Interreg - IPA CBC
CCI 2014TC16I5CB006

STUDY OF THE PREPAREDNESS OF LOCAL CITIZENS FOR NATURAL AND HUMAN-CAUSED DISASTERS

This project sets out the parameters of behavioral ignorance regarding risk management in the community to help draw up an action plan for greater awareness and provide tools for timely and adequate response

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Contents

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Introduction

Economic and geographical characteristics of the town of Dupnitsa

Dupnitsa Municipality is located in the southwestern part of Bulgaria, along the valley of the river. Current. Here the roads from Thessaloniki to Sofia and from the Adriatic to Istanbul intersect.

The territory of Dupnitsa Municipality is 359 km² or 0.32% of the territory of the Republic of Bulgaria. The average altitude is 946.3 m. To the east the municipality of Dupnitsa borders with the municipalities of Sapareva Banya and Samokov, to the west with the municipality of Bobov dol, to the north with the municipality of Radomir and to the south with the municipalities of Rila and Boboshevo.

The area and number of the population are presented in Table 1.

Table 1. Population and area of Dupnitsa municipality

MUNICIPALITY	Area of the district / municipality , km²	Number of inhabitants places
Dupnitsa	3 59 , 6	17

Relief

The whole municipality has mountainous and semi-mountainous relief. To the southeast rises the northwestern part of Rila Mountain, to the northeast - Verila Mountain and to the west - Konevska Mountain. Depending on the relief, the lower part of the outskirts is divided into three parts:

Gorno Dupnishko Pole - covers the northeastern part of the Municipality.

Razmetanitsa - the western part of the Municipality, surrounded by Konyavska and Pogled mountain. Dolno Dupnishko field - occupies the southwestern part of the municipality, which expands along the river. The current and the valleys and tributaries of the river. German and Rila River.

Climate

The climate of the Municipality of Dupnitsa is temperate-continental with some Mediterranean influence, which enters the valley of the river. The current, through the German River. The average annual temperature is 10.6 ° C. The warmest month is July and the coldest is January. The maximum temperature is

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39.8 ° C, and the minimum 26.7 ° C and the average annual temperature for the region is 12 ° C, which is due to the almost constant outflow wind in the valley of the German River.

Water

Dupnitsa Municipality has a variety of water resources. Surface water is of paramount importance. The largest river that flows through the Dupnitsa valley is the river. Current. The rivers German, Bistritsa, Otovitsa , Jubrena , Topolnitsa and Goritsa are also important for the water balance.

Drinking and domestic water supply is supported by Dyakovo Dam.

The underground water wealth of the Municipality of Dupnitsa is formed by several mineral springs in the town of Dupnitsa, village Extreme dol and s.P. alatovo . So far, however, they have not been studied, their qualities have not been proven and they are not actually exploited.

Soil cover

diverse relief, climate, vegetation, soil -forming rock and other conditions determine the presence of diverse soil cover on the territory of the Municipality. The soils that are important for agro-technical and reclamation activities are: alluvial - meadow, cinnamon forest and brown forest.

Flora, fauna and protected natural areas

Part of Rila National Park falls on the territory of Dupnitsa Municipality. The closest reserve to the town. Dupnitsa is "Skakavitsa" (on the land of the town. Sapareva Banya), characterized by a centuries-old Belomurov forest. 22% of the territory of Dupnitsa Municipality is occupied by forests. There are forests of mistletoe , mixed in places with hornbeam and mesophytic grass formations (meadows), mixed forests of Moesian beech, hornbeam, linden and white pine.

Shrub coenoses are represented by rose hips, hawthorn, dogwood, hazel, sumac, wicker, viburnum and others. , and the herbaceous ones - from yarrow, wormwood, hare's shadow, coin, snake's milk, ochanka , strawberry, marigold, cinquefoil, geranium and others.

The fauna is characterized by representatives of the species of reptiles, birds, amphibians and mammals, characteristic of the temperate-continental climate zone.

Demographic characteristics

Apart from the factors of the natural complex, the socio-economic development of the Municipality of Dupnitsa is influenced by the demographic and labor potential. The population (Table 2) is an essential circumstance for the improvement and territorial location of the productive forces.

Table. 2 Distribution of the population as of 31.12.2018 for Dupnitsa on place of residence and sex

	everything			**in cities**			**In the villages**		
	everything	**men**	**women**	**everything**	**men**	**women**	**everything**	**men**	**women**

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Dupnitsa	**39 414**	**18 879**	**20 535**	**29 698**	**14 127**	**15 571**	**9 716**	**4 752**	**4 964**

Source: NSI

Organizational structure of the municipal economy

In recent years, a number of small and medium-sized companies have established themselves on the territory of the Municipality of Dupnitsa, which operate primarily in the field of services and light production.

Characteristic of the local economy is that there are no processes of mass liquidation and closure of companies, on the contrary in the four-year period of analysis there is an increase in the share of newly registered sole proprietorships by 192 on average, and in limited liability companies on average. 32 pieces per year. This fact is indicative that the Municipality of Dupnitsa has a favorable business climate and conditions for the development of free business initiative.

Industry

Pharmaceutical industry

Balkanpharma - Dupnitsa - specializes in the production of dosage forms, medicines and veterinary preparations;

Pharma AD - produces medicines and cosmetics;

ET "Reni - B. Vasev " - production and trade in drugs.

Mechanical engineering and metalworking

The development of these branches of the municipal economy are important in terms of UTPs and production infrastructure. Machine elements and units and tools are manufactured in the companies: " Instrumental - Ltd."; Metel Ltd. , ZIO Ltd., 16 Partisans Ltd .; Metalsnab - Holding EAD. "Elevator equipment - Ltd." specializes in the production of elevators and elevator equipment. Avtoremont AD is engaged in the repair of buses and trucks, and Minstroy Metallic Mer AD - in the implementation of facilities for the mining industry. The capacities of these economic entities are lightly loaded and a faster restructuring process is needed, in accordance with the new market requirements.

Electrical industry

Electricity Transmission and Electricity Distribution - presented by Elektrorazpredelenie EAD;

Production of electrical appliances, electrical installations and electronic components - " Energo - Service Engineering" Ltd. , " Specialremont " Ltd.

Sewing industry

This is a traditional livelihood, mainly due to the availability of skilled labor. Representatives of the clothing and footwear industry are the companies: " Marena "; "Master"; ET " Nixar - N. Ganchev"; ET "Plamen Raynov"; Mistral Pass; " Eurohouse "; "Guarantor"; ET "Ivan Stoyanov"; TPK "Quiet Labor"; Specialremont EOOD ; Modena Ltd . ; TPK "Solidarity" and others.

Logging, forestry, wood processing and furniture industry

3.1% is the relative share of the timber and furniture industry, which is directly related to the natural proximity of the location to the Rila Mountains. The processing of wood into joinery, plywood, veneer, furniture and others is carried out in the companies: "Veli lak"; " Lesko prima "; ET "Bor - V. Blatski"; Galilee Ltd .; Rilales EAD . Forestry is carried out by the State Forestry.

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Printing industry

State Printing House, Sagittarius - E. Kovachki ET and TPK Tih Trud.

Construction

Industrial and residential construction: in the municipal economy the appearance of the sub-sector is given by the companies: Astroy Global Commerce OOD, Vasko Blagoev ET, Georgi Karimov ET, Dartrade AD, Technomax ET - P. Raynova, ET ; ” Stroymatetis - Iv. Kyosev ”and others .

Road construction, road maintenance

Construction of road facilities - bridges, roads, overpasses:

The companies Hemus Motorways AD, Regional Road Service and others.

Construction, repair

Specialized in hydraulic engineering construction and repairs are the companies: " Water and Sewerage" Ltd. , " Hydrostroy - Riltsi", "Irrigation Systems" EAD, " Ecoengineering " Ltd. and others.

Production of bricks and building materials

ET "IKO" - production of building structures, " Rapid " Ltd. - bricks and ceramics for construction. The presence of sands, gravels, clays and dolmites are the basis for the development of productions for construction materials - bricks are produced in the village of Yahinovo, aggregates - in the screening plant.

Production of steel - concrete structures

ET " Universalproekt - Ts. Tsekov" produces concrete products, paving slabs, curbs, parking - elements, pavers and more.

Agriculture

The managed land in the area of Dupnitsa Municipality amounts to 197,246 decares, incl. 130,142 decares of arable land and 67,104 decares of pastures. The usability of the land at this stage is about 45-50%, and the main reasons for this low percentage are the lack of markets for agricultural products, the incomplete restoration of agricultural land to their former owners and the depopulation of villages.

transport infrastructure

The territory of Dupnitsa Municipality is served mainly by road and rail transport. Through it the production connections and the civil travels between the settlements are realized. The E-79 Sofia-Kulata-Thessaloniki highway and the electrified railway pass through the location . line Sofia - Kulata (Table 3).

Table 3. Transport infrastructure

Transport infra structure	**Republican road network**					**Municipal road network**
	European Transport Corridor (km)	Motorways (km)	Class I roads (km)	Class II roads (km)	Class III roads (km)	**IV class roads and municipal streets**
Municipality of Dupnitsa	-	23,583 th most common	23,300 th most common	13,100 th most common	10,860 th most common	80,766 km - municipal

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		p.v.4,372	p.v.4,900			streets; 63,900 km common roads

Infrastructure for the supply of basic goods / services.
Energy supply.

In FIG. 1 shows the power supply system of Bulgaria with transits to and through Dupnitsa

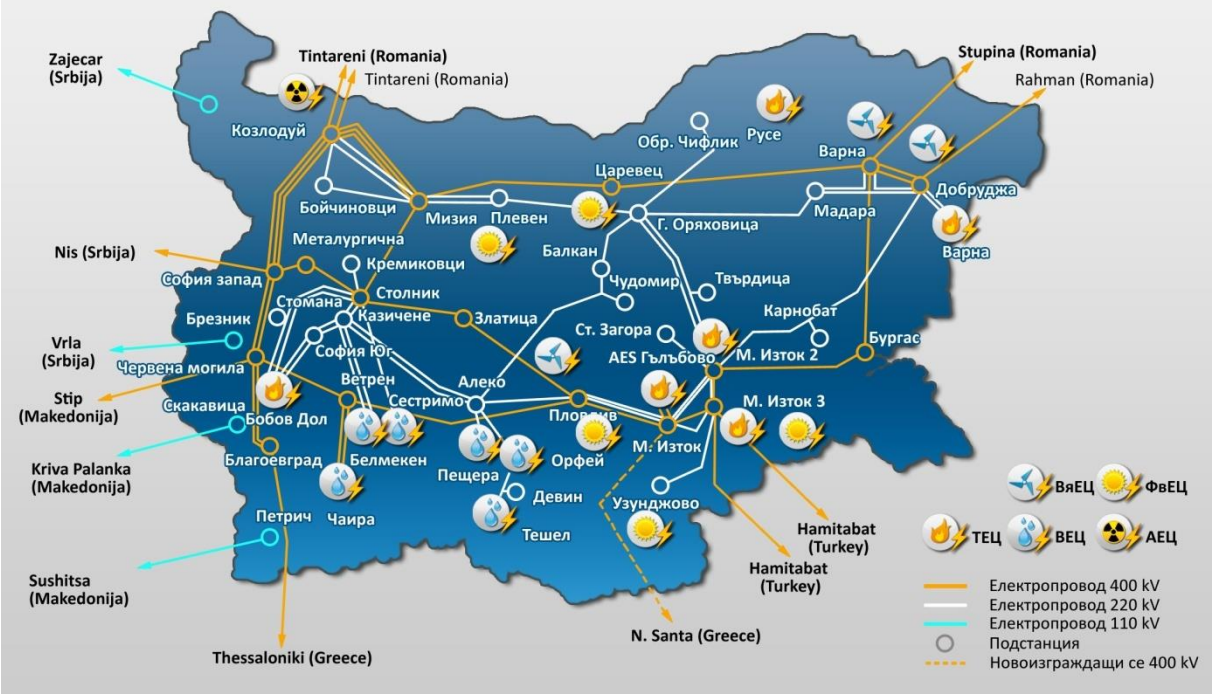

FIG. 1 Dupnitsa municipality is powered by substations of the same name, located in the city .

Gas pipelines.

The main gas pipeline enters the territory of Dupnitsa Municipality from the land of the village of Saparevo, where there is a built / PC 493 + 70 / km 56.3, from there through the land of the village of Kraynitsi - SKZ № 7 - km 63.5, north of Cherven Breg and the village of Yahinovo, crosses the Drumska River / PK 638 + 46 /, crosses the main road E-79/636 + 46 / and exits at SKZ № 8, Piperevo village km 73.3. From there, the pipeline splits in the direction of the Republic of Northern Macedonia and the Republic of Greece . In the village of Piperevo there is a diversion for the town of Dupnitsa and Balkanpharma-Dupnitsa AD. (Fig. 2)

The direction to the Republic of Greece crosses the railway line Dupnitsa-Bobov dol at km 3 + 500 crosses the road Dupnitsa-Kyustendil at the junction for the village of Balanovo continues along the river German and near the village of Gramade leaves the territory of the municipality.

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The direction to the Republic of Northern Macedonia from the watershed of the village of Piperevo on the northern slope of the Kavaklia locality crosses the Dupnitsa-Bobov Dol railway line, at kilometer 6 + 0.50 crosses the Dupnitsa-Bobov Dol road and along the Dupnitsa-Kyustendil road, at The village of Pancharevo leaves the territory of the municipality. The diversion for the town of Dupnitsa passes south of the village of Piperevo, crosses the main road E-79 at the junction for the village of Piperevo, crosses the railway Pernik-Dupnitsa at the pumping station and the river Dzhubrena after the railway bridge Yahinovo - Balkanpharma-Dupnitsa "AD.

FIG. 2 Transit gas pipelines through Dupnitsa. Source - BTG

Cultural monuments

Within the territorial boundaries of the Municipality of Dupnitsa are a number of cultural monuments, the location of which forms the historical development of the location. The cultural monuments in the Municipality of Dupnitsa are communicatively accessible and are included in the Concept for sustainable development of cultural tourism in Kyustendil District. It is necessary to update the list of cultural monuments in the location and improve the transport network in order to include these sites in cross-border cultural routes.

Schools

Primary school St. St. Cyril and Methodius, Dupnitsa

High school St. Kliment Ohridski, Dupnitsa

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PG Academician Sergei P. Korolev , Dupnitsa

HRISTO BOTEV HIGH SCHOOL, Dupnitsa

SOU SV. PAISIY HILENDARSKI, Dupnitsa

EVENING SOU DIMCHO DEBELYANOV, Dupnitsa

PGOSU, Dupnitsa

Evlogi Georgiev Primary School, Dupnitsa

HRISTAKI PAVLOVICH PRIMARY SCHOOL, Dupnitsa

Private Professional College of Sports and Health, Dupnitsa

Neofit Rilski Primary School, Dupnitsa

Vocational High School of Transport, Dupnitsa

Vocational High School of Food and Chemical Technologies, Dupnitsa

Health facilities Dupnitsa
Multi -profile hospital for active treatment - "St. Ivan Rilski "EOOD

Medica Ltd.

Dupnitsa State Forestry

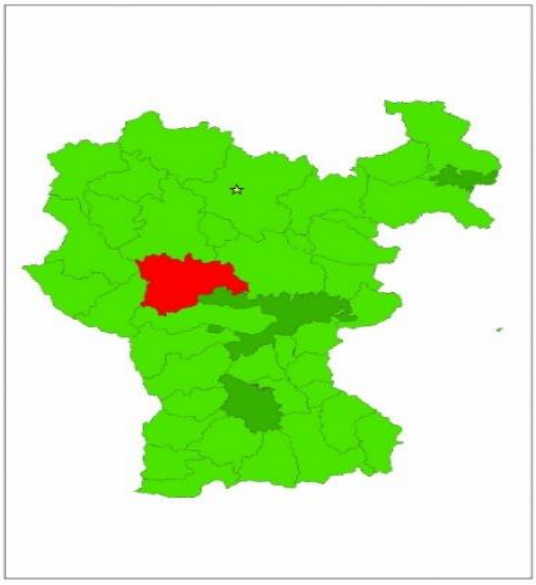

FIG. 3 Dupnitsa State Forestry. Source: https://www.uzdp.bg/

It is located on parts of the Rila, Verila, Konyavska and Vlahina mountains (Fig. 3). The relief is very diverse. The altitude is in a wide range - from 350 to 2010 meters.

The hydrographic network is delineated by the Struma River, the German River and its tributaries, which originate mainly from the Rila.

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The total area of the state forest territories is 17,503 ha, and nearly 21% of them are included in the European ecological network "Natura 2000".

With the biggest. participation in coniferous forests are white pine, black pine and spruce.

The forests on the farm have extremely important ecological functions: protection of the steep slopes in the mountains from erosion, taming the torrents and supplying the settlements with drinking water.

Numerous anti- erosion facilities have been built and hundreds of decares of crops have been afforested in the implementation of technical projects to combat erosion, such as the Saparevski Dol, Badinski Poroi and Karchinski Poroi barrage systems .

Transport

Vehicles transporting fire and explosive, highly poisonous, etc. pass through the territory of the district. substances which, in the event of an accident, create conditions for environmental pollution and are a threat to the life and health of the population. In case of traffic accidents and technological accidents in sites working with oil, oil products and natural gas, conditions for pollution and real danger for the population will be created.

Common part

Community risk reduction

Community risk reduction is defined as a process of identifying and prioritizing local risks, followed by integrated and strategic investment of resources (emergency response and prevention) to reduce their occurrence and impact.

In the current community risk reduction study, we use a six-step approach to development (Figure 4).

From the considered demographic, economic - geographical, data, sociological surveys and surveys among different groups of the population - students, employees, owners and managers of companies, municipal employees, people with disabilities and others. specific recommendations will be made to increase the readiness of local citizens to deal with natural and man-made disasters.

The Service for Fire Safety and Protection of the Population is actively involved in fire prevention through education, construction inspections and other activities. RS PBZN Dupnitsa, together with the municipality help local communities to create and develop a specific plan to reduce the risk of fires based on the types of risks for this particular community.

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FIG. 4 Six steps to reduce the risk

Risk identification

Добра практика е самите пожарникари, служители от МВР, общински служитеи, когато пътуват да записват и локализират различни видове опасности за последващ анализ.

A systematic approach is needed to identify potentially hazardous areas where a fire may occur. Although the consequences are comparable to the occurrence of a large forest fire and a home fire, the causes are sometimes very different. They must be studied, known and applied in every place.

Identification of ignition sources in urban environments

One of the three conditions for ignition and hence the fire is the presence of a heat source. Look for possible heat sources that may be hot enough to cause a fire, such as:

Cigarettes, matches and lighters

Candles or gas or liquid fuel equipment with open flame

Cooking equipment, gas hobs, bottles

Hot processes or surfaces

Electric, gas or oil heaters

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Check for signs of burns, cigarette burns and charred electrical plugs on electrical equipment. Old cables are hard and brittle. Bugs, spiders can often get into the plugs, so that the pollution becomes so dense that it causes a short circuit. The electrical panels on the sidewalk in front of the house can become a home for wasps. The swarm tightly fills the interior space and leads to arcs, fires and in bad circumstances and injuries and even disfigurement.

Identify fuel sources

The second condition for a fire is the presence of fuel.

Look for items that you keep in sufficient quantities and that can burn easily. This will provide a fire with fuel and lead to its spread to other sources of fuel.

Attics and basements are often clogged with unnecessary wood and paper waste - old window frames, books and magazines, boxes, woven furniture. A common practice is the storage of fuels - gasoline in plastic bottles.

Common corridors in old residential buildings , often crowded with construction waste, which in addition that they are flammable can be fatally difficult to evacuate. Even more worrying is the locking of the mezzanine floors, which, in addition to hindering the evacuation, also makes it difficult for firefighters to respond.

Identify sources of oxygen

The third condition for the emergence and maintenance of fire is the source of oxygen. The main source of oxygen for a fire is air: either from natural air flow or from air conditioning systems.

Other sources of oxygen include fireworks and oxygen from storage systems for bottles and pipelines (for example, oxygen used in welding processes or to provide oxygen to healthcare facilities.

Identification of the risk of forest fires

Forest fires on the border - mountain and city - pose a serious threat to communities, as they can be extremely destructive, killing civilians and firefighters and destroying homes and other structures.

Forest fires also have a catastrophic impact on the ecological functioning of many ecosystems, as they partially or completely burn plant layers and affect soil and plant processes after fires, such as soil erosion, debris, floods and vegetation restoration. [1]

Forests are usually remote areas full of trees, dry and withered wood, leaves, etc. that act as a source of fuel. These elements form a highly flammable material and are the ideal condition for initial ignition and act as fuel for the later stages of the fire.

Flames can be caused by human actions such as smoking or a barbecue party, or by natural causes such as high temperatures on a hot summer day or broken glass acting as a lens focusing sunlight on a small area for an extended period of time. leading to ignition.

Natural phenomena such as a thunderstorm can also cause ignition.

[1](Morgan, P. and others (2014)). Challenges of assessing fire and burn severity using field 8 measures, remote sensing and modeling. International Journal of Wildland Fire, vol. 23, pp. 1045-1060].

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Once the ignition starts, the flammable material from a small fire grows almost instantly until a fire is lit on a wide front, especially if there is a strong wind. The initial stage of ignition is usually called the "surface fire" stage. It can then set fire to neighboring trees and the flames of the fire become higher and higher, thus becoming "crown fire". Most often at this stage the fire becomes uncontrollable and the damage to the landscape can become excessive and can last a very long time depending on the prevailing weather conditions and terrain.

Different methods can be used to identify risk areas. One of the relatively new methods is to identify areas at risk of forest fires, produced by the combination of three territorial variables: spatial localization of fires, road network and areas with urban-wild interface. The combined effects of these criteria make it possible to obtain layers of geographical information that can be weighed against other territorial variables in order to create an integrated model of fire protection.[2]

Fire safety risk assessment

A fire risk assessment can be considered as an in-depth study of what in your home or your work activities and workplace can cause injury or death to people from a fire. This will help determine the likelihood of a fire and the dangers of fire that may occur at home or at work.

The purpose of the assessment is to determine whether the existing fire-fighting measures are adequate and reasonable in relation to the overall risks presented or require additional control and action.

The term " **fire risk"** can be defined **as the probability of fire** multiplied by the **severity of the fire,** ie. The "potential for harm" and the **consequences** in terms of loss of life, spread of fire, damage, etc.

The potential for damage from a fire hazard depends on the potential for the development of a fire resulting from the hazard, and then from the potential consequences in terms of loss of life and / or property.

Determining the potential for harm requires an assessment of the possible outcome of the hazard.

In addition to assessing the ignition potential, it is necessary to determine the frequency of recurrence of hazardous situations, whether society is prepared to react during a fire, environmental conditions and the condition of equipment.

The potential for development will be influenced by a number of factors, not least the length of time the fire may burn before it is detected and how long it takes for the fire to develop before the fire threatens roads and evacuation facilities. .

Factors such as the construction of the building (flammable materials - insulation, beams, etc.) and content (flammable materials that will provide fuel or gas installations, propane butane cylinders, etc.) will also affect the potential for fire.

The fire risk assessment must meet a number of criteria, as follows:

- To make an accurate and sufficient fire risk assessment;
- Include significant findings and measures to reduce and manage fire risk;
- Identify each group of individuals at particular risk;
- Regular review of the existing situation in case of change in the premises, work processes, etc.

Risk factors for forest fires include land use, altitude, slope, temperature, relative humidity and wind strength, which were performed using ArcGIS software .

[2][The identification and assessment of areas at risk of forest fire using fuzzy methodology Miguel E. Castillo Soto].

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The risk assessment process consists of five steps:

Step 1 - Identify fire hazards in your premises - we looked at it at the beginning.

Step 2 - Identify people at risk

Step 3 - Assess and decide whether existing fire safety measures are satisfactory or need improvement

Step 4 - Write down the findings, make an emergency plan, instruct, inform and train

Step 5 - Organize a regular review of the assessment

Conducting in-depth interviews and surveys described in the special section shows the current state of fire safety issues facing the public in Dupnitsa.

The most important part of any activity related to the occurrence of disasters, including fires is the protection of life and health of the population.

