

MASTER OF PUBLIC HEALTH

A cooperative Program of

JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH
&
INDIAN INSTITUTE OF HEALTH MANAGEMENT RESEARCH

Capstone Project
at
Urban Health & Climate Resilience Centre, Surat,
Gujarat, INDIA
(UHCRC)

By

Dr. Prashant Tiwari

IIHMR/JHSPH MPH

2013-2015

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At

**Urban Health & Climate Resilience Centre (UHCRC),
Surat, Gujarat, INDIA**

**An Observational Pre-Monsoon (Climate Change) Study of
Knowledge, Practices, Treatment Seeking Behavior, Sanitation
& Surveillance of Fever in Urban Rehabilitated Slums of Surat,
with focus on Vector Born Diseases, mainly Malaria and
Dengue.**

By

Dr. Prashant Tiwari

Under the guidance of

Dr. Suresh Joshi

Master of Public Health

Year 2013-15

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Prashant Tiwari student of Master of Public Health Program offered by Institute of Health Management Research, Jaipur in cooperation with Johns Hopkins Bloomberg School of Public Health, Baltimore has undergone capstone training at Urban Health & Climate Resilience Centre, Surat, Gujarat, India. on the topic An Observational Pre-Monsoon (Climate Change) Study of Knowledge, Practices, Treatment Seeking Behavior, Sanitation & Surveillance of Fever in Urban Rehabilitated Slums of Surat, with focus on Vector Borne Diseases, mainly Malaria and Dengue from 1st June 2014 to 19 September 2014.

The Candidate has successfully carried out the study designated to him during capstone training and his approach to the study has been sincere, scientific and analytical.

The Capstone is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



Dean, Academics and Student Affairs

IIHMR, Jaipur



Capstone Advisor

IIHMR, Jaipur / JHSPH, Baltimore

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CERTIFICATE BY SCHOLAR

This is to certify that the Capstone Project titled **An Observational Pre-Monsoon (Climate Change) Study of Knowledge, Practices, Treatment Seeking Behavior, Sanitation & Surveillance of Fever in Urban Rehabilitated Slums of Surat, with focus on Vector Born Diseases, mainly Malaria and Dengue** and submitted by **Dr. Prashant Tiwari** Enrollment IIHMR-JHU/MPH/2013-2015/1-6 under the supervision of **Dr. Suresh Joshi** for award of **Master of Public Health** carried out during the period from 1st June 2014 to 19th September 2014 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.


Signature

ACKNOWLEDGEMENT

The success of any task would be incomplete without the expression of appreciation of gratitude to the people who made it possible. Though words fall short to express the sincere gratitude towards everyone who helped directly or indirectly in my endeavor. It is a pleasant aspect that, I now have the opportunity to express my gratitude for all of them.

This is a humble attempt in this regard. I would like to render my sincere thanks to **Dr. Suresh Joshi** for providing me with such unique learning experience. His dynamic thinking, his broad and profound knowledge, his warm smile have given me constant encouragement to achieve the task allotted.

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This report is

Dedicated to

My Beloved Late Grand Mother

ABSTRACT

Vector born diseases are common in India. Trends of these diseases are very much related to climate change. Urbanization also plays a vital role in developing new breeding sites in the environment. A natural calamity like Flood creates a natural habitat for breeding of mosquitoes.

Surat as a city of immerging opportunities in the area of Diamond and Textile business attract rural and economical weaker labourers towards better employment. So, increasing burden of urbanization leads to so many problems. First and foremost is less knowledge and rigid attitude towards bad health care practices.

Urban health can't be looked in isolation. Urban health care in addition to health system development needs to at least consider sanitation and climate, care of socio economically vulnerable.

Fever is a very familiar symptom for vector born, infectious and other bacterial diseases. It also indicates the morbidity pattern of population in particular months of seasonal change like pre-monsoon.

Thrust areas of the study are component of vector borne disease which results in many infections leading to fever, climate as well as the local environmental condition goes hand in hand to aggravate the fever cases.

The result of this study could be used in gaining an insight into the mindset of the people as what are their coping strategies in case of fever, knowledge and practice pattern of a certain population. Confidence in the private practitioner is an interesting area, as well as the subtle nature of people wherein they know the preventive measures in case of diseases but still denies its practice is well reported in the study.

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1. Introduction:

The changing climate around the globe is known to have an effect on human health in different ways through a range of diseases. Out of these vector borne diseases which are common in most parts of the India and are likely to be affected by climate change¹. Surat city has a favorable climatic condition to reflect its effect on the life cycle of a mosquito and the development of malaria parasite and vector born diseases². The key factors are temperature and humidity, which is also ideal to speed up the disease dynamics. Location, climate, socio demographic composition and developmental activities of Surat city are highly encouraging to vector breeding, survival and its effectiveness to spread infections. Location of Surat city on the bank of river and on the seashore provides appropriate environment (Temperature and Humidity) all through the year as well as increase the number of water pools as breeding sites for mosquito³.

Photo1.1 Popular outdoor sites Mosquito breeding (Source: www.malariasite.com)



Paddles

**Tender Coconut
shell**

Open tank

Tyres

In the city, the other sites for mosquito breeding are the water tanks; lack of water supply in city makes it crucial to have these tanks in almost every building. Sump tanks, overhead tanks, storage tanks, ornate tanks etc. are habitually left exposed and this provides possibility for mosquito breeding.

