

# KNOWLEDGE, AWARENESS AND PRACTICES REGARDING DENGUE AMONG RURAL AND SLUM COMMUNITIES IN NORTH INDIAN CITY, INDIA

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## ABSTRACT

**Background:** Dengue fevers (DF), transmitted by *Aedes aegypti*, is an arboviral disease endemic in the Asian subcontinent. It has emerged as a notable public health problem in recent decades. Rapid urbanization, environmental changes and neglected (rural and slums) areas results in vector breeding causes rise in dengue outbreaks.

**Aims & Objective:** To study the knowledge, awareness and practices regarding dengue among rural and slum communities in Chandigarh City.

**Materials and Methods:** This community based cross sectional study was conducted in Chandigarh city, India during June-July 2011 among 800 respondents. The sample area was the two rural (villages) and two slums of the city. Each 200 respondents from each village and slum area. The aim was to assess the knowledge and awareness, preventive measures and most prevalent source of information regarding dengue. Simple random sampling method was used for interview by using structural questionnaire.

**Results:** Results showed that knowledge and awareness about dengue fever was generally inadequate. It was more in rural (48.5%) as compared to slum (30%). Only 72.62% of the respondents answered that mosquito was responsible for the transmission of dengue. They had insufficient knowledge that dengue mosquito bites at day time and breeds in clean water. 70.87% don't know the dengue symptoms. Most prevalent preventive method was coils, liquid vaporizers. Health professional and television /radio were the important source of information for dengue.

**Conclusion:** There is a need to make villages and slum people aware of different preventive practices and reduce this knowledge application gap. Thus, understanding people perception and practices could help in identifying the targets areas to control outbreaks.

**Key Words:** Dengue Fever; Knowledge; Awareness; Practices; Rural; Slums; Chandigarh

## Introduction

Dengue fevers (DF), transmitted by *Aedes aegypti*, is an arboviral disease endemic in the Asian subcontinent.<sup>[1]</sup> It has emerged as a notable public health problem in recent decades in terms of the mortality and morbidity associated with it.<sup>[2]</sup> According to the World Health Organization (WHO), incidence of dengue has shot up 30 fold in the past 50 years. It has been estimated that globally there were 50-100 million dengue infections taking place annually.<sup>[3]</sup> South-East Asia is one of the regions with highest risk of DF/DHF, accounting for 52% of the global risk.<sup>[4]</sup> The case fatality rate in patients with dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) can be as high as 44%.<sup>[5]</sup> In fact, the problem has become hyper-endemic in many urban, peri-urban and rural areas, with frequent epidemics.<sup>[6]</sup>

Dengue is endemic in many parts of India and epidemics are frequently reported from various parts of India<sup>[7-9]</sup> and abroad<sup>[10,11]</sup>. "India emerges in the analysis as the country with the world's highest dengue burden, with about 34% of all such cases occurring here. The cases of malaria and chikungunya have shown a dip across the country but

dengue cases are picking up. The fatalities caused by the mosquito-borne disease have also gone up. In 2012, 247 deaths took place, compared to 169 fatalities reported in the previous year. In 2009 and 2010, the number of fatalities due to dengue was 96 and 110 respectively.<sup>[12]</sup> Incidence of dengue has been attributed to increased air-travel, increased urbanization, amplified mosquito population due to deterioration in the public health infrastructure and changing climatic conditions.<sup>[13]</sup>

The rapid increase in human population, lack of awareness among people, environmental changes, social changes and increased breeding of vector mosquitoes resulted in increased dengue transmission.<sup>[14,15]</sup> Water storage drums, criterns, flower vases, cement tanks, plastic and metal drums, tyres, bottles, tin cans, coconut shells and other such discarded containers which can hold rainwater, overhead tanks, ground water storage tank, etc. are the source of breeding of aedes mosquitoes.<sup>[16,17]</sup>

Since there is no vaccine, vector control is the ideal way to control dengue. Vector control methods can be successful, only if there is community participation, and for the success of a community-based programme, it is important

to assess the community's perception regarding the disease, its mode of transmission and breeding sites. Knowledge, awareness and practice studies serve as an educational diagnosis of a population. This information helps programs set communication objectives linked to increased community engagement and demand for services and develop tailored strategies appropriate for the social, cultural and political contexts of at-risk communities. In Chandigarh, total number of cases of dengue fever has been reached to 196 in 2012.<sup>[18]</sup> Hence, this study was conducted to assess the knowledge, awareness and practices regarding dengue fever among rural and slum communities in Chandigarh.

**Objectives:** (1) To assess how many people have knowledge and awareness of dengue; (2) To know about most prevalent preventive measure; and (3) To ascertain the source of information regarding dengue.

