



# Increasing Deaths Due to Lightning in Bangladesh: Call for Urgent Public Health Actions

Kh Shafiur Rahaman<sup>\*</sup>

London School of Hygiene and Tropical Medicine, London, United Kingdom

\*Corresponding Author: Kh Shafiur Rahaman, Email: shafiur.mr@outlook.com

Received: August 13, 2023, Accepted: November 26, 2023, ePublished: December 29, 2023

## To Editor,

Lightning is a phenomenon that occurs when there is a sudden release of static electricity in the environment, resulting in the transfer of an electrical charge. It is estimated that lightning can carry a current ranging from 10 000 to 200 000 A and a voltage ranging from 20 million to 1 billion V. The impact of lightning on the human body depends on various factors, including the strength of the current, the duration of contact, the path the lightning passes through the body, the activity and position of the person relative to the ground at the time of the event, and the type of lightning strike.<sup>1</sup> Lightning injuries pose a significant global public health concern, as they are the primary cause of weather-related deaths, ranking higher than tornadoes, flash floods, and hurricanes<sup>2</sup>. When lightning strikes occur, they can lead to dysfunction in multiple systems of the body, and individuals who survive such strikes may endure long-lasting disabilities even after recovering from the initial damage. Most fatalities following lightning strikes are attributed to either primary or secondary cardiac arrest caused by a lack of oxygen (hypoxia).<sup>1</sup>

Globally, the mortality rate attributed to lightning is estimated to range from 0.2 to 1.7 deaths per 1 000 000 population. This phenomenon predominantly affects young individuals and those who work outdoors.<sup>3</sup> Annually, more than 20 000 people are affected by lightning strikes and thousands of them do not survive their injuries.<sup>4</sup> In the last 25 years, the frequency and intensity of the events like storms, floods, cyclones, and so on have increased significantly due to climate change and global warming. Lightning is a common phenomenon in Bangladesh peaking from March to May (pre-monsoon season). The frequency of lightning occurrences in the country is considerably high.<sup>5</sup> According to experts, there is a consensus that the frequency of lightning has amplified in recent years in Bangladesh, attributed to the combined effects of climate change, global warming, and environmental imbalances.<sup>6</sup> Another study highlights

that the rate of lightning-related deaths in Bangladesh is 0.9 per 1 000 000 population per year, surpassing the rates observed in high-income countries.<sup>7</sup> Very few studies have been conducted on lightning and national statistics on lightning-related deaths and injuries are very hard to get. From 2010 to 2017, the annual fatality rate due to lightning was 2.08 deaths per million people, while the injury rate was 1.7. From 1990 to mid-2016, the majority of lightning-related deaths occurred in rural areas (93%). Furthermore, males were predominantly affected by these incidents, and farming was reported to be the major activity during which these fatalities occurred.<sup>8</sup> In a developing country like Bangladesh, most people rely on agriculture and other outdoor activities to earn their livelihoods; therefore, farmers, fishers, day laborers, and school-going children are the most vulnerable groups to lightning-related deaths and injuries. People living in northern Bangladesh are more prone to lightning strikes. The trend of mortality and morbidity due to lightning is continuing. According to a recent report, 340 people were killed by lightning strikes in the country from April 2022 to May 3, 2023. From March to May 3, 2023, a total of 66 people died due to lightning, 63 of whom were men. On average, 250 people die every year from lightning strikes, according to the Bangladesh Meteorological Department. In addition to humans, livestock can be injured or killed by lightning.<sup>9</sup> In many rural areas of Bangladesh, there are various misconceptions, stigmas, and superstitions related to lightning injuries.<sup>10,11</sup>

Considering the significant number of fatalities caused by lightning, the Government of Bangladesh recognized it as a natural calamity in 2016. The relevant authorities have initiated numerous projects and invested substantial amounts of money to minimize casualties in the country, but they have been unsuccessful in their efforts to address the risks associated with lightning despite the considerable expenditure. These efforts include the planting of one million palm trees nationwide, raising public awareness about thunderstorms and lightning through printed and

electronic media as well as other platforms, promoting the cultivation of tall trees such as palm trees, and installing lightning rods in residential buildings. Additionally, efforts have been made to enhance warning systems to alert people to lightning and ensure preparedness. Alongside public awareness initiatives, the Directorate General of Health Services under the Ministry of Health and Family Welfare regularly gathers information on thunderstorm and lightning-related fatalities and injuries throughout the country while providing emergency healthcare services for the affected individuals.<sup>12</sup>