Photo1.2 Popular indoor Mosquito breeding.



In house water tanks & their groves

Buckets¹⁷

There is abundant scope for water collection outside and inside of the construction sites: water stored in tanks; the water film on the surface of the cement concrete; puddles of water in and around the place of building construction– all these offer scope for mosquito breeding¹⁷. To append the problem, construction workers are likely to port the malaria parasite, due to recurrent infections remaining to their poor standards of living. Thus, irrigation canal and building construction sites not only offer for mosquito breeding but also bring in the parasites. This is the reason why malaria tends to be more frequent in part of study area where construction of irrigation canal & buildings is in full swing.

Densely populated rehabilitated slums, overcrowded homes with poor ventilation and sanitation are adding to the proneness of illness. As per epidemiological triad health is determined by a balance between agent, host and environment. Health is an outcome of complex interaction of several internal and external environmental factors, where environment has a broader definition of physical, social, economical, political, service system. Urban health profile is a better model to fit in this¹.

Photo1.3 Poor Sanitary Conditions.



Urban health cannot be looked at in isolation. Urban health care in addition to health system development needs to at least consider sanitation and climate, care of socio economically vulnerable³.

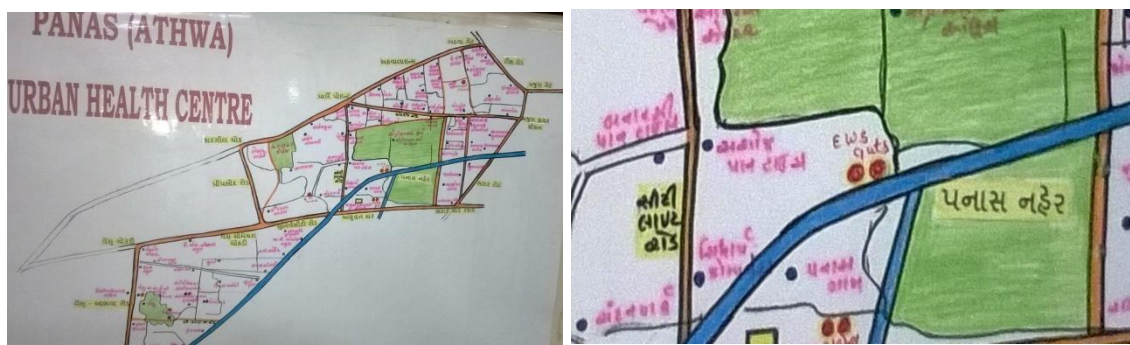


Photo 1.4 Map of Panas Ward & Location of EWS quarters. (Source SMC office)

A small cluster EWS Quarter of Panas ward, an area under Municipal Corporation of Surat is identified for the study as a preliminary study by Urban Health & Climate Resilience Centre (UHCRC).

The governing body of Urban Health & Climate Resilience Centre (UHCRC) is Surat Climate Change Trust (SCCT)⁸.

The Surat Climate Change Trust (SCCT) is an inventiveness of third phase of Asian Cities Climate Change Resilience Network (ACCCRN) program by The Rockefeller Foundation (USA)⁶.

SCCT is a public trust registered under Bombay Public Trust Act 1950. Surat Climate Change Trust is promoted by multiple city and state level stakeholders lead by Surat Municipal Corporation (SMC) as chief stake holder. It includes members from various

government and private institutions including Gujarat State Disaster Management Authority, Narmada, Water Resources and Water Supply Department, South Gujarat Chamber of Commerce & Industries etc. This is one of the initial City level multi-stakeholder trusts in India^{8,6}.

Taking into consideration the close inter-relationship between issues of climate change (CC), urbanization and poverty, The Rockefeller Foundation has launched Asian Cities Climate Change Resilience Network (ACCCRN) covering India and South East Asia. The aim of the ACCCRN is to measurably improve the resilience of selected associate partner cities' institutions, systems and structures to the current and potential climate risks, and through this, build up the lives of poor and weak people^{2,6,8}.

Both UHCRC and SMC are holding hands together on a range of health & environmental related issues like Vector born disease, Water born disease, Climate change mitigation & Disaster Management.

1.2 Surveillance of Vector borne disease

Surveillance of vector born disease in city is mainly done by SMC. But a small number of measures like health education are also done by UHCRC and it plays a significant role to mobilize community.

The main measures are discussed below:

a. Anti larval actions

Peri domestic efforts:-

Peri domestic actions have carried out about 327 Sq. / K.M. areas round the year at weekly interval. Continuing construction sites, outdoors water bodies, underground tank, overhead tank, ground tank, stable water bodies and seepages of the canals were regularly vigil for breeding of mosquitoes by health workers right through the year¹⁶.

b. Intra domestic efforts:-



Photo 1.5 Malaria kit, Surveillance System & Preparation of malaria slide

Intra Domestic survey actions have taken for intra domestic breeding places like different types of water tanks (ground & underground tank, overhead tanks, barrel, drums, earthen pots etc) in buildings as well as residential houses, commercial complex, and flats. All positive spots have treated by means of suitable insecticides & health education consciousness built to the community¹⁶.

c. Biological efforts:-

The efforts for biological measures were also undertaken. Larvivorous fish were released in permanent water bodies like pond, fountain, permanent water logging, and river in different zones of SMC¹⁶.

