

REVIEW ARTICLE
PRACA POGLĄDOWA

EPIDEMIOLOGY OF DISEASES OF THE CIRCULATORY SYSTEM AMONG THE POPULATION OF POLTAVA REGION

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Vyacheslav M. Zhdan, Valentin M. Dvornyk, Inna V. Bielikova, Iryna A. Holovanova, Iryna L. Dvornyk

UKRAINIAN MEDICAL STOMATOLOGICAL ACADEMY, POLTAVA, UKRAINE

ABSTRACT

Introduction: In Ukraine more than half of deaths have been caused by cardio-vascular diseases (CVD). Among the able-bodied population, the share of CVD in the structure of causes of mortality is 29,9%. In the structure of causes of mortality among the persons of retirement age, CVDs accounted for 75,9% and exceeded the proportion of neoplasms in 6,5 times.

The aim is to analyze of morbidity and mortality rates of diseases of the CVD among the population of Ukraine and Poltava region, to conduct a comparative analysis of data to identify possible ways to improve the situation.

Materials and methods: A retrospective study of morbidity and mortality rates by age, gender and cause (2014-2018) was conducted and the statistical method was used to analyze dynamic (time) series.

Review: An analysis of the dynamics of population mortality indicates significant fluctuations in its levels over ten years. At the same time, by the method of alignment of the dynamic series, a tendency to a slight decrease in the mortality rate of the population from 17,1‰ to 16,9‰ was established. The mortality of the population of Ukraine in 2018 from diseases of the circulatory system was 1000,8 per 100 thousand people. Data on mortality rate in the Poltava region significantly higher than those in Ukraine.

Conclusions: The age structure of the population of Poltava region belongs to the regressive type. The mortality rate among the population of Poltava region is slightly decreasing but remains at a very high level (16,9‰). In the structure of causes of death, diseases of the circulatory system are at the first place (70,8%), the second place belongs to neoplasm (13,5%), and third are the external causes of death (4,8%).

KEY WORDS: population health statistics, epidemiology, circulatory system diseases, myocardial infarction

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INTRODUCTION

According to data from the World Health Organization, there is 17 million people die annually from the circulatory disease and by 2030 this indicator level will be about 23,3 million in a year mainly from heart disease and stroke, which are projected to remain the only major causes of death [1].

The main oriented target of policy "Health 2020" in Europe is the annual reduction in the indexes of untimely mortality on the 1,5% for four groups of causes: cardiovascular diseases (CVD), malignancies, diabetes and chronic respiratory diseases [2].

The tasks set out in the document "Health-21. The basics of health policies for all in the WHO European Region" aimed at addressing cardiovascular disease-related mortality reductions in people under 65 by an average of 40% [3].

In the countries of the European Region (26 countries) life expectancy at birth according to WHO is more than 75 years, while in Ukraine, according to the National Bureau of Statistics (2017), the estimated life expectancy was 71,98 years.

Studies on the health of the population, including the spread of diseases of the circulatory system, are devoted to a number of works that indicate an unsatisfactory epidemic situation [4, 5, 6, 7].

In Ukraine, since the middle part of 1970s and till the present time, more than half of deaths have been caused by cardio-vascular diseases (CVD). Among the able-bodied population, the share of CVD in the structure of causes of mortality is 29,9%. In the structure of causes of mortality among the persons of retirement age, CVDs accounted for 75,9% and exceeded the proportion of neoplasms in 6,5 times [8].

Also, it should be noted that diseases of the circulatory system occupy the first rank place among causes of disability in the adult population (23,1%) and the second place (22,6%) among the able-bodied population - according to Ipatov AV et al. (2018) [9].

Nowadays there is a lot of knowledge that is needed for the prevention, diagnosis and treatment of diseases of the cardiovascular system, but the analysis of the situation allows us to conclude that the existing methods are not always effective. The Institute for the Measurement of Health and Health Assessment through DALY calculates that in Europe 60% of the burden of disease is accounted by seven leading risk factors: high blood pressure, smoking, alcohol abuse; high cholesterol content in the blood; overweight; low consumption of fruits and vegetables; sedentary lifestyle [10].

