

## Issues on Vector Related Diseases Transmission: People's Perception & Practices

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### ABSTRACT

**Background:** The vector borne diseases pose an immense public health concern and also a growing urban and rural problem. The aim of this study was to find out the perception and practices among the rural households regarding vector related diseases in some selected villages of Dhamrai Upazila.

**Material and Methods:** This descriptive cross sectional study was carried out among 1380 respondents by purposive sampling technique during the period from 6<sup>th</sup> to 8<sup>th</sup> January, 2018 in different villages of Dhamrai Upazila, Dhaka..

**Results:** Then study revealed that majority of the respondents 89% were Muslims by religion and about 65% respondents were found within the age 25-55 years. (mean age  $37.81 \pm 14.72$  years). Out of 1380 respondents, majority 87% & 86% mentioned Mosquitos and Houseflies as vectors transmitting the diseases followed by 48% Itch mite, 45% Louse and 27% Sandflies. About 85% & 88% mentioned Malaria & Dengue fever transmitted by vectors followed by 58% Chikungunya, 42% Kala azar, 13% Filariasis and 44% Typhoid fever. However, 71%, 83%, 59% & 3% respondents mentioned Mosquito bite as the mode of transmission of Malaria, Chikungunya and Filariasis respectively. About 88%, 75%, 44% and 39% respondents mentioned Personal protection, Avoidance of water collection, Fogging and Insecticidal spraying as the vector control measures. Nevertheless, 92%, 81% and 30% respondents are found practiced Mosquito net, Mosquito coil and Screening of windows as their usual vector control measures.

**Conclusion:** In this study community awareness in terms of perceptions, knowledge and practices regarding vector borne diseases are found deficient. There should be intensified efforts in promoting personal protective measures through creating public awareness towards prevention of vector borne diseases in the locality.

**Key Words:** Vector borne diseases, perception & practices.

### Introduction

tor-borne diseases account for more than 17% of all infectious diseases, causing more than 1 million deaths every year globally. More than 2.5 billion people in over 100 countries are at risk of contracting Dengue<sup>1</sup>. Many vector-borne diseases namely malaria, dengue, chikungunya, filariasis and kala-azar are prevalent in South-asia and have become serious public health problem<sup>2</sup>.

Vectors are living organisms that can transmit infectious diseases between humans or from animals to humans. Mosquitoes are the best known disease vector. Others include ticks, flies, sandflies, fleas, triatomine bugs and some freshwater aquatic snails.<sup>3</sup> Vector-borne diseases account for more than 17% of all infectious diseases, causing more than 1 million deaths annually.<sup>3</sup> Yet, five vector-borne diseases -

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Chagas disease, dengue/severe dengue, human African trypanosomiasis, leishmaniasis, lymphatic filariasis and schistosomiasis - are among the 17 neglected tropical diseases.<sup>4</sup> The incidence of dengue has increased 30-fold over the last 50 years. Up to 50-100 million infections are now estimated to occur annually in over 100 endemic countries, putting almost half of the world's population at risk.<sup>5</sup> In 2012, there were an estimated 207 million cases and an estimated 6,27,000 deaths were due to malaria, mostly (90%) in sub-Saharan Africa.<sup>6</sup>

Many vector-borne diseases are prevalent in the SouthEast Asia Region. These include, among others, mosquito-borne diseases (e.g. malaria, dengue, chikungunya, Japanese encephalitis, lymphatic filariasis), sandfly-borne disease (kalaazar) and snail-transmitted disease (e.g. schistosomiasis). Vector-borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by mosquitoes, sandflies, triatomine bugs, blackflies, ticks, tsetse flies, mites, snails and lice. Every year there are more than 7,00,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis, globally.

Malaria is endemic in all the countries of South-East Asia region except Maldives, which has been malaria-free since 1984. WHO estimated that there were 27 million cases and 42 000 deaths due to malaria in 2012 in this region, where around 1.4 billion people are at risk.<sup>4</sup> About 147 million people (mainly the poor and marginalized populations) in three countries (Bangladesh, India and Nepal) are at risk of kala azar.<sup>8,9</sup> Distribution of vector-borne diseases is determined by complex demographic, environmental and social factors. Global travel and trade, unplanned urbanization and environmental challenges such as climate change can impact on pathogen transmission, making transmission season longer or more intense or causing diseases to emerge in countries where they were previously unknown.<sup>10,11</sup>

The South-East Asia Region has become hyperendemic with regular reporting of dengue cases since 2000. The maximum number of cases (3,55,525) and deaths (1982) were recorded during 2010.<sup>12</sup> In 2012, a total of 2,57,204 cases and 1229

deaths were reported from this Region.<sup>13</sup> The purpose of this study was to explore perception and practices of rural households regarding vector borne diseases.

