

5. Epidemiology and prevention of vaccine preventable diseases seventh edition, January 2002, Department of Health and Human Services Centres for Disease Control and Prevention, Atlanta, Georgia, USA;73-83.
6. Isac M, Iarovoi P, Râmiș C, ș. a. Studiul de seroprevalență privind hepatitele virale B și C în contingentul femeilor de vârstă fertilă din Republica Moldova. *Sănătate publică, economie și management în medicină*. 2010;1:38-42.
7. Пынтя ВЕ, Седлецкая ЛА. Вирусная В инфекция у беременных. *Материалы конференции а III-а а infecțiоniștilor din Republica Moldova*. Chișinău, 1991;53-54.
8. Пынтя ВЕ, Андриуца КО. Выявление вирусной инфекции среди беременных. *Tezele conferinței științifice а IS Medicină din Chișinău (14-16 mai, 1991)*. Chișinău, 1991;310.
9. Татуева ЗД, Платошину ОВ, Кеименцева АН, и др. Клинико-эпидемиологическая характеристика гепатитов В и С у беременных. *Материалы I конференции Северо-Западного Региона России „Инфекционный контроль в ЛПУ”*, 28-29 марта 2000;СПб.
10. Spănu C, Iarovoi P, Holban T, ș. a. Hepatita virală В (etiologie, epidemiologie, diagnostic, tratament și profilaxie). Chișinău, 2008;156-191.
11. Змушко ЕИ, Белозёров ЕС, Ионниди ЕА. Вирусный гепатит. Москва: Элиста, АПП, Джангар, 2002.

REVIEW ARTICLES

Pharmaceutical service tasks in emergency situations

E. Bernaz*, Gh. Ciobanu, V. Safta

National Centre of Scientific Practice for Emergency Medicine 1, August 31 Street
Chisinau, MD-2012, Republic of Moldova

*Corresponding author: +37322237388. E-mail: bernaz_e@yahoo.com

Manuscript received August 15, 2011; revised October 03, 2011

With the sharp rise of accidents and great catastrophes caused by man, local military conflicts in recent centuries, and unprecedented acts of terrorism, the economies of many countries are faced with choosing liquidation as a solution to the related medical consequences in order to provide medical assistance to their victims—in particular the prediction of sanitary losses and stockpiling drugs necessities for these purposes. The economy and health system in The Republic of Moldova is currently facing such a situation. The analysis results defined the role and place of drugs and other medicine supply systems along with the need to establish appropriate pharmaceutical resources depending on the projected number of sanitary losses as a consequence of emergency situations. Based on the estimated volume of sanitary losses and the nomenclature and consumption quantity of drugs for medical assistance, a number of victims were identified with common needs or drugs for these purposes. An emphasis was placed on the ability of the country's pharmaceutical market for the creation of an adequate supply of medicines for emergency-situation needs and simultaneously save funds under the state budget deficit.

Key words: medicines, emergency situations, stockpiling, sanitary losses, pharmaceutical system, earthquakes, needs.

Задачи фармацевтической службы в чрезвычайных ситуациях

Одновременно с резким ростом, в последние столетия, количество техногенных аварий и катастроф особо крупных размеров, локальных военных конфликтов во многих странах мира, террористических актов, невиданных по своей жестокости, экономика стран столкнулась с решением проблем по ликвидации последствий чрезвычайных ситуаций. В частности, в оказании медицинской помощи пострадавшим, что предполагает прогнозирование санитарных потерь и создание запасов медицинского имущества для этих целей. С подобными ситуациями сталкивается экономика и система здравоохранения Республики Молдова. В результате проведенных анализов были определены: роль и место снабжения медикаментами и другим медицинским имуществом, необходимость создания соответствующих запасов, в зависимости от прогнозируемого количества санитарных потерь, как следствие чрезвычайных ситуаций. Исходя из объема прогнозируемых санитарных потерь, номенклатуры и количества медикаментов для оказания медицинской помощи определенного количества пострадавших, были определены общие потребности для этих целей. Был сделан акцент на возможности внутреннего фармацевтического рынка в создании необходимых запасов медикаментов для чрезвычайных ситуаций, что одновременно может сэкономить значительное количество денежных средств из государственного бюджета страны.

Ключевые слова: медикаменты, чрезвычайные ситуации, запасы, санитарные потери, землетрясение, нормирование, фармацевтическая система.

Introduction

The state bears responsibility and cares permanently for the prepared condition of the population, businesses, local and

governmental organizations on every level in order to avoid or minimize the effects of disasters and provide the lowest human and material losses. According to Article 37 of the Moldovan

Constitution, "Everyone is entitled to a safe environment for life and health from the ecological point of view..."

The end of the XX century was marked with a sudden increase in the number of breakdowns, large-scale natural and man-made catastrophes, the outbreak of local military conflicts in many countries and unprecedented terrorist acts in cruelty and proportions. The dangers of disasters and technogenic breakdowns are largely related to the rapid urbanization with an increasing concentration of population and the enlargement of the urban areas, accompanied by congestion on a small area of a huge amount of gases and petroleum products, power stations, large production complexes, the pollution of which contain considerable reserves of toxins and poisons, flammable and explosive materials. Every year, as a result of industrial production activities the environment is being polluted with 145 millions tons of sulfur dioxide, 250 millions tons of dust, almost one million tons of lead components and other metals. Polluting nature in such a way, results in a slow and deliberate socio-ecological catastrophe that is increasing its scale by the year and is manifesting identically throughout the Republic of Moldova [2].

The purpose of this paper is to determine the role and place of pharmaceutical supply, the need to create reserves of medicinal and other medical materials, depending on the amount of possible sanitary losses following the outbreak of exceptional situations due to possible disasters on the territory of the Republic of Moldova.

