CONTRIBUTION OF MORTALITY FROM CARDIOVASCULAR DISEASE TO OVERALL MORTALITY

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ABSTRACT

Introduction. The most significant chronic non-infectious diseases (CVD) are cardiovascular diseases (CVD), oncological, chronic respiratory diseases, diabetes, which together account for 59% of 57 million deaths each year in the world and constitute 46% of the global burden of the disease.

Aim. To study the contribution of cardiovascular diseases to the overall mortality of the population of the Poltava region.

Materials and Methods. For the study, the mortality data of the population of Ukraine and the Poltava region for 2005-2015 were used. Sources of data on the natural movement of the population were forms of state statistical reporting and official data on calculations for primary data of statistical offices. The calculation of intensive death rates by the method of direct standardization according to the world standard (Standard "World"), approved by WHO [19] was carried out. For the analysis of time trends, the JoinPoint software, the Regression Program Statistical Methodology and Applications Branch, the Surveillance Research Program (Electronic Resourse) / National Cancer Institute, was used to analyze population-based piece-wise time trends, as well as the MS EXCEL 2010 office suite.

Results. It was shown the increase in the overall mortality of the population of the Poltava region and Ukraine as a whole. In the structure of the causes of death, the first place is occupied by diseases of the cardiovascular system, and in the structure of the Diseases of the blood supply systems, the greatest part is occupied by ischemic heart disease. An increase in mortality and mortality from acute myocardial infarction was noted.

Conclusions. The contribution of diseases of the cardiovascular system plays a leading role among all causes of mortality in the Poltava region and in Ukraine as a whole. There is an increase in overall mortality and in particular from acute myocardial infarction. A significant difference between mortality rates, both general and from myocardial infarction, in Ukraine and the Poltava region was not revealed ($p > 0.05$).

KEY WORDS: Myocardial infarction, mortality, population, mortality structure

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INTRODUCTION

The most significant chronic non-infectious diseases (CVD) are cardiovascular diseases (CVD), oncological, chronic respiratory diseases, diabetes, which together cause 59% of 57 million deaths each year in the world and constitute 46% of the global burden of the disease. One of the main medical and social problems among the CVD for the whole of mankind are cardiovascular diseases, both in terms of prevalence, severity of complications, and moral and material damage. [1].

Cardiovascular disease (CVD) was the underlying cause of death in over 45,000 deaths in 2014 (29% of all deaths) according to the AIHW National Mortality Database. It was an associated cause of death in a further 37,558 deaths.

Where CVD was listed as the underlying cause of death:

- 45% were due to coronary heart disease (CHD)
- 18% were due to stroke
- 10% were due to heart failure and cardiomyopathy [2]

In the overall mortality structure, CVD occupy a leading position worldwide. So according to WHO More than 50% of deaths and incapacity for work are caused by heart diseases. From ischemic heart disease and stroke, 12 million people die each year. Previously considered as diseases of industrially developed countries, CVD are rapidly covering developing regions. Thus, about 80% of all CVD deaths occur in developing countries and low- and middle-income countries, with the age of death from CVD being relatively younger in these countries than in developed countries [2].

According to WHO, the analysis of death rates from coronary heart disease in CIS countries showed that the highest mortality rates are registered in the Republic of Moldova - 496.16 per 100 thousand population, then descending in Ukraine (491.91), Kyrgyzstan (444.59), The Russian Federation (359.33), Lithuania (313.91), Latvia (248.88), Estonia (199.15), Romania (187.19), Kazakhstan (181.32), the Czech Republic (161.82)), Bulgaria (114.26) (Figure 1). [3].

In most industrialized countries, mortality in general, and cardiovascular disease mortality in particular, have shown decreasing trends since around 1970, following stagnation or increases observed during the 1950s and 1960s. In some countries, however (e.g. in Eastern Europe), male mortality from cardiovascular diseases increased during recent years. The levels and trends of mortality from cardiovascular diseases vary considerably among countries. Measured in terms of age-standardized rates, the ratio between the highest and the lowest rates around 1985 was about 2 for total mortality but about 4 for all cardiovascular diseases combined. With further breakdowns the ratio was even greater, i.e. 4-5 for heart

