

# Febrile Illness In Bangladesh

**Md Kaiissar Mannoor**

Head and Senior Scientist

Institute for developing Science and Health  
initiatives (ideSHi)

Dhaka, Bangladesh



# Febrile Illness

- Febrile Illnesses are the most common cause of hospital admission in Bangladesh
- These illnesses contribute to considerable morbidity and deaths among both children and adults
- Diagnosis of febrile illness remains challenging as it is a common presentation of many infectious diseases
- Up to 80% of febrile illness cases remain undiagnosed<sup>1</sup>

<sup>1</sup>Susilawati TN, McBride WJ. Acute undifferentiated fever in Asia: a review of the literature. Southeast Asian Journal of Tropical Medicine and Public Health. 2014 May 1;45(3):719.

# Current Febrile Diseases in Bangladesh

## Febrile illnesses Under National surveillance

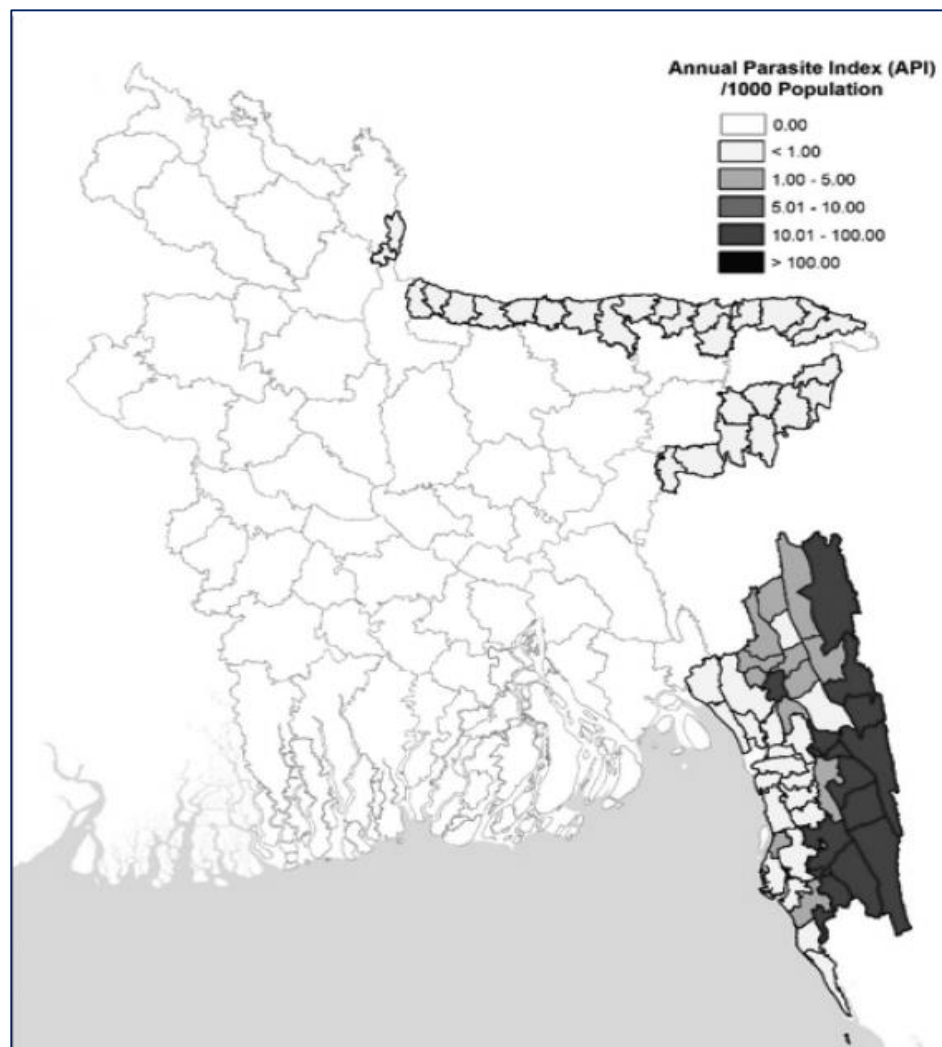
- Malaria
- Dengue
- Tuberculosis
- Chikungunya
- Visceral leishmaniosis (kala-azar)