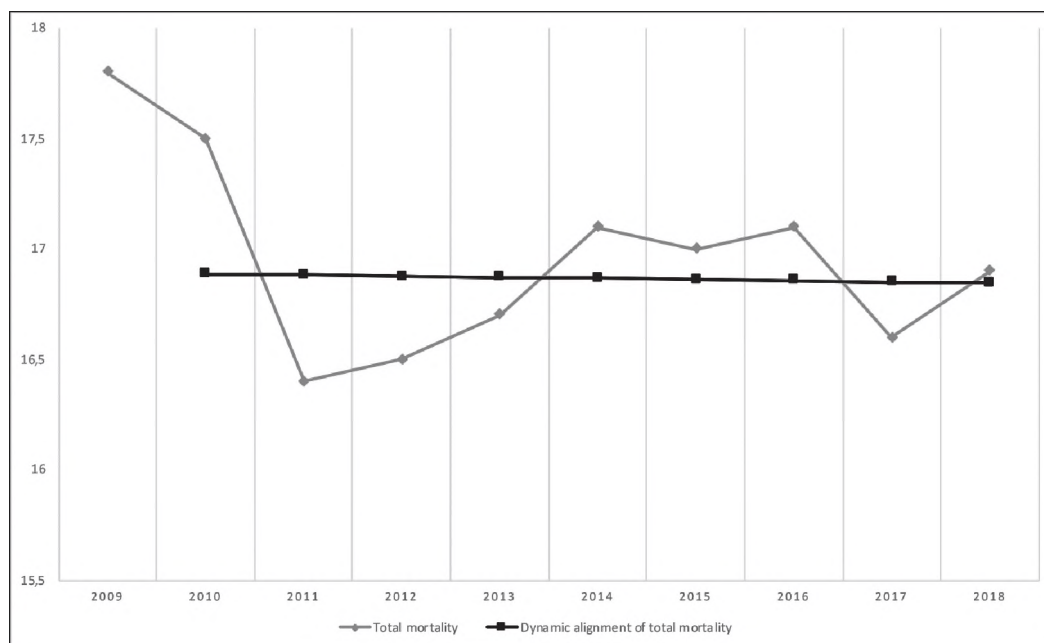


Fig. 1. Dynamics of mortality rate in population of Poltava region (%) in a period of 2009-2018 years.

The leading role in shaping the burden of disease and mortality in the countries of the WHO European Region play cardiovascular diseases, malignant neoplasms, chronic obstructive pulmonary disease, diabetes and risk factors for their development, they should be monitored and the object of attention of executives and health professionals, people who make decisions.

The study of the prevalence of diseases of the cardiovascular system, including myocardial infarction, and their impact on untimely mortality rates in Ukraine, should provide a basis for deliberate policy development for public health.

THE AIM

The main task is to analyze the dynamics of morbidity and mortality rates of diseases of the circulatory system among the population of Ukraine and Poltava region, to conduct a comparative analysis of data to identify possible ways to improve the situation.

MATERIALS AND METHODS

The materials of this study were the materials of the State Statistics Service of Ukraine, the data of the Public Enterprise "Poltava Regional Information and Analytical Center of Medical Statistics of the Poltava Regional Council", as well as the "Health for All" Database (HFA-DB) was used. A retrospective study of morbidity and mortality rates by age, gender and cause (2014-2018) was conducted. During the study, biblio-semantic and information-analytical methods were used, and the statistical method was used to analyze dynamic (time) series.

REVIEW AND DISCUSSION

According to the census which were conducted in 2001, the population of Poltava region was 1630,1 thousand

inhabitants, including urban population – 956,7 thousand people (58,7%), rural population – 673,4 thousand people (41,3%); it is also known that 45,9% were male, 54,1% were female. As of January 1, 2019, the permanent population of the Poltava region is 1392,6 thousand people, and compared to 2001, the population decreased by 247 800 people (15,1%). According to estimated data, the urban population is 861400 people, which is 61,8%, and the rural population - 531201 people (38,2%).

The demographic situation of the Poltava region is by many features typical for all agrarian and industrial regions of Ukraine. In the last decade, negative indicators of population reproduction have characterized it.