d. Parasitological actions:-

The active surveillance and passive surveillance has taken out on usual basis as per the norms of Urban Malaria scheme for early finding and complete treatment. In active surveillance, 489 surveillance health workers have surveyed door-to-door in areas by 15days interval. For passive surveillance 39 Urban Health Centers have been establish in areas¹⁶.

e. Night Activities:-

Surveillance activities are also going in night to detect filariasis because parasite of Filariasis releases in circulatory system of human body from lymph at night only, the surveillance for filaria is taken out around 6 to 8 pm. Monitoring of cases is done with the help of municipal corporation clinic. Each year in the December 98% of inhabitants covered with M.D.A programme. D.E.C and Tab.Albendazole are administrated to all the people. The aim of this programme is to irradiate the filaria in the population by year 2015¹⁶.

f. Dengue/Chikungunya Activities:-

For inspection of Dengue/Chikungunya, Sera samples of suspected cases from government and private hospital have collected and sent to for serological investigation of IgM antibodies. Control measures were taken at the premises of suspected dengue cases, immediately intensified intra domestic surveillance to searching of Aedes infestation in addition to spray around 200 meters radius of the house¹⁶.

g. Health Education programmes:-



Photo1.6 Health Education Activities.

All over the year, health education to the community has remained of prime importance. It has imparted with intense interest to seek most advantageous participation from the community regarding awareness of malaria & other mosquitoes borne diseases. Having fever means that the body temperature is high than normal. Something within the body, such as an infection, has increased your temperature. Fever is very familiar symptom for

vector born, infectious and other bacterial diseases³. So, that's why this study is based on fever in studied area.

1.3 OBJECTIVES:

1. To study fever prevalence in study area.
2. To study epidemiology of fever in study area in last year.
3. To observe fever treatment seeking behavior in study area.
4. To observe reach of fever case surveillance system in study area.
5. To observe community knowledge and practices for prevention of mosquito born diseases.

2. Literature review:

Changing climate and its impact on incidence of malaria a Study of Urban settlement of Bhopal, India by Nigam R.K stated that summers and winters are getting warmer with low precipitation and erratic pattern of rain fall over last five years. The incidence of malaria, which was presumed to be more frequent during rainy season, is also showing its stronger impacts in early and late winters too. However, the future projections about further increase or decrease in the incidence of malaria will depend on the rate and extent of change in city climate over the years. Hence, this depicts that not only in Surat, but in others parts of India also there is are drastic climate changes which affect the health conditions of the residents' residing²⁰.

A study of rapid assessment of mosquito breeding & vector control measures, observation of treatment seeking behavior in surat slums during the of post-flood by A.B. Pawar, R.K. Bansal, M. Kumar, N.C. Jain & K.G. Vaishnav.

It discusses that the increasing trend of falciparum malaria is seen in Surat. The study was carried out in the villages of Buhari of Surat, which had exposed an elevated occurrence of Plasmodium falciparum malaria^{19,4}.

The use of nets and assortment of doors and windows cooperate a crucial role in mosquito control. While this study was being conceded out that the Surat Municipal Corporation had carried out the arrangements for coating of insecticides on mosquito nets by an NGO. It was shocking to know that 99% respondents did not use mosquito nets to avoid mosquito bites and vector borne diseases. After the makeover of the previous 'plague city' into one of the highest clean city in India, the residents of Surat do not feel the requirement of mosquito net use, and the common residents of the city barely uses mosquito nets. Upon an additional enquiry, it was exposed that 86% of these primary respondents were of the belief that mosquito net is not necessary in Surat City due to their apparent efficient mosquito control procedures being taken by the vector control department of SMC⁴.

Trend of dengue in a tertiary care hospital of surat city, Western India Tank Arun G1, Jain Mannu R2 1Resident Doctor, 2Professor & Head, Department of Microbiology, Surat Municipal Institute of Medical Education & Research (SMIMER), Umarwada, Surat - 395010 (Gujarat) India¹⁸.

The objective of this study was to see the trend of established dengue cases admitted in a tertiary care hospital & to recognize the seasonal disparity of the disease

through the period of three years in Surat city, this study was based on the secondary analysis of data of Dengue patients gathered from three hospitals of Surat and it was seen that there was a decline of numbers in dengue cases in this study time. It also concludes that population awareness, early and timely diagnosis and better management and mosquito control measures were strengthened due to which outcome become reduce in number of cases¹⁸.

Joint Monitoring Mission Report: National Vector Borne Disease Control

Programme This report that NVBDP is doing well in the development of proof based policies and guidelines for implementing them in spite of the complexity and the diversity of challenges facing this enormous programme^{12,15}. However, some policies need updating based on new evidence, implementation experience, and global best practices. Translating policies into action at the district level in a health system that is constrained by limited resources and capacity to plan, implement and monitor is still a challenge. The strong political commitment to control VBDs under the NRHM and good leadership of the NVBDP provide a good opportunity to improve the existing strategies and to introduce new policies. In order to take full advantage of this situation, the strategic direction of the NVBDP should be oriented towards controlling the old and emerging VBDs in the context of the growing economy and the availability of effective new tools and technologies^{12,15}.

3. Rationale

India has the world's largest rural population and second largest urban population. India is more and more urbanized in which the changes within the growth of population become coupled through the present trends of urbanization are extremely debilitating. 31% of the

urban population is poor. 25% of the India's poor live in urban areas. In 1991-2001 decade, Indian population grew by 2%, urban India by 3%, mega cities at 4% and slum population by 5%^{1,3,5,12,14}.

