

Knowledge, Attitudes, and Practices Towards Dengue Fever in Urban and Rural Areas of Bangladesh: Implications for Prevention and Control

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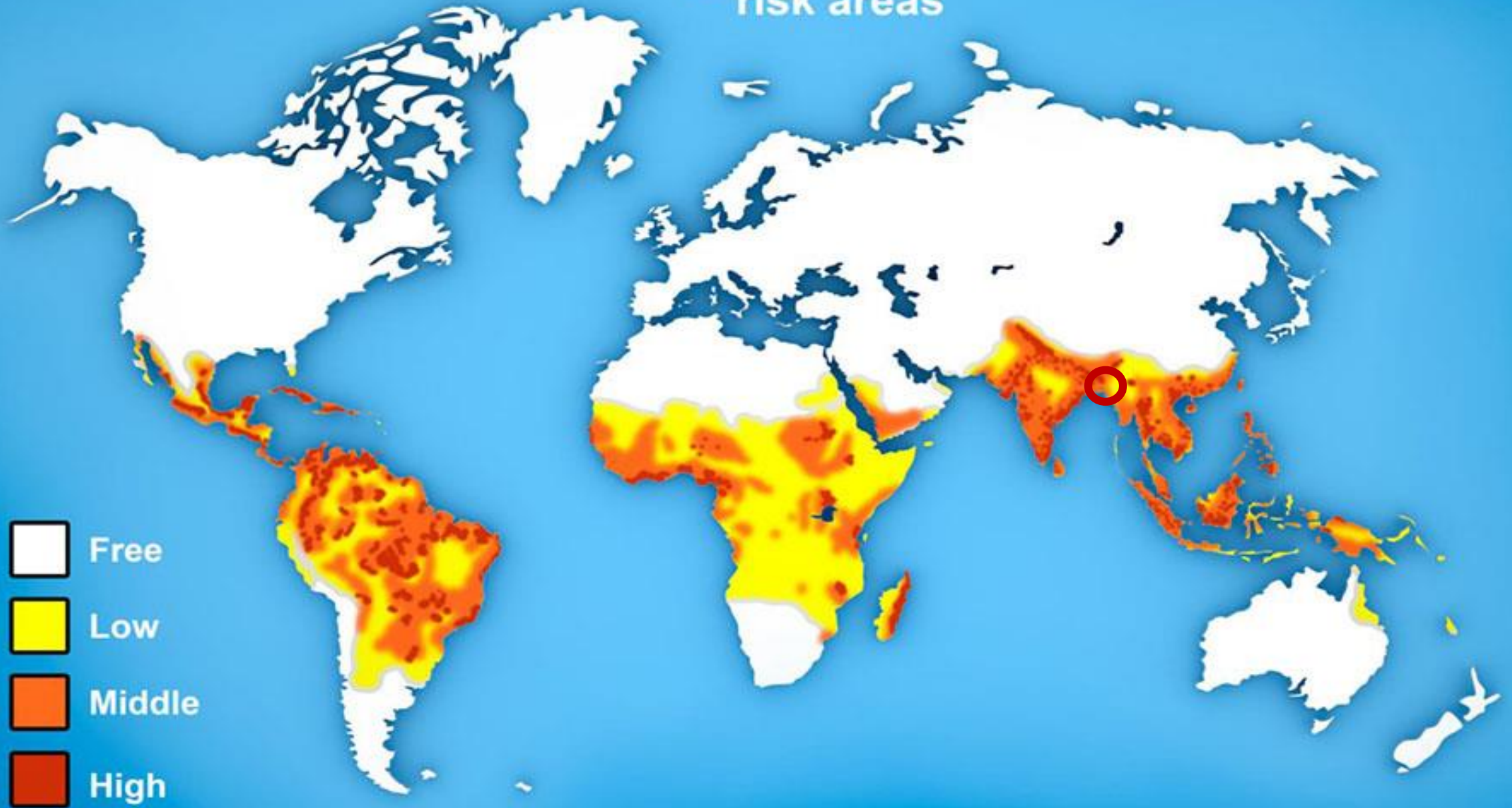


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**Rabiul Alam Md Erfan Uddin, Dr Alak Paul, Abdullah Abu Sayeed,
Janardan Mahanta, Md. Abdus Sattar, Hasina Nasreen, Rumana Rashid, Md
Sydul Alam, Md. Akib Jabed, Sadia Tabassum, Sreemoyee Mazumder,
Salma Mamtaz, Aniruddha Ghose**

