

**SOCIAL CHARACTERISTICS OF DEATH CASES CAUSED BY ELECTRICITY IN PLOVDIV REGION OVER THE PERIOD FROM 2006 – 2015.**

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**Abstract:**

Death cases caused by electricity are relatively rare and usually are result of accidents.

Material and method: We made 10-year retrospective study of death cases caused by electricity in Plovdiv region. For data processing we used historical and statistical methods.

Results: During the period 2006-2015 in the Department of Forensic Medicine at the University Hospital "St. George "EAD Plovdiv are registered 42 death cases, caused by electricity. Among the number men are 37 (88,10 ± 4,99%), while the number of women are five (11.90%). Victims distribution is evenly by their home in the village in Plovdiv. The average age of the victims is 36.3 years. For women the average age is about 30.8 years, and for men- about 37 years. The scene of the death is most often in the home of the victims (35.71%) and workplace ( 30.96%) and rarely outdoors or any different locations. There're no registered death cases of murders, but there are 2 death cases caused by atmospheric electricity and 5 death cases of suicide.

Conclusion: death by electrocution in Plovdiv District is rare and is mainly result of domestic and industrial accidents. Most often the victims are men at working age.

*Key words: Electricity Plovdiv region, labor and household accidents.*

Electricity is an integral part of the life of contemporary society. Fast expansion in the lifestyle of people hides high risk of accidents, some of them fatal. It is most often a result of an accident (3, 4, 6, 7, 8, 9, 11, 13, 14, 16, 17) and there are suicide cases, which are rare (5, 9, 11, 17). Murders committed by electricity are extremely rare (9, 17).

Despite the substantial use of electricity and everyday contact with electrical appliances and sources, fatalities caused by electricity are extremely rare and still not well studied. Up to now, there aren't detailed studies conducted in Plovdiv about this type of incidents.

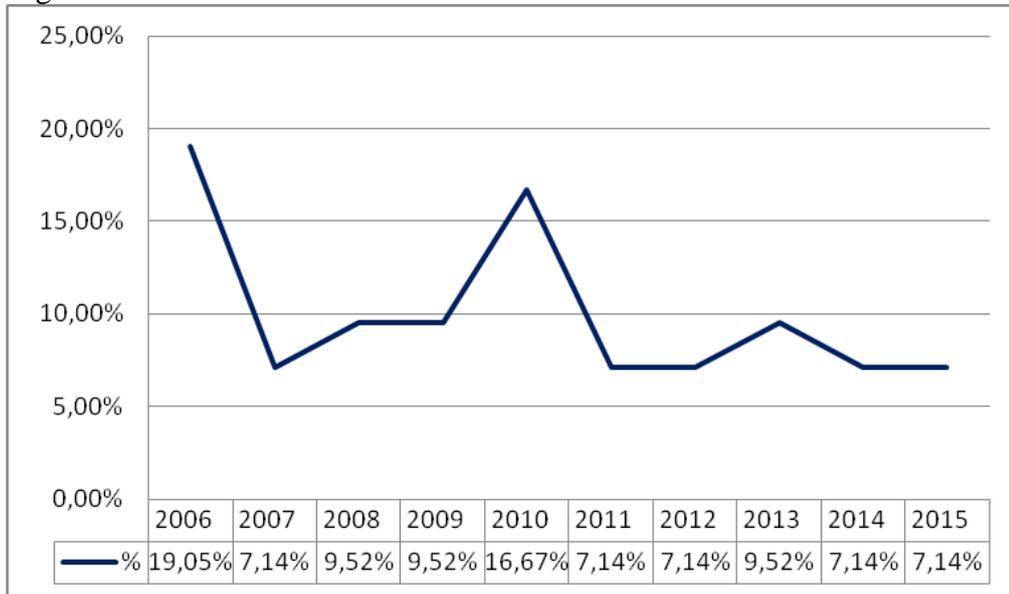
The objective of the current research is to examine victims of electricity in the region of Plovdiv, their social status, and to assess the risk factors that led to the incidents.

Material and Method: Data was analyzed from autopsies performed at the Department of Forensic Medicine at the University Hospital "St. George " in Plovdiv for the period 2006 - 2015. The cases are classified according to several criteria such as the total number of cases and their dynamics over the years, gender, place of residence and age of the victims, as well as type and scene of the incident. While processing the data we used the methods of historical and alternative analysis (1, 2).

Results: During the period of 2006 – 2015 our department conducted 4485 autopsies. Out of them 42 death cases were established to be caused by electricity. They are distributed unevenly over the years, with the most incidents reported in 2006 and 2010. After 2010, there is a reduction and stabilization in the number of cases. (Fig. 1).