Historically Surat city was popular as a city of Filariasis before 1960. Then 1987 to 1992 was an era of malaria and falciparum malaria. Post flood plague outbreak in 1994 and leptospirosis in 2006 were medical history. Experience of last six decades provides an evidence of vulnerability of Surat city to vector born diseases in routine as well as episodes of flood. Surat is probably the only city in Gujarat with an irrigation canal of approximately 70 kms passing through the city and nearby the study area, which is added risk for mosquito breeding in the study area^{1,3,5}.

Unplanned urbanization and disorderly growth of slums have led to the creation of the conditions conducive to spread of diseases and outbreaks of epidemics. Environmental pollution and degeneration of social structure in urban area have resulted in to socio psychological stress, alcohol and drug abuse etc. Gujarat government provided these residences to the slum population to rehabilitate them. So, the Economic Weaker Residential Quarters in Panas Ward of Surat Municipal Corporation is perfect place to do pre-monsoon observational study of fever cases in Surat Gujarat^{1,3,5,12,10,16}.

4. Methodology:

4.1. Study area: Urban Health and Climate Resilience Centre (UHCRC), an initiative of Surat Climate change Trust supported by Rockefeller Foundation (U.S.A). This centre is a part of climate resilience initiatives of Surat Municipal Corporation and executed under health department of Surat Municipal Corporation. Centre is the first of its kind in India.

4.2. Study period

Primary data of a rapid assessment is taken for last one year (May 2013- May 2014) and a detailed study is made for the cases of last two months i.e. April and May-2014, (pre-monsoon)

4.3. Study design

It is observational cross sectional study. This study design allows in comparing many different variables at the same time.

4.4 Study tools: Quantitative data is collected using two questionnaire in which mostly closed and few open ended questions are included. One questionnaire is for Rapid assessment of fever cases in last year. Second Questionnaire is for detailed assessment of fever cases in last two months.

5. Results

5.1 Fever prevalence in study area.

It is very evident in the below table that the cases of fever are comparably high in the month of May which is a preceding month to monsoon in the country, hence the change in weather conditions are held responsible for growing infections leading to fever in the population. Although the study was predetermined for this season so that the impact of vector borne diseases can be easily seen. In the month of March, cases of fever reported are 33 which show that even in spring season due to climatic changes people get infections easily. Therefore climate along with unhygienic conditions such as stagnant water, open fill puddles, swampy areas enhance mosquito breeding leading to malaria fever, viral fever etc. One important element of recall bias is clearly depicted from the data collected during the

study as in the year 2013 data shows nil results of fever cases which is not practically possible ,so it can be assumed that the participants were not able to recollect experiences (fever) from the past.

Table 5.1 Month Wise Case Distribution Of Fever Cases.

Months & Year	Number of Cases
01-05-2013	NIL
01-06-2013	NIL
01-07-2013	NIL
01-08-2013	1
01-09-2013	2
01-10-2013	1
01-11-2013	3
01-12-2013	5
01-01-2014	13
01-02-2014	9
01-03-2014	33
01-04-2014	12
01-05-2014	45
Total fever cases in last year	124

So, the Prevalence of fever in studied population is $(124/1908 \times 100) = 6.5$

5.2 Epidemiology of fever

5.2.1. Population & Place

Below table suggests that Sample size is universal (100%). Universal population is taken because this survey is done in a small cluster and it is a part of a larger intervention taken by organization. There are total 43 story blocks A to Q. Each block has 16 housing units. Out of total number no of 688 houses, 412 (60%) household units were surveyed remaining were either locked or family is not present at the time of survey or refused for giving any information. The total population of studied cluster is 1908 in 43 buildings. Among them 57 cases are found for detailed assessment in last two months.

Table 5.2.1 Block wise distribution of average family size, percentage of studied household

NAME OF BLOCK	Total House holds	Block wise studied house hold	% of house hold studied	Total studied family members	A
A	48	25	52	109	
B	48	24	50	106	
C	48	31	65	148	
D	48	30	63	144	
E	48	28	58	123	
F	32	19	59	92	
G	48	30	63	137	
H	48	32	67	170	
I	48	34	71	150	
J	48	29	60	135	
K	32	15	47	115	
L	32	22	69	102	
M	32	19	59	82	
N	32	21	66	86	
O	32	18	56	95	
P	16	9	56	34	
Q	48	26	54	129	
Total	688	412	60	1908	

5.2.2 Age & Sex Ratio of fever cases

This Table clearly reflects that the population in the age groups of 19 yrs to 45 yrs i.e. all the adults and middle aged people are much prone to fever. Some of the reasons being that this age group is more exposed to environmental hazards, working conditions being unfavorable, unhygienic environment and much more. Hence the vulnerable group is caught by infections easily. Secondly children in the age group of less than 6 years are in the most crucial stage of development and at the same time exposure to infected environment due to changing weather conditions leads to many infections causing fever. Poor immunity at this age leads to lifetime compromised immunity and hence fever in case of children must be a matter of concern.

Table 5.2.2 Age & Sex Wise Distribution of Fever Cases.

AGE (in Years)	M	F
LESS THEN 6	20 (26%)	16 (34%)
07 TO 18	21 (27%)	15 (31%)
19 TO 45	28 (36%)	10 (21%)
46 TO 65	5 (06%)	2 (04%)
66 TO 80	3 (04%)	4 (08%)
TOTAL	77 (62%)	47 (37%)

5.3 Fever treatment seeking behavior

5.3.1 Measures used to detect fever

This can be easily reflected from the graph that there is less knowledge in the population about the instrument used to check fever as only few people used thermometer, rest of them just reported fever by checking it with hand.

