

## LIGHTNING FATALITIES IN BANGLADESH IN MAY 2016

Ronald L. Holle  
Holle Meteorology & Photography  
Oro Valley, Arizona 85737

A.K.M. Saiful Islam  
Institute of Water and Flood Management  
Bangladesh University of Engineering and Technology  
Dhaka-1000, Bangladesh

### 1. Introduction

On 12 and 13 May 2016, media reported as many as 81 lightning-caused fatalities in Bangladesh. This event caused significant concern within the population and the national government, which usually does not monitor lightning fatalities. Additional reports varied in the number of fatalities, but it was apparent that a major loss of life from lightning occurred during the two-day period. In order to understand the situation on these two days, a study was undertaken to determine the circumstances of the high mortality due to lightning.

### 2. Data

Information has been collected from the following daily newspapers published in Bengali language:

1. The online newspaper [bd24live.com](http://www.bd24live.com) in English is available in Bengali at the following address:  
<http://www.bd24live.com/bangla/article/90665/index.html>
2. The online newspaper [bdnews24.com](http://bdnews24.com) in English is available in Bengali at the following address  
<http://bangla.bdnews24.com/bangladesh/article1151440.bdnews>

### 3. Number, gender, and age of fatalities

Based on these two online newspapers, it was determined that 64 people were documented to have been killed by lightning, 41 on 12 May, and 23 on 13 May. Of the total, 54 were men (86%) and 10 were women (14%). No event had more than two fatalities. The majority of the incidents occurred during the afternoon.

The ages of fatalities were known for 59 of the 64 individuals, as shown in Fig. 1. The most common category is from 21 to 30, with a secondary maximum between the ages of 41 and 50. Nevertheless, there is a wide range of ages from under 10 years old to over the age of 71. The number, gender, and age distributions of lightning fatalities in other countries are also discussed in Holle and Cooper (2016).

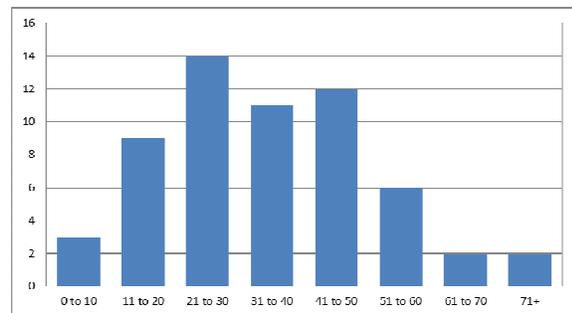


FIGURE 1. Age distribution of lightning fatalities in Bangladesh on 12 and 13 May 2016.

#### 4. Activities and locations of fatalities

The activities and an indication of the associated locations of fatalities are listed in Table 1. It is apparent that agriculture is a major component of the events, since 23 of the 38 deaths (61%) occurred during various types of field work, including tending cattle. Other major categories included being in the open, playing football (soccer) or cricket, as well as during water and other activities. These activities have been noted in similar studies such as Holle (2016) and Holle and Cooper (2016).

TABLE 1. Activities and associated locations of 38 lightning fatalities in Bangladesh on 12 and 13 May 2016.

Agriculture	23
--Harvesting boro rice crop	5
--Tending cattle	5
--Working in fields	5
--Collecting mangoes	3
--Harvesting paddy	3
--Working in jute field	2
Open area, outside	5
Playing soccer (3), cricket (1)	4
Home, road	3
Water (fishing, launch, bath)	3
Total	38

#### 5. Daily maps of fatalities and strokes

The districts where the fatalities occurred are listed in Tables 2 and 3, for 12 and 13 May 2016, respectively. Only four districts are repeated on the two days - Dhaka, Naogaon, Kishoreganj, and Gazipur. All but Naogaon are located in the center to the northeast of the country.

The districts where the fatalities occurred are shown in Fig. 2. On both days, the fatalities are generally located in an east-west swath across the center of the country.

TABLE 2. List of districts with one or more lightning fatalities in Bangladesh on 12 May 2016.

12 May 2016	
District	Fatalities
Pabna	6
Norshingdi	5
Rajshahi	5
Sirajganj	5
Brahmanbaria	4
Kishoreganj	4
Dhaka	2
Gazipur	2
Nator	2
Dinajpur	1
Habibganj	1
Naogaon	1
Netrokona	1
Pirajpur	1
Syedpur	1

TABLE 3. List of districts with one or more lightning fatalities in Bangladesh on 13 May 2016.

