CHAPTER-6

DISEASE PATTERN IN VADODARA DISTRICT

This chapter provides the information on diseases prevalent and emerging pattern of diseases and Health care facility in Vadodara district at macro level. Secondary sources of data are collected *taluka* wise of Vadodara district and analysed.

6.1 Introduction

The undivided Vadodara district is located between 21° 50’ and 22° 50’ north latitudes and 72° 50’ and 74° 10’ east longitudes. Spread over an area of 7,546 sq km., the district accounts for 3.79 per cent of the geographical area of Gujarat. Physiographically, the district is characterized by plains in the western part and hilly terrain in the eastern part. It has twelve *talukas.* Total population of Vadodara district increased from 30.90 lakhs in 1991 to 36.41 lakhs in 2001 and to 41.65 lakhs in 2011. Vadodara city is the administrative headquarter of the Vadodara district. It is also known as Baroda and is the cultural capital of the State. The city stands on the bank of River Vishwamitri (District Census Handbook, Vadodara, 2011, 12). The maximum north-south and east-west stretch of the district is 109.3 and 148.1 kilometers respectively. It is bounded by Kheda and Anand in the north-west, Panchmahals and Dohad in the east, Narmada and Bharuch in the south. This district also touches the border of Madhya Pradesh and Maharashtra states. It occupies 10th rank in terms of area (District Census Handbook, Vadodara, 2001, 8).

Vadodara district is endowed with two distinctly different resource regions - the western coastal region, that is agriculturally suitable and has been the abode of a civilization exposed since time immemorial to advanced form of agriculture, trade, commerce and urban-industrial development; the eastern region is hilly and undulating, agriculturally unsuitable and forested, and has nurtured the primitive tribal communities of western India since ages. The processes of development that have unfolded until the beginning of pre-colonial phase of Indian history permitted the two regions to maintain their exclusive characteristics. While the western non-tribal plain region benefitted from the processes of change and development and experienced multifarious socio-cultural upheavals, the eastern tribal region remained by and large isolated and deprived of the ongoing socio-cultural transformations in the

neighbourhood. It is only recently that circumstances in the latter region have been changing through concerted and purposeful institutional interventions. Consequential patterns of development including levels of awareness of the population and infrastructural facilities between the two regions differ markedly and can be seen reflecting on the health conditions of the population in the two regions.

An attempt has been made in the present chapter to analyze the spatial pattern of prevalence of major diseases in the two regions based on data generated from secondary sources. For the purpose, eight *talukas* out of the twelve *talukas* of the district have been selected, including four *talukas* each from the non-tribal/plain area and tribal/hilly area. From each *taluka*, one village has been chosen randomly for detailed investigation. Household schedules were administered to around fifty randomly selected households of each sample village for the generation of primary data. The four *talukas* of the non-tribal / plain area include, Tundav village (Savli *taluka*), Kelanpur village (Vadodara *taluka*), Vadu village (Padra *taluka*) and Handod village (Karjan *taluka*). The four villages selected from the tribal/hilly area of the District are, Chalamali village (Jetpur Pavi *taluka*), Tejgadh village (Chhota Udaipur *taluka*), Palasani village (Nasvadi *taluka*) and Navalja village (Kavant *taluka*).

6.2 Prevalent Diseases in Vadodara District

With an intention of describing and analysing the spatial patterns of prevalent major diseases in the Vadodara district, the Integrated Disease Surveillance Project (IDSP) Vadodara (Gujarat) Report has been used as a secondary source of data. The data contained in the report pertains to the years between 2005 and 2009. The main objective of the IDSP was to detect the early warning signals of the impeding outbreaks and help response. It is a decentralized state based system of surveillance for communicable and non-communicable diseases. Data are computerised through IDSP portal (www.idsp.nic.in).Under the IDSP, data is collected on a weekly basis. The information is collected on specified formats, namely ‘S’ (Suspected Cases), ‘P’ (Presumptive Cases) and ‘L’ (Laboratory Confirmed Cases) formats. The ‘S’ forms are filled up by health workers and submitted by sub-centres. The ‘P’ forms are filled up by the Medical Officer and submitted by PHCs, CHCs and District and Private Hospitals. The ‘L’ forms are filled up by Microbiologists, Laboratory Assistants/Technicians and submitted by PHC, CHC and District Hospitals and District Public Health Department, Private Hospitals and Private Laboratories. After

collection of data on diseases, compilation and analysis is done by the District Surveillance Officer (DSO) and the Chief District Health Officer (CDHO) and alerts and feedbacks are given to blocks and PHCs. The type of diseases prevalent in the population in Vadodara district and recorded in the report are classified and presented in Table 6.1.

Table - 6.1 : Types of Diseases in Vadodara District

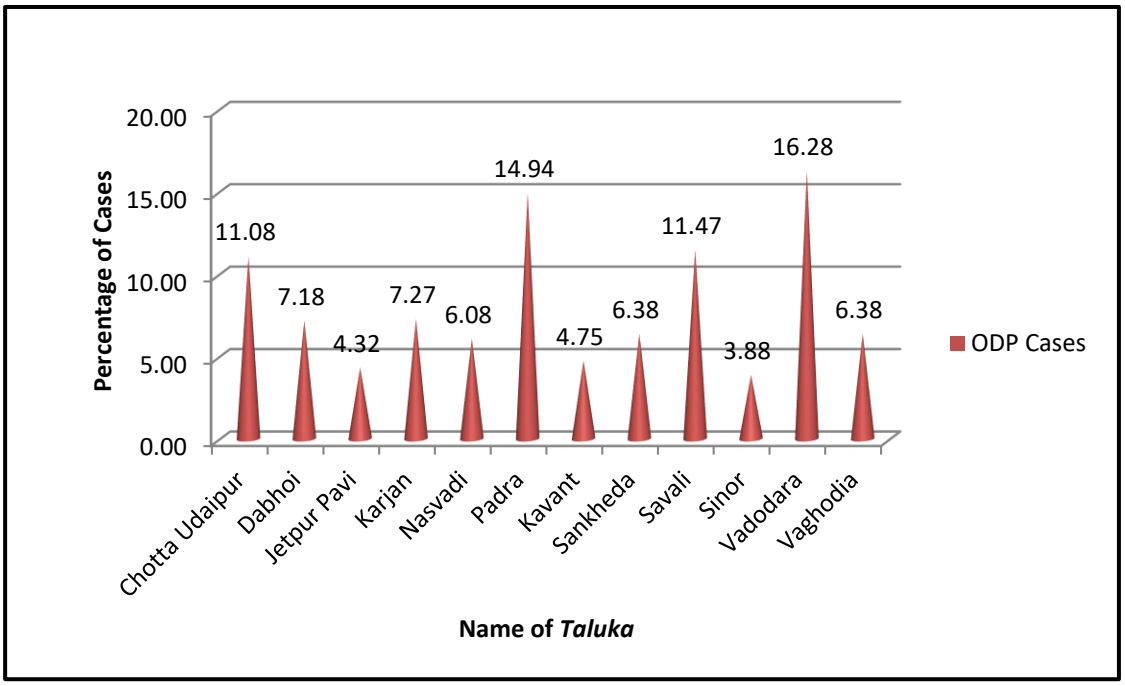
Types of Disease	
Water Borne Diseases	Acute Watery Diarrhoea
	Acute Bloody Diarrhoea
	Acute Diarrhoea Vomiting
	Acute Viral Hepatitis (Lab confirm Hep A and Hep E)
	Cholera (Lab confirm)
	Enteric Fever (Lab confirm)
Vaccine Preventive Diseases	AFP (below 15yrs of age)
	Diphtheria
	Neonatal Tetanus
	Measles
	Pertussis
	Whooping Cough
Vector Borne Diseases	Malaria
	Chikungunya
	Dengue Fever (Lab confirm)
Other Diseases	Suspected Meningitis
	Acute LRTI & Pneumonia
	Acute Encephalitis Syndrome
	Leptospirosis
	Chicken Pox
	Unusual Syndrome

Source: Integrated Disease Surveillance Project, Vadodara, Annual Report 2009.

A perusal of new cases examined at the Out Patient Departments (OPDs) of different hospitals during the year 2009 reveal that the highest percentage of new cases were examined in Vadodara (16.28 %) followed by Padra (14.94 %), Savli (11.47%) and Chhota Udaipur (11.08%) *talukas* (Fig. 6.1). Vadodara, being the district headquarters, has all the modern health care facilities. The best trained doctors, nurses as well as the other trained staff are available here. Even Government hospitals here are well-equipped. Examination of new cases in the same year remained moderate in Karjan (7.27 %), Dabhoi (7.18%), Nasvadi (6.08%) *talukas*. It

is interesting to note that the new OPD cases were the lowest in the predominantly tribal *talukas* of Sinor (3.88%), Jetpur Pavi (4.32%) and Kavant (4.75%). Lower reporting of new cases in the tribal *talukas* may be due to poor quality of health care facility rather than lower incidence of diseases. It is has been observed that people of the tribal *talukas* generally prefer to take the patients to Vadodara instead of utilising the locally available medical services.