## Febrile illnesses not under National surveillance

- Enteric Fever
- Leptospirosis
- Rickettsia

Undifferentiated/Unexplained fever in Bangladesh

# Malaria



**Map:** Thirteen malaria-endemic districts of Bangladesh

## Malaria situation in 2016

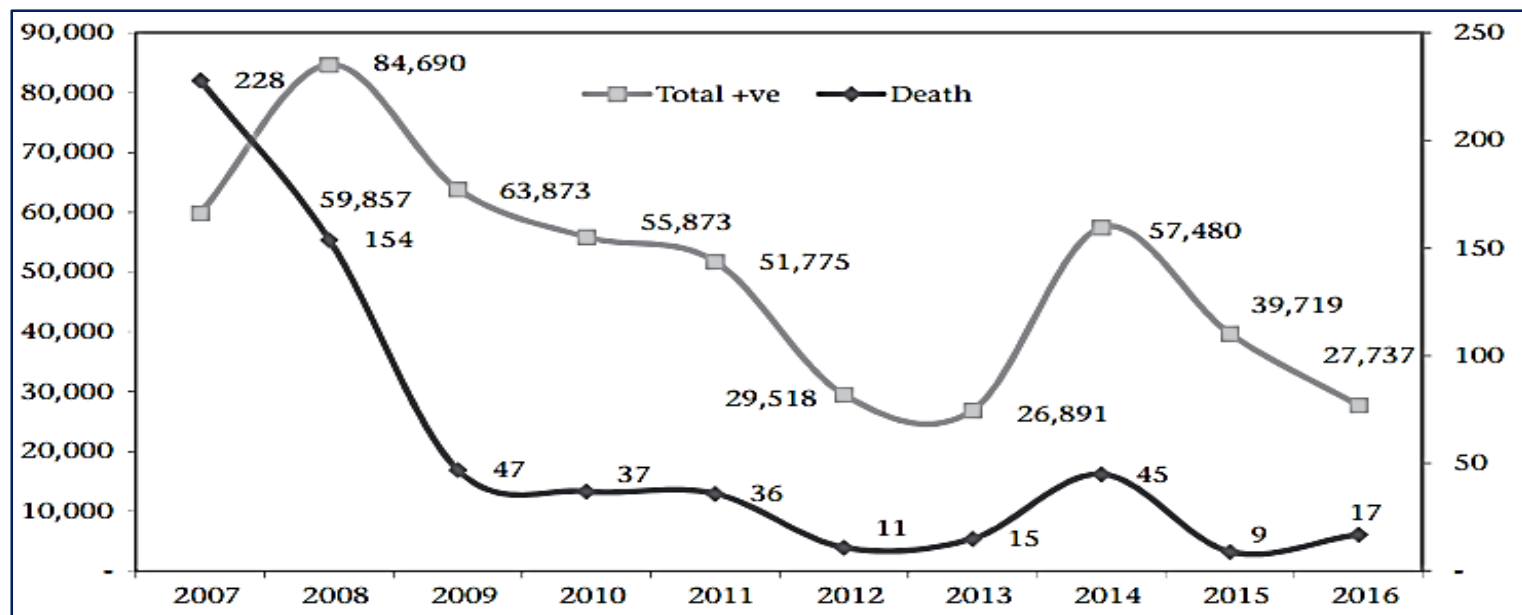
Population at risk: **17.52 million**

No. of endemic districts: **13**

Total cases: 27,737, No. of deaths: **17**

API: **1.58/1,000** population , Mortality rate: **0.10/100,000**

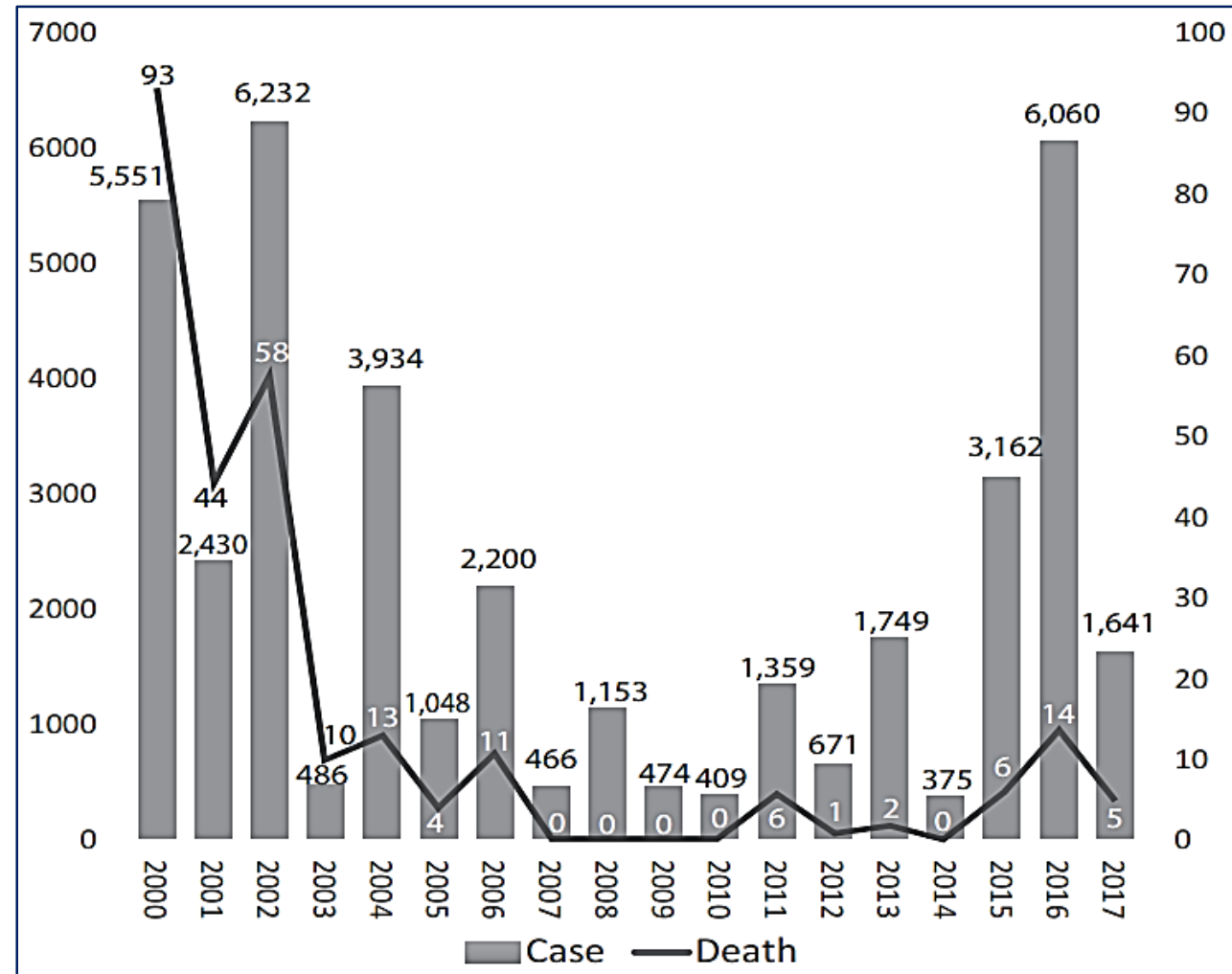