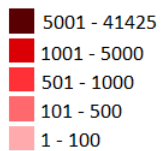


Dengue fever risk areas



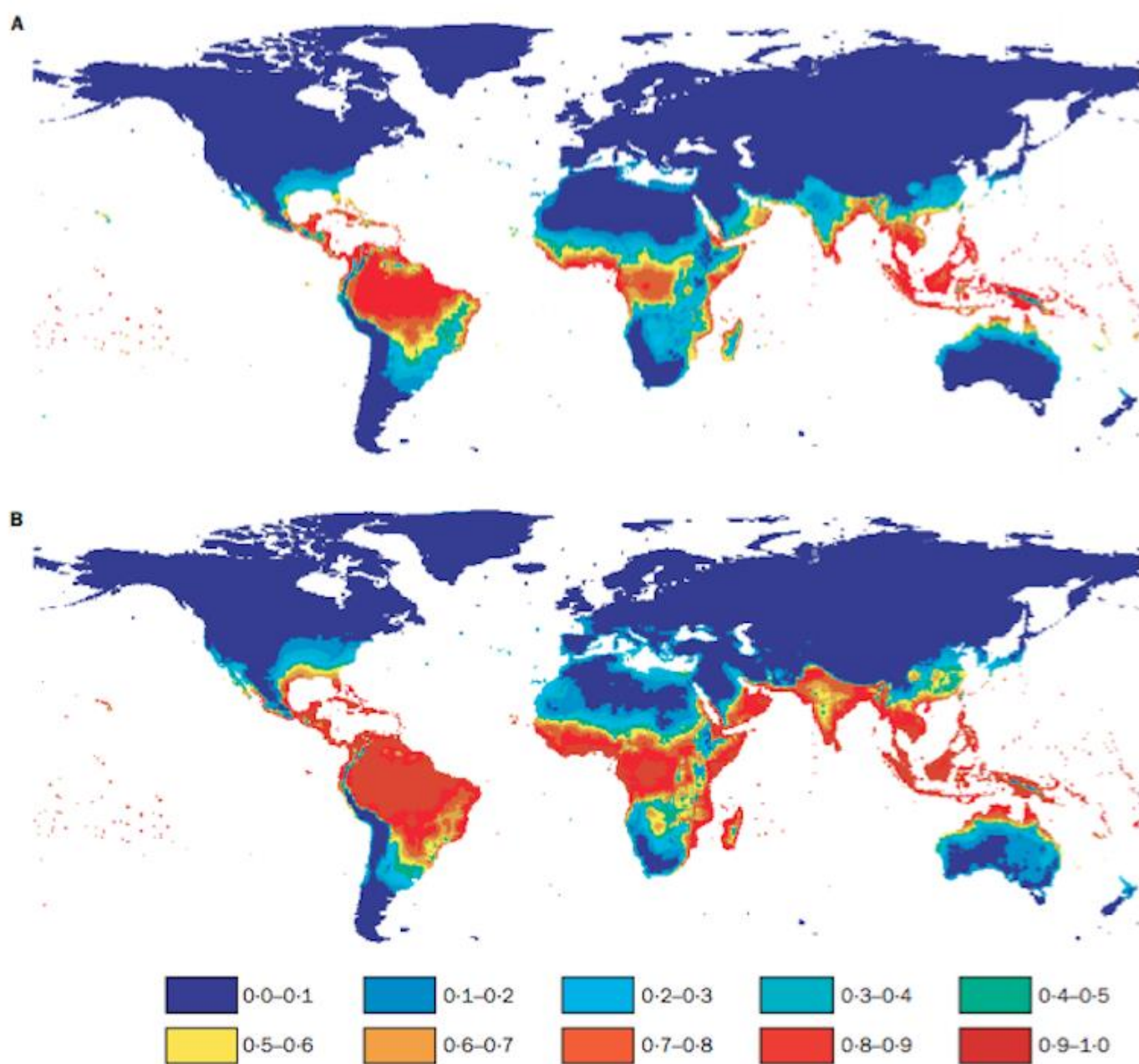
Bangladesh dengue outbreak-year 2023

Hospitalised cases by districts (11-08-2023)



Between 1 January and 7 August 2023, a total of **69 483 dengue cases** including **327** related deaths (case fatality rate = **0.47%**) were reported in Bangladesh

- 1st dengue outbreak in Dhaka was in 1964 and was known as 'Decca Fever'
- Epidemiologically became challenging in 2000.
- Along with other South Asian countries, its incidence and fatality hampers the regional economy.



Dengue has been considered a climate-sensitive emerging neglected tropical disease related to

- average rainfall,
 - temperature, and humidity;
 - breeding location and
 - duration of the incubation period
- have now been found to be correlated with temperature throughout most of the year.

Figure 2: Estimated baseline population at risk in 1990 (A) and estimated population at risk in 2085 (B)
 Results of a logistic regression model with vapour pressure (humidity) as the predictor of dengue fever risk, using climate data from 1961 to 1990 (A). Forecast geographical distribution of dengue transmission based on climate projections for 2080–2100 from a global circulation model (CCGMA2) (B). Colours represent probability of dengue fever transmission.

- No effective vaccine is yet in action to prevent Dengue
- Knowledge attitude and practice related to dengue can influence the incidence of Dengue
- The educational level of the family head is contributory
- Preventive practices can influence the incidence

PLOS NEGLECTED TROPICAL DISEASES

RESEARCH ARTICLE

Knowledge, attitude and practice (KAP) and risk factors on dengue fever among children in Brazil, Fortaleza: A cross-sectional study

Yang Zhang¹, Monica Zahreddine², Kellyanne Abreu³, Mayana Azevedo Dantas³, Katia Charland², Laura Pierce², Valéry Ridde⁴, Kate Zinszer^{2,5*}



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and Public Health



Article

Knowledge, Attitude, and Practices towards Dengue Fever among University Students of Dhaka City, Bangladesh

Md Mostafizur Rahman¹, Saadmaan Jubayer Khan¹, Kamrun Nahar Tanni¹, Tuly Roy¹, Musabber Ali Chisty², Md. Rakibul Islam¹, Md. Alim Al Raji Rumi¹, Mohammed Sadman Sakib¹, Masrur Abdul Quader¹, Md. Nafee-Ul-Islam Bhuiyan¹, Farzana Rahman³, Edris Alam^{4,5} and Abu Reza Md. Towfiqul Islam^{6,*}



Material and methods

Materials and methods



Cross-sectional



8 sites



**8 data
collectors**



2 months

Sample size calculation

Purposively we selected 4 wards in city corporation and 4 unions in the Chattogram district for the sampling area.