Resource materials like scientific publications on social, man-made and natural disasters that took place in the world and in the Republic of Moldova were reviewed; the human and sanitary losses were rated according to the case gravity, as a consequence of an emergency situation. Taking into account the probable volume of sanitary losses, nomenclature and consumption quantities of medicines necessary to treat a number of sanitary losses, the needs focusing on domestic pharmaceutical market possibilities for the creation and management of the emergency situations pharmaceutical stocks in the Republic Moldova were assessed. Mathematical, analytical, comparison, logical and descriptive methods were used.

1. Responsibilities and collaboration

The importance of pharmaceutical supply for the medical care process in case of a mass occurrence of sanitary losses is considerable. This is confirmed by the existence of many programs and agreements of a reciprocal assistance. In case of the appearance of the mass sanitary losses as a consequence of the calamities for a reciprocal assistance in the event of mass victims primarily assistance will be met by the United Nations, World Health Organization, and Commonwealth of the Independent States [3, 4].

The article 1§ 1 (1, 2) of the Law nr. 589-XIII of 22.09.1995 "Concerning the state materials and mobilization reserves" states that "state material reserves are special material goods, set up to intervene to ensure stable functioning of the national economy, to protect people in emergency situations caused by natural disasters, epizootics, industrial accidents, social or economic phenomena, external conjunctions, in case of siege

and war, as well as in case of a humanitarian assistance. The mobilization reserves are special stocks of materials, created ... to conduct special operations, units' formation ... in case of war ... business or public and military forces protection, medical assistance under the application of modern means of destruction..." [5].

With the current risks when emergency situations occur having inefficient supplies can have catastrophic consequences on the lives of people. Unsatisfactory pharmaceutical supply essentially diminishes the scientific significance of the population protection and puts the most qualified specialists-doctors in disadvantaged and difficult circumstances suffering from major sanitary losses, especially when they have to save lives of victims potentially causing serious consequences [6].

The decision on the required amount of reserves and the stocks quantity cannot be rationalized without the knowledge of the probable sanitary losses in disasters, means and forces available at the district, regional and state level medical assistance to the victims as a consequence of incurred disaster.

2. The maximum probable volume of the sanitary losses on the territory of the Republic of Moldova

According to statistical reports of the Department of Statistical and Sociological Analysis of the Republic of Moldova, from disasters that occurred during the years of 1990-2007, there have been 35 registered technogene accidents, 675 natural disasters, 18 epidermises and 38 070 fires, in total claiming the death of 1 522 people in the country. The total number of natural calamities and different kind of technogenic situations recorded over a period of ten years is 38 837.

The earthquakes are considered the most devastating disasters likely to happen in the Republic of Moldova with very serious consequences for the national economy and an enormous number of sanitary losses.

Fig. 1 presents the seismic zones of the territory of Moldova, data on the total area, number of localities, the human population and the general figures of probable losses. Depending on environmental changes it can be difficult to determine general human losses in a probable earthquake with a magnitude of 8.00 after Richter scale, so four different stages were created for simplicity.

- Stage I – up to 5% of the population is outside the premises.
- Stage II – up to 15% of the population is outside the premises.
- Stage III – up to 20% of the population is outside the premises.
- Stage IV – up to 40% of the population is outside the premises [7, 8].

According to seismic zones on the territory of Republic of Moldova, data concerning the type and number of towns and population, the injuries are estimated between 400 000 and 630 000 victims (tab. in fig. 1).

A particular importance for the health system is presented in the sanitary losses structure in case of earthquakes is presented in the following tab. 1:

Therefore, the most likely and simultaneous volume of

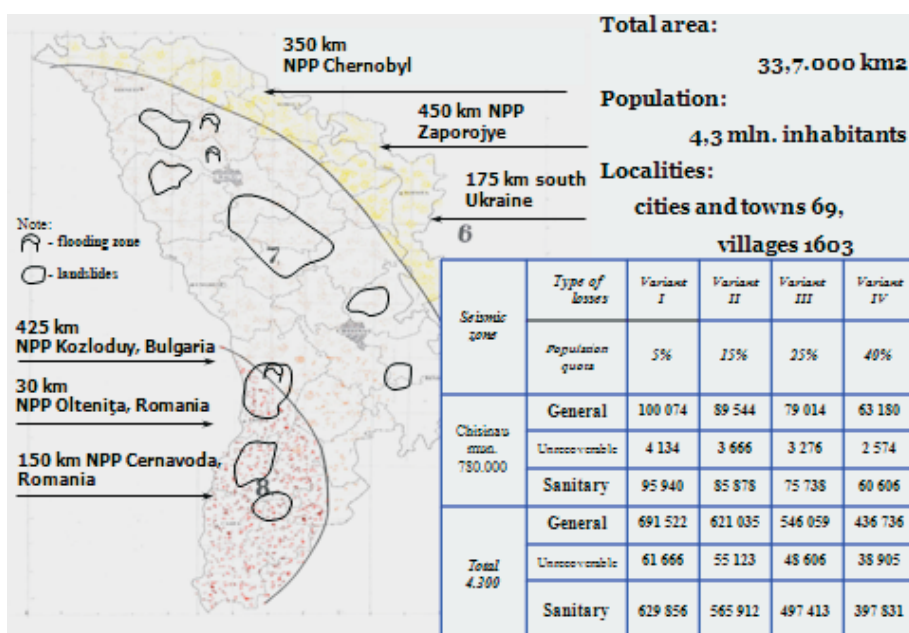


Fig. 1. The map of seismic zones on the territory of the Republic of Moldova.