Step 2. Identify people at risk

People may be at risk of fire regardless of their physical and mental health, age, education. The greatest attention to the identification of people at risk is paid to:

Anyone who can sleep in the room;

- Present large groups of organized and unorganized people in large stores, stations and bus stations, theaters, etc .;
- Those who are not familiar with fire safety rules, emergency plans, evacuation schemes, etc .;
- Exposed to specific fire risk;
- Those with impaired vision, hearing, mobility or any other impairment;
- People working near fire-hazardous places - gas pipelines, gas stations, fuel depots, ammunition, etc .;
- People working alone or in remote or isolated areas (eg roof spaces or storage rooms. This is especially true for installation work related to welding, cutting tools, etc.);
- Children or parents with babies;
- Elderly or infirm;
- All people who can't react quickly;
- Foreigners, migrants , etc. people who do not know Bulgarian and cannot read Bulgarian.

Step 3 - Assess and decide whether existing fire safety measures are satisfactory or need improvement

(1) Determine the risk of fire

The risk assessment for a building is:

LOW	Average	HIGH

Low

Minimal risk of fire, little available combustible materials, lack of highly flammable substances. There are no heat sources.

Medium

There are large amounts of combustible materials and heat sources

but the fire will remain limited or spread slowly.

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High

Serious risk to life from fire, significant amounts of combustible substances and materials, highly flammable substances or likelihood of rapid spread of fire, intense heat or smoke.

Determine the potential consequences if a fire occurs

Given the construction and purpose of the building and occupants, as well as fire protection, it is considered that the consequences for the safety of life in case of fire will be:

- **Slight damage**
- **Moderate disability**
- **Extremely severe damage**

Criteria for assessing the potential consequences of a fire

Slight damage - A fire is unlikely to cause serious injury or death to occupants.

Moderate Injury - A fire can injure one or more occupants, but is unlikely to involve multiple deaths.

Extremely severe damage - significant potential for serious injury or death to one or more occupants.

Actions to eliminate and mitigate the risk

This procedure is applied after the risks have been identified and the fire safety assessment has been assessed as inadequate. Action is then taken to eliminate or reduce the risk of fire where possible. For example:

- Replace highly flammable materials with less flammable ones;
- Make sure you keep flammable materials away from sources of ignition;
- No smoking;
- Reduce evacuation time and length of evacuation routes;
- Provide additional evacuation routes
- Install additional fire alarm points
- Improve the visibility and dimensions if necessary of fire signs;
- Consider installing active fire protection systems, e.g. Sprayers;
- Appointment of fire responders ;
- Providing appropriate evacuation routes for people with disabilities;
- Increase hours of fire safety training and exercises, including various vulnerable groups.

Step 4 - Write down the findings, make an emergency plan, instruct, inform and train

In this step you need to record, plan, instruct, inform and train. You will need to record the fire hazards identified in step 1 and the people at risk identified in step 2. You will also need to record the action you took in step 3.

Make an emergency plan tailored to your premises. It should include the actions to be taken in the event of a fire in your room or nearby.

Step 5 - Organize a regular review of the assessment

You need to make sure that the fire risk assessment is up to date and valid. Always update the risk assessment whenever the level of risk in the premises changes.

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The review may include:

- Type, location and nature of the premises;
- Type and number of people using the room;
- Type, location, location of facilities and equipment;
- Changes in premises, people, facilities and equipment;
- Materials stored on site
- Storage of new materials;
- Changes in work shift patterns, especially new night shifts.

Risk prioritization in existing buildings

The need to prioritize risk is to ensure that an appropriate level of safety is achieved in existing buildings.

The main goal of risk prioritization is to form a basis for resource allocation.

It is interesting that the prioritization is carried out both in risk assessment and after the fire - in the fire phase and after it in the recovery.

After a fire breaks out, the sooner you can identify and prioritize the most risky hazards, the better you can focus your resources on early mitigation and plan for long-term recovery.

Fire risk mitigation strategy and plan

Climate change and weather change require the need for year-round work to prepare homes and property if there is a risk of forest fires (Fig. 5) or fires in homes and yards.

FIG. 5 Forest fire near homes https: // www-ready-gov

There are several things that will protect your life and property from a fire that has broken out near your home and threatens to engulf your property and home:

- Make an emergency plan;

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- Make sure everyone in your household knows and understands what to do if a quick evacuation is to be arranged;
- Provide the ability to quickly gather important documents;

Strengthen your home

- Use refractory materials to build the house, renovate or repair;
- Provide an external water source with a hose that can reach any part of your property.
- Create a fire zone without leaves, debris or flammable materials at least 10 meters from your home.

Define an evacuation zone

You may need to evacuate quickly due to a forest fire. Investigate your evacuation routes. Do frequent workouts with family members. Don't forget your pets. Determine where you will go.

Follow the instructions of the local authorities. They will direct you or take you to the safest places.

Maintain a first aid kit and urgent needs

This will allow you to get medical help for minor injuries by relieving the burden on emergency centers and hospitals.

Be aware of the potential hazards if you carry flammable products that can cause fires or explosions if handled incorrectly, such as aerosols, cooking oils, painkillers and hand sanitizers.

If available, store N95 mask to prevent inhalation of smoke.

Keep your cell phone charged when there are forest fires in your area.

If you are ill and need medical attention, contact 112 and your GP for additional instructions on care and shelter, if possible.

Adults and children with asthma may need to be evacuated long before the fire reaches their homes, as the smoke can spread far beyond the boundaries of a forest fire.

There are five things to never forget when evacuating:

People, recipes, documents, personal needs and priceless items.

Fire risk reduction plan and its implementation

When preparing the plan, use the services of PBZN experts or other specialists. The plan must be short, workable and clearly defined. Carry out periodic training according to the plan and adjust it if necessary. As drawing up a disaster risk reduction plan is a separate issue, it will not be considered in this study.

Build a community profile

Risk assessment should also include obtaining information on people affected by or part of the disaster.

Data needs to be collected to develop a demographic profile of the community. The risk is often influenced by economic and social problems. Therefore, the process of reducing risk in the community must address socio-economic issues. The demographic composition of a community usually includes statistics on its population.

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To fulfill the objectives of the project, it is necessary to make a community profile for the town of Dupnitsa.

Dupnitsa is located in the southwestern part of Bulgaria (Fig. 6, along the valley of the German River, at the foot of Rila Mountain. Through the land of Dupnitsa passes one of the main arteries of the country - international road E 79, such as Dupnitsa is the point where the roads cross south to Thessaloniki, the Adriatic, Istanbul or west through Macedonia and Serbia to the countries of Western Europe.

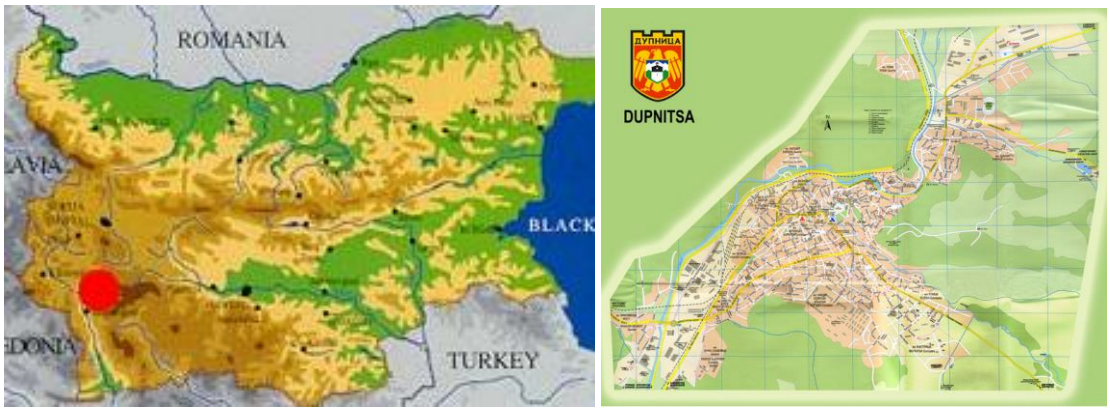

FIG. 6 Gr. Dupnitsa. General view https://www.dupnitsa.bg

The territory of Dupnitsa Municipality is 359 km² or 0.32% of the territory of the Republic of Bulgaria. The average elevation is 946.3 m.

To the east the municipality of Dupnitsa borders with the municipalities of Sapareva Banya and Samokov, to the west with the municipality of Bobov dol, to the north with the municipality of Radomir, and to the south with the municipalities of Rila and Boboshevo (Fig. 7).

FIG. 7 Gr. Dupnitsa. https://www.google.com/map

Demographic and labor potential in the Municipality of Dupnitsa [3]

Trends in the demographic development of a municipality in the period 2007-2017 have been studied.

[3] https://dupnitsa.net

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The population of Dupnitsa Municipality according to data from the General Directorate "Civil Registration and Administrative Services" (GRAO4) as of September 2017 amounts to 44,599 people (residents with permanent and current address in the village). In terms of population, 33rd out of all 265 municipalities. About 0.6% of the population of Bulgaria lives here. In Kyustendil district Dupnitsa municipality is on the 2nd place, after Kyustendil municipality, as 32% of the district live on the territory of Dupnitsa. On the territory of the municipality is the largest number of inhabitants of the town of Dupnitsa - 34 869 people, followed by that of S. Yahinovo - 1 845 and S. Kraynitsi - 1673.

According to data provided by the National Statistical Institute (NSI) at the end of 2016 (31.12.2016) on the territory of the municipality of Dupnitsa live 40,789 people. As of the same date, according to GRAO data, the persons with permanent and current address in the settlement on the territory of the municipality are 44,709 people. The difference of 3,920 people is due to the fact that these persons maintain their address registration in the municipality, but do not live here for most of the year. These are property owners or members of households with their own properties.

The municipality is characterized by a high degree of urbanization, as in 2017 78% of the population lives in the municipal center - Dupnitsa, and only 22% in the villages located in the municipality.

At the end of 2016, the number of inhabitants of Dupnitsa municipality formed 33% of the population of Kyustendil district, 1.90% of that of South Central region (NUTS 2) and 0.6% of the population at national level.

The dynamics of the population of the municipality for the last 19 years is characterized by a significant increase in the period 2000-2003, when the whole country reported a "boom in birth rates" and a sharp decline after 2009 due to the economic crisis in the country and Europe. trend deepens in subsequent years as a result of negative natural and mechanical growth. Information for the population of the town of Dupnitsa is given in Table 3.

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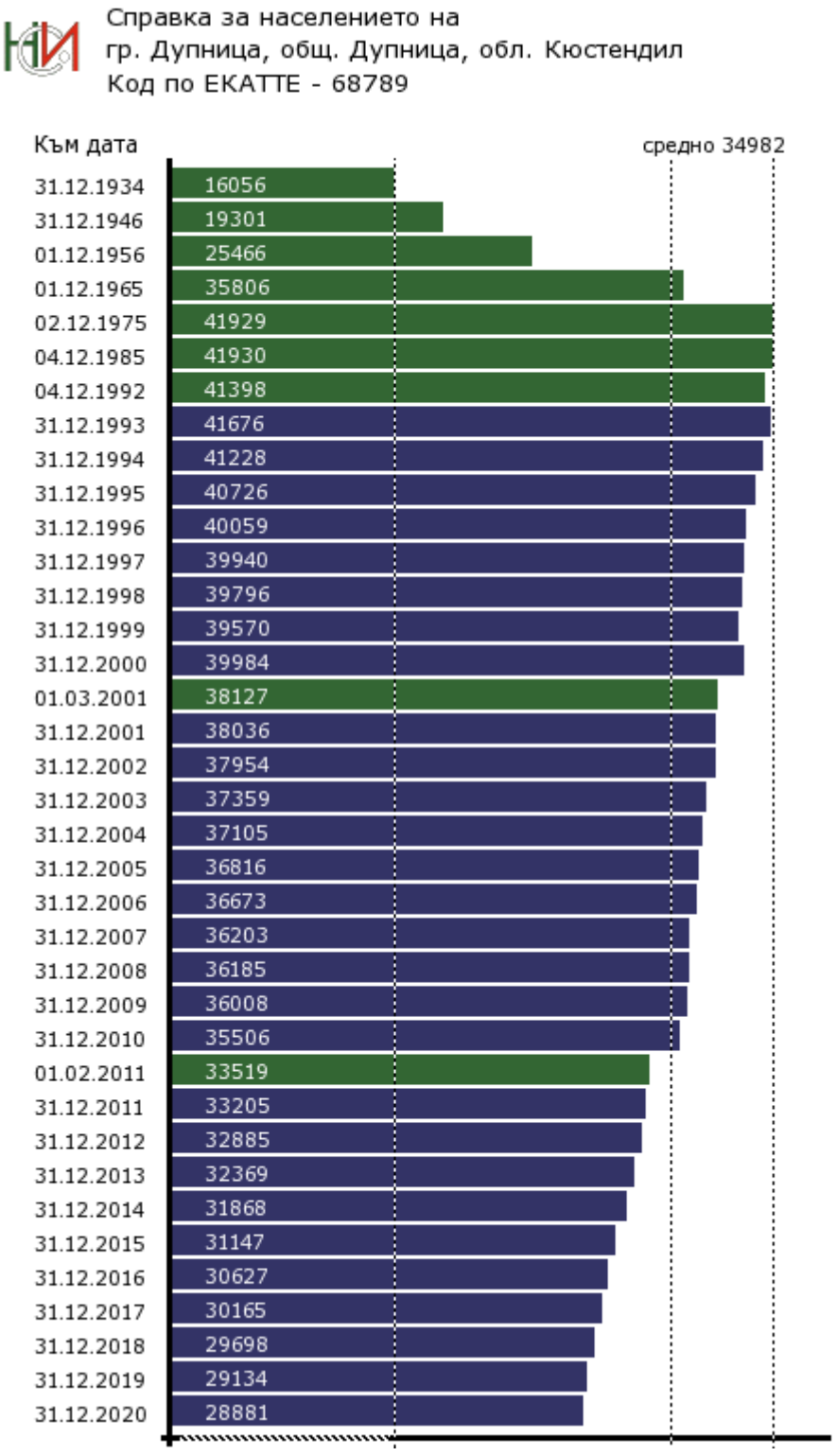

Table 3 Population of Dupnitsa. https://nsi.bg/nrnm/show9.php?sid=4508&ezik=bul

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Day center for children with disabilities, Dupnitsa,

Veliko Tarnovo Street № 4 - capacity 20 seats

A set of social services that create conditions for comprehensive service to consumers during the day, related to the provision of food, meeting daily, health, educational and rehabilitation needs, as well as the needs of leisure and personal contacts **.**

RS PBZN Dupnitsa,

Dupnitsa, 6 Samokovsko Shosse Street

The area of operation of RSPBZN - Dupnitsa covers the territory of the municipalities of Dupnitsa, Sapareva Banya and Boboshevo.

Forces and means for disaster response in the municipality of Dupnitsa

The overall organization of the training of the governing bodies, the response forces and the population is carried out by the person in charge of " Municipal Health " of the municipality.

The training of the management bodies is carried out by organizing and conducting staff trainings and exercises at the municipal level in the companies and sites of the municipality, paying special attention to potentially dangerous sites and those in potential disaster areas.

The response forces at the municipal level are trained according to the training program for employees , launched by the Ministry of Interior for companies and sites and practically through conducting site exercises and trainings.

The training of the population is carried out on a voluntary basis and by giving talks in the local media.

Conducting exercises to work out the interaction between the governing bodies, the response forces and the population in case of disasters / accidents.

Every year in the sites of the national economy, primary and secondary schools and kindergartens in the municipality are organized and conducted practical classes and exercises with the participation of the forces of the unified rescue system, voluntary formations and personnel of the sites.

From the survey in connection with the Plan for Integrated Development of the Municipality of Dupnitsa [4]can be made interesting conclusions about the attitude of citizens to various problem areas in the municipality, which may affect the readiness of residents in disasters. The next five graphs are from those cited in [3] source.

[4] https://www.dupnitsa.bg/assets/plan

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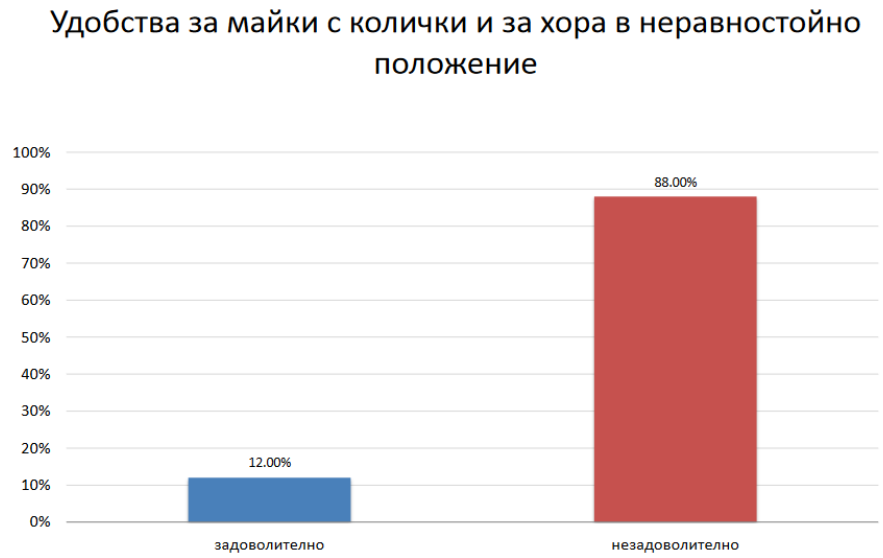

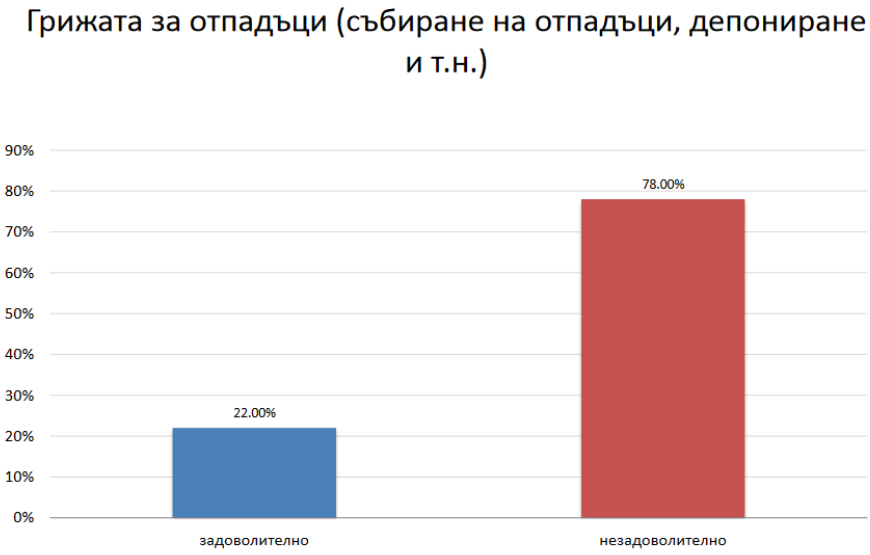

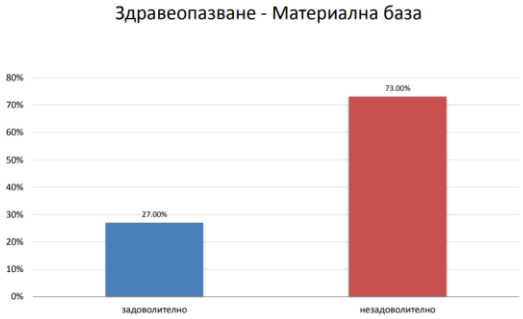

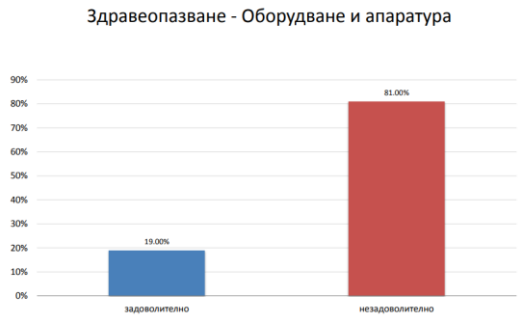

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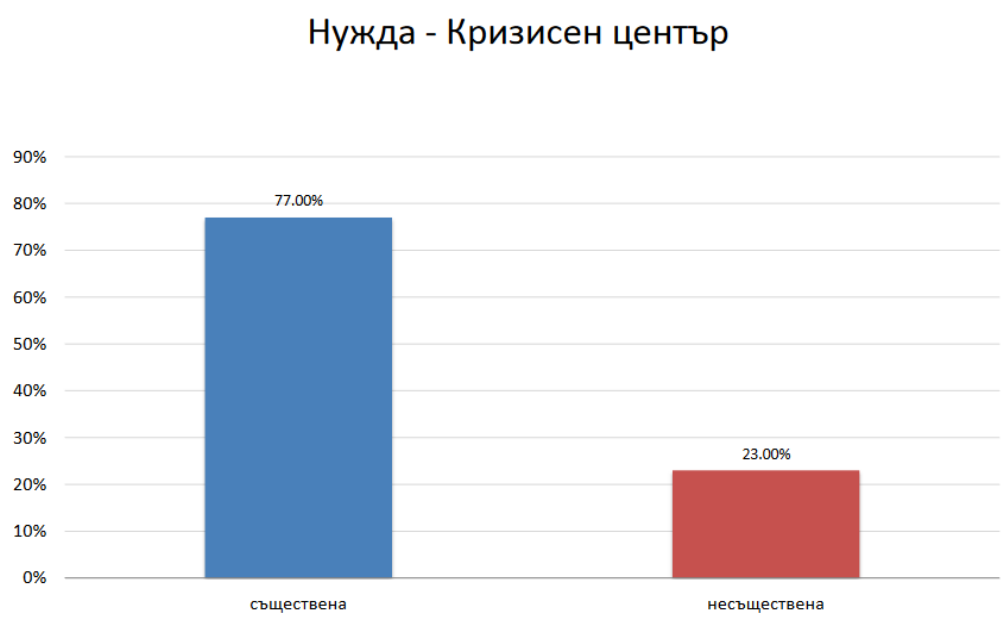

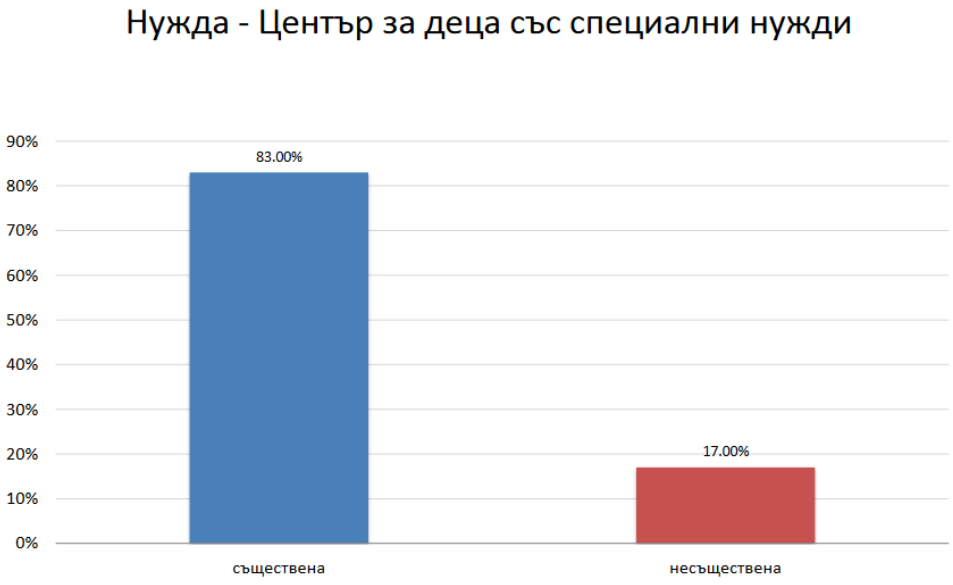

The study shows that the most important activities are critically unsatisfactory, even in a calm, non-crisis environment. In the event of a catastrophic disaster, the municipality will not be able to cope with the consequences and recovery on its own.

Disabled

There are people in Dupnitsa with short-term or permanent disabilities, which will limit their ability to move.

The damage manifests itself to varying degrees.

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Every building owner or manager (residential, public, hospital, etc.) must have a plan in place to evacuate a building, regardless of the physical condition of the occupants or visitors. When preparing for a disaster, we must carefully consider all aspects and categories disabilities.

