



# Burden of Snakebite in Bangladesh

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# Outline

- **Introduction**
- **Epidemiological burden**
- **Disability: Physical, Psychological**
- **Economic burden.**
- **Additional stress during disaster**

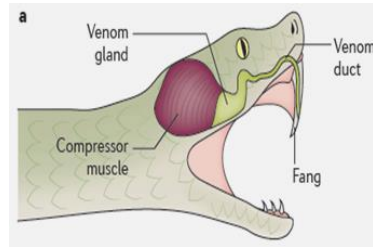
# Introduction

**Snakebite envenoming is:**

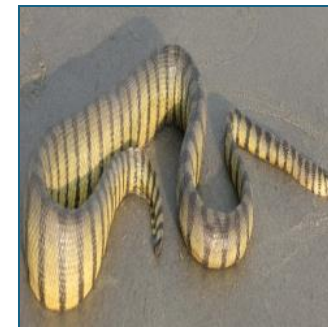
- **One of the devastating neglected tropical diseases in rural areas of tropical and subtropical countries around the world**
- **An important community public health emergency, occupational and socio-economic problem in Bangladesh.**



# Snake fauna in Bangladesh

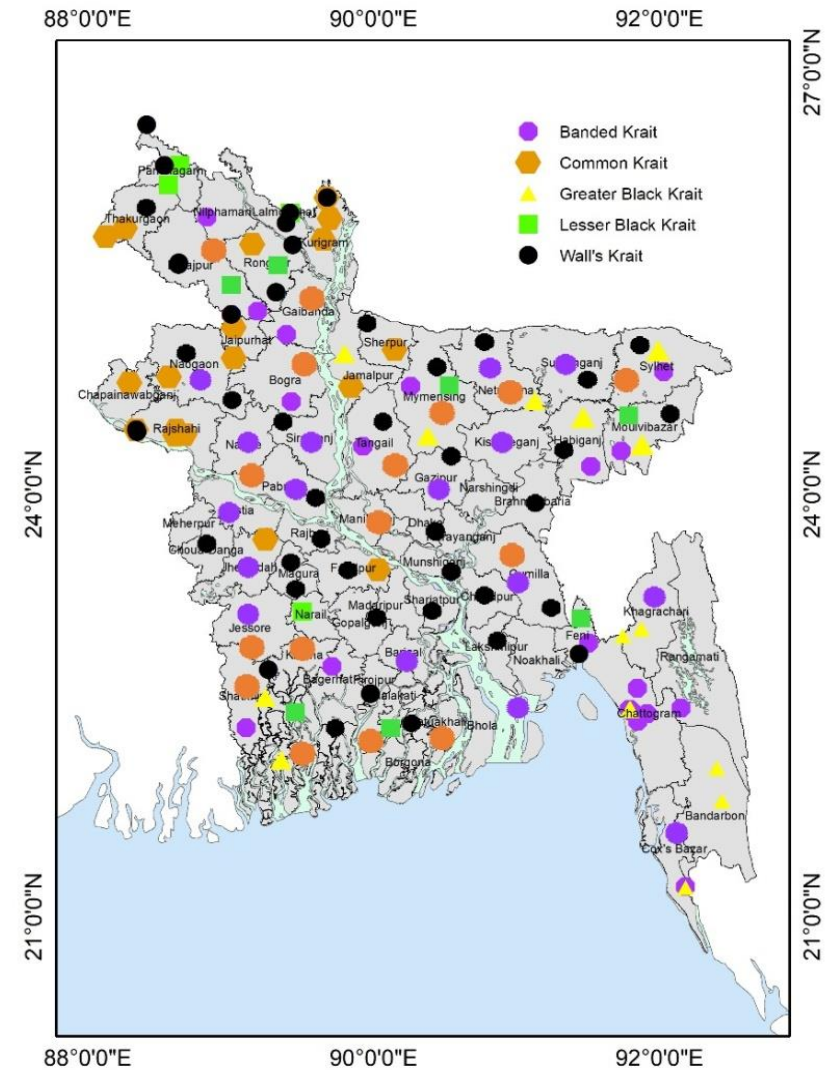
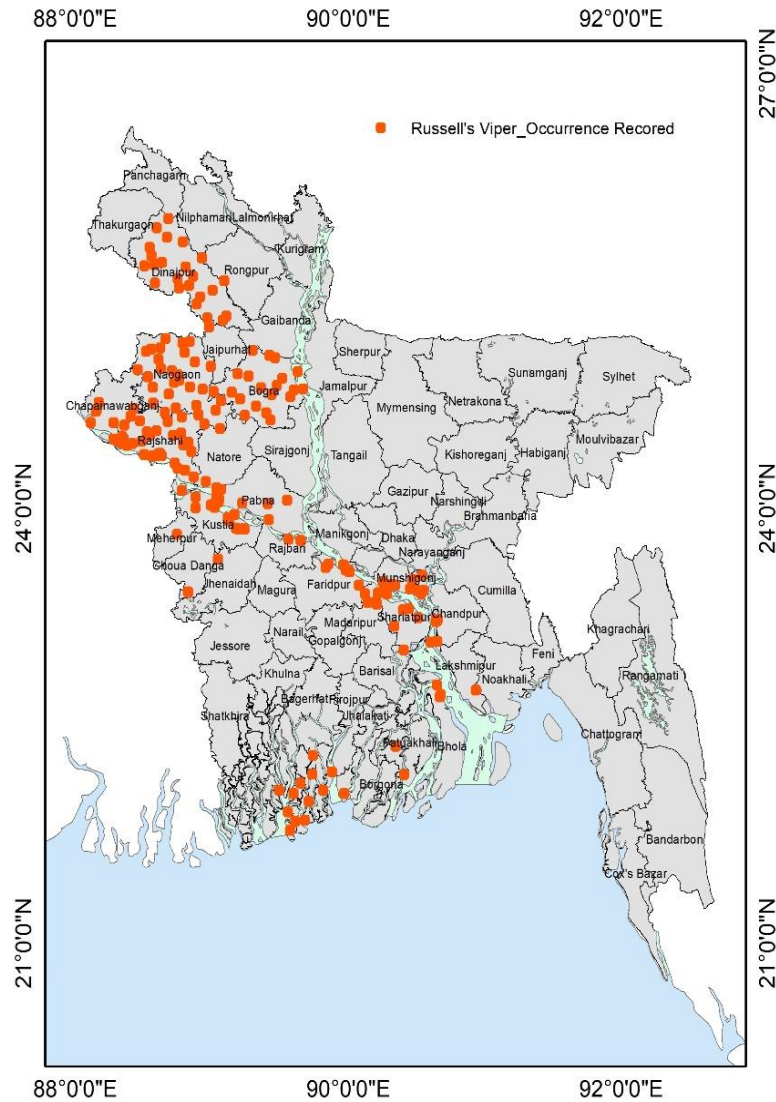