Table 1

The gravity of sanitary losses in case of an earthquake with a magnitude of up to 8.0 after Richter scale in the Republic of Moldova

Seismic zones	Level of casualties	Variant I	Variant II	Variant III	Variant IV
		amount	amount	amount	amount
Chisinau mun. 780 000 inhabitants	Total	95 940	85 878	75 738	60 606
	Heavy	6 484	5 823	5 135	4 109
	Medium	10 496	9 395	8 286	6 630
	Low	78 960	70 660	62 317	49 867
Total 4 300 inhabitants	Total	629 856	565 912	497 453	397 831
	Heavy	59 247	53 131	46 811	37 438
	Medium	85 112	76 349	87 222	53 762
	Low	485 497	436 432	383 420	344 069

sanitary losses in emergency situations that may arise on the territory as a consequence of earthquake varies between 38-60 thousand persons in serious condition, 54-85 thousand persons to the average state and between 350-500 thousand persons light condition (including in Chisinau municipality from 4 to 6.5 thousand persons in serious condition, 6.6 to 10.5 thousand persons to the average state and light condition between 50-80 thousand people) [2].

The bases of the presented data are based on the severe damage of the earthquake that took place in Moldova in 1986 and resulted in 7 000 effected buildings with an estimated damage of 510 million USD [9]. The data shows that such earthquakes, possibly stronger, could potentially take place every 10-30 years and amount to the partial or the total devastation of the 7 000 buildings damaged during the earthquake of 1986. With a probability of these huge consequences and large medico-sanitary losses, the estimated sanitary losses for each of the buildings are at least 100 people. Also noted since 1986 a large number of houses built or buildings put into operation are in breach of technical regulations and in many of the buildings people have made changes which violate the

regulations in force. This increases the danger of devastation in the event of earthquakes. Taking into account the above information the possible number of victim after a potential earthquake in Moldova could be even greater than expected from the above statistics.

As a confirmation of the potential scenario that could occur in Moldova, the consequences of the 7.5 magnitudes from the earthquake in Haiti in 2010 are observed. There were 230 000 deaths, 300 000 injuries, 1.1 million deaths from the cholera outbreak, one million people left homeless and around 250 000 houses and 30 000 buildings collapsed or were severely damaged [10].

3. Pharmaceutical management of emergency situations' consequences

Based on the research and evaluation of the emergencies caused by natural disasters, technogenic and conflict situations, probable medical consequences, the existing organizational forms and methods to supply drugs and medical supply means [11] the following scheme of principle management of consequences of the pharmaceutical emergency situations is proposed.

The medical disaster concept determines the place and

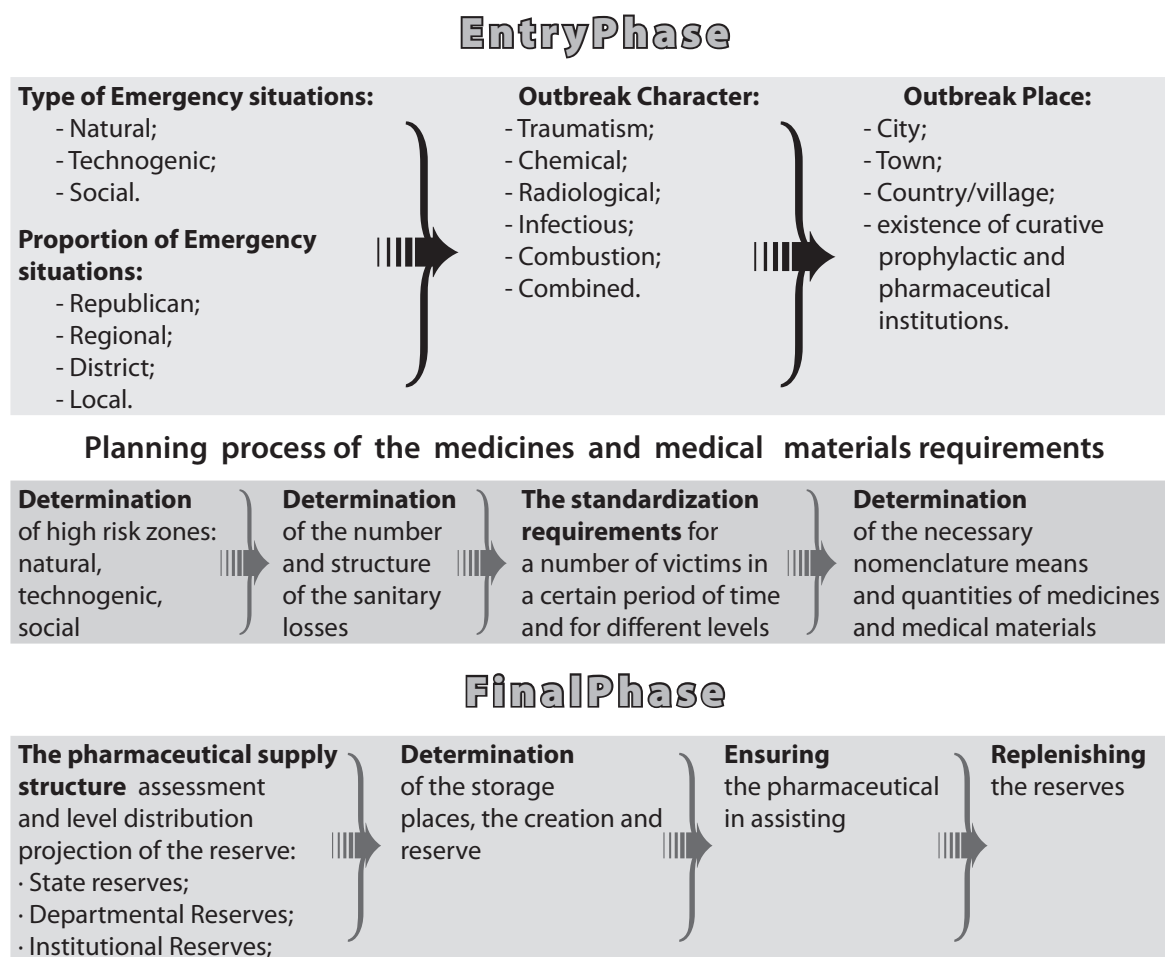


Fig. 2. The main pharmaceutical management schema to ensure and eliminate the emergency situations consequences.