DYNAMICS OF SHARE VICTIMS OF ELECTRICITY

Figure 1

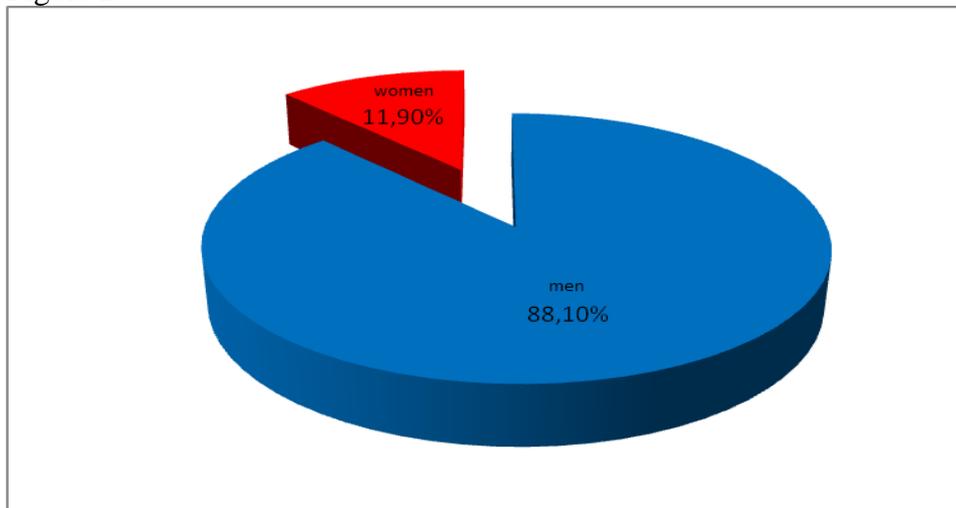


The proportion of death cases caused by electricity to all autopsied cadavers is moving from 0.63% to 1.68%, and the average value for this period is 0.94%. Taking into account the population in the area we found that the index of fatalities of electricity is 0.6‰.

The victims included 37 men (88,10 ± 4,99%) and 5 women (11.90%). The ratio between males and females is 7.4: 1.0 (Fig. 2).

DISTRIBUTION OF VICTIMS OF ELECTRICITY BY GENDER

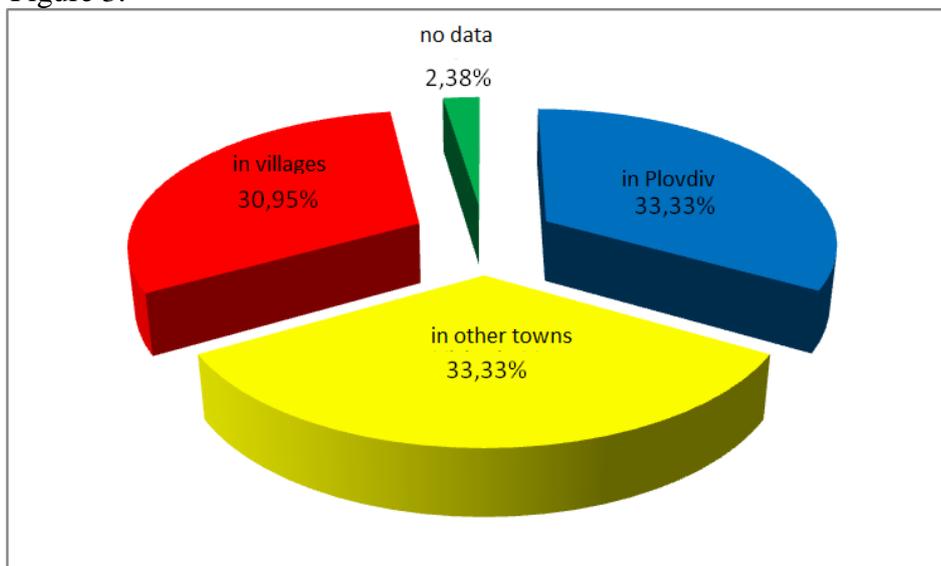
Figure 2.



In order to determine the risk of accidents in different settlements, we traced victims distribution by place of residence which are divided into three groups: the city of Plovdiv, and other towns and villages in the region (Fig. 3).

DISTRIBUTION OF VICTIMS BY RESIDENCE

Figure 3.