Test positivity rate: **2.78%**



**Figure:** Epidemiological trend of malaria cases and deaths during 2007-2016

# Dengue

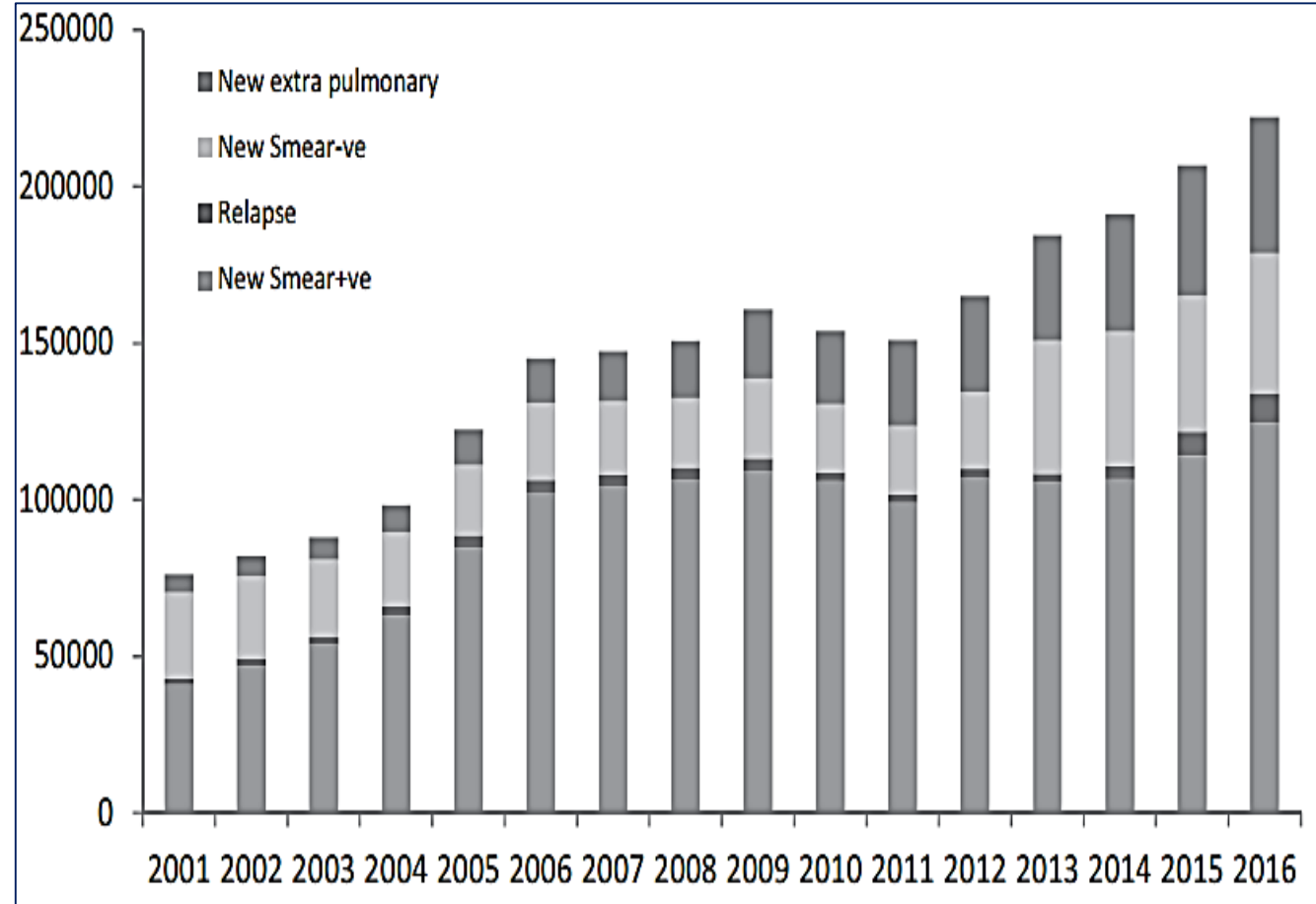
- *Aedes aegypti* was the main vector responsible for the epidemic while *Aedes albopictus* was identified as potential vector in Chittagong
- The prevalent serotypes are **DENV1**, **DENV2**, and **DENV3**, with the highest number of reported cases attributed to DENV3.
- The peak time for Dengue infection is **July to October**



