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MEDICAL AND SOCIAL PROBLEM OF CARDIOVASCULAR DISEASES IN KAZAKHSTAN

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Introduction. In the most developed countries cardiovascular diseases (CVD) take the highest rank in the structure of mortality, they are a major cause of disability, and the question of their prevention is medical and social problems.

The aim of the study is analysis of structure, morbidity and mortality rates from cardiovascular diseases in Kazakhstan and particularly in the East Kazakhstan Region, in comparison with worldwide rates.

Methods. Descriptive analysis of statistical data on demographics, mortality and morbidity rates in the Kazakhstan population using official information from statistical compilations "Health of the population of Kazakhstan and activities of public health organizations" for 2011-2013, as well as global data statistics about cardiovascular diseases using databases "PubMed", "Cochrane library", "Research Gate" system, and the annual reports of the WHO.

Results. Mortality from CVD is 52.8% of the total mortality of the Kazakhstan population. This is mainly due to Ischemic heart disease and cerebrovascular diseases, which proportion in CVD mortality structure is 47.7% and 36.4%, respectively.

In 2013 mortality rate from CVD in Kazakhstan was 256.76 per 100,000; in the East Kazakhstan Area it was one of the highest in the country - 361.44 per 100,000. In the rural areas these figures were significantly lower than in urban areas: 203.63 per 100,000; in the East Kazakhstan region - 403.7. Morbidity rate from CVD was 2463.1 per 100,000, for women these rates were 2612.5 per 100,000. Incidence rate of hypertension in Kazakhstan was 1172.5 per 100,000 (for women - 1352.3); in the East Kazakhstan region - 1084.6 per 100,000 (for women - 1548.0). The incidence of coronary heart disease was 507.4 and 519.8 per 100,000, respectively.

Conclusion: CVD mortality in Kazakhstan is in 3-4 times higher than in highly developed countries, which needs in implementation the prevention programs.

Key words: cardiovascular diseases, mortality, morbidity, prevention

МЕДИКО-СОЦИАЛЬНАЯ ПРОБЛЕМА БОЛЕЗНЕЙ СИСТЕМЫ КРОВООБРАЩЕНИЯ В РЕСПУБЛИКЕ КАЗАХСТАН

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Введение. В большинстве развитых стран болезни системы кровообращения (БСК) занимают наиболее высокое ранговое место в структуре смертности населения, являются основной причиной инвалидизации, а вопрос их профилактики является не только медицинской, но и социальной проблемой.

Целью исследования явился анализ структуры, показателей смертности и распространенности болезней системы кровообращения среди населения Казахстана и, в частности, Восточно-Казахстанского региона, в сравнении с общемировыми показателями.

Методы. Дескриптивный анализ статистических данных, характеризующих демографическую ситуацию, показатели смертности и распространенности болезней системы кровообращения с использованием официальной информации из казахстанских статистических сборников, а также мировых статистических данных с использованием поисковых баз данных "PubMed"", "Cochrane library", системы "Research Gate".

Результаты. Смертность от БСК составляет 52,8 % в структуре общей смертности населения Казахстана. Этот показатель определяется, главным образом, двумя причинами – ИБС и цереброваскулярными заболеваниями, доля которых в структуре смертности от БСК в целом соответственно составляет 47,7% и 36,4%. В 2013 году показатель смертности от БСК в Казахстане составил 256.76 на 100,000; в Восточно-Казахстанской области (ВКО) он был одним из наиболее высоких - 361.44 на 100,000. В сельской местности он был значительно ниже, чем в городах: 203.63 на 100,000; в ВКО - 403.7. Показатель распространенности БСК был 2463.1 на 100,000, для женщин - 2612.5 на 100,000. Заболеваемость артериальной гипертонией в Казахстане в целом составила 1172.5 на 100,000 (для женщин - 1352.3); в ВКО - 1084.6 на 100,000 (для женщин - 1548.0), ИБС - 507.4 и 519.8 на 100,000 соответственно.

Вывод: Показатели смертности и заболеваемости БСК в Казахстане в 3-4 раза выше, чем в развитых странах, что требует внедрения профилактических программ.

Ключевые слова: болезни системы кровообращения, смертность, распространенность, профилактика.

ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДАҒЫ ҚАНАЙНАЛЫМЫ ЖҮЙЕЛЕРІНІҢ АУРУЛАРЫ МЕДИЦИНАЛЫҚ – ӘЛЕУМЕТТІК МӘСЕЛЕСІ

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Кіріспе. Көптеген дамыған мемлекеттерде қанайналымы жүйесі аурулары (ҚЖА) тұрғындардың өлім – жітім құрылымында ең жоғары рангілік орын алуда, мүгедектіліктің негізгі себебі болып табылады, ал олардың алдын алу сұрағы тек қана медициналық емес, сонымен қатар әлеуметтік мәселе болып табылады.

Қазақстан халқының арасында және атап айтқанда Шығыс Қазақстан аумағында, жалпыдүниежүзілік көрсеткіштермен салыстырғанда қанайналымы жүйесі ауруларының құрылымын, өлім –жітім көрсеткіштерін және таралуын талдау **зерттеу мақсаты** болып табылады.

Әдістері. Қазақстандық статистикалық жинақтардан, сол сияқты "PubMed"", "Cochranelibrary", "ResearchGate" жүйе мәліметтерінің іздестіру базаларын пайдаланумен дүниежүзілік статистикалық мәліметтерді ресми ақпараттарды қолданумен қанайналымы жүйесі ауруларының өлім – жітім және таралуы көрсеткіштерін, демографиялық жағдайды сипаттайтын статистикалық мәліметтерге дескрептивті талдау.

Нәтижелері. Қазақстан халқының жалпы өлім – жітім құрылымында ҚЖА-дан өлім – жітім 52,8% құрайды. Бұл көрсеткіш басты-басты екі себептермен анықталады - ЖИА және цереброваскулярлы аурулармен, ҚЖА – дан өлім – жітім құрылымындағы оның үлесі жалпы тиісінше 47,7% және 36,4% құрайды. 2013 жылы Қазақстандағы ҚЖА – дан өлім – жітім көрсеткіші 100,000 шаққанда 256.76 құрады; Шығыс Қазақстан облысында (ШҚО) ол ең жоғарғылардың бірі болды - 100,000 шаққанда 361.44. Ауылдық аумақтарда ол қалаларға қарағанда көбінесе төмен: 100,000 шаққанда 203.63; ШҚО - 403.7. ҚЖА таралу көрсеткіші 100,000 шаққанда 2463.1, әйелдерде - 100,000 шаққанда 2612.5 болды. Қазақстанда жалпы артериалды гипертониямен аурушаңдық 100,000 шаққанда 1172.5 құрады (әйелдерде - 1352.3);

ШҚО - 100,000 шаққанда 1084.6 (әйелдерде - 1548.0), ЖИА - 100,000 шаққанда тиісінше 507.4 және 519.8.

Тұжырымдар Қазақстанда, дамыған елдерге қарағанда ҚЖА өлім – жітім және аурушаңдық көрсеткіштері 3-4 ретке жоғары, ол алдын алу бағдарламаларын енгізуді талап етеді.

Кілт сөздер: қанайналымы жүйесі аурулары, өлім – жітім, таралуы, профилактика.

Introduction

In the most developed countries cardiovascular diseases (CVD) take the highest rank in the structure of mortality, they are a major cause of disability, and the question of their prevention is medical and social problems [24]. CVD comprises any disease that affects the cardiovascular system, and includes heart disease, vascular diseases of the brain and kidney, and peripheral artery disease. These diseases have multifactorial aetiology but the underlying pathophysiology generally involves atherosclerosis and/or hypertension.

CVD constitutes a major component of the global burden of disease [15]. Ischemic heart disease and stroke are the leading causes of death worldwide, and they rank first and third in life-years lost. With aging societies, the burden of CVD has risen continuously over the past two decades. Their importance has also increased in terms of disability-adjusted life-years [17] - ischemic heart disease and stroke ranked first and second in 2010. This overall picture is remarkable given that worldwide a decrease in ischemic heart disease for individuals aged 35-64 years between the mid-1980s and mid-1990s has been demonstrated [22], and that this trend has continued until now in most Western countries [11, 18, 19]. Both prevention and treatment contributed approximately half to the CVD mortality decrease.