**Rich and diverse**



**Venomous snakes include at least few types of Kraits (5), 2 Cobras, 4-5 Green pit viper, Russell's Viper, Sea snakes**

# Distribution of Russell's viper and Krait in Bangladesh



# The demography and epidemiology of snakebite in published literature from Bangladesh

Publication year	duration (months)	Total number of patients (n)	Non envenoming bites (%)	Envenoming bite (%)	Recovery from envenoming bite (%)	Outdoor bite (%)	Indoor bite (%)	Male (%)	Female (%)	Manage of the patient (yrs)
<b>1995</b>	12	44	61	39	94	79	21	68	32	29.6
<b>1996</b>	32	179	73	27		79	21	66	34	24.8
<b>1997</b>	13	211	78	22	87	70	30	68.2	31.8	23.8
<b>1999</b>	12	68	60	40	74	88	12	72	28	26.7
<b>2008</b>	24	537	68	32				54.2	45.8	27.5
<b>2010</b>	42	884	60	40		72	28	68	32	26.4
<b>2011</b>	8	111	90	10	49	53	47	62	38	
<b>2012</b>	30				53.6	86	14	71.4	28.6	31.7
<b>2012</b>	5	83	54	46	87			71	29	
<b>2013</b>	11	161	55	45	100	100	0	100	0	
<b>2014</b>	24	537	68	32						
<b>2014</b>	18	50	76	24	83	54	46	82	18	38.5
<b>2015</b>	15	50	40	60	70	55	45	70	30	
<b>Total</b>	<b>246</b>	<b>2915</b>	<b>65.25%</b>	<b>34.75%</b>	<b>77.5%</b>	<b>73.6%</b>	<b>26.4%</b>	<b>70%</b>	<b>28.9%</b>	<b>28.6</b>