## Methodology

This was a descriptive cross sectional and qualitative study carried out among rural households in different villages (Choibaria, Kumrail, Islampur, Ambagan, Hajipara and Ponchas) of Dhamrai Upazila during the period from 6<sup>th</sup> to 8<sup>th</sup> January, 2018. There were 1380 respondents selected purposively. A pre tested structured questionnaire and FGDs were the instruments for data collection. The 3<sup>rd</sup> year MBBS students (AKMMC-08) were engaged in implementation of questionnaire. Prior interview a consent form duly signed by the respondents was considered as an ethical practice. It was processed and analyzed manually and by using computer.

## Results

**Table 1:** Distribution of respondents by socio-demographic characteristics n = 1380

Variables	Variables	Number of respondents	Percentage (%)
Age	15-25	290	21.0
	25-35	407	29.49
	35-45	285	20.65
	45-55	205	14.84
	55-65	116	8.47
	65-75	59	4.27
	75-85	18	1.28
Sex	Male	572	41.45
	Female	808	58.55
Educational level	Illiterate	377	27.31
	Primary	413	29.93
	Secondary	400	28.99
	HSC and above	190	13.77
Occupation	Service	124	8.99
	Business	218	15.80
	Agriculture	67	4.86
	Housewife	634	45.93
	Day laborers	130	9.42
	Others	207	15.00
Monthly income	<5,000	302	21.88
	5,001- 8,000	255	18.48
	8,0001-11,000	342	24.78
	> 11,000	481	34.86

About 65% respondents were found within age of 25-55 years with mean age 37.89 and  $\pm$ SD 14.72. Majority (59%) were female. About 30% and 29% respondents were found primary and secondary level of education. However, 22% were found monthly income below 5,000 BDT.

**Table-II:** Distribution of respondents by name of the insect that act as a vector

Name of the insect	Yes	No	Don't Know
Mosquito	1205 (87.31)	130 (9.4)	45 (3.3)
Houseflies	1189 (86.15)	121 (8.78)	70 (5.07)
Itch Mite	666 (48.26)	392 (28.44)	322 (23.3)
Louse	622 (45.07)	356 (25.80)	402 (29.13)
Sand-fly	374 (27.10)	320 (23.20)	686 (49.7)

*N.B: Figures in parenthesis indicates percentage*

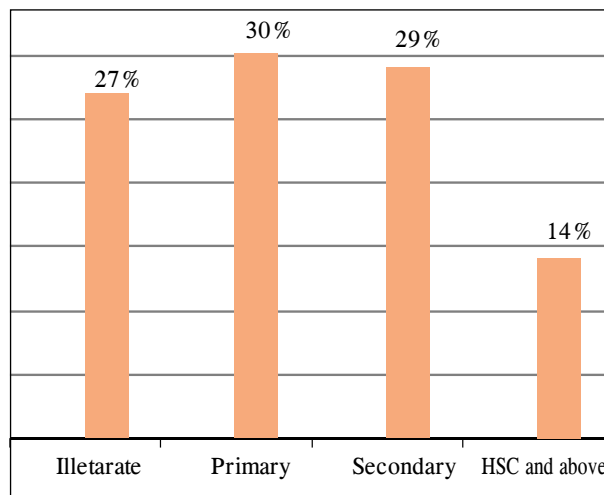
About 87%, 86%, 48%, 45% and 27% respondents mentioned Mosquitoes, Houseflies, Itch mite, Louse and sand Fly respectively as a vector.

**Table-III:** Distribution of respondents by knowledge on mode of transmission of common vector borne diseases n= Multiple response

Name of Diseases	Mode of Transmission					Total
	Bite of Mosquito	Bite of Sandflies by Houseflies	Food contamination	Impure water Intake	Don't Know	
Malaria	1108 (71.08)	23 (1.47)	110 (7.05)	106 (6.8)	212 (13.6)	1559 (100)
Dengue	1202 (83.4)	11 (0.7)	39 (2.7)	62 (4.39)	127 (8.81)	1441 (100)
Chikungunya	829 (59.04)	20 (1.52)	32 (2.2)	31 (2.2)	492 (35.04)	1404 (100)
Kala-azar	223 (16.23)	34 (2.450)	28 (2.02)	37 (2.6)	1063 (76.7)	1385 (100)
Filariasis	51 (3.6)	5 (.50)	14 (1)	32 (2.3)	1289 (92.60)	1391 (100)

About 71%, 83%, 59% respondents correctly mentioned mosquito bite as a mode of transmission of Malaria, dengue, chikungunya and Filariasis respectively.