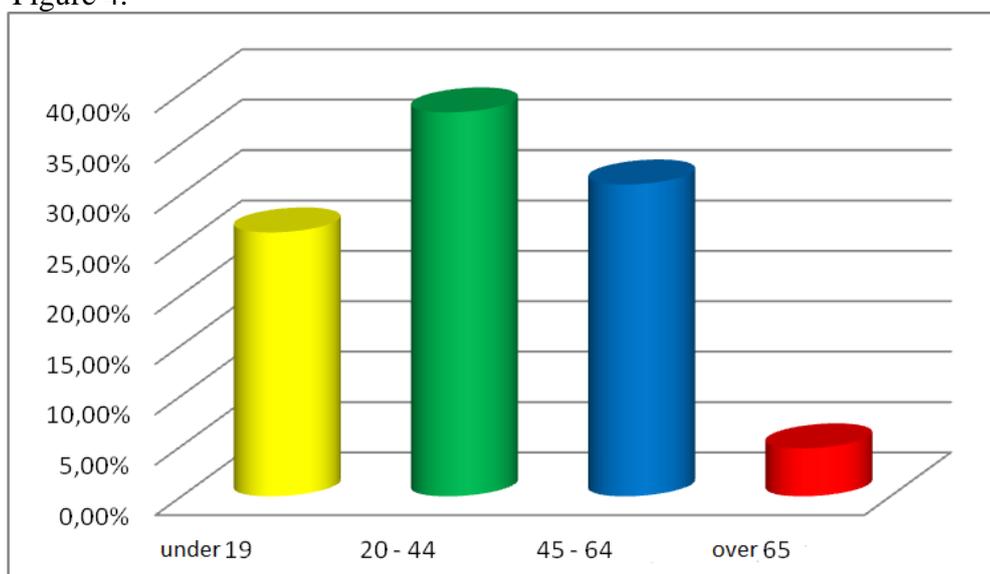


The data show an even distribution of the victims in the three groups of settlements: Plovdiv  $33,33 \pm 7,27\%$ ; other cities  $33,33 \pm 7,27\%$ ; villages of  $30,95 \pm 7,13\%$ .

Victims of electricity are aged 2 to 71 years, with an average age of 36.3 years. For men, the average age is 37,0 years, and for women - 30,8 years. According to the place the victims occupy in the age distribution of society, they are divided into 4 groups: adolescents aged 0 to 19 years ( $26,19 \pm 6,78\%$ ); young adulthood from 20 to 44 years ( $38,10 \pm 7,49\%$ ); adults aged 45 to 65 years ( $30,95 \pm 7,13\%$ ); and elderly aged over 65 years (4.76%) (Fig. 4).

VICTIMS SEPARATED OF AGE

Figure 4.

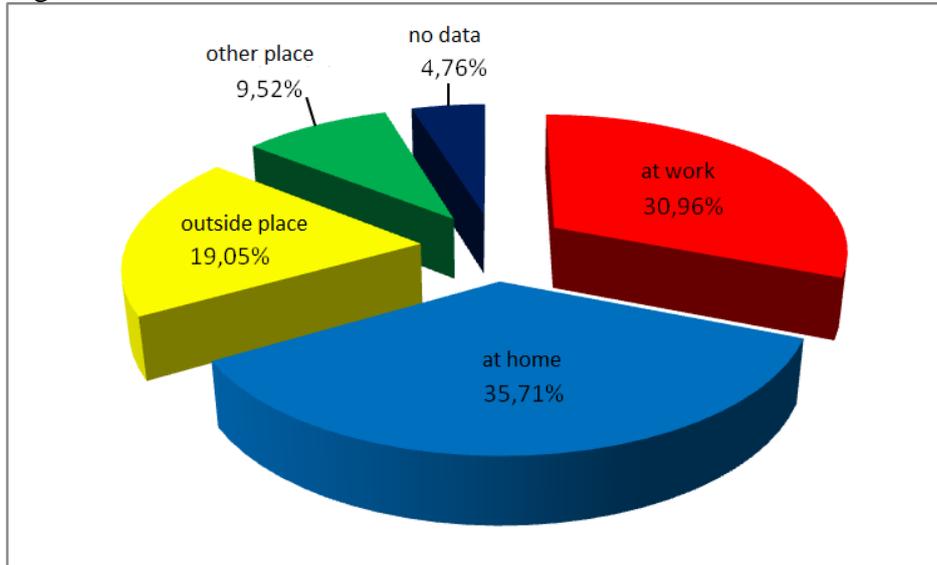


Victims of electricity are usually in their young adulthood. Least affected are elderly people.

According to the place, where the fatal accidents happened, most of them occurred home ( $35,71 \pm 7,39\%$ ) or workplace ( $30,96 \pm 7,13\%$ ) (Fig. 5).