The age structure of the population of the region refers to the regressive type. The share of persons aged 60 years and over is 24,3%, while the share of persons from 0 to 14 years is 14,2%. And it should be noted that the share of persons over 60 years is constantly changing. According to the 2001 census, the share of people over 60 in the Poltava region was 24,1%, in 2009 it was 22%, and in 2019 it was already 24,3%.

An analysis of the dynamics of population mortality indicates significant fluctuations in levels over ten years. At the same time, by the method of alignment of the dynamic series, a tendency to a slight decrease in the mortality rate of the population from 17,1 ‰ to 16,9 ‰ was established (Fig.1).

Traditionally, in the hierarchy of death causes of the population of Ukraine, the first five places consisted of the following classes of causes: diseases of the circulatory system, neoplasms, external causes of death, diseases of the digestive system and diseases of the respiratory system.

There is a certain difference in mortality rates across age and gender groups. Naturally, mortality from circulatory system diseases is higher among men in all age groups. Mortality rates are equal for men and women in the age group of 80 years and older.

Table 1. The level of mortality from diseases of the circulatory system among the population of Ukraine and Poltava region (per 100 thousand people)

	From diseases of the circulatory system (I00-I99)						
	Total	Including		Coronary heart disease (I20-I25)		Cerebrovascular disease (I60-I69)	
		M	W	M	W	M	W
Ukraine	1000,8	942,6	1051,4	652,9	733,9	164,8	197,0
Poltava region	739,6	1111,1	1219,9	772,8	831,3	251	320,5
Visibility index,%	118,4	121,0	117,6	121,3	115,1	154,5	164,5

Table 2. Analysis of the dynamics of the prevalence and incidence of diseases of the circulatory system among the population of Poltava region

Year	Prevalence				Incidence			
	Row level	Absol. growth	Visibility index	Growth rate	Row level	Absol. growth	Visibility index	Growth rate
2014	6378,9	-	100	-	382,9	-	100	-
2015	6507,4	128,5	102	2	408	25,1	106,6	6,6
2016	6494,1	-13,3	101,8	-0,2	420,3	12,3	109,8	3,0
2017	6623,6	129,5	103,8	2,0	411,9	-8,4	107,6	-2,0
2018	7745,6	1122	121,4	16,9	485,2	73,3	126,7	17,8

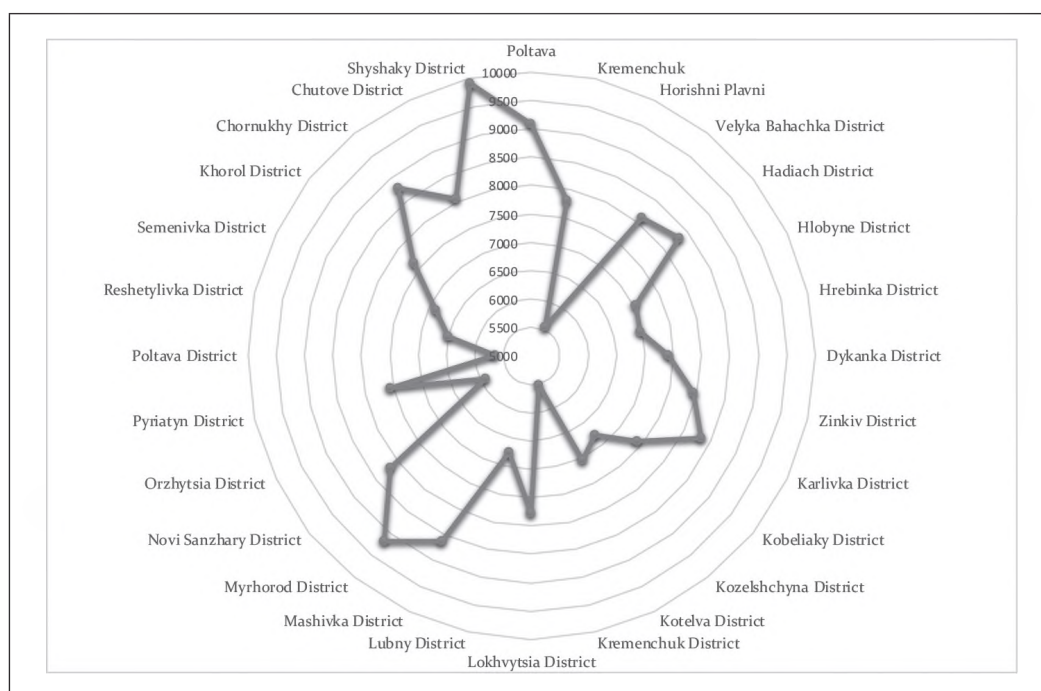


Fig. 2. Prevalence of circulatory system diseases in districts of Poltava region in 2018.

