OUTBREAK OF TRAUMATIC DEFEAT FIRES IN BULGARIA – PUBLIC HEALTH ASPECTS

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ABSTRACT

For Bulgaria fires are typical disasters. They create an outbreak of traumatic defeat with combined striking factors. The health consequences for society due to fires are a serious challenge. *The purpose* of the study is to analyze the public health aspects of the consequences of fires in the last five years. *Methods*. Statistical survey in Bulgaria for casualties of fires for the period 1995-2017 are analyzed. *Results*. The most affected by the fires are: Stara Zagora (over 2300), Dobrich (over 1800) and Burgas (near 1500) regions. The data indicate that the most common causes of the fires are technogenic - over 85%, and nearly 10% are deliberate. Among the population the largest number (144 people) died in 2017, and the highest number (349) injured in 2012. *Conclusions*. There is a large number of people killed and injured in the country in the event of fires. The consequences for society are significant. Municipalities and teams of the single emergency system 112 have an action plan for fires and medical provision for the population. Since 2016 there is a methodology and mapping of the risk of fires on the territory of the country which improves the management and the public health activities.

Key words: outbreak of traumatic defeat fires; casualties; public health; Bulgaria

INTRODUCTION

Fires are one of the most widespread risks in the world today. Statistics on forest and field wildfires during the last 25-30 years are published in EU Forestry Monitoring Center reports. Observations in the EU member states during the period 1980 - 2005 show an increase in the number of areas affected by fires. (1-9)

For Bulgaria fires are typical disasters. They create an outbreak of traumatic defeat with combined striking factors. The health consequences for society due to fires are a serious challenge. (1-3)

PURPOSE

The purpose of this study is to examine and analyze the public health aspects of the traumatic defeat of the fires for the period 1995-2017, with an emphasis on the last five years.

METHODS

A database of NSI, Ministry of Interior, Bulgarian Academy of Sciences (BAS) and the

European Forest Fire Database (EFD) has been applied and analyzed. The range - *fires* and *fire hazard* on the territory of the country. Data analysis covers a *period from 1995 to 2017*, with an emphasis on the last five years. *Statistical units* of the study - fires, medical casualties. *Unit of measure* - number and relative share. A descriptive, retrospective and comparative analysis of the medical casualties was made among the population in the country.

RESULTS

According to data of the Ministry of Interior, totally the most affected by fires for this period are the districts: Stara Zagora (over 2300), Dobrich (over 1800) and Burgas (near 1500) and Kurdzhali. (Table 1) (5, 6)

The largest number and area burnt by forest fires were reported in Regional Forest Directorate /RFD/ Kardzhali – 91 fires burning 3495 ha, RFD Stara Zagora with 34 burning 695.5 ha and RFD Burgas with 45 fires affecting 497.5 ha. All of them are situated in South – Central part of the country. (5, 6, 8, 10)

According to the Executive Forest Agency database in 2016 the number of forest fires in Bulgaria was 584 and the burnt area is

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estimated to be 6 340 ha. The average size per forest fire in 2016 increased to 10.8 ha. The biggest forest fire affected 871.7 ha of forest

territories, but the biggest fire burned more than 4 500 ha, 500 ha of them in forest. (5, 6, 11-16) (**Figure 1**)

Table 1. Level of fire risk in RFD (1991 – 2000 г.) (Source GD"FSCP" - MoI)

Level of fire risk	Regional Forestry Directorates (RFD)
Low	Ruse, Varna, Blagoevgrad, Shumen, Veliko Turnovo, Smolyan
Moderate	Sofia, Plovdiv, Burgas, Pazardzhik
High	Lovech, Kyustendil
Very high	Kurdzhali, Stara Zagora, Sliven

Forest fire statistics - Bulgaria

Bulgaria's statistic about forest fires

Figure 1. Forest fire statistics – 1971-2006 (Source GD"FSCP" - MoI)