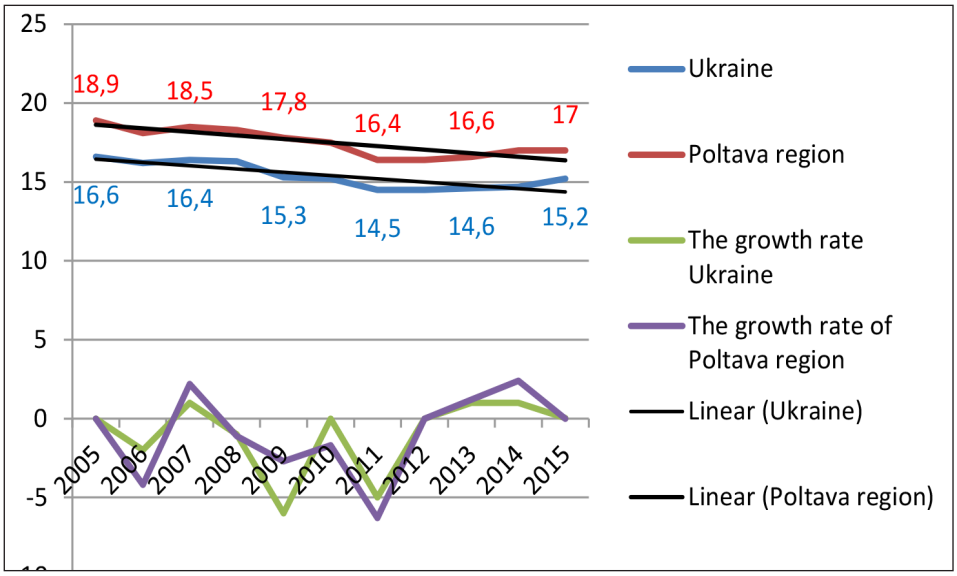


Fig. 1. Dynamics of death rates in Ukraine and the Poltava region.