Within the sampling area for calculating number of respondents we used following formula

$$\text{Sample size} = \frac{z^2 \times p \times (1-p)}{MoE^2} \dots \dots \dots (i)$$

where z = z score, p = standard deviation, and MoE = margin of error/confidence interval.

We calculated the sample size with a 95% confidence interval (z score = 1.96), 0.5 standard deviation (p), and 10% margin of error/confidence interval (MoE).

$$\text{Sample size (each study site)} = \frac{1.96^2 \times 0.5 \times (1-0.5)}{(10\%)^2} \dots \dots \dots (ii)$$

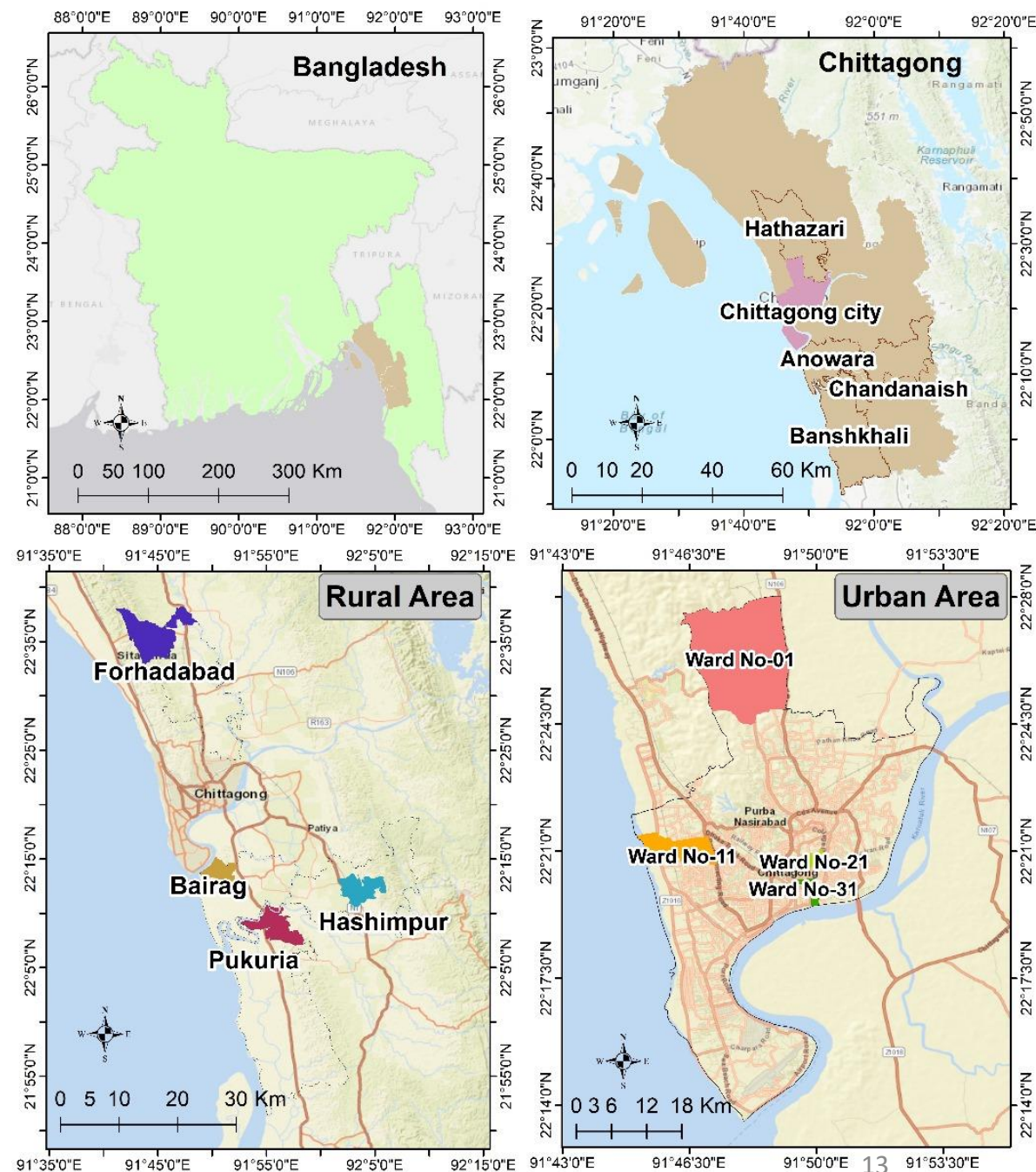
Approximately 96 people per site were required for interview

