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Organization and performance of the territorial Disaster Medicine Service of the Department of Healthcare in Moscow

Abstract: The article considers the structure of the territorial Disaster Medicine Service (TDMS) of Moscow, the tasks of TDMS, results of the TDMS's activity for the last year, both in on-line operation and daily activity.

Keywords: emergency situation (ES), territorial disaster medicine service, the injured, liquidation of medical consequences.

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 territorial disaster medicine service (TDMS) of the Department of Healthcare of Moscow established in 1991 is a functional union of efforts and funds of the city healthcare attracted for the purpose of liquidation of medical

consequences of emergency situations (ES) on the territory of the city. TDMS is one of the priority functional sub-systems of the Moscow system of prevention and liquidation of ES. The purpose of TDMS is the ensuring of effective and appropriate reaction of the Moscow healthcare service to crisis and emergency situations of different types and scale to satisfy the needs in emergency medical service.

The tasks of TDMS include:

– sustenance of constant readiness of the management bodies of establishments, sub-divisions and formations of the

TDMS for liquidation of medical and sanitary consequences of emergency situations during peace and war time;

- performance of complex measures on counteraction to terrorist attacks, including, the use of poisonous, biological (bacteriological) agents, and increase of safety of city medical institutions in accordance with administration documents of the Department of Healthcare and decisions of antiterrorist commission of the Department;

- enhancement of the readiness of sub-divisions of the disaster medicine service for liquidation of medical and sanitary consequences of realized terrorist attacks;

- timely and effective rendering of all types of medical service to those injured in an ES;

- reduction of psycho-neurological and emotional impact of disasters on the population involved in the emergency situation;

- participation in the ensuring (jointly with sanitary-epidemiological and communal services) of sanitary wellbeing in the zone of ES, prevention of the outbreak and spread of mass infectious illnesses;

- conduct of a forensic expertise of the deceased and a forensic medical examination of the injured;

- mpreservation of health of the TDMS staff during the period of liquidation of medical consequences of the ES;

- interaction with city and departmental federal agencies involved in the liquidation of the ES consequences;

- coordination of actions of the disaster medicine service and civil defense of the city's healthcare service during the conduct of scheduled events and in the conditions of an emergency rule;

- assessment of on-line medical and sanitary condition during a potential hazard on the territory of the city;

- reduction of risks and level of medical and sanitary consequences of the ES during peace time and hazards for the population in the conditions of war time;

- conduct of scientific-research and experimental-engineering works on the problems of «disaster medicine»: improvement of the organization, management and technologies of emergency medical service in the ES;

- conduct of complex measures on improvement and further development of the territorial service of disaster medicine.

The TDMS that currently operates in the city has a first-rate emergency medical service and a full-fledged chain of multi-speciality hospitals. Every hospital of the Service has a minimum supply level of drugs and a reserve of medical property that enables to ensure uninterrupted rendering of emergency medical service to the injured within 72 hours. Today, the Service is oriented to a possible number of on-time sanitary losses that doesn't exceed 18 thousand of the injured.

The Service functions in 3 modes: everyday activity, high alert and emergency situation.

The territorial disaster medicine center (TDMC) established in 1991 plays the most important role in the operation of the service; it performs the functions of the main office of the territorial disaster medicine service and is responsible for

the organization of all kinds of medical service in the ES. During the period of liquidation of medical consequences of the ES, all institutions of the service are in on-line subordination of the Center.

The TDMC performs its activity in two main directions:

- direct effective and practical work on the expected and realized events with a threat to life and health of people regulated by the respective administration documents and prompt managerial decisions;

- scheduled work that includes a complex of measures on the enhancement of readiness of the service for an ES.

The most important structural sub-division of the TDMC is its on-line service that consists of the following departments: operative information (dispatcher and emergency response brigades), operative control, operative communication, automated information systems as well as a warehouse of the on-line reserve of the medical property.