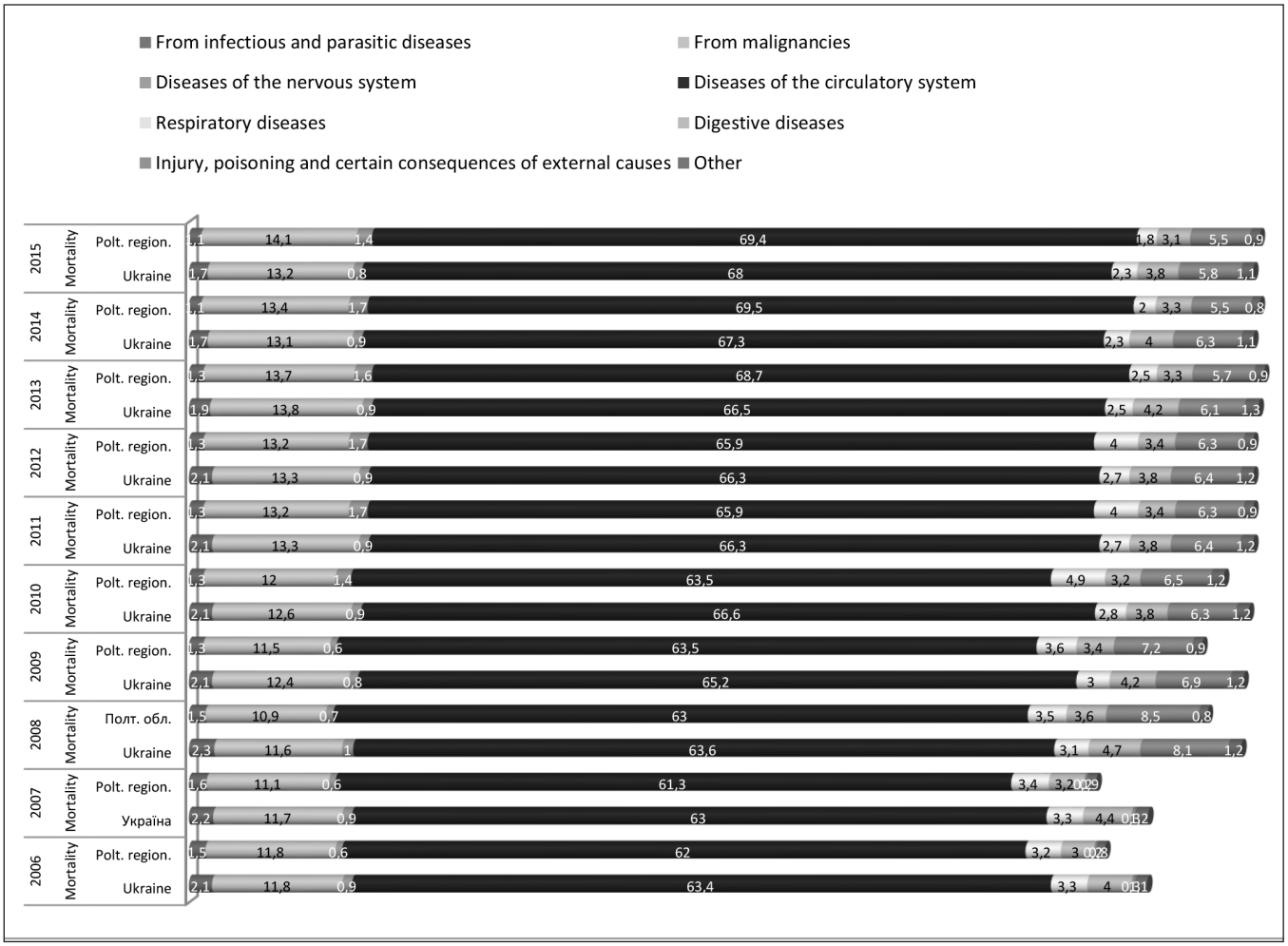


Fig. 2. The structure of causes of death from 2006 to 2015.

diseases and 6-7 for cerebrovascular disease. For ischaemic heart disease alone, the ratio reached as high as 10, though part of this wide range should be attributed to artefacts due to the varying diagnostic practices followed in different countries. The speed of mortality changes also differed among countries, ranging from a rapid decrease

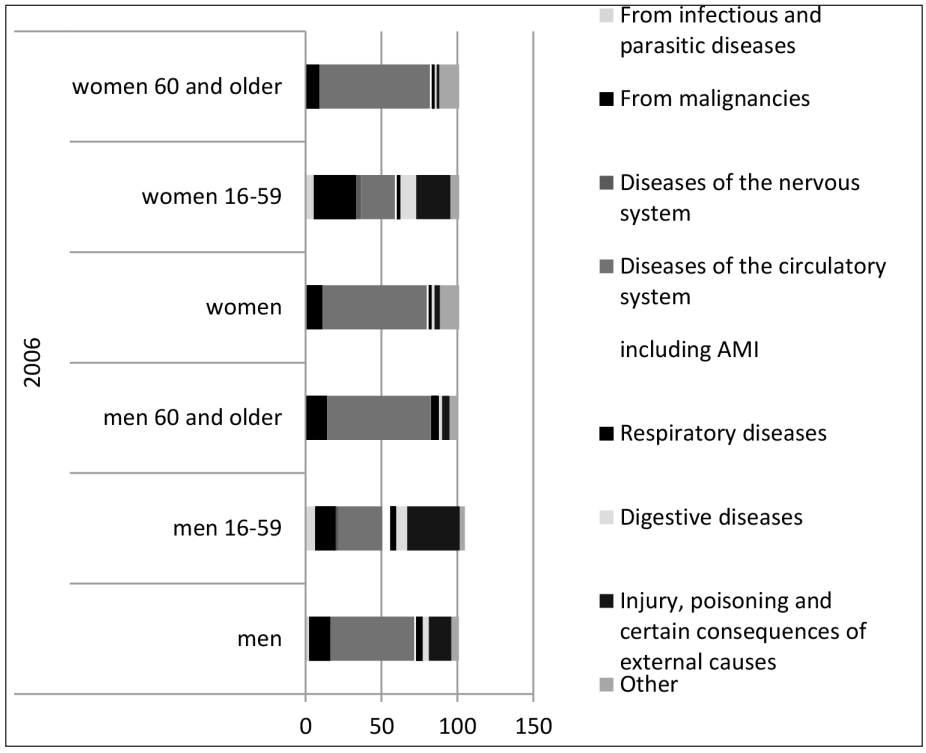


Fig. 3. The structure of the causes of total mortality according age and sex in 2006.