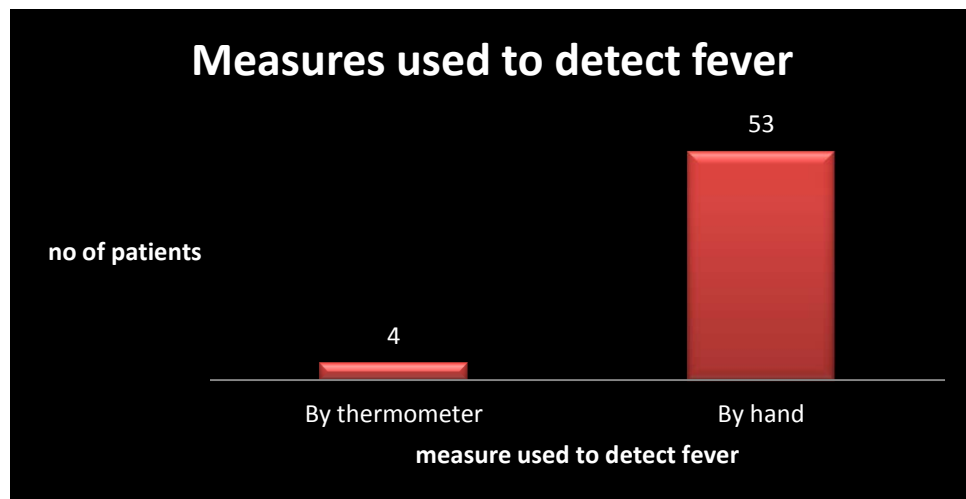


Fig: 5.3.1 Measure to Detect Fever

5.3.2 Common symptoms of fever present in population

From the graph below it can be interpreted that 40%(n=57) of the patients reported severe frontal headache as the most common symptom of fever, whereas nobody reported retro blubber pain, shivering and chills were also some of the symptoms told by people.

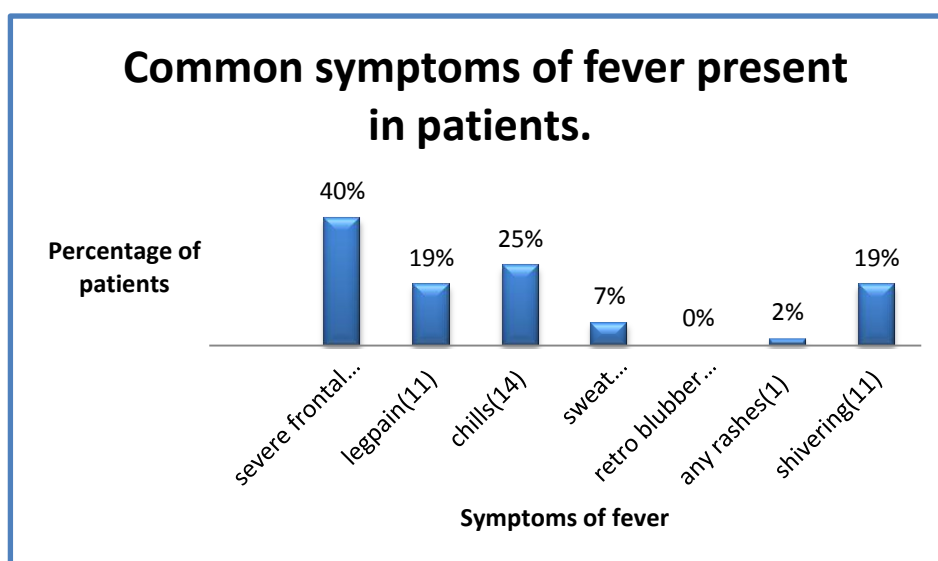


Fig: 5.3.2 Symptoms of Fever

5.3.3 Duration of fever

The graph depicts that maximum no of people ie 28 suffered for at least 3-4 days from fever, whereas 14 people suffered for 5-8 days which shows that population suffered from many vector borne diseases and hence the fever was for prolonged duration of time. There were even cases of fever for more than 9 days which shows prevalence of malaria, dengue and other diseases.