CVD is strongly connected to lifestyle, especially the use of tobacco, unhealthy diet habits, physical inactivity, and psychosocial stress [23]. The major risk factors for CVD include smoking, obesity, physical inactivity, diabetes, hypertension and high blood cholesterol levels [14, 4]. Constitutional non-modifiable risk factors are age, gender, ethnicity and family history [21]. The World Health Organization (WHO) has stated that over three-quarters of all CVD mortality may be prevented with adequate changes in lifestyle. CVD prevention, remaining a major challenge for the general population, politicians, and healthcare workers alike, is defined as a co-ordinated set of actions, at public and individual level, aimed at eradicating, eliminating, or minimizing the impact of CVDs and their related disability. The bases of prevention are rooted in cardiovascular epidemiology and evidence-based medicine [12].

The aim of the study is analysis of structure, morbidity and mortality rates from cardiovascular diseases in Kazakhstan and particularly in the East Kazakhstan Region, in comparison with worldwide rates.

Methods

We have conducted a descriptive analysis of statistical data on demographics, mortality and morbidity rates in the Kazakhstan population using official information from statistical compilations "Health of the population of Kazakhstan and activities of public health organizations" for 2011-2013, as well as global data statistics about cardiovascular diseases using databases "PubMed", "Cochrane library", "Research Gate" system, and the annual reports of the WHO.

Results

Mortality from cardiovascular diseases is 52.8% of the total mortality of the Kazakhstan population. This rate is mainly due to two causes: Ischemic heart disease and Cerebrovascular diseases, which proportion in the structure of mortality from CVD is 47.7% and 36.4% respectively (figure 1) [1].
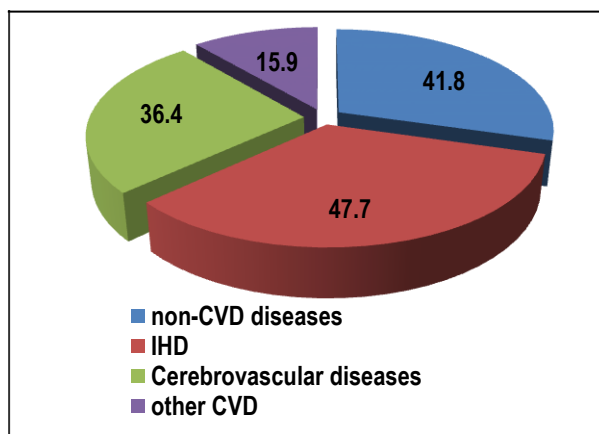
Figure 1. Structure of mortality including mortality from CVD in the Kazakhstan, 2011