**Figure:** Distribution of dengue cases and deaths in Dhaka by year (2000-2017)

# Tuberculosis

- The incidence and prevalence rates of all forms of tuberculosis in 2016 are 221 and 260 per 100000 people respectively
- It is estimated that about 40 per 100000 people died of TB in the same year
- From 2008 to 2016, a total of 5,258 multidrug-resistant TB patients had been enrolled for treatment



**Figure:** Nationwide TB case notification; absolute number, 2001-2016

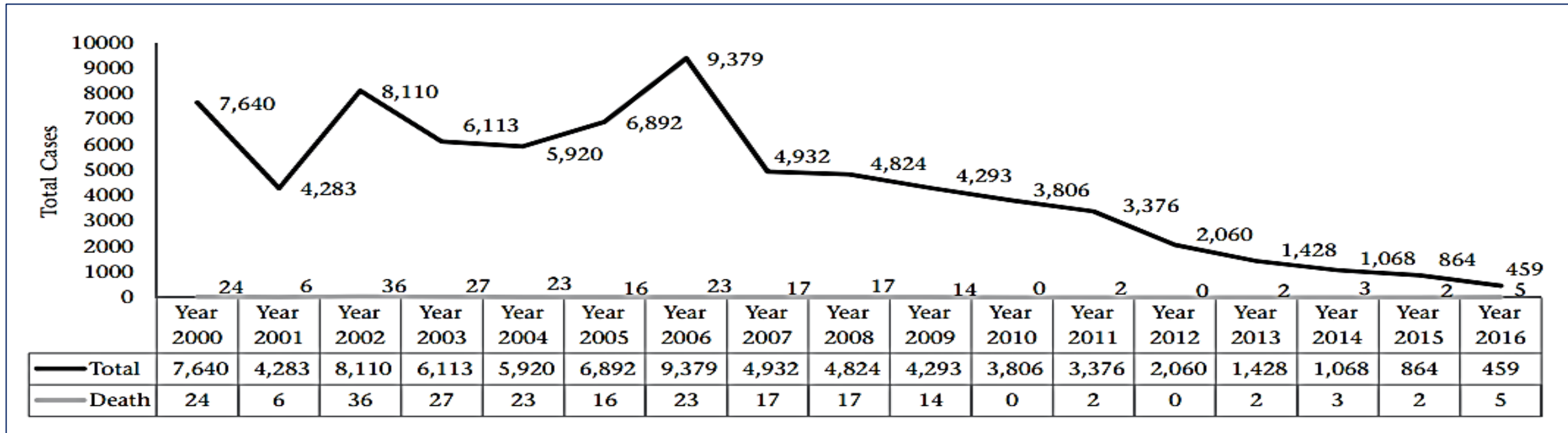
# Chikungunya

- *Aedes* mosquito is identified as the vector for chikungunya viruses
- First outbreak in 2008 in Rajshahi and Chapainawabganj affecting 39 patients
- Outbreak in 2011 in Dohar, Dhaka affecting 196 patients
- Sporadic cases occurred between 2013-2016
- The largest outbreak was recorded In 2017
- From 1,480 households, **2,956 suspected cases** with chikungunya infection were identified

**Table:** Number of patients admitted in different **hospitals** of Dhaka for suspected chikungunya, 2017

Name of hospital	Number of patients
Dhaka Medical College Hospital	4864
Mitford Hospital	2348
Shaheed Suhrawardy Medical College Hospital	2558
Shaheed Mansur Ali Medical College Hospital	9
Mugda Medical College Hospital	131
Dhaka Shishu Hospital	93
United Hospital	522
Apollo Hospital	197
Delta Hospital	255
Other private hospitals/physicians	547
IEDCR	2290
<b>Total</b>	<b>13814</b>