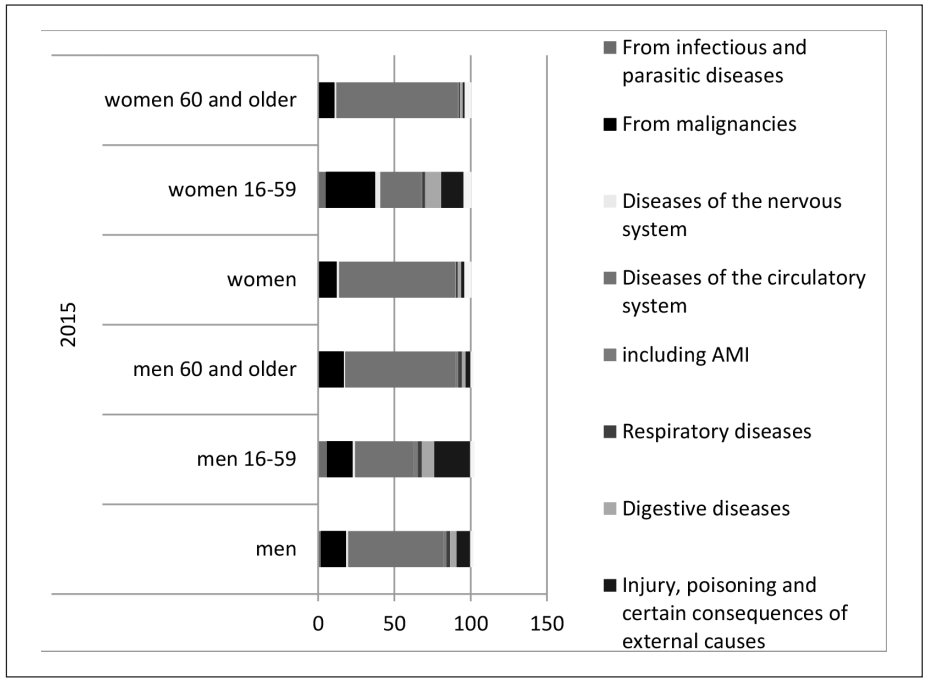


Fig. 4. The structure of the causes of total mortality under age and sex for 2015.

to a rapid increase. In general, the trends were much more favourable in females than in males [4].

THE AIM

Aim of the study examine the contribution of cardiovascular diseases to the overall mortality of the population of the Poltava region.

MATERIALS AND METHODS

For the study, the mortality data of the population of Ukraine and the Poltava region for 2005-2015 were used. Sources of data on the natural movement of the population were forms of state statistical reporting and official data on calculations for primary data of statistical offices. The calculation of intensive death rates by

