Improvement of the Policy of Struggle against Cardiovascular Diseases in the Republic of Kazakhstan Based on Foreign Experience

ZH.T. Sayrambayeva[1], A.B. Otarbayeva[2]

Abstract: *The article is devoted to one of the types of socially significant diseases, which not only significantly reduce the lives of many people, but also lead to death. Every year, 17.9 million people die from cardiovascular diseases in the world, as well as affect people of working age. According to the Ministry of Health of the Republic of Kazakhstan, Kazakhstan occupies a leading position in the number of deaths from cardiovascular diseases, and also refers to countries with a very high level of risk. Given the social and economic losses from cardiovascular diseases, the main goal of this article is to identify risk factors that contribute to the occurrence of circulatory diseases and to propose improved preventive measures based on research from foreign countries. To identify a problem in the fight against cardiovascular diseases, the authors of the article made an analysis of the current regulatory legal acts and state programs for combating cardiovascular diseases, as well as conducted a survey among citizens about the types and terms characterizing cardiovascular diseases.*

Keywords: cardiovascular disease, Kazakhstan, risk factors, prevention, regulatory documents.

1. Introduction

To date, damage to the heart and blood vessels of various nature, leading to disruption of the entire cardiovascular system - are the most common and dangerous diseases in the world. Cardiovascular disease (CVD) is the most common type of noncommunicable disease from which 17.9 million people die every year, accounting for 31% of all deaths. [1]. Increasing the number of CVD patients is not only a problem in developing countries, but many developed countries are struggling with this disease. Since CVD causes over 1.83 million deaths in the European Union each year (35.7% of all deaths). In every fifth European, death is CVD, of which 15% of women and 16% of men die every year. In different countries and regions of Europe, CVD statistics vary. According to statistics, the highest level and mortality of CVD is observed in countries such as Bulgaria (66.2 thousand), Romania (58.2 thousand), Latvia (56.1 thousand), Estonia (52.4 thousand), the most low mortality in France (24.3 thousand), Denmark (23.9 thousand), the Netherlands (26.3 thousand) and Belgium (28.1 thousand) [2].

In the United Kingdom (UK) cardiovascular disease affects around seven million people and is a significant cause of disability and death, affecting individuals, families and communities. CVD is responsible for one in four premature deaths in the UK and was responsible for 26% of all deaths (129,147) in England in 2015. Healthcare costs in the UK associated with CVD are estimated at €12.3 billion (~ £ 8 .96 billion at the time of the study) and non healthcare costs estimated at € 5 .6 billion (~ £ 4.04 billion) [3].

In the United States in 2016, cardiovascular disease was cause of 840,678 deaths, approximately 1 of every 3 deaths. In 2016, Coronary Heart Disease was the leading cause (43.2%) of deaths attributable to cardiovascular disease in the US, followed by stroke (16.9%), High Blood Pressure (9.8%), Heart Failure (9.3%), diseases of the arteries (3.0%), and other cardiovascular diseases (17.7%). Between 2013 and 2016, 121.5 million American adults had some form of cardiovascular disease. Also for CVD and stroke accounted for 14% of total health expenditures in 2014-2015. This is more than any major diagnostic group. Total direct medical costs of CVD are projected to increase to $749 billion in 2035, according to a 2016 study [4].

In 2018, mortality from the CVD group in 2018 amounted to 573.6 cases per 100 thousand people, thereby taking the first place in the structure of causes of death, which is more than half of deaths in Russia. The total incidence rate per 100 thousand of the population due to circulatory system diseases (BSC) in 2017 was maximally recorded in the Northwestern Federal District and amounted to 27703.2, which is 13.2% higher than the average Russian indicator. The minimum overall incidence of cardiovascular disease was recorded in the North Caucasus Federal District [5]. Due to diseases of the circulatory system, Russia loses up to 5 percent of GDP annually, since now the disease affects not only the elderly, but also young and able-bodied people [6].