Study sites

4 wards from CCC

4 Unions from Chattogram District

Urban sites	Rural sites
South Pahartali	Forhadabad, Hathazari Upazila
South Kattali	Pukuria, Banshkhali Upazila
Jamal Khan	Bairag, Anowara Upazila
Alkaran	Hashimpur, Chandanaish Upazila



Questionnaire

Knowledge		
Socio-demographic Characteristics		
1	Gender (Male, Female)	
2	Age (=>18-30, 31-40,41-50,51-60, >60 Yrs)	
3	Education of the respondents (No formal education, Primary, Secondary, Higher Secondary, Diploma, Undergraduate, Graduate, Postgraduate)	
4	Highest education of family member (Primary, Secondary, Higher Secondary, Diploma, Undergraduate, Graduate, Postgraduate)	
5	Occupation of respondent (Govt job, Private job, Business, House maker, Daily worker, Retired, Student, Unemployed)	
6	House condition (Independent house, Multi-storied house, Semi-pucca, Hut, others)	
7	Locality (Urban area, Sub-urban, Rural area)	
8	Family income (<10,000, 10-20,000, 20-30,000, 30-40,000, 40-50,000, >50,000)	
9	History of dengue (Yes/ No)	
Knowledge about dengue fever (DF)		
	Epidemiology	
10	Do you know what cause dengue fever? Yes/No	
11	If yes, what it is? (Bacteria, virus, fungus, Protozoa, others)	
12	Does it spread person to person? Yes/No	
13	Does it transmit through water? Yes/No	
14	Do you know what insect or vector spread dengue? Yes/No	
15	If yes What is it?	

	Mosquito /Flee/ Rat/ Cat/Dog/ others
	If answered mosquito ask next question
16	What is the name of the mosquito?...../don't know
17	What type of Aedes mosquito bite human/? Male/ female/don't know
18	Do you know only female dengue (Aedes) mosquitoes bite human? Yes/No
19	Do you know which is the peak season for dengue transmission?/don't know
20	Can you mention where Aedes mosquito breeds?/ don't know
21	Is insecticide affective against dengue mosquito? Yes/No/don't know
22	Are there any vaccines for DF? Yes/No/ Don't know
23	In which part of the day Aedes mosquito bite? Don't know/ day/night/late evening
34	To your knowledge what are the symptoms of dengue? Don't know/fever /headache /joint pain /muscle pain /nausea /vomiting / diarroe <u>diarrhoea</u> / abdominal pain/rash/others(specify.....)
25	Does dengue fever causes death? Yes /No/don't know
Attitudes towards DF	
1	Do you think that DF can be prevented? Yes/No
2	How dengue can be prevented? Don't know/Removing breeding place/Insecticides/Others
3	Do you think that stagnant water around the houses (e.g.in discarded tyres, broken pots and bottles) are breeding places of Aedes mosquitoes? Yes/No
4	Is insecticide fogging by city corporation/government good enough to prevent DF? Yes/No
5	Will you take extra action to prevent dengue infection if you know the risk of being infected with dengue is increasing in your area? Yes/No
6	Will removal of mosquito breeding sites at your premises reduce the chance of dengue infection among your family members? Yes/No
7	Can dengue outbreak in your area be controlled if every household is committed to remove mosquito breeding sites? Yes/No

8	Do you think that community people actively participate in controlling dengue mosquitoes? Yes/No
Attitudes towards prevention of DF	
1	What do you do to prevent breeding of mosquito? Nothing/
2	Do you search and destroy mosquitoes breeding sites? Yes/No
3	If yes, how many times in last 1 month?
4	Do you call professional pest control to reduce mosquitoes? Yes/No
5	Do you remove stagnant water from around the house to reduce mosquitoes? Yes/No
6	If yes, how many times in last 1 month?
7	Do you use mosquito bed nets when sleep? Yes/No
8	Do you use mosquito coils to reduce mosquitoes? Yes/No
9	Do you dispose water holding containers such as tires, plastic bottles, pots, etc. around your house? Yes/No
10	Do you use mosquito repellent cream? Yes/No
11	Do you tightly cover water containers in your house? Yes/No
12	Does city corporation/municipal council sprays insecticides for controlling mosquitoes? Yes/No
13	What do you do if you suspect to get symptoms of dengue like fever. body ache, headache? Nothing/ took medicine from pharmacy by myself/ took Medicine with consultation with pharmacy/ visit quack/ visit physician/go to hospital