Figure-6.1 : All New Cases Examined –OPD(2009)



Source: IDSP, Vadodara, Annual Report, 2009.

6.3 Distribution and Trends of Major Diseases in Vadodara District

Vadodara district occupies the part of Gujarat plain which is sub-divided into seven micro physiographic units, such as Kambhat silt, Mahi Plain, Vadodara Plain, Orsang-Heran Plain, Narmada Gorge, lower Narmada valley and Vindhayan Hills. Vindhyan Hills extend over Chhota Udaipur, Kavant and Nasvadi *talukas* (District Census Handbook, Vadodara 2001, 7). The terrain of the Vadodara district is characterized by plain topography in the west. The elevation increases gradually along the eastern part and finally along the eastern border it becomes a hilly tract covered with forests. The western plain region has a cluster of urban and industrial centers, while the eastern hilly region is almost entirely rural, with higher concentration of

tribal population. This difference in physiography and seasonal changes in the rainfall plays significant role in the distribution of diseases. The change in climatic condition impacts human infectious diseases via pathogen host and transmission (X. Wu and et.al, 2016). The common infectious diseases that grips Vadodara district are acute diarrhoea, cholera, enteric fever**,** malaria, measles, chikungunya, dengue fever, leptospirosis and chickenpox etcetera (IDSP-2009).

6.3.1 Acute Diarrhoea

Diarrhoea is three or four passage of loose, liquid or watery stools per day. It may continue for about two weeks without medical care leading to death. It is noticed that in the temperate regions, bacterial diarrhoea occurs more frequently during the warm season. Bacterial diarrhoea increases during the hot and rainy seasons. Viral diarrhoea which is often caused by rotavirus occurs during the winter season. In the tropical areas, rotavirus diarrhoea occurs throughout the year and its frequency increases during the drier and cool months (Park,1997, 196) (https://en.wikipedia.org/wiki/Diarrhea).

Table-6.2 : Cases of Acute Diarrhoea – Vadodara District (2005-2009)

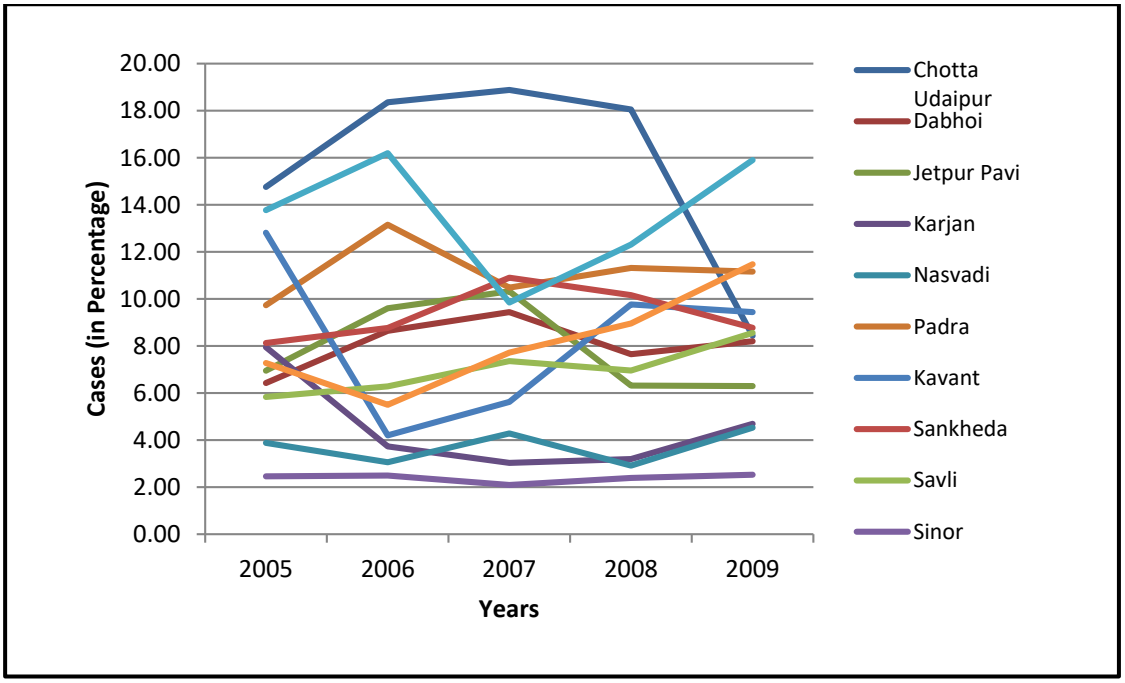
Taluka	Percentage of Cases				
	2005	**2006**	**2007**	**2008**	**2009**
Chhota Udaipur	14.76	18.36	18.88	18.05	8.43
Dabhoi	6.43	8.65	9.44	7.65	8.20
Jetpur Pavi	6.95	9.60	10.32	6.32	6.30
Karjan	7.95	3.73	3.04	3.19	4.69
Nasvadi	3.88	3.06	4.28	2.92	4.53
Padra	9.73	13.15	10.48	11.32	11.16
Kavant	12.81	4.20	5.62	9.77	9.44
Sankheda	8.13	8.77	10.91	10.16	8.78
Savli	5.83	6.28	7.36	6.96	8.56
Sinor	2.46	2.50	2.10	2.40	2.53
Vadodara	13.77	16.19	9.85	12.31	15.91
Vaghodia	7.28	5.50	7.72	8.96	11.48
Total	**100**	**100**	**100**	**100**	**100**

Source: Computed from IDSP, Vadodara, Annual Report 2009.

According to the IDSP, Vadodara, Annual Report 2009, reported cases of acute diarrhoea have registered a decreasing trend only in three of the twelve *talukas*

of the district. These include two tribal *talukas* of Chhota Udaipur and Kavant and the non-tribal *taluka* of Karjan. There has been no significant change in another three *talukas* including the tribal *taluka* of Jetpur Pavi. Remaining six *talukas* or half of the *talukas* of the district have experienced increment in the incidence of acute diarrhoea. It is worth noting that the most urbanised and industrialised Vadodara *taluka* has not only reported the highest percentage, but an almost consistent increase of such cases. Chhota Udaipur *taluka*, which reported the highest percentage of the disease at the start year of 2005, has been able to control its incidence. Sinor *taluka* seems to be the best placed among all the *talukas* of the district in the context of acute diarrhoea related cases with the minimum percentage (less than 3.00%) of patients in the *taluka* suffering from acute diarrhoea. Overall it can be said that during the five years in reference acute diarrhoea cases have been on the increase in majority of the *talukas* of Vadodara district (Table – 6.2 & Figure 6.2).

Figure - 6.2 : Cases of Acute Diarrhoea Diseases– Vadodara District (2005-2009)



Source: Integrated Disease Surveillance Project, Vadodara, Annual Report, 2009.

6.3.2 Fever

The term "enteric fever" includes both typhoid and paratyphoid fevers. The disease can occur sporadically, epidemically or endemically. Typhoid fever is recorded all over the year and in all parts of the world where water supplies and

sanitation are not good. The *S.tyhi* (bacteria)is the major agent causing enteric fever. The incidence of the disease is the maximum during the rainy season between July and September in India. The bacilli are found in water, ice, food, milk and soil for varying periods of time. Typhoid fever is transmitted via the faecal-oral route or urine-oral routes. It can also transfer through the soiled hands contaminated with faeces or urine of cases or carriers, or by the ingestion of contaminated water, milk and/or food, or through flies (Park, 1997, 207-208).

Table-6.3 : Cases of Fever – Vadodara District (2005-2009)