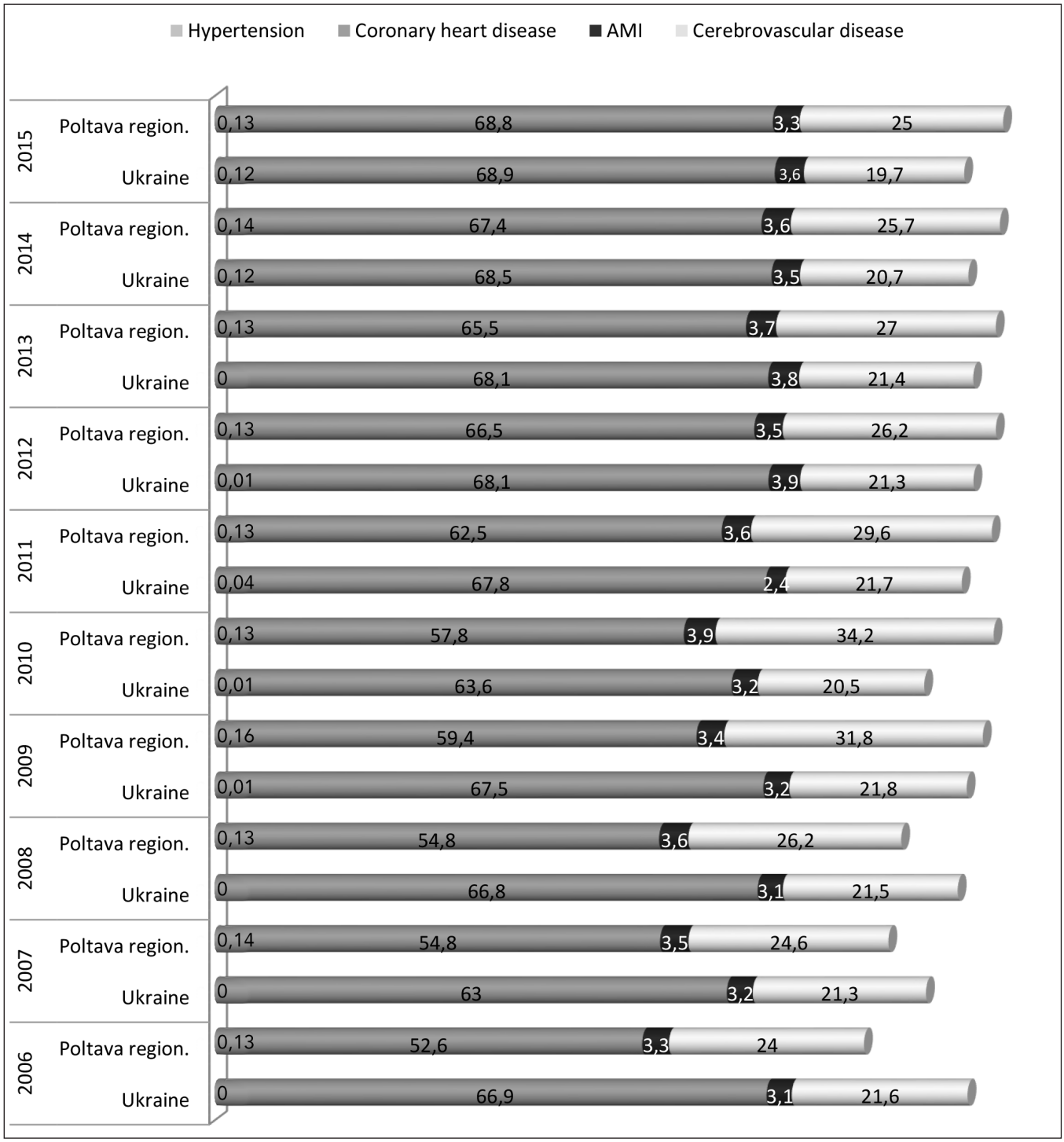


Fig. 5 The structure of causes of death of CVD from 2006 to 2015

the method of direct standardization according to the world standard (Standard "World"), approved by WHO [19] was carried out. For the analysis of time trends, the JoinPoint software, the Regression Program Statistical Methodology and Applications Branch, the Surveillance Research Program (Electronic Resourse) / National Cancer Institute, was used to analyze population-based piece-wise time trends, as well as the MS EXCEL 2010 office suite.

RESULTS

Indicators of overall mortality in Ukraine over the past 10 years from 2005 to 2015 as a whole decreased by 1.4 cases per 1 thousand. People, or 8.4%. Growth rate - was the largest in 2007, 2013, 2014 and in Ukraine in 2014 in the Poltava region significant differences between these indicators have not found ($p > 0.05$). When aligning time series indicated that overall mortality both in the Poltava region and in Ukraine, tends to decrease (fig.1).