# Visceral leishmaniasis (kala-azar)



**Figure:** Trends of kala-azar cases (2000-2016)

- Around 31 million people are at risk and 26 districts of Bangladesh are endemic for kala-azar
- The ICT-based rK39 is being used for the diagnosis of kala-azar both in the field and hospitals



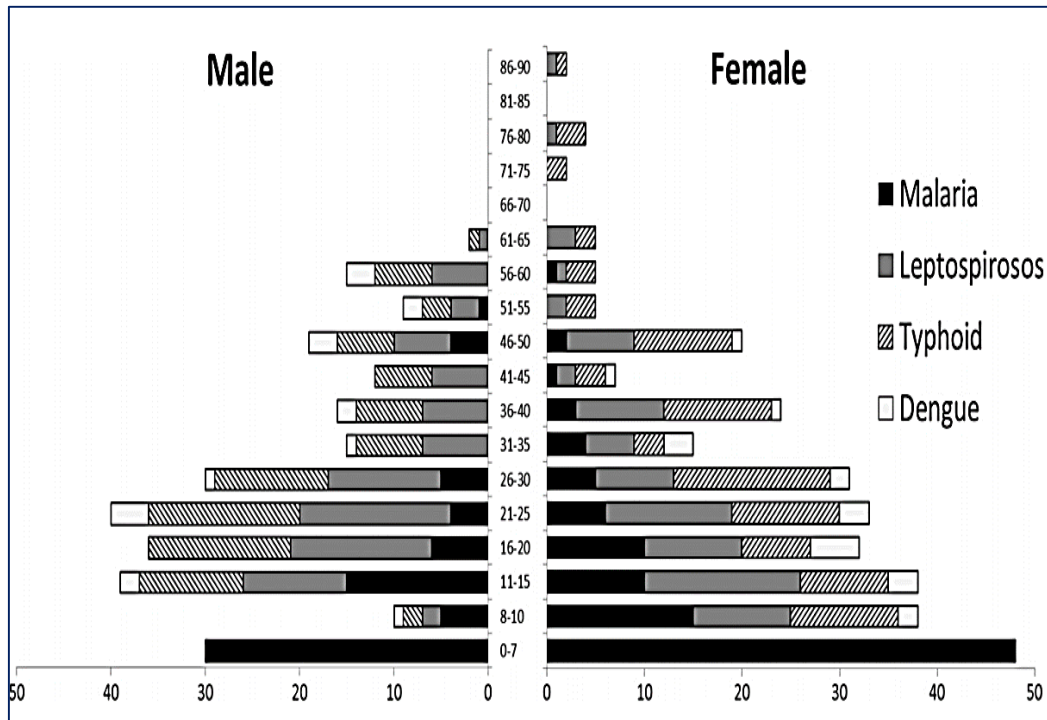
# Enteric Fever

- Bangladesh is situated in a region where Typhoid fever is highly endemic
- Children aged <5 years bear a large burden (10.5/1000 person-years)
- Multi-drug resistant strains were identified in approximately 15% cases of all age group patients
- However, the proportion of *Salmonella* spp. among febrile illness patients in Bangladesh is still unknown

<sup>1</sup> Naheed, Aliya, et al. "Burden of typhoid and paratyphoid fever in a densely populated urban community, Dhaka, Bangladesh." *International Journal of Infectious Diseases* 14 (2010): e93-e99.

<sup>2</sup> Khanam, Farhana, et al. "Typhoid fever in young children in Bangladesh: clinical findings, antibiotic susceptibility pattern and immune responses." *PLoS neglected tropical diseases* 9.4 (2015): e0003619.

# Leptospirosis



**Figure:** Test positivity of different type fever. In the age group 0–7 years only malaria diagnosis was performed

Test positivity	Positive cases* N (%)	Temperature °C mean (range)
<b>Double positive (108)</b>		
malaria + leptospirosis	16 (3.2%)	37.1 (35.8–42.0)
malaria + typhoid fever	17 (3.4%)	37.1 (35.9–39.6)
malaria + dengue	5 (1.0%)	37.4 (36.5–38.5)
leptospirosis + typhoid fever	56 (11.1%)	36.9 (35.0–38.9)
leptospirosis + dengue	3 (0.6%)	37.4 (36.4–39.5)
dengue + typhoid fever	11 (2.2%)	37.2 (34.8–39.2)
<b>Triple positive (21)</b>		
malaria + leptospirosis + dengue	13 (2.6%)	36.4 (36.1–39.5)
malaria + leptospirosis + typhoid fever	2 (0.4%)	37.7 (36.7–39.5)
malaria + typhoid fever + dengue	1 (0.2%)	38.8
leptospirosis + typhoid fever + dengue	5 (1.0%)	37.9 (36.2–39.3)