According to the Ministry of Health of the Republic of Kazakhstan, the circulatory system diseases are also leading in the structure of Kazakhstan's total mortality for 2016, which makes up more than 50% of all deaths [7], while the standardized mortality rate of the population of the Republic of Kazakhstan due to circulatory system diseases (BSC) is twice as high. than in the countries of the European region. In total, in 2018, about two million people suffering from cardiovascular diseases (CVD) were registered in Kazakhstan [8]. Also in the structure of the circulatory system disease, the main threat to public health is coronary heart disease and its acute forms, especially acute myocardial infarction, which grew by 5% in Kazakhstan. Despite the measures taken at the state level to prevent CVD, in 2019 in Kazakhstan, up to 70% of patients with CVD are people of working age, from 40 to 70 years old. The reason for the increase and "rejuvenation" of cardiovascular diseases is the lifestyle of the modern generation, accumulated stress, inability to adequately cope with various life situations.

It is no secret that young people do not lead a healthy lifestyle, that is, they eat fast food, carbonated drinks, do not lead an active lifestyle, etc. This mode of life, first of all, affects the nervous regulation of all organs and systems, and, of course, the heart and blood vessels. The sympathetic part of the autonomic nervous system is activated, which can lead to spasm of blood vessels, including heart arteries. Junk food is rich in preservatives and cholesterol, which creates the conditions for the early development of atherosclerosis - the main cause of damage to the arteries of the heart. Under stress, coagulation is activated, that is, blood coagulation and blood clots, which are a direct cause of clogged arteries and the development of myocardial infarction [9].

Statistical data show that despite the development of modern medicine, diseases of the circulatory system remain the most urgent problem of medical science and practice, which affects socio-economic indicators (incidence, mortality, disability, working capacity, life expectancy of the population, etc.).) Given the seriousness and danger of CVD, the aim of the study is to study the risk factors and determinants of CVD, consider preventive measures and diagnose diseases of the circulatory system in developed countries, the use of which helps to improve the system of care for patients with cardiovascular diseases in Kazakhstan.

2. Literature Survey

When writing this article, statistical and informational data provided by the European Union [2], American Heart Association [4], the World Health Organization (WHO) and the Ministry of Health of the Republic of Kazakhstan were used. Risk factors and a cardiovascular disease prevention strategy are detailed in collections such as: 2016 European Guidelines on Cardiovascular Disease Prevention in Clinical Practice [10], World Atlas of Cardiovascular Disease Prevention and Control 2017 [11], World Health Statistics 2017 [12].

Recommendations for the prevention, diagnosis and treatment of CVD are provided in the international Recommendations Global action plan for the prevention and control of noncommunicable diseases [13], in the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases [14], as well as in the Recommendation for the Prevention and Control of Noncommunicable Diseases in Kazakhstan. Arguments in favor of investing [15].

The rules for the prevention and provision of medical care for cardiovascular diseases at the state level of the Republic of Kazakhstan are detailed in such documents as:
1) Strategy "Kazakhstan-2050": a new political course of a successful state;
2) The strategic plan of the Ministry of Health of the Republic of Kazakhstan for 2017-2021;
3) Decree of the Government of the Republic of Kazakhstan dated December 26, 2019 No. 982 "On approval of the State program for the development of healthcare of the Republic of Kazakhstan for 2020 - 2025
4) The order of the acting Minister of Health of the Republic of Kazakhstan dated November 10, 2009 No. 685 "On the establishment of target groups of persons subject to preventive medical examinations, as well as the rules and frequency of these examinations».

3. Methods

A review of domestic and foreign literature on the status of the prevalence of cardiovascular diseases in America, European countries, the Russian Federation and Kazakhstan, taking into account the indicators of the statistical report of health organizations from 2016 to 2019, as well as an analysis of risk factors associated with the spread of CVD.