## Materials and Methods

A descriptive cross-sectional study was done from June – July Month 2011 to assess the knowledge, awareness and practices regarding dengue was conducted among residents of selected rural (villages) and slums with different socio-economic backgrounds in Chandigarh. The sampling was simple random sampling. The sample area was the two rural (villages) and two slums of Chandigarh. (Villages: Badheri, Dadumajra and Slums: Colony No. 4 and 25 sector Janta Colony.) The total sample size of the study was 800 respondents from these areas. Each 200 from each village and slum area. Therefore, total rural areas (n=400) and total slums (n=400).

Face-to-face interview based on a questionnaire developed by investigator which comprised of 26 questions, and was divided into four sections which included: (1) Socio-demographics profile; (2) Knowledge and awareness about the dengue; (3) practices related to prevention against diseases; and (4) Surrounding Observations. Interviews were conducted by investigators who underwent training in interviewing techniques under professional supervision. At the end of the interview each respondent was provided a hand-out with information relating to dengue fever. This hand-out contained Information on the vector, its breeding sites, biting time; malaria and dengue fever, its transmission, symptoms, treatment and preventive measures. Data analysis was done in Microsoft Excel, SPSS 16 version. The study was approved by Institute Ethical Committee where the study was performed and the study subjects gave informed consent for the participation in the study. Confidentiality of each participant was ensured.

## Results

The socio-demographic characteristic of total 800 interviewed each (n=400) from slum and rural area are given in Table 1. Out of which 66% were males and 34% were females in study population. Their ages categorized into from 18-25, 26-40, 41-64 and 65> years. Majority belongs to the age group of 41-64 years in rural areas and to 26 -40 years age group in slums. Total 30.80% of the respondents were illiterate out of which 16.5% and 45.25% in rural and slum respectively. Monthly income of majority of families in slums ranged from 3000-5000 and in rural areas from 5000- 20,000.

Table 2 contains the results of the awareness and knowledge of dengue study. 59.25% of the respondents were aware and 40.75% were unaware of dengue fever. The awareness was more in rural areas (48.5%) as compared to slum (30%). Only 72.62% of the respondents answered that mosquito was responsible for the transmission of dengue, the rest (25.5%) were ignorant about the mode of transmission. Regarding symptoms of dengue (fever, joint pain) only 13.75% of the respondents knew the symptoms and rest 70.87% don't know the symptoms. 73.12% respondents go for blood test for dengue. Significant associations were found between areas and awareness (p=0.000), symptoms (p=0.000) and blood test of dengue (p=0.000) by the respondents. Awareness on dengue and its mode of transmission was observed to be higher among the rural as compared to the slum respondents.

Regarding knowledge about breeding 71% of the respondents reported that unclean water-holding containers could be potential breeding places for the dengue-transmitting vector. The rest of the respondents reported that drainage, garbage and stagnant dirty water could be the breeding sites for dengue vector. Among rural respondents 65.5% people and 45% slum people says that collected dirty water is the common breeding site for mosquito. Stagnant water/cooler/tyre are according to 29.75% slum people and 20.75% rural people. The dengue mosquito breeds in clean standing water (2.6%) was unaware by all the respondents. About the timing of the mosquito biting habits, 56.62% Respondents indicated that it is night time, while about 8 % respondents thought it is at rainy season. 27.37% said mosquito bites any time. Knowledge of dengue vector breeding was significantly (p=0.02) more in rural respondents.

Generally, to prevent mosquito bites, 63.75% of the respondents used coils, Liquid vaporizers, particularly, to

ward off the dengue vector; 6.25% use mosquito nets and 16.25% use using of fan to rid the mosquito out of which 17.5% and 15% in slum and rural areas respectively ; 8.5% use smoke to vanish mosquitoes as shown in table 3.

Table 4 shows respondents' sources of information about dengue. Health professional and TV/radio was identified as the major source of public information as 44.87% and 32.75% respectively. Only 5.2% from newspaper; 7-6% from friends/family/schools.

