

## SUPPLY OF MEDICINES BY HUMANITARIAN ORGANIZATIONS IN WAR CONDITIONS

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**Abstract.** Natural and war disasters lead to stagnation in economic, social and, yes, health development. During the war, the own production of medicines was significantly reduced or even completely stopped due to the destruction of factories, the impossibility of securing raw materials for the production of medicines, and due to the difficulty of importing, transporting and distributing medicines. Even during the war, chronic non-communicable diseases that require daily intake of several groups of drugs are common, the therapy is long-term, and it is necessary to provide a large amount of drugs for these patients. (Abrams J. Nitroglycerin and long-acting nitrates. *N Engl J Med* 1980; 302:1234). Under these conditions, humanitarian organizations are often the only ones who are able to secure and deliver medicines to certain war-affected areas, which was the case in Bosnia and Herzegovina. Frequent scientific and non-scientific discussions indicate that the medicines donated through humanitarian organizations are outdated and inadequate in relation to the needs of the population. In my research related to the humanitarian organization "Igasas", which included a clinic and a pharmacy and provided help through diagnostics and therapy mainly to chronic internal medicine patients, and for the period from January 2, 1994 to December 31, 1995. I found the following data: 12,839 patients with (CVD, GIO and diabetes mellitus) sought help in this clinic and pharmacy. Of these, 68.00% had CVD, 17.00% GIO and 15.00% diabetes mellitus. Of the total number of patients, 59.00% were women, and 41.00% were men. A significant difference was recorded in the number of patients with CVD according to GIO and diabetes mellitus ( $p = < 0.001$ ). The highest consumption of drugs was for the treatment of CVD patients (75.00%), while the number of drugs for the treatment of GIO and diabetes mellitus amounted to (25.00%) of the total drug consumption, this is shown by a significant difference ( $p = < 0.001$ ). The total monetary value of medicines issued in the period 1994 and 1995 in the humanitarian pharmacy "Igasas" is 369,816.28 KM. There was a significant difference in the consumption of medicines as well as the difference in the monetary value of the dispensed medicines between the humanitarian pharmacy "Igasas" and the civilian pharmacy "Bašćaršija".

**Keywords:** Internal diseases - leading diseases - drug needs - drugs for chronic diseases

**1. INTERNAL DISEASES - LEADING DISEASES**

**1.1. The problem of chronic diseases**

Chronic non-communicable diseases are common from the point of view of diagnosis, therapy and control of treatment success in the daily work of doctors. A large number of residents suffer from these diseases, several diseases often occur together in one patient, the disease lasts a long time, and the treatment of these patients is expensive. (Tomić, Zagreb, 1989). Patients with chronic non-communicable diseases are often absent from work, there is a high percentage of disability and mortality, and because of this, these diseases represent a major health and social problem.

**1.2. Leading chronic internal diseases in the war**

If we exclude violent injury and mortality in war conditions caused by weapons that are increasingly deadly and destructive, then the leading problem in medicine (internal medicine) is certainly cardiovascular system diseases, they are the leading cause of mortality and disability. The average mortality rate has been falling in Europe since 1990, but is increasing in Eastern and Central Europe. (Božidar Vrhovac & Suradnici, Interna medicina Zagreb, 1997). Chronic diseases of the respiratory system are in the first place of out-of-hospital morbidity. The frequency of malignant diseases varies and depends on age, gender, place of residence and various environmental factors.