When writing the work, a survey method was used among 100 people aged 20 to 70 years. Among them, 60 women (average age 40 years) and 40 men (average age 45 years). The respondents had a higher or secondary education. During a survey with citizens, the interviewer asked questions about the types of SPZ and terms related to BSK. The results of the study showed that the majority of respondents either did not understand the meaning of medical terms, or the understanding of the term was exclusively descriptive. 90% of respondents knew a heart attack and stroke, but when asked about diseases such as "coronary insufficiency", "cerebrovascular disease", "atherosclerosis" only 20% were able to answer, 70% were not aware of such types of SPZ as "peripheral vascular disease", " Cardiomyopathies "," Cardiac arrhythmias "respondents did not understand the term" hypercholesterolemia ". 75% of the respondents knew the term "cholesterol", 50% of the patients knew the term "angina pectoris," 60% said the term "risk factors." This means that many people know the common name for CVD as a stroke or heart attack, a significant number of respondents either do not know or incorrectly understand the meaning of the basic cardiological terms. Unfortunately, it should be recognized that if citizens have a poor understanding of the basic medical terms for a disease that is prevalent among the population, it is difficult to expect that they will adhere to a healthy and active lifestyle and implement the recommendations of the WHO and the Ministry of Health of the Republic of Kazakhstan, not to mention already about patients who are vital to observe preventive measures.

4. Results/Discussion

Most CVD deaths are preventable by eliminating or correcting risk factors. What are the main risk factors affecting the development of cardiovascular disease and what are risk factors? According to the definition of the American epidemiologist W. Kannel, a "risk factor" is a characteristic of a person (demographic, anatomical, physiological) that increases the likelihood (risk) that this person will develop some manifestations of the disease. " If an individual has a combination of risk factors, they mutually reinforce each other's action. All risk factors that can lead to the development of CVD can be divided into three groups [11].

Behavioral risk factors: tobacco use, lack of physical activity, unhealthy diet (lots of salt, fats and calories), harmful use of alcohol.

Metabolic risk factors: high blood pressure (hypertension), high blood sugar (diabetes), high blood lipids (such as cholesterol), overweight and obesity.

Other risk factors: poverty and low educational status, old age, gender, genetic (genetic) predisposition, psychological factors (e.g., stress, depression), other risk factors (e.g., excessive homocysteine levels). According to studies, behavioral and metabolic risk factors play a key role in the etiology of CVD. Most cases of premature death due to CVD can be avoided if people knew the basic determinants of CVD and adhered to preventative measures. Since the experience of high-income countries shows a significant reduction in age-related mortality from CVD due to a combination of preventive measures aimed at preventing the development of diseases, early treatment to prevent death in acute conditions (heart attacks and strokes) and the provision of medical care to prevent relapses and increased life expectancy of people with CVD in the anamnesis (A set of practical measures for the management of patients with cardiovascular diseases at the level of primary health care [16].

The concept of risk factors, developed in the 60s of the last century, laid the scientific basis for the prevention of CVD, in connection with which WHO identifies a number of population-based preventive interventions, the economic feasibility of which is beyond doubt regardless of the economic status and other characteristics of the country [17], and the rejection of their implementation leads to the loss of health, lives of people and money in the economy. Preventive measures include population-based measures to control tobacco consumption (tax increase, ban on smoking in the workplace in public places, etc.), measures to control excessive alcohol consumption (tax increase, ban on advertising, etc.) and nutritional correction measures (decrease in salt intake with food, replacement of saturated fats with unsaturated fats, etc.). According to WHO estimates, in any country in the world, minimum investments of less than 1 US dollar per capita per year during population-based prophylaxis reduce the burden of CVD [18].

Small particles inhaled from the air are known to cause cardiovascular and respiratory diseases, as well as cancer [19]. These hazardous particles can come from tobacco smoke, open fire smoke when cooking and heating homes, or from transport and industrial sources.

Tobacco products are a recognized cause of many diseases and 50% of avoidable deaths, half of which are CVDs. Smokers double the 10-year risk of fatal CVD. The RR of a 50-year-old smoker is 5 times higher than the RR of a non-smoker. Smoking, even in small to moderate amounts, leads to vascular risk. In the EUROASPIRE IV survey among CAD patients, 16% smoked after a mean follow-uptime of 16 months, and nearly half of the participants who smoked at thetime of their coronary event were persistent smokers. The survey also foundthat evidence-based treatment for smoking cessation was underused [10].

What needs to be done to encourage citizens to quit smoking?

Firstly, the usefulness of short talks about the dangers to health, all types of nicotine replacement therapy (NRT), bupropion and varenicline has been proven. Combinations of drugs are more effective (except the combination of NRT / varenicline).

