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The results of the activity of the territorial service of emergency medicine of Moscow

Abstract: The authors present a retrospective statistical analysis of the kinds and scale of emergency and crisis situations on the territory of Moscow for 2011–2015.

Keywords: emergency situations (ES), ES structure, organization of emergency medical service in the ES.

The problem of organization of rendering of emergency medical service to the injured in emergency and crisis situations remains important according to the publications [1; 2; 3; 4].

Liquidation of medical consequences of emergency situations in Moscow is laid upon the territorial disaster medicine service (TDMS) of the Department of Healthcare and its lead agency Scientific-Research Center for Emergency Medical Services — the territorial disaster medicine center (TDMC).

The DMS currently operating on the territory of the city has a strong disaster medicine service and a full-fledged chain of trauma centers of the 1st and 2nd level. In accordance with the approved plans-tasks on the admission of the mass flow of the injured for adult and children population in respect of certain specializations, the city hospitals can arrange up to 15 thousand beds within a short period of time in case of an ES.

The automated information-analytical system «Disaster Medicine of Moscow» (AIAS «Disaster Medicine of Moscow») established in the TDMC performs the functions of recording, functions related to collection, registration, grouping and generalization of data about ES in Moscow, functions of formation of operative and reporting information, functions of control of the condition of resources as well as planning of resources and regulation of their use.

The following sub-systems function in the AIAS «Disaster Medicine of Moscow»:

- Management of medical team and equipment of EMS («Team and equipment of EMS»);
- Recording, control and analysis of everyday medical-sanitary situation in the city («Monitoring of medical-sanitary situation in the city»);
- Management of medical support of scheduled city all-city events with large concentration of people («Medical support of public events»);
- «Monitoring of medical-sanitary situation in the ES zone»;
- Personified recording of the injured in large-scale ES and results of rendered medical aid at all stages of medical-evacuation support («Injured — ES»);
- Formation and keeping of data base of the AIAS «Disaster Medicine of Moscow».

In order to improve the organization of operation of the territorial disaster medicine service of Moscow, a retrospective statistical analysis of emergency and crisis events of different kind and scale on the territory of Moscow during 2011–2015 was conducted.

The following events contained in the data base of the AIAS «Disaster Medicine of Moscow» were selected by us for the purpose of the study:

1. Vehicle accidents:

- Road traffic accidents with the injured more than 3,
- All RTA with public transport,
- Accidents with rail, water and air transport;

2. Fires:

- All fires with the injured,
- All fires with evacuation, failures,
- All fires at institutions, enterprises, medical organizations;

3. Failures not related to fires:

- All events with the cause «Failure»;

4. Technological accidents (including production) with causes:

- «Explosion» of non-criminal character,
- «Emission of high-toxic substances», «Emission of radioactive materials», «Emission of BIO agents»,
- «Life support system accidents», «Spill of fuels»,
- «Detection of aggressive substances», «Gas emission»,
- «Breach of safety guidelines at production facilities»;

5. Biological-social:

- All events with the cause «Infectious diseases»,
- Poisoning with medical and non-medical products;

6. Social:

- All events with the cause: criminal, violent and anti-social activities, including explosion threats, realized explosions, detection of explosive devices, mass disorders, use of guns and offensive weapons,
- Terrorist attacks;

7. Natural:

- Hydro-meteorological (hurricanes, rain showers, landslides, floods).

The structure of crisis and emergency situations as well as their dynamics for 2011–2015 are presented in the table and figures.

Table 1. – Structure of the causes for crisis and emergency situation calls

Type of crisis and emergency situation	Years									
	2011		2012		2013		2014		2015	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Technogenic:	1546	56.0	1701	61.7	1662	60.8	1682	63.2	1501	60.6
Fires	770	27.9	792	28.7	768	28.1	854	32.1	732	29.6
Vehicle accidents	708	25.6	808	29.3	785	28.7	725	27.2	649	26.2
Failures not related to fires	13	0.5	11	0.4	20	0.7	20	0.8	14	0.6
Technological accidents	55	2.0	90	3.3	89	3.3	83	3.1	106	4.3
Biological-social	260	9.4	252	9.1	280	10.2	220	8.3	170	6.9
Social	933	33.8	770	27.9	771	28.2	742	27.9	771	31.1
Natural	22	0.8	21	0.8	19	0.7	12	0.4	21	0.8
Other	–	–	11	0.4	–	–	5	0.2	13	0.5
Total	2761	100	2755	100	2732	100	2661	100	2476	100