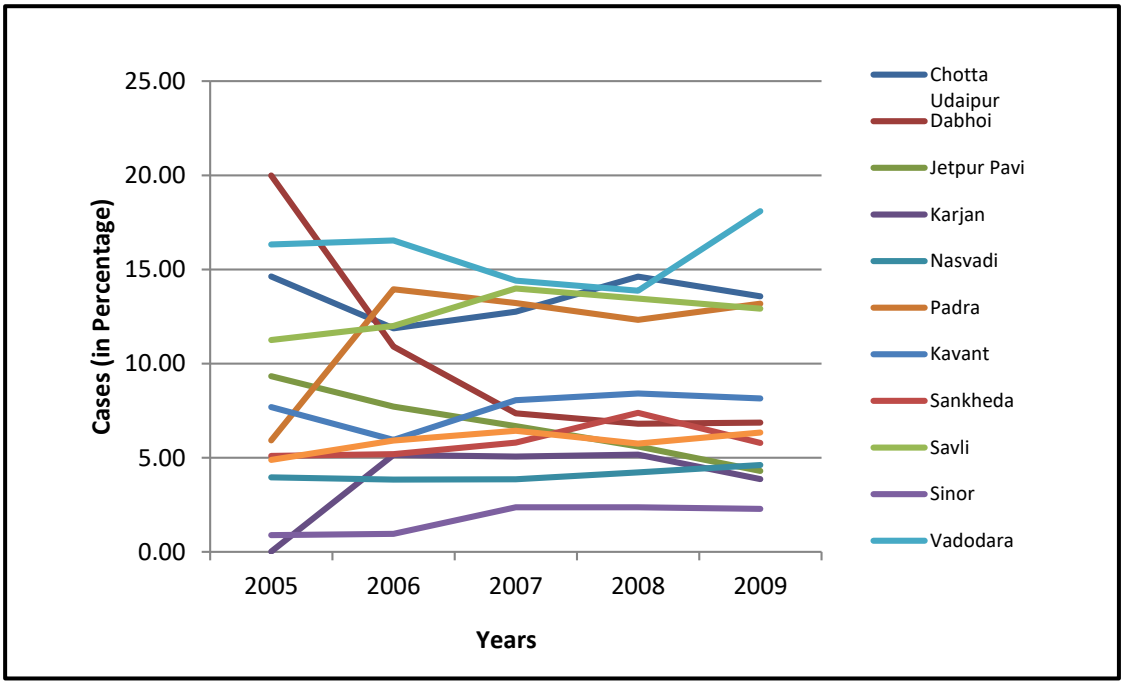
Taluka	Percentage of Cases				
	2005	**2006**	**2007**	**2008**	**2009**
Chhota Udaipur	14.63	11.88	12.76	14.62	13.58
Dabhoi	19.99	10.91	7.36	6.81	6.87
Jetpur Pavi	9.33	7.71	6.68	5.60	4.30
Karjan	0.02	5.15	5.07	5.16	3.86
Nasvadi	3.96	3.84	3.86	4.22	4.62
Padra	5.92	13.95	13.22	12.33	13.18
Kavant	7.69	5.95	8.06	8.42	8.16
Sankheda	5.10	5.19	5.81	7.39	5.79
Savli	11.25	12.00	13.99	13.45	12.92
Sinor	0.89	0.96	2.37	2.37	2.29
Vadodara	16.33	16.54	14.41	13.87	18.10
Vaghodia	4.89	5.91	6.43	5.75	6.34
Total	100	100	100	100	100

Source: Computed from IDSP, Vadodara, Annual Report, 2009.

Reported fever cases in the district seem to be on the increase during the five years reference period of 2005 to 2009. Nine out of the twelve *talukas* have registered increasing trend in the reported cases of the disease. Decrease is noticed only in case of three *talukas* including the two predominantly tribal *talukas* of Chhota Udaipur and Jetpur Pavi. However, the only non-tribal *taluka* of Dabhoi has registered an incredible decrease from 19.99 per cent of cases in 2005 to only 6.87 per cent cases in 2009. On the other hand, increment in the percentage of patients reporting for fever in Padra *taluka*, has been exorbitant with an increase from only 5.92 per cent in 2005 to 13.18 per cent in 2009. But it is noticeable that the disease has affected the maximum proportion (16.33 to 18.10 %) of patients of Vadodara *talulka* among all the *talukas* of

the district. The position of Sinor *taluka* remains the best even with reference to reported cases of fever with the minimum percentage of cases (Table 6.3 & Figure 6.3).

Figure - 6.3 : Cases of Fever – Vadodara District (2005-2009)



Source: IDSP, Vadodara, Annual Report 2009

6.3.3 Malaria

Malaria is a protozoal disease, caused by infection with parasite of genus plasmodium. Malaria is transmitted to the human body through infected female anopheline mosquito.

About 109 countries in the World are malaria endemic including 45 countries of the WHO African region. Malaria is caused by four species of the malaria parasite- *P.vivax, P.flcciparum, P.malariae and P.ovale*. The *P.vivax* parasite is known for causing around 70 per cent of the malarial infections in India. India's tropical climate and its associated characteristics create conditions favourable for the germination and transmission of the *P.vivax* parasite. Malaria is a seasonal disease and most cases in India are reported during the months of July to November, when temperature and relative humidity remain between 20°C to 30°C and 60 per cent respectively. Rainfall increases the breeding of mosquitoes and gives rise to epidemics of malaria. Parts of the country lying 2,000 meters above sea level are free from the anopheles mosquito due to unfavourable climatic condition (Park, 1997, 222-225).

Table - 6.4 : Cases of Malaria – Vadodara District (2005-2009)

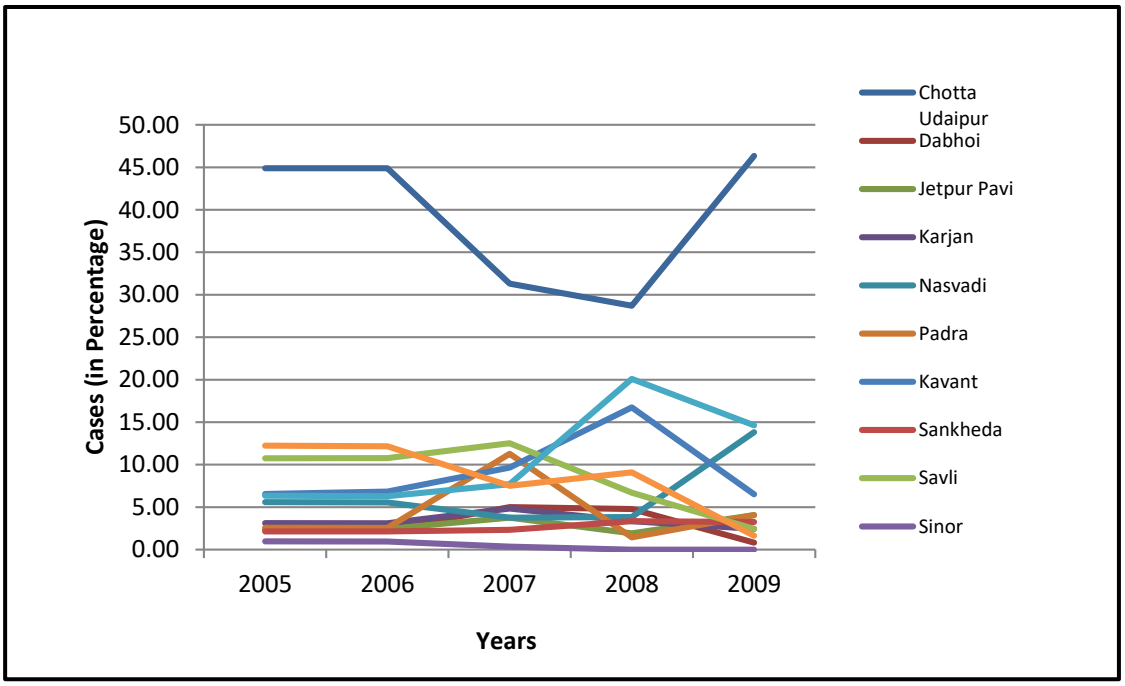
Taluka	Percentage of Cases				
	2005	**2006**	**2007**	**2008**	**2009**
Chhota Udaipur	44.90	44.88	31.31	28.71	46.34
Dabhoi	2.36	2.35	5.01	4.78	0.81
Jetpur Pavi	2.47	2.45	3.76	1.91	4.07
Karjan	3.11	3.09	4.83	3.35	2.44
Nasvadi	5.59	5.54	3.76	3.83	13.82
Padra	2.58	2.56	11.27	1.44	4.07
Kavant	6.55	6.82	9.66	16.75	6.50
Sankheda	2.15	2.13	2.33	3.35	3.25
Savli	10.74	10.77	12.52	6.70	2.44
Sinor	0.97	0.96	0.36	0.00	0.00
Vadodara	6.34	6.29	7.69	20.10	14.63
Vaghodia	12.24	12.15	7.51	9.09	1.63
Total	100	100	100	100	100

Source: Computed from IDSP, Vadodara, Annual Report 2009.

Chhota Udaipur *taluka*, located on the eastern part of Vadodara district has consistently reported malaria cases that accounts for almost half the malaria cases in the entire district. The gradual decreasing trend on the proportion cases is disrupted during 2009 with a sudden and exorbitant increase, indicating concentration of the incidence of malaria in the *taluka*. The increment in the share of malaria cases is experienced in half of the *talukas* of the district including Chhota Udaipur, Nasvadi and Vadodara, where it is substantial. Share of malaria cases in the remaining *talukas* has either been constant or reduced. It is interesting to observe that very insignificant or no cases of malaria have been reported from Sinor *taluka* during the five years in reference. Other *talukas* which account for very small proportion of malaria cases in the district include Dhaboi, Karjan, Savli and Vaghodia. It may be pointed out here that all these *talukas*, including Sinor, are characterised by plain topography, relatively more urbanised and industrialised, accommodating mostly non-tribal population. On the other hand, proportion of malaria cases is not only high but also have either increased or remained constant during the reference period in the predominantly tribal, hilly and forested *talukas* of the district, namely, Chhota Udaipur. Jetpur Pavi, Nasvadi and Kavant. Among the non-tribal *talukas*, Padra, Sankheda and Vadodara display increment in the proportion of malaria cases during the five years. While the increment is minor in case of Padra and Sankheda, the two to

three fold increase in case of Vadodara *taluka* during 2008 and 2009 is a matter of serious concern (Table- 6.4 & Figure -6.4).

Figure - 6.4 : Cases of Malaria – Vadodara District (2005-2009)



Source: IDSP, Vadodara, Annual Report 2009.