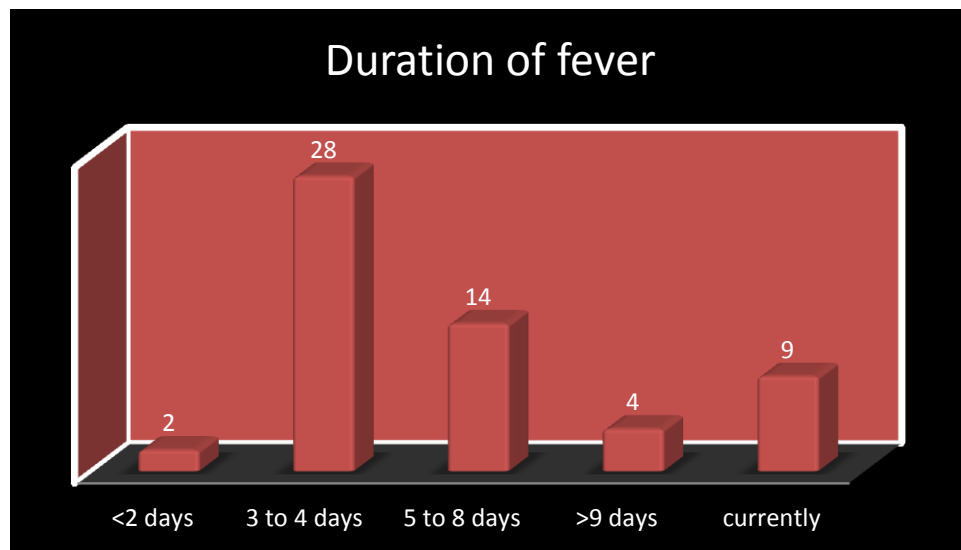


Fig: 5.3.3 Patients and duration of fever

5.3.4 Place of treatment in case of fever

From the graph it can be interpreted that out of 57 people, 78.90% of them visits private practitioner, 15.80% goes to urban health centre and 5.3% did home based remedy. This also throws light on the fact that private practitioner provides them with more attention, whereas in UHC's there are paucity of doctors as well as less individual care and treatment is not given. Population residing had good health benefits from the medicine and also shares a good rapport with Pvt Doctors or their family doctors.

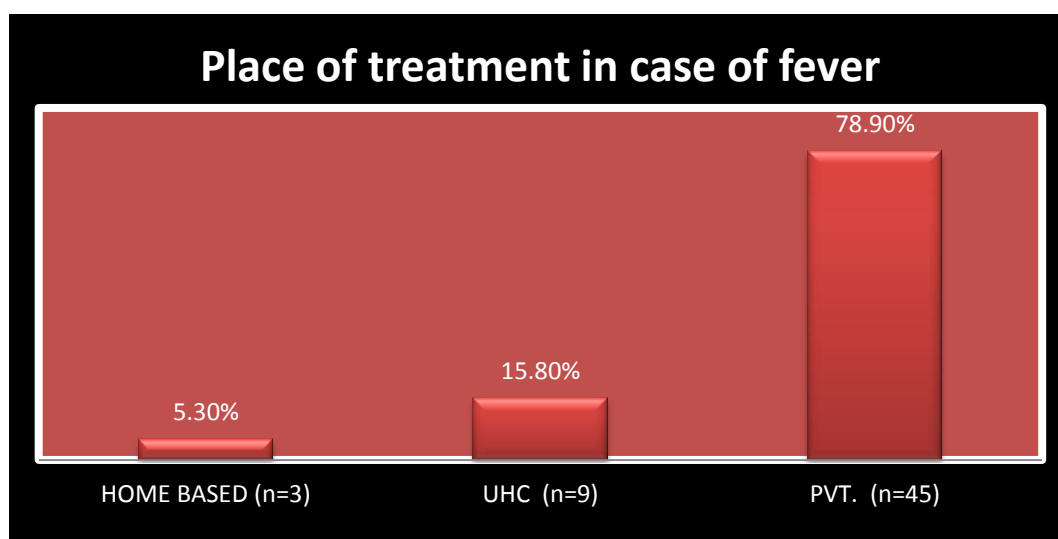


Fig: 5.3.4 Treatment Place

5.3.5 Secondary action taken in case of fever

It can be interpreted that about 66% of the population (n=8), take treatment from private practitioner, whereas only a very less percentage of people preferred UHC and hospital. A strong inclination towards the treatment from a private practitioner or a family doctor is seen.

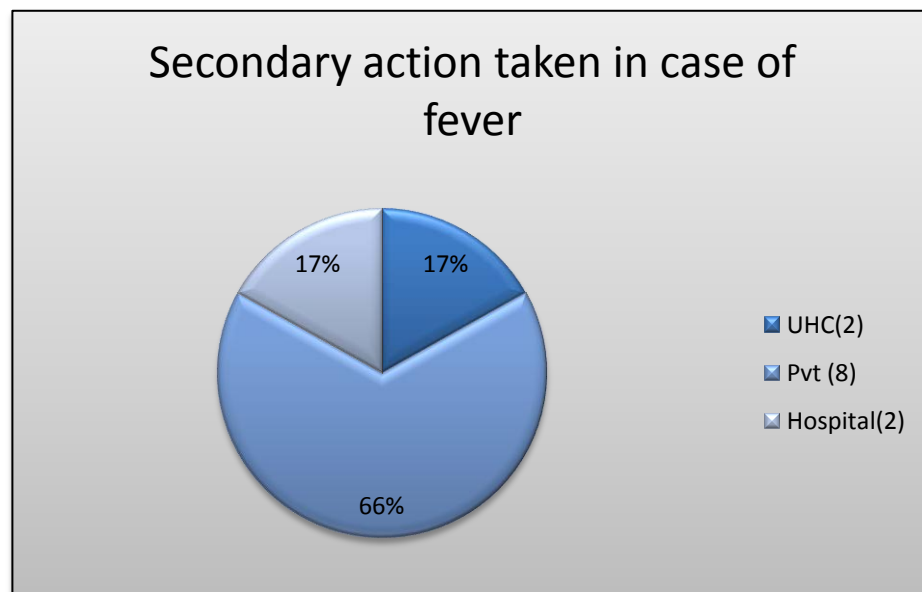
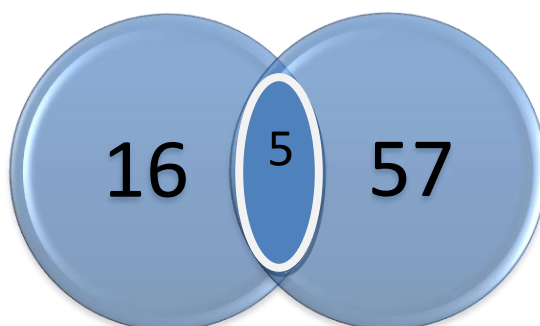


Fig: 5.3.5 Secondary Action taken by patients.