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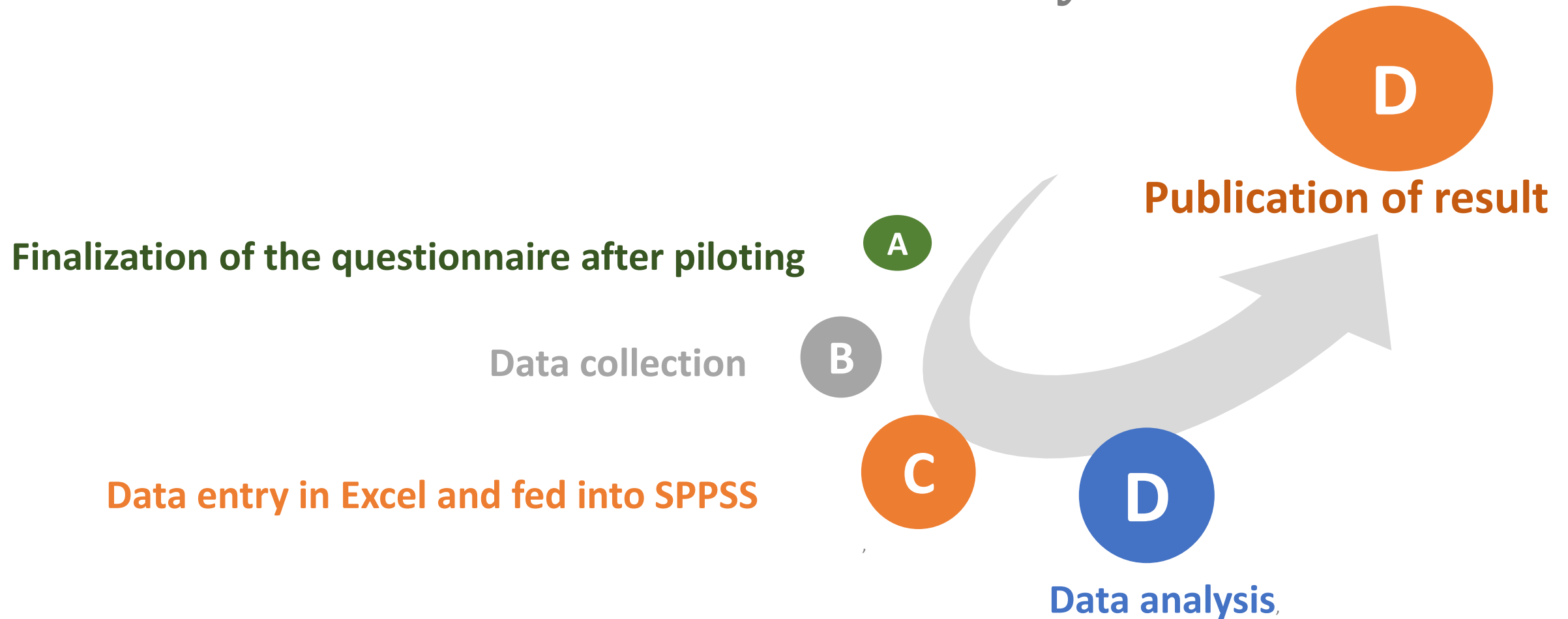
After one day of training regarding data collection, they started collection of data