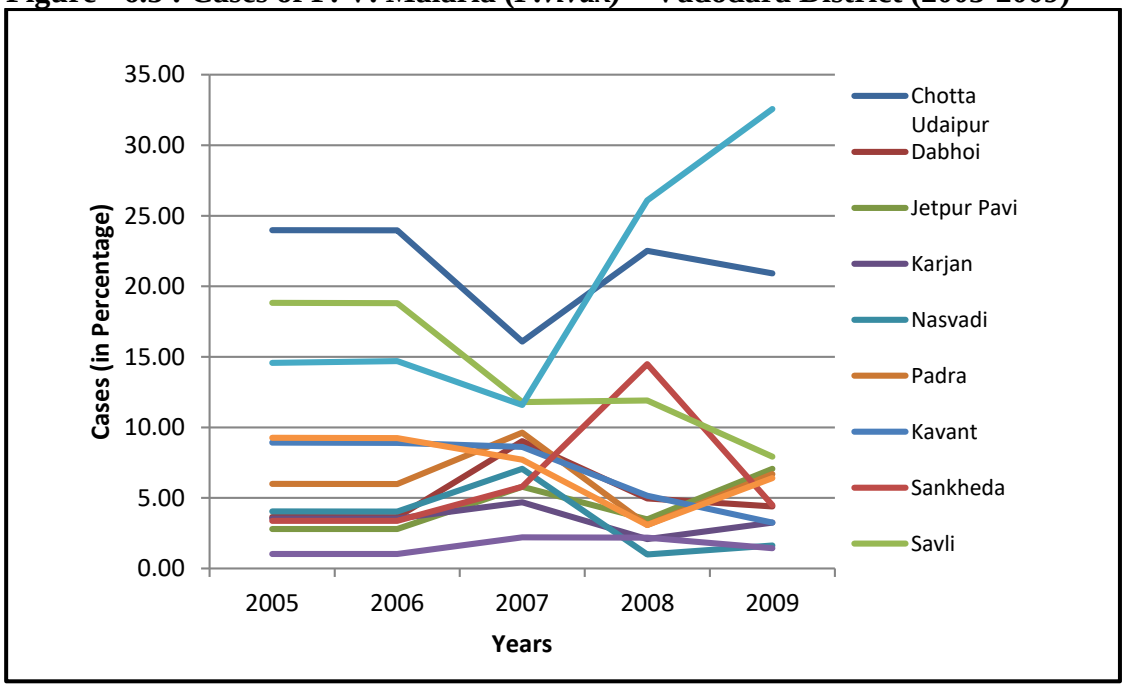
A reference to P.V. (*P.vivax*) malaria cases during the same period reveals a similar pattern and trend across the *talukas* of the district (Table-6.5 and Figure -6.5). The highest percentage of cases is from the *taluka* of Vadodara followed by Chhota Udaipur and Savli. More than half of the P.V. malaria cases in the district have been recorded in the two *talukas* of Vadodara (32.57 % and Chhota Udaipur (20. 92 %) taken together. Proportion of cases has drastically increased during the reference period in Vadodara, Chhota Udaipur and Jetpur Pavi *talukas*. Minor increase is also noticed in the *talukas* of Dabhoi, Jetpur Pavi, Padra and Sankheda. The situation in Sinor *taluka* remains appreciable even in this case, which accounts for less than two per cent of the P.V. malaria cases in the district in all the five years in reference (Table - 6.5 and Figure - 6.5).

Table - 6.5 : Cases of P. V. Malaria (*P.vivax)* – Vadodara District (2005-2009)

Taluka	Percentage of Cases				
	2005	**2006**	**2007**	**2008**	**2009**
Chhota Udaipur	23.98	23.97	16.08	22.52	20.92
Dabhoi	3.64	3.64	9.02	4.96	4.39
Jetpur Pavi	2.80	2.79	5.80	3.47	7.07
Karjan	3.54	3.53	4.69	2.08	3.25
Nasvadi	4.04	4.03	7.06	0.99	1.62
Padra	5.99	5.98	9.63	3.08	6.69
Kavant	8.93	8.90	8.61	5.16	3.25
Sankheda	3.38	3.37	5.80	14.48	4.49
Savli	18.83	18.81	11.80	11.90	7.93
Sinor	1.03	1.03	2.20	2.18	1.43
Vadodara	14.58	14.70	11.59	26.09	32.57
Vaghodia	9.27	9.25	7.71	3.08	6.40
Total	100	100	100	100	100

Source: Computed from IDSP, Vadodara, Annual Report 2009.

Figure - 6.5 : Cases of P. V. Malaria (*P.vivax)* – Vadodara District (2005-2009)



Source: IDSP, Vadodara, Annual Report 2009

6.4 Calculation of Prevalence Rate

Disease occurrences can be measured by the incidence and prevalence rates. Prevalence rate broadly pertains to, "the total number of all individuals who have an attribute or disease at a particular time (or during a particular period) divided by the population at risk of having the attribute or disease at this point of time or midway

through the period". Prevalence rate helps to find out the magnitude of health or disease in the population. There are two types of prevalence rates, namely, Point Prevalence and Period Prevalence and are expressed in the following manner (Park, 1997, 57-58).

Point Prevalence =A/Bx100

Where,

- 'A' is number of all current cases (old and new) of a specified disease existing at a given point in time
- 'B' is estimated population at the same point in time.
- '100' is the constant.

Period Prevalence= A/Bx100

Where,

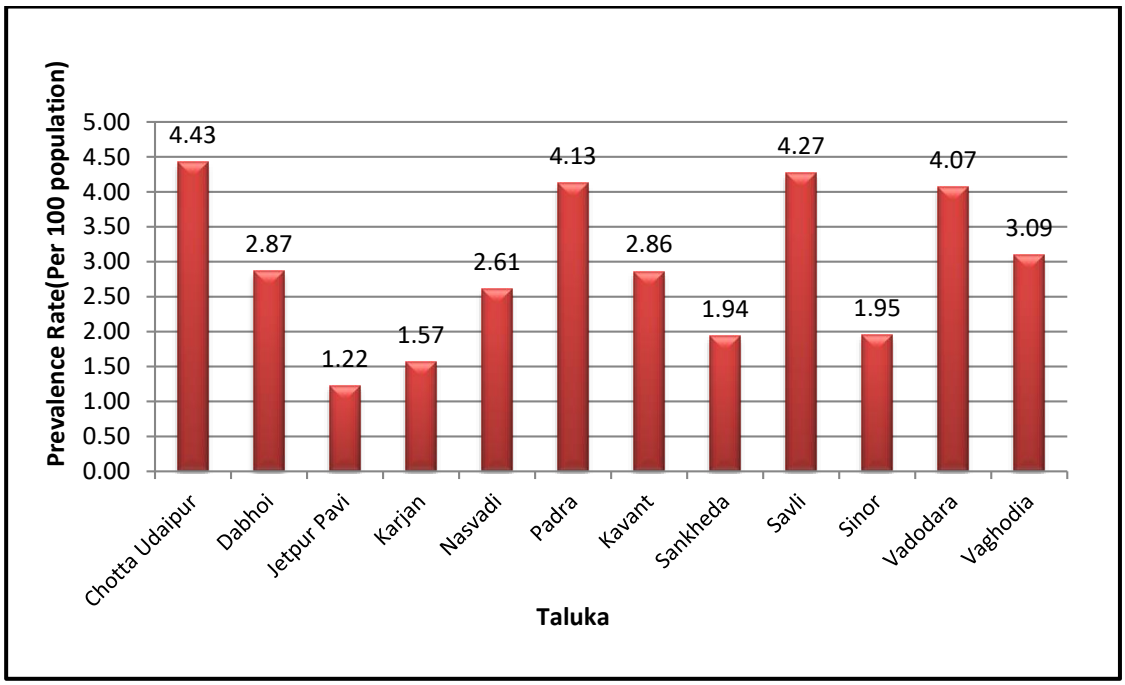
- 'A' stands for the number of the existing cases (old and new) of a specified disease during a given period of the time interval,
- 'B' stands for the estimated mid-interval population at risk, and
- '100' is the constant.

For the purpose of this study, period prevalence rate of selected diseases have been calculated with help of the above mentioned formulae for the district at *taluka* level. Data pertaining to these diseases have been procured from the IDSP, Vadodara, Annual Report 2009. The diseases for which the period prevalence rate has been calculated are fever, acute diarrhoea, P.V Malaria and P. F Malaria of all *talukas* of Vadodara district.

