villages (74.83%) out of 302 in the district are malaria free and only 9 villages are having API > 1.0. The district aims to achieve malaria elimination in the next five years. **Conclusion:** Gandhinagar district has made rapid stride towards malaria elimination in a

cost effective manner by utilizing the available resources. The strategies adopted by the district can be replicated by other districts and States to achieve the goal of malaria elimination.

## Keywords

Annual Parasitic Incidence, Surveillance

## 1. Introduction

Government of India has lunched the frame work for eliminating malaria from the country by 2030 in a phased manner. But progressive States like Gujarat has to achieve the target by 2024 or even before that. The first step in this direction is to bring down the Annual Parasitic Incidence less than 1.0. Under National Vector Borne Disease Control Programme various activities for Vector control coupled with good surveillance ensuring complete treatment to confirm malaria cases within 24 hours were given more focus and implemented diligently and effectively. Gandhinagar district could effectively control the incidence of malaria during the last 10 years and is in a better position to sustain the achievements and make the district free from malaria. This study was undertaken with an aim to evaluate the progress of the efforts being undertaken for malaria elimination in Gandhinagar district, with an aim to further strengthen the efforts to achieve the ultimate goal of “Malaria Free Gandhinagar district”.

## 2. Methods and Results

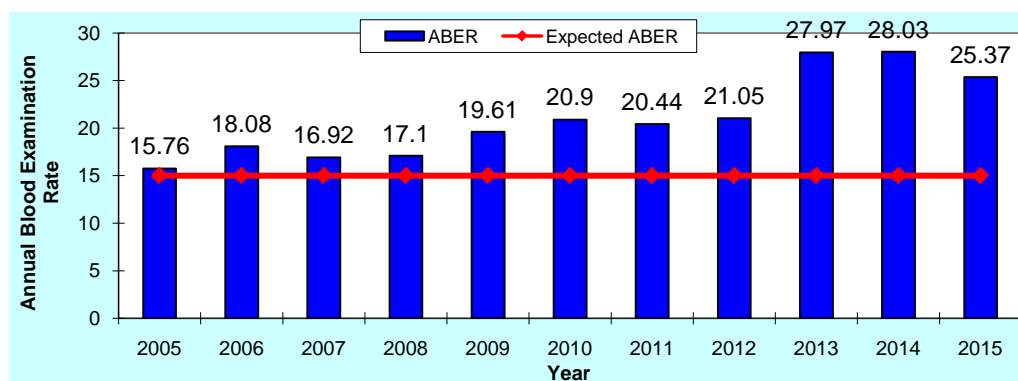
Gandhinagar district comprising of 4 talukas, 302 villages with a total population of 12.02 lakhs. Do have good health infrastructure. There are 171 Sub Centers, 26 PHCs, 4 towns, 9 CHCs and 1 Hospitals. The 914 ASHAs deployed under National Health Mission since 2009 has improved surveillance for malaria. Taluka wise details are given in the **Table 1**.

Though the district implemented malaria control activities within the framework of the strategies formulated by Government of India, the activities under various strategies were fine tuned to get maximum impact. One of the important activity in which more attention was given was surveillance as can be seen from the **Graph 1 & Graph 2**. The red line in the graph denotes the expected Annual

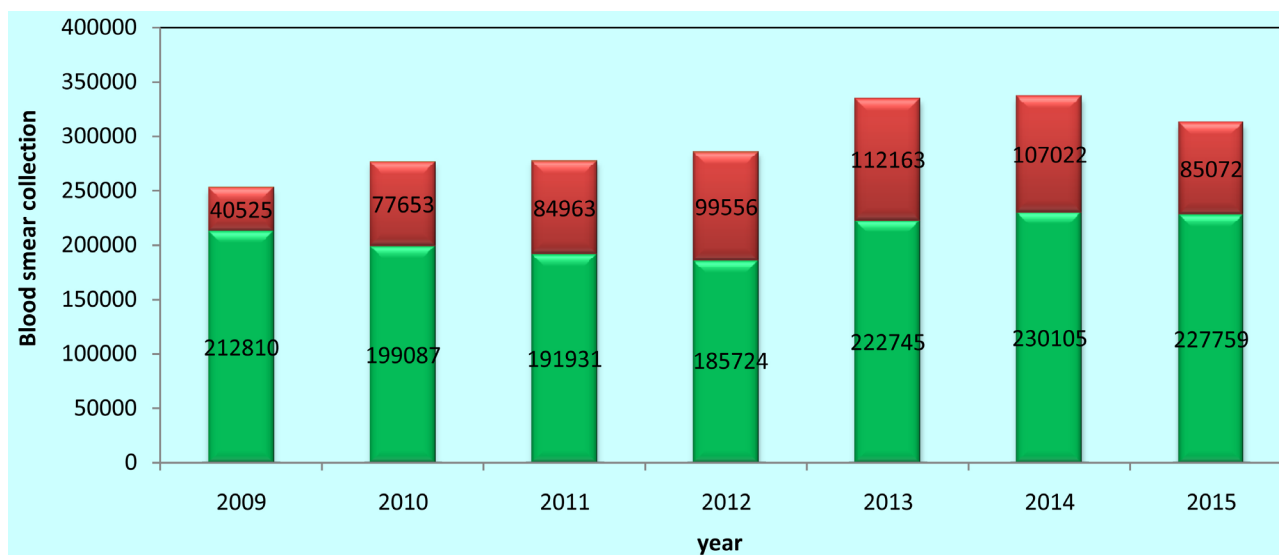
**Table 1.** Demographic details and health infrastructure in Gandhinagar district.