Considering the social, economic, and public health importance of lightning, the initiatives taken by the government should be further strengthened, which require continuous involvement of regional and local stakeholders and specialists to identify the severity of the problem and act effectively to reduce the deaths, disabilities, and damage related to lightning. A monitoring system with a robust reporting system across the country could be formed to identify the most vulnerable parts of the country to lightning-related deaths and injuries. This would help the authorities to decide where to provide necessary intervention and allocate resources. Moreover, developing a prepared plan and acting upon it before the pre-monsoon season each year can save many lives and reduce socio-economic burdens. A special system in the hospitals in the risky zones can be created to provide emergency treatment to the victims. Social and electronic media should also come forward to take part in the initiatives taken by the government and promote activities that can prevent lightning injuries and deaths particularly before and during the pre-monsoon season when the risk is high. The general population has a role to play by following guidelines provided by the government and other authentic sources, teaching children about lightning safety, and spreading information among friends, family, and community members to raise awareness.

#### Competing Interests

None.

#### Ethical Approval

Not applicable.

#### Funding

None to declare.

#### References

1. Seidl S. Pathological features of death from lightning strike. In: Tsokos M, ed. *Forensic Pathology Reviews*. Totowa, NJ: Humana Press; 2006. p. 3-23. doi: [10.1007/978-1-59259-921-9\\_1](https://doi.org/10.1007/978-1-59259-921-9_1).
2. Biswas A, Dalal K, Hossain J, Ul Baset K, Rahman F, Rahman Mashreky S. Lightning Injury is a disaster in Bangladesh? - Exploring its magnitude and public health needs. *F1000Res*. 2016;5:2931. doi: [10.12688/f1000research.9537.1](https://doi.org/10.12688/f1000research.9537.1).
3. Aslar AK, Soran A, Yildiz Y, Isik Y. Epidemiology, morbidity, mortality and treatment of lightning injuries in a Turkish burns units. *Int J Clin Pract*. 2001;55(8):502-4.
4. Khatun M, Islam MA, Haque MA. Studies of thunderstorms and lightning on human health, agriculture and fisheries in Mymensingh and Jamalpur district of Bangladesh. *Progress Agric*. 2016;27(1):57-63.
5. Karim N. Disasters in Bangladesh. *Nat Hazards*. 1995;11(3):247-58. doi: [10.1007/bf00613409](https://doi.org/10.1007/bf00613409).
6. Islam S, Uddin MN, Alam M, Deb B, Dulal AA. *Lightning Claims 16 More Lives Across the Country as Storms Continue*. Dhaka: Dhaka Tribune; 2018.
7. Gomes C, Kithil R, Ahmed M. Developing a lightning awareness program model for third world based on American-South Asian experience. In: *Preprints of the 28th International Conference on Lightning Protection*. Kanazawa: ICLP; 2006.
8. Dewan A, Hossain MF, Rahman MM, Yamane Y, Holle RL. Recent lightning-related fatalities and injuries in Bangladesh. *Weather Clim Soc*. 2017;9(3):575-89. doi: [10.1175/wcas-d-16-0128.1](https://doi.org/10.1175/wcas-d-16-0128.1).
9. Dhaka Tribune. *Govt Issues Advisory on How to Avoid Casualties During Lightning Strikes*. Dhaka: Dhaka Tribune; 2023.
10. Sumangala CN, Kumar MP. Lightning death: a case report. *J Indian Acad Forensic Med*. 2015;37(1):93-5. doi: [10.5958/0974-0848.2015.00023.8](https://doi.org/10.5958/0974-0848.2015.00023.8).
11. Trengove E, Jandrell I. Lightning myths in Southern Africa. *Nat Hazards*. 2015;77(1):101-10. doi: [10.1007/s11069-014-1579-4](https://doi.org/10.1007/s11069-014-1579-4).
12. Rahman SM, Hossain SM, Jahan M. Thunderstorms and lightning in Bangladesh. *Bangladesh Med Res Counc Bull*. 2019;45(1):1-2. doi: [10.3329/bmrcb.v45i1.41801](https://doi.org/10.3329/bmrcb.v45i1.41801).