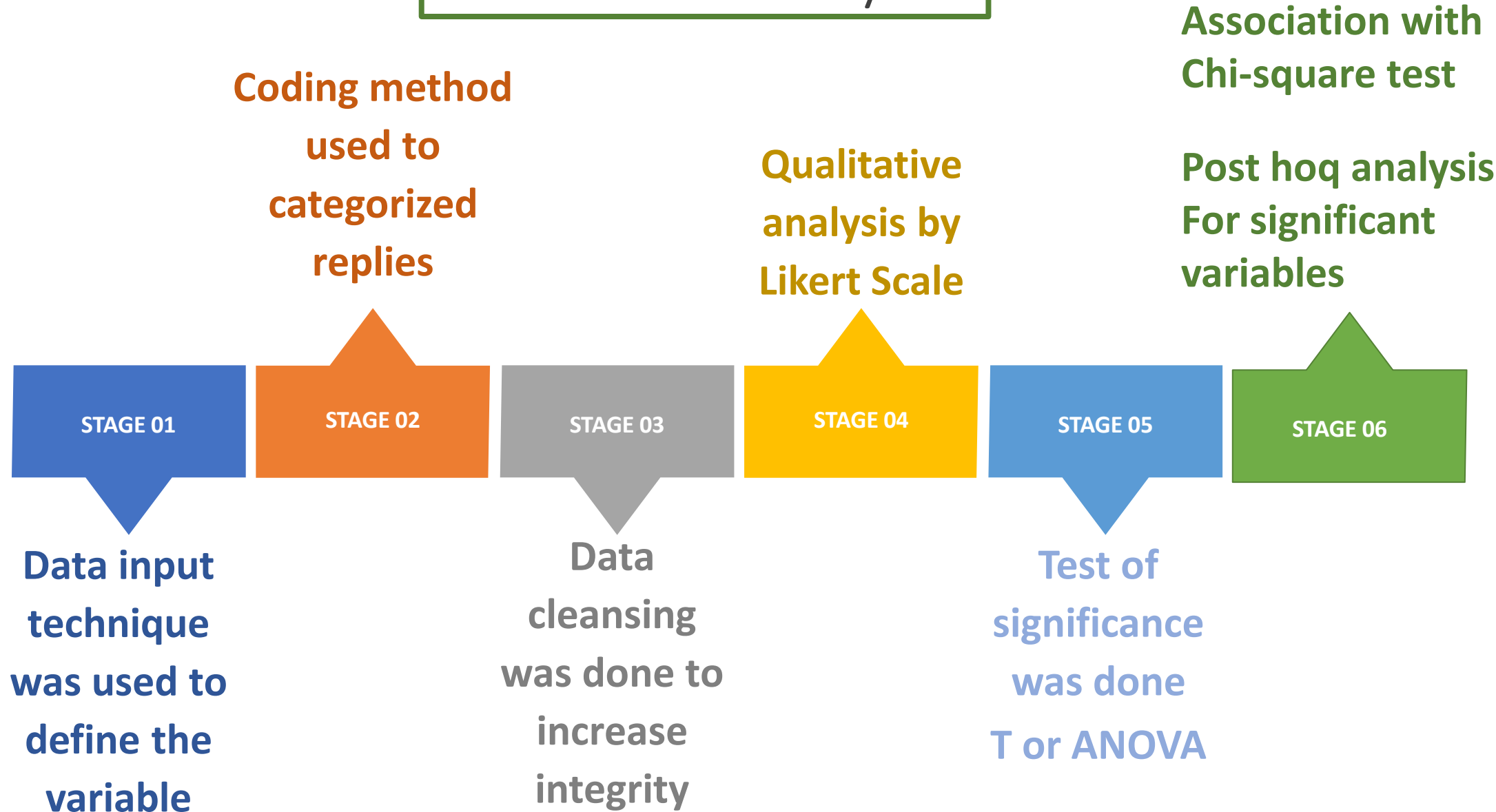
Data collection



Data collection and analysis



STEPS of Data Analysis





Dengue KAP Rabiul BSMCON

Results

Gender distribution

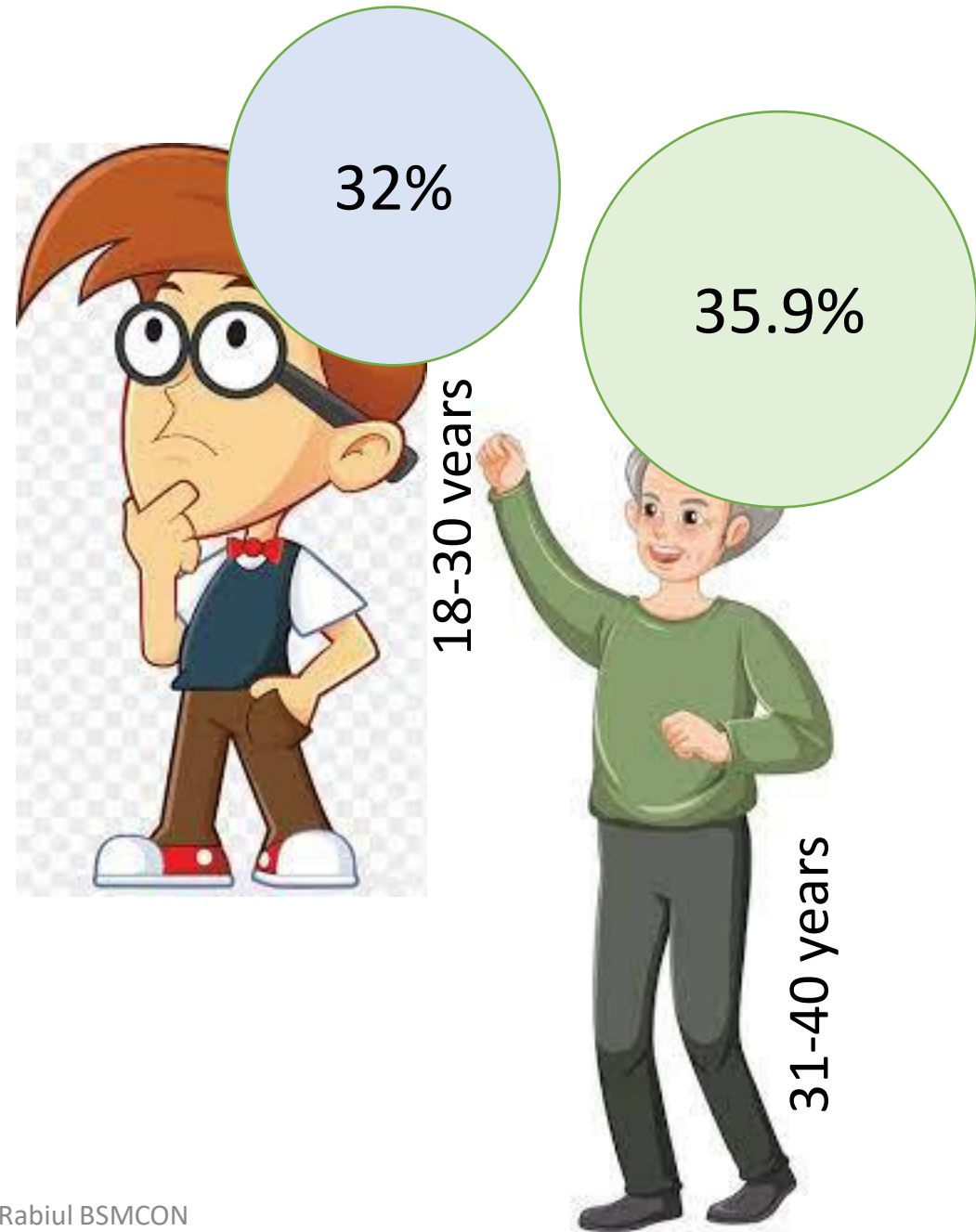


65.3%

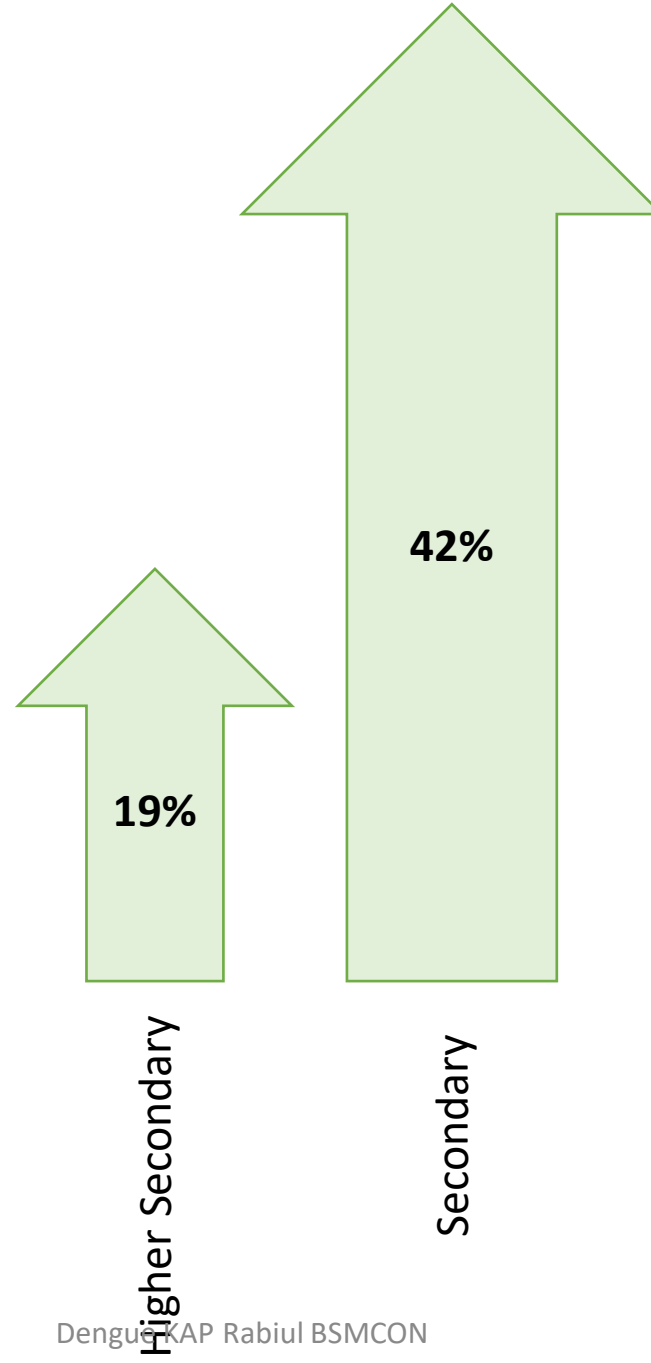


34.7%

Age distribution



Highest academic qualification



Occupation House Income of the responders

		Urban		Rural	
		Frequency	Percentage	Frequency	Percentage
Occupation					
	Service	76	17.5	84	19.3
	Business	63	14.5	42	9.7
	House maker	223	51.3	239	54.9
	Student	11	2.5	11	2.5
	Others	62	14.3	59	13.6
House					
	Structured House	266	61.1	253	58.2
	Nonstructured House	169	38.9	182	41.8
Income (Taka)					
	< 10000	48	11.0	50	11.5
	10000 – 20000	123	28.3	131	30.1
	20000 – 30000	139	32.0	126	29.0
	30000 – 40000	73	16.8	77	17.7
	> 40000	52	12.0	51	11.7



Questions	Responses	Urban		Rural	
		Frequency	Percentage	Frequency	Percentage
What do you do to prevent the breeding of mosquitoes?					
	Cleaning	217	49.9	187	43.0
	Clean accumulated water	130	29.9	154	35.4
	Nothing	88	20.2	94	21.6
Do you search and destroy mosquito breeding sites?					
	Yes	335	77.0	340	78.2
	No	100	23.0	95	21.8
If yes, how many times in the last 1 month?					