As it is seen from the data presented in the table, the events of social character (criminal, violent and anti-social activities, including explosion threats, realized explosions, detection of explosive devices, mass disorders, use of guns and offensive weapons), fires and vehicle accidents were the most frequently occurred among all ES in different years. Herewith, during the last three years, there was an obvious tendency for reduction of the total number of crisis and emergency situa-

tions. Thus, compared with 2011, the number of ES in 2015 reduced by 10.4%. Similar tendency is observed throughout Russia in the whole.

The analysis of the dynamics of events according to years shows that crisis and emergency situations of technogenic character prevail (Fig. 1).

Among technogenic ES, the first place is taken by the fires and vehicle accidents (Fig. 2).

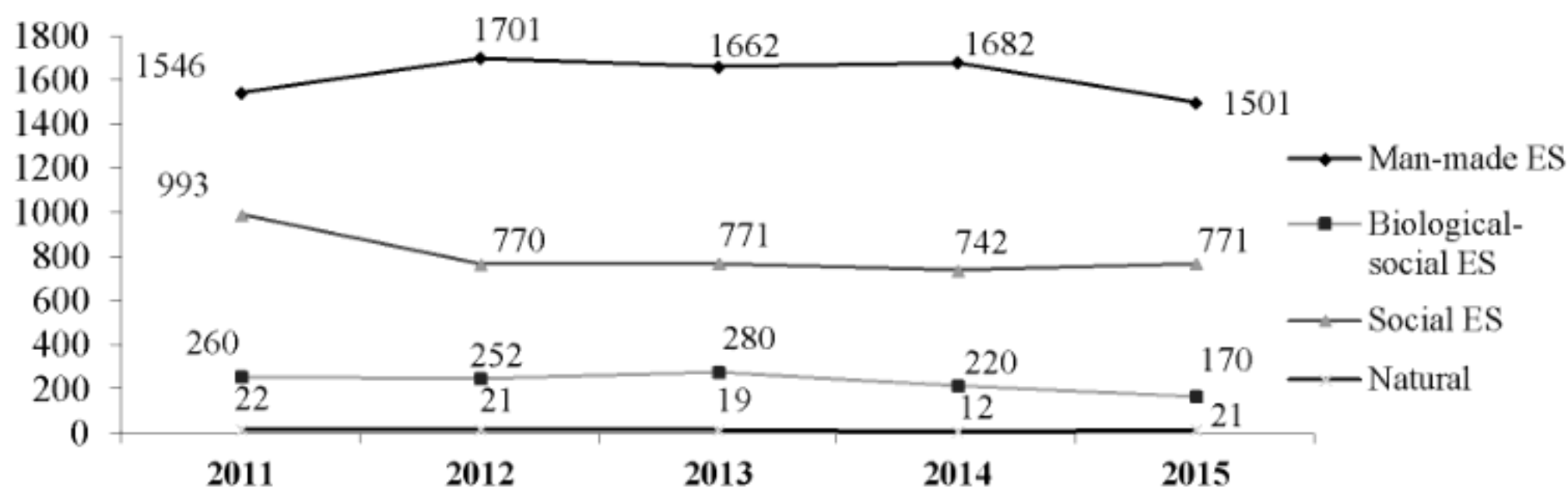


Fig. 1. Dynamics of ES and crisis situations in Moscow

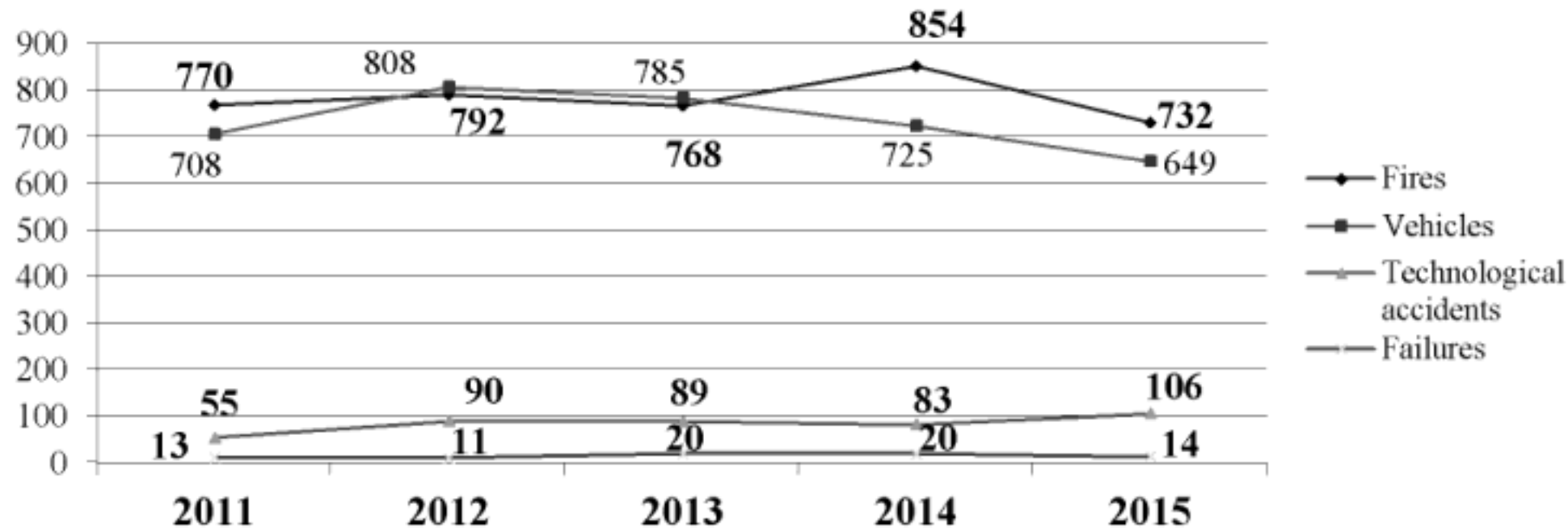


Fig. 2. The structure of ES of man-made character in Moscow for 5 years

In 2015, there structure of crisis and emergency situations underwent some alternations. The first place, just like in 2011, was taken by the ES of social character that accounted for 31.1%. Fires took second place and accounted for 29.6%. Starting from 2014, there has been a tendency for reduction of vehicle accidents. Thus, in 2015, vehicle accidents took third place in the structure of crisis and emergency situations and accounted for 26.2% (Table 1, Fig. 1 and Fig. 2). The reduction by 19.7% took place compared with 2012.

The assessment of the scale of events according to the size of sanitary losses certifies that the structure of events hasn't changed scale-wise for the last 5 years. The biggest number is the events with sanitary

losses from 1 to 5 (68% at average), events with the injured from 6 to 10 people accounted for 2.5%, and the events with sanitary losses with over 10 people — 1.2%. Events without sanitary losses were 28.3%. However, crisis situations without sanitary losses but being a risk event (failures not related to fires, technological accidents and events of social character) took first place for separate kinds of events.

Figure 3 shows that the number of ES with the injured has a tendency for reduction and the number of events without the injured is increasing starting from 2012.

The dynamics of sanitary losses as a result of emergency and crisis situations for 5 years is presented in Figure 4.