**Table:** Double and triple positive cases with corresponding axillary temperature

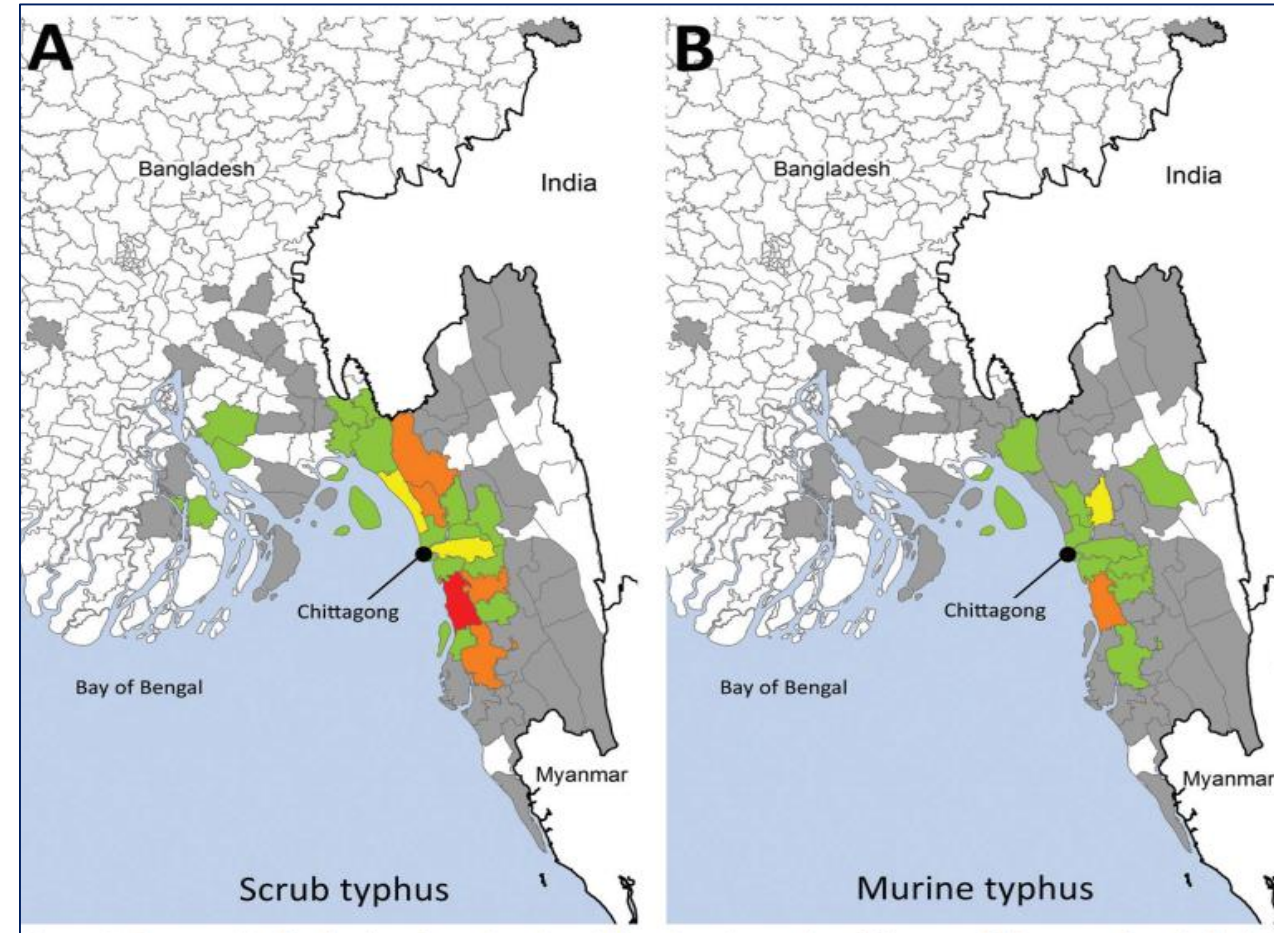
- A study in Kamlapur (2001), reported that about 8.4% febrile illness are caused by *Leptospira* infection<sup>1</sup>
- Another Study in Chittagong (2007-2010), Bangladesh revealed that high proportions of febrile illness (leptospirosis, typhoid fever) are potentially being **misdiagnosed as malaria**<sup>2</sup>

<sup>1</sup> Kendall, Emily A., et al. "Leptospirosis as a cause of fever in urban Bangladesh." *The American journal of tropical medicine and hygiene* 82.6 (2010): 1127-1130.

<sup>2</sup> Swoboda, Paul, et al. "Evidence of a major reservoir of non-malarial febrile diseases in malaria-endemic regions of Bangladesh." *The American journal of tropical medicine and hygiene* 90.2 (2014): 377-382.