The mortality of the population of Ukraine in 2018 from diseases of the circulatory system was 1000,8 per 100 thousand people, including cases of coronary heart disease – 696,2, and cases of cerebrovascular disease – 182,0. The second largest cause of death is neoplasms – 201,2 per 100 thousand people. Third place among the causes of death of the population of Ukraine was held by external causes – 79,6 per 100 thousand people (Tab.1).

Data on mortality rate in the Poltava region significantly higher than those in Ukraine: overall mortality by 14%, mortality from coronary heart disease in men by 21,3% and women by 15,1%, cerebrovascular disease in men by 54% and women 64%.

Thus, in 2018, 70,8% (in 2014 – 69,5%) cases of deaths are caused by circulatory system diseases; 13,5% (in 2014 – 13,6%) of causes of death are neoplasms; 4,8% (in 2014 – 5,5%) of cases were caused by external causes; respiratory diseases accounted for 3,3% (3,3% in 2014) of deaths. The proportion of causes of death of digestive diseases decreases from 2,0% in 2014 to 1,2% in 2018.

An analysis of the incidence and prevalence rates of circulatory system diseases shows of the moderate fluctuations in the levels of these indicators, but the visibility indicator shows a 21,4% increase in circulatory system disease prevalence in 2018 compared to 2014. At the same time, there is a 26,7% increase in newly registered diseases.

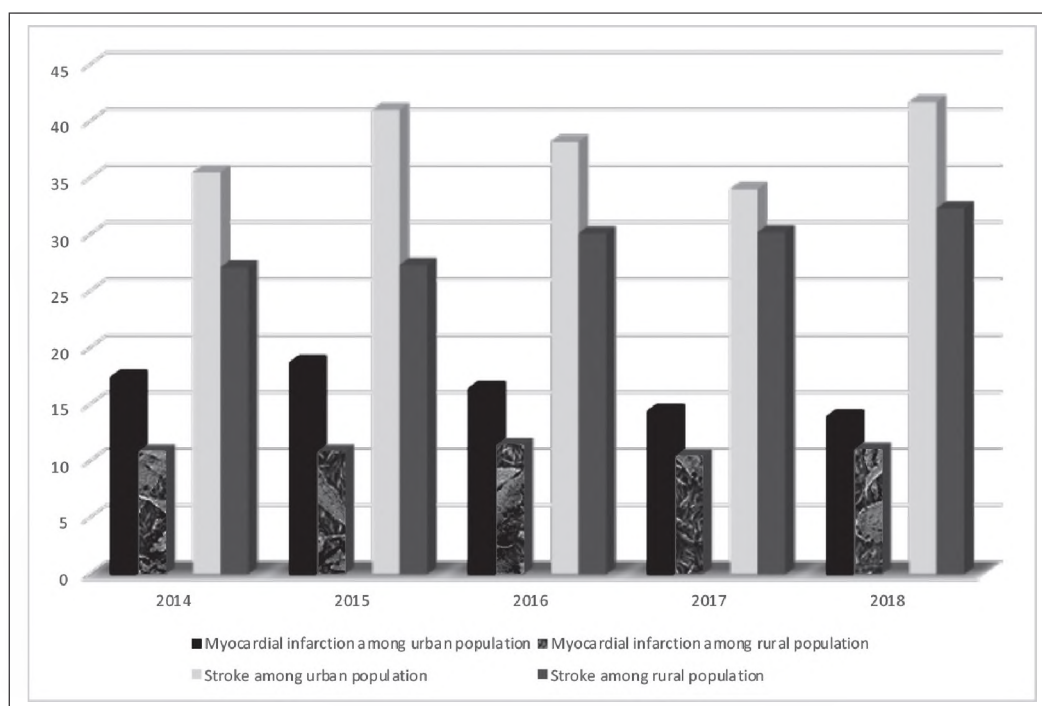


Fig. 3. Dynamics of myocardial infarctions and strokes among urban and rural population of Poltava region in a period of 2014-2018.