On the other hand, only 2% respondents correctly mentioned bite of sandflies as the mode of transmission of kala azar and 93%, 77% and 35% mentioned nothing about the mode of transmission of diseases.



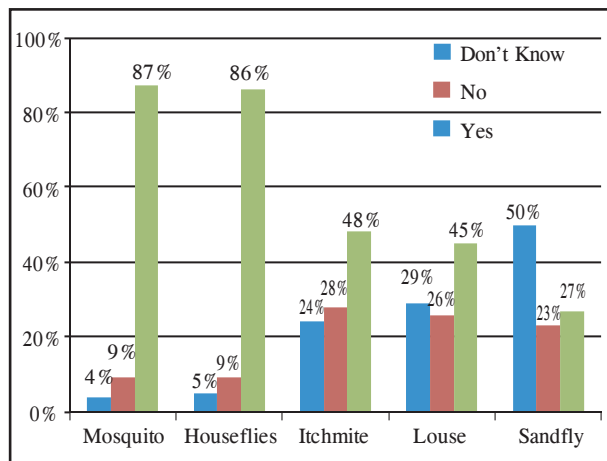
**Fig. 1:** Bar diagram showing distribution of respondents by level of education.

It shows that about 27% respondents were found illiterate and 3% and 29% respondents were found primary and secondary level of education respectively.

**Table -IV:** Distribution of respondents by practice of vector control measures n=1380

Practice of vector control measures	Yes	No	Total
Use of repellent vaporizer	212 (15.36)	116 (8.41)	1380 (100)
Use of Mosquito net	1264 (91.59)	116 (8.41)	1380 (100)
Screening of windows	414 (30)	966 (70)	1380 (100)
Use of repellent cream	55 (4)	1325 (96)	1380 (100)
Use of Mosquito coils and net	1126 (81.5)	254 (18.5)	1380 (100)

About 92%, 81% and 30% respondents practiced Mosquito net, coils, screening of windows as the vector control measures. However, 96%, 85% and 75% didn't practice these accordingly.



**Fig. 2:** Multiple bar diagram showing distribution of respondents by knowledge on name of insect that act as a vector

It shows that about 87% and 86% respondents mentioned Mosquitos and Houseflies as vector followed by 48% Itch mite, 45% louse and 27% Sandflies.

**Focus Group Discussions (FGDs)**

There was spontaneous exchange of ideas among the participants However, participants offered opinion related to itch mite and only few of them knew that itch mite can cause disease. In terms of control

measures each and every one had clear conception that mosquito bite is the mode of transmission of disease but the other misconception they had were contaminated foods, ripen foods and poor sanitation etc. Regarding the practice of vector control measures participants response was very poor.

**Discussion**

A descriptive cross sectional study was carried out among 1380 rural households of Dhamrai Upazila. The aim of this study was to find out the perception and practices among the rural households regarding vector related diseases in Dhamrai Upazila.

The study reveals that majorities (89%) of the respondents were Muslims and 65% respondents were found within age of 25-55 years with mean age 37.81 yrs and SD±14.72. About 41% were male and 59% were female respectively. The literacy rate of the respondents was about 73% of whom 29% had secondary level of education. Among the respondents 87%, 86%, 48%, 45% & 27% mentioned Mosquitos, Houseflies, Itch mites, Louse and Sandflies respectively as the vector. Similarly about 85%, 88%, 58%, 42% 13% and 44% respondents mentioned Malaria, Dengue, Chikungunya, Kala azar, Filariasis and Typhoid fever as the vector borne disease. However, 67%, 37%, 28%, 25% & 11% respondents mentioned nothing about the above stated diseases regarding transmission. In this study participants had good knowledge regarding vector and vector transmitted diseases which is similar to the study done in India<sup>9</sup>.

Regarding mode of transmission of common vector borne diseases, about 71%, 83%, 59% & 3% respondents correctly mentioned Mosquito bite as the mode of transmission of Malaria, Dengue, Chikungunya and Filariasis respectively. On the other hand, only 2% respondents correctly mentioned bite of Sandflies as the mode of transmission of Kala azar and 93%, 77% & 35% respondents mentioned nothing about the mode of transmission of Filariasis, Kala azar and Chikungunya respectively. This is in contrast to the result of study by Taran *et al.*<sup>7</sup>. Information on knowledge on vector control measures, about 88%, 75%, 44% & 39% respondents mentioned personal protection, avoidance of water collection, fogging and insecticidal spraying respectively as the vector

control measures and 52%, 18% & 15% respondents were unaware about the vector control measures.