The operative information department ensures round the clock receipt, analysis and rendering of information about an ES or a threat of their appearance on the territory of the city in the dynamics through the channels of emergency notification; assessment of the formed condition according to the data of the on-site emergency response teams of the TDMC from the site; organization of all kinds of medical service. This department bears responsibility for collection of stage and full information about medical consequences of the ES and drawing of intermediate and final reports. During the period of work of the dispatcher service, the number of received and rendered messages increased from 8 000 during the first 15 years to 15 thousand in 2014.

A round the clock shift of the department consists of 3 dispatcher operators, senior doctor, 8 brigades of emergency response, one of which is a helicopter brigade. Currently, 10 helicopter pads at several traumatology centers of the first rate and at different sites of the Moscow ring road are put into operation. The arrival of a helicopter from its base to any destination point in Moscow is 11–15 minutes and the delivery of the injured to a hospital does not exceed 7 minutes, which has a special significance in the conditions of heavy road traffic. The number of flights of a medical helicopter increases annually. The number of flights doubled in the last ten years and reached 585 flights in 2014. In total, the medical helicopter team performed 6500 flights, 60 % of which were the calls for mass road accidents. Medical service was rendered to over 3000 injured, over 500 of which were children.

If required, the intensified brigades and mobile emergency rooms are formed on the basis of two specially re-equipped busses.

In 2014, the territorial disaster medicine service performed the following operative practical work in accordance with the above specified functions.

The service of TDMS was used in 7594 cases in total.

One of the tasks of the Service is medical provision of the events related to mass concentration of people, which, to a certain respect, refer to «risk events». In 2014, the share

of calls for medical provision of mass city events accounted for 15.6%. The percentage of calls with regard to admission of the ill and injured from other regions, assessment of the on-line medical condition and training (48.6%) continues to remain high. The calls for direct crisis and emergency situations accounted for 35.1%.

In 2014, fires took the first place in the structure of crisis and emergency situations and amounted to 32.1%; transport accidents as well as criminal, violence and anti-social actions, including the threats of explosions, realized explosions, detection of explosive devices, mass riots, application of fire and cold arms divided in approximately equal proportions (27.2%, 27.9% respectively) (Fig. 1).

The number of medical losses in ES with one-time injured of 5 and more people accounted for 2094 people in 2014. It is explained by the reduction of mass outbreaks of infectious diseases.

Among the injured, a considerable part (69.5%) was hospitalized; the share of the deceased at the accident site decreased and accounted for 7.9%, and 22.6% of the injured were given an ambulatory care on the spot.

The most number of injured, with the exception of those who fell ill as a result of infectious diseases, referred to transport accidents as in previous years (Fig. 2).

The number of risk events, which the TDMC subdivisions are involved in, increases every year. (Table 1).