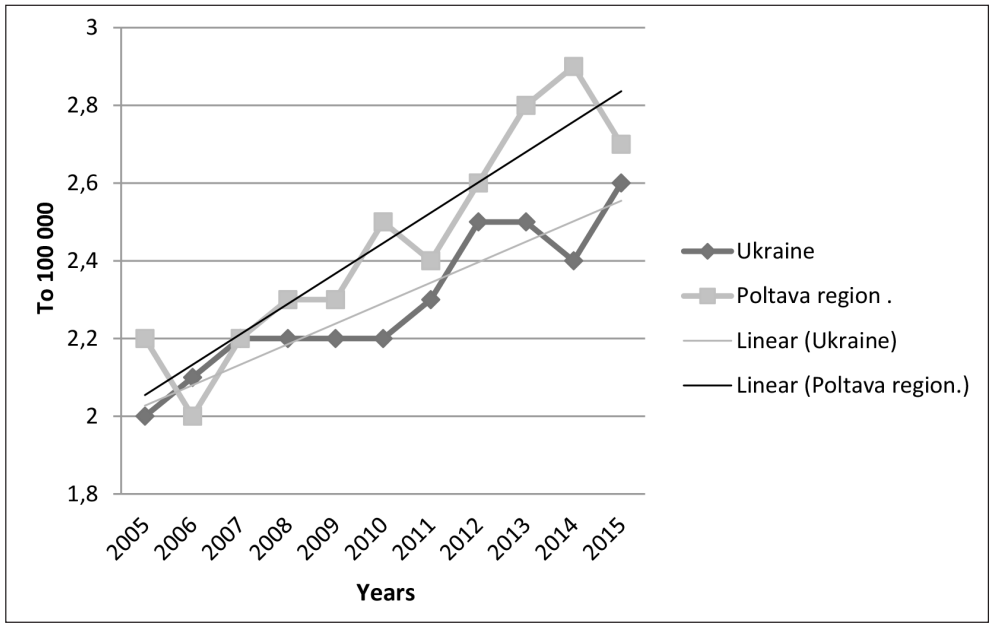


Fig. 6. Dynamics of mortality from acute myocardial infarction in Ukraine and the Poltava region.

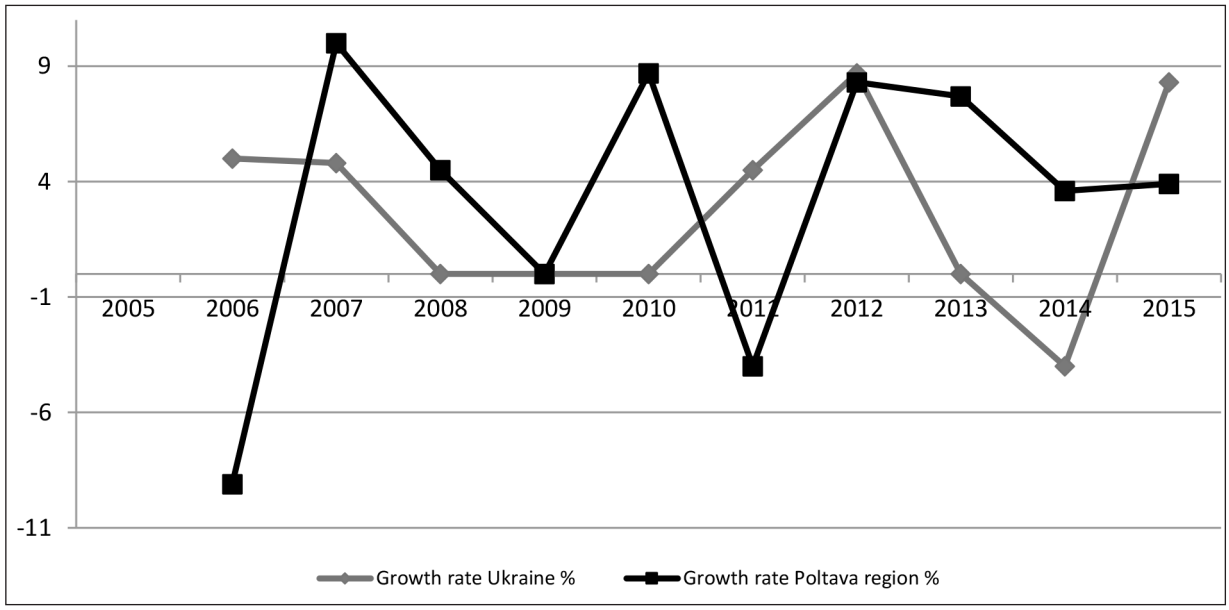
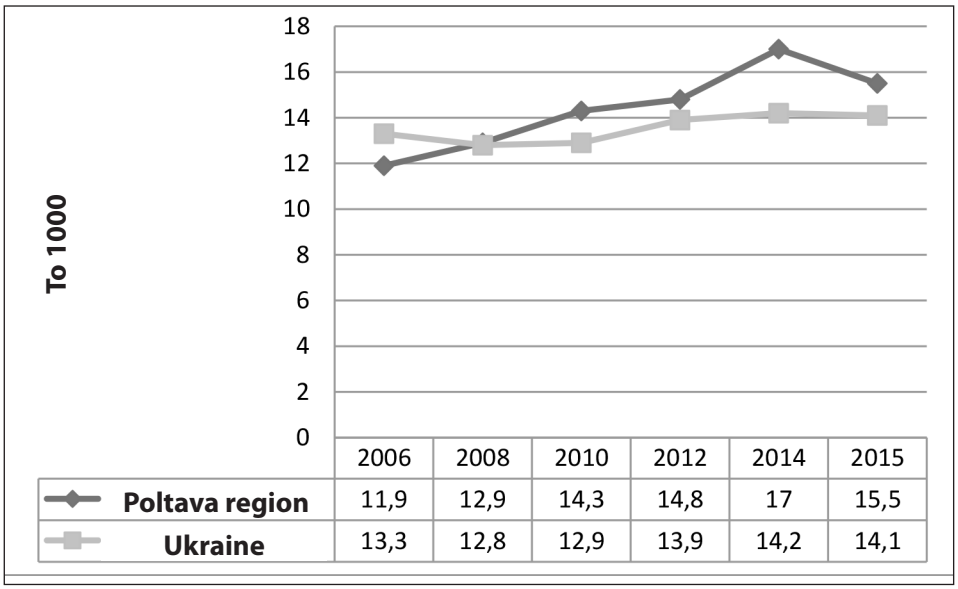