Table 3. Dynamics of the average duration of treatment and lethality of patients with diseases of the circulatory system in hospitals in Poltava region

Year	Diseases of the circulatory system		Coronary heart disease		Acute myocardial infarction		Cerebrovascular diseases	
	Average duration of treatment (days)	Lethality	Average duration of treatment (days)	Lethality	Average duration of treatment (days)	Lethality	Average duration of treatment (days)	Lethality
2014	11,0	4,8	11,0	4,7	13,6	17,0	10,1	8,8
2015	10,7	4,5	11,0	4,7	13,5	15,5	10,6	8,1
2016	10,5	4,9	10,7	5,2	11,6	13,9	10,3	8,1
2017	10,2	4,7	9,9	4,8	11,7	13,7	10,3	8,5
2018	9,9	5,1	9,7	5,3	11,5	14,0	10,2	8,1
In % to 2014	90,0	106,3	88,2	112,8	84,6	82,4	101,0	92,0

It is established that in comparison with 2014, the prevalence of circulatory system diseases is increasing (by 2,6% - among urban population; by 4,2% - among rural population). Primary morbidity rates have increased (by 3,4% among urban population, by 29,1% among rural population) (Tab.2).

Analysis of data by separate districts of Poltava region indicates significant fluctuations in the prevalence of diseases of the circulatory system: the lowest indices in the Kremenchuk district (5525,6 per 10 thousand population) and in Horishni Plavni (5556,2 per 10 thousand population), the highest indicators in the Shyshaky district (9923,6 per 10 thousand population) and Myrhorod district (9181,6 per 10 thousand population) (Fig.2).

Analyzing the dynamics of myocardial infarction and stroke rates in the urban and rural population of Poltava region (2014-2018), we can conclude that the number of

cases of myocardial infarction among the urban population of Poltava region compared with 2014 decreased by 20,1%, and among the rural population on the contrary, it increased by 1.85%. In turn, the increase in the number of strokes among the urban population by 17,46% and among the rural population by 19,9% is worrying (Fig.3).

An analysis of the dynamics of hospital morbidity show that the number of hospitalizations with diseases of the circulatory system has slowly tendency to decreasing, so in 2018 it's level was on 49,4 per 100 thousand population (48,7 in 2014). The average duration of treatment for circulatory system diseases is reduced by 10%, with the mortality rate increasing by 6.3% in 2018 compared to 2014. The mortality rate from coronary heart disease has also increased by 12,8%. It should be noted that lethality rates from myocardial infarction are reduced by 17,3% and cerebrovascular diseases by 8% (Tab.3).

CONCLUSIONS

After the analyzing of the demographic indicators of the population of Poltava region, as well as the incidence of diseases of the circulatory system, we can make the following conclusions. The age structure of the population of Poltava region belongs to the regressive type. The mortality rate among the population of Poltava region is slightly decreasing but remains at a very high level (16,9%). In the structure of causes of death, diseases of the circulatory system are at the first place (70,8%), the second place belongs to neoplasm (13,5%), and third are the external causes of death (4,8%). There is an increase in the incidence and prevalence levels of diseases of the circulatory system, mainly among the rural population. The incidence of myocardial infarction among the urban population decreased by 20,11%, while in the rural population it increased by 1,85%.

Indicators of mortality and morbidity of the population of Poltava region with circulatory system diseases are indicators of organizational accomplishments in the policy of preserving the health of the population. It is also the basis for further steps in the prevention of premature mortality and morbidity.

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Authors' contributions:

According to the order of the Authorship

ORCID numbers:

Vyacheslav M. Zhdan - 0000-0002-4633-5477

Valentin M. Dvornyk - 0000-0002-3693-2403

Inna V. Bielikova - 0000-0002-0104-3083

Iryna A. Holovanova - 0000-0002-8114-8319

Iryna L. Dvornyk - 0000-0002-3660-3239

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CORRESPONDING AUTHOR

Inna V. Bielikova

Ukrainian Medical Stomatological Academy

Shevchenka, 23, Poltava, Ukraine

e-mail: byelikova.inna@gmail.com

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