Taluka	Population	Villages	PHCs	CHCs	Towns	Hospitals	ASHAs
Gandhinagar	345,817	73	8	3	1	1	286
Dehgam	278,935	93	7	2	1		225
Mansa	233,249	66	5	1	1	1	177
Kalol	375,011	70	6	3	1		226
	1,233,012	302	26	9	4	2	914

PHC: Primary Health Centre, CHC: Community Health Centre, ASHA: Accredited Social Health Activist.



Graph 1. Year wise Annual Blood Examination Rate from 2005-2015.



Graph 2. Year wise Blood Smear Collection and contribution of ASHA from 2009-2015.

Blood Examination rate (ABER) and in all the years it has been achieved.

Under parasite elimination and disease management several innovations were introduced viz. ensuring treatment of malaria cases within 24 to 72 hours (208/237 malaria cases in 2014 and 201/205 malaria cases in 2015) tracking of all malaria cases (100%) and timely referral of severe patients from the periphery. Use of RDTs by ASHAs too helped ensuring early and complete treatment. Case fatality was zero in the district. 102 test done by ASHA and 1 positive case found in RDT [3].

Similarly under Integrated Vector Management all the vector control options were implemented considering the prevailing situation and feasibility. During the period of 2005 to 2015 dependence on Indoor Residual Spray was gradually reduced as shown in the following Table 2 [4] [5].

Other environmental friendly measures such as biological control, treatment of mosquito nets owned by the community was also taken up quite effectively and the work done under these activities are given in the Table 3 & Table 4 [7].

Effective supervision and monitoring played a vital role in achieving the desired success. This activity was diligently carried out at all levels *i.e.* PHC, Taluka

**Table 2.** Year wise information of Indoor Residual Spray from 2006-2016.

Year	Total in the district		Eligible for spray		Targeted for spray			Covered under Spray			% Room Coverage
	Villages	Pop	Villages	Pop	Pop	Houses	Rooms	Pop	Houses	Rooms	
2006	298	1,191,830	22	54,041	54,041	10,808	28,642	54,041	9395	24,897	87
2007	298	1,225,877	23	57,685	57,685	11,537	30,573	57,685	9986	28,551	86
2008	298	1,260,582	16	50,250	50,250	10,050	26,633	50,250	8056	21,514	81
2009	298	1,292,093	1	1435	1435	287	761	1435	255	665	87.4
2010	298	1,324,412	2	7810	7810	1564	4145	7810	1357	3614	87.2
2011	298	1,354,938	2	5967	5967	1193	3162	5967	1034	2740	86.6
2012	298	1,354,938	2	5810	5810	1162	3079	5810	1037	2747	89.1
2013	302	1,192,517	5	18,043	18,043	3609	9563	18,043	3220	8482	88.7
2014	302	1,199,478	3	8507	8507	1701	4509	8507	1498	3877	86
2015	302	1,233,012	2	495	495	106	424	495	98	390	91.9
2016	302	1,225,731	0	0							NO SPRAY

**Table 3.** Year wise information of Biological control from 2006-2015.

Biological control	
Year	Number of places where larvivorous fishes introduced
2006	260
2007	792
2008	1040
2009	511
2010	837
2011	625
2012	629
2013	450
2014	1340
2015	2700

**Table 4.** Year wise information of Insecticide Treated Mosquito Nets from 2006-2015.

Mosquito nets	
Year	Number of Mosquito nets treated with insecticides
2006	7623
2007	19,969
2008	15,820
2009	9461
2010	22,550
2011	24,010
2012	15,271
2013	917
2014	11,537
2015	11,501