13 May 2016	
District	Fatalities
Rajbari	3
Chittagonj	2
Dhaka	2
Gaibandha	2
Jaypurhat	2
Kishoreganj	2
Naogaon	2
Norail	2
Sunamganj	2
Chandpur	1
Gazipur	1
Jessore	1
Magura	1

Lightning for each day in Fig. 3 is located by Vaisala's Global Lightning Dataset GLD360 network (Said and Murphy 2016; Said et al. 2013). The agreement with Fig. 2 is especially strong on the 12<sup>th</sup>. Lightning had been quite infrequent during the days preceding the 12<sup>th</sup> but then became very active (Fig. 4).

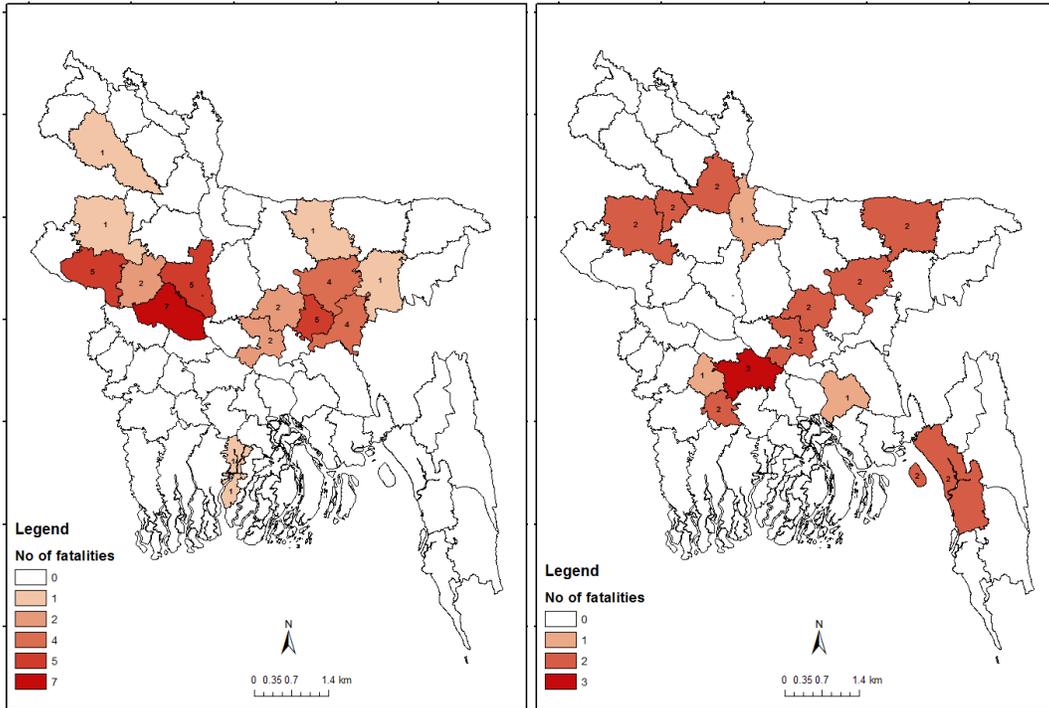


FIGURE 2. Districts within Bangladesh where lightning fatalities occurred on 12 May 2016 (left) and 13 May 2016 (right).