# Epidemiology of snakebite: Bangladesh

## Snakebite Epidemiology in Bangladesh—A National Community Based Health and Injury Survey

Jahangir Hossain<sup>1</sup>, Animesh Biswas<sup>1,2</sup>, Fazlur Rahman<sup>1</sup>, Saidur Rahman Mashreky<sup>1</sup>, Koustv Dalal<sup>2</sup>, Aminur Rahman<sup>1</sup>

Health, 2016, 8, 479-486

- 10.98/100,000
- 15,372 individual
- 1709 deaths (2003)

OPEN ACCESS Freely available online



## Annual Incidence of Snake Bite in Rural Bangladesh

Ridwanur Rahman<sup>1</sup>, M. Abul Faiz<sup>2</sup>, Shahjada Selim<sup>1</sup>, Bayzidur Rahman<sup>3</sup>, Ariful Basher<sup>2</sup>, Alison Jones<sup>4</sup>, Catherine d'Este<sup>5</sup>, Moazzem Hossain<sup>6</sup>, Ziaul Islam<sup>7</sup>, Habib Ahmed<sup>8</sup>, Abul Hasnat Milton<sup>5\*</sup>

Rahman R et. al (2010). PLoS Negl Trop Dis 4 (10): e860

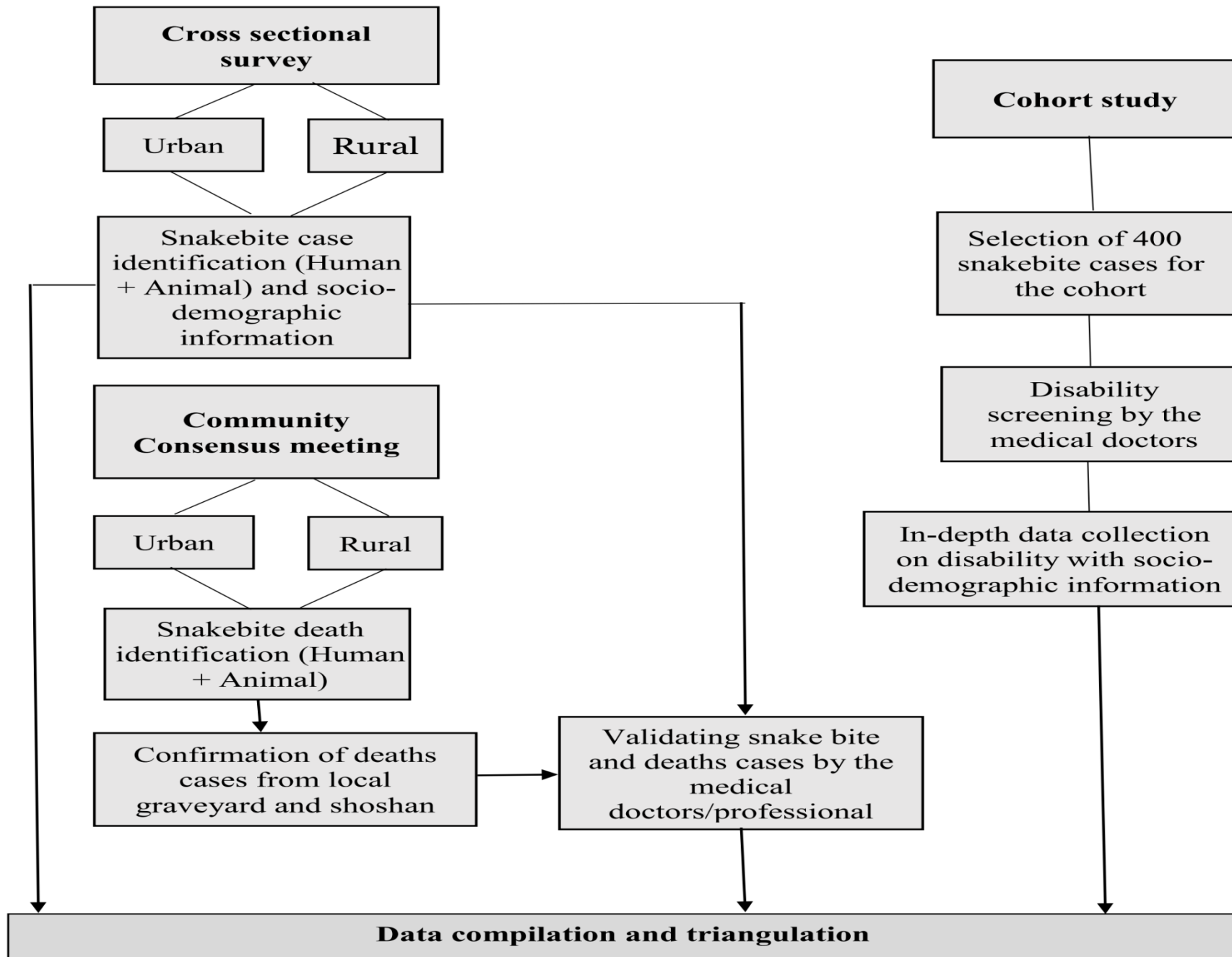
- 623.4/100,000 per yr
- 6,00,000 individual
- 6041 deaths (2009)