In the municipality of Dupnitsa there are representatives of the five known general categories of disabilities:

- Mobility disorders;
- Visual impairment;
- Hearing impairment;
- Speech disorders and
- Cognitive impairment

Worrying is the fact that the survey and interviews clearly showed that in private homes almost 100% do not have at least one smoke detector installed for each level of the house (or apartment) outside the sleeping area.

For people with disabilities, it is especially important to install a blinking system for the hearing impaired.

People with disabilities should have a team of help from people, mainly neighbors, and can help in emergencies if needed. The real first responders to emergencies are often neighbors, friends and colleagues.

Such teams should be set up in every place where a person with a disability spends most of the day: at work, at home, at school. Pay attention to detail. Exercises should be held at least once a year.

The social services in the municipality must identify reliable, physically healthy and emotionally capable people who can provide reliable help. You don't have to rely on one person.

For both people and people with disabilities, other people must be able to provide and receive information in different ways and through different channels.

Different communication systems work differently. In emergencies, some can work when others fail. The more systems you have, the more likely you are to be able to connect with other people.

The most important communications include:

1. E-mail

2. Internet

3. Pagers

4. Text messages

5. Standard phone that does not need electricity (most new phones, including cordless phones, must be plugged into an electrical outlet)

6. Mobile phone

7. Low cost two-way radios (Walkie -Talkie)

The needs of older people are often similar to those of people with disabilities. Keep in mind that some people who are blind or visually impaired, especially the elderly, may be reluctant to leave a familiar environment when the request for evacuation comes from a stranger.

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People with impaired mobility are often afraid of being dropped when they are picked up or carried. Personal assistants, people who help this category of people, train on the right way to transfer or move someone in a wheelchair.

Social workers and hospital staff are able to help people with mental retardation who may not be able to understand the emergency and may become disoriented or confused about how to respond. The problem is with random first responders who do not have the necessary training. These issues need to be addressed in the training modules.

The municipality must provide a specialized vehicle designed to transport a wheelchair or other mobility equipment to be provided to those in need in case of need.

In Table. 4 presents data on the number of crisis events in total for the country.

Table 4. CRISIS EVENTS FOR THE PERIOD 2010 - 2020 - TOTAL FOR THE COUNTRY[5]

Indicators	Number of crisis events										
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**20**
tal for the untry	**4,571 th most common**	**8,268 th most common**	**10,826 th most common**	**2,728 th most common**	**4,356 th most common**	**4,008 th most common**	**3,577 th most common**	**1,594 th most common**	**1,420 th most common**	**1,066 th most common**	**1,215 m comm**
es	1,630 th most common	2,185 th most common	3,010 th most common	764	2,245 th most common	2,474 th most common	2,448 th most common	741	480	521	
ndslides	59	76	72	51	75	125	71	32	27	31	
rthquakes	12	4	22	6	4	1	2	.	.	.	
oughts	6	30	23	3	1	.	.	28	.	4	
ods	651	382	692	547	360	266	184	159	84	108	
rm, tornado, nado, whirlwind	47	48	528	89	14	12	29	6	13	5	
il	16	13	14	13	8	21	5	14	8	3	
owstorms	103	94	93	50	26	56	87	52	13	4	
ng, frostbite	18	134	186	20	3	7	2	52	20	1	
cidents	7	24	312	314	76	33	1	48	68	11	
hicle accidents	1,937 th most common	5,218 th most common	5,858 th most common	841	1,530 th most common	994	734	455	701	355	

[5] The data were obtained on the basis of the annual reports submitted to the NSI by the municipal administrations. https://www.nsi.bg/bg

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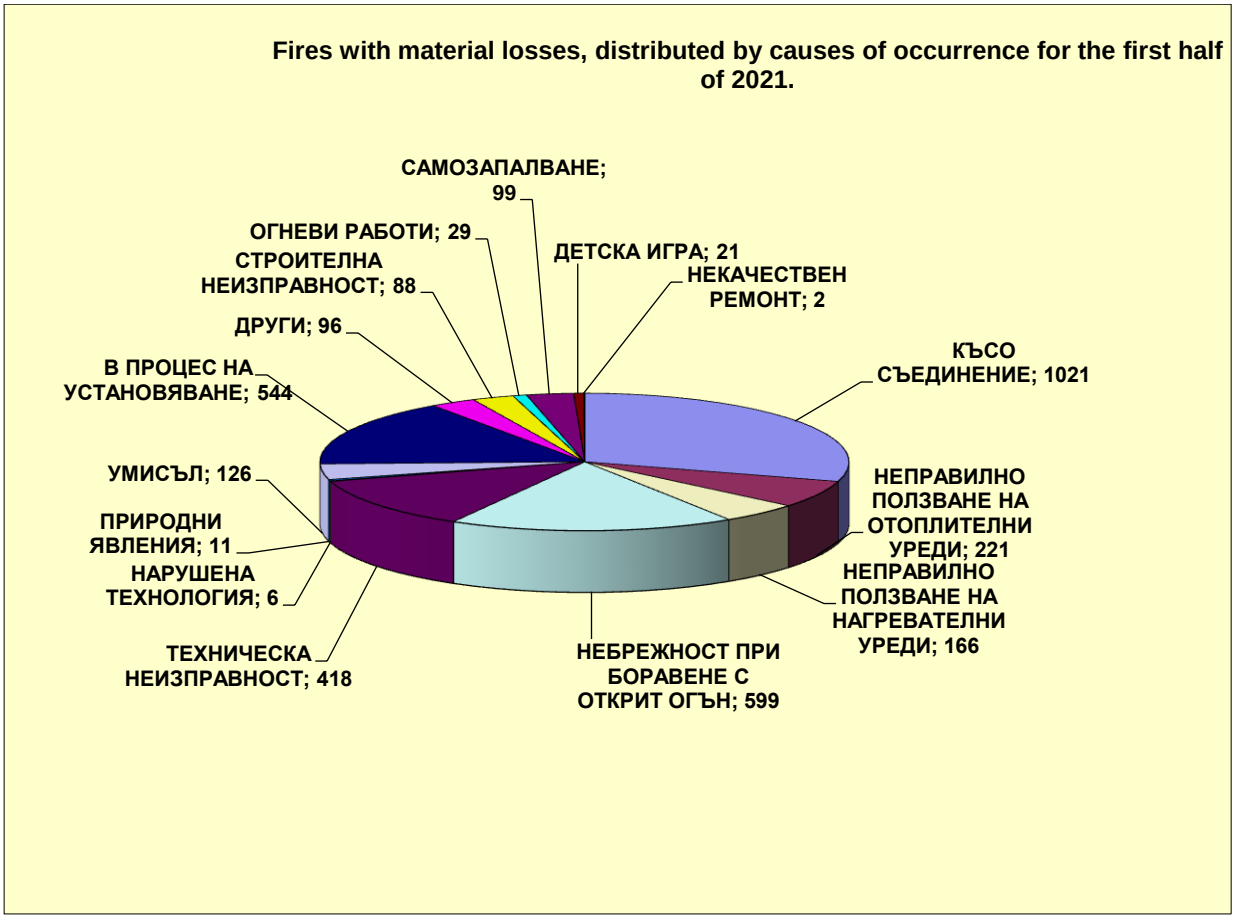
lution (with emicals, hazardous ste, household ste, etc.)	45	42	7	19	3	8	5	2	1	2
man epidemics	12	7	7	6	3	5	4	.	2	3
imal epidemics cluding birds)	5	2	.	1	6	2	3	.	1	3
her crisis disasters l events	21	9	2	2	1	2	.	4	1	14

It is useful to see the distribution of the causes of fires. The sample is only for the first half of 2017/2021 and compares the results of all regional directorates of PBZN (Chart 1) and separately only for Kyustendil - Chart 2 (Dupnitsa)



Graph 1. Fires with material losses due to causes

Source: GDPBZN

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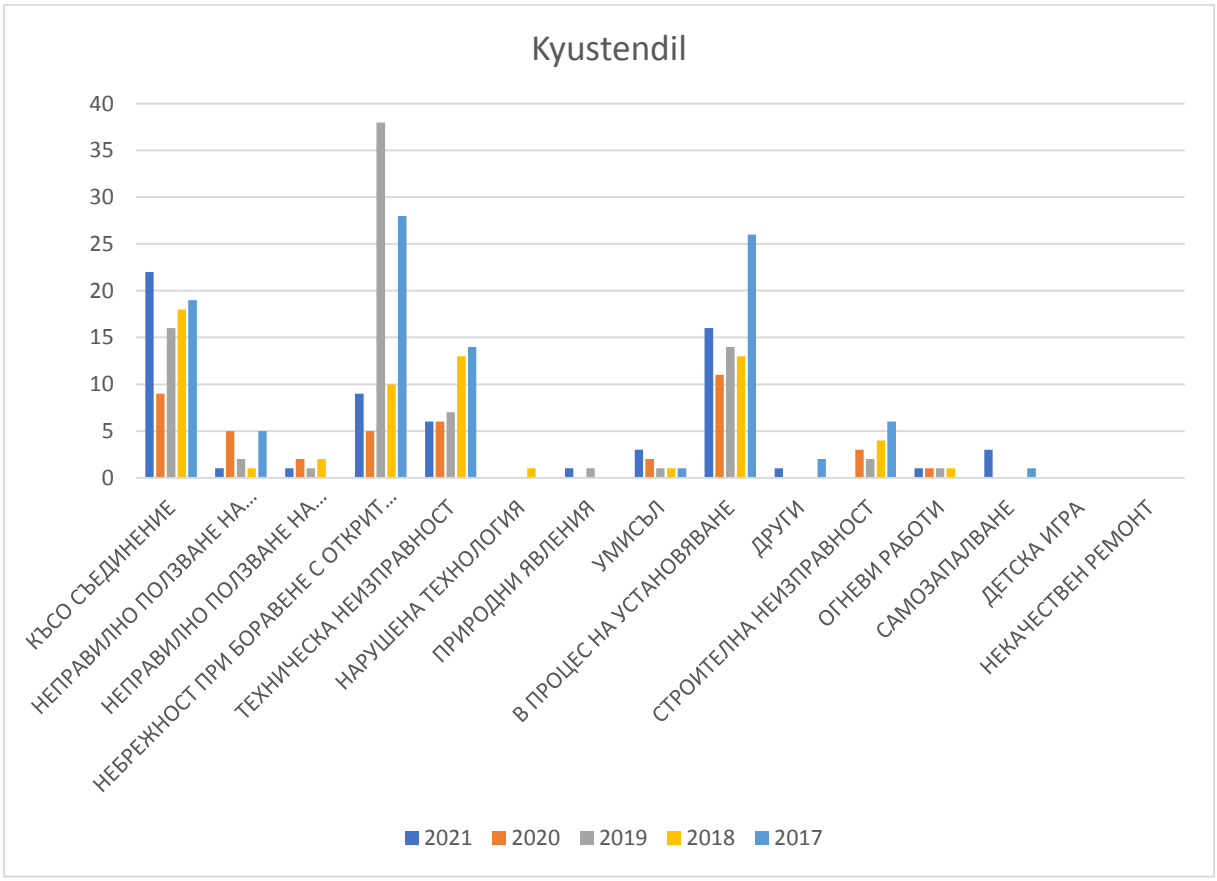

Graph 2. Data for Kyustendil (Dupnitsa) Source: GDPBZN

It is clear that the causes of fires in the district of Kyustendil (Dupnitsa) and for the country is short circuit and negligence in handling open fire. The share of the causes of fires due to natural disasters is very small.

Assessment of the current situation in relation to the awareness, skills and knowledge of citizens

In order to prepare an adequate assessment of the current situation in relation to the information, skills and knowledge of the citizens in Dupnitsa, we conducted a study on this topic.

A survey and in-depth interviews were conducted with more than 200 people with different social and health status, the unemployed, managers and owners of companies, civil servants and the military.

The collected opinions and summaries will help to define the scope of this study and will be used to further develop policies to inform municipal officials, specialized services to further address the issue of fire safety and risk in existing buildings and forest areas. .

The representative groups among which the survey was conducted are required to give a personal and summary opinion to the people and organizations they represent.

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The information provided in response to this consultation, including personal data, meets the requirements of the Personal Data Protection Act as amended. DV. issue 93 of November 26, 2019 Personal data will not be published or disclosed.

Keep in mind that the survey results only refer to personal data (name, address and anything that can be used to identify you personally), not the content of your answer to the interview and the survey.

The interview questions are aimed at establishing the readiness of the interviewees regarding:

1. Training
2. Determining the risk of fires
3. Total for fire
4. Evacuation
5. Fire protection systems
6. *Work with fire extinguishers*

The work was divided into two stages:

• Stage 1 Conducting random interviews between 200 people, covering different social, educational, age groups with pre-prepared questions. The purpose of the interview is to obtain feedback to assess the knowledge, experience and views of the interviewees about the capabilities of stakeholders conducting training and fire protection in the municipality of Dupnitsa.

- Stage 2. Evaluation of the received answers

Identifies gaps and deficits, incl. in the educational program on the basis of a survey and in-depth interview .

SURVEY

A. CHILDREN'S QUESTIONNAIRE

A target group of 30 children and young people was selected and surveyed with questions that they had to answer according to the acquired knowledge, practice and personal experience.

Summary data and results:

Total	30
girls	12
boys	18

Distribution of answers

years	the boy	girls
14	0	1
15	6	4
16	7	3
17	5	3
18	0	1
	18	12

Given the number of children surveyed, we have indicated the answers to each question, taking into account the percentage.

1. **Do you know what the evacuation route sign contains? Point out a few elements.**
   77% sweat, 23% do not know or do not give an answer.

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2. **Do you know what the evacuation plan should contain?**

87% give a positive answer,

13% give a negative answer

3. **Why do you have to crawl on the floor to get out of a burning building?**

67% gave the correct answer, 33% gave the wrong answer

4. **Do you know if there is at your workplace, school, office, etc. facilities that help people with disabilities?** (ramps, railings, wheelchairs, signal lamps)

All children know - 100%

5. **What do you think is the leading cause of deaths in fires in at home** ?

57% of respondents give the correct answer, and 43% do not know the exact reason

6. **Do you know how to work with a fire extinguisher?**

Up to 30%

Not 70%

7. **When should you use a fire extinguisher?**

In the initial stage of the fire - 57%

If the fire spreads - 33%

As soon as it is close to you and there is a fire - 10%

8. **What is the most important thing to do if a fire ever breaks out in your home?**

Leave the scene of the fire and call 112 57%

Let's start extinguishing immediately until the fire comes 6%

Let's start the shutdown and call 112 37%

9. **Many people were burned because their clothes were engulfed in flames. What should you do if your clothes catch fire?**

Download immediately - 24%

Stop lying down and rolling on the ground 6%

Drizzle with water 70%

10. **Which three things are responsible for having a fire?**

57% of the respondents give the correct answer

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Incorrect - 43%

11. Do you have a fire evacuation plan for your family?

Up to 20%

Not 80%

12. Where can you go safely if you are on the first floor, second floor or basement / attic?

Comply with your workplace, home, school and describe:

Outside the house 87% **;** 13% did not answer

13. Have you seen a pocket fire safety guide? If not, should there be?

Up to 37%

No 63% Of them Need 22% / It is not necessary to have 78%

14. Where do you get information on disaster and fire protection?
(you can specify more than one answer)

Newspapers 20%

Magazines 17%

Internet 77%

News sites 27%

Radio 13%

Television 67%

GDPBNN Bulletin 3%

Conversations with acquaintances 37%

Another 3% of the demonstration

15. Are you familiar with the emergency evacuation procedures operating in the building (s) you are visiting?

Up to 93%

Not 7%

16. Do you need written emergency evacuation procedures?

Up to 37%

Not 63%

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17. **Do you need written emergency procedures in an alternative format (Braille, audio file)**

Up to 20%

Not 80%

18. At the places where you visit, are the signs indicating the emergency roads and exits for unimpeded escape clear?

Up to 97%

Not 3%

19. Has anyone been appointed to help you get out in an emergency?

Yes 73%

Not 27%

20. **In an emergency, do you know how to contact the person (s) responsible for the evacuation of the building (s) and tell them where you are?**

Up to 67%

Not 33%

Excerpts from the survey - CHILDREN

In the case of the respondents, we focus on the answers that differ by more than 30%. This shows that the respondents do not have solid knowledge based on training, but answer for general reasons based on their ideas.

The answers of the boys and girls are almost identical in percentage.

Of interest are the pair of questions 1 and 18.

Almost all respondents 97% say (question 18) that they are clear about the signs that indicate emergency roads, but 3% do not know.

In a more detailed conversation, it was noticed that the evacuation signs were not examined carefully and their exact purpose was not known (77% of the respondents).

The pair of questions 2 and 11 and 16 relate to the use and need for an evacuation plan.

87% say they know what the evacuation plan should contain (question 2). 80% (question 11) did not indicate one in the family, and when asked whether there should be written procedures for emergency evacuation (question 16), a positive answer was whether 37% and 63% thought it was not necessary.

A large part (33%) of the respondents (question 20) do not know how to contact the persons responsible for the evacuation of the building. 67% say they know.

Conclusions :

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Although the surveyed students have some knowledge of evacuation signs, evacuation plans and procedures, their knowledge is not systematic, superficial and needs to be given more attention to these issues, including through on-site training and education.

***Questions 3, 5, 8, 9, 10, 12** deal with the respondents' knowledge of their own safety and knowledge of the fire.*

From the answers given by the respondents, it can be concluded that their knowledge of fire is incomplete and superficial. They have a general idea of the dangers and how to avoid them (questions 3 and 5). Of particular interest are the answers to questions 8 and 9.

Respondents aren't sure what to do in the event of a home fire . Slightly more than 50% give the correct answer - to leave the scene of the fire and call 112, while less than 50% give wrong answers.

Even more alarming are the answers to actions in burning clothes. 70% would pour water, 24% would start taking off their clothes and only 6% would do what is necessary - stop, lie down and roll.

Conclusions :

More attention needs to be paid and fire response issues need to be included in the training modules with practical exercises.

Repeat the basic rules of fire protection constantly. Have more materials and visual lessons.

Questions 6 and 7 concern the training of children to work with a fire extinguisher.

70% of respondents say they do not know how to work with a fire extinguisher. Only 30% of respondents say they are familiar and know.

57% answered correctly for the initial time of using the fire extinguisher, while the other 43% gave the wrong answer.

Conclusions :

The children do not know well the work, the conditions, the ways of using the fire extinguishers. In additional conversations it was found that they do not know well the types of fire extinguishers and their use. Almost no one could explain the safety and dangers of fire when using, storing and recharging the batteries of mobile phones, computers and more. mobile devices.

Question 14 . The answers to question 14 proved to be very useful. They indicated the sources of information on disaster protection and especially on fires. More than one answer is given (Figure 3)

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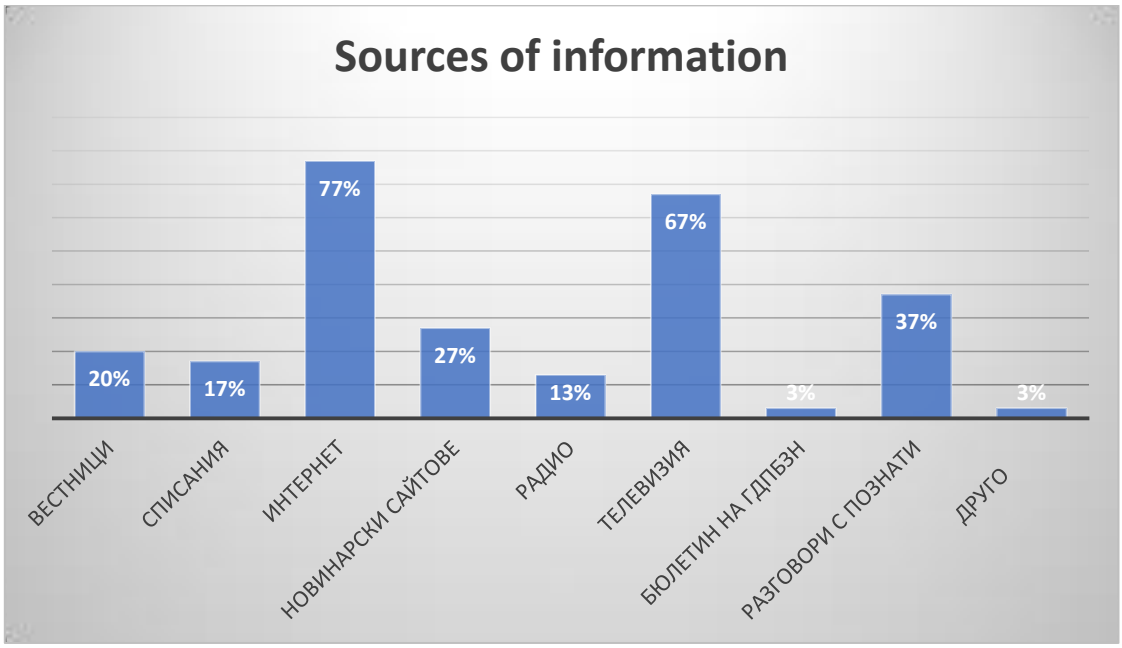

Graph 3. Distribution of the indicated sources of information

As expected, most of the sources cited for information were the Internet and news sites, followed by television and conversations with friends. Although he uses the Internet, only 1 indicated that he had looked at the DGFS bulletin.

Conclusions

The channel for disseminating information over the Internet needs to become much more active and attractive. Young people mainly trust the internet. The website of DGPBZN and RSPBZN Dupnitsa needs to be closer to the needs of young people for information and training. Facebook , Instagram and others are mentioned in separate additional conversations . It is obvious from the study that children actively exchange information with each other and this should also be used in various forms of learning.

B. Survey ADULTS AND PEOPLE WITH DISABILITIES (THE QUESTIONS ARE THE SAME AS FOR CHILDREN)

In parallel with the survey of children, an additional survey was conducted with the same questions of 131 people.

The questions are structured so as to establish the readiness of citizens in the event of a fire.

Different age groups from 21 to 77 years of age were covered, as well as people with disabilities from 27 to 70 years of age.

The distribution by sex and education is shown in Table 4

Distribution of respondents by gender, health status and education.

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The health status of the respondents is summarized in general for men and women. Of all respondents, 78 declared - "healthy" and 53 - "disabled".

Table 4

Gender and health status	**Respondents No.**	**Education**		
		High	**Average**	**Basically**
Men	47	6	27	14
Women	84	43	27	14

We will analyze in more detail questions 1 to 9, 11, 14, 16, 19.

The survey shows that the answers are the most diverse and almost do not depend on education and gender, and the distribution of answers is evenly distributed. The analysis focuses mainly on the two groups of respondents - healthy and people with disabilities.