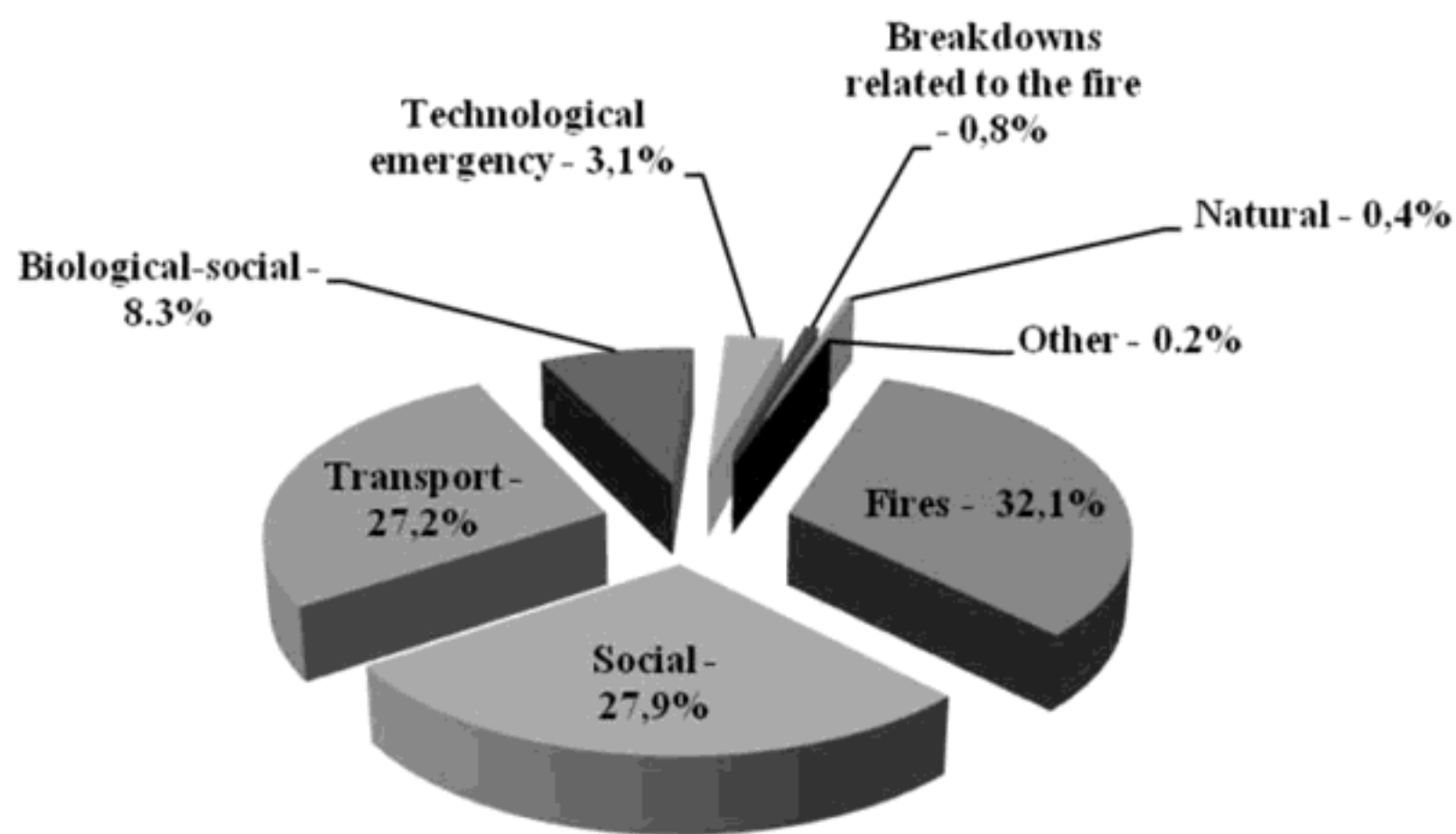


Fig. 1. Structure of crisis and emergency situations in 2014

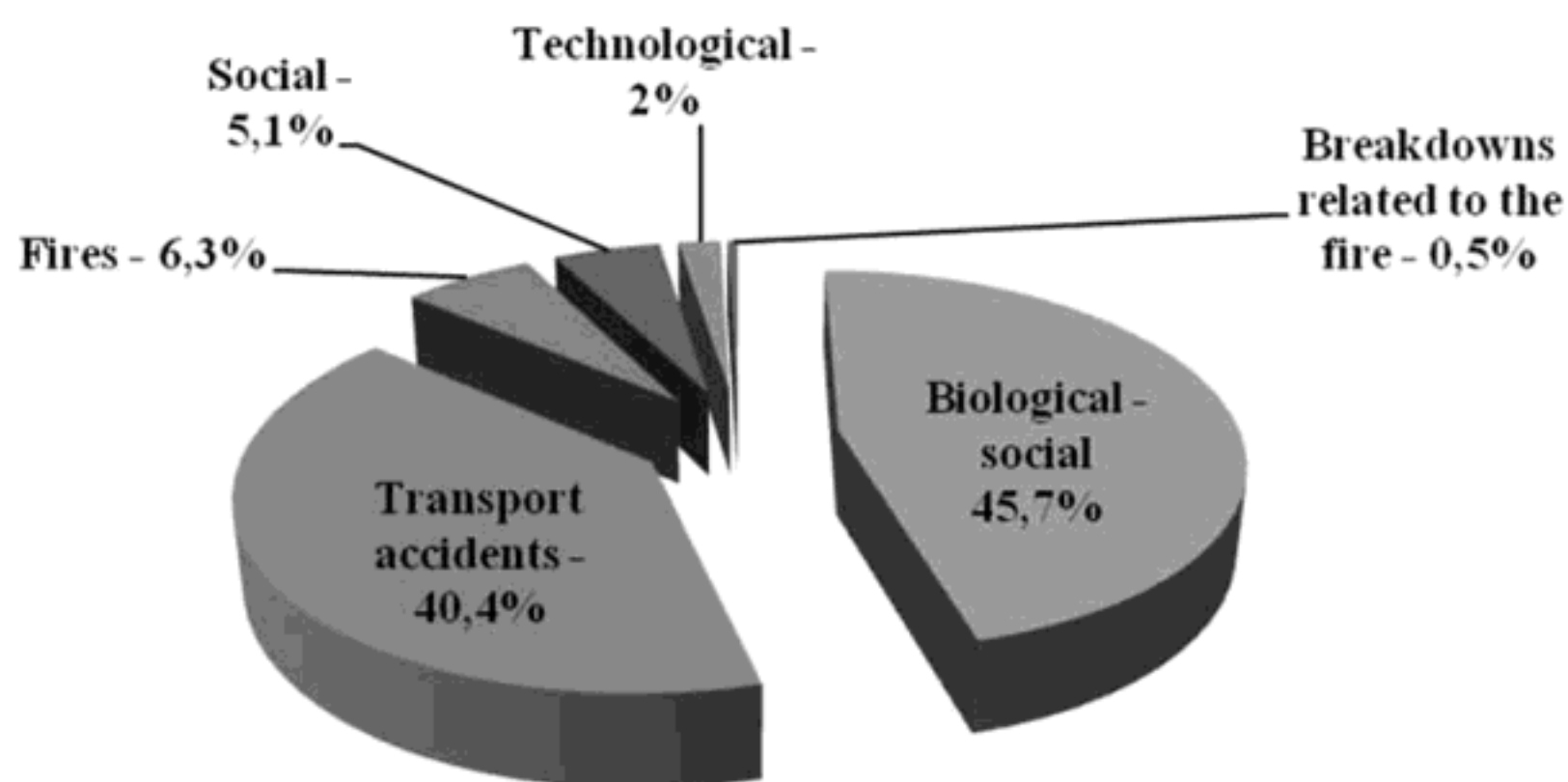


Fig. 2. Structure of the injured in crisis and emergency situations in 2014

Table 1. – The number of TDMC calls for risk events

TDMC sub-divisions	Years				
	2010	2011	2012	2013	2014
Emergency response brigades of TDMC	3073	3920	6721	7005	7297
TDMC busses	91	52	70	113	81
Medical helicopter brigade	494	567	530	570	585
Total	3658	4539	7312	7688	7963

Stationary stage of rendering medical service to the injured in the ES was ensured by multi-speciality city hospitals that had a plan-task for the admission of a mass flow of the injured. According to the data of TDMS hospitals, the biggest number of the injured with mechanical, thermal and chemical traumas were hospitalized to the TDMS traumatology centers of the first rate (81.0 %).

It should be noted that out of all injured people sent for hospitalization, 33.0 % were released home on the same day after they had been treated at the admission department; 63.7 % were discharged with improvements after treatment; 22 people (3.3 %) with a severe concomitant injury died at hospitals, whereas 15 of them were injured in a road accident.