PLACE OF THE INCIDENT

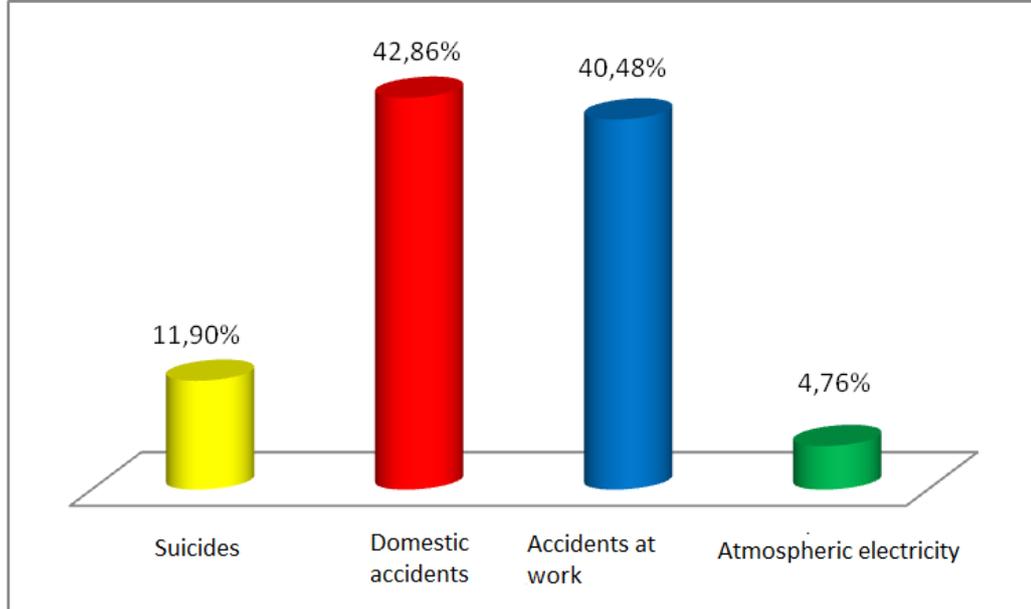
Figure 5.



The scene in most cases is associated with the manner in which death occurred. For this reason, domestic ( $42,86 \pm 7,63\%$ ), and labor ( $40,48 \pm 7,57\%$ ) incidents are the most common (Fig. 6).

DISTRIBUTION OF VICTIMS BY TYPE OF INCIDENT

Figure 6.



Study Conclusions: The results show that death cases caused by electricity in the region of Plovdiv are relatively rare (less than 1% of all fatal accidents). The established quantitative indicator of 0.6‰ is lower than the ones reported for other parts of Bulgaria (4, 6, 7). The uneven distribution of deaths of this type reported by other authors (8, 9) which shows a lack of regularity.

The established distribution of victims by gender is comparable with the ones observed in the literature data which is probably a result of the bigger participation of men in activities related

to electricity (3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17).

We found no data in literature for distribution of the victims by their residence. In the district of Plovdiv urban residents are three times more than those in rural areas. Therefore, regardless of the even distribution of the victims in the city of Plovdiv, the regional towns and the villages of the district, rural residents are at increased risk of accidents related to electricity. The reason for this can be found in the use of outdated and poorly secured electrical devices and networks in rural areas.

The average age of victims in Plovdiv region corresponds to the one reported by other authors at home and abroad (3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16). This clearly shows that most vulnerable to electricity are young and mature people. The possible reason for this is their larger contact with electrical devices due to their increased work and life activity. Older people handle electrical appliances less and mortality risk among them is minimal.

Fatal accidents are with everyday character and they occur people's homes, or at their workplace with the case of suicide being rare (4, 6, 8, 9, 13, 14, 16, 17). In the analyzed cases we discovered two death cases caused by atmospheric electricity in the mountain during storm. During the period of 2006 – 2015 in Plovdiv region there are no registered murders committed with electricity.

### CONCLUSIONS:

1. Death cases of electricity are very rare in Plovdiv District.
2. Victims men are 7.4 times more than women.
3. In the working age of 20 – 64 they are  $69,08 \pm 7,13\%$  of all the victims caused by electricity.
4. Many accidents caused by electricity are at home and in the workplace.
5. Accidental cases ( $83,34 \pm 5,74\%$ ) are results of domestic and industrial incidents.

### CONCLUSION:

The conducted 10-year retrospective study of victims of electricity in the region of Plovdiv showed that men aged 20 - 44 living in rural areas are at increased risk of fatal accidents.

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