Regarding practices of vector control measures about 92%, 81% & 30% respondents practiced mosquito nets, mosquito coils, screening of windows respectively as the vector control measures.

### Conclusion

Various studies had been undertaken among the rural people in the world and in Bangladesh, but the information on knowledge and a practice regarding the vector borne diseases at the community level is still inadequate. In this study, it was found that a moderate proportion of people did not have sufficient knowledge regarding the name of vector and the diseases transmitted by them. A certain proportion of people did not have adequate knowledge regarding mode of transmission of Chikungunya, Kala azar and Filariasis. Regarding methods and practice of vector control measures, deficiency in knowledge also found in certain proportion of people. However, it was found a good proportion of people having adequate knowledge regarding the name of vector & diseases transmitted by them, their mode of transmission as well as different control measures for the prevention of vector borne diseases. This study also examined the perception & practices among the rural households regarding vector related diseases at Dhamrai Upazila in particular.

### Recommendations

Considering the findings of present study recommendations are as follows

- Further large scale in depth study is needed to increase the knowledge of the people regarding name of specific insect and the diseases transmitted by them.
- Development strategy to utilize mass communication method to educate people about the mode of transmission of different vector borne diseases.
- Intensified efforts should be made towards creating public awareness and strengthening knowledge and practice of vector control measures to prevent vector borne diseases.

- Further large scale in depth study is needed to formulate policy in regards to prevent common vector borne diseases.

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**Conflict of interest:** This paper has no conflict of interest among the authors.

### References

1. Fact sheet on Vector Borne Diseases, World Health
2. Organization <http://www.who.int/Mediacentre/factsheets/fs387/en/>. Annual Report 2014-1, national vector Borne Disease Control Programme, Director General of Health Services, Government of India
3. World Health Organization, World Health Day-7 April 2014. Geneva: WHO, 2014. <http://www.who.int/campaigns/world-health-day/2014/event/en/>-accessed 28 March 2014
4. World Health Organization. World Health Day: protect yourself from vector borne diseases. Geneva: WHO, 2014. <http://www.who.int/campaigns/world-health-day/2014/en/>-accessed 28 March 2014
5. World health Organization, Neglected tropical diseases. Geneva: <http://www.who.int/neglected-diseases/diseases/en/>-accessed 28 march 2014
6. World Health Organization. Dengue Control. Geneva: <http://www.who.int/dengue-control/en/>-accessed 28 march 2014.

7. World Health Organization. World Malaria report 2013. Geneva: HO, 2013. [http://www.who.int/Malaria/pblications/World - Malaria-report-2013/en/ accessed 28 march 2014](http://www.who.int/Malaria/pblications/World-Malaria-report-2013/en/ accessed 28 march 2014)
8. World Health Organization, Regional Office for South East Asia. The regional strategic plan for elimination of lymhatic filariasis, 2010-2011. New Delhi: WHO - SEARO, 2012. <http://www.earo.who.int/entity/world-health-day/2014/LF-CD203.pdf> accessed 28 March 2014
9. World Health Organization, Regional office for South East -Asia. Regional strategic framework for elimination of Kala-azar from the South East Asia Region, 2011-2015, New Delhi: WHO-SEARO, 2012
10. Dash AP, Bhatia R, Karla NLL. Dengue in South East Asia: an appraisal of case management and vector control. *Dengue Bulletin*. 2012; **36**: 1-13
11. World Health Organization, Regional Office for South East Asia. Aide memorie dengue. New Delhi: HO-SEARO. <http://www.earo.who.int/entity/world-health-day/2014/Adde-memorie-Dengue.pdf> accessed 28 March 2014
12. World Health Organization. Chikungunya. Fact sheet. <http://www.earo.who.int/entity/world-health-Day/2014/Chikungunya-factsheet-A4.pdf> accessed 28 March 2014.
13. [http://www.thedailystar.net/country/Bangladeshi-women-susceptible -mosquito-borne diseases-131145](http://www.thedailystar.net/country/Bangladeshi-women-susceptible-mosquito-borne-diseases-131145)
14. World Health Organization. Chikungunya. Fact sheet. <http://www.earo.who.int/entity/world-health-Day/2014/Chikungunya-factsheet-A4.pdf> accessed 28 March 2014.
15. Pallavi, V tenglikar, M Hussain, *et al*. Knowledge and practice regarding mosquito borne disease among people of an urban area in Klaburgi, Karnatak. *National Journal of Community Medicine*; 2016; **3(7)**: 223-225.