From the answers to **question №1** , it can be concluded that the signs for evacuation routes and what they contain are not well known. The interview shows that very few of the respondents pay attention to the signs for evacuation when visiting new places. The percentage of non- respondents is very high . The answers of people with disabilities who do not know what the evacuation route signs show are worrying. (Graph 4)

Graph 4

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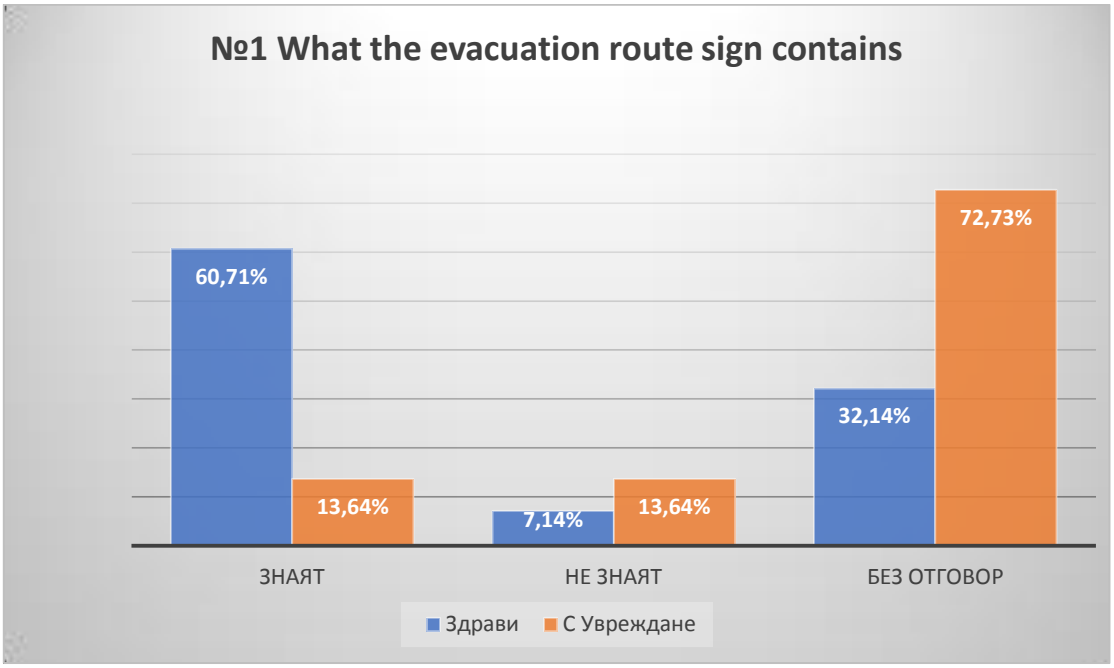
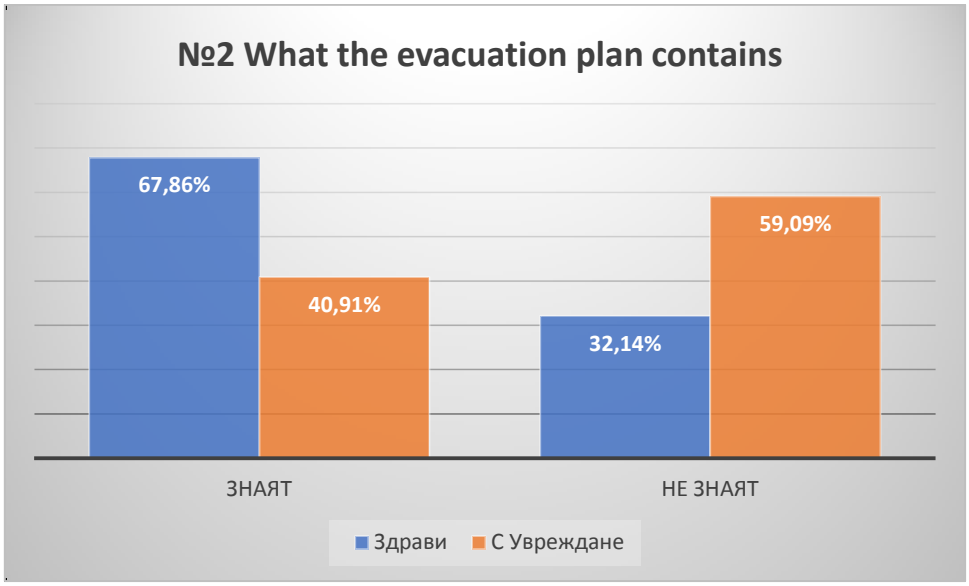


Question №2 addresses the issue of knowledge regarding an evacuation plan. Healthy people are better acquainted with the content of the evacuation plan (Chart 5).

Graph 5



More than 59% of people with disabilities have no idea about the content of the evacuation plan: what it contains and what it is used for. It is obvious that more work needs to be done in this direction and the need to draw up an evacuation plan and training for its use needs to be clarified.

Respondents gave a variety of answers to **question №3** about the reasons for crawling on the floor in case of fire and smoky room. Most of them are correct, but it is interesting that half of the respondents with disabilities know why they should crawl on the floor in case of fire, and healthy people are more familiar with the reasons for crawling on the floor in case of smoke (Figure 6)

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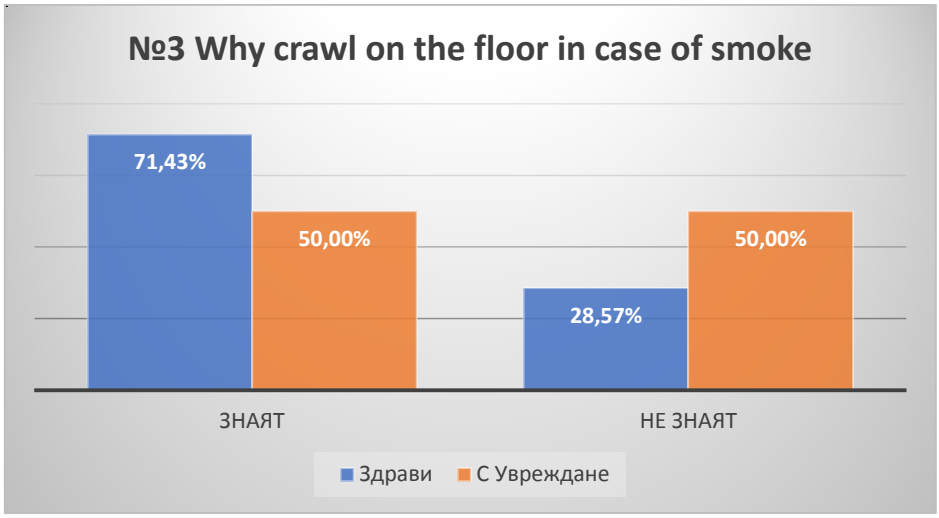
Graph 6



The answers to **Question № 4** give an idea of people's awareness of existing facilities that make it easier for people with disabilities to move. More than 77% of people with disabilities (Figure 7) do not know if there are such facilities in their workplace. This can lead to unpredictable consequences in case of need to evacuate disabled people in case of fire. It is necessary to have signposts, color markings, training not only for people with disabilities, but also for healthy people who are able to help their colleagues with disabilities.

Graph 7

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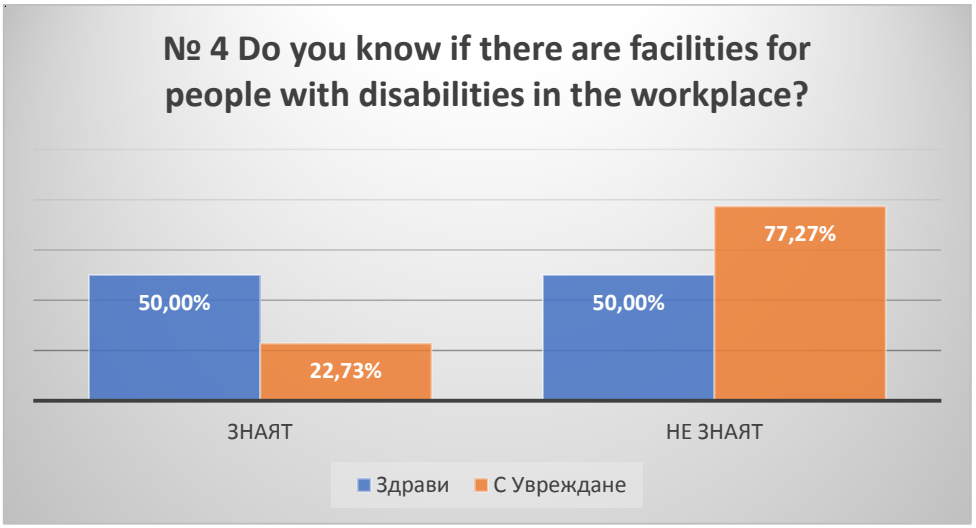
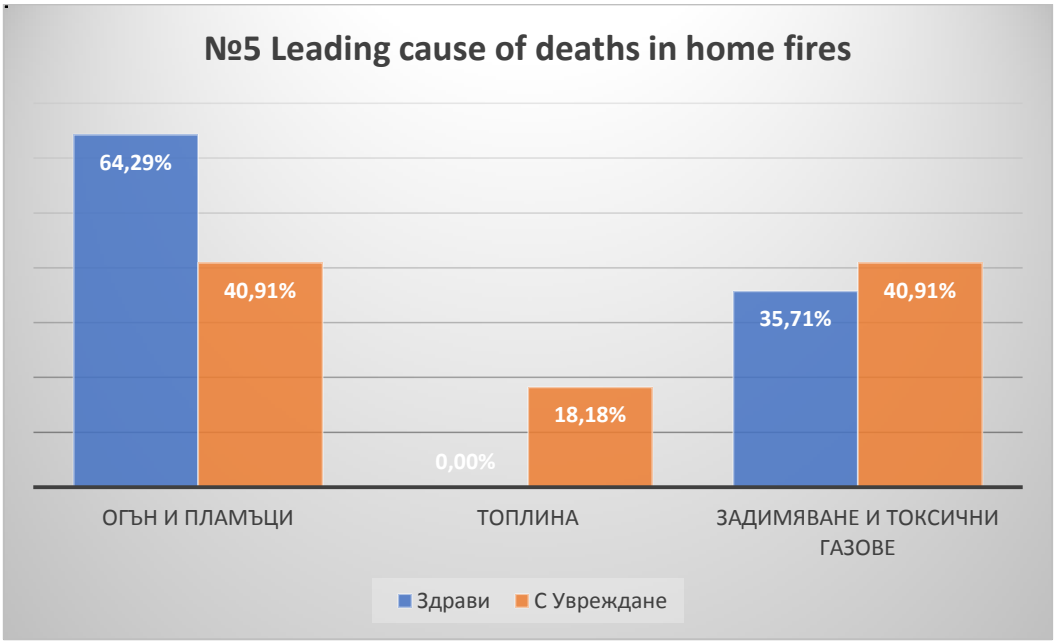


Interesting results are given by the answers to **question № 5.** Regardless of education, both healthy and disabled people give incorrect answers to the leading cause of death in fires. 64.29 of the healthy and 40.91% of people with disabilities stated that the cause of death was fire and flames (Chart 8). It has been observed that people with disabilities are more aware of the leading cause of death than those in good health. Nevertheless, it can be concluded that more training, explanatory materials and explanations are needed for both groups.

Graph 8.



In **question №6** , the percentage of 60.71% of healthy people who do not know how to work with a fire extinguisher is relatively high. (Chart 9). 64.3% of people with disabilities know how to work with a fire extinguisher. Unfortunately, the percentage (36.36%) of people with disabilities who do not know how to work with a fire extinguisher is also high. This may be due to health, but it is not clear in detail. Although healthy people also state (39.29%) that they know how to work with a fire extinguisher, this percentage is very low and

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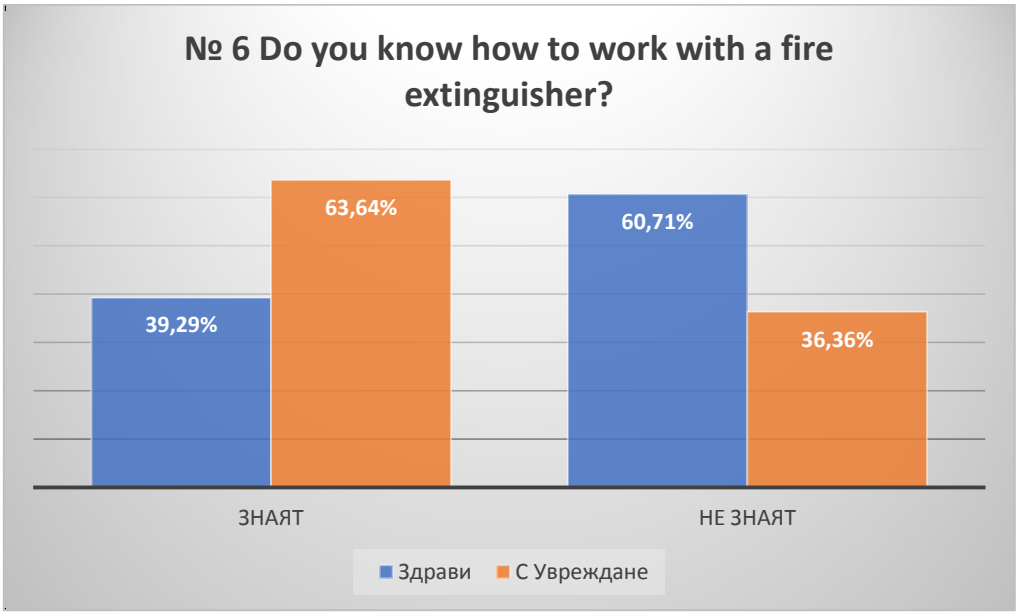
it is necessary to increase the hours for training in firefighting, both for people with disabilities and for students and healthy groups.

Graph 9



A high percentage of correct answers is given by both groups of **question № 7,** (Chart 10).

Graph 10

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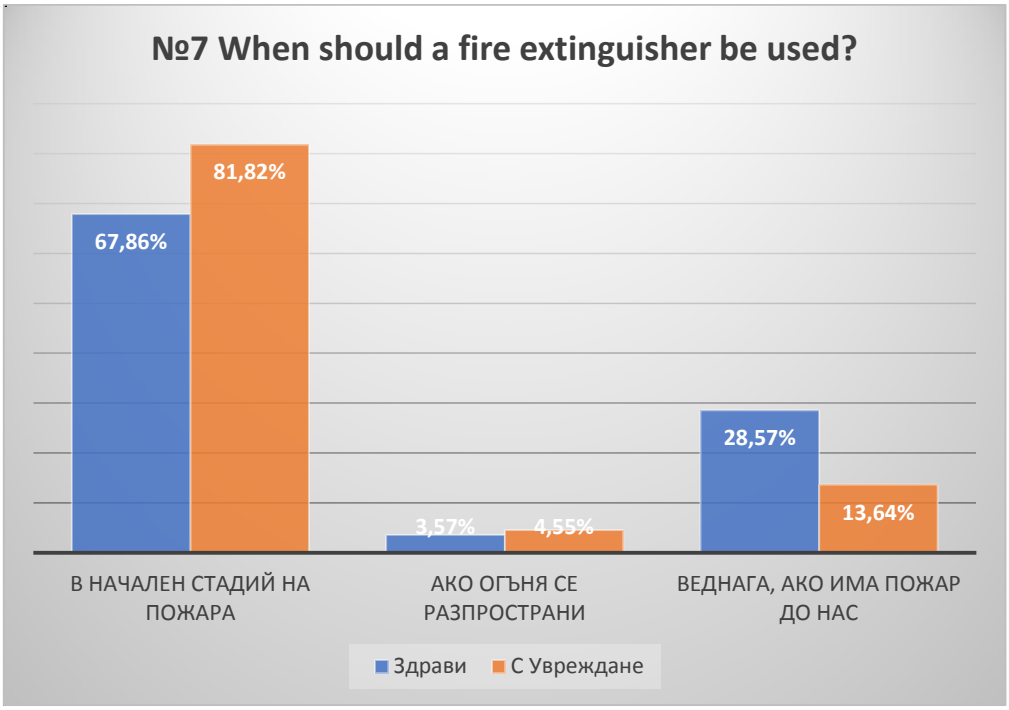

Definitely, the healthy answer the **question № 8.** (64.29%), while only 27.27% of people with disabilities give the correct answers. (Chart 11) People with disabilities are more likely to act impulsively in the event of a fire and rely on their own efforts to put it out by neglecting their safety (45.45%). they need to be more involved in the training of both groups, especially the healthy ones.

Graph 1 1

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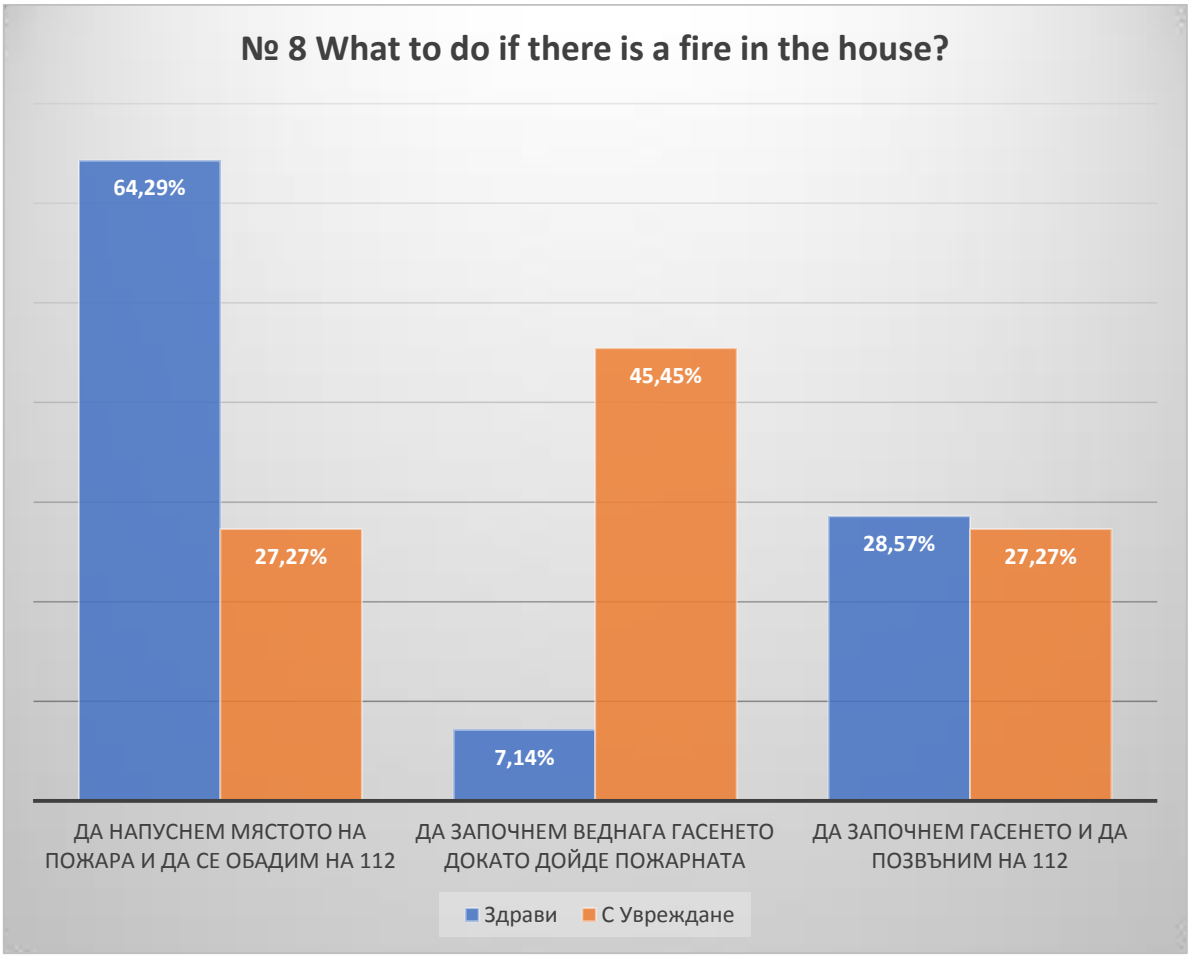

To question №9 , people with disabilities give a higher percentage of correct answers (40.91%) than healthy people (25.00%). The percentage is high for both groups who answered incorrectly. (Chart 12).

Graph 1 2

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Question № 11 answers the question of the existence of a family evacuation plan in case of fire or other natural disaster (Chart 13). As in the survey and in the interview, a huge number of interviewees stated that they did not have a family evacuation plan and therefore never practiced it. Unlike other countries (Japan, Germany, Australia, Greece, etc.), lack of training and knowledge is a major cause of improper evacuation and severe injuries and loss of life in the event of a disaster. At all levels, the development of a family evacuation plan should be promoted, provided and assisted in the creation of such plans, as well as their training.

Graph 1 3

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The results of the answers to **Question 14** on sources of information on fires are expected (Chart 14). Respondents most often cite the Internet as a source of information, followed by television, radio and newspapers. Unfortunately, only 3.57% of the healthy and 0% of people with disabilities indicate as a source of information the Bulletin of the General Directorate for Combating Organized Crime. Although the website of the General Directorate for the Prevention of Corruption (https://www.mvr.bg/gdpbzn) has sufficient information and recommendations for behavior in various hazards and disasters and the website of the Ministry of Interior has been uploaded on the Internet and can be assumed to be a channel for dissemination of information, respondents have not recognized this site as theirs on the Internet.

Graph 1 4

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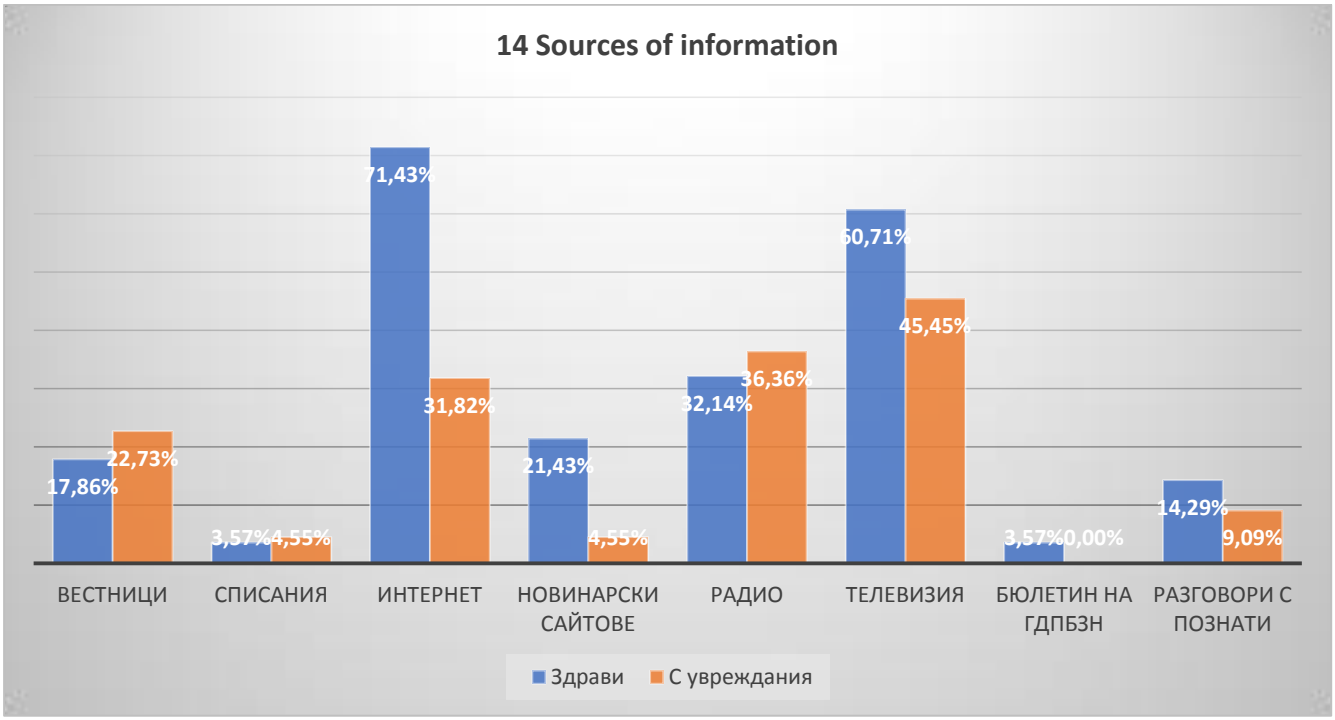

From these answers, it can be concluded that not enough is being done and the most commonly used channels are not used to promote and educate the population. The channel of the Ministry of Interior itself is not sufficiently known to the population as a source of information and recommendations for action in case of disaster.

The results of the answers to **questions 16 and 17 (** Graphs 15 and 16 **) are interesting** . While more than 60% of healthy respondents stated the need for written evacuation procedures, 59% of people with disabilities stated that they did not have such a need even in an alternative format (63.64%). 32.29% of healthy respondents also indicated the need to receive information in an alternative format. The percentage (63.64%) of people with disabilities who do not feel the need to receive evacuation procedures in an alternative format is high. From the conducted interviews it was found that they do not know the different forms of alternative presentation of different instructions, procedures, etc.