5.4 Surveillance of Health System

No of fever cases reported in the study in 2 months(April, May) was 57 which is the primary data and secondary data from Surat Municipal Corporation reported 16 cases of fever of the above mentioned 2 months. 5 cases were found similar in both the data collected. Primary as well as secondary data shows that the no of fever cases in the city was pretty high. Lack of facilities led to many cases of relapse and with poor supportive management and less dietary modification, the no of people suffering from infections and late recovery were on the higher side.

Fig:5.4 Common Fever Cases with SMC



5.5 Malaria worker visit

	NO. CASES	TOTAL CASES	%
Visit of malaria worker	4	57	7

Table 5.5 Visit of malaria worker during the episode.

The table shows that there was much carelessness observed on the part of the malaria worker as only in 4 cases of fever he made a visit. His visit is much related to the important tasks such as mentioning the do's and don'ts to the

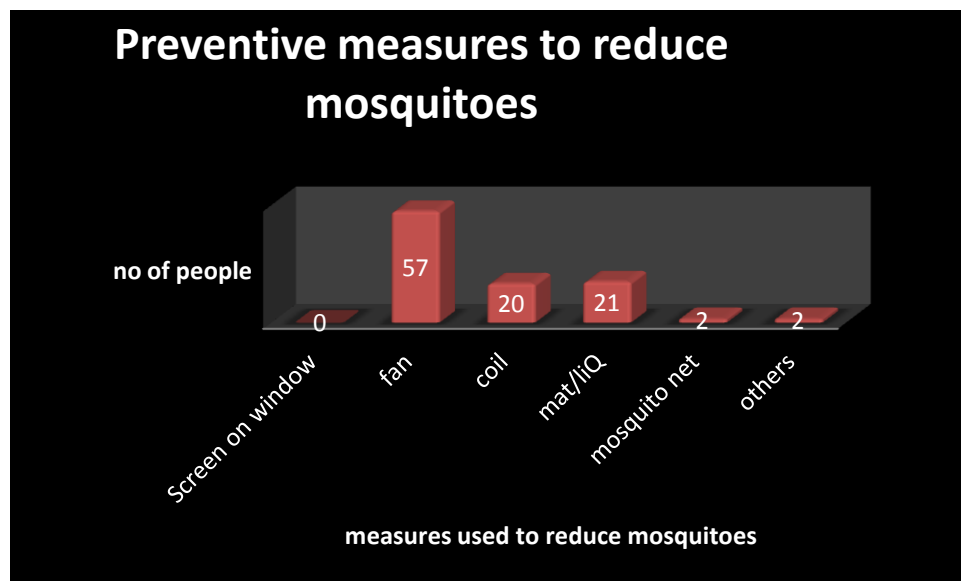
people, collecting blood, making the population aware about the precautionary measures to be taken in case of malaria. Actual sewage situation is also told to the authorities by him and hence his less visits missed on the important components, due to which people either recovered late or were not even treated properly.

5.5 Community Knowledge And Practices

5.5.1 Preventive measures to reduce mosquitoes

From the graph below it can be seen, that out of 57 people, everybody used fan as a preventive measure to reduce mosquitoes, none of them used screen on windows, mat and coil were also used by some. This gives a clear indication of the fact that people are not much aware about the measures which can be adopted to reduce mosquitoes, or else they find fan much effective over other things.

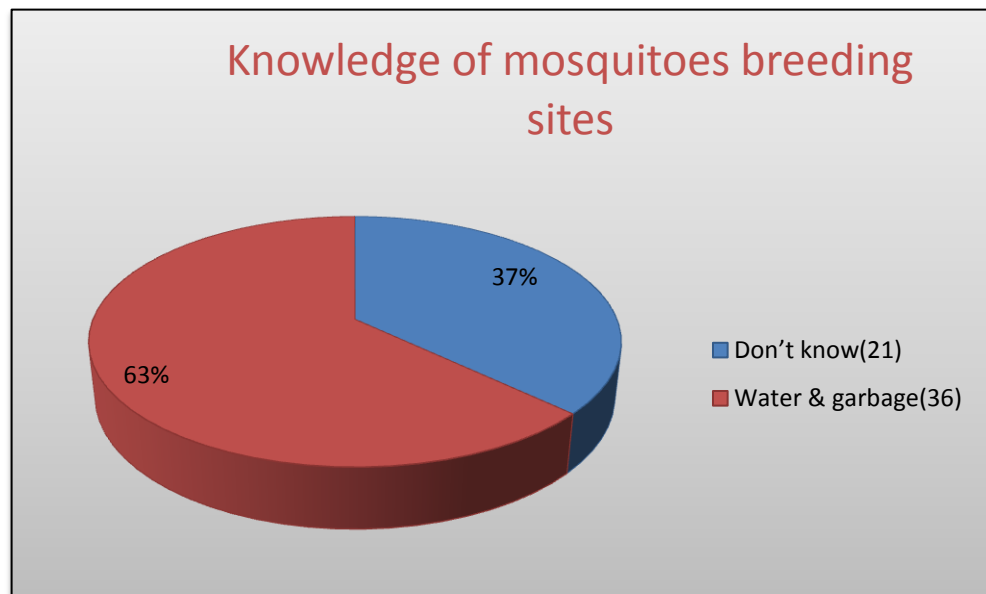
Fig: 5.5.1 Preventive Measures.