The data indicate that the most common causes of the fires are technogenic, and due to human negligence (unsealed beads, glass, fire-burning) - about 90%, and about 10% are deliberate. Only 1% are caused by lightning. (4-10) The MoI statistics show that almost ½ of the fires are in the Housing and Communal Sector with a high-risk group of people with disabilities. About one-third of those killed in 2006 are from this social group. From official statistics by the ministry of forests, food and agriculture written in Bulgarian fires between 1970 and 2005 have huge incensement in the year 2000. (6) Among the population, totally the largest number (144 people) died in 2017, and the highest number (349) injured in 2012. (**Table 2**)

DISCUSSION

Fires are dynamic and with a variable risk of fire at a higher frequency in the summer. According to the data, the forest territory of our country accounts for 35.8% of the territory of the country. Of this area, 92% is covered with forests and the remaining 8% are non-wooded areas. Statistics show that the number of perished and injured people in Australia, Russia, Portugal, Italy, Greece, Bulgaria, Turkey and so on has increased as a result of the forest fires. (6, 16) In the case of fires, members of the rescue teams are also affected. (8, 13, 16)

The negative effects of fire include hazard to life and property, atmospheric pollution, and water contamination. Totally effects are social, ecological, economical, health. There are danger to life and health, loss of life or health. (**Figure 2**) (1-3, 6, 10, 15)

Table 2. Statistics data on fires, deaths and injuries for the period 1995 to 2016 (Source GD"FSKP" - MoI)

FIRES										
YEAR	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
With material losses	7621	11670	7540	8136	9487	9728	8503	7781	420	9058
Without material losses	7437	26802	11430	16894	32403	35203	24401	15417	703	28304
TOTAL	15058	38472	18970	25030	41890	44931	32904	23198	1123	37362

DECEASED										
AGE	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Up to 7	14	1	6		5	2	5	4	1	10
8-14	1	1	1	3			1	1		1
15-18		1								1
19-60	56	40	46	32	37	35	39	30	33	38
61-70	9	21	16	11	18	20	19	22	19	24
over 70	27	34	33	32	60	60	40	42	55	55
UNKNOWN				1	2	4	2	4	1	0
TOTAL	107	98	102	79	122	121	106	103	109	129

INJURED										
AGE	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Up to 7	14	12	9	14	14	21	3	7	10	5
8-14	7	5	11	6	10	7	7	2	9	4
15-18		4	4	3	7	8	6	3	9	8
19-60	86	147	134	160	185	190	168	144	185	189
61-70	9	36	15	47	45	48	35	41	44	39
over 70	11	33	50	54	73	72	76	63	78	53
UNKNOWN				8	3	3	10	3	4	0
TOTAL	127	237	223	292	337	349	305	263	339	298

Figure 2. Effects of fires – public health aspects (Source GD"FSKP" - MoI)

Health problem link to primary and secondary formed damage factors - flame, heat, soot, poisonous chemicals (carbon monoxide, cyanide, etc.). Toxic chemical traumatism is typical of the injured, besides burns, hypovolemic shock, acute respiratory failure. In the event of a fire, citizens on the territory of the country may request assistance from Bulgaria's single rescue system via 112. Municipalities and emergency teams of the single emergency system 112 have an action plan for fires and medical insurance for the population.

Response time is important. This reduces risks and losses. Preparing the population for pre-fire and fire action is a guarantee to improve the output from fires. The training of the medical teams for medical insurance of the population in case of fires is the correct way to reduce the medical casualties.

CONCLUSIONS

Fires are a global disaster with high risk for the whole territory of Bulgaria. They cause direct and indirect material and non-material damage. The implications for society are complex and wide-ranging. The environmental, socio-economic and health effects of the population are significant. Traumatism, TChT and respiratory system damage are the main causes of hospitalization. Since 2016, a methodology and mapping of the risk of fires on the territory of the country has been presented, which improves the management and the public health activities. In countries like the US, Russia and Turkey, the fight against forest fires is seen as an element of their national security.

Abbreviations

MC - Medical Casualties

TChT – Toxo-chemical Traumatism

RFD - Regional Forestry Directorates

GD"FSKP" - General Directorate "Fire Safety and Civil Protection"

MoI - Ministry of Interior

NSI - National Statistical Institute

MH - Ministry of Health

HL - Health Law

MAF - Ministry of agriculture and food executive forest agency forest sector in the Republic of Bulgaria.

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