**Table 1. Diseases, conditions and injuries determined in ambulatory-polyclinic activities by cantons in FBiH in 1998**

Chapters, diseases, conditions and injuries according to 10. ICD	20-64. years			65 and over		
	No. patients	Index structure %	Rate per 10,000 residential	The number of patients	Index structure %	Rate per 10,000 residential
Diseases of the circulatory system	115.593	12,5	944	67.457	24,6	2.780
Diseases of the respiratory system	187.832	21	1.534	58.777	21,4	2.422
Diseases of the digestive tract	60.825	6,8	497	19.793	7,2	816
Endocrine and metabolic diseases with eating disorders	29.196	3,3	241	15.499	5,6	639
Neoplazme	7.174	0,8	59	2.226	0,8	92
Diseases of the genitourinary system	110.965	12,4	906	17.055	6,2	703
Mental behavioral disorders	39.567	4,4	323	11.406	4,2	470
Other disease		38,8			30	
Total		100 %			100%	

From the point of view of morbidity, disability and mortality, cardiovascular diseases represent a significant medical problem. It is believed that every sixth inhabitant in the world suffers from some kind of cardiovascular disease, and that almost every other person dies because of cardiovascular diseases. (Editorial. Calcium antagonists and blood pressure. *Lancet* 1983; 2:22). Abundant smoking, increased food consumption, reduced physical activity, changed conditions and lifestyle, increased living standards, faster pace of life and other factors contribute to the increasingly frequent occurrence of cardiovascular diseases, especially hypertension and coronary disease (angina pectoris and myocardial infarction). These diseases often affect people in the most productive age and these people become disabled or die early. (Elkayam U, Gleicher *JAMA* 1984). The development of cardiology as a scientific discipline has significantly progressed with the development of new medical technologies; (electrocardiogram, and its application in everyday medical practice, dynamic electrocardiography (Holter, echocardiography, selective coronary angiography, etc.). (Famakoterapijski priručnik, 7. Izdanje. Zagreb, 2008). The invention of an artificial rhythm guide and the progress of cardiac surgery in the overall care of cardiovascular patients are important.

### **1.3. MEDICINE NEEDS - Medicines for chronic diseases**

#### **a. Drug needs for chronic diseases**

Chronic non-communicable diseases are mass diseases, they last for a long time, and for treatment it is necessary to take a long-term and daily combination of several groups of drugs, and therefore it is necessary to provide a large amount of different groups for these patients.

#### **b. War and emergency conditions and the relationship between health care and the needs of patients**

War and natural disasters lead to stagnation in economic, social and health development. Every country must be ready to mitigate and rehabilitate the consequences of these disasters. (Braunwald E *i sur. N Engl J Med* 1984; 310:459). In the conditions of the war, the own production of medicines was significantly reduced or completely stopped, due to the destruction of factories, the impossibility of finding raw materials for production, the import, transport and distribution of medicines was difficult, and the needs of the population increased in the conditions of war and natural disasters.

#### **c. Medical treatment of patients with internal diseases**

Internal medicine patients, especially those suffering from chronic internal medicine diseases, have to take medicine every day, and often come for check-ups with the doctor, both to determine the state of the disease and from the aspect of determining the effectiveness of certain medicines. (Čustović F, Golder V, Čikeš I, ur. *Klinička kardiologija. Medicinska naklada, Zagreb, 1995*). In the conditions of war, patients do not come regularly for check-ups and are often treated with medicines that are available to the doctor and are often not effective enough.

**d. Necessary medicines**

When it comes to chronic internal diseases, the following drugs are necessary:

Cardiacally active glycosides, antiarrhythmics, vasodilators for the treatment of heart disease, antihypertensives and diuretics in combination, diuretics, potassium-sparing diuretics, peripheral vasodilators, beta blockers, calcium channel blockers, selective calcium channel blockers with direct effect on the heart, ACE Inhibitors, ACE Inhibitor combinations, antacids, medicines for the treatment of ulcer disease, medicines for the treatment of diabetes, oral antidiabetics.