Secondly, brief conversations about the dangers to health combined with help during refusal of drugs and dynamic observation and support are recognized as the most effective.

Thirdly, electronic cigarettes can help with smoking cessation, but their sale should be carried out according to the same rules as regular cigarettes.

Also, protection for non-smokers is necessary, as secondhand smoke carries a significant risk [10].

Here I would like to note the experience of Ireland, where between 2000 and 2015 the probability of dying from any of the four main NCDs aged 30 to 70 years decreased from 17.8% to 10.3%, which corresponds to an overall decrease of 42%. The largest decrease in mortality from the four major NCDs is associated with a decrease in mortality from cardiovascular disease. Ireland has achieved such results thanks to government policies to combat cigarette smoking [20], the normalization of blood pressure, as well as improved medical care and reduced exposure to harmful particles in the air. In general, public policies pursued in Ireland to reduce exposure to hazardous particles have led to documented reductions in mortality from chronic respiratory diseases. A policy that began back in 1990 included a ban on the sale of coal, which contributed to lower black smoke concentrations and lower NCD mortality observed since 2000. Since 2004, Ireland has become the first country in the world to ban smoking in all closed public spaces and workplaces. A private home is considered a workplace when people work there, such as plumbers or electricians. The premises should have a warning sign informing about the smoking ban, as well as information who should be contacted in case of any complaints. A workplace may be fined 3,000 euros for each person who smokes (for example, 15,000 euros for five people who violate the smoking ban). In addition, the Tobacco Control Authority has developed a hotline where people can report smoking cases in a closed public place. Studies have shown that this ban led to a significant reduction in hospital admissions for lung disease and acute coronary syndromes [21], as well as mortality from coronary heart disease, stroke, and chronic obstructive pulmonary disease [22].

The next important risk factor for a large number of diseases, including CVD, diabetes, and some cancers, is junk food. Compliance with the principles of healthy eating helps to reduce the risk of CVD and maintain health. Mortality from coronary heart disease (CHD) can be halved due to only a moderate reduction in risk factors; it was suggested that dietary adjustment alone ("eight dietary priorities") could halve mortality from CVD [10]. According to the recommendations of the International Diabetes Federation, the use of the following products helps to reduce the

development of CVD, diabetes, and some oncological diseases, these include:

- Choosing water, coffee or tea instead of fruit juice, soda or other sugar sweetened beverages.
- Eating at least three servings of vegetables every day, including green leafy vegetables.
- Eating up to three servings of fresh fruit every day.
- Choosing nuts, a piece of fresh fruit or unsweetened yoghurt for a snack.
- Limiting alcohol intake to a maximum of two standard drinks per day.
- Choosing lean cuts of white meat, poultry or seafood instead of read of processed meat.
- Choosing peanut butter instead of chocolate spread of jam.
- Choosing whole-grain bread, brown rice, or whole-grain pasta instead of white bread, rice, or pasta.
- Choosing unsaturated fats (olive oil, canola oil, corn oil or sunflower oil) instead of saturated fats (butter, ghee, animal fat, coconut oil or palm oil) [23].

Compliance with the above recommendations can also help prevent obesity. Since worldwide, between 1980 and 2013, the proportion of overweight or obese adults increased from 28.8% to 36.9% among males and from 29.8% to 38.0% among females. Using the Global Burden of Disease study statistical model, the Pacific Island countries, Eastern Europe, Central Asia, and the North Africa / Middle East region have the highest mortality rates attributable to high Body Mass Index [4]. In addition, according to prospective epidemiological studies, there is a relationship between overweight or obesity, on the one hand, and cardiovascular morbidity, cardiovascular mortality and overall mortality. Obesity is closely associated with major cardiovascular risk factors such as arterial hypertension, decreased glucose tolerance, type 2 diabetes and dyslipidemia [24]. Overweight and obesity have a negative metabolic effect on blood pressure, cholesterol, triglycerides, and insulin resistance. With an increase in overweight, the risk of coronary heart disease, ischemic stroke, and type 2 diabetes mellitus is steadily increasing [25].