pharmaceutical service missions and regardless the disaster type is based on the following principles:

- pharmacist participation in the analysis of the possible disasters, predicting the probable sanitary losses, assessing the amount of necessary medical assistance;
- the creation of a unique pharmaceutical insurance system for rescue activities at medical evacuation stages, starting from the calamity generator and ending with the hospitals;
- the medicine reserves creation and medical equipment according to calculations and staggering under the volume of care planned for each stage of medical evacuation;
- planning activities related to pharmaceutical supplies in calamities - the daily activity regime, in a state of intensive readiness and in the state of emergency regime;
- development of different strategies for pharmaceutical supply to cover the medical assistance for the possible victims, taking account of the potential consequences that on a particular territory can be triggered by the catastrophe, medico-social and economic characteristics of these areas [12].

4. The forces and the means of the Medical System in the Republic of Moldova to eliminate the calamities' medical consequences

a) For pre-hospital medical assistance (sanitary loss with mild and severe condition):

1. The victims of light injuries in most cases will carry out

the necessary first aid independently or will assist each other. Their number in case of mass sanitary losses could reach up to 500 thousand persons.

2. For victims with average gravity the medical assistance will be organized within the Family Medicine Centers, Medical Centers and Family Medical Offices. This number in case of mass sanitary losses may reach 85 thousand people and in most cases will not require hospitalization.

Today, the Health System has 49 Family Medical Centers, 369 Health Center and 580 Family Medical Offices with the capacity to fit an approximate of 26 000 patients every day (according to the MH report, in 2010, those centers have received around 10 million visitors for the 2010 year). Therefore we can conclude that the health system will cope with 85 000 average gravity sanitary losses within 3-5 days.

3. As intermediaries between outbreaks, the Family Medical Centers and the Hospitals will enable 35 Emergency Medical Aid Stations North, Center and National Center for Emergency Medical Care. The annual demand is about 1 million. Therefore, a maximum of 3 000 applicants can be served daily [13]. The transportation needs for victims from the disaster area to the curative-diagnostic medical sanitary institutions in an earthquake with a magnitude of 8.0 after Richter scale will be from 100 thousand to 150 thousand, which is 30-50 times more than daily accomplished today.

b) For providing hospital care (serious health losses)

The Health System currently has 82 Hospitals consisting from 62 public Hospitals, 10 Departmental Hospitals and 10 Private Hospitals. The total number of beds in public hospitals consists of 20,021 beds [14]. Given the existing number of beds in the first days will be possible to hospitalize about 10-15 thousand sanitary losses with severe gravity.

So, there will be no possibility to hospitalize about 25-45 thousands of sanitary losses with severe gravity, out of the probable 40-60 thousand.

Conclusions on the possibility of partial use of current medical stocks to assist probable sanitary losses can be taken only after determining the medicine needs for medical care of the probable sanitary losses, considering the needs to treat patients that could not be discharged due to the health conditions and comparison with existing drug stocks.

5. Pharmaceutical reserves for the emergency situations

There are three categories of medical reserves depending on the level of management in the Health System: Institutional Departmental and State pharmaceutical reserves.

Given the likely amount of sanitary losses as a consequence of possible emergency situation, the maximum pharmaceutical reserves, which ideally would be necessary to possess the Health System, is for the treatment of about 350-500 thousand people (for which special reserve according to the legislation are not planned). With slight state, about 54-85 thousand the average gravity and an approximate of 38-60 thousand people in serious condition, including the Chisinau municipality: from 4 to 6.5 thousand in serious condition, 6.6 to 10.5 thousand people with average state and around 50-80 thousand light condition. Under the existing norms of drugs for pre-hospital medical care (sanitary losses with average gravity - rule nr. 1) and in-hospital (serious health losses - rule nr. 2) for 100 sanitary losses [15] and their acquisition cost based on the drugs prices for the medical institutions in the current year (2011) the estimated amount for each of the rules has been determined. In order to qualitatively analyze the norms for each group of pharmacotherapeutic, drugs have been determined representative quote of each group in the total. As well, the need of drugs based on the minimum and maximum probable sanitary losses taking into account the se-

Table 2

The prehospital reserves according to the ATC classification in Moldavian leis

Pharmacotherapeutic groups	Minimum	Maximum
A - Alimentary tract and metabolism	5 341 680	8 408 200
B - Blood and blood forming organs	15 388 218	24 222 195
C - Cardiovascular system	461 700	726 750
D - Dermatologicals	1 880 280	2 959 700
G - Genito-urinary system and sex hormones	0	0
H - Systemic hormonal preparations, excluding sex hormones and insulins	22 140	34 850
J - Antiinfectives for systemic use	265 140	417 350
L - Antineoplastic and immunomodulating agents	10.368	16 320
M - Musculo-skeletal system	355.320	559 300
N - Nervous system	2 226 852	3 505 230
R - Respiratory system	675 162	1 062 755
V - Various	226 044	355 810
Total	26 852 904	42 268 460

ismic zoning of the Republic of Moldova has been determined. The results are presented in the following figures and tables.