**Table-1: Socio-demographic characteristics**

Variables	Slums*		Rural**		Total		
	N	%	N	%	N	%	
Sex	Male	242	60.5	286	71.5	528	66
	Female	158	39.5	114	28.5	272	34
Age (Years)	18-25	40	10	20	5	60	7.5
	26-40	224	56	167	41.75	391	48.7
	41-64	130	32.5	189	47.25	319	39.87
	65>	6	1.5	24	6	30	3.5
Education	Graduate/PG	0	0	39	9.75	86	10.75
	Intermediate/Diploma	15	3.75	67	16.75	82	10.25
	High School Certificate	70	17.5	104	26	170	21.25
	Middle school certificate	54	13.5	53	13.25	107	13.3
	Primary School certificate	80	20	71	17.75	114	14.25
	Illiterate	181	45.25	66	16.5	247	30.8
Income	<3000	46	11.5	6	1.5	52	6.5
	3000-5000	216	54	27	6.75	243	30.3
	5000-10,000	134	33.5	180	45	314	39.25
	10,000-20,000	04	1	152	38	156	19.5
	20,000-35,000	0	0	30	7.5	30	3.75
>35,000	0	0	5	1.25	5	0.6	

\* Slums: Colony No.4 and 25 sector Janta Colony (n=400); \*\* Rural: Villages-Badheri and Dadumajra (n=400)

**Table-2: Awareness and Knowledge about dengue and its vector**

Variables	Slums		Rural		p-value	Total	
	N	%	N	%		N	%
<b>Awareness on Dengue</b>							
Aware of Dengue Fever	Yes	120	30	194	48.5	0.000	474 59.25
	No	280	70	206	51.5		326 40.75
Mode of Transmission	Mosquito bite	281	70.25	300	75		581 72.62
	Fly bites	4	1	11	2.75	0.27	15 1.87
	Don't Know	115	28.75	89	22.25		204 25.5
Know the Symptoms*	Yes	36	9	74	18.5		110 13.75
	No	50	12.5	73	18.25	0.000	123 15.35
	Don't know	314	78.5	253	63.25		567 70.87
Whether go for blood test	Yes	230	57.25	355	88.75	0.000	585 73.12
	No	170	42.5	45	11.25		215 26.87
<b>Knowledge on Dengue</b>							
Dengue Vector Breeding	Clean water	3	0.75	18	4.5		21 2.6
	Unclean water	283	70.75	285	71.25	0.002	568 71
Common Breeding sites	Don't know	114	28.5	97	24.47		211 26.37
	Collected dirty water	180	45	262	65.5		442 55.25
	Stagnant water /cooler/tyres	119	29.75	83	20.75	0.000	202 25.25
	Unhygienic conditions	66	16.5	8	2		74 9.25
Dengue Vector Behaviour	Don't know	35	8.75	47	11.75		82 10.25
	Day time	14	3.5	18	4.5		32 4
	Evening time	12	3	9	2.25		21 2.6
	Night time	259	64.75	194	48.5		453 56.62
	Any time	68	17	151	37.7		219 27.37
	Don't Know	6	1.5	5	1.25		11 1.3
	Rainy season	41	10.25	23	5.75		64 8

\* Symptoms of dengue: fever, joint pain, rashes with retro-orbital pain; statistically significant difference (p value <0.05)

**Table-3: Common Preventive measures against Dengue**

Preventive Measures	Slums		Rural		Total	
	N	%	N	%	N	%
Mosquito mat/coil/liquid vaporizer/repellent cream	233	58.25	277	69.25	510	63.75
Mosquito net	5	1.25	45	11.25	50	6.25
Use of Fan	70	17.5	60	15	130	16.25
Use of smoke to drive away mosquitoes	56	14	12	3	68	8.5
None	36	9	6	1.5	42	5.2

**Table-4: Sources of Information**

Sources	Slums		Rural		Total	
	N	%	N	%	N	%
Health Professional	178	44.5	181	45.25	359	44.87
TV/Radio	130	32.5	132	33	262	32.75
Newspaper	22	5.5	20	5	42	5.2
Friends/family	30	7.5	32	8	62	7.7
School/colleges	31	7.75	30	7.5	61	7.6
None	9	2.25	5	1.25	14	1.7

## Discussion

The current study documented the knowledge, awareness and preventive practices regarding Dengue among the communities of Chandigarh city, in view of the fact that this city had been hit by several dengue outbreaks in recent years. The poor living conditions in the low socioeconomic areas (rural and slums) not only contribute to the spread of the disease but also make it difficult for health services to curtail the vector population effectively in these areas. Understanding people perception and their practices could help in identifying of targets areas and also in formulating strategies so to combat these out breaks.

The half (59.25%) of the respondents in this study had previously heard about dengue fever; the distribution being similar in the slum and villages. In another study done in urban settlement area of south Delhi, 90% of the respondents were reportedly aware of dengue<sup>[19]</sup>, 78% subjects knew dengue as a study done in Brazil<sup>[20]</sup> whereas in Thailand knowledge about dengue was 67%<sup>[21]</sup>. The possible explanation for the less awareness among the residents could be due to scarce health education messages widely available through mass media like television and newspapers which was found to be less only 32% found in the study.