# **National Survey on Annual Incidence and Epidemiology of Snakebite in Bangladesh, 2022**

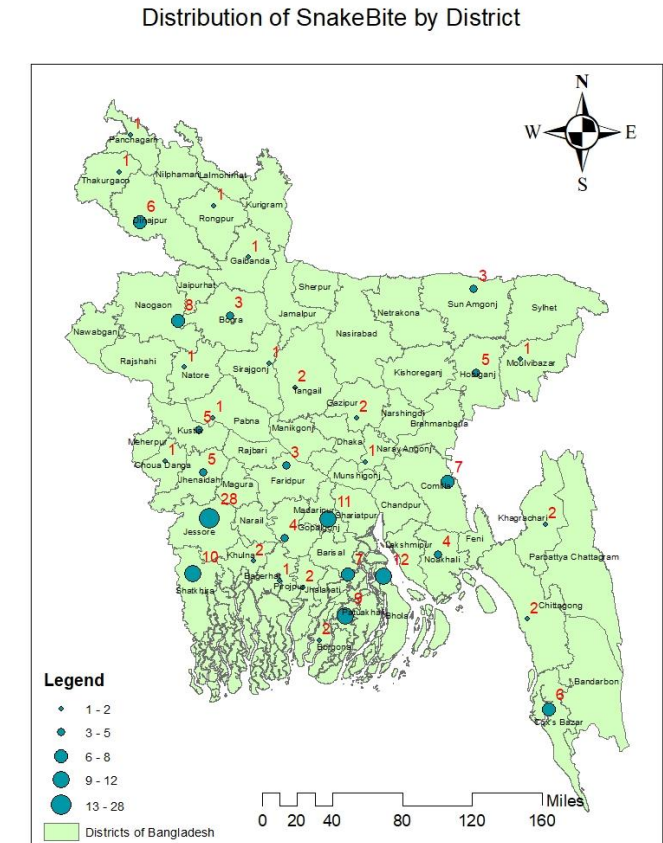
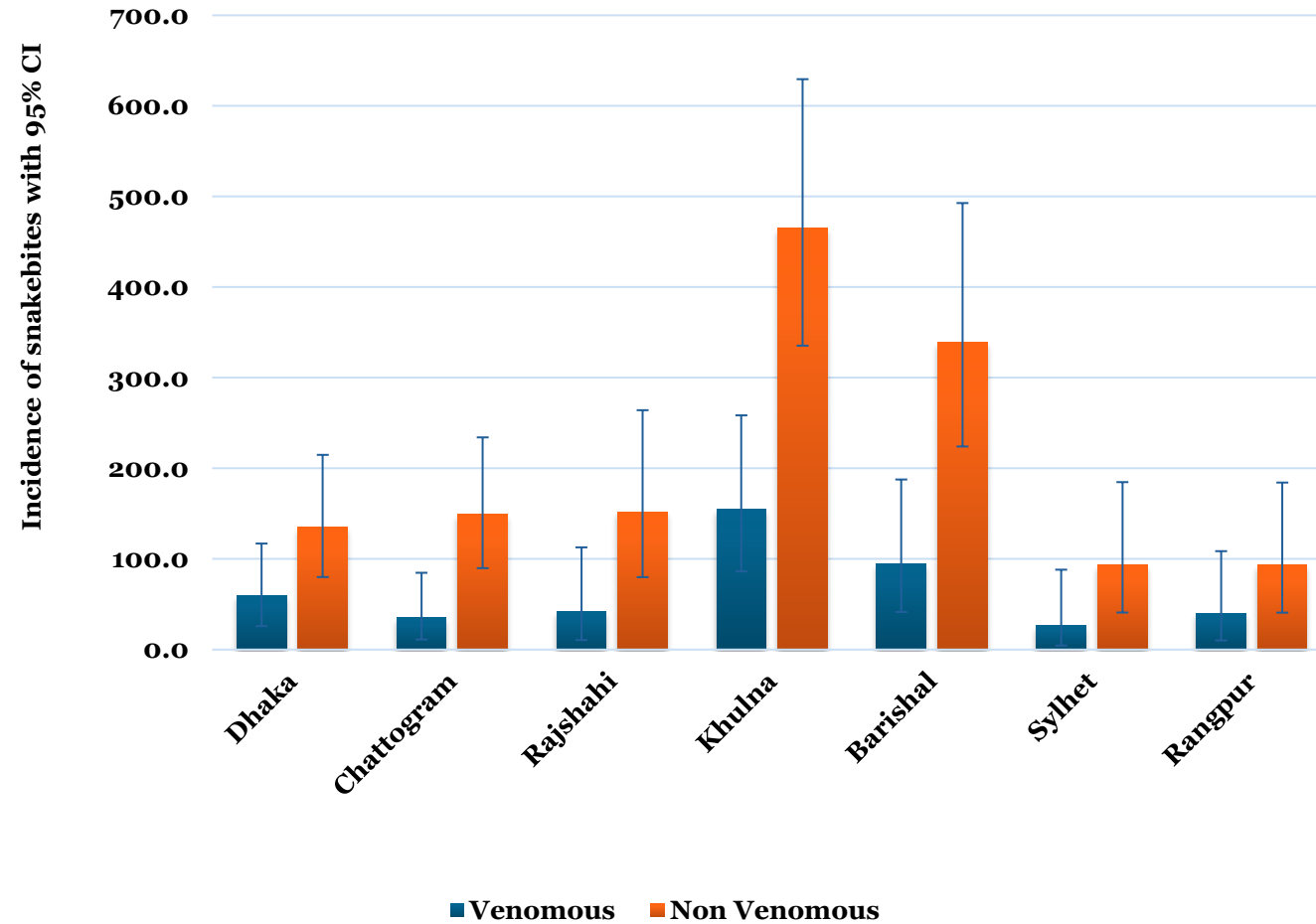
## **Methodology:**