Graph 1 5

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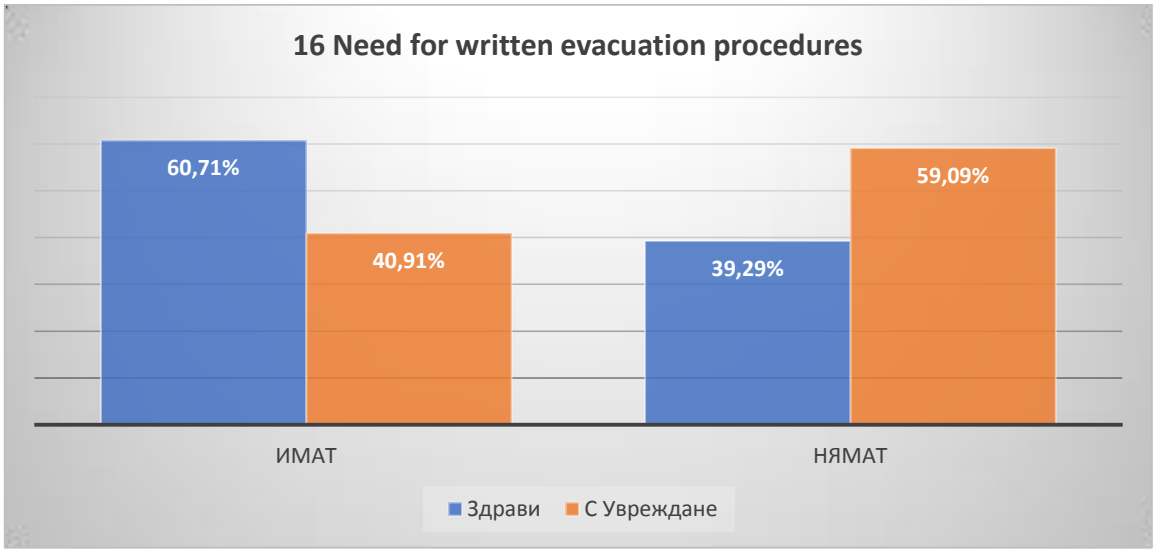
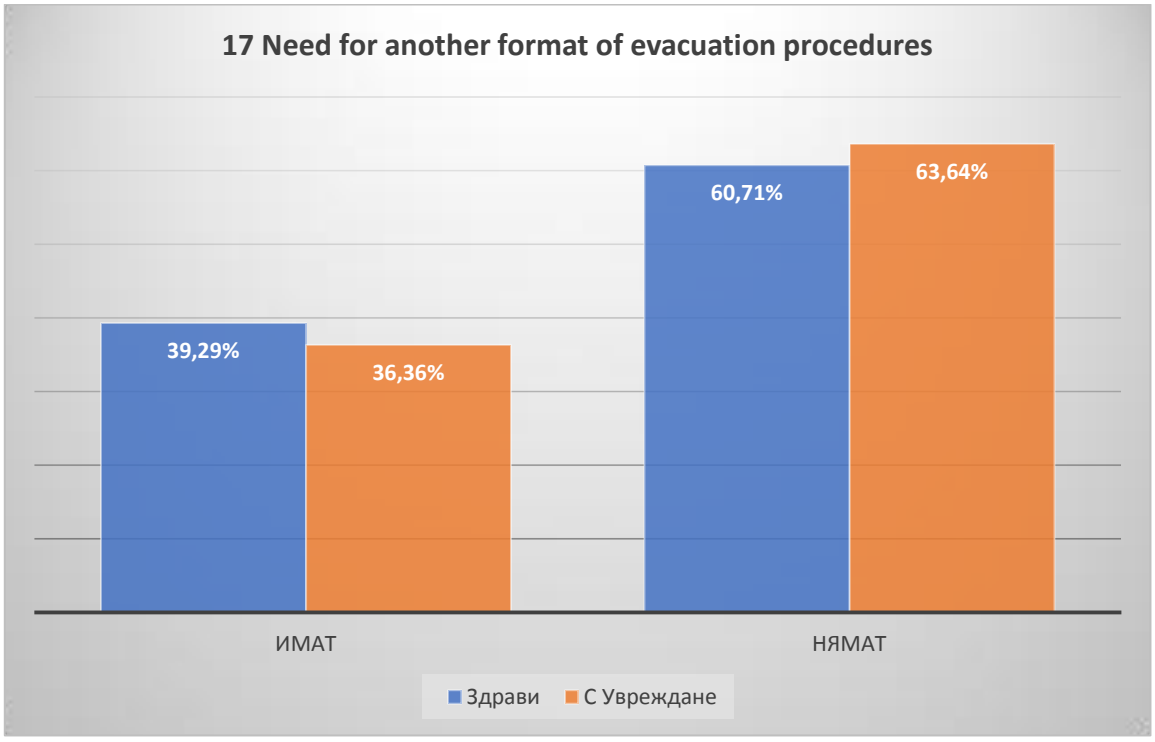


Graph 16



It is necessary to explain the different formats - sound files, Braille, etc., as well as to provide training and coaching in their use.

The answers (Graphs 1 7 and 18) given by the respondents to **questions 19 and 20 are worrying** . Only 4.55% of people with disabilities know who can help them in an emergency, and 95.45% have no idea who can help them. The situation is slightly better for the healthy - 35.71% know and 64.29% do not know who can help.

Graph 17

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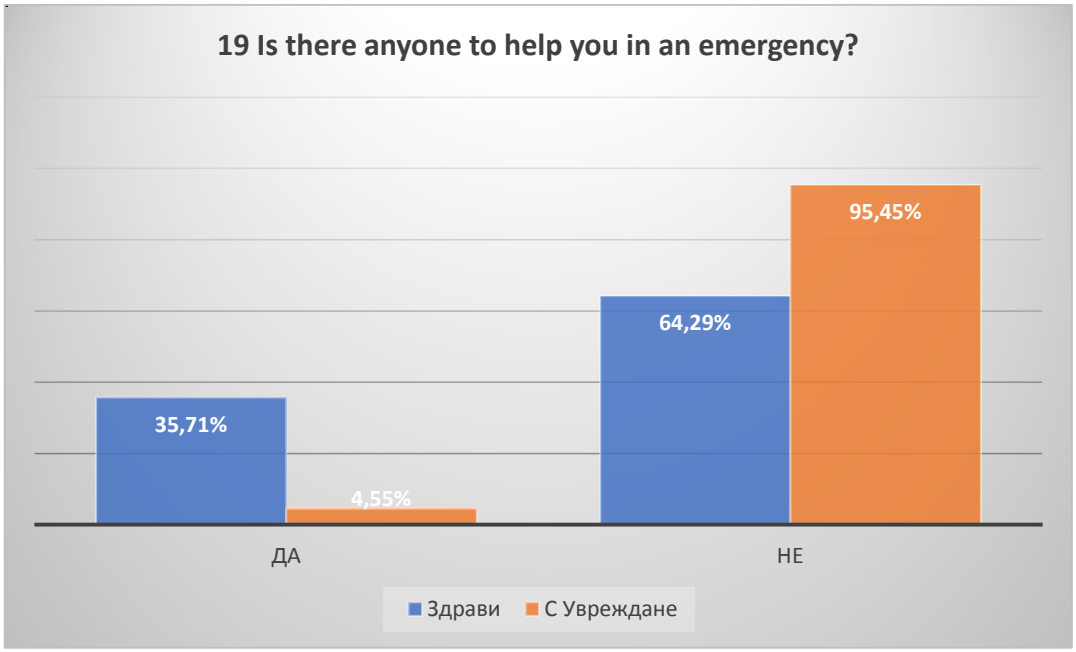

Graph 1 8

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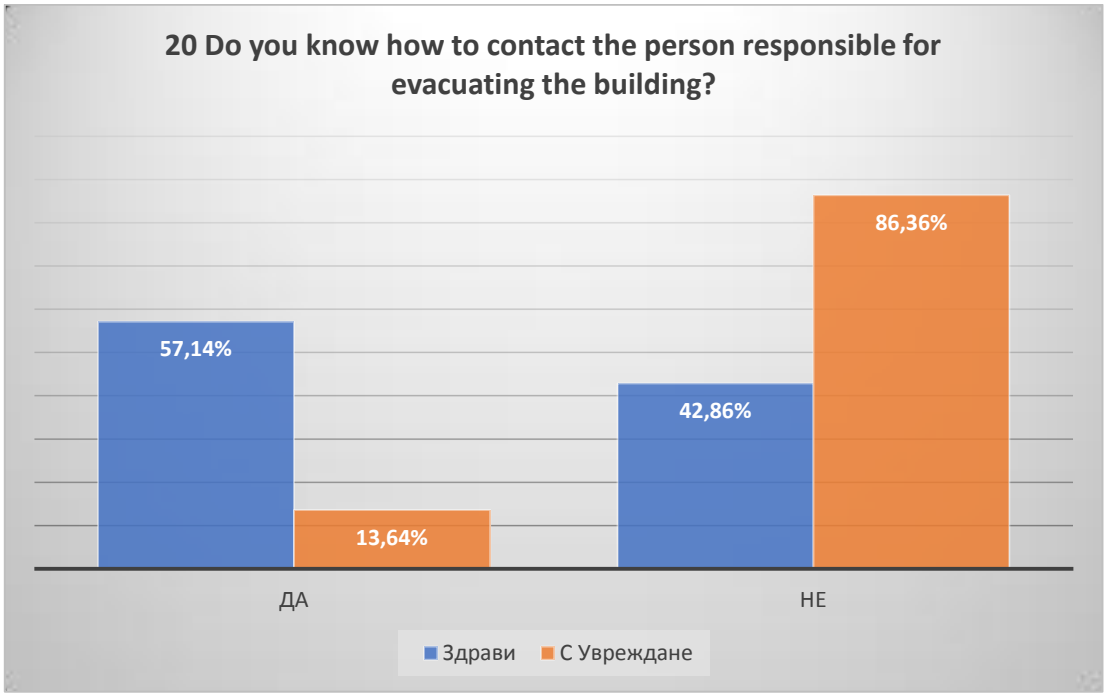

Only 13.64% of people with disabilities know, and 86.36% do not know how to contact the person responsible for evacuating the building where they are. Among the healthy respondents, 57.14% know and 42.86% do not know how to contact the person in charge of evacuation of the building where they are.

Even more striking is that when visiting new buildings where they do not reside permanently, no one has any idea who to turn to in the event of an evacuation of the building. Given that evacuation signs are not known and studied in advance, the result of an emergency evacuation under difficult, real conditions is obvious.

INTERVIEW

The results of the talks, as well as the surveys and interviews, showed the readiness of the communities and the municipality to deal with the challenges of fire, both in the city and on the border mountain - settlement.

The analysis of the responses showed a clear and strong need to assess the possible causes of fires and safety activities.

• to identify emerging fire safety problems

• to assess resource productivity

Questions that were the basis of the in-depth interview. Some of the questions that were included were control questions regarding the conducted surveys. The analysis of the results shows that there are no significant deviations from the answers to the survey and the control questions from the interview.

The survey consisted of 20 closed questions with specifically formulated answers. An additional 30 youth interviews, 234 interviews and 233 surveys of children, young people and adults and people with disabilities of different social status were conducted. In the surveys and interviews with students and children, as well as with adults, permission and consent of the institution or the participants was obtained, without personal data being reported.

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The interviews were structured and the interviewer had a questionnaire and followed the sequence of questions, which included data and information on knowledge of fire risk at work, at home and in the mountains, knowledge of fire science, fire control, safety methods and prevention, as well as some issues of firefighting and fire safety practice. The interviewers also had the opportunity to ask additional questions without manipulating the respondent's mind and influencing his answers.

Children are dependent on adults for their physical, emotional and cognitive abilities for safety, as well as protection against emergencies and disasters. In recent decades, disaster education programs have been seen for children as an innovative approach to disaster risk reduction.

Many theories support the usefulness of these programs. Education can increase children's risk perception.

According to studies conducted in various countries such as Japan, there is a direct link between education, increased risk perception and measures to reduce students' risk. Encouraging children to think about the importance of prevention and preparedness can bridge the gap between knowledge and knowledge-based action.[6]

People with disabilities, as well as the elderly, need special training in specific ways regarding physical conditions and cognitive impairments. If people with disabilities are informed about possible disaster protection practices, they can be saved without assistance in such circumstances. According to some studies, the training of such people is directly related to their survival after disasters.

The questions are intended for different groups. Respondents are asked to give their answer in free text. Possible answers for clarification and explanation of the interviewer are given in brackets). Risk is defined as the probability of something happening that will have harmful consequences (for the life or health of the population, property or the environment). Risk is measured in terms of harmful effects and probability.

The questions are aimed at establishing the readiness of the interviewees regarding:

1. Training
2. Determining the risk of fires
3. Total for fire
4. **Evacuation**
5. Fire protection systems
6. *Work with fire extinguishers*

List of questions:

1. Who do you think are the vulnerable groups that need special attention to increase skills and awareness of disasters - fires, earthquakes, floods?

(Children, the sick, the elderly and people with disabilities. Disability: Limitation or loss (due to inadequacy) of the ability to perform an activity in the manner or to the extent considered normal to humans).

2. Can you identify the hazards that may occur in your area?
   (flood, earthquake, fire, landslides, storms, etc.)

3. What hazards are most likely to occur in your workplace - school, office, home)?

4. Do you know how to analyze the risk of these dangers?

[6][Faber MH, Giuliani L, Revez A, Jayasena S, Sparf J, Mendez JM. An interdisciplinary approach to education and research on disaster resilience. Proceedings Econ Finance. 2014; 18: 601–9].

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(In terms of **probability** - very likely, probably, rare; In terms of **consequences** - catastrophic , large, small, insignificant; in terms of risk **level - extreme, high, moderate, insignificant)**

5. Do you know how to assess the risk?
   (in terms of **severity** - social, infrastructural, economic losses, environment; in terms of manageability - prevention, preparedness, response, recovery)

6. Do you feel the need for conversations, talks, training and exercises to get acquainted with the main types of disasters?

7. Where do you think are the most common places where fires occur?

8. What kind of fire safety training should be provided?
   (theoretical, practice, training, talks, quizzes and games, role-playing games)

9. Describe a specific fire safety event that you attended for training)?

10. Do you know if there are courses and training at work, school, at home for fire safety? Describe exactly where.

11. How much time do you have to spend on fire safety and disaster protection training each month?

12. Where should the training take place - at school, at work, in informal groups, at a training ground for specialists in fire safety and protection of the population?

13. At what age should fire safety training begin?

14. Do you know how to report a fire - at home, in the woods, on a bus, train?

15. Have you had a fire evacuation drill?

16. Do you know who to turn to if you are alone at home and a fire breaks out? Are there people with whom you have agreed what to do if a fire breaks out?

17. Do you have a meeting place if a disaster strikes and you are separated from your loved ones?

18. Do you have a fire alarm in your home?

19. Do you know if there is a fire alarm at the place where you spend the day - school, work, gym, cinema? Where did you see it placed?

20. If you have an alarm at home, is it battery powered? If so, how often do you change the battery?

21. Do you know what the evacuation route sign contains? Point out a few elements.

22. Do you know what the evacuation plan should contain?

23. Why do you have to crawl on the floor to get out of a burning building?

24. Do you know if there is at your workplace, school, office, etc. facilities that help people with disabilities?
   (ramps, railings, wheelchairs, signal lamps)

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25. What do you think is the leading cause of deaths in home fires?

26. *Do you know how to work with a fire extinguisher?*

27. *When should you use a fire extinguisher?*

28. What is the most important thing to do if a fire ever breaks out in your home?

29. Many people were burned because their clothes were engulfed in flames. What should you do if your clothes catch fire?

30. Which three things are responsible for having a fire?

31. Do you have a fire evacuation plan for your family?

32. Where can you go safely if you are on the first floor, second floor or basement / attic?

33. Have you seen a pocket fire safety guide? If not, should there be?

34. Where do you get information on disaster and fire protection?

35. Are you familiar with the emergency evacuation procedures operating in the building (s) you are visiting?

36. Do you need written emergency evacuation procedures?

37. Do you need written emergency procedures in an alternative format?

38. In the places you visit, are the signs indicating the emergency roads and exits and for unimpeded escape clear?

39. *Do you hear the fire alarm (s) in your room or classroom?*

40. Do you need help to get out of your room or classroom in an emergency?

41. Has anyone been assigned to help you get out in an emergency?

42. In an emergency, do you know how to contact the person (s) responsible for the evacuation of the building (s) and tell them where you are?

43. Can you move fast in case of emergency?

44. Do you find the stairs difficult to use?

Excerpts from the interview

The interview questions contained control questions, which covered some of the questions in the survey. The interview was conducted not only with questions, but also with an additional conversation with the interviewees.

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For the purposes of the study, we will focus on the most typical questions that complement the survey and provide a broader understanding of fire safety issues. 30 children were interviewed and responded to the survey.

The questions for risk analysis and assessment (questions 4 and 5) almost all (93.33%) give a negative answer. Although children are responsible, it is advisable to explain more carefully, in detail and according to their age the main points in assessing the risk of disasters - in this case fires. This is confirmed by the desire (83.33%) to have more talks, conversations (question 7) about major disasters (fires).

It is positive that all children have undergone in one way or another training and coaching (question 15) for evacuation in case of fire. At the same time, 70% do not have a designated meeting place for relatives in the event of a disaster (question 17), without even discussing this with their parents and relatives.

All children state that they know and have seen a fire alarm in their school (question 19), they know what it is for, but 100% state (question 18) that they do not have such an alarm in their home. The reason is that the parents are not interested, do not have the means to buy and are sure that they will not have a fire.

The various answers to question 21 show that the children do not have a clear idea of the signs on the evacuation sign. Greater attention needs to be paid to this issue in children's education. None of the children (and later the adults) understand that they are not in the habit of studying these signs when visiting in an unfamiliar environment - buildings, premises, offices and more.

Question 22 answers the question of whether children know about the contents of an evacuation plan. They are not familiar with the contents of such a plan and have not seen. Also (question 31) shows that 90% said they do not have such a plan in the family.

Only 26.6% know how to work with a fire extinguisher, but only 1 indicates when the fire extinguisher is used correctly - in the initial phase of the fire.

Alarming results are given in the answer to question 29 - What should you do if your clothes catch fire (Figure 19).

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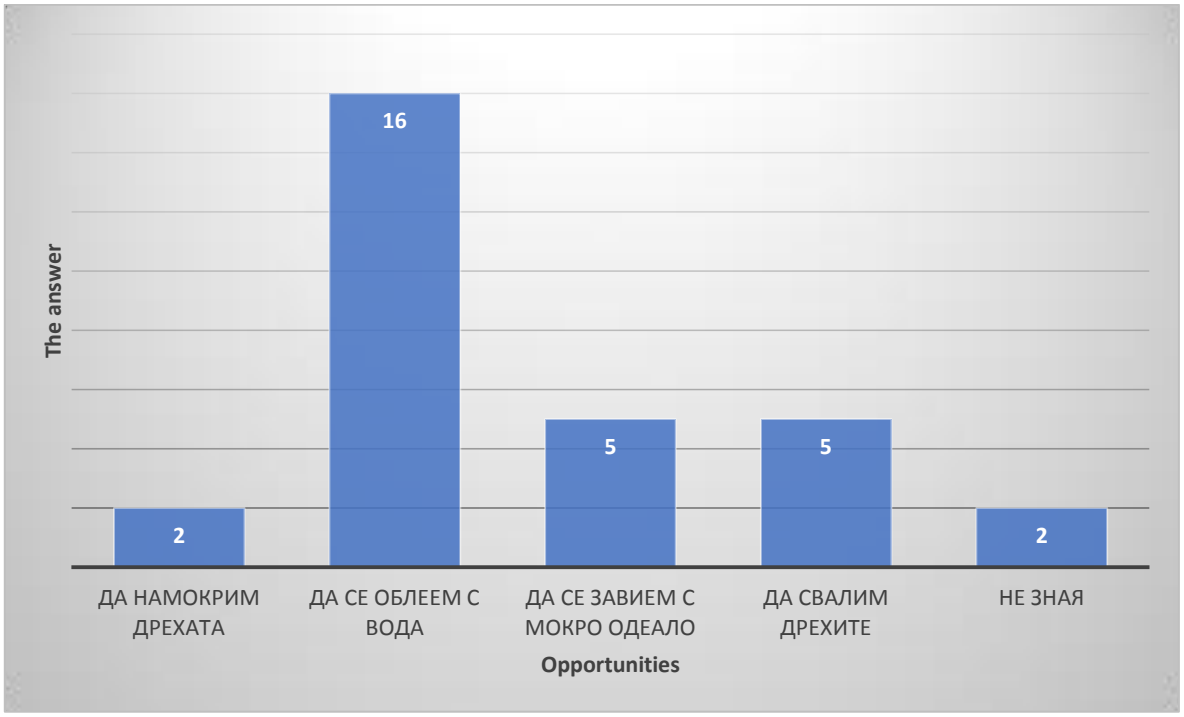

Graph 19

OVERALL STATEMENT OF SUPPLEMENTARY SURVEYS AND SURVEYS

Fire safety is a key component and requirement in infrastructure plans. Providing a fire safety system, such as emergency exits, various types of fire extinguishers, safe evacuation area, fire protection system are mandatory in schools, workplaces, medical facilities, hospitals and laboratories. Fires are not uncommon in hospital rooms, especially now that there is intensive use of oxygen near hospital beds.

Regarding the attitude to fire safety and prevention, respondents were asked to answer 44 free-answer questions. The goal was to evaluate knowledge concerning firefighter triangle , fire safety and control, risk of fire accidents in schools and the workplace. Some of the questions were addressed to people with disabilities. The interview and the survey did not aim to establish a link between the level of education and knowledge of fire safety, although such is definitely the case.

RESULTS

This study includes 263 surveys and 264 interviews with different groups of children, students, employees, people with disabilities, adults, business managers, examining their attitudes towards fire safety and control, fire science, firefighting, safe environment and infrastructure. .

It was found that 5% of respondents participated for one reason or another - victims, witnesses of fires in the past. 95% agree that a fire can occur anywhere.

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The majority of respondents (over 90%) agree that everyone should know what to do in case of fire, how to protect themselves from fire and how to report danger and real fire. Many respondents agree that training and practical training are the things that should be more widely covered in curricula, training in work teams, even at the neighborhood level, without indicating how this can happen and what their expectations are. .

Many respondents (70%) do not know and have not participated in the use of fire extinguishers and hydrant faucets. They do not know the fire triangle (80%) and its components, as well as the different types of fire and its distribution in urban and forest environments.

Almost everyone (99%) knows about the National Emergency and Emergency Call System 112. But not everyone knows exactly what to say when calling.

Due to lack of sufficient experience, insufficient real training and exercises in almost real conditions, we expect that over (90%) will prefer to shout, shout for help, extinguish uncoordinated and inefficient (but demonstrate unconscious activity) in case of fire in their presence.

Most of the respondents (85%) knew the correct method of escape (especially in a familiar situation - school, place of work) and warning people in case of fire and accidents. However, more than 90% are not in the habit of getting acquainted with the indicative evacuation signs when visiting in an unfamiliar environment - shops, institutions, hospitals, etc. Over (98%) no meeting place is designated in case of fire or other disaster and separation.

3 . Specific recommendations to stakeholders when it comes to ensuring better preparedness of citizens in the context of man-made disasters and natural disasters

Orientation is recommended for capacity building and programs, including fire safety, specially designed for children, people of different age groups, including people with disabilities. The programs themselves must be at the national level and accepted for training. A unified certificate for the whole of Bulgaria should be issued to the graduates. Special attention should be paid to regular training.

The infrastructure must be comfortable for the elderly and people with disabilities.

Ramps and railings alone are not enough. It is necessary to create and maintain appropriate infrastructure.

Each building must have at least two exits. It is mandatory to ensure that all corridors, staircases and exit doors are open and passable at all times. All buildings must have appropriate fire-fighting equipment, preferably located near exit doors. Suitable automatic fire detection and alarm systems.

The potential dangers of fire in schools, hospitals, places of recreation, forest, workplace, etc. are huge and they include fuel sources such as combustible materials such as clothes, curtains, etc. fabrics, carpets, wood materials, alcohol, gas lamps, gas cylinders, bottles with flammable liquids, gas pipelines, sources of ignition such as oxygen, waste materials - old wooden windows, car tires, etc.

It is necessary to strengthen habits and learn techniques for rescuing other victims.

It is advisable to include fire and disaster related content, prevention and control methods and precautions in a disaster management curriculum.

Practical exercises are crucial to ensure the safety and protection of life.

Hours of practical work with a fire extinguisher should be increased. Many respondents do not know at what point the fire extinguisher should be used, and also in which fire which fire extinguisher is used.

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There is not enough understanding and ways to save when burning clothes. Many students and young people give priority to watering and taking off their clothes.

It is not explained in detail how to read the evacuation signs.