6.4.1 Fever

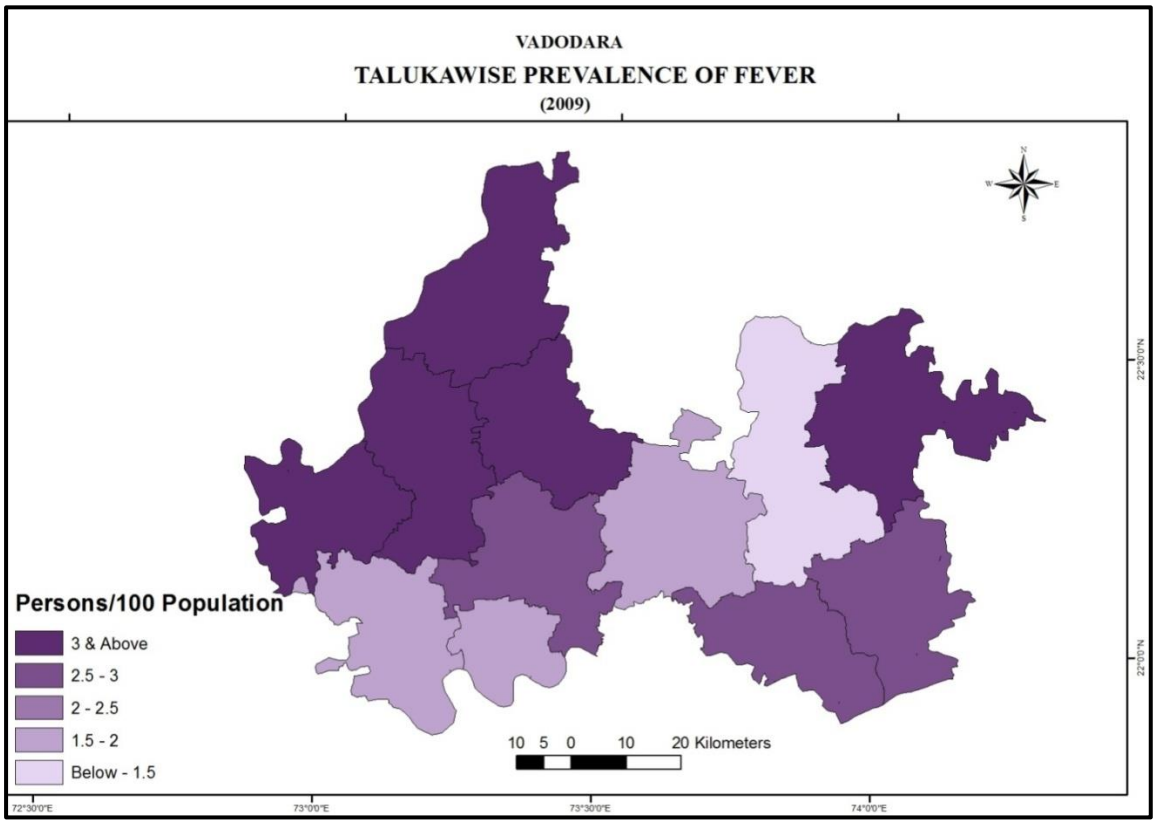
Figure 6.6 depicting prevalence rate of fever in year 2009 reveals that between 1.22 to 4.43 persons in every 100 persons were affected by it in the district. The highest prevalence rate of 4.43 persons is reported from Chhota Udaipur *taluka* followed by Savli (4.27), Padra (4.21) and Vadodara (4.07) *talukas*. Moderate prevalence rate is seen in Vaghodia (3.09), Dabhoi (2.87), Nasvadi (2.61), Kavant (2.86), Sankheda (1.94) and Sinor (1.95) *talukas* of the districts. Situation in Jetpur Pavi (1.22) and Karjan (1.57) *talukas* is the best with the lowest prevalence rates (Map-6.1).

Figure-6.6 : *Taluka*-Wise Prevalence Rate of Fever – Vadodara (2009)



Source: IDSP, Vadodara, Annual Report, 2009.

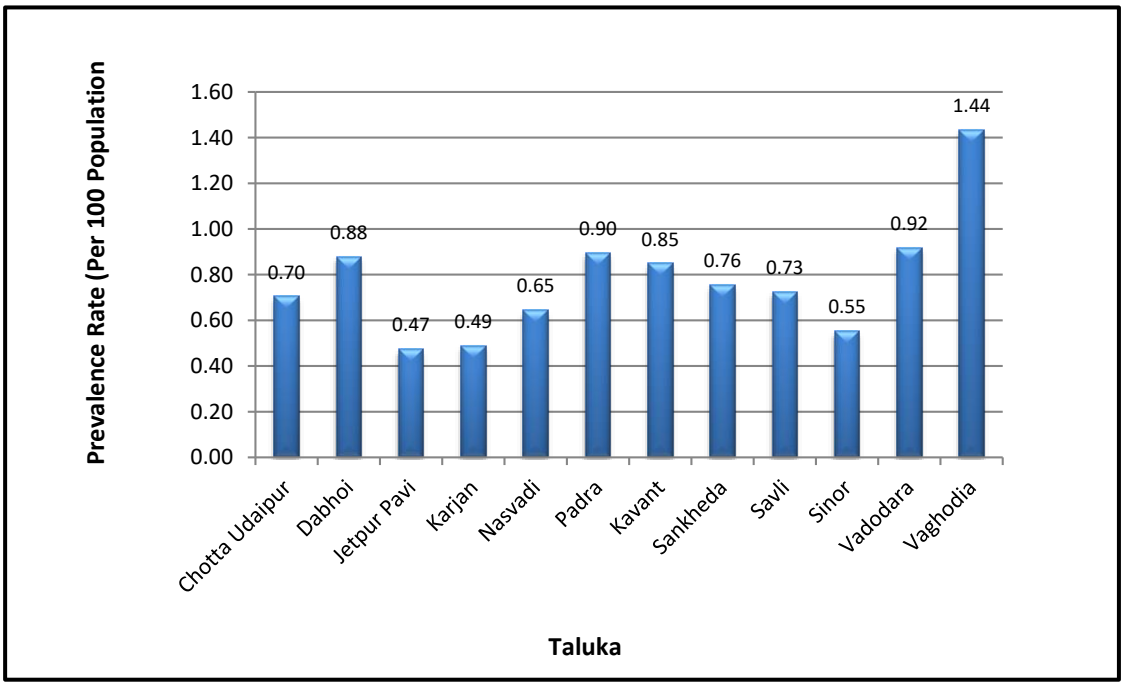
Map-6.1



6.4.2 Acute Diarrhoea

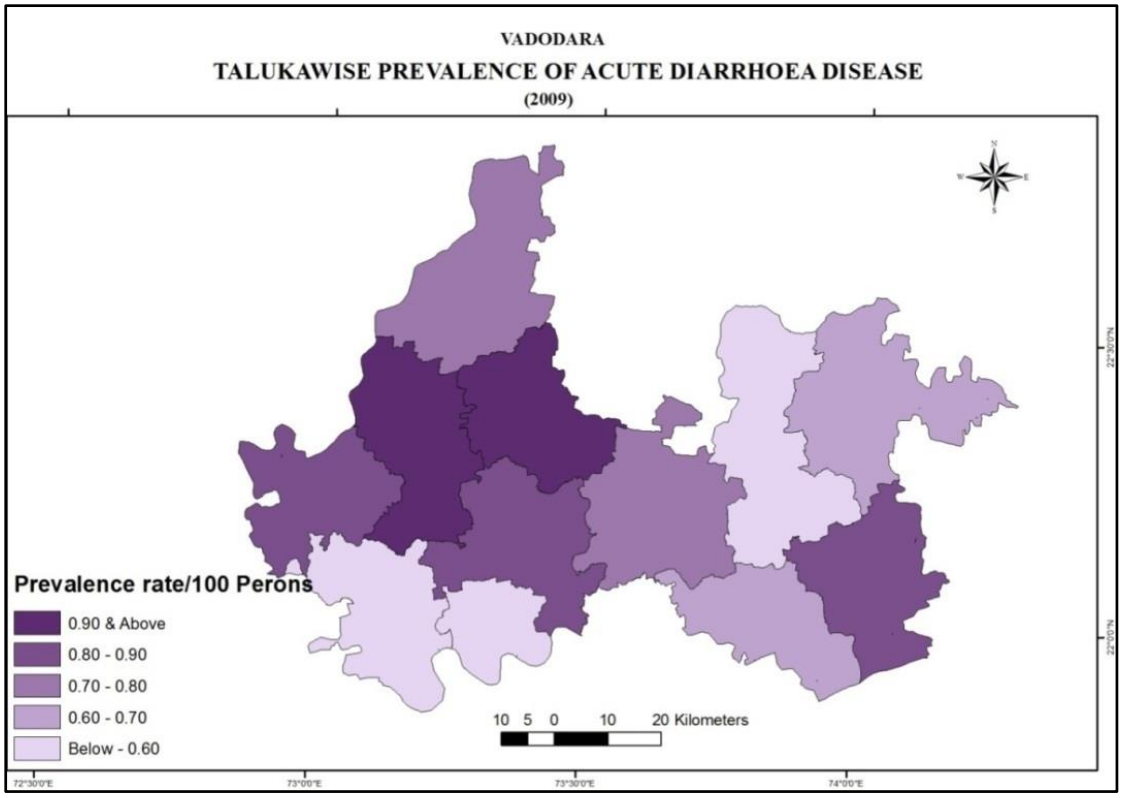
Prevalence rate of acute diarrhoea in the year 2009 was relatively lower in the *talukas* of the district (Fig. 6.7). Across the *talukas* of the district, between 0.47 to 1.44 persons in a population of 100 persons were affected by the disease. Among the *talukas*, the highest prevalence rate is seen in Vaghodia (1.44), Vadodara (0.92), Padra (0.90), Dabhoi (0.88) and Kavant (0.85) *talukas*. Sankheda (0.76), Savli (0.73) and Chhota Udaipu (0.70) *talukas* have been affected moderately. The situation is the best in Sinor (0.55), Karjan (0.49) and Jetpur Pavi (0.47) *talukas* where the prevalence rate of acute diarrhoea is the least (Map-6.2).