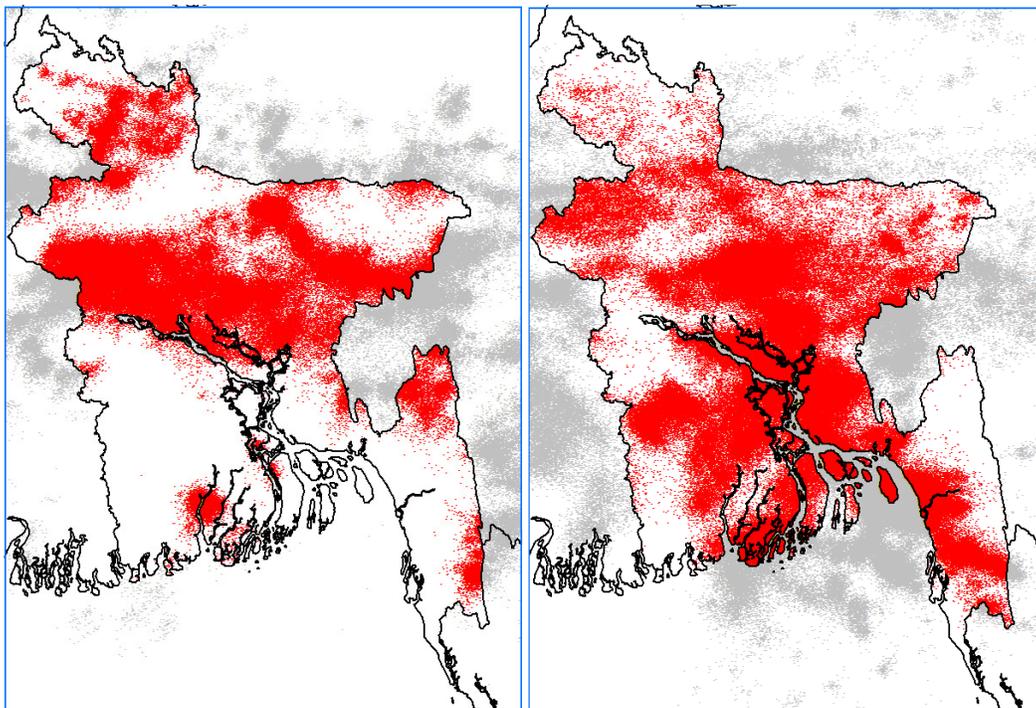


FIGURE 3. Locations of lightning strokes detected by Vaisala's Global Lightning Dataset GLD360 network on 12 May 2016 (left) and 13 May 2016 (right).

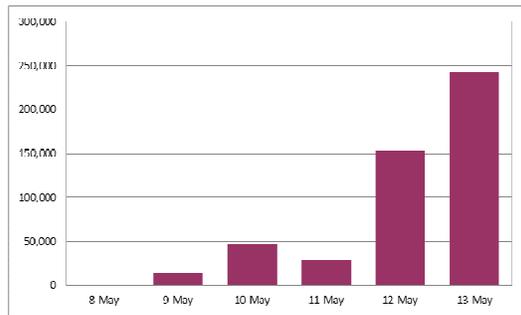


FIGURE 4. Number of lightning strokes detected by the Global Lightning Dataset GLD360 network from 08 through 13 May 2016.

## 6. Summary and conclusions

A review was made of 64 fatalities that occurred on 12 and 13 May 2016 in Bangladesh. Information was collected from two daily online newspapers in the Bengali language. Of this total, 86% were males, and the most frequent age was between 21 and 30 while nearly as many were from 41 to 50. No incidents had more than two fatalities, and most were in the afternoon. This study complements Dewan et al. (2017) that summarizes Bangladesh fatalities from 1990 through 2016.

Maps of fatalities showed an east-west swath across the center of Bangladesh, and lightning data showed a similar pattern, especially on the 12<sup>th</sup>. The most common

activity was agriculture (61% of total) followed by other scenarios that were all outside and exposed to lightning. No fatalities on these two days occurred inside substantially-built structures or fully enclosed metal-topped vehicles.

## References

- Dewan, A., M. F. Hossain, M. M. Rahman, Y. Yamane, and R. L. Holle, 2017: Lightning-related fatalities and injuries in Bangladesh from 1990 to 2016. *Wea., Climate, and Society*, in review.
- Holle, R. L., 2016: Lightning-caused deaths and injuries related to agriculture. Preprints, 6<sup>th</sup> International Lightning Meteorology Conference, April 18-21, San Diego, California, 5 pp.
- Holle, R. L., and M. A. Cooper, 2016: Lightning occurrence and social vulnerability. Chapter 1, in *Atmospheric Hazards – Case Studies in Modeling, Communication, and Society Impacts*. J.S.M. Coleman (editor), InTech, 18 pp., doi:10.5772/63001.
- Said, R., and M. J. Murphy, 2016: GLD360 upgrade: Performance analysis and applications. Preprints, 24<sup>th</sup> Intl. Lightning Detection Conf., San Diego, CA, Vaisala, 8 pp.
- Said, R., M. B. Cohen, and U. S. Inan, 2013: Highly intense lightning over the oceans: Estimated peak currents from global GLD360 observations. *J. Geophys. Res.: Atmos.*, **118**, 1-11, doi:10.1002/jgrd.50508.