Almost none of the respondents indicated that they have a fire action plan at home,

Municipalities must be prepared to provide psychological assistance to separated families and children left alone.

GIS environment

The use of GIS technology is necessary to be present in RS PBZN of Dupnitsa. The GIS tool has been shown to be useful not only in risk assessment, but also in other types of planning, preparedness and disaster response and recovery activities. GIS map projects are made up of layers of data. Each of the layers can be created from different data sources and stored in a standard relational database. In this way, GIS is much more than a map - it is an information system with location information that allows you to create, manage and display relevant data. Because information can be organized by specific geographic location, it allows you to see the relationship between different layers of data.

First of all, determine the data sources, as well as their update and use in GIS layers.

Identify and increase the available experience in working with GIS and potential training requirements. This may include a GIS analyzer; other fire services or organizations using GIS; and sources of training. It can also be useful to network with GIS user groups in your area, as well as collaborate with other fire departments. The use of GIS platforms helps to analyze the spread of fires, the movement of fire, working with volunteers, updating escape routes and sharing information with the community.

The first step in risk assessment is to identify buildings or properties that could harm the community if a fire occurs. Employment, size, safety of life and economic impact are some of the criteria used to assess the risk of a building or property.

Understanding risk can be a time-consuming process and reducing the time required to make an assessment saves firefighters money. It also allows them to regularly assess their community and measure the effectiveness of mitigation strategies. Targeted hazard analysis is usually applied by fire departments who want to understand the risk in their community and use the assessment to prioritize pre-planning activities, fire inspections and other risk activities in the community.

Include the following information products in the target risk analysis:

ArcGIS Pro design package used by fire service personnel to identify properties and buildings that could lead to loss of life or have a negative impact on the community if a fire occurs. When you implement an ArcGIS solution in your organization, you also receive an ArcGIS element Solution that organizes key information products and summarizes all included elements of ArcGIS (applications, forms, projects, maps, feature layers, layer views, etc.). The ArcGIS element Solution also illustrates all the dependencies that the elements have on each other. The map of FIG. 8 illustrates a model of sarin gas jet and color-coded concentration zones.

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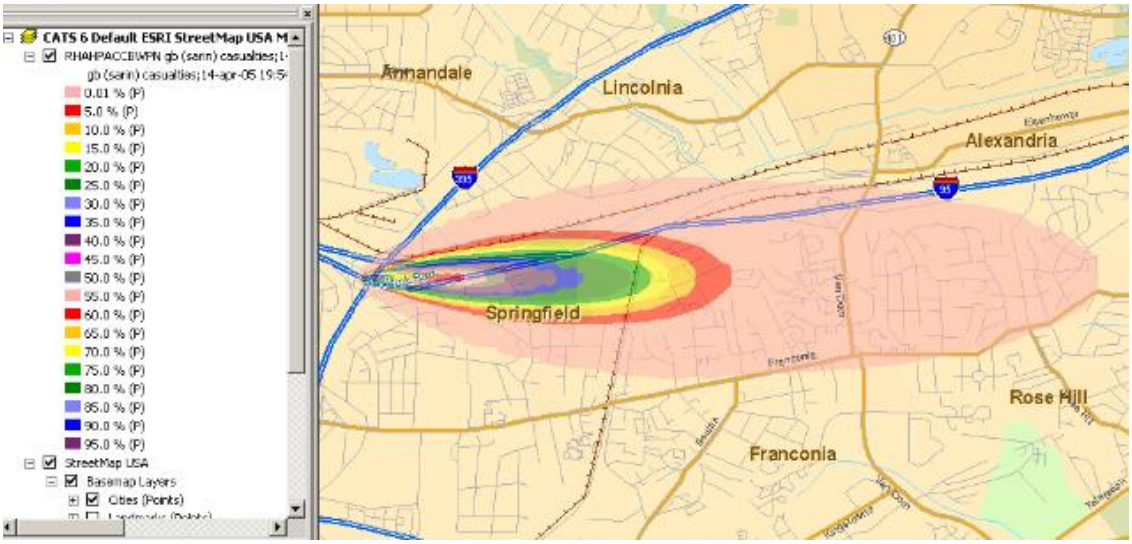

Fig.8 Model of sarin gas jet and color-coded concentration zones. *ESRI GIS Technology and Applications*

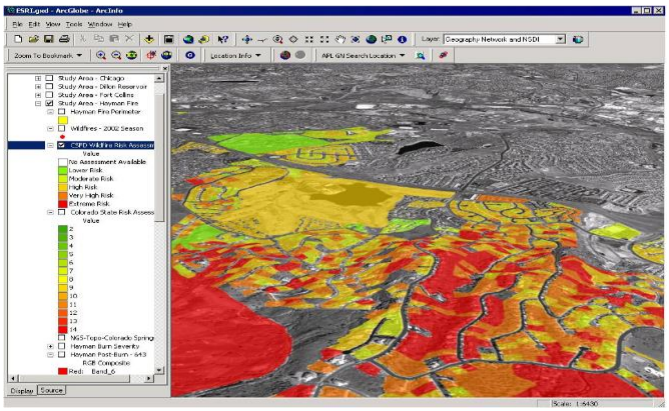

Fig.9 GIS illustration of fire hazard zones. ESRI GIS Technology and Applications

FIG. 10 shows strategy models using a GIS environment

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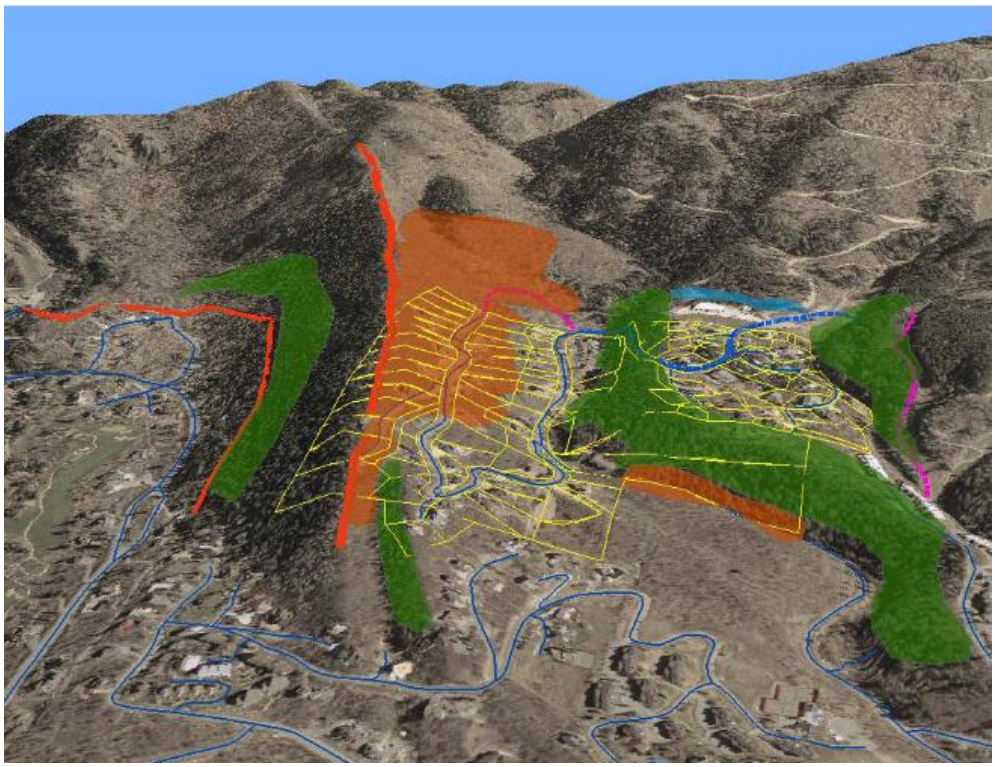

Fig.10 GIS modeling of potential fire protection strategies for the wilderness-city interface. ESRI GIS Technology and Applications

Meteorological forecast and analysis

Inerreg project when analyzing weather forecasts , maps and routes Greece-Bulgaria www.risk.map .

Summarized and verified meteorological information from several meteorological sites using artificial intelligence is used. Through the combined use of meteorological forecasts as well as GIS maps, regional analyzes of possible storms, wind direction and speed, air and soil humidity and many others are made (Fig . 11, Fig. 12).

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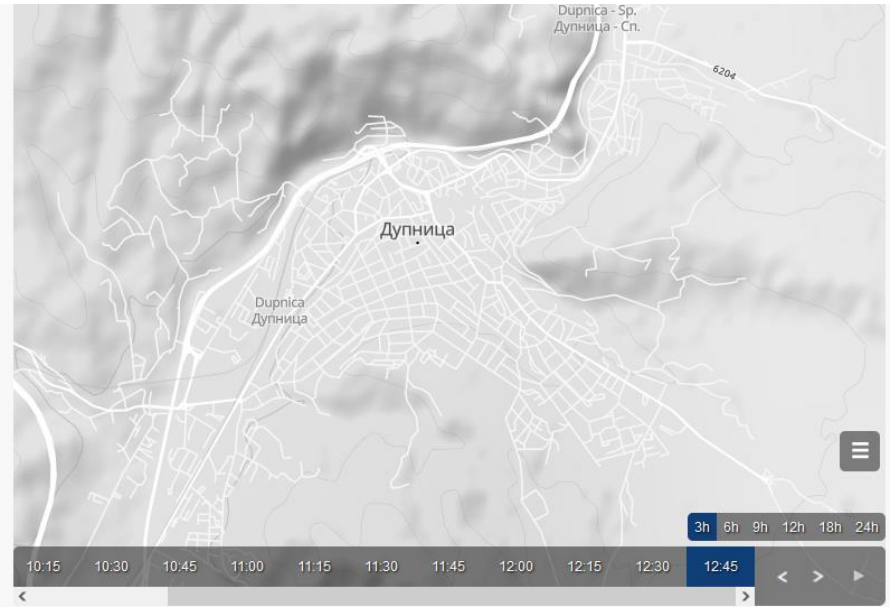

Fig.11 Satellite image for rains www.Meteoblue.com

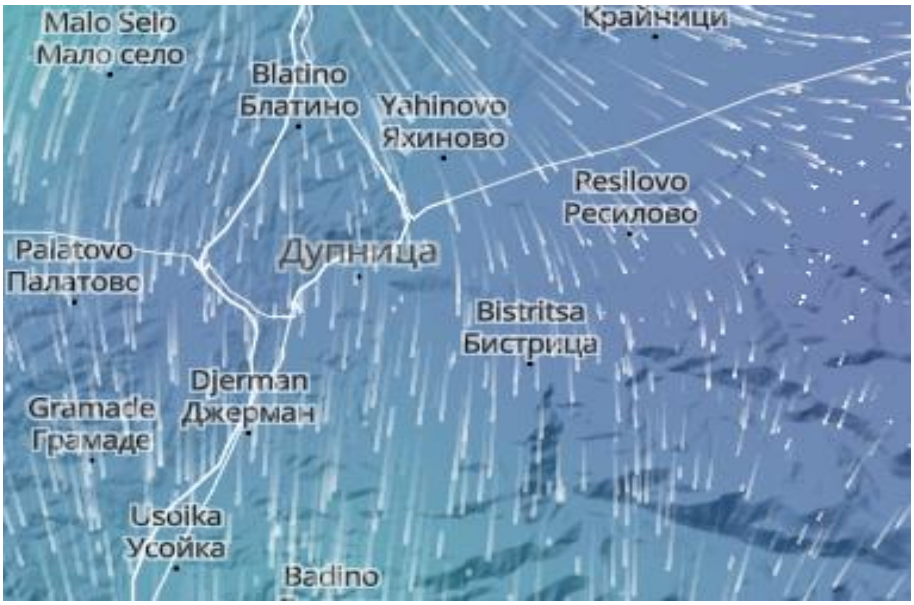

Fig.12 Satellite image for rains www.Meteoblue.com

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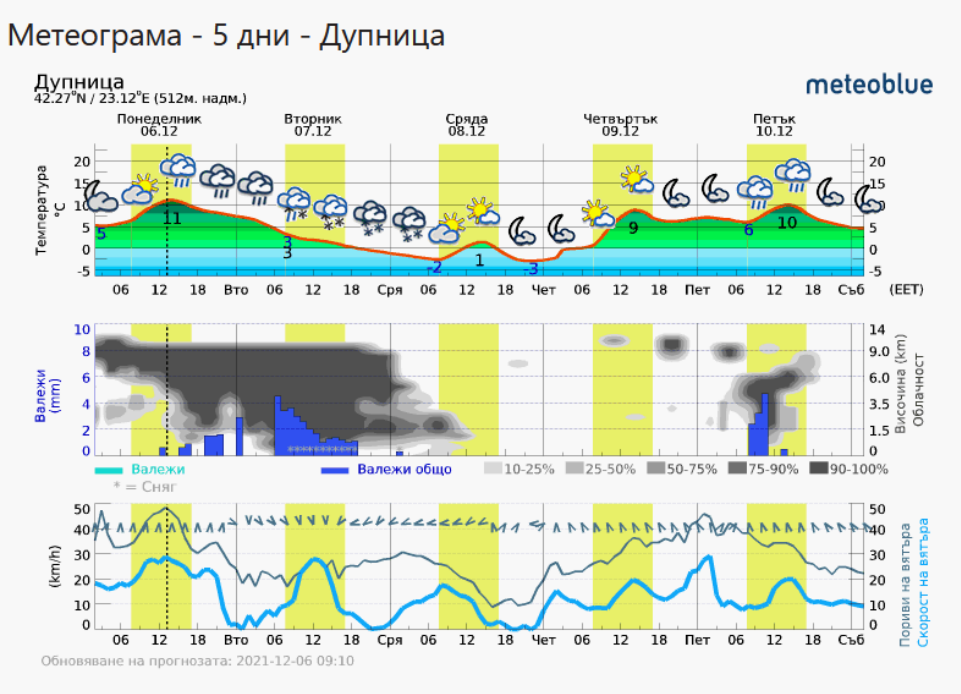

FIG. 13 Meteogram for Dupnitsa. www.meteoblue.com

The combined data on wind speed and direction, humidity and temperature of air and soil, atmospheric pressure, amount of precipitation, (Fig. 13, Table 5)) silvicultural characteristics of the area, soil terrain, vegetation type, population density and other data allow quick analysis of the situation in case of time deficit for making managerial decisions in case of disasters and accidents.

Table 5

Дата и час	Температура	Атм. влажност	Атм. налягане	Кол. валежи	Посока и скорост на вятъра	Влажност на почвата	Температура на почвата	Точка на оросяване
07 Dec 08:00	6.99°C	100 %	1001.5 hPa	0	ЮЗ - 1.51 m/s	96.47 %	9°C	6.99
07 Dec 07:50	7.09°C	100 %	1001.5 hPa	0.25	ЮЮЗ - 2.01 m/s	96.47 %	9°C	7.09
07 Dec 07:40	6.93°C	100 %	1001.5 hPa	0.25	ЮЗ - 3.02 m/s	96.47 %	9°C	6.93
07 Dec 07:30	6.85°C	100 %	1001.7 hPa	0.25	ЮЗ - 0 m/s	96.47 %	9°C	6.85

Monitoring of evacuation routes, forces and means, voluntary formations

The use of GIS maps, meteorological forecast and hourly analysis of changing climatic conditions, and the development of the situation, can be determined by pre -set basic and backup evacuation routes. The introduction of information about the available forces and means, the exact location and quantities of equipment, materials

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and consumables for extinguishing urban and forest fires and their effective management, saves lives and property.

Scenarios and models for determining and assessing the risk of forest fire. Evaluation and mapping model for identification, classification and mapping of fire hazardous areas

Scenario development that includes natural and human factors in each step of determining the risk of forest and urban fires.

For example, in determining the risk of forest fires, we propose to apply the methodology shown in Fig . 14.

Fig.14 Scheme of the methodology for risk of forest fires

The first step is to gather data and information from various sources. The main goal of risk assessment is to assess the potential for forest fire hazard. There are four steps as follows:

(1) Collection of satellite images and other forest fire data for

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Risk Assessment;

(2) Hazard identification, vulnerability. Analysis of the capacity to respond to emergencies

(3) Spatial analysis, (GIS specialist analyst), and

(4) Export of a map of the forest fire zone.

In each fire service, a combined hazard map , vulnerability map and emergency response map need to be developed and tested with a practical focus to reflect the integrated risk in the region.

A final forest fire risk map would be useful for identifying on-site firefighting resources and would improve the safety of forests and urban areas and communities, especially near forests.

Fire is an uncontrollable burning in time and space, threatening the property, life and health of people.

The natural disaster for the district is characterized by large forest and field fires, which arise from thunderstorms, intentionally or by lighting a fire during the dry months of the year. The rugged terrain makes it extremely difficult for the forces and the technique to quickly control them and stop their spread. On the territory of Dupnitsa, fires can occur in a number of alpine, difficult to access and cross-border forests with significant material and environmental damage.

Risky fire hazardous sites are cereals in June, July and August throughout the district.

The fire can be caused by thunderstorms, intentional or created in violation of technological discipline at the sites.

Важно условие за съпричастността на гражданите и тяхната подготовка по превенцията от пожари е наличната информация за възникнали пожари.

Практиката показва, че нито на национално, нито на областно или общинско ниво има обобщена верифицирана и подробна информация за възникнали пожари. Намирането на такава информация е трудна, бавна административна процедура, която нито е в полза на гражданите, нито на организациите, които искат да помогнат в анализа на пожарите, така и на самите пожарникари, които могат да имат полза от сравняване на минали пожари с актуални такива.

Detailed information is available online in most countries in Europe, Asia, Africa, the Americas and Australia.[7]

The European Forest Fire Information System (EFFIS) was set up by the European Commission (EC) in cooperation with national fire administrations to support services responsible for protecting forests from fires in the EU and neighboring countries, as well as to provide EC and European Parliament with harmonized information on forest fires in Europe.[8]

[7] T he European Forest Fire Information System (EFFIS) (https://effis.jrc.ec.europa.eu/about-effis)

[8] http://effis.jrc.ec.europa.eu

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Since 1998, EFFIS has been supported by a network of experts from the countries of the so-called Expert Group on Forest Fires, which is registered with the General Secretariat of the European Commission.[9] This group currently consists of experts from 43 countries in Europe, the Middle East and North Africa.

The European Forest Fire Information System (EFFIS) (Fig. 12) consists of a modular web geographic information system that provides near-real-time historical information on forest fires and forest fire regimes in Europe, the Middle East and North Africa. . EFFIS fire monitoring includes the full fire cycle, providing information on pre-fire conditions and an assessment of post-fire damage.

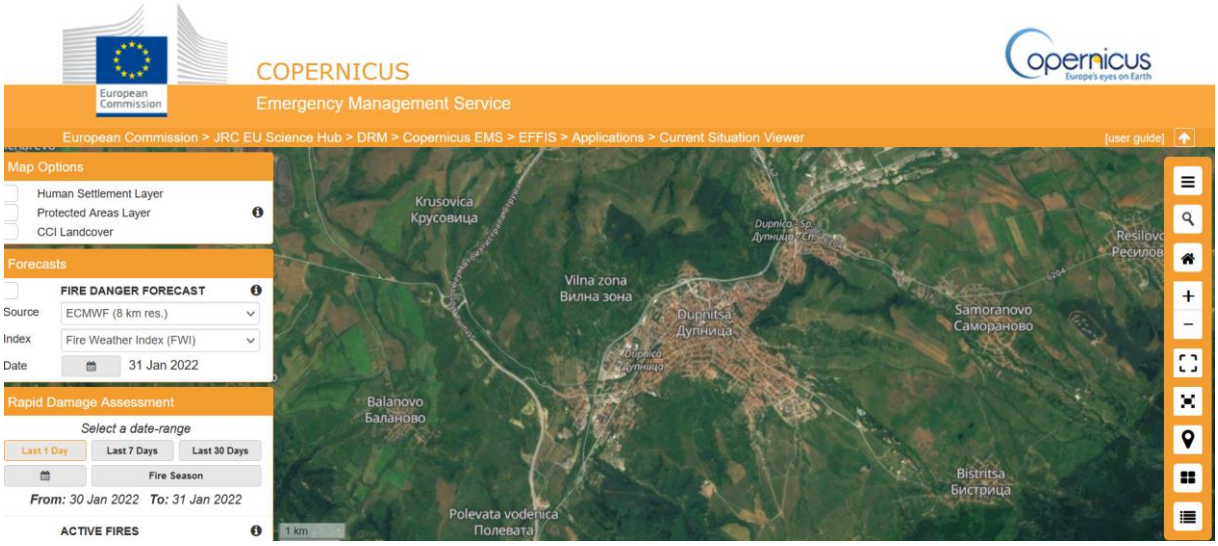

FIG. 12 View of Dupnitsa, designed by Copernicus . Source: https://effis.jrc.ec.europa.eu/apps/effis_current_situation/

EFFIS includes, starting from the pre-fire state, the following modules:

Fire hazard assessment
Rapid damage assessment, which includes
Active fire detection
Assessment of the severity of the fire and Assessment of the damage to the ground cover
Estimation of emissions and smoke scattering
Assessment of potential soil loss and vegetation regeneration.
In addition, another EFFIS module supporting fire surveillance is the Fire News module [10], which locates the geolocation of all forest fire news published on the Internet in one of the European languages.

Almost real-time information on the first two modules mentioned above is provided through the so-called "current situation" review tool.[11]

EFFIS is based on the so-called fire database, which includes detailed information on the individual fire records provided by the EFFIS network countries. Currently, the data in the database includes nearly 2 million

[9] http://ec.europa.eu/transparency/regexpert /index.cfm?do=groupDetail.groupDetail&groupID=416
[10] http://effis.jrc.ec.europa.eu/applications/firenews/
[11] http://effis.jrc.ec.europa.eu/applications/current-situation/

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records provided by 22 countries. The information on the data in the database is provided through the EFFIS fire history application. [12]

4. Good examples, practices and initiatives at local, national and transnational level to educate citizens on the issue, such as various fire academies, trainings, seminars, etc.

Good practices are related to real-time risk management - in the event of a forest or city fire, assessment of the damage to the burned areas and potential recovery efforts.

The basis for reducing the risk of fires is the collection and dissemination of information on good practices in connection with the successful development of full-fledged policies in this area.

The risk of a fire in the workplace can hardly be denied.

Preventing fires in the workplace is one of those topics that people easily ignore and postpone. This is because people think that this cannot happen to them and fires are not something that will happen soon. Unfortunately, without adequate planning and training, the consequences of fires can be severe. If you are not careful, you can put your workers' lives and the future of your business at risk.

What are the best practices to reduce the risk of fire during work?

The benchmarks are generally three - from eliminating the dangers of fire to appropriate training of employees to drawing up an evacuation plan.

There are many things a company and its employees can do to reduce the risk of fire. Last but not least is the danger of fire during repairs in a building where many people live.

Such a fire broke out in 2006. In the Boila hypermarket in the capital.

The fire broke out in a room where refrigeration equipment was being repaired, and when cutting sheets with an angle grinder, flying sparks set fire to the thermal insulation, which is not even visible, hidden under the sheet metal panels. Black smoke was highly toxic from styrofoam burning. There were many offices, warehouses, etc. in the hypermarket. Fortunately, there were no gassed or injured people except one, who was transported to Pirogov 's toxicology . The causes of the fire were improper operation, lack of control and instruction of workers.

Eliminate hazards in the office

Office appliances, machines, electrical outlets, cables, etc. pose a potential fire hazard. You also need to pay attention to your kitchen, because most fires in the office and in the household start there. To be safe, follow these tips:

Make sure all office machines and appliances are always in good condition. Repair any damage immediately.

Do not overload electrical outlets and circuits. For example, if you use heaters or other energy-intensive appliances, do not connect them to the same power strip at the same time.

[12] http://effis.jrc.ec.europa.eu/applications/fire-history

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Always keep flammable objects away from electrical equipment, especially those that generate heat. For example, your trash cans or recycling bins should be kept away from electrical appliances.

Make sure that the kitchen area and equipment there are always clean, dry and well ventilated and especially free of oil and dust.

Always keep a fire extinguisher in the kitchen where everyone has access to it. Conduct briefings, especially with new employees to learn about fire extinguishers and how to use them properly.

Be sure to turn off all appliances after use, especially in the kitchen area.

Make sure there are no unnecessary objects or furniture in front of the fire exits.