In 2012 overall mortality rate in Kazakhstan was 9.01 per 1,000 population; in 2013 - 8.41 per 1,000 population, while in the East Kazakhstan region these figures were 11.81 and 11.19 per 1,000 respectively. Mortality rate from CVD was 256.76 and 207.40, respectively, in the East Kazakhstan Area it was one of the highest in the country - 361.44 and 330.46 per 100,000, respectively, in 2012 and 2013 (figure 2). In the rural areas these figures were significantly lower than in urban areas. Thus, among the city residents in 2012 general mortality rate from CVD was 300.58 per 100,000, while in rural areas - 203.63; in the East Kazakhstan region - 403.7 and 302.23, respectively [2].
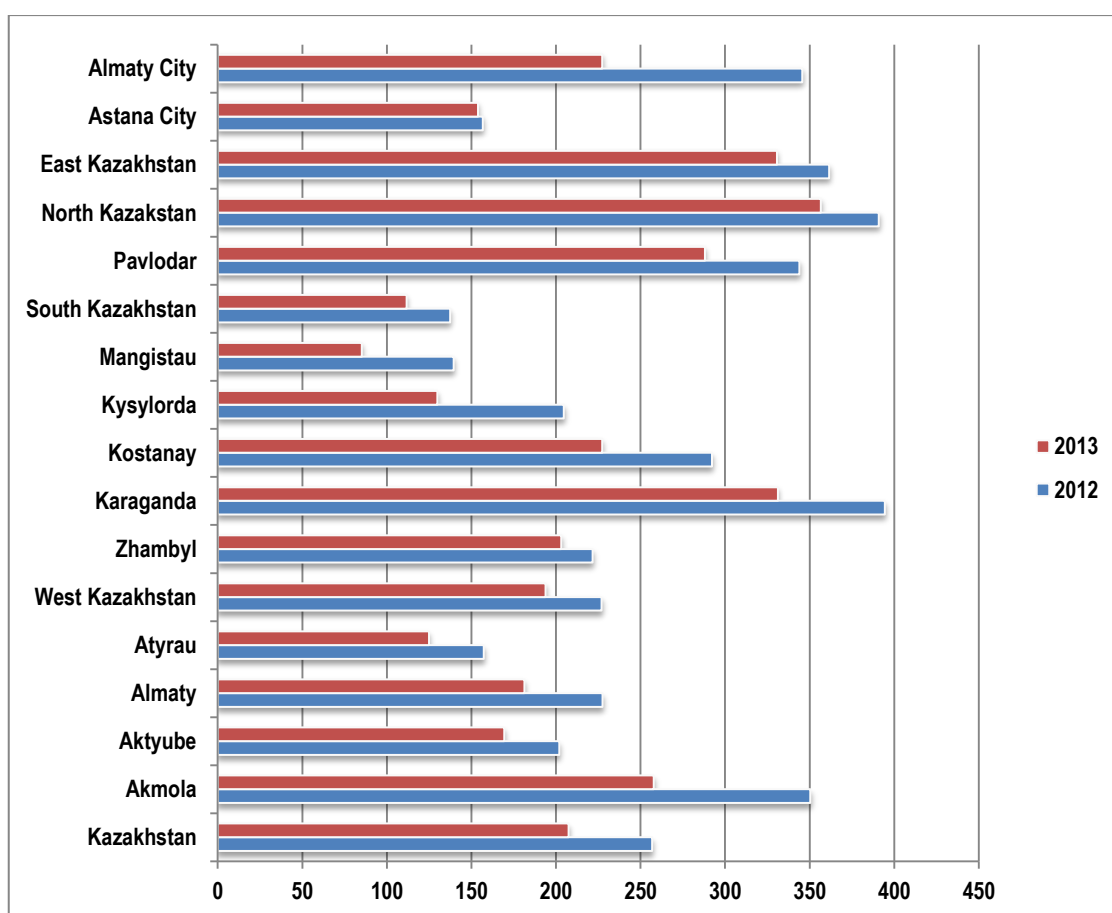

Figure 2. Mortality rate due to cardiovascular diseases in Kazakhstan, 2012-2013 (per 100,000).

Compared standardized mortality rates in some countries the death rate from the CVD in the Republic of Kazakhstan was about average one for the countries of the former Soviet Union: in 2010 it was 621.09 per 100,000 population (in Russia - 673.7; in Kyrgyzstan - 701.93, Uzbekistan - 754.15; Ukraine - 667.14, in the Confederation of Independent States as a whole - 674.49). It should be noted that in European countries with highly developed economies this rate was in 3-4 times

lower. For example, in the UK the mortality rate from CVD in 2010 was 164.19, in Germany - 195.2 per 100,000 (Figure 3).

In general, age-standardized mortality rate from CVD per 100,000 population in the world in 2013 was 293.2 (280.4; 306.1); from coronary heart disease - 137.8 (123.9, 148.2); from cerebrovascular diseases - 110.1 (101.8, 122.2); from ischemic stroke - 57.3 (49.3; 62.9); from hemorrhagic stroke - 52.8 (48.0; 62.3) (Table 1).

Table 1.

Age-standardized world death rate (per 100000) from cardiovascular diseases in 2013.

Cardiovascular diseases	Age-standardized world death rate (per 100000) in 2013	
	Rate	CI
Total CVD	293,2	280,4; 306,1
Ischemic heart disease	137,8	123,9; 148,2
Cerebrovascular diseases	110,1	101,8; 122,2
Ischemic stroke	57,3	49,3; 62,9
Hemorrhagic stroke	52,8	48,0; 62,3