The cost of nr.1 norm for 100 losses with average severity (pre-hospital) is estimated at 60 287 lei of which 49 727 leis are drugs, 6 624 leis are parapharmaceutical and 3 935 lei the

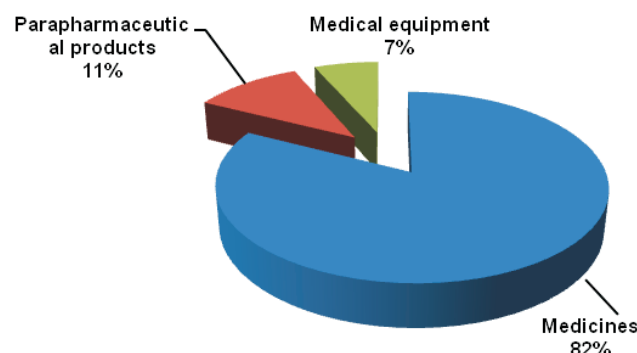


Fig. 3. The percentage of medicines, parapharmaceutical products and medical devices in the cost value of prehospital standard.

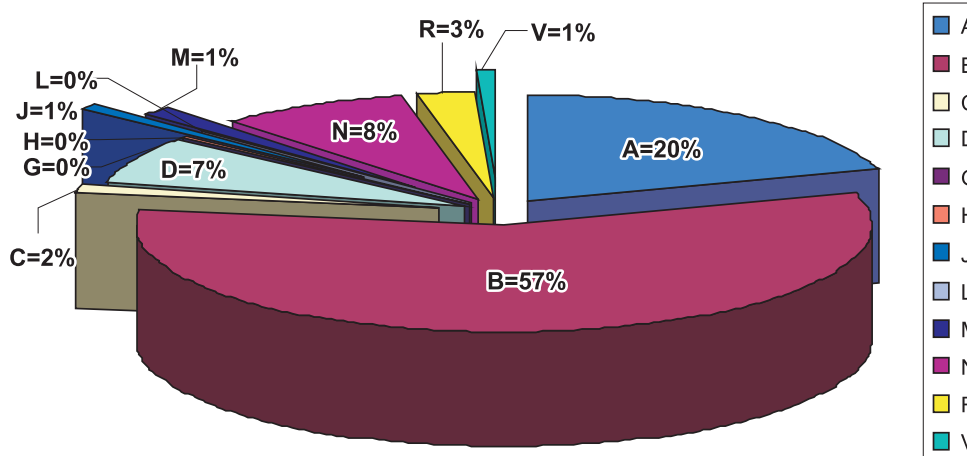


Fig. 4. The prehospital qualitative standards structure according to the ATC classification.

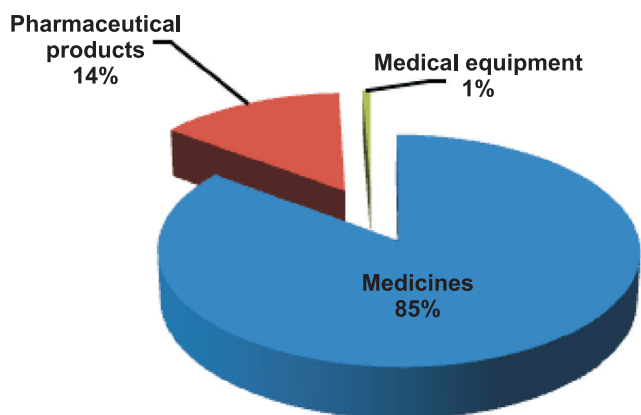


Fig. 5. The percentage of medicinal products, parapharmaceutical and medical devices in the cost value of the hospital standards.

medical devices. In the figure 4 is presented the prehospital qualitative norms according to the ATC classification.

As shown in fig. 1 most representative drugs are the ATC classification group B - blood and hematopoietic elements, A - digestive tract and metabolism, N - central nervous system, D - dermatological drugs. The cost of drugs for 100 sanitary losses with average severity (prehospital) is estimated to 49 727.

In the tab. 2 is foreseen the pre-hospital medications according to the ATC classification in Moldavian leis.

The calculation was made based on the probability of 54 000 minimum and 85 000 maximum of sanitary loss with average condition to be treated in the prehospital institutions. The necessary amounts for these purposes will vary between 27 and 43 million leis.

The cost of nr. 2 norm for 100 serious loss of health (hospital) is estimated at 423 456.5 Moldavian leis out of which 361 106.5 lei are medicines, 59 839 lei - parapharmaceuticals and 2 511 lei medical equipment.

The Hospital drugs' normative is highlighted with higher representation compared to the pre-hospital pharmacotherapeutic groups B - blood and hematopoietic elements, J - systemic use anti-infective and representation of lower use of drugs groups A - digestive tract and metabolism, D - dermatological drugs. The cost of drug for 100 serious

Table 3

The prehospital requirements according to the ATC classification in Moldavian leis

Pharmacotherapeutic groups	Minimum	Maximum
A - Alimentary tract and metabolism	16 023 004	25 299 480
B - Blood and blood forming organs	80 448 128	127 023 360
C - Cardiovascular system	1 889 436	2 983 320
D - Dermatologicals	6 031 360	9 523 200
G - Genito-urinary system and sex hormones	1 276 8	2 016
H - Systemic hormonal preparations, excluding sex hormones and insulins	92 378	145 860
J - Antiinfectives for systemic use	12 271 340	19 375 800
L - Antineoplastic and immunomodulating agents	60 838	96 060
M - Musculo-skeletal system	1 835 590	2 898 300
N - Nervous system	8 608 178	13 591 860
R - Respiratory system	3 176 268	5 015 160
V - Various	6 782 658	10 709 460
Total	137 220 455	216 663 876

sanitary losses (hospital) is estimated to 361 106 Moldavian leis. In the table 3 are the hospital medications according to the ATC classification.