Install fire alarm systems - smoke detectors

They are the first line of defense in case of fire. Smoke detectors, along with the rest of the fire alarm system, help you and your staff detect the first signs of a fire before it spreads and causes significant damage.

Types of fire alarm systems and their choice

The best way to determine what works best for you is to use a fire safety professional.

There are 3 main types of automatic fire alarm systems: conventional, wireless and addressable.

Conventional fire alarm

This type of fire alarm is what most people think of when they think of a fire alarm. It divides your rooms into wide zones and in case of a signal the fire alarm panel identifies the zone. This system is best suited for smaller or lower risk environments.

Addressable fire alarm

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This system is more intelligent, as each individual fire alarm device has its own unique email address. If someone activates, the fire alarm panel tells you exactly where the problem is. It is most suitable for larger or riskier environments such as schools, nursing homes, hospitals.

Wireless fire alarm

This intelligent system works in a similar way to an addressable fire alarm, but lacks cables. Instead, the system uses a secure wireless connection between the sensors and the fire alarm panel. It is usually most suitable for rooms where saturated wiring is not suitable, such as churches and historic buildings.

Always use the best fire alarm systems in the rooms where you work or live. Do not save money in this regard, but as we said - first seek the advice of a specialist in this field.

Make sure you check all smoke detectors and sprinkler systems at least once a month. After the inspection, make sure that you document correctly so that you know what has been checked and what you need to fix.

Under no circumstances should you deactivate a smoke detector or other device that is part of the fire alarm system.

Designate people in charge of working with fire hydrants or fire extinguishers. This is especially true for staff in hotels, hospices, malls, hospitals, repair shops and more.

It is also possible to install additional automatic fire extinguishing systems at home - these are sprinklers.

Create and implement an evacuation plan

An evacuation plan is a guide that helps employees on what to do in the event of an accident. Always remember that the best way to prevent a fire in the workplace is to prepare in advance.

A well-planned emergency evacuation procedure is essential, but it is only effective if everyone in your organization has been trained in fire safety. Education and training are key.

Make sure everyone receives regular training and understands the importance of fire safety.

Employers are required by law to provide information, instruction and training to employees on fire safety measures in the workplace.

Your evacuation plan should include basic and alternate evacuation routes. That way, if part of the building is affected by fire or blocked, your employees will have other alternative ways out of the building.

Choose a collection point that is a safe distance from your building. Make sure everyone knows which routes to evacuate and where to gather. This is achieved through training . Appoint a person in charge to

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direct all personnel to this area in the event of a fire. Confirm that all employees are reported in the event of a fire and no one is left in the building.

Do the same for family members - identify a few places you could go to in an emergency, such as a friend's home in another city or hotel. Choose destinations in different directions to have options during an emergency.

Your evacuation plan should be applicable to all staff members, regardless of their gender, age or physical condition.

If a family member or staff member needs extra help, make sure you have a personal emergency plan and evacuation plan that clearly explains how to evacuate.

Compose, distribute and instruct occupants and staff of the building on fire prevention methods and what to do in case of fire.

Place exit routes and maps in visible areas of your workplace. Make sure everyone can see it.

Practice this plan by doing office workouts as many times as you can.

Explore alternative fire safety measures in the event of a temporary shutdown of firefighting equipment or systems so that the safety of occupants is maximized.

Develop and promote procedures for the use of elevators, stairs and evacuation of building occupants requiring special assistance.

Established procedures to assist the fire brigade in accessing the building and locating the fire. For large facilities, it is recommended to place floor plans on each floor, showing starting points.

Develop a reporting system that can report all occupants of the building after an evacuation, including notifying the fire department of all missing occupants and their last known location .

Contact the professionals from RS PBZN Dupnitsa for more details and recommendations.

Firefighters

The following rule applies in normal risk areas:

Less than 20 employees: At least one firefighter;

With 20-75 employees: At least two firefighters;

For each additional 75: One additional person in charge.

Attention is paid if the organization works in shifts. Every shift must have such a person in charge.

Training

Fire safety training is not just about what to do when a fire alarm goes off. It is also about fire prevention and methods to minimize damage if a fire breaks out. Prevention is the best form of firefighting. Training can stop fires.

Employers are required by law to provide information, instruction and training to employees on fire safety measures in the workplace. What are the four steps that need to be covered?

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Good practices

- Interaction with the local authorities, LU - Dupnitsa to ODMVR - Kyustendil, FSMP - Dupnitsa, voluntary formation to the municipality of Dupnitsa and others.

- Providing electronic information materials for the population and the information site of the directorate and in other electronic media, as well as direct participation in the specific coverage of information in the media in a complicated operational environment under PBZN during campaigns and socially significant events and others.

- Conducting training meetings for adolescents and outreach activities among the working population.

- Raising the awareness of the elderly over the age of 65 as the most at-risk group by giving presentations in pension clubs and day care centers for the elderly.

- Carrying out preventive activities through the participation of employees in mobile teams.

- Participated in conducting practical exercises with the components of the ESS, conducting fire -tactical exercises with the staff and year-round theoretical training.

- Maintaining fire and rescue equipment in working order and constant operational readiness.

- Involvement of volunteers in conducting trainings and exercises together with the employees of RSPBZN - Dupnitsa.

- Preparation of joint plans for ensuring fire safety in forest areas.

- Increased control in ensuring the fire safety of the sites during the spring-summer fire season, the autumn-winter heating season, the harvest campaign, etc.

- Preparation of brochures on various topics and their distribution among various target groups of employees under the PDK.

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Good practices

Development of specific measures / based on good practices / to be implemented by local businesses to assess and improve the safety of their employees, as well as a wide range of recommendations to citizens to make their living environment safer, to prepare properly in case of fires and learn more about the steps they can take to prevent such dangers in their daily lives.

96% of forest fires are the result of human negligence. Only 4% of forest fires arise from nature, everything else is the result of human negligence and a very small percentage of intent. (Desislava Taneva, former Minister of Agriculture and Food)

Prevention is the main method for preventing, reducing or quickly eliminating fires and fires. The main measures that municipalities need to take to reduce the risk of fire are:

- Conducting preventive activities - training, maintenance of people and firefighting equipment;
- Keeping the forces and means ready, including the communication and information system for monitoring, analysis and assessment of the situation;
- Defining the duties and responsibilities of each of the participants in the rescue activities and in the elimination of the consequences of fires;
- Maintenance of the old and construction of new barrier barriers and strips;
- Appointment of fire observers for timely notification in case of mass forest and field fires, construction and maintenance of observation towers, fire depots and boards;
- Establishment of extinguishing groups in town halls and in State forestries, establishment of an organization for mass participation of forces and means for extinguishing forest and field fires;
- Timely notification of the population, the governing bodies and the forces necessary for carrying out rescue and urgent emergency-recovery works in case of mass fires;
- Providing all kinds of assistance to the population caught in the area of the mass fire.
- Making maps classifying forest areas according to the degree of fire danger;

Climate change and increasing the risk of fires

Areas with very low or low fire risk could feel an increase in risk, as climate forecasts show an expansion of the forest fire risk area. Consider studies on the effects of climate change on forest fire trends before deciding whether to develop fire-intensive projects with greater intensity than those previously experienced in the region.

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Insurance

For the risk of a wildfire that cannot be mitigated, consider insurance products that can be used to account for the probability of loss and the rate of return on assets.

Equipment

In many regions, human activities cause most fires. Common activities that cause accidental ignition and spread of forest fires include welding, grinding, defective machines, discarded cigarettes, cooking and explosive bearings.

Think for the locals systems for warning for the weather on forest fire and activate levels and find out how these se used locally. Regional fire services can advise on the appropriate level of fire hazard, for which the widespread use of potential sources of fire should be avoided or managed.

Modify activities in response to these warning systems, such as limiting ignition sources and restricting certain arrangements or access activities. Restricting certain activities may be a legal requirement that, if not followed, could lead to legal liability.

Fire risk mitigation and management

Reducing fuel (eg by cutting) is a key strategy for forest fire risk management.

Oh secure access to water supply , which can Yes continue Yes provides water in case on interruption on electricity supply or the effects of forest fires on the water supply infrastructure itself. An uninterrupted water supply can be used to put out small fires. Consider the effects of forest fires affecting your power grids and backup systems for important materials and documents.

Analyze the different plant species that are afforested. Related projects _ s the forest farm or the rural farm , follows Yes subject to on evaluation whether the increase on the quantity fuel (specific vegetation subject to afforestation) or the introduction on new fuels in given zone would could Yes increase risk from forest p fire at the local level.

Analyze available or designed warehouses to store and use on combustible or dangerous materials. Assess the consequences and the impact it will have on the forest fire in zones for storage .

Planning, design and construction practices

Both in urban environments and in forests, where there is construction of construction sites and buildings (hotels, villas, villages), take into account the potential for combined action of strong winds and additional effects of wind on fire development.

It is important to choose the building material used for the construction of buildings and especially their facades, which is a non-combustible material. Conventional construction techniques using and / or a combination of steel and concrete have been shown to be reliable in the event of a fire, provided that these structures are well sealed.

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Plan the load of the road surface, slopes, clearance and turning circles to allow access to fire vehicles in case of fire.

Surveillance, early warning and notification systems for managing authorities, response forces and the public

It is obvious that the nine fire alarm towers built on the territory of the Southwestern State Enterprise are not enough. The towers themselves do not work if there is no modern equipment for monitoring in different optical ranges, mapping, communications or so-called. automated systems for the prevention of fire accidents in forests.

Training of managing authorities, response forces and the population

The bodies of the executive power and the other state bodies organize training of the employees from their subordinate units, services and other operative structures for implementation of fire protection activities;

Providing regular training of children from kindergartens and schools for behavior and action in case of fire;

Conducting exercises to test the interaction between the governing bodies, the components of the Unified Rescue System and the population in case of fire.

Preparation of instructions, movies, internet presentations - rules of conduct and actions of the population in case of fire.

Preparation of instructions - rules for behavior and actions of the population in case of fire in order to broadcast them through the media, and if necessary with mobile alarm systems installed on vehicles.

Directorate of Emergency Aid and Prevention (DAPP) - Sofia Municipality, commissioned the creation of training films on urban and forest fires, floods, earthquakes, radiation and nuclear pollution, which were broadcast in the corridors of municipal and district administration, and which were distributed in other municipalities , forestry, schools, etc.

DAPP - regularly conducts education and training of children, adults, employees of embassies and companies at the landfill of Sofia Municipality in Pancharevo (Fig. 13).

Fig.13 Training of children in fire safety

The rules of conduct of the population in case of forest and field fires are of special importance in the cases when the settlements are very close to forest or field massifs.

It is important that the population is aware of the fire situation to prevent panic and hysteria. Be familiar with evacuation routes and assembly points.

Financing

Apart from the usual sources of funding - the national budget - for voluntary formations;

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- municipal budget - for the governing bodies, municipal administration and the population;

Pursuant to Art. 18, para. 4 of the Disaster Protection Act, funding or co-financing may be sought from other sources, such as European Union funds.

The Rural Development Program 2014-2020 envisages enabling the state to complete fire towers throughout the country. The funds of 20 million euros under measure 8 "Investments in forest development and improving the viability of forests" of the program are sufficient to build fire towers to complement the national unified information system for fire prevention. Whether the program is implemented is a matter of another consideration.

problem is the construction of the national unified information system for fire prevention

Application

Business proposals

1. Business checklist before evacuation

1. Always evacuate if you think it is not safe to stay. Do not wait to receive an emergency notification if you feel threatened by fire.

2. INVESTIGATE YOUR EVACUATION AREA

You may need to evacuate quickly. Study in advance your community's emergency response plan in case of fire and have a plan of where to go.

Follow the instructions of the local authorities. They will provide basic and backup recommended routes to leave your location

3. STOP THE GAS CONSUMPTION OF YOUR SITE

In the event of an emergency, the supply of gas must be switched off to prevent the feeding of fire.

4. MOVE INFLAMMABLE EQUIPMENT

Move pallets, tables and chairs, benches, outdoor equipment, signs, inventory and bulk combustible items indoors.

5. CLOSE DOORS AND WINDOWS

Close all interior and exterior doors and windows and leave them unlocked.

Close the commercial garage doors completely. Closing doors and windows can prevent fire from entering the house or structure and igniting combustible materials, burning them from the inside out.

6. SWITCH OFF VENTILATION HOLES

This will help prevent external smoke from entering the building and causing preventable damage.

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7. KEEP YOUR PROPERTY EASY VISIBLE AND ACCESSIBLE FOR FIREFIGHTERS IN SMOKE CONDITIONS

Leave your lights on so firefighters can see your building in smoky conditions.

8. EVACUATION

Evacuate immediately if authorities tell you to.

9. Provide infrastructure for people with special needs.

10. Conduct regular evacuation drills.

11. Designate people in charge of the various activities to cover all working hours.

2. General rules of conduct and information on fires for all population groups

In order to be able to anticipate and avoid fires, it is most important to learn what the combustion process itself is, as well as to study the most common causes that can lead to a fire , and of course to avoid them.

Fire is the visible effect of the combustion process - a special type of chemical reaction. A reaction occurs between oxygen in the air and some fuel. The products of the chemical reaction are completely different from the starting material.

The fuel must be heated to its ignition temperature to produce combustion. The reaction will continue as long as there is enough heat, fuel and oxygen. This is known as the fire triangle (Fig. 5)

FIG. 5 Fire triangle - oxygen, fuel and heat are needed to start a fire.

Fire is a combustion that spreads uncontrollably over time and space, characterized by the release of heat accompanied by smoke or flames, or both (BDS ISO 842 -1).

Chemical reaction in the combustion process

Fuels can be solids, liquids or gases. During the chemical reaction that causes a fire, the fuel heats up to such an extent that (if it is no longer gas) it releases gases from its surface.

Only gases can react during combustion. Gases are made up of molecules (groups of atoms). When these gases are hot enough, the molecules in the gases decompose and, together with oxygen from the air, form new product molecules - water molecules (H 2 O), carbon dioxide (CO 2) molecules - and other products if combustion continues.

The heat generated by the reaction is what sustains the fire. The heat of the flame will keep the remaining fuel at the ignition temperature. The flame ignites the exhaust fumes and the fire spreads. As long as there is enough fuel and oxygen, the fire continues to burn.

Fuel + oxygen (from the air) = fuels (mainly CO 2 + H 2 O) + heat.

Classification of fires

Fires can be divided into several groups depending on where they occur - in the village: buildings, houses, offices, shops, public places; on the field; in the forest; in a vehicle.

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Fires can be caused intentionally - criminal acts or inadvertently - welding, smoking and throwing the butt in inappropriate places, non-compliance with technological discipline, vehicles or damage to electrical installations, engines or gas installations in cars.

Without human participation - are characterized by the fact that there is no immediate presence of people in the event of a fire - short circuit of electrical installation, charging batteries, gas leaks and more.

From natural phenomena - lightning, earthquakes, landslides.

Causes of fires in the home

The most common causes of fires based on statistics for 2011-2015 are presented in the following diagram.

Cooking barriers and ovens

With them we have open fire or ignition in a closed volume - ovens, toasters , stoves and pans, microwave ovens.

Fires caused by stoves and ovens are the main cause of home fires and injuries. Most cooking fires start with the ignition of ordinary household items (ie wall coverings, paper or plastic bags, curtains, etc.).

Kitchen fires are most often caused by:

- Leaving food for cooking unattended;
- Placing fuels and substances too close to the heat source;
- Accidental switching on or off of equipment.

At open fire, barbecues, etc. the wind can blow coals and ignite dry grass and twigs (Fig. 6). Left unattended by the fire at the end of cooking, it can ignite and the wind can spread it to neighboring areas.

FIG. 6 Dangerous outdoor barbecue

What safety rules can we apply in these cases:

- Never leave food to cook on the stove unattended and carefully observe the preparation of food in the oven;
- Keep cooking areas clean and do not place flammable materials (matches, lighters, deodorants, towels, rags, curtains, napkins, food packaging, etc.);
- Keep children and pets away from cooking areas by creating a "child-free area" around the stove. Teach children to follow the rules of safe cooking and fire protection with you;
- Turn the handles of the pan or saucepan inwards so that they cannot be hit or children grab them;
- Wear short, tight-fitting sleeves when cooking. Loose clothing can be hung on stove burners and ignited;
- Never use wet gloves, as this poses a risk of burns if the moisture in the glove heats up;

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- Always use a glove and hold the lid with the other hand. If a small fire appears in the pan or skillet, place it in the oven and blow out the flames by gently sliding the lid over the pan. Switch off the burner. Do not remove the lid until it has cooled completely. Never pour water on greasy and burning surfaces, as water and burning fat are scattered around the kitchen, so the fire can spread around;

- If there is a fire in the oven (Fig. 7), turn off the heat and keep the door closed to prevent burns and fire in the clothes. Call the fire department.

Fig.7 Fire in the oven

- If there is a fire in the microwave, keep the door closed and turn off the power. Food cooked in a microwave oven can be dangerously hot. Remove caps or other coatings from food that will be placed in the microwave. Do not use metal utensils in the microwave;

- With gas hobs, be careful when placing the pot or pan. The flame expands more than 100% to the side, slides along the bottom of the pan and can ignite objects placed next to the hob or burn and ignite the wall next to the cookware.

Heating installations

Safety tips when using heating systems.

Heating equipment and installations are the second most important cause of fire at home. Half of the heating equipment is used in November, December, January and February.

Some simple steps to follow can prevent most heating fires:

- Store everything that can burn at least three steps from the heating equipment - stove, fireplace, wood stove or portable boiler;

- Set a limit of 1 meter to declare a "childless area" around open fires and boilers;

- Never use the oven to heat your home;

- Use only professionally made radiators and installations - boilers, fireplaces, ovens, central heating. Follow the manufacturer's instructions and instructions;

- Heating equipment, filters and chimneys must be cleaned and inspected annually by a qualified specialist;

- Remember to turn off the portable heaters when you leave the room or go to bed;

- Always use fuel specified by the manufacturer for the heaters;

- Make sure the fireplace has a sturdy screen to stop the embers from escaping into the room. The ash must be cooled before placing it in a metal container. Keep the container at a safe distance from your home;

- Test smoke alarms at least once a month;

- Use reliable UPSs and batteries for water jacket fireplaces and solar water heaters. If the power supply is interrupted for a long time, switch off and do not supply fuel to the fireplaces. Circulation pumps will not run after the emergency batteries have been used up and water may boil in the system, leading to explosion of the chamber, destruction and fire.

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Electric blanket

It is nice to feel the warmth of the blankets on cold days. Electric blankets are often used (Fig. 8). They are convenient but also dangerous if not used and maintained properly. Each season, check for damage or wear before using your electric blanket.

Fig.8 Danger when using an electric blanket

Check the cable, control switch and plug for damage and look for worn or exposed wires or breaks in the heating element.

To check, turn on the blanket for 15 minutes at the highest heating temperature, with continuous monitoring, and then turn it off. Run your hand over the blanket and check for hot spots. Hot spot means that the heating coil has been crushed or damaged. This may result in fire or electric shock. Take it to a service center for repair or replace it with a new one.

Use an electric blanket only to warm the bed. Reduce heating if you are in bed or preferably before using it to avoid overheating. Overheating can be life- threatening , especially for many young, sick or elderly people. When installing the blanket, make sure that it is not wrinkled, as folding can damage the heating elements. Secure the blanket using the fasteners . No pins or sharp objects should be used. Keep the cable and control switch away from the bed so that they are not damaged.

Putting clothes or other things on the bed while the electric blanket is on can cause the blankets to overheat and cause a fire. Never leave the electric blanket unattended for an extended period of time when it is turned on.

Never use an electric blanket if it is wet. Dry carefully according to the manufacturer's instructions. Never drink in bed or put a hot water bottle in bed when using an electric blanket. Electric blankets should not be used for young children. If the blanket is damaged, any moisture can cause electric shock.

In summer, store the blanket in corrugated cardboard, on the bed or in a dry place where no objects will be placed. Never fold your blanket, as this can damage the heating elements.

Some people are more sensitive to electricity than others and may feel a slight tingling sensation from the electric blanket, even in the off position. Any such sensation from an electric blanket or other electrical appliance must be checked by an electrician or other competent person before further use. Never buy second-hand electric blankets.

Small electrical appliances

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Store small electrical appliances, such as toasters , kettles, irons, hair dryers, hair straighteners, etc., until they are unplugged and unplugged.

If the appliance accidentally falls into water, unplug it immediately without immersing your hands in the water. Make sure it is also unplugged before attempting to remove it from the water. Do not attempt to reuse the appliance until it is completely dry and checked by an electrician or other competent person. Care must be taken not to use it by anyone else who does not know that the appliance has been immersed in water. Place a warning message on the appliance or remove it from its normal use until it has been checked.

Never place metal objects, such as a knife, screwdriver, etc., in appliances such as toasters , heaters or dryers, especially if they are still plugged in.

Plug

Make sure the plugs are properly inserted in the sockets. A short circuit may occur if you have loose or partially removed cables from the pins and the outlet itself is connected to the mains.

Use plugs with insulated pins.

Use SHUKO plugs. The name "Schuko" is an abbreviation of the German word " Schutzkontakt " (literally: protective contact), which means that the plug and socket are equipped with protective earthing contacts. Typically, Schuko connectors are used in circuits with 220/230 V, 50/60 Hz and for currents up to 16 A. In rooms with baths and showers, washbasins, laundry rooms, rooms with heaters for saunas, sockets are used, specially designed for installation in such places.

Do not overload the network by connecting many high-power consumers to one socket - boilers, ovens, irons, etc. This poses a risk of fire. Install an additional outlet instead of risking a fire.

How to connect a plug to cables

We recommend that you buy molded plugs that do not require reconnection. If you need to connect cables to a plug, study the diagram below and make sure you always connect the correct color with the correct letter. Most often, the colored wires inside the power cords look like the picture. They must be connected as shown below.

According to BDS HD 308 S2: 2004 for identification of cores of rigid and flexible cables for single-phase consumer the blue conductor is connected to zero (N), the brown conductor is connected to phase (L), and the yellow-green is grounding conductor (PE) and in most cases it connects to zero.

Electric switches

The main thing to know about electric switches for lighting is that they interrupt and supply only phase to the luminaire.

FIG. 9 Switching on the luminaire via a simple electric switch

The zero of the electrical installation is attached directly to the luminaire (Fig. 9).

The cables you use and connect must be new, free of scale, without damaging the insulation.

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Power strips

Power strips are electrically portable devices with several electrical outlets mounted on a portable housing. This allows you to turn on several appliances at once.

Check the maximum load and be careful not to exceed it.

Power strips are ideal for supplying electricity to appliances that consume minimal power, such as computers and televisions.

They should not be used with appliances that consume high power such as heaters, electric kettles, washing machines and stoves. These appliances must be plugged directly into the socket.

Power strips are often used in old houses, where sometimes there is only one socket in a room. They are used to accommodate the growing number of appliances in households, even in new homes.

Use power strips safely

Usually most couplers include 2 to 8 sockets. They are removable and are often placed far from the place of inclusion in the wall, which leads to a risk of physical damage, as they can easily be dropped or pressed under furniture. These damages are not always obvious and often go unnoticed. The result of these damages and breakages often leads to poor electrical contact between the pins of the included appliances and the coupler. Check regularly for wear. If the power strip is damaged, stop using it and replace it.

Poor electrical contact and overload is the main cause of fires, especially if the connected appliances are powerful consumers: heaters, electric kettles / kettles, washing machines, stoves.

These consumers must be plugged directly into an electrical outlet and not into a power strip, because when used together, they may exceed the allowable total load of the power strip.

Never use them in wet areas if they are intended for "indoor use only".

Always keep the power strip out of the reach of small children.

Additional safety features for power strips

When possible, choose power strips with additional protection features such as:

Excluded nests that do not allow children to insert anything into them.

Built - in RCD (Residual Current Device) , which will automatically turn off the power in case of incorrect grounding.

Surge protector that prevents damage to sensitive electronic equipment from electric shock.

When there are holidays - Christmas, New Homeland, fire safety measures are absolutely mandatory.

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Do not allow artificial trees and decorations to obstruct corridors, exit roads or other exit roads.

Wreaths can be hung on the outside of the outer doors.

Decorative luminaires must be low voltage for indoor use. A maximum of 3 circuits of electrical contact lights can be used. Outdoor lights must be weatherproof and intended for outdoor use. No lights can be installed on all-metal artificial trees or supports.