# Rickettsia

- A study in Chittagong (2014-15) diagnosed 16.8% scrub typhus and 5.8% murine typhus among febrile illness patients<sup>1</sup>
- Deaths occurred in 4% of the cases; case-fatality rates were 4% each for scrub typhus and murine typhus
- Overall, 23.1% of patients had evidence of treatable rickettsial illnesses

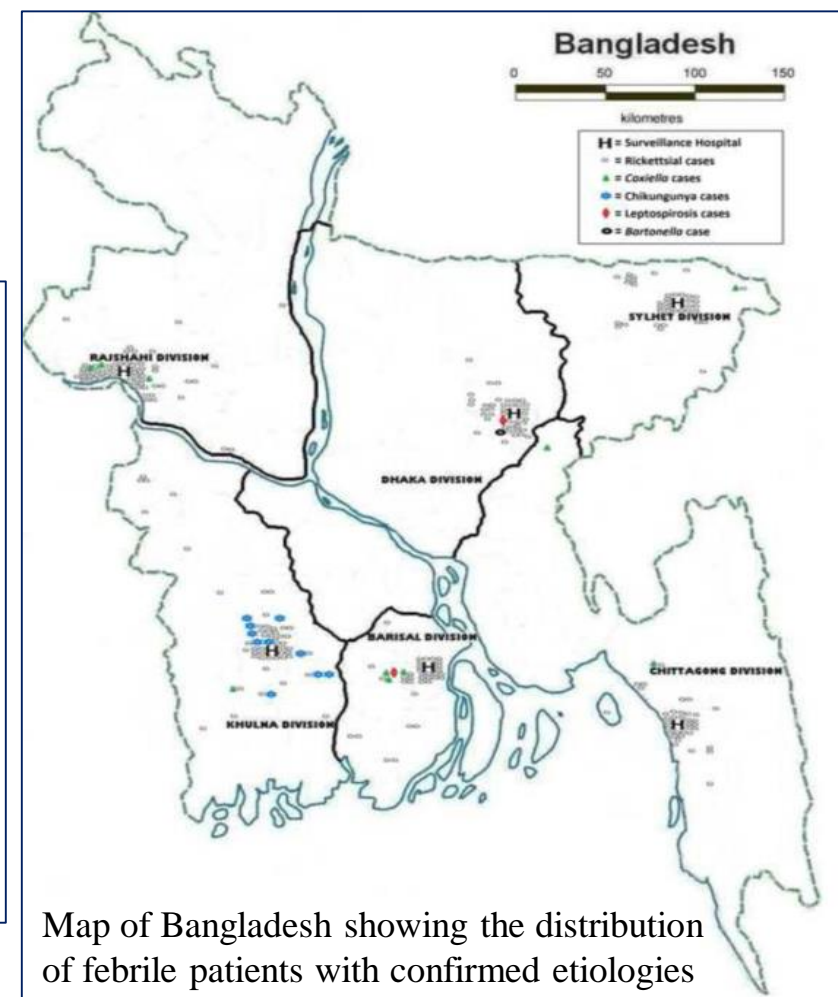
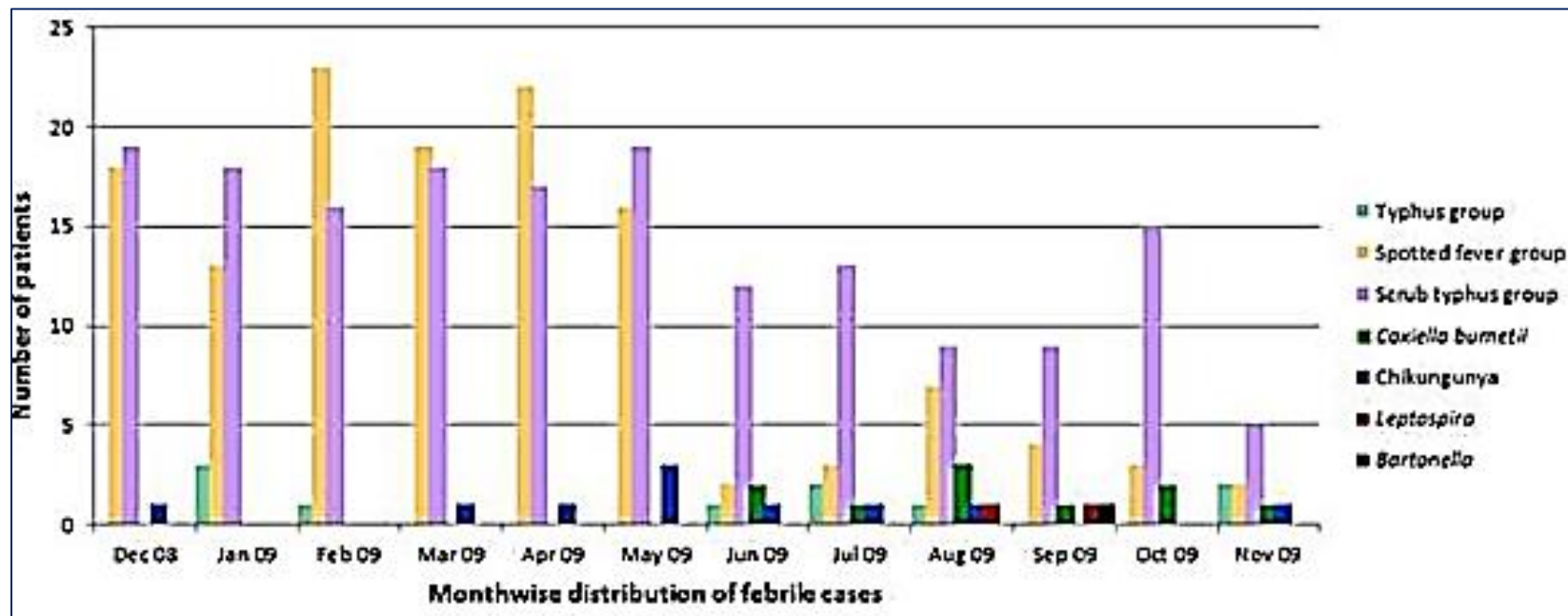