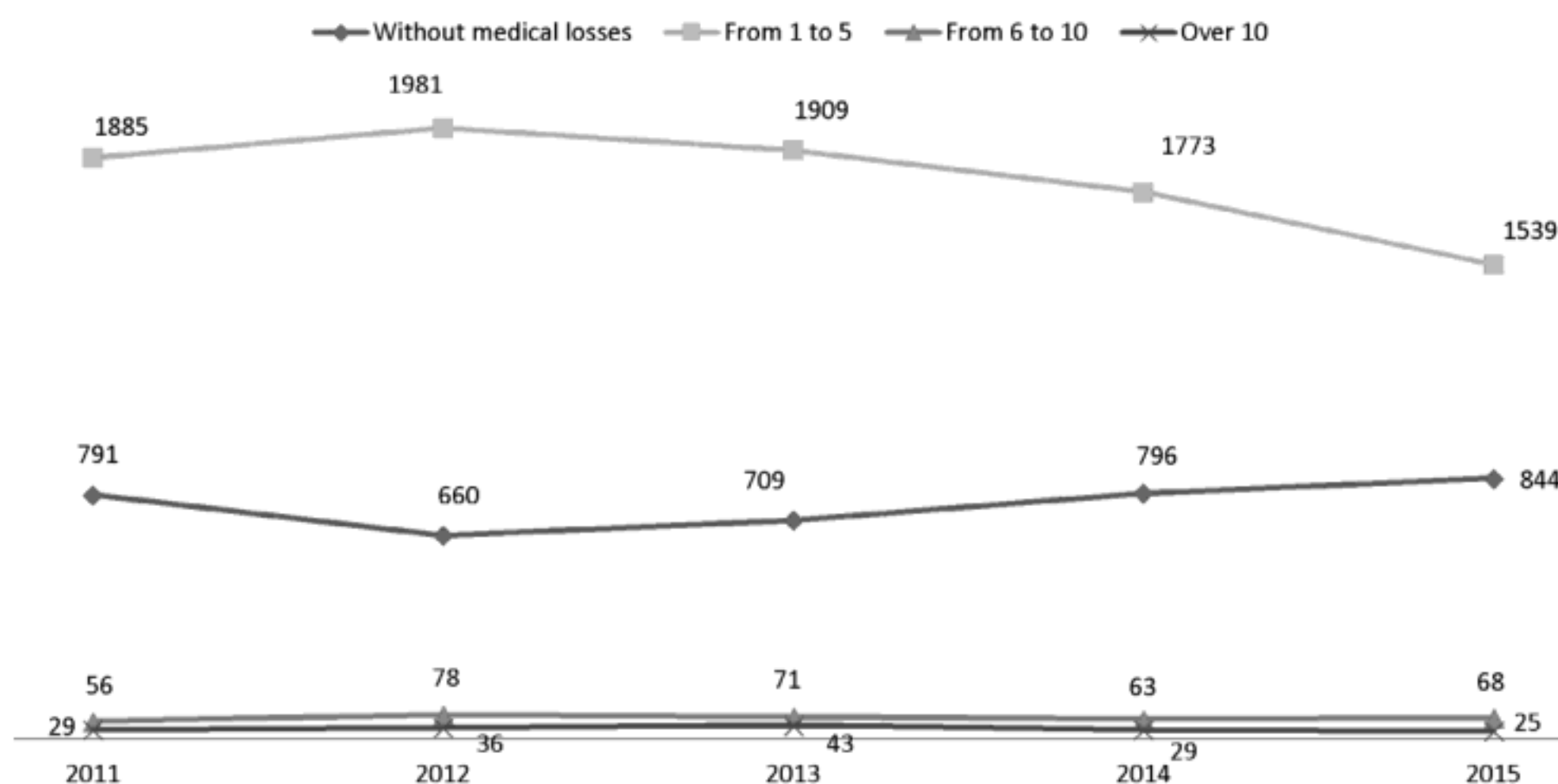


Fig. 3. Scale of events in the dynamics for 5 years

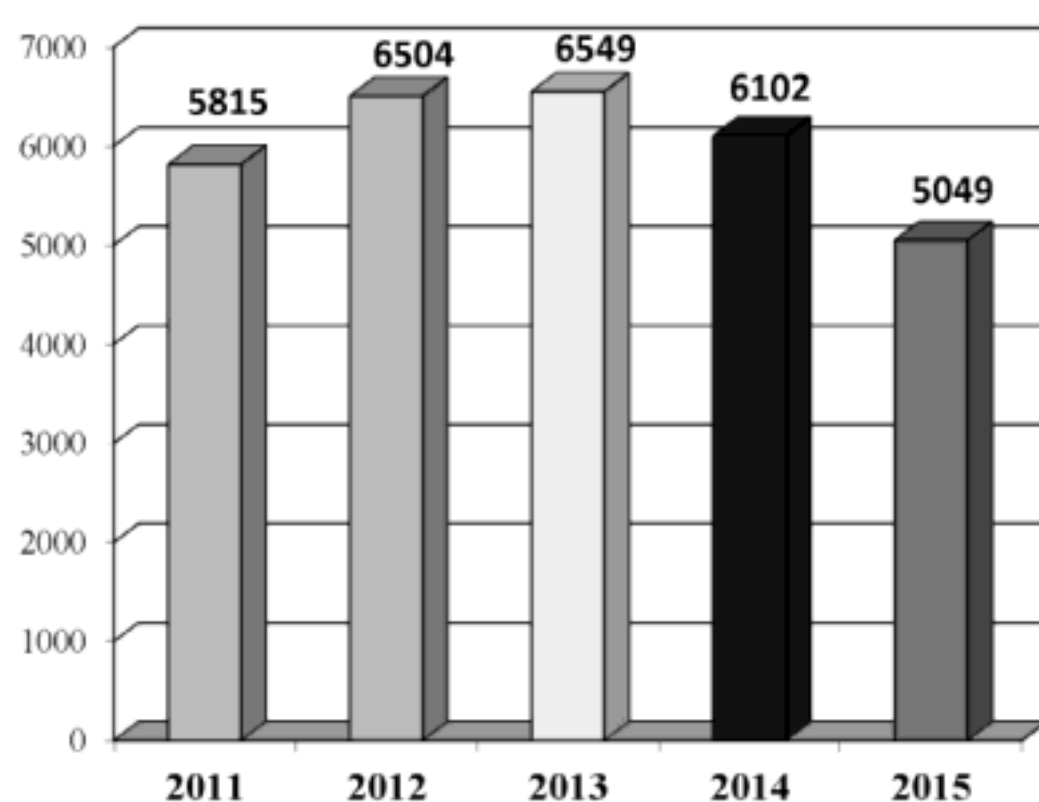


Fig. 4. The dynamics of sanitary losses as a result of emergency and crisis situations for 5 years

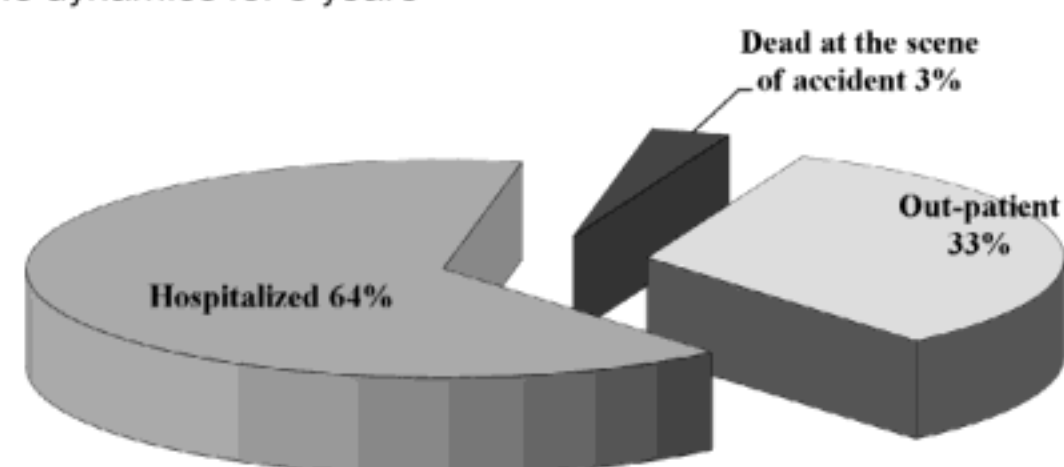


Fig. 7. Medical consequences of crisis and emergency situations of social character

The presented data certifies that the number of medical losses in ES has a tendency for reduction.

This tendency is especially noticeable in vehicle accidents and ES of social character. Thus, the number of the injured in vehicle accidents in 2015 reduced by 21.6 % compared with 2011, and the number of the injured in ES of social character in 2015 reduced by 44.6 % compared with 2011.

The structure of sanitary losses for the last years remains unchanged.

Among the injured, at average, a significant number (65.2 %) was hospitalized; the share of the deceased at the scene of accident was 6.4 %, and 28.4 % of the injured were provided out-patient help at spot.

Figures 5–7 present the structure of sanitary losses for separate kinds of ES in total for 5 years.

The presented data certifies that despite the most number of the injured in vehicle accidents, deaths at the scene of accident accounted for 5 %. Whereas, deaths during pre-hospital period during fires is 5 times more than the deaths during vehicle accidents and accounted for 25 % at average, which indicates significant sanitary losses and severity of the condition of the injured in the fires.