The calculation was made based on the probable of a minimum of 38 000 and a maximum of 60 000 in sanitary losses in serious condition which are planned to be treated in hospitals. The necessary amounts for these purposes will vary between 138 and 217 million leis. Therefore, the hospital drugs' needs for the mentioned purposes are more than five times higher than the pre-hospital ones.

Fig. 7 is presents the qualitative structure of the total pre-hospital sum and the hospital ones, but in the table 4 the value indicators of the necessities according to the ATC classification.

The qualitative structure according to the ATC classification of the amount of pre-hospital and hospital procedures will allow the pharmaceutical internal market analysis to compare and acknowledge the reserves possibilities to cover the state needs in order to face and terminate the medical consequences as a result of disasters.

Therefore, the cost sum to cover the pre-hospital and

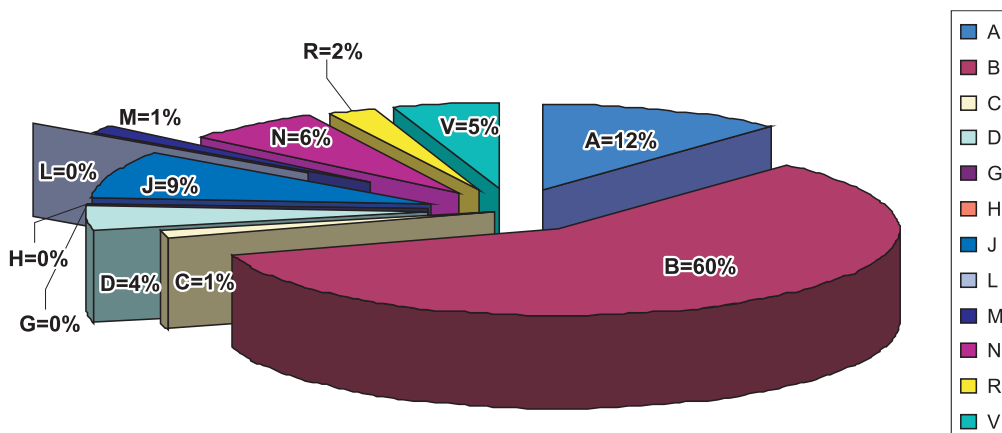


Fig. 6. The prehospital qualitative standards structure according to the ATC classification.

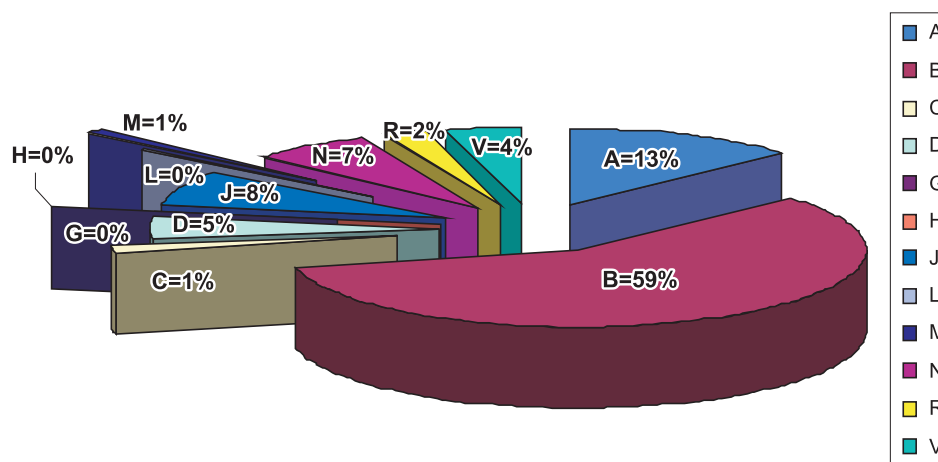


Fig. 7. The amount qualitative structure of the prehospital and hospital standards according to the ATC classification.

Table 4

The prehospital and hospital reserves requirements according to the ATC classification in Moldavian lei

Prehospital and hospital reserves		
Pharmacotherapeutic groups	Minimum	Maximum
A - Alimentary tract and metabolism	21 364 684	33 707 680
B - Blood and blood forming organs	95 836 346	151 245 555
C - Cardiovascular system	2 351 136	3 710 070
D - Dermatologicals	7 911 640	12 482 900
G - Genito-urinary system and sex hormones	12 768	2 016
H - Systemic hormonal preparations, excluding sex hormones and insulins	114 518	180 710
J - Antiinfectives for systemic use	12 536 480	19 793 150
L - Antineoplastic and immunomodulating agents	71 206	112 380
M - Musculo-skeletal system	2 190 910	3 457 600
N - Nervous system	10 835 030	17 097 090
R - Respiratory system	3 851 430	6 077 915
V - Various	7 008 702	11 065 270
Total	164 084 850	258 932 336

Table 5

The prehospital and hospital reserves requirements for medical material resources in Moldavian lei

Medical material resources	Minimum	Maximum
Prehospital reserves		
Medicines	26 852 804	42 268 460
Parapharmaceutical products	3 577 176	5 630 740
Medical equipment	2 124 900	3 344 750
Amount	32 554 980	51 243 950
Hospital reserves		
Medicines	137 220 455	216 633 876
Parapharmaceutical products	22 738 820	35 903 400
Medical equipment	954 180	1 506 600
Amount	160 913 455	254 073 876
Total	193 468 435	305 317 826

hospital medical care is estimated at a minimum 164 million lei and a maximum of 259 million lei. For the municipality of Chisinau this amount, which is included in the total country data, will respectively cover the pre-hospital medical care from 3.3 to 5.2 million leis and hospital from 14.9 to 23.4 million leis. The total amount is estimated to be from 18.2 to 28.6 million. Included in table 5 is the pre-hospital and hospital reserve necessities.