Fig. 7. Rate of increase / decrease in mortality from acute myocardial infarction in Ukraine and the Poltava region

The structure of causes of death first place, as in Ukraine and in Poltava region occupied by cardiovascular diseases. The largest share of this disease - 69.4% in 2015, the second biggest cancer (fig. 2).

In determining the structure of mortality by age and sex in 2006, found that men generally dominated disease cardiovascular diseases, accounting for 54.8%, including acute myocardial infarction is 1% whereas in men 16-59 years of first injuries occupy 34.6%, followed by COD - 29% and 4.9% of them is mortality from AMI. After 60 years of cardiovascular diseases occupy the leading position, accounting for 68.2% of which 0.2% of AMI. In women, there is a similar pattern (Fig. 3). The structure of the entire female population in the first position of the disease COD 68.6% of which 1.1% of AMI, the second position other diseases, which included blood diseases and blood-forming organs, endocrine system, mental and behavioral disorders, diseases of the genitourinary system accounted for 12.6% of the population and the third position malignant tumors - 10.3%. Among women 16-59 years nearly the same position occupied by malignant neoplasms 27.6% of cardiovascular diseases including 22.5% 1.2% AMI and injuries - 22.6%. In the senior women 60 years since separation from other causes of death occupy cardiovascular diseases - 73% of which 1.1% of AMI, followed by other causes 13% and in third place - malignant tumors (fig. 3).

For 10 years, our observations overall picture has not changed: the leading position occupied leading cause of



	2006	2008	2010	2012	2014	2015
Poltava region	11,9	12,9	14,3	14,8	17	15,5
Ukraine	13,3	12,8	12,9	13,9	14,2	14,1

Fig. 8. Indicators of mortality from acute myocardial infarction in Ukraine and the Poltava region.

death from cardiovascular diseases. Men of all ages in the first place COD 62.5% of which 1.8% of AMI, followed by malignant neoplasms 16.6% and the third - injury - 9%. In men aged 16-59 years, first take COD - 38.4%, of which 2.6 AMI, the second - 23.6% of injuries and the third - malignant tumors - 17.1%. In men older than 60 years the dominant position occupied by COD, representing 72.5% of which 1.6% is myocardial infarction, malignant tumors - 16.6%.

All men and women 60 and older there is a similar picture: in the first place COD 76% (0.6% AMI) and 79.6% (0.6% AMI), followed by malignant neoplasms 12% and 10.6% respectively while causes of death among women 16-59 years come first malignancies, representing 32.3% of COD in second place - 26.8% (0.5% AMI) and the third place - injuries - 14.8 % (Fig. 4).

After reviewing in detail the question of mortality is from cardiovascular diseases, noted that top position is coronary heart disease, followed by cerebrovascular diseases and the third position is acute myocardial infarction (Fig.5). In studies conducted by other authors, and coronary heart disease has a leading position. Ischemic heart disease was the leading cause of global mortality, accounting for 1.4 million deaths in the developed world and 5.7 million deaths in developing regions. [5]

Mortality from AMI, both in Ukraine and in Poltava region tends to increase. During 11 years, mortality from AMI increased by 0.6 and 0.5 cases per 100 people or 30% and 22.72% respectively. The growth rate was the highest in 2012 and amounted to 8.7% and 8.3% respectively. Between Dostovernoy raznytsы эtymy indicators were found (p> 0.05) (fig. 6,7).