Thus, the conducted retrospective statistical analysis of crisis and emergency situations in Moscow revealed the tendency for reduction of events starting from 2011.

The size of sanitary losses over the last two years also showed the tendency for reduction, especially in vehicle accidents and ES of social character.

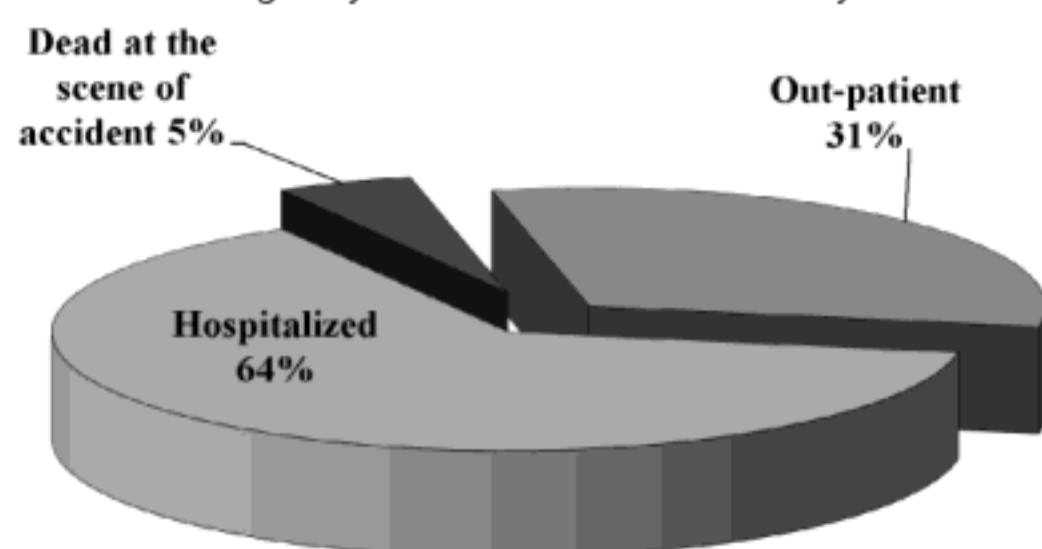


Fig. 5. Medical consequences of vehicle ES

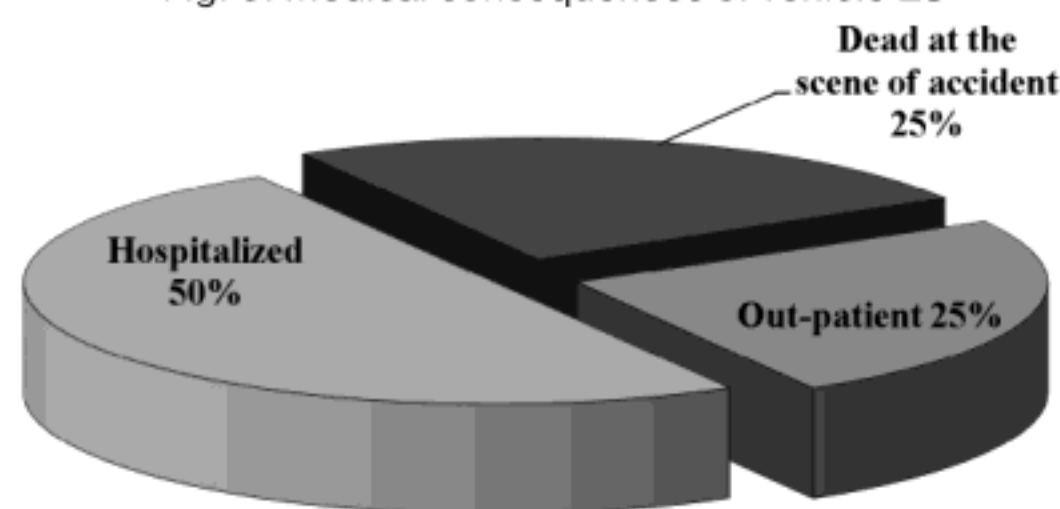


Fig. 6. Medical consequence of fires

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