As seen from the results in tab. 5 the requirements in medical material resources for pre-hospital medical care and hospital health care, in case of earthquake losses that would affect the southern districts currently at 8, the Central at 7 and the East at 6 points after the Richter scale, would depend on several factors from 194 up to 305 million Moldavian leis.

Fig. 8 shows a representative share of the main groups pre-hospital and hospital of medical material resources reserve requirements for medical care at the minimum and maximum average sanitary loss severity according to tab. 5.

Taking into account the number of pharmaceutical plants and pharmaceutical wholesalers agents (which in 2010 have commercialized drugs amount to \$140 millions or about 1 milliard 680 million leis), between 164 million leis and 259 million leis medicine necessities, 26 and 42 million leis products and 3 and 5 million leis for the medical devices needed to create necessary reserves from the state budget necessary for the mentioned purposes could have been minimized. For the rhythmic activity the economic agents would need reserves that would satisfy the pharmaceutical market over a period of at least 2.5 to 3 months or reserves amounted to 420 million leis.

The study of current reserves of the pharmaceutical factories and pharmaceutical agents wholesalers with a high probability can result in permanent existence of medicines stocks needed for the emergency situations. The obtained results will serve as a key argument in addressing the state problem of maintaining the medication stocks needed for emergency situations, following the concluded purchase contracts (with payment and delivery only in emergencies situations, corresponding the economic agents and state interests) because the state would have the obligation to pay the storage and re-supplement drugs taxes, but the economic

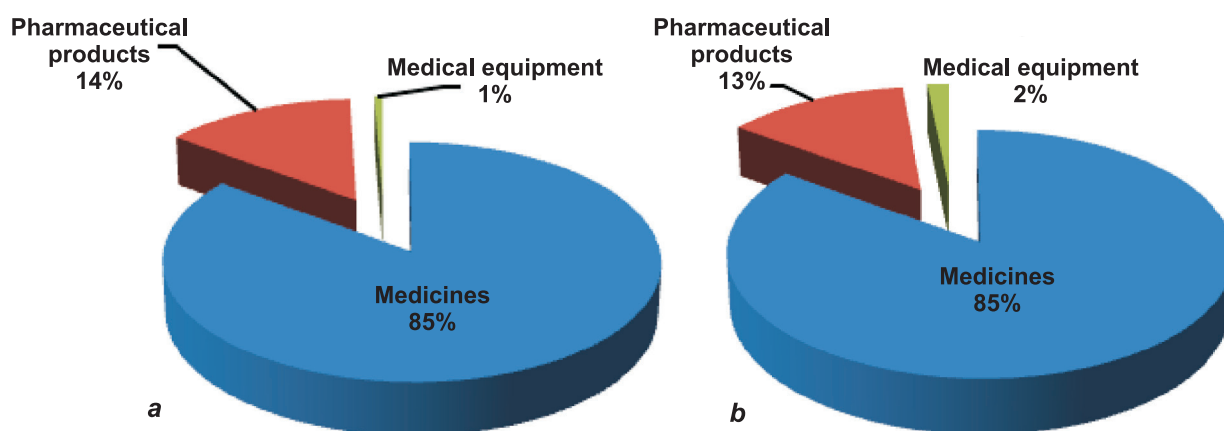


Fig. 8. The share of drugs, medical products and parapharmaceutical products cost value of reserve requirements: a) minimum b) maximum prehospital and hospital.

agents could help the state in case of calamities and will be paid for the delivered medications. At the same time, it will be achieved the decentralization of the reserves as an important factor in emergency situations.

In spite of the fact that it has been approved that volumes of medico-sanitary materials to be kept in mobilization reserves [16] through the Governmental Decision the Nomenclature and there has been a special working group within the MH RM created [17] this problem remains and is still far from being solved completely.

To provide medical assistance in emergency situations that can take place only in certain regions, it is considered optimal that the country's Health System maintains a sufficient amount of drugs for the medical assistance of 10-15% percent out of the maximum number of sanitary losses with average-serious gravity, e.g. for about 10 000 sanitary losses with average severity kept in Family Medical Centers and around 5 000 severe gravity sanitary losses kept mainly in republican hospitals.

Conclusions

1. The missions of the pharmaceutical service regardless of the calamity type in emergency situations is to participate in the assessment of potential disaster situations based on type, proportions, character and outbreak location, predicting the probable sanitary losses, determination and establishment of the medicines reserves, pharmaceutical products and medical material devises, planning activities related to pharmaceutical provision in disaster situations and medical service to provide medical assistance to the probable victims. In the Republic of Moldova it is common to create a centralized system that ensures pharmaceutical assistance in rescue activities at the medical evacuation stages, starting with the calamity outbreak and ending up with hospitals.

2. According to the made forecast, the maximum amount of sanitary losses, in case of a probable earthquake with the 6 to 8.00 magnitude after the Richter scale, for Moldova is estimated at approximate of 435 - 629 000 people, depending on several factors, out of which with medium and serious

injuries 91 000 - 144 000 and light injuries from 344 000 to 485 000 persons.

3. Assessing Health System's landmark health consequences liquidation in the event of emergencies has demonstrated:

a) the systems possibility to cope with the medical assistance for the potential sanitary losses with average and light gravity injuries;

b) a considerable deficit of medical personnel and medical transportation to pre-hospital stage, and a considerable lack of medical personnel and hospital beds to provide treatment for serious sanitary losses.