When studying mortality from acute myocardial infarction, there was a tendency to increase both in Ukraine and in the Poltava region. The number of cases of mortality in Ukraine per 1000 population increased by 0.8 cases, or by 6.01%, in the Poltava region by 3.6 cases or by 30.2%. The growth rate was the largest in 2014 - 15% in the Poltava region and in 2012 - 8% in Ukraine. Significant differences between these indicators in Ukraine and the Poltava region were not revealed (p> 0.05) (tabl.3), (fig.8)

DISCASSION

Thus, the data obtained by us show a decrease in the level of overall mortality both in Ukraine and in the Poltava region. Compared to 2014, the overall mortality rate has increased, which is possibly connected with the anti-terrorist operation in the east of Ukraine. Mortality at adult and old ages, as demonstrated in Benjamin & Soliman [6] and, reveal decreasing annual death probabilities. Life expectancy is greater then ever before and increasing rapidly. The past 100 years have seen many improvements in life expectancy, but the pattern of the improvement is changing markedly. In the first half of the 20th century, infectious diseases were almost eradicated, and this gave massive improvements in mortality among the young ages. However, cancer and heart disease kept mortality rates stable for older people. Since then, substantial increases in longevity have been achieved at later ages. As shown by our surveys, mortality due to cardiovascular diseases is a leading position not only in Ukraine and Poltava region in all age groups, but also in Europe and America, the latter is confirmed by scientific research of foreign scientists [7]. An increase in the proportion of myocardial infarction among all causes of mortality is shown. Acute myocardial infarction is the undisputed leader in the structure of mortality throughout the world. In half the cases, death occurs within the next 2 hours after the appearance of the first signs of the disease. Typically, this occurs before the patient is taken to the hospital, so the early diagnosis of acute myocardial infarction (clinical and laboratory) can act as a powerful factor in reducing the death rate from coronary heart disease.

The incidence of acute myocardial infarction directly depends on age: the older the person, the higher the risk of developing the disease. Although in recent years, myocardial infarction has a tendency to spread among younger people (30-40 years) [8]. The data obtained as a result of the study testify to the need to optimize cardiovascular prophylaxis in the territory of Ukraine, including the Poltava region. However, coronary atherosclerosis and its complications in the form of MI is a pathological process that is formed over a long period of time (months and years), in this connection, it can be stopped or regressed only by prolonged medical and non-medicamentous action aimed at eliminating or weakening the effect factors of cardiovascular risk. The suspension of the progression of this pathological process and especially the reverse development of it is an extremely difficult process that requires many years of rehabilitation. In addition, it is necessary to develop measures at the population level to reduce risk factors for diseases of the blood supply system.

CONCLUSIONS

1. The overall death rate both in Ukraine and in the Poltava region is growing and in 2015 reached a high level of 15.2 and 17.0 ‰ significant difference between the indicators of Ukraine and the Poltava region have not been revealed (p> 0.05).
2. The structure of causes of death first place, as in Ukraine and in Poltava region occupied by cardiovascular diseases. The largest share of this disease - 69.4% in 2015, the second biggest cancer.
3. The structure of causes of death from diseases of the circulatory system found that the largest share accounted for coronary heart disease and the largest share of 68.8% and 68.9% was in 2014 and 2015.
4. Mortality from AMI, both in Ukraine and in Poltava region tends to increase. During 11 years, mortality from AMI increased by 0.6 and 0.5 cases per 100 people or 30% and 22.72% respectively. Significant differences between these indicators in Ukraine and the Poltava region were not detected (p> 0.05)
5. The number of cases of mortality in Ukraine per 1000 population increased by 0.8 cases or 6.01%, in the Poltava region by 3.6 cases or by 30.2%. The growth rate was the largest in 2014 - 15% in the Poltava region and in 2012 - 8% in Ukraine. Significant differences between these indicators in Ukraine and the Poltava region were not detected (p> 0.05)

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