Figure-6.7 : *Taluka*-Wise Prevalence Rate of Acute Diarrhoea Diseases - Vadodara (2009)



Source: IDSP, Vadodara, Annual Report 2009

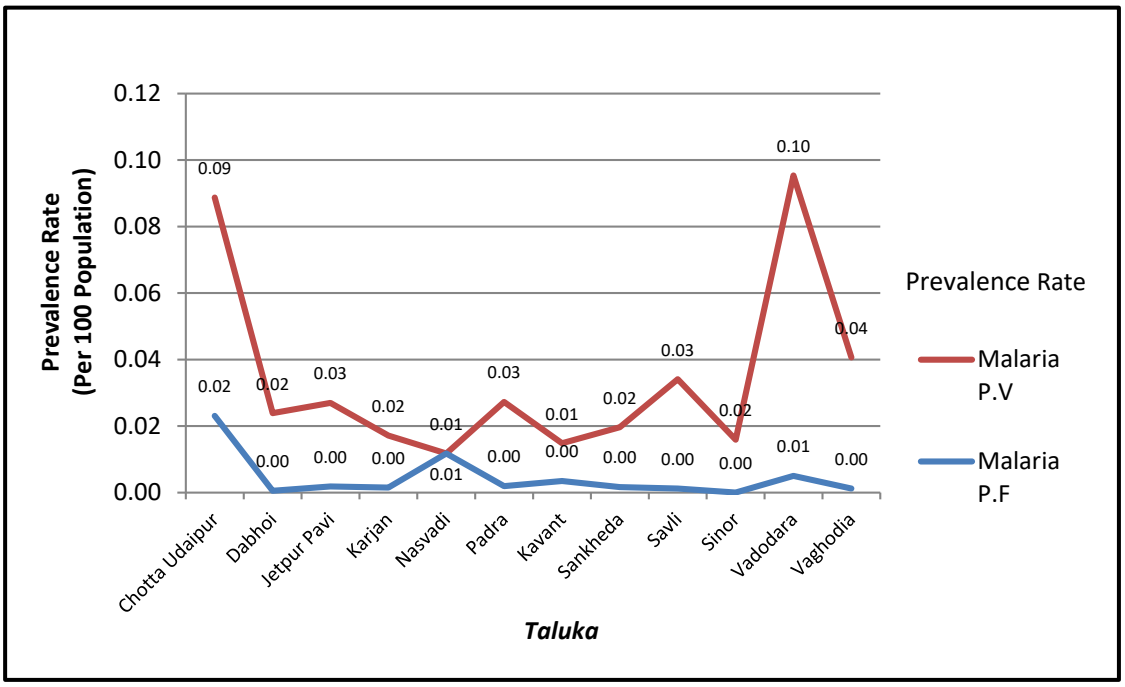
Map-6.2



6.4.3 Malaria

Malaria P.V is a common type of malaria and is prevalent in every corner of the country excepting in the high mountains. Prevalence rate of malaria PV in the Vadodara district varies between 0.01 to 0.10 persons per 100 population. It is interesting to note that the *talukas* of Vadodara (0.10) and Chhota Udaipur (0.09), which are marked respectively by high density of urban-industrial population and hilly and forested areas experience the highest prevalence of malaria P.V. The prevalence of this type malaria is rather much lower in the remaining *talukas* of Dabhoi (0.02), Jetpur Pavi (0.03), Karjan (0.02), Padra (0.03), Kavant (0.01), Sankheda (0.02), Savli (0.03), Sinor (0.02) and Vaghodia (0.04) (Map-6.3)

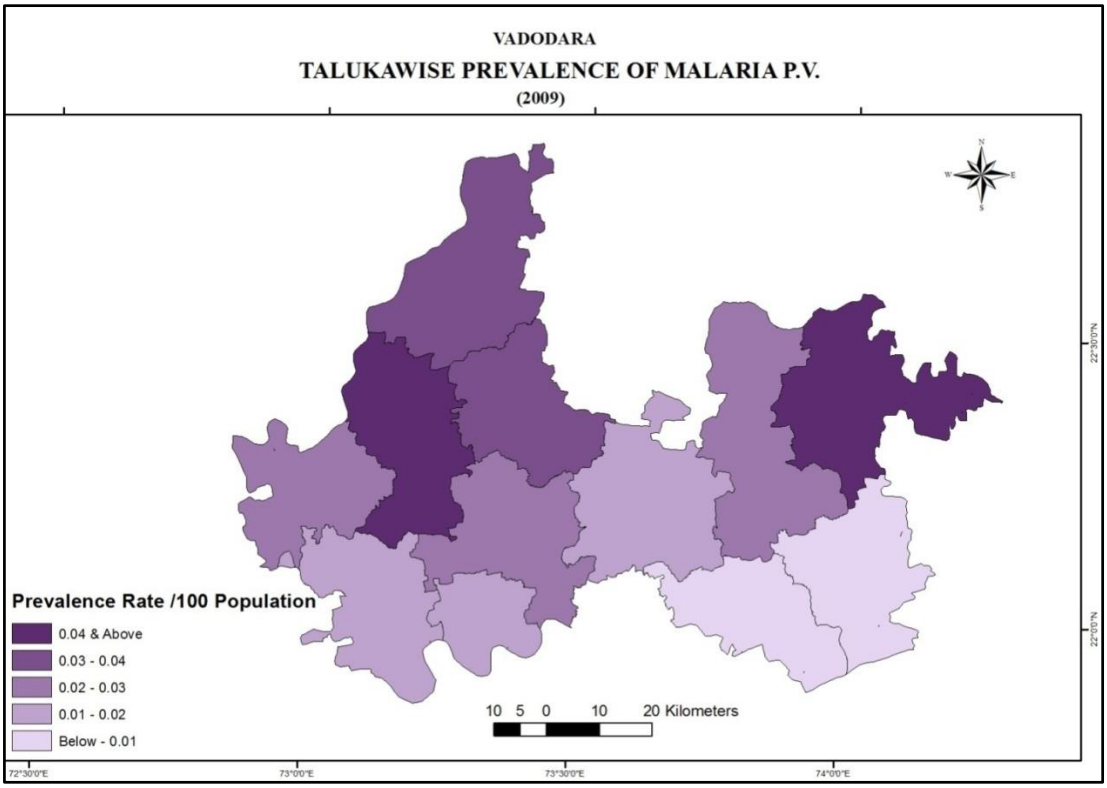
Figure-6.8 : ***Taluka*-wise prevalence rate of Malaria P.V and Malaria P.F - Vadodara (2009)**



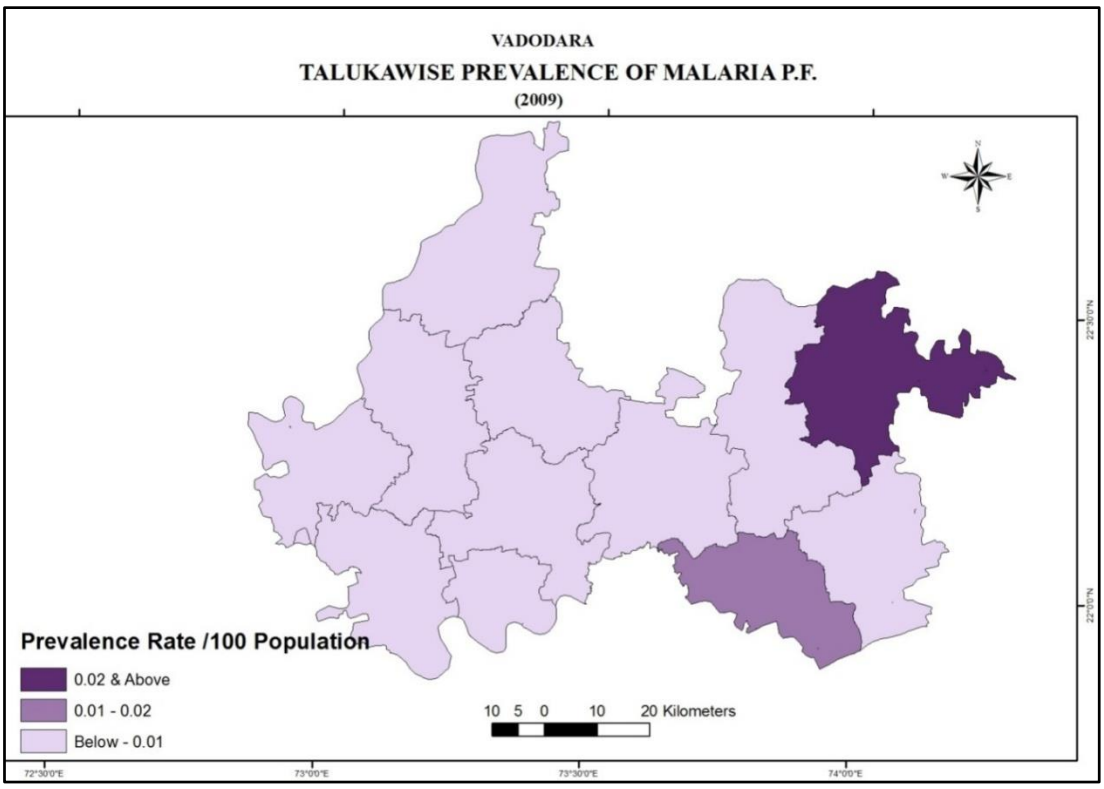
Source: IDSP, Vadodara, Annual Report 2009

Malaria P.F type is highly lethal. Fortunately however, prevalence of this type of malaria is rare in India. Obviously therefore, its prevalence rate in Vadodara district is very low and reaches a maximum of 0.01 persons per 100 population. This type of malaria is seen only in the *talukas* of Chhota Udaipur (0.02), Vadodara (0.01) and Nasvadi (0.01). Elsewhere, the prevalence of malaria P.F. is almost rare (Fig. 6.8 and Map-6.4).