**Figure 1.** Geographic distribution of scrub typhus (A) and murine typhus (B) cases, Chittagong, Bangladesh

<sup>1</sup>Kingston, Hugh W., et al. "Rickettsial illnesses as important causes of febrile illness in Chittagong, Bangladesh." *Emerging infectious diseases* 24.4 (2018): 638.

# Neglected Febrile Illness

A study in Dhaka detected *Rickettsia*, *Coxiella*, *Leptospira*, *Bartonella*, and Chikungunya virus infections among febrile patients presenting at hospitals in Bangladesh<sup>1</sup>



Map of Bangladesh showing the distribution of febrile patients with confirmed etiologies

<sup>1</sup>Faruque, Labib Imran, et al. "Prevalence and clinical presentation of *Rickettsia*, *Coxiella*, *Leptospira*, *Bartonella* and chikungunya virus infections among hospital-based febrile patients from December 2008 to November 2009 in Bangladesh." *BMC infectious diseases* 17.1 (2017): 141.

# Undifferentiated/Unexplained Febrile illness

Diagnostic Category	All		MPI Poor		MPI Non-Poor		Poor vs. Non-Poor P-value <sup>a</sup>
	n = 527 (18 deaths)		n = 269 (16 deaths)		n = 258 (2 deaths)		
	n (%)	Died	n (%)	Died	n (%)	Died	
Respiratory Tract Infection	110 (21%)	.	56 (21%)	.	54 (21%)	.	0.351
Central Nervous System Infection	93 (18%)	11	61 (23%)	9	32 (12%)	2	0.002
Enteric Fever <sup>b</sup>	78 (15%)	.	31 (12%)	.	47 (18%)	.	0.037
Urinary Tract Infection	55 (10%)	2	24 (9%)	2	31 (12%)	.	0.258
Malaria	38 (7%)	3	28 (10%)	3	10 (4%)	.	0.004
Dengue Fever <sup>b</sup>	34 (6%)	.	10 (4%)	.	24 (9%)	.	0.012
Febrile Convulsion	23 (4%)	.	12 (4%)	.	11 (4%)	.	1.000
Hepatobiliary Infection	23 (4%)	.	12 (4%)	.	11 (4%)	.	1.000
Gastrointestinal Infection	10 (2%)	1	7 (3%)	1	3 (1%)	.	0.340
Sepsis	9 (2%)	1	5 (2%)	1	4 (2%)	.	1.000
Soft Tissue Infection	8 (2%)	.	6 (2%)	.	2 (1%)	.	0.286
Undifferentiated Febrile Illness	46 (9%)	.	17 (6%)	.	29 (11%)	.	0.063

**Table:** Summary of Clinical Diagnoses and deaths

Condition	Cases <5	Cases 5+	Total
Unexplained fever <sup>2</sup>	22053	56326	78379
Acute respiratory infection	37962	37118	75080
Acute watery diarrhoea <sup>3</sup>	15677	20850	36527
Bloody diarrhea	5211	9528	14739
Other diarrhea	7284	4771	12055
Suspected malaria <sup>4</sup>	184	4928	5112
Acute jaundice syndrome	292	572	864
Suspected measles/rubella	590	148	738
Mumps	206	305	511

**Table:** Major causes of morbidity among FDMN people

<sup>1</sup>Herdman, M. Trent, et al. "The relationship between poverty and healthcare seeking among patients hospitalized with acute febrile illnesses in Chittagong, Bangladesh." *PloS one* 11.4 (2016): e0152965.

<sup>2</sup>Rohingya Refugee Crisis in Cox's Bazar, Bangladesh: Health Sector Bulletin, 26 February 2018

**Thank you**