- **A multistage cluster sampling method**
- **Distribution of PSUs for urban and rural areas**
- **Both men and women of all ages were considered as the survey population.**
- **The estimated sample size: 62,000 population.**
- **Interviewed 65,925 population of 15,639 households from 300 PSUs across the country.**





# Geographical distribution of snakebite victims by incidence



# Survey findings

- Annual incidence of snakebite in Bangladesh 244.0/100,000 population
- An estimated 399,653 people are beaten by snakes; M 58.4%: F 41.6%
- 95% of the in the rural areas: Highest in Khulna division (616/100,000 population).
- Higher rate among the age category 35-44 years (348/100,000 population)
- 24.2% venomous snakebite.
- Rate of death: 4.55/100,000 population.
- Annually 7,447 persons are dying due to venomous snakebite in Bangladesh.

# **Physical Disability Following Snakebite**

**N = 400 from the hospitalized cohort and 135 cases from the cross-sectional survey**

**Mild to moderate form of physical disability 10.6%**

- **Amputation following snakebite: 0.2% (n=1)**
- **Difficulties during movement: 4.7% (n=25)**
- **Persistence pain in the bite site: 7.3% (n=39)**
- **Problem with vision: 10.3% (n=55)**
- **Problem with hearing: 2.4% (n=13)**
- **General tiredness: 25.2% (n=135)**
- **Mild form of disability (support is needed for daily work, but can walk with support): 7.7% (n=41)**
- **Headache after snakebite: 23.2% (n=124) .**

# **Mental Disability Following Snakebite**

- **400 cases from the hospitalized cohort and 59 cases from the cross sectional survey**
- **Analysed for the assessment of depression, anxiety, and PTSD**
- **Depression**
  - **Mild 22.2% (n=102)**
  - **Moderate 16.9% ( n=29)**
  - **Severe 0.9% (n=4)**
- **Anxiety**
  - **Mild 19.6% (n=90)**
  - **Moderate 12% (n=55)**
  - **Severe 3.5% (n=16)**
- **PTSD**
  - **Partially developed PTSD 8.7% (n=40)**
  - **Possible 3.1% (n=14)**
  - **Confirmed 9.2% (n=42)**

**Snakebite data from (DHIS 2) MIS, DGHS,  
Government of Bangladesh**

<b>Year</b>	<b>Total Snakebite reported</b>	<b>Death</b>
2023	16521	91
2024	24432	118
2025 (June)	8405	43