Map-6.3


VADODARA
TALUKAWISE PREVALENCE OF MALARIA P.V.
(2009)
Prevalence Rate /100 Population
0.04 & Above
0.03 - 0.04
0.02 - 0.03
0.01 - 0.02
Below - 0.01
10 5 0 10 20 Kilometers
72°30'0"E
73°0'0"E
73°30'0"E
74°0'0"E

Map-6.4


VADODARA
TALUKAWISE PREVALENCE OF MALARIA P.F.
(2009)
Prevalence Rate /100 Population
0.02 & Above
0.01 - 0.02
Below - 0.01
10 5 0 10 20 Kilometers
72°30'0"E
73°0'0"E
73°30'0"E
74°0'0"E

6.5 Health Care Services

Health of the population and development of the country to a great extent depend on the availability of efficient health care services. A health care service is also the indicator of health status of the people. However, it is uncommon to find appropriately distributed health care service in all parts of the World. Uneven distribution of health care services is rather a common feature of the less developed and developing countries. According to the Rural Health Statistics in India 2017 Report (RHS), the health care services are provided in a three tier system or at three levels i.e. Sub-Centres (PHS), Primary Health Centres (PHCs) and Community Health Centres (CHCs), which have to cater to prescribed specific size of target population. According to RHS-2017, currently there are 1,56,231 PHSs, 25,650 PHCs, and 5,624 CHCs in the country. Gujarat has 9,082 PHSs, 1,392 PHCs and 363 CHCs. There are 242 PHSs, 42 PHCs and 10 CHCs in Vadodara district (Table 6.6).

Table - 6.6 : Number of Functioning PHSs, PHCs & CHCs (As on 31st March 2017)

Health Services	All India	Gujarat State	Vadodara District
PHSs	1,56,231	9,082	242
PHCs	25,650	1,392	42
CHCs	5,624	363	10
Sub Divisional Hospital	1,108	36	1
District Hospital	779	22	1

Source: RHS-2017 Report.

6.5.1 Shortfall in Health Infrastructure

It would be worthwhile to assess the sufficiency or insufficiency of the available health care services in the country and Gujarat. A comparison between the number of available health care services and manpower in the health sector with their respective prescribed numbers clears the picture on their sufficiency or insufficiency (Table 6.7 & Fig. 6.9). Overall, it would not be wrong to say that Gujarat is much better placed in comparison to the country as a whole with reference to health infrastructure and health sector manpower, with a few exceptions. With respect to health infrastructure, unlike the country, the state is privileged to have a surplus number of PHSs, PHCs and CHCs. The country has around 20 or more per cent shortfall in these services. There is, in general, a shortfall of manpower in the health sector of the country. In this context too, the position of Gujarat is better in

comparison to the country excepting with respect to the availability of female health workers (ANM) at the PHSs and PHCs and different specialists at the CHCs. It is surprisingly pathetic to note that the shortfall of specialists at the CHCs in the country (82%) and in the state (94%) is extremely high. Similarly, the availability of Radiographers at the CHCs is highly insufficient at both the National (65%) and State (55%) levels. There is 40 per cent shortfall of Laboratory Technicians at PHCs & CHCs in India. The analysis clearly indicates that there is great dearth of specialist doctors and other medical staff in the country.

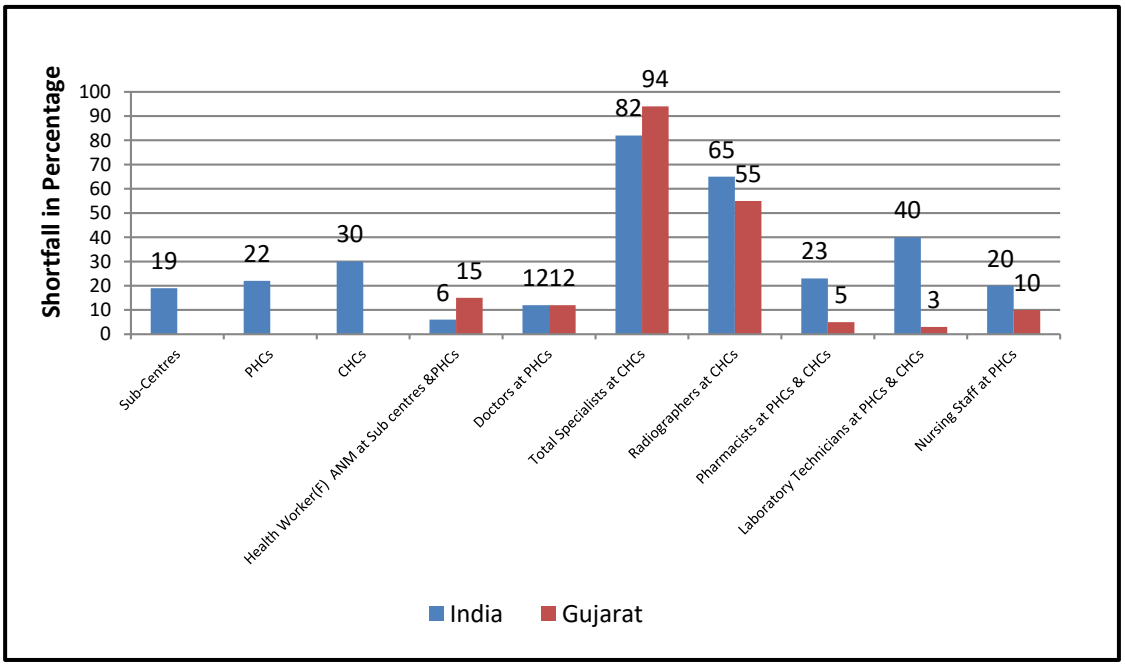
Table-6.7 : Shortfall in Health Infrastructure

Health Services and Infrastructure	**Position**	**India**	**Gujarat**
Sub Centres (PHS)	Required	179240	8008
	In Position	156231	9082
	Shortfall	34946	*
	Shortfall (%)	**19**	*****
Primary Health Centres (PHC)	Required	29337	1290
	In Position	25650	1392
	Shortfall	6409	*
	Shortfall (%)	**22**	*****
Community Health Centres (CHC)	Required	7322	322
	In Position	5624	363
	Shortfall	2168	*
	Shortfall (%)	**30**	*****
Health Worker (Female)/ANM at Sub-Centres & PHCs	Required	181881	10474
	Sanctioned	211388	10549
	In Position	220707	8859
	Vacant(S-P)	27890	1690
	Shortfall(R-P)	10112	1615
	Shortfall(%)	**6**	**15**
Doctors at PHCs	Required	25650	1392
	Sanctioned	33968	1769
	In Position	27124	1229
	Vacant(S-P)	8286	540
	Shortfall(R-P)	3027	163
	Shortfall(%)	**12**	**12**
Total Specialists (Surgeons, Obstetricians & Gynaecologists, Physicians & Paediatricians) **at CHCs**	Required	22496	1452
	Sanctioned	11910	611
	In Position	4156	92
	Vacant	8105	519
	Shortfall	18347	1360
	Shortfall(%)	**82**	**94**

Radiographer at CHCs	Required	5624	363
	Sanctioned	4155	363
	In Position	2129	162
	Vacant	2061	201
	Shortfall	3629	201
	Shortfall(%)	**65**	**55**
Pharmacists at PHCs & CHCs	Required	31274	1755
	Sanctioned	29315	1782
	In Position	25193	1665
	Vacant(S-P)	4582	127
	Shortfall	7092	90
	Shortfall(%)	**23**	**5**
Laboratory Technician at PHCs & CHCs	Required	31274	1755
	Sanctioned	23902	1756
	In Position	18952	1704
	Vacant(S-P)	5753	52
	Shortfall	12511	51
	Shortfall(%)	**40**	**3**
Nursing Staff at PHCs & CHCs	Required	65018	3933
	Sanctioned	77956	3994
	In Position	70738	3529
	Vacant	11288	465
	Shortfall	13194	404
	Shortfall(%)	**20**	**10**

*Note: *:- Surplus*
Source: RHS -2017 Report.