In the fight against obesity, it is important to eat not only healthy food, but also lead an active lifestyle. An active lifestyle is possible only with regular physical activity, this helps to reduce cardiovascular mortality and mortality from all causes of CVD. WHO has made recommendations on physical activity for different age groups:

- Children and young people aged 5-17 years should engage in physical activity from medium to high intensity for at least 60 minutes daily.
- Adults 18–64 years of age should spend at least 150 minutes a week on medium-intensity aerobic exercise (brisk walking, jogging, gardening), or at least 75 minutes a week on high-intensity aerobic exercise, or a similar combination of medium physical activity and high intensity.
- Elderly people are recommended similar volumes of physical activity, as well as performing exercises to balance and strengthen the muscular system, in accordance with their abilities and circumstances [23].

Lifestyle modification interventions affect a number of risk factors and should be used before or in combination with drug therapy.

In addition, legislation aimed at reducing salt and trans fatty acids in foods, as well as reducing the prevalence of smoking, is cost-effective in preventing CVD. Lowering cholesterol with statins and improving blood pressure control are cost effective if they target people with high SSR [10].

There is a direct causal relationship between the level and model of alcohol consumption, on the one hand, and the risk of CVD, on the other hand, since the harmful use of alcohol leads to damage to the heart muscle, increases the risk of stroke and provokes the development of arrhythmia [11]. The French Law on Alcohol and Tobacco Policy (the so-called "Law of Even" (La LoiÉvin), is an example of restrictions on the advertising and marketing of alcohol [26]. This strategy prohibits the advertising of all alcoholic beverages containing more than 1.2% alcohol by volume, on television or in cinemas, and also prohibits alcohol companies from sponsoring sports and cultural events. The Even Act also prohibits targeted exposure to youth and controls the content of alcohol ads. Text and images in such ads should contain only information about the properties advertised products, and in every advertisement there should be a warning about health hazards.In 2008, this law was expanded and began to apply to alcohol advertising on the Internet, newspapers and magazines [11].

In this context, motivation for a healthy lifestyle for patients already suffering from chronic noncommunicable diseases seems to be a difficult task. It is difficult for them to change their behavior or to take some other form of organization of their life; most of them relate to risk factors differently. Similar studies were carried out in many countries (in the UK, Canada, Germany, the USA and others). At the same time, researchers drew attention to the inconsistency of the practice of applying stimulation to maintaining a healthy lifestyle. On the one hand, every citizen has the right to medical care, and on the other hand, he may not follow the recommendations that are prescribed to him in connection with his health condition and treatment (for example, quit smoking). Perhaps in the future, special regulatory documents will be created that will regulate the areas of responsibility of people with CVD in Kazakhstan, which will increase not only the importance of preventive examinations, but also the commitment to treating such patients and the ability to monitor compliance with recommendations for individual behavior. In addition, moral incentives are often powerless over market incentives. Under these conditions, the state and employers should look for other incentive measures, for example, by adding one day to the annual vacation, provided that you exercise or lose weight. Thus, the motivational policy, in order to achieve the stated goals, must be linked to other mechanisms to ensure the health of the nation [27].

Thus, the will of citizens and patients themselves play an important role in the prevention of NCDs. According to the World Health Organizations, human health depends on the healthcare system by only 10% and 50% on the lifestyle that

is formed under the influence of a person's environment, the right to choose, quality of life and the availability of health promotion opportunities. Prevention offers the most cost-effective long-term strategy for combating noncommunicable diseases.

At the international level, the monitoring system is complemented by the WHO Global Plan of Action for the Prevention and Control of NCDs 2013–2020 (WHO Global Plan of Action for NCDs), endorsed by the 66th World Health Assembly [13], which presents a phased action plan and possible policy options for achieving nine voluntary global goals. In 2015, these prevention commitments were reinforced by the adoption by the United Nations General Assembly of the 2030 Agenda for Sustainable Development. [28] In this regard, countries have agreed to take steps to achieve ambitious goals by 2030 - reducing by one third of premature deaths from NCDs, ensuring universal health coverage and ensuring access to affordable essential medicines.