It should be noted that in the majority of both developed economically countries and developing countries mortality from coronary heart disease and stroke leaded in the structure of general mortality. The only exceptions are some countries in Central and Latin America, South Africa, where communicable diseases and injuries dominated in the structure of general mortality [10].
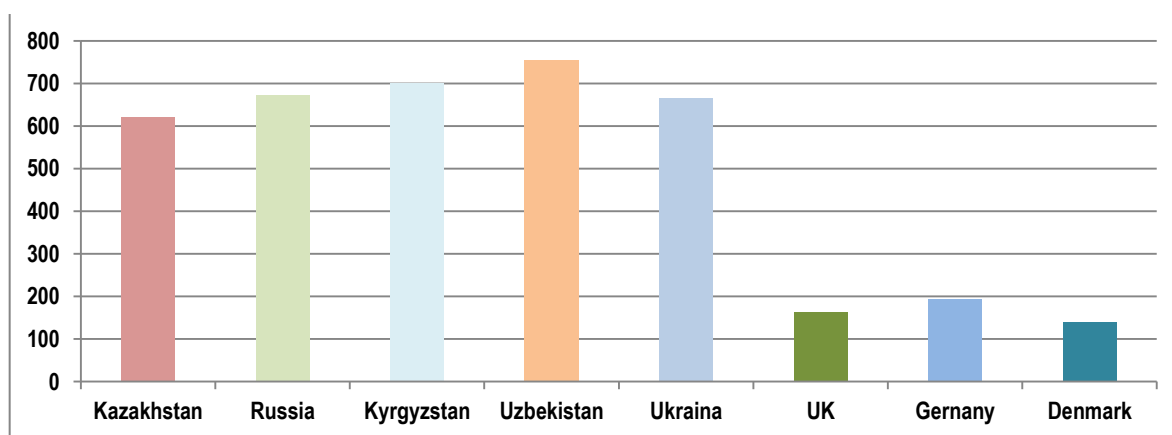

**Figure 3. Age-standardized mortality rates from CVD
in the countries of CIS and Europe, 2010 (per 100,000)**

Prevalence of CVD in Kazakhstan in 2012 was 12838.3 per 100,000, in 2013 - 13391.6. Morbidity rate from CVD in 2012 was 2,454.0; in 2013 - 2463.1 per 100,000, for women these rates were 2620.7 and 2612.5 per 100,000, respectively. In the East Kazakhstan region, these figures were 2603.7 and 2737.3, respectively, (for women 2920 and 2654.0 per 100,000) (Figure 4).
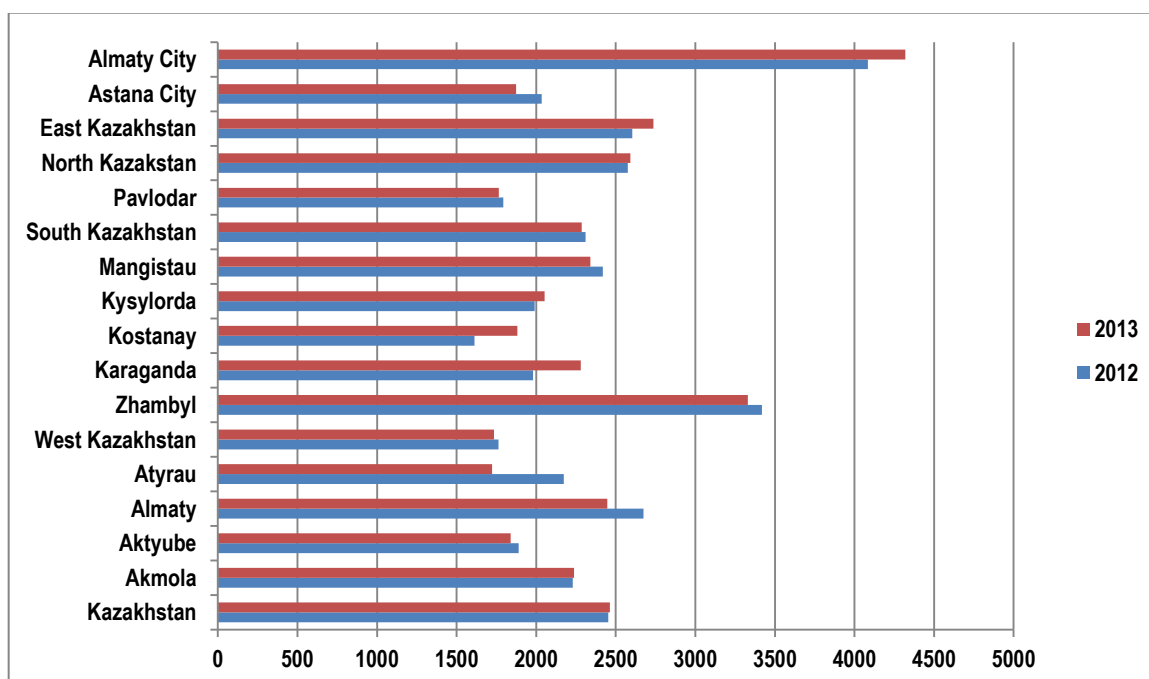