Figure-6.9 : Shortfall in Health Infrastructure-2017



Source: RHS -2017 Report.

6.5.2 Facilities Available at Sub Centres

An attempt was made to understand the status of facilities available at the PHSs of the country and the State. For the purpose, the data available in the Rural Health Statistics in India 2017 Report has been taken into consideration (Table 6.8). It may be pointed out at this juncture that the role of the female health worker (ANM) is to provide pre-natal, natal and post-natal care and immunizations etcetera to the population of a village or a group of villages. The facility of the ANM worker is a health care measure at the grass-root level, whose presence in the neighbourhood of the target population is essential. On this count, living quarters are supposed to be provided to the ANM workers at the PHSs. The available data suggests that the availability of living quarters for the ANMs and utilisation of the available quarters by the ANM workers in the country as well as in the State is poor. Slightly more than half (55.4%) of the PHSs in the country have ANM living quarters attached to them, and a similar proportion (56.4%) of these are occupied by the ANM workers. Compared to the Nation as a whole, Gujarat is better off in terms of available ANM living quarters (61.6%), but lags behind in their utilisation (42.1%). The report also makes it clear that majority of the PHSs in the country are not functioning as per the prescribed norms. The status in the State with regard to this aspect cannot however be assessed due to non-availability of data. While all the PHSs of Gujarat are provided with uninterrupted supply of water and electricity, and are accessible by motorable approach road, same is not true in case of the country. Around one fifth of the PHSs in the country have no water or electricity supply, and one tenth are not accessible by motorable roads (Table 6.8).

Table -6.8 : Status of Facilities Available at Sub-Centres (Number & Percentage) (As on 31st March, 2017)

Facilities Available at Sub-Centres	India	Gujarat
Sub Centres with ANM quarters	86525(55.4%)	5596 (61.6%)
Sub Centres with ANMs living in sub centre quarter	48781(56.4%)	2356(42.1%)
Sub-centres Functioning as per PHS norms	17204(11.01%)	N.A
Without regular water supply	31985(20.5%)	0
Without regular electric supply	37387(23.9%)	0
Without all-weather motorable approach road	15536(9.9%)	0

Note: N. A: Not Available.Source: RHS -2017 Report.

6.5.3 Facilities Available at PHCs

What the RHS 2017 Report reveals with regard to the available facilities at the PHCs in the country and the state of Gujarat is not very encouraging (Table 6.9). The State however compares better with the country in many respects, particularly with reference to facilities like, labour room, hospital beds, electricity and water supply, motorable approach road, telephone connection and computer facility. It however lags much behind the country with respect to PHCs functioning on 24x7 bases and as per the IPHS norms, and availability of operation theatres. It is rather surprising to note that none of the PHCs in the state are functioning as per the prescribed norms (Table 6.9).

Table-6.9 : Facilities Available at PHCs (Number & Percentage) (As on 31st March, 2017)

Facilities Available at PHCs	India	Gujarat
Number of PHCs functioning on 24x7 basis	10044(39.2%)	314(22.6%)
With Labour Room	17688(69.0%)	1113(80.0%)
With Operation Theatre (OT)	9422(36.7%)	364(26.1%)
With at least 4 beds	19559(76.3%)	1392(100.0%)
Without regular electric supply	920(3.6%)	0
Without regular water supply	1695(6.6%)	0
Without all-weather motorable approach road	1361(5.3%)	0
With Telephone	13918(54.3%)	1392(100.0%)
With Computer	16688(65.1%)	1299(93.3%)
Referral Transport	14171(NA)	1392(NA)
Registered RKS	22077(NA)	1392(NA)
No. of PHCs Functioning as per IPHS norms	**3303(12.8%)**	**0**

Source: RHS -2017 Report.

6.5.4 Facilities Available at CHCs

CHCs occupy a position higher than the PHCs and PHSs in the health care structure and are supposed to cater the population with more number of facilities (Table 6.10). Here again, Gujarat state excels the country as a whole in the provision of most of these facilities. The State has achieved cent per cent success with respect to the provisions of functional laboratories and labour rooms, and referral transport

facility and allopathic medicines for common ailments. However, the CHCs in the State are poorly equipped with specialists, living quarters for the specialists and specialists living in the available quarters meant for them and AYUSH drugs for common ailments. Like the PHSs and the PHCs in the State, none of the CHCs of the State are functioning as per the prescribed norms (Table 6.10). On the whole, it would not be wrong to suggest that the state of Gujarat is relatively better equipped with facilities at the CHCs as compared to the CHCs elsewhere in the country.

Table -6.10 : Facilities Available at CHCs (Number & Percentage)
(As on 31st March, 2017)

Facilities Available at CHCs		India	Gujarat
With all four specialists		454(8.0%)	0
With computer/Statistical Asst. for MIS/Accountant		4843(86.1%)	311(85.6%)
With functional Laboratory		5303(94.2%)	363(100%)
With Operation Theatre (OT)		4696(83.4%)	290(79.8%)
With functional Labour Room		5186(92.2%)	363(100%)
With functioning Stabilization Units for new Born		2237(39.7%)	156(42.9%)
With New Born Care Corner		4722(83.9%)	340(93.6%)
With at least 30 beds		4083(72.5%)	290(79.8%)
With functional X-Ray machine		3122(55.5%)	258(71.0%)
With quarters for specialist Doctors		2816(50.0%)	81(22.3%)
With specialist Doctors living in quarters		1770(31.4%)	52(14.3%)
With referral transport available		5217(92.7%)	363(100%)
With registered Rogi Kalyan Samiti (RKS)		5116(90.0%)	328(90.3%)
Functioning as per IPHS norms		912(16.2%)	0
No. Of CHCs having a regular supply of	Allopathic drugs for common ailments	5418(96.3%)	363(100%)
	AYUSH drugs for common ailments	3415(60.72%)	0

Source: RHS -2017 Report.

6.6 Conclusion

The analysis of data provided in the Integrated Disease Surveillance Project (IDSP) Vadodara (Gujarat) Report and the Rural Health Statistics (RHS) in India 2017 Report in this chapter makes significant revelations pertaining to the status of health care facilities in India and in the state of Gujarat. Prevalence rate of fever in the year 2009, varied between 1.22 to 4.43 persons per 100 population. The highest prevalence rate (4.43) of fever was reported in Chhota Udaipur *taluka* followed by, Savli *taluka* (4.27). It may be recollected here that while the earlier *taluka* belongs to the group of hilly, forested and predominantly tribal *talukas*, the latter lies in the predominantly non-tribal dominated plain areas. The prevalence rate is however the lowest in two of the *talukas* of the first group, namely Jetpur Pavi (1.22) and Karjan (1.57). Prevalence of acute diarrhoea disease seems to affect people in the plain areas more than in the hilly and forested areas. Highest prevalence rate of acute diarrhoea is seen in Vaghodia (1.44) and Vadodara (0.92) *talukas*, while it is the lowest in the Jetpur Pavi *taluka* (0.47). Malaria P.V is a common type of malaria and highly prevalent in India. It is interesting to note that the highly urbanised *taluka* of Vadodara (0.10) and the hilly and forested Chhota Udaipur *taluka* (0.09) have registered the highest prevalence rates of malaria P. V. On the other hand, less urbanised *talukas* of Dabhoi (0.02) and Sinor (0.02) with plain topographic conditions have the lowest prevalence rates of the disease. This pattern may be the result of the fact that both urbanisation with its typical characteristics and, hilly and forested ecology provide conditions suitable for the spread of the disease. From this it is clear that major pattern of diseases type are common infectious diseases that grips Vadodara district are acute diarrhoea, cholera, enteric fever**,** malaria, measles, chikungunya, dengue fever, leptospirosis and chickenpox etcetera

A comparison between the number of available health care services and manpower in the health sector with their respective prescribed numbers clears the picture on their sufficiency or insufficiency. The analysis reveals that Gujarat is much better placed in comparison to the country as a whole with reference to health infrastructure and health sector manpower, with a few exceptions. With respect to health infrastructure, unlike the country, the State is privileged to have a surplus number of PHSs, PHCs and CHCs. The country has around 20 or more per cent shortfall in these services. There is, in general, a shortfall of manpower in the health

sector of the country. In this context too, the position of Gujarat is better in comparison to the country excepting with respect to the availability of female health workers (ANM) at the PHSs and PHCs and different specialists at the CHCs. It is pathetic to note that the shortfall of specialists at the CHCs in the country (82%) and in the State (94%) is extremely high. Similarly, the availability of Radiographers at the CHCs is highly insufficient at both the National (65%) and State (55%) level. There is 40 per cent shortfall of Laboratory Technicians at PHCs & CHCs in India. The analysis clearly indicates that there is great dearth of specialist doctors and other medical staff in the country. The living quarters meant for the medical staff are found to be insufficient at the country as well as the State level. Besides, the available living quarters are found to be highly underutilised. This is expected to negatively impact the attendance and availability of the health staff at the time of need.