**Data from Snakebite Clinic of Chittagong Medical College Hospital,  
Chattogram, Bangladesh 2018- 2025 (June)**

Years	Total Patients	Venomous			Snake Name					Snake Death			
		Total Patients	Discharge	Death	Krait	Cobra	Krait or Cobra	Russell's Viper	Green pit viper	Krait	Cobra	Krait or Cobra	Russell's Viper
2018	896	272	268	4	14	9			248	1	2		
2019	703	310	307	3	15	22			273	1	2		
2020	539	216	215	1	7	16			193	1	1		
2021	631	233	231	2	16	10	7		200	1	1		
2022	1276	305	304	1	14	25			265		1		
2023	1227	280	278	2	17	29	1		237	1	1		
2024	1037	358	355	3	14	46		1	307	3			
2025	579	141	138	3	6	15	2		118	2	1		
<b>Total</b>	<b>6888</b>	<b>2115</b>	<b>2096</b>	<b>19</b>	<b>103</b>	<b>172</b>	<b>10</b>	<b>1</b>	<b>1841</b>	<b>10</b>	<b>9</b>		



## Data from Rajshahi Medical College Hospital, Rajshahi, Bangladesh 2021-2025 (May)

Years	Total Patients	Venomous			Snake Name				Snake Death			
		Total Patients	Discharge	Death	Krait	Cobra	Krait or Cobra	Russell's Viper	Krait	Cobra	Krait or Cobra	Russell's Viper
2021	409	178	125	53	52	29	60	37	15	5	23	10
2022	637	160	126	34	25	41	63	31	5	3	16	10
2023	747	213	164	49	40	55	68	50	13	4	19	13
2024	1059	314	274	40	69	67	92	86	7	8	12	13
2025	363	66	55	11	5	17	22	22	0	3	3	5
<b>Total</b>	<b>3215</b>	<b>931</b>	<b>744</b>	<b>187</b>	<b>191</b>	<b>209</b>	<b>305</b>	<b>226</b>	<b>40</b>	<b>23</b>	<b>73</b>	<b>51</b>

# Post-Flood (2024) Health Concerns

**Snakebite: 471 bites, 02 deaths: (20.8.24 to 03.09.24)**



- **Most bites are non-venomous, absence of confirmatory diagnostic tests: Observation for 24 hours for features of envenomation, antivenom supply issue;**
- **First aid, prevention and rapid transport to hospital.**



# Out of pocket expenditures for snakebite treatment

N 139	Average, range BDT
Overall	2232 (100 to 20,000)
Ozha	1372 (100 to 6000)
Qualified professional	3140 (200 to 20,000)

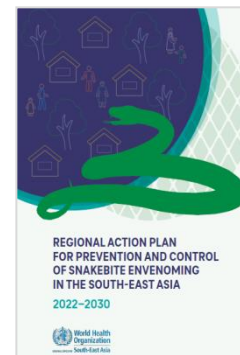
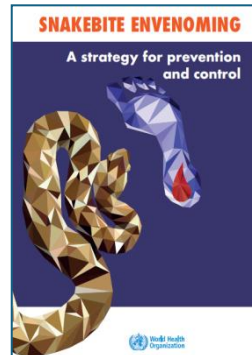
**90,02,03,544 BDT (10,590,629 USD)**

# **Snakebite among the animals and economic loss**

- **29 snakebites reported in 25 households during the previous 12 months.**
  - **Poultry 75.9% (n=22); Goat 6.9% (n=2); Cows 17.2 % (n=5).**
- **Multiple bites among the animals 8% (n=2).**
- **Estimated 18,999 cattle are bitten annually 2508 are dying.**
- **The highest number of incidences in Barisal and Chattogram division.**
- **Economic loss:**
  - **Due to loss of cattle:  $(2504 \times 100,000 = 250,400,000 \text{ BDT } (2,945,882 \text{ USD}))$ .**
  - **Due to loss of chickens:  $(55,085 \times 200 = 11,017,000 \text{ BDT } (129,611 \text{ USD}))$ .**

# Conclusion

- Snakebite continued to be a significant health problem mostly among the rural farmers.
- Death toll following snakebite in human & animal is ‘Big’.
- Physical and psychological disability following snakebite have been described for the first time in Bangladesh.
- Implementation of the regional and country strategy and action plan is essential to reach the WHO target for reduction of death and disability by 2030.



*Thank You*