Figure 4. Prevalence rate for CVD in the regions of Kazakhstan, 2012-2013 (per 100,000).

The prevalence of hypertension in Kazakhstan according to data of different researchers varies from 15.2 to 27.0%, the prevalence of hypertension in urban and rural areas are the same, which is comparable to international data [3].

Incidence rate of hypertension in Kazakhstan in 2012 was 1,173.3, in 2013 - 1172.5 per 100,000 (for women - 1356.0 and 1352.3,

respectively). In the East Kazakhstan region, these rates were 1319 and 1084.6 per 100,000 (for women the figures were again higher than for men - 1226.9 and 1548.0 per 100,000, respectively) (figure 5). The incidence of coronary heart disease in Kazakhstan in 2012 was 507.4 in 2013 - 500.6 per 100,000, in East Kazakhstan region - 493.1 and 519.8, respectively.
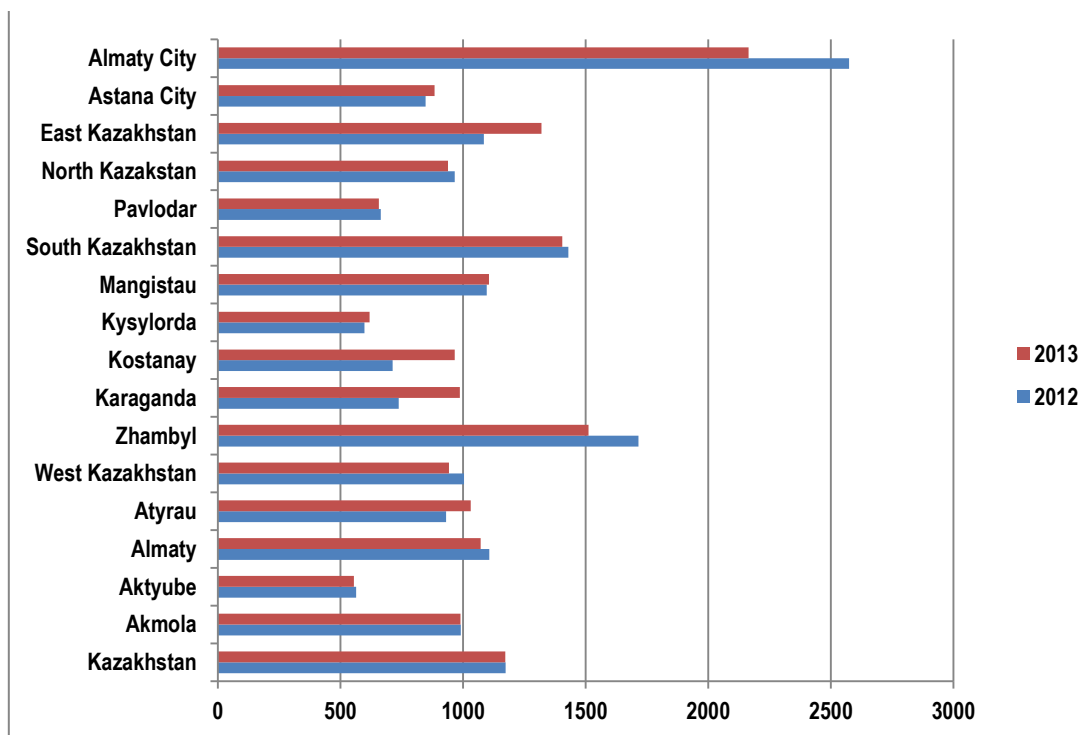

Figure 5. Incidence rate of hypertension in Kazakhstan, 2012-2013 (per 100,000).