4. The mass sanitary losses drugs' needed for pre-hospital care is estimated at a minimum of 164 million leis and a maximum of 305 million leis. The reserves and current domestic drug manufacturers and pharmaceutical wholesalers' deposits are at about 25% from the commercialized volume which for 2 010 is approximately 420 million leis. The main drugs demanded according to the main ATC classification constitutes: Group B - blood and hematopoietic elements between 80.5 and 127 million leis, Group A - digestions tract and metabolism between 16.0 and 25.3 million leis, Group J - systemic use anti-infective between 12.3 and 19.4 million leis, N - nervous system between 8.6 and 13.6 million lei, V - varies between 6.8 and 10.7 million leis, D - dermatological drugs between 6.0 and 9.5 million others.

5. Requires strengthening and restructuring of the Pharmaceutical Insurance System involving, if necessary, all forces and means of the domestic pharmaceutical producers and companies with private and state capital, to eliminate the medical consequences in case of the emergency situations; as well as, the legislation that determines the preventive modality of the insurance organization with medical means and supplies and regulation of state interaction with the economical agents to achieve these principle needs for these purposes. Furthermore, is needed to review the principles of the pharmaceutical supply and the reserves staging for the consequences liquidation the medical of disasters.

Recommendations

1. In addressing issues related to state demands to determine, create and maintain inventories of drugs to reduce medical consequences as a result of disasters of different types, requires a decision making process at legislative plan and normative concerning the missions, structure and pharmaceutical system location in case of emergency situations.

2. Based on the data regarding the probable sanitary losses, capacity assessment of the Health System in overcoming the medical consequences in emergency situations, proposals preparation for the adoption of legislative and normative regarding the mobilization training and the country mobilization in case of serious sanitary losses - up to 5 000, 10 000 in case the system would independently cope with the treatment of the potential victims and 10 to 20 thousand and more thousand victims with serious sanitary losses, when the system will confront a greater number of problems to eliminate the medical consequences of the emergency situation.

3. In order to determine the demand of drugs in emergency situations, obtaining a considerable economic effect of considerable financial budget resources, it is necessary to evaluate the current reserves of all state and private owned economical agencies for contracting the Health System necessary medications for the emergency situations. In determining the amount of reserves will take into account the current stock of public medical institutions. Thus, the state will not impose economic burdens to the economic agents, but will be sure in existence of the necessary reserves.

4. To maintain a high degree of readiness for the potential emergency situations, it is important to maintain the pharmaceutical reserves of the Ministry of Health with sufficient quantities of 5-10% to ensure the medical care for the serious gravity sanitary losses, for about 10 000 average gravity sanitary losses and 5 000 severe sanitary losses at the state deposits, Family Medical Centers and Republican Hospitals.

Bibliography

1. Constituția Republicii Moldova. *Monitorul Oficial nr. 1* din 18.08.1994.
2. Bernaz EP. Argumentarea sistemului de aprovizionare farmaceutică a Forțelor Armate ale Republicii Moldova: autoref. tezei de doctor în farmacie. Chișinău, 2007;21.
3. Acord între GRM și ONU cu privire la măsurile de urgentare a importului, exportului și de tranzitare a ajutoarelor umanitare și a averii personalului de acordare a ajutorului în caz de calamități și situații excepționale din 17.09.1999.
4. Acord cu privire la ajutorul reciproc în caz de producere a avariilor și altor situații excepționale la obiectivele electroenergetice ale statelor-membre ale Comunității Statelor Independente din 30.05.2002.
5. Legea cu privire la rezervele materiale de stat și de mobilizare nr.589-XIII din 22.09.95, MO al RM nr.11-12/114 din 22.02.1996, Chișinău, 1996.
6. Ибрагимов ГЯ, Сбоева СГ. Роль провизора в условиях чрезвычайной ситуации. *Фармация*. 2002;2:37.
7. Гончаров СФ, Лобанов ГП, Бобий БВ, и др. Методические рекомендации по определению потребности в медицинских силах и средствах при землетрясениях. Москва: ВЦМК „Защита”, 1999;27.
8. Давыденко АМ, Володин АС, Гришин ВИ. Совершенствование средств и методов прогнозирования санитарных потерь. *Военно-медицинский журнал*. 2002;4:73-76.
9. Assessment of health security and crises management capacity. WHO Regional Office for Europe. Republic of Moldova. Copenhagen, Denmark, 2008;20.
10. [http://ro.wikipedia.org/wiki/Ro.wikipedia.org/Cutremurul_Haiti_\(2010\)](http://ro.wikipedia.org/wiki/Ro.wikipedia.org/Cutremurul_Haiti_(2010)).
11. Жильев ЕГ, Макаров НВ. Обеспечение медицинским имуществом формирований в чрезвычайных ситуациях мирного времени. *Военно-медицинский журнал*. 1994;2:23.
12. Петров ГВ. Концепция военно-гражданского сотрудничества в осложненных чрезвычайных ситуациях: позиция ОСНА/ИЩДН и опыт Всероссийской службы медицины катастроф. *Медицина катастроф*. 2000;4:4-5.
13. Ciobanu Gheorghie. Activitatea serviciului asistență medicală urgentă a MS RM anul 2010 și obiectivele pentru anul 2011. Raport anual. Chișinău, 2011;86.
14. Pîsla M. Evaluarea siguranței spitalelor din R. Moldova”. World Health Organisation, Regional office for Europe. Chișinău, 2010;15.
15. Ord. MS RM nr. 201 din 24.05.2007 „Cu privire la punerea în aplicare a Normelor de calcul al necesităților de medicamente și consumabile parafarmaceutice pentru acordarea ajutorului medical în caz de situații excepționale”. Chișinău, 2007.
16. Hotărârea Guvernului nr 441-11 din 21.03.2008 „Nomenclatorul și volumele de materiale medico-sanitare ce urmează a fi păstrate în rezervele de mobilizare”.
17. Dispoziția MS nr.140d din 08.04.2010 „Cu privire la instituirea grupului de lucru”.