**Table 2. Consumption of medicines in the "Centar" pharmacy for the period January 1, 2001 - December 29, 2001**

The table shows that the highest consumption is antihypertensive drugs (24.00%), followed by antidiabetics (19.00%), drugs for the treatment of peptic ulcer (14.00%), vasodilators for the treatment of heart disease (11.00%) , calcium antagonists (9.00%), peripheral vasodilators (8.00%), cardiac active glycosides (6.00%), diuretics (4.00%), beta blockers (3.00%), antacids (1.00%) and antiarrhythmics (1.00%)

Lijekovi	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Ukupno	%
Antihipertenzivi	842	905	938	860	860	925	1.023	934	903	928	1.015	1.091	11.224	24,00
Antidijabetici	494	704	696	648	798	658	700	866	734	636	686	608	8.228	19,00
Lijekovi za liječenje peptičkog ulkusa	403	539	508	458	544	593	527	550	581	642	471	420	6.239	14,00
Vazodilatatori za liječenje bolesti srca	429	338	446	506	399	473	412	495	441	400	360	436	5.135	11,00
Antagonisti kalcija	328	279	386	343	282	390	379	316	337	342	330	297	4.009	9,00
Perif.vazodilatatori	291	206	264	361	334	248	279	349	325	279	344	274	3.554	8,00
Srč.aktivni glikozidi	238	180	216	208	242	251	213	244	280	191	188	131	2.582	6,00
Diuretici	95	137	153	136	152	160	142	157	179	156	186	110	1.763	4,00
Beta blokatori	46	48	77	64	50	49	58	53	53	74	50	53	1.327	3,00
Antacidi	51	73	72	46	58	47	70	47	33	44	43	42	626	1,00
Antiarritmici	19	12	19	14	22	24	28	15	26	17	39	29	319	1,00
Ukupno	3.236	3.421	3.775	3.644	3.741	3.818	3.831	4.026	3.892	3.709	3.630	3.491	44.296	100,00

## 2. PROBLEM DEFINITION

The economic, social and health situation of the population was disrupted in the war, the weapons used in the current wars are extremely destructive, so both the military and civilian population suffer, and material and technical goods also suffer. (N Engl J Med 1983). Own production of medicines has been reduced or completely stopped due to the destruction of production facilities, the suffering of professional staff or departure from the country, the inability to secure the raw materials necessary for the production of medicines. Health facilities are also targets of attack, health workers are decimated, and health doctrine is prioritized. Under these conditions, humanitarian organizations are sometimes the only ones that can deliver food and medicine to certain areas, which was a frequent case during the war in Bosnia and Herzegovina. However, often the medicines that are delivered that way do not meet the needs of the population in conditions of war. (Hadzić, N: i Sar. Zagreb 1985). Humanitarian organizations, which are known often and through experience from individual wars, can significantly contribute to providing the most useful medicines for such disasters, because there is a large disparity between the population's need for medicines, the possibility of insurance and the need for the most necessary medicines of great importance. (Marliss E B. Insulin: sixty years of use. N Engl J Med 1982;306:362). Chronic patients are greatly affected by the impossibility of adequate therapy in wartime conditions, because the success of their treatment is daily and often combined therapy, which is difficult to ensure in wartime conditions. (Martindale (1996).

## 3. HYPOTHESIS

### 3.1. Research hypothesis

- a. That the frequency of prescribing drugs for mass non-communicable diseases in the war period was reduced in the civilian pharmacy, considering the material, technical and personnel resources that were available at that time.
- b. That the economic value of the drugs dispensed in the humanitarian pharmacy "Igasa", which served as a sample for the research, is significantly higher compared to the civilian pharmacy.

### 3.2. The null hypothesis

There were no significant differences either in humanitarian organizations or in civilian pharmacies.

## 4. PURPOSE OF THE WORK

The aim of this paper is to determine the structure of chronic diseases in patients treated in humanitarian clinics, and the structure of the drugs provided for the treatment of chronic patients in the same clinics during the war in Sarajevo.

**5. METHOD OF WORK**

**5.1. Test Type:**

Retrospective data from medical documentation (protocol) in the period from January 2, 1994 to December 31, 1995 in the humanitarian clinic and pharmacy "Igasa"

**Medicines:**

- **Medicines for cardiovascular diseases**, vasodilators for the treatment of heart disease, calcium antagonists, peripheral vasodilators, cardiac active glycosides, antihypertensives, beta blockers, diuretics, antiarrhythmics.
- **Medicines for diabetes mellitus:** oral antidiabetics,
- **Medicines for the treatment of the stomach and intestines**, drugs for the treatment of peptic ulcer, antacids.