As it was indicated above, a significant volume in the work of TDMS referred to medical provision of large-scale mass city events that are regarded as «risk events» and require a serious organizational development and implementation of considerable medical efforts. Apart from emergency medical service brigades and brigades of emergency response of the TDMC, doctor and nurse brigades (DNB) of ambulatory polyclinic establishments are constantly involved in the medical provision of mass events. Total 732 DNBs (530 for adults and 222 for children) were formed in 2014.

The major number of events that involve DNB is mass events of city and district level; herewith, the number of people who sought medical assistance in 2014 accounted for 2639.

In 96.4 % of cases, doctor and nurse brigades were involved in the events with mass concentration of people up to 2 thousand. The participation of DNB in the events with the number of people from 2 to 10 thousand was 3.6 %.

The activity of the city disaster medicine service is related to not only the liquidation of medical consequences of the ES and risk events, but also to the performance of the events as everyday activity, aimed at the sustenance of TDMS readiness to actions in the conditions of the ES.

In accordance with the approved plans, complex inspections of the readiness of medical organizations of the state healthcare system of Moscow to work in the ES conditions were performed. In the whole, the readiness of the management bodies and healthcare institutions is evaluated as «in compliance with the set requirements» and they are ready to perform tasks in the sphere of prevention and liquidation of emergency situations.

The educational and methodical work on TDMS staff training and enhancement of the readiness level of the subdivisions of the territorial disaster medicine service is conducted. During the year, 580 people, out of which 262 doctors, 84 people of nursing staff and 234 others passed an initial training and advancement with regard to prevention and liquidation of emergency and crisis situations, rendering of emergency service at federal and Moscow educational and methodical bases.

The medical staff of the A. S. Puchkov emergency and first-aid station of Moscow is trained annually on the program

«Rendering of emergency medical service during emergency situations» at the education department of the TDMC.

Moreover, the TDMC staff is given a field training on rendering first-aid medical service to school children, teachers and students of higher vocational institutions (up to one thousand people) and employees of the special battalion of the State inspection of road safety of the Main department of internal affairs in Moscow (over 800 people).

An important element of enhancement of readiness of the city healthcare system in the ES is the organization and conduct of trainings. Total 1300 trainings are conducted in medical organizations of the state healthcare system of Moscow.

The work on optimization of interaction of the disaster medicine service with emergency non-medical services of rapid response is performed.

The system of emergency notification and information interaction with all services involved in the work in the ES is worked out and corrected timely.

The disaster medicine service of the city performs a monthly monitoring of medical consequences of road-transport accidents on the territory of Moscow and the injured who suffered from external effects (fire, drowning, poisoning, suicide, natural disasters). Furthermore, the record of antidotes is kept at hospitals that set up beds for admission of the injured in case of a mass chemical exposure.

The automated information analytical system «Disaster Medicine of Moscow» (AIAS «Disaster Medicine of Moscow») applicable at the TDMC is under a constant development with consideration of modern requirements imposed on the activity of disaster medicine service by the federal and city authorities in order to make the applicable algorithms comply with organizational technologies determining the order of work of the disaster medicine service of Moscow. The functions of record keeping related to collection, registration, grouping and generalization of data, functions of formation of rapid and reporting information, functions of resource control as well as planning of resources and regulation of their use are laid on the AIAS.

Information provision is considerably determined by not only the presence of the information, but also by the system of notification and communication, optimization of which is also included in the TDMC functions. The department of the operative communication ensures round the clock uninterrupted work of the city and inter-departmental telephone connection with the TDMS institutions of the city, as well as operative radio channel and uninterrupted operative communication at the place of conduct of mass events and events on liquidation of medical consequences of the ES.

Thus, the city territorial disaster medicine service of the Department of Healthcare of Moscow and its head institution — territorial disaster medicine center, a unified effectively functioning system, perform the set tasks and prove their constant readiness to protect lives and health of the Moscow population during crisis situations in practice.