The incidence of myocardial infarction in 2012 in Kazakhstan was 57.9 per 100,000, in East Kazakhstan region - 154.3 and 142, 7, respectively. The incidence of cerebrovascular disease in 2012 was 193.3 per 100,000, in 2013 - 208.1, in East Kazakhstan region - 214.5 and 252.7, respectively (Table 2).

From 2006 to 2010, age-adjusted CHD prevalence in the United States declined overall from 6.7% to 6.0% (Table 1). In 2010, the prevalence of CHD was greatest among persons aged ≥65 years (19.8%), followed by those aged 45--64 years (7.1%) and those aged 18--44 years (1.2%). CHD prevalence was greater among men (7.8%) than women (4.6%). Among racial/ethnic populations, CHD prevalence was greatest among American Indians/Alaska Natives (11.6%), followed by blacks (6.5%), Hispanics (6.1%), whites (5.8%), and Asians or Native Hawaiians/Other Pacific Islanders (3.9%). By race and sex in 2010, the greatest male prevalence were among American

Indian/Alaska Natives (14.3%) and whites (7.7%), and the greatest females prevalence were among American Indian/Alaska Natives (8.4%) and blacks (5.9%) [6]

In Europe, the burden remains high: CVD remains a major cause of premature deaths and loss of DALYs—a composite of premature death and living with the disease. It is not widely appreciated that CVD is the main cause of premature death in women: CVD was responsible for 42% of all deaths below 75 years of age in European women and for 38% of all deaths at 75 years in men. However, a decline in age-standardized CHD and CVD mortality has been observed in many European countries between the 1970s and 1990s, with the earliest and most prominent decrease in the more affluent countries, illustrating the potential for prevention of premature deaths and for prolonging healthy life expectancy. In several eastern European countries, however, CVD and CHD mortality remains high [18].

Table 2.

Incidence of separate CVD forms in the Kazakhstan regions, 2012-2013 (per 100,000).

Region	Ischemic Heart Disease		Myocardial Infarction		Cerebrovascular diseases	
	2012	2013	2012	2013	2012	2013
Kazakhstan	507.4	500.6	57.9	57.5	193.3	208.1
Akmola	434.8	487.1	83.9	87.8	156.3	144.9
Aktyube	351.8	349.9	28.1	28.1	186.2	176.0
Almaty	587.6	631.9	35.1	38.7	126.5	120.2
Atyrau	375.6	309.8	44.3	45.4	109.9	113.1
West Kazakhstan	355.6	323.8	38.5	38.7	202.1	182.3
Zhambyl	967.9	708.9	33.5	33.9	304.6	421.4
Karaganda	354.9	421.4	80.4	75.6	209.8	200.0
Kostanay	284.6	285.1	54.7	56.9	183.3	177.9
Kysylorda	252.5	258.0	11.3	10.9	129.4	157.7
Mangistau	552.0	520.2	28.0	24.4	114.3	112.8
South Kazakhstan	482.1	475.3	40.7	42.4	195.3	194.1
Pavlodar	365.1	327.2	61.6	59.5	239.8	219.2
North Kazakstan	483.1	515.1	131.4	138.5	428.4	508.3
East Kazakhstan	493.1	519.8	154.3	142.7	214.5	237.2
Astana City	213.8	199.6	21.6	13.4	218.0	252.7
Almaty City	980.8	971.6	45.8	53.0	140.0	192.5

Discussion

"Coronary heart disease (CHD) is now the leading cause of death worldwide; it is on the rise and has become a true pandemic that respects no borders". This statement from 2009 on the website of the WHO11 does not differ much from the warning issued in 1969 by its Executive Board: 'Mankind's greatest epidemic: CHD has reached enormous proportions striking more and more at younger subjects. It will result in coming years in the greatest epidemic mankind has faced unless we are able to reverse the trend by concentrated research into its cause and prevention' [13]. The second major CVD-stroke-is another substantial cause of death and disability. For these reasons, the fifth JTF guidelines refer to the total burden of atherosclerotic CVD.