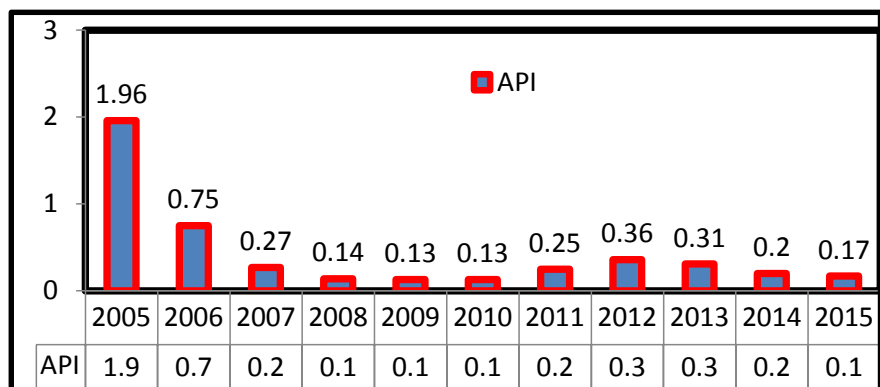
and District level. Prescribed check lists were used for effective supervision. Treatment cards were maintained to verify completion of treatment given to malaria cases.

### 3. Conclusions

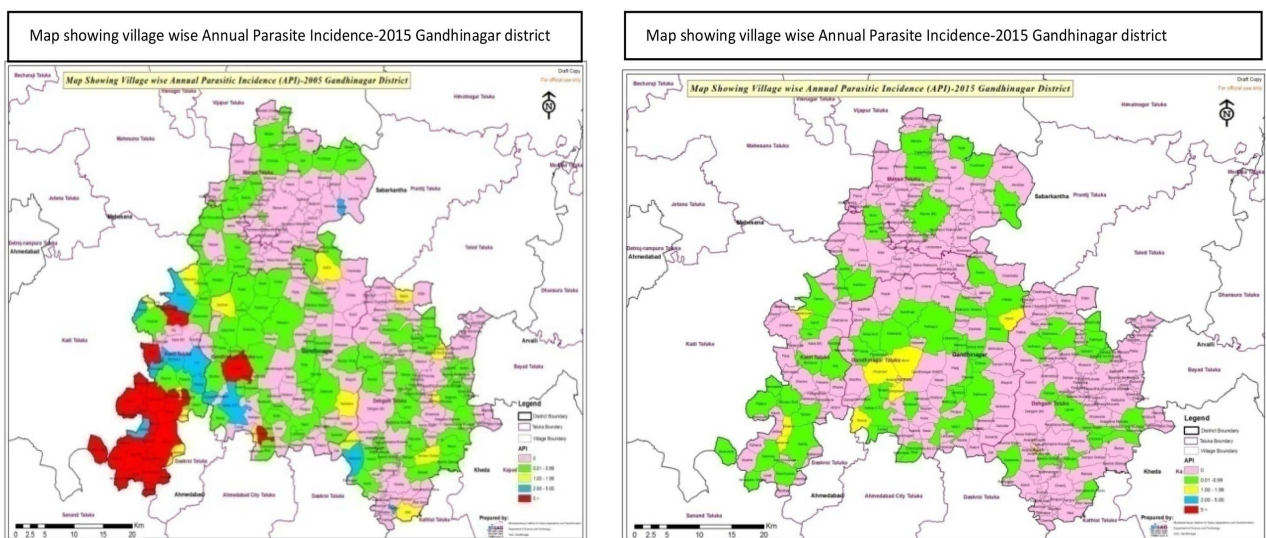
The study revealed that the integrated approach adopted in the district has brought down the malaria incidence to a very low level as Annual Parasitic Incidence has declined in 2015 as compared to 2005 as shown in the **Graph 3** ([6] [7]).

Majority of the villages in the district could be made malaria free as can be seen from the GIS **Map 1**.

This achievement is of much significance as the surveillance for malaria has remained very good all these years. The outcome of the efforts made in Gandhinagar district is quite encouraging when concerted efforts have been put in and milestones have fixed for elimination of malaria. The key for elimination from the context of this study is to establish a robust surveillance mechanism (concept



**Graph 3.** Year wise Annual Parasite Incidence from 2005-2015.



**Map 1.** Left, Map showing village wise Annual Parasite Incidence-2005 Gandhinagar district; Right, Map showing village wise Annual Parasite Incidence-2015 Gandhinagar district.

of T3: Test, Treat and Track) with equal emphasis for vector control and monitoring activities on a regular basis.

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