A large portion of the sample population could identify the vector as a mosquito but little was known about the species. In our study we found that 72.62 % respondents mentioned mosquito bite as cause of dengue which is similar to a study done in Brazil.<sup>[20]</sup> and believed that the disease could spread by mosquito bite. Swaddiwudhipong et al<sup>[21]</sup> reported that >90% respondents knew the disease is transmitted by Aedes mosquitoes. Good knowledge on the mosquito vector and signs and symptoms of dengue is essential in identifying the disease and in seeking early and appropriate medical treatment to save lives.

The common symptoms of DF are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, and mild bleeding. In our study it could indicate that people are not aware of specific signs and symptoms of dengue. The knowledge of dengue disease symptoms was much lower, especially the dengue specific symptoms of fever with retro-orbital pain, rashes, which were mentioned by only 13.75% of the study participants. This knowledge was very less in slum as compared to rural areas. The study done by Gupta et al<sup>[22]</sup> reported 92 % knew about fever followed by headache as a symptom of dengue whereas Degallier N et al<sup>[20]</sup> and Benthem et al<sup>[23]</sup> found that rash or bleeding is a specific symptom of dengue infection indicating to distinguish dengue infection from other diseases.

Surprisingly, about majority of respondents had wrong knowledge that dengue mosquito breeds in unclean water. Matta et al<sup>[24]</sup> found that, 79.8 % respondents knew about breeding places of mosquitoes. Moreover, our study shows, around 25.25% participants reported that mosquito breeds on stagnant water/cooler/tyres. Bridging this gap in knowledge is important in planning and designing programs and activities to educate the respondents on preventive measures to combat dengue.

The *Aedes aegypti* mosquito typically bites during the day. In our study, large number of respondent doesn't know the biting time of the mosquito. Nearly 4% knew the biting time of dengue mosquitoes. Mosquito mats and coils were used by more than half of the respondents and all of them used it during night time. This highlights the existing gap in the knowledge with respect to the biting habits of *Aedes* mosquito.

Most respondents were aware of measures to protect themselves against contact with mosquitoes through window screening, Mosquito mat/coil/liquid vaporizer/repellent cream, use of bed nets, using fans, use of smoke to drive away the mosquitoes especially both rural and slum areas. Itrat A et al<sup>[25]</sup> and Hairi F et al<sup>[26]</sup> had reported these methods to be most effective means of preventions.

However, there was no utilization of insecticide sprays, professional pest control, and screen windows as ways to reduce mosquito and prevent dengue. These strategies may be considered as costly considering that most of the respondents have limited financial capabilities in slum and rural areas of the city. This suggests that government educational campaigns should give more emphasis on cost effective ways of preventing dengue such as environmental measures and control.

Most important role seemed to be played media including television and radio. In the our study, health professional and television/radio was the most important source of information, Further, it was found that the role of health personnel in creating awareness in respect to DF was satisfactory as 44.87% of those who were aware, got the relevant information from health staff. Interestingly, only a few proportion of the respondents cited schools and health centers as sources of dengue information. Similar to a study done by Swaddiwudhipong W<sup>[21]</sup> study from south Delhi, east Delhi and Kuala Lumpur.<sup>[27-29]</sup>

Based on our findings, it is recommended that future campaigns should involve more aggressive health education through active involvement of health workers and community representatives. Mass media can also be used as a tool for community awareness. Health education programs should not only focus on providing knowledge and creating awareness but also ensure that this knowledge gets translated into practice.

This study provides important baseline information. It can also help in identifying areas that can be targeted in future campaigns. The knowledge obtained from this study may thus be used to monitor the effectiveness and progress of dengue prevention campaigns by the Government officials for effective implementation of programs. Moreover provides evidence for allocation of resources for preventing dengue in the rural and slum areas.

Thus, government can maximize the potential use of these educational and health institutions by providing adequate support like information, education and communication (IECs) materials and other visual aids that may effectively communicate dengue preventive measures.

## Conclusion

The knowledge and awareness about dengue fever is generally inadequate with only 59.25% of the sample. The awareness was more in rural areas (48.5%) as compared to slum (30%). Only 72.62% of the respondents answered that mosquito was responsible for the transmission of dengue. Also, people had insufficient knowledge that dengue mosquito bites at day time and breeds in clean water. They are practicing preventive measures application at night. There is a need to make villages and slum people aware of different preventive practices and reduce this knowledge application gap. Health professional and television /Radio were the important role in conveying health information to the population. But due to poor financial condition all cannot buy TV/Radios,



newspapers for information. So effective IEC campaigns should be done.

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