The choice of total burden of atherosclerotic CVD may give the impression that nothing has changed over the past 40 years, but this is not true. On the contrary, the epidemic has been and still is extremely dynamic and is influenced by both changes in cardiovascular risk factors and in increased opportunities for targeted interventions to prevent and treat CVD. This results in ups and downs of cardiovascular morbidity and mortality over relatively short periods with wide variability across the globe, including developing countries where the major proportion of all events occurs nowadays. In different parts of the world, the dynamics of the epidemic vary greatly in pattern, magnitude, and timing [25]. In Europe, the burden remains high: CVD remains a major cause of premature deaths and loss of DALYs-a composite of premature death and living with the disease. It is not widely appreciated that CVD is the main cause of premature death in women: CVD was responsible for 42% of all deaths below 75 years of age in European women and for 38% of all deaths at 75 years in men [9].

However, a decline in age-standardized CHD and CVD mortality has been observed in many European countries between the 1970s and 1990s, with the earliest and most prominent decrease in the more affluent countries, illustrating the potential for prevention of premature deaths and for prolonging healthy life expectancy. In several eastern European countries, however, CVD and CHD mortality remains high [7].

Prevention of CVD ideally starts during pregnancy and lasts until the end of life. In daily practice, prevention efforts are typically targeted at middle-aged or older men and women with established CVD (i.e. secondary prevention) or those at high risk of developing a first cardiovascular event [e.g. men and women with combinations of smoking, elevated blood pressure (BP), diabetes or dyslipidaemia (i.e. primary prevention)]; CVD prevention in the young, the very old, or those with just a moderate or mild risk is still limited, but can result in substantial benefit. Prevention is typically categorized as primary or secondary prevention, although in CVD the distinction between the two is arbitrary in view of the underlying, gradually

developing atherosclerotic process. Since the instruction by Geoffrey Rose decades ago, two approaches towards prevention of CVD are considered: the population strategy and the high-risk strategy [20]. The population strategy aims at reducing the CVD incidence at the population level through lifestyle and environmental changes targeted at the population at large. This strategy is primarily achieved by establishing ad-hoc policies and community interventions. Examples include measures to ban smoking and reduce the salt content of food. The advantage is that it may bring large benefits to the population although it may offer little to the individual.

The impact of such an approach on the total number of cardiovascular events in the population may be large, because all subjects are targeted and a majority of events occur in the substantial group of people at only modest risk. In the high-risk approach, preventive measures are aimed at reducing risk factor levels in those at the highest risk, either individuals without CVD at the upper part of the total cardiovascular risk distribution or those with established CVD. Studies have shown that preventive measures (i.e. BP lowering and smoking cessation) are beneficial up to advanced age [5, 8]. These facts exemplify that prevention of CVD should be a lifelong effort.

Within the State Program of Health Care Development in Kazakhstan "Salamatty Kazakhstan", 2011 – 2015, it was planned forming the national screening program. Starting from 2011 it was planned a staged screening for early detection of cardiovascular diseases, and diabetes.

Screening for diseases of the cardiovascular system in Kazakhstan is carried out in the framework of guaranteed free medical care in all district clinics for men and women aged 18, 25, 30, 35, 40 years, 40 to 64 years, who do not have diagnosed heart disease and diabetes - 1 time in 2 years. During the screening they have been conducted a questioning to determine the risk factors (family history, smoking, physical inactivity, excessive alcohol consumption), the measurement of height and weight to detect excess weight, blood pressure measurement, the analysis of blood cholesterol and sugar. It allows you to identify individuals at high risk of cardiovascular mortality and to conduct the pharmacological and non- pharmacological prevention measures.

According to data of "Medinfo" company in 2011 screening examination for cardiovascular disease in Kazakhstan were conducted in the more than 2.5 million adults. As a result, more than 200 thousand (7.9% of examined people) were identified as the patients with heart disease. Most of these patients had not previously under the dispensary monitoring and did not receive the necessary treatment. Assign the necessary drugs, correction of lifestyle and diet, eliminating of bad habits significantly improve their prognosis and reduce the chance of cardiovascular mortality.

Conclusion

Thus, cardiovascular diseases caused by atherosclerosis, are widespread throughout the world. However, death rates from CVD in the developed countries is 3-4 times lower than in the countries of Eastern Europe and Central Asia. This may be due to the introduction of primary and secondary prevention, using a scientific approach based on evidence-based medicine and the development of cardiovascular diagnosis and surgery in countries with high economic level.

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