To stop the increase in the incidence of CVD, it is imperative to scale up preventive measures at the population level. Policies are needed to increase the availability of low-cost foods and drinks for a healthy diet, stimulate physical activity and reduce tobacco exposure. Companies in the media and social marketing can contribute to positive change and a healthy lifestyle. Such strategies can reduce the likelihood of CVD, especially among young citizens, as well as reduce the number of its complications. The availability of low-cost treatment is critical to reducing preventable CVD mortality and improving outcomes [23]. In 2015, the Declaration adopted by the High Level Meeting of the UN General Assembly called on countries to join efforts of all sectors of society, economic sectors and accelerate the implementation of effective measures to prevent and combat cardiovascular and other non-communicable diseases. The implementation of the planned measures should lead to a reduction in premature mortality from NCDs by 30% by 2030 [29]. The UN General Assembly also hosted the third high-level meeting on NCDs in 2018 to review progress in countries achieving voluntary global goals by 2025.

It is worth noting that many European countries have achieved a reduction in the number of patients with CVD, thanks to preventive measures, including the successful legislation on smoking, the prevalence of coronary heart disease has more than halved compared to the beginning of the 80s. Methods were also used to promote population strategies and integrate them into national or regional prevention programs, taking into account the peculiarities of local medical services, and in accordance with the report of the World Health Organization (WHO) on noncommunicable diseases [10].

In many developed countries, research is being done to prevent the spread of CVD. Since among the population there are many undetected patients with an increased risk of CVD. A simulation study based on data from a cohort study of the European Advanced Cancer Research - Norfolk (EPIC-Norfolk) showed that, compared to the National Health Service (NHS) national strategy for screening all adults aged 40-74 years for CVD risk, an invitation to

examine 60% of the highest-risk population also effectively prevented the development of new CVD cases with potential cost savings [10].

Also, in this recommendation, using the SCORE Scale, to assess the 10-year risk of fatal CVD, to help make the right therapeutic decisions and avoid both inadequate and over-treatment. In this study, Kazakhstan was among very high-risk countries, more than twice as high as in low-risk countries (i.e., cardiovascular mortality> 450/100000 for men and> 350/100000 for women). High-risk patients (SCORE ≥5% and <10%): need intensive non-drug and sometimes drug intervention. - Patients with a very high risk (SCORE ≥10%) more often require drug therapy. For patients over 60 years of age, the specified risk threshold should be interpreted more carefully, because age itself can determine the risk, even if the risk factors are "normal". In this regard, elderly patients should be carefully prescribed drugs [10].

A very high level of risk in Kazakhstan means the presence of problems and the need to improve the state program and action plan for CVD. According to the Ministry of Health of the Republic of Kazakhstan, the main reasons for the growth of CVD diseases are the personnel shortage of the cardiac surgery service; depreciation of medical equipment, insufficiency of the ECMO system, as well as drugs of the inhibitor group; insufficiency of the level of prevention; untimely diagnosis; the absence of PCI centers or their remoteness from the population. "

Currently, there are 31 centers of percutaneous coronary intervention (PCI) in Kazakhstan. In the regions, seven additional PCI centers are required to be opened. The number of medical organizations that provide assistance with a stroke (IC II and III level) is determined at the rate of 30 beds per 250 thousand people, in Kazakhstan, according to the agency, there should be at least 69 stroke centers. As of 2019, in the Republic of Kazakhstan, the number of ICs is 60, i.e. 86.9%. According to the standard, it is necessary to open nine more ICs in such regions as WKO, Almaty, Zhambyl, in the Almaty region, the cities of Nur-Sultan, Shymkent, Almaty. Also, there is no shortage in the NKO, but taking into account the remoteness, it is necessary to open additional information centers in the Kostanay region, it is additionally necessary to open one information center in the city of Arkalyk "[30].

Deficiency of special medical facilities plays an important role in CVD. Since the time factor is the most important. From the onset of pain, the patient begins to count down, which determines his life prognosis. In the first hour, 50 percent of the risk area for myocardial necrosis is affected. The first hour is the "golden hour" in helping patients with myocardial infarction. It is very important that a person who has pain behind his breastbone calls an ambulance as soon as possible. The countdown is for minutes if medical care is provided at the first hour and in full, the patient's life can be saved [9].

The next problem is financing of the health system, in Kazakhstan for 2018 this amounts to 3.2% of GDP, this indicator in