	Up to 5 days	243	55.9	244	56.1
	6 to 10 days	164	37.7	159	36.6
Dengue KAP Rabiul BSMCON	More than 10 days	28	6.4	32	7.4 24



		Urban		Rural	
		Frequency	Percentage	Frequency	Percentage
Do you call professional pest control to reduce mosquitoes?					
	Yes	58	13.3	33	7.6
	No	377	86.7	402	92.4
Do you remove stagnant water from around the house to reduce mosquitoes?					
	Yes	435	100.0	435	100.0
If yes, how many times in the last 1 year?					
	Up to 15 <u>day</u>	273	62.8	275	63.2
	16 to 60 days	119	27.4	110	25.1
	More than 60 days	43	9.9	50	11.7
Do you use mosquito bed nets when sleep?					
	Yes	395	90.8	416	95.6
	No	40	9.2	19	4.4

		Urban		Rural	
		Frequency	Percentage	Frequency	Percentage
What do you do to get a remedy from mosquitoes?					
	Nothing	87	20.0	98	22.5
	Cream	2	0.5	4	0.9
	Spray	61	14.0	46	10.6
	Incense	16	3.7	12	2.8
	Mosquito Coil	269	61.8	275	63.2
Do you dispose of water-holding containers such as tires, plastic bottles, pots, etc., around your house?					
	Yes	387	89.0	409	94.0
	No	48	11.0	26	6.0
Do you tightly cover water containers in your house?					
	Yes	434	99.8	435	100.0
	No	1	0.2	0	0.0
Does the city corporation/municipal council spray insecticides to control mosquitoes?					
	Yes	260	59.8	84	19.3