**6. STATISTICAL PROCESSING**

The collected data were processed in the Microsoft Excel software package. The results are displayed in tables.

- a. Types of drugs
- c. Medicines and their monetary value
- d. Comparing the humanitarian pharmacy "Igasa" and the civilian pharmacy "Bašćaršija"

**Medicines for the period January 2, 1994 to December 31, 1995**

**Statistical parameters**

<b>Medicines</b>	<b>Average value</b>	<b>St. Dev.</b>
Medicines for cardiovascular diseases	1.067,125	± 135,125
Medicines for gastrointestinal diseases	280,083	± 42,100
Using the t-test, a significant difference was determined (P= <0.001)		

**Statistical parameters**

<b>Medicines</b>	<b>Average value</b>	<b>St. Dev.</b>
Medicines for cardiovascular diseases	1.067,125	± 135,125
Medicines for diabetes mellitus	176,870	± 62,400
Using the t-test, a significant difference was determined (P= <0.001)		

**Statistical parameters**

<b>Medicines</b>	<b>Average value</b>	<b>St. Dev.</b>
Medicines for gastrointestinal diseases	275,833	± 91,320
Medicines for diabetes mellitus	176,875	± 62,400
Using the t-test, a significant difference was determined (P= <0.001)		

**Mean values of dispensed medicines for the period January 2, 1994 to December 31, 1994 in the humanitarian pharmacy "Igasa" and the civilian pharmacy "Bašćaršija"**

**Statistical parameters**

Pharmacies	Medicines	Average value	St. Dev.
Humanitarian pharmacy "Igasa"	KVD	1.067,250	± 135,250
Civil pharmacy "Bašćaršija"	KVD	586,333	± 82,800
Using the t-test, a significant difference was determined (P= <0.001)			

**Statistical parameters**

Pharmacies	Medicines	Average value	St. Dev.
Humanitarian pharmacy "Igasa"	GID	339,833	± 83,800
Civil pharmacy "Bašćaršija"	GID	226,333	± 48,730
Using the t-test, a significant difference was determined (P= <0.001)			

**Statistical parameters**

Pharmacies	Medicines	Average value	St. Dev.
Humanitarian pharmacy "Igasa"	Diabetes mellitus	224,750	± 47,310
Civil pharmacy "Bašćaršija"	Diabetes mellitus	82,916	± 37,220
Using the t-test, a significant difference was determined (P= <0.001)			

**7. DISCUSSION**

Following the frequent discussions in both scientific and non-scientific circles that during the war a large amount of medicines of dubious quality and out of date were poured into Sarajevo, I decided to share my own experiences because I worked in the humanitarian pharmacy "Igasa" for two full years and I worked closely with the staff cooperated and occasionally influenced their choice of drugs. Usually, chronic patients who need daily therapy, which includes a large amount of different groups of drugs, were treated in our clinics.

**8. CONCLUSION**

- The highest consumption of drugs for the treatment of cardiovascular diseases (vasodilators for the treatment of heart disease, calcium antagonists, cardiac active glycosides, diuretics, beta blockers, antiarrhythmics) and antiulcer drugs, antidiabetics, which corresponds to the prevalence of certain diseases.

- Using the t-test of significance, a significant difference  $p = < 0.001$  is established. The research hypothesis is accepted: that the frequency of prescribed drugs for mass non-communicable diseases in the war period was reduced in the civilian pharmacy.
- The economic value of the drugs dispensed in the humanitarian pharmacy "Igasa", which served as a sample for the research, is significantly higher compared to the civilian pharmacy.
- The null hypothesis that there were no significant differences between the pharmacy at the humanitarian organization and the civilian pharmacy is rejected.

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