When installing decorative lighting fixtures, do not glue or pin the cable, do not run wires under carpets or through the door. Before installing them, check the light cables for broken sockets or slots.

Do not hang decorative lighting on pipes or in any of the corridors. Torches and candles are not allowed. Turn off all decorative lights when you leave the building. Do not let the lights shine at night.

Do not leave the Christmas tree with lighted candles and sparklers unattended. It is absolutely forbidden to light a sparkler on the Christmas tree and go to the other room to watch the fireworks. Sparks from the sparkler can ignite cotton on the Christmas tree, curtains, carpet and other combustible materials around it!

Deliberate fires

Some of the fires caused are the work of criminals who cause fires for various reasons. Whether it is revenge, destruction of evidence - cars, crime scene or clearing land for new construction, they are a criminal act.

Another category of people cause fires when clearing sidewalks, mainly in agricultural areas, or burning forests to provide timber. These arsons can grow rapidly and uncontrollably and become unmanageable in a very short time, leading to major damage to vast areas that affect the lives and property of many people, in addition to direct losses to burned forests or forests.

CIGARETTE FIRE

Smoking materials, including cigarettes, pipes and cigars, caused about 17,200 domestic fires in the United States alone in 2014. The fires caused 570 deaths, 1,140 injuries and $ 426 million in direct property damage. Smoking materials caused 5% of reported domestic fires, 21% of deaths at home, 10% of domestic fires and 6% of direct property damage from domestic fires.

The place where we feel safest - at home, is the place where you smoke the most and where deaths and injuries are highest. Smoking is one of the leading causes of death from home fires.

Smoking safety.

If you smoke, use only cigarettes that protect against fire - self- extinguishing . Smoke outside. Most deaths are the result of fires that start in living rooms and bedrooms. Keep cigarettes, matches and lighters and other smoking materials out of the reach of children in a locked cupboard.

Use a deep, sturdy ashtray. Keep it away from anything that can burn. Do not throw cigarettes and butts in mulch , potted plants or lawns, peat moss, dried grass, leaves or other things that could easily catch fire. Before disposing of butts and ashes, make sure that they do not burn or smolder. It is best to immerse them in water or sand.

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Never smoke or allow others to smoke in rooms where oxygen is used - industrial halls, hospital rooms. There may be an oxygen leak and an explosion and fire.

The risk of death and fire from ignition while smoking increases with age. Factors such as alcohol, fatigue and drugs can increase the risk of inflammation many times over.

What should we do in case of fire?

In closed rooms (Fig. 10) - homes, offices and outbuildings, the fire can spread quickly and cover a large area only in cases where the room has spilled and flammable liquids (kerosene, alcohol).

Fig.10 Fire in an apartment building in St. Zagora.

Starozagorci.com

In gasified houses, this can happen in the event of a gas leak and an explosion. In homes, fires often begin with the appearance of a small flame, which is preceded by a more or less prolonged period of residual heat or solid combustible objects. The presence of the smell of overheated material and slight smoke are the first subtle signs of a fire.

Then more and more concentrated smoke appears, the eyes water. The electrical wires gradually heat up when overloaded. "Signal" for overheated installation. Ignition of the insulation follows.

Fig.11 Short circuit https://www.pat.org.uk/property

Simultaneously with the smell of burnt rubber, the lamp lights may flash. These signs signal an imminent danger of ignition of the cable insulation (Fig. 11). When there is forced ventilation in the room where the fire starts (open windows, balcony door), people in neighboring rooms may not smell burnt, but hear crackling, like the rustling of dry wood burning in a kiln. firewood. Sometimes a whistling sound can be heard, lightning can be seen. When soot burns in the chimney, a whistling sound is sometimes heard, like the blowing of wind and the resinous smell of soot. Constantly burning soot rises from the top of the chimney.

Signs of a fire in a residential building help to take timely measures to eliminate the fire and the fire itself.

As soon as the first signs of fire are noticed , it is necessary to immediately notify the fire service. It should be borne in mind that the sooner the fire brigade is notified, the faster and easier the fire will be extinguished. The fire brigade must be called when there is even a small amount of smoke in the house, when there is a danger of fire in a place inaccessible to inspection or if it is impossible to determine the cause of smoke. The spread of fire in a residential building is most often facilitated and expanded by ventilation shafts, windows and doors through which fresh air enters, which leads to an additional influx of oxygen, which contributes to the development of fire. It is not recommended to open the windows and open the doors to the adjacent rooms. If the fire is detected late and the available fire extinguishers are not sufficient, measures must be taken to delay the spread of the fire. To do this, you need to tightly close all the doors and windows in the room where the fire started. Put a wet towel in the gap between the floor and the door, stop the gas supply , turn off the electricity.

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If the house or apartment is filled with smoke, you should breathe through a damp cloth and move as close to the floor as possible (there is less smoke). We must remember that children, frightened by fire or smoke, can hide in secluded places (under the bed, in the closet) and not respond to unfamiliar voices.

Before opening a closed door in a burning house, touch it with the back of your hand. Do not open if you think the door is warmed by the heat behind it. Try to get people out of the burning house (apartment). Do not try to take valuables and other things with you. Choose the safest way to evacuate. Don't panic.

Do not use elevators during a fire, but go down the stairs. Never run chaotically. When firefighters arrive, obey their commands completely. Do not return to the burning room until firefighters say the danger is over.

What will happen if the fire breaks off the road to the exit?

The most important thing is to stay calm. Go away from the fire room, closing all the doors tightly behind you. Open the window and try to attract the attention of passers-by with cries for help. When they hear you, they will call the fire department. If your apartment is located on a low level and you are in immediate danger, go out the window. First, keeping your feet close to the window, lower your body as close to the ground as possible, and then jump.

FIRE NOTIFICATION PROCEDURE

THE TELEPHONE NUMBER IN CASE OF FIRE IS 112.

When giving information about a fire, be precise, clear and specific. Accurate and complete information about the fire will allow the fire brigade to navigate the situation, plan their activities and make the necessary decisions to counteract and extinguish the fire. In addition to the information about the fire and the address where it occurred, the place of occurrence and whether it is a threat to people must be specified.

If possible, the caller should indicate the shortest route to the fire. If the fire broke out at home, you may need to evacuate in the dark. Plan your withdrawal routes in advance. Make sure there are no obstacles to evacuation on your way - objects, furniture, broken and destroyed floor or other things that may hinder you.

For the disabled and the elderly, it is recommended that the rooms be located next to the exits on the first floor. There should be a telephone or alarm device near the bed.

Many home fires occur at night .

Here are some simple things you should do every night to protect yourself and your family from fire:

- Switch off all electrical appliances that are not intended for permanent use;

- turn off all gas appliances;

- make sure you do not leave smoldering cigarettes;

- turn off the temporary heaters;

- install a fence around an open fire (stove, fireplace).

- If the combustion has just started, you can easily extinguish it with water, cover with a thick blanket or tablecloth covered with sand, soil;

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- Never extinguish burning electrical cables and live electrical appliances with water - this is life-threatening;

- if you see that you can not cope with the fire and it threatens to spread, leave the room immediately;

- Never hide in a smoke-filled environment in secluded places.

For children : If there are adults nearby, call them immediately for help;

If a TV or computer catches fire:

- Unplug the appliance;

- Report a fire to the fire department;

- If burning continues after turning off the TV, fill it with water or cover it with a thick blanket. If the burning still continues, the last thing is to throw the TV out the street window. But before you do, be sure to look down;

- To avoid poisoning with combustion products, immediately remove people who are not involved in extinguishing, especially children;

- After removing the fire if the property is insured, notify your insurance broker within the prescribed period.

- Do the same if this happens with other electrical appliances.

Note : If the TV has exploded and the fire has intensified, do not endanger your life by staying in the room. Close the door and windows and leave the room.

Ignition of batteries in laptops, phones, tablets

Lithium batteries (Fig. 12) are compact, lightweight batteries that can withstand many recharge cycles and have a large capacity. Batteries are everywhere - in laptops, cameras, mobile phones and electric cars. Although accidents are rare, those that do occur can be impressive, causing an explosion or fire. To understand why these batteries explode and catch fire and how to minimize the risk of an accident, you need to understand how batteries work.

Fig.12 Laptop battery. commons.wikimedia.org

HOW LITHIUM BATTERIES WORK

The lithium battery consists of two electrodes separated by an electrolyte. Typically, batteries transfer an electrical charge from a lithium metal cathode through an electrolyte consisting of an organic solvent containing lithium salts to a carbon anode. Specifications depend on the battery, but lithium-ion batteries usually contain a metal coil and a flammable lithium-ion liquid. Small metal fragments are immersed in the liquid. The contents of the battery are under pressure, so if a metal fragment breaks through a barrier that holds the individual components or the battery breaks, lithium reacts vigorously with the water in the air, generating high temperatures and sometimes causing a fire.

Lithium batteries are high power with minimal weight. The elements of the battery are designed to be light, which is achieved by thin partitions between the cells and a thin outer shell.

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Barriers or coatings are quite fragile, so they can really be drilled. If the battery is damaged, a short circuit occurs. This spark can ignite highly reactive lithium.

Another reason leading to ignition is that the battery can heat up to a critical point. The heat released puts pressure on the battery, which can cause an explosion.

How to minimize the risk of fire or explosion.

The risk of fire or explosion increases if the battery is exposed to heat, if it is covered, or if the battery or internal component is affected. You can reduce the risk of an accident by:

- Avoid storing the battery at high temperatures;
- Do not store batteries in hot cars;
- You do not allow a blanket to cover your laptop;
- Do not keep your mobile phone in a warm pocket;
- Avoid storing all your lithium-ion batteries together. When traveling, especially on an airplane, you will have all the electronic items in one bag. This is inevitable, but you can usually save a little space between rechargeable items. Although lithium-ion batteries in the immediate vicinity do not increase the risk of fire in the event of an accident, other batteries can catch fire and worsen the situation;
- Avoid recharging the batteries. These batteries do not suffer from the "memory effect" like other types of rechargeable batteries. They can be switched off and charged repeatedly almost until they are initially charged. However, they are not so good if they are completely depleted before recharging or overloaded. Car chargers are used to recharge batteries;
- Using a charger other than the one used for the battery may increase the risk of damage.

What to do if the battery still catches fire?

Fig.13 Special fire extinguisher for LI batteries https://www.safelincs.co.uk

Conventional fire extinguishers are ineffective against igniting lithium-ion batteries. LITH-EX (Fig.13, 14) solves this problem by easily dealing with small fires that can occur in electronic devices equipped with lithium batteries, e.g. mobile phones, laptops, tablets, toys.

What makes LITH-EX so unique?

FIG. 14 LITH- EXx

The LITH-EX fire extinguisher is a new fire extinguisher called AVD. The ecological water solution is applied in the form of a mist, creating a film on the fire. This strong film dries instantly, creating a barrier between the fire and the atmosphere, which leads to extinguishing the fire.

Never flood a burning lithium -ion battery with water!

In case of fire in the lobby of a building or house

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1. Call the fire department.

2. If the smoke is light and you feel that you can breathe, try to determine where the source of smoke (apartment, mailbox, waste, etc.), the smell can determine what caught fire - electrical wires , rubber, flammable liquids, paper.

3. Remember that the fire and smoke in the stairs spread only in one direction - from bottom to top .

4. If you manage to find the fire, try to extinguish it yourself or with the help of neighbors with improvised means. But as stated in item 1, you must first call 112 to report a fire.

5. If it is not possible to quickly put out the fire, inform the occupants and those present in the building or house, and without panic, try to escape using the emergency stairs or follow the instructions of the fire brigade to leave through the windows or balcony, using the fire escape. Going through the smoke areas, try to overcome them by holding your breath or covering your mouth and nose with a wet handkerchief.

6. If the smoke comes from the apartment and shouts are heard from there, it is necessary, without waiting for the firefighters, to open or smash the doors. Remember that you may find yourself in front of a fiery front. Breaking and opening the door increases the flow of oxygen and the fire can spread.

7. However, if you are at the entrance and find yourself engulfed in thick smoke, then you should immediately return to the apartment and close the door tightly. The openings under the door and manholes should be sealed with wet rags or clothes. If the smoke is still penetrating, leave the hallway and lock yourself in the room, trying to attract attention from a window or balcony.

FIRE and smoke in the basement

1. Call the fire department.

2. Do not try to break into the basement yourself to believe what is happening. Curiosity can end tragically for you.

3. If you still went down to the basement or were there at the time of the fire, then try to be as low to the ground as possible while looking for a way out. Try breathing through a towel or rag. If you get lost, try to determine where the smoke rises faster. There is probably a front door there. It is most dangerous to panic and wander aimlessly. You may end up in the heart of the fire and die. It is better to cover yourself with something, breathe through a wet towel and hope they find you.

What to do in case of FIRE IN APARTMENT or HOUSE:

- to fight the flame itself without calling the fire brigade if you have not dealt with the fire for a few seconds, its spread will lead to an even bigger fire that you will not be able to deal with;

- Try to get out of a smoking corridor or staircase (smoke is very toxic, hot air can burn the lungs);

- To go down the facades of the house using gutters, grounding installations, homemade ropes, sheets and more. (if this is not absolutely necessary), because without experience and training , falling is inevitable;

- jump from the window (from the fourth floor, every second jump is deadly).

FIRE IN A PERSONAL CAR

There are three most important things you should always have in your car - a first aid kit with medicines, a fire extinguisher and a non-synthetic towel. If the car catches fire, then:

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- Stop the car and turn off the engine;

- Apply the parking brake and lock the wheels;

- Put a sign on the road to report the incident;

- Take care of the victims;

- Call 112 to seek help - fire, police, ambulance;

- Make sure there are no gas leaks or a lit cigarette.

The fire in the car almost always comes out under the hood due to a rupture of a pipeline that supplies gasoline, or burns in the carburetor or gas system and tank.

- The first thing you need to do is turn off the outlet by removing the key from the dashboard. If the machine is running on gas, stop the flow of gas from the fuel tank. Then direct the fire extinguisher jet towards the base of the flame; if there is no fire extinguisher - use sand, soil, mantle, clothes. A bag of water thrown with force on the part of the car that engulfed the flame is also effective.

- If the fire affects only the carburetor, it is enough to start the engine at maximum speed, which will help put out the fire;

- If there are injured, they must be taken to a safe place;

- If the fire has spread to the rear of the car, where the gas tank is located, quickly withdraw from the car. An explosion of the tank can occur if it is almost empty or the car is running on gas;

- If the fire has engulfed the interior of the car, know: the danger is great, the fire quickly spreads to the upholstery, consisting of fabric and plastic. Smell and smoke are highly toxic, suffocating and dangerous if inhaled.

WORKPLACE FIRE

It's necessary:

1. Call 112 to report the fire.

2. Inform all colleagues around you about the fire.

3. Try using fire hydrants and fire extinguishers and improvised means to put out the fire.

4. If you see that it is not possible to put out the fire yourself, leave the danger zone immediately.

5. When firefighters arrive, explain what is burning and where

WHEN A MAN BURNS

Fig.15 Burning man. istockphoto.com

1. Do not allow the person to run (Fig. 15). Terrified, the man runs away, making his situation worse. The flame ignites even more (exposing the flame to burnt clothing for 1-2 minutes leads to severe burns with a fatal outcome). If necessary, knock the running burning person to the ground and cover him with a blanket, thick cloth or cover him with water, snow, sand. If possible, discard the burning garment, but this should be done within the first few seconds of ignition. This also applies to you if you catch fire.

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2. If you cover a burning person with a thick blanket, his head should be outdoors so that he does not suffocate from the products of combustion.

3. Call an ambulance and the fire department.

4. Provide first aid. (If you try to set yourself on fire, call the police).

SHOUTS "FIRE!" AND PANIC OCCURS IN PUBLIC PLACES.

1. After hearing the cries of "Fire", "Fire", try to stay calm and self-control, passing this calm on to others. Assess the situation, make sure there is a real danger (maybe someone with this shout wants to get people's attention).

2. Stay still, look around carefully. If you see a real fire, quickly look for a fire alarm button. Activate the alarm and call the fire department (many people think others have done so and so the fire department may not be notified). Head quickly but calmly to the nearest exit.

3. When the room is smoking, the lights are usually turned off. Try to go to the exit, holding on to walls, railings and the like. Breathe through a handkerchief or sleeve of clothing. Guide the children, if they are with you, as they are in front of you and hold them by the shoulders.

4. In any situation, keep calm, by your behavior convey confidence and calm to others. Don't let panic grow (if you can, take the lead). Soothe the panicked. Help those who are numb with fear and unable to move. Shake them, a few slaps on the cheeks can help get out of numbness. Speak to them calmly and clearly, supporting them under your arms.

5. After you get out of the crowd, help the victims, take them out into the fresh air, unbutton their clothes and call an ambulance.

FIRE IN TROLLEYBUS, BUS, TRAM

1. Report a fire to the driver immediately, try to stop and open the door (use the emergency open button).

FIG. 16 Bus fire Wikipedia.org

2. Try using a fire extinguisher and improvised fire extinguishers. Be careful! In the case of trolleybuses and trams, the metal parts may be energized as a result of the burning of the protective insulation of the conductors.

3. When locking the doors, use the emergency hatches for evacuation through the roof and through the side windows. If necessary, break glass with both feet (with a hammer or hard object). If you succeed, without getting serious injuries, as much as possible, help others, especially children and the elderly.

4. Vehicles have materials that emit toxic gases (Fig. 16) when burned, so quickly leave the cabin by closing your mouth and nose with a handkerchief or sleeve. Once out of the trap of the vehicle, move away quickly, as it may explode the fuel tanks or short-circuit the high-voltage mains.

FIRE IN THE METRO WAGON

Unpleasant situation, especially since the closed space and the feeling of the layers of earth above you intensifies the panic (Fig. 17). But what should be your actions:

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Fig.17 Fire in the subway car. Internet

1. As soon as you smell smoke, notify the driver of the fire immediately and follow his instructions. Try not to panic in the car, calm people down, take the children and hold their hands. In case of heavy smoke, close your eyes and breathe through a damp towel, respirator or gas mask.

2. Stay on the floor while the train moves in the tunnel. Once you arrive at the station and the doors open, take the children and adults out first. Make sure there is no one left in the car to help you leave the car. Report the fire to the station attendant immediately. Assist, if possible, subway workers using fire extinguishers and other available firefighting equipment to put out the fire.

3. If there is an open fire in the subway car while driving, try to extinguish it with the help of fire extinguishers or improvised means. If possible, go to the unaffected part of the wagon (preferably forward), trying to extinguish or keep the fire from spreading by covering the flame with clothes or flooding it with non-flammable liquids - water, milk, soft drinks - if you have them at shopping, etc.). Never try to stop the train in the emergency brake tunnel - this will make it difficult to put out the fire and evacuate you and your passengers.

4. When stopping a train in a tunnel, do not try to leave it without the driver's command. Do not touch metal objects in the wagon and doors until the high voltage is switched off in the whole area. After permission to leave, open the doors or break the windows, get out of the car and move forward along the train to the station. Move without touching any metal rails on the side of the rails to avoid electric shock when the voltage is turned on.

5. Be especially careful about the oncoming train.

TRAIN FIRE

FIG. 18 Train fire. bulawayo24.com

1. Immediately notify the conductor or train supervisor of a fire, even if at first you only smell burnt or smoke. As soon as the first signs of a fire in the car are felt - a strong smell, smoke or fire, without panicking, loudly, clearly and calmly announce to the passengers about the accident. Wake the sleeping passengers and take the children by the hand. It is safest to evacuate in the front cars, but if this is not possible, go to the end of the train, tightly closing the compartment door and the intermediate doors between the cars. Do not forget to check with the chief of the train or the conductor for the presence of people in the different rooms and sections of the cars - corridors and toilets.

2. Use fire extinguishers and other available means (blankets, wet rags, etc.) and together with the passengers, try to put out the fire. Close the windows so that the wind does not blow the flame. Do not try to take luggage from the fire if it endangers your safety (take only the essentials - documents, money, valuables, etc.). If the fire cuts off the way to the car exits, enter the compartment or toilet and close the door tightly, open the window and call for help to draw attention to yourself. Do not jump off the train when it is moving. Climbing the roof of the train is extremely dangerous! As a last resort, jump off the train through doors or windows, putting on all available clothing beforehand, and if you have a blanket or mattress, use it to soften the impact of the jump.

In a convenient place - not on a bridge or in a tunnel, stop the train with the emergency brake, get all the people out of the car. If possible, service personnel must uncouple the wagons so that the fire does not spread from one wagon to another. Wagons must be locked to prevent them from moving by inertia, especially when the fire is growing.

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SHIP FIRE

FIG. 19 Ship fire. www.marine-knowledge.com

Despite the abundance of water around you, your situation is much more problematic than on land (Fig. 19). What should be your actions:

1. Most often the declaration of fire is made by a member of the crew. After the announcement of the fire on the radio or by a sailor on duty on the ship, strictly follow the instructions of the evacuation crew. Exit the cabins or common areas of the ship - halls, lobby bar and more. and go to the deck of the lifeboats. Take the most valuable and small things with you - money, documents and valuables. It is good to put in a plastic bag. Hurry up, get out, but don't panic. Try to find a life jacket for yourself. Discipline is the key to salvation.

2. If the exit from the cab is cut off by fire and smoke, stay put, close the door tightly. Break the window glass and go out through it. If this is impossible and there is no chance of help after wrapping your head in a wet cloth, try to get through the fire.

3. Help children and women get on lifeboats. Then you go up. Swim away from the ship and signal to attract attention. If you are outside the rescue vessel, grab a piece of debris. Discard the clothes and shoes that are on you if you have not already done so. They will soak up the water and make it harder for you to stay afloat. If the shore is far away, stay in the water, do not lose strength and wait for help.

FIRE IN THE FOREST

Huge fires in the forest, in hot and dry weather, can occur for various reasons - lightning, negligence in lighting fires by tourists, cleaning pastures, sparks caused by agricultural machinery, unquenched butts, intentionally and more.

FIG. 20 Forest Fire www.aljazeera.com

The spread of the fire can cause casualties and burned houses in settlements, burned buildings, bridges, electric poles.

The speed of spread of ground fire is from 0.1 to 3 meters per minute, and in the crown of trees - up to 100 meters per minute in the direction of the wind.

When burning peat and plant roots, underground fires can spread in different directions. Peat can burn spontaneously without access to air or even under water. In the formation of "hot ash" from peat dust, strong winds can carry long distances and cause new fires.

PREVENTIVE MEASURES

In order to protect the population and reduce the damage in case of mass fires, meadows and land strips with a width of 5-10 meters in deciduous forests and up to 50 meters in coniferous forests are paved and cleared in advance. In the settlements, there are lakes and dams, where the capacity is estimated at not less than 30 cubic meters per 1 hectare of the village or town. In case of danger of forest fires in settlements:

- the fire service is obliged to monitor the fire situation in the forests near settlements;

- cleaning of soil strips between buildings and adjacent forest areas is carried out;

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IF YOU ARE IN THE RANGE OF A FOREST FIRE

If you are in the woods near the fire site and you are unable to handle and locate it yourself, immediately warn everyone in the area of the need to get out of the danger zone. Organize the evacuation to open areas, if there is a lake or river, get out of the danger zone quickly, perpendicular to the direction of movement of the fire. If it is impossible to escape from the fire, enter the lake or cover yourself with wet clothes. Breathing is easier and safer very close to the ground. Use a towel or garment as a filter when breathing. After leaving the fire area, inform about the place, size and nature of the fire in the administration of the settlement, forestry or fire service, as well as the local population. Give the warning signals for the approaching fire to the settlement and participate in the organization of the extinguishing. The flames in small and local fires near the ground are extinguished with the help of branches, hardwood, to be watered, to throw wet earth on the fire, to be trampled with feet.

If you travel by car on the highway or roads near forests, the presence of large fires can cause heavy smoke on the road and visibility becomes zero. A car traveling at 100 km / h will cover about 120 m in just 4 seconds. Just one gust of wind can make zero visibility and cause a series of catastrophes with unpredictable consequences many casualties and material damage. In this case, you must quickly turn aside, turn on the hazard warning lights, give an audible signal and notify 112 of the road situation. Do not get out of the car if the road does not allow it. If possible, leave the car immediately, moving away quickly to the side, perpendicular to the road. Watch out for precipices and canals near the road.

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