5.5.2 Knowledge of mosquito breeding sites

It can be clearly seen that out of 57 people, 36 had the knowledge on places where mosquitoes breed i.e. in garbage and water which shows that people are pretty much aware about the places where mosquitoes develop and hence they can be mobilized to keep their surroundings clean and tidy. Various vector borne diseases are caused due to filthy environment and leads to malaria, dengue etc.

Fig: 5.5.2 Knowledge of mosquito breeding sites.



5.5.3 Perception of people regarding mosquitoes

From the graph below it can be interpreted that 14% of the people did not know about the spread of mosquitoes being less or more, equal percentage of the population reported no change whereas a good no of people ie 51% said that there are less mosquitoes in the area.21% of them were of the opinion that more mosquitoes are present.

Fig: 5.5.3 Comparison of last year and this year mosquito nuisance



6. Some More Findings

- Some of the data suggests that there is large no of proportion of people suffering from fever in the month of March and May which reflects that climate change leads to sudden increase in the spread of mosquitoes.
- Dietary modification has also been adopted by people in case of fever mostly after consultation with their doctor. It was seen that out of 57 people 14 people changed their during the course of fever whereas 43 of them did not do any change, although effects of diets are not much noticed.
- Factor of trust was observed in the case of family doctors who were taken as immediate help in case of fever, people believed that they provide good medicine as well as individual care and treatment is given.
- Some of them also preferred urban health centre as an immediate help as they consider it affordable and medicine are available at cheaper rate.
- Malaria health worker was seen quiet active in the case of this area as he visited almost once in a month to people and did the essential work required such as registering name, collecting blood, giving tablets, checking water storage.

Knowledge of people regarding the supportive management they can do in order to reduce mosquitoes was that they can maintain hygiene and cleanliness and can use mosquitoes net.

7. Suggestions:

- Group discussions - one to one interactions with the people can help to improve their knowledge, attitude and practices.
- Community participation while imparting health education with emphasis on **Behavior Change Communication** in the area of cleanliness, hygiene and sanitation can lead to the lower rates of infections in public.
- Findings of the study could be forwarded to government so that various measures of BCC plan may be adopted especially for **sanitation & preventive measures** from mosquito biting, these actions can turn together into a policy for the welfare of people living in EWS.
- Cases of fever in the age group of less than 6 yrs should be a matter of much concern for health authorities as it is the most vulnerable group to infection and can lead to death due to low immunity.
- The result of this study could be used in gaining an insight into the mindset of the people as what are their coping strategies in case of fever, knowledge and practice pattern of a certain population. Confidence in the private practitioner is an interesting area, as well as the subtle nature of people wherein they know preventive measures in case of diseases but still denies its practice is well reported in the study. So, the private doctors may change this attitude of people.

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Annexure: Tools

UHCRC Surat

Sr. No.	House No.	Total family members	Duration of Stay	Information about Fever case in last one year (If there is a history of fever in the family put tick mark in month and age and sex of case)													
				May	June	July	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	

Rapid Fever Case Survey

Study of Fever in Last Month

Date: Sr. No. Sr.No-RPCS:

House no:

1	Name	
2	Age	
3	Sex:	
4	Occupation:	
5	Date of onset of fever:	
6	Duration of fever:	
7	Detection of Fever :	Thermometer/By-hand/Any other.
8	Immediate action: (Reasons for preference)	Home Based / UHC/ Pvt. Doc/ Any Other
8.a.	Treatment details:	

8.b.	Supportive management:	
8.c.	Dietary modification:	
8.d	Outcome: (Which day of fever)	Recovered/ second action
9	Second Action: (Reasons for preference)	If first M/m is other than : UHC/ Private Doctor/ Hospital
9.a.	Treatment details:	
9.b.	Supportive management:	
9.c.	Dietary modification:	
9.d	Outcome:	Recovered/ Other
10	Any Diagnosis / Prescription	Y/N

	Present :	
11	Symptoms of fever:	Severe frontal Headache / leg pain / Chills / Sweats profusely and feels much Better / retro-blubber pain / any rashes /severe weakness / arthralgia.
12	Is malaria worker visiting your house regularly?	Y/N
12.a	When did he last visit?	
12.b	Mention things he do during visit:	Registered name/ collected blood / gave tablets/ checked water storage/ other
13.c.	Visit of Malaria worker during this episode:	Y/N
13.d	If yes What He Did:	Registered name/ collected blood / gave tablets/ checked water storage/ other

14	Name diseases transmitted by mosquitoes:	Malaria / Dengue / Filarial / Chickengunia / Any other / Unknown
14	Where do they develop?	
16	What is your experience about Mosquito nuisance this year compared to last year:	More / Less Rank out of 5
17	What measures you take to protect family from Mosquito bite:	Nil/ Fan/ Coil / mat / mosquito net / screen on window / Any other
18	Can you also participate in reduction of number of mosquitoes? If Yes what you can do?	Y/N