		Urban		Rural	
		Frequency	Percentage	Frequency	Percentage
What do you do if you suspect getting symptoms of dengue-like fever, body ache, or headache?					
	Took medicine from the pharmacy by myself	37	8.5	58	13.3
	Took Medicine with consultation with pharmacy	21	4.8	38	8.7
	Visit physician	347	79.8	320	73.6
	Go to hospital	30	6.9		
What do you do if you suspect getting symptoms of dengue-like fever, body ache or headache?					
	Awareness	165	37.9	114	26.2
	Cleaning	71	16.3	63	14.5
	Government Initiative	140	32.2	193	44.4
	Do not Know	59	13.6	65	14.9



Bivariate analysis/chi-square (χ^2) test of KAP and sociodemographic characteristics

Knowledge about dengue

Urban

Rural

Age

Education

Employment

Housing type

Income

Gender

Education

Employment

Mean score of
3.40 ± 1.65 on a
scale of 10

Mean score of
3.39 ± 1.56 on a
scale of 10

At cut-off value 80%

Category	Groups	Knowledge					
		Urban			Rural		
		Knowledge		P Value	Knowledge		P value
		Good	Poor		Good	Poor	
Gender	Male	36	115	0.326	41	110	0.014
	Female	56	228		50	234	
Age	Up to 30	42	97	0.002	40	108	0.154
	31-40	28	128		23	110	
	41-60	13	97		23	99	
	60+	9	21		5	27	
Education	Up to Primary	6	93	0.000	5	90	0.000
	Secondary	23	159		26	160	
	Higher Secondary	27	59		24	59	
	Above Higher Secondary	36	32		36	35	
	Service	23	53	0.014	25	59	0.004

Bivariate analysis/chi-square (χ^2) test of KAP and sociodemographic characteristics

Attitude about dengue

Urban

Rural

Age
Education
Income

Education
Employment

Mean attitude score
(4.53 ± 0.74),

Mean attitude score
(4.48 ± 0.73)

> 5 indicate positive attitude

Category	Groups	Attitude					
		Urban			Rural		
		Attitude		P Value	Attitude		P Value
		Good	Poor		Good	Poor	
Gender	Male	91	60	0.067	95	56	0.233
	Female	193	91		167	117	
Age	Up to 30	101	38	0.001	92	56	0.328
	31-40	110	46		86	47	
	41-60	55	55		66	56	
	60+	18	12		18	14	
Education	Up to Primary	51	48	0.009	46	49	0.013
	Secondary	122	60		115	71	
	Higher Secondary	62	24		49	34	
	Above Higher Secondary	49	19		52	19	
	Service	51	25		63	21	0.030

Bivariate analysis/chi-square (χ^2) test of KAP and sociodemographic characteristics

Practice about dengue

Urban

Rural

Age
Occupation
Income

Occupation

Score is moderate
(2.11 ± 0.79 on a
scale of 4

Score poor (1.64 ± 0.69 on a
scale of 4)

Category	Groups	Practice					
		Urban			Rural		
		Practice		P Value	Practice		P Value
		Good	Poor		Good	Poor	
Gender	Male	50	101	0.364	16	135	0.511
	Female	88	196		29	255	
Age	Up to 30	52	87	0.017	11	137	0.470
	31-40	44	112		14	119	
	41-60	39	71		16	106	
	60+	3	27		4	28	
Education	Up to Primary	25	74	0.121	7	88	0.315
	Secondary	54	128		18	168	
	Higher Secondary	31	55		13	70	
	Above Higher Secondary	28	40		7	64	
	Service	25	51	0.025	18	66 ₃₀	0.003



What were the key observations?

The results of this study indicate that the vast majority of people from both urban and rural areas according to the Chattogram database know that :

- dengue is not a communicable disease;
- more than two-thirds of people in both areas express that dengue does not transmit from person to person.
- surprisingly, more than half of the participants pronounced that dengue is transmitted through water
- we found that most of the participants used mosquito nets as a preventive measure

What were the key observations?

- 70% of the total participants mentioned that removing the breeding location of mosquitos lessen the incidence
- People in this study assumed that community members actively participate in controlling dengue mosquitoes
- Just less than 80% of the respondents were found to search for and destroy mosquito breeding sites to prevent dengue outbreaks
- close to 90% of people dispose of water-holding containers such as tires, plastic bottles, pots, etc., around their houses

The level of knowledge among rural people is a little bit less than the metropolitan people may be due to less incidence in rural areas.

Attitude related to educational level whether rural or urban

Despite of experience of dengue outbreak each year for last 25 years, our practices to prevent Dengue is not satisfactory

Limitation

- Due to the fund crisis, we could not manage Focal group discussions, in depth interviews of patients which may increase the understanding

Acknowledgement

- Chittagong Medical University for allowing a grant to conduct study at community

Conclusion

Knowledge as well as incidences of Dengue increasing in rural settings which expedite the need to take nationwide measure to improve attitude and practice to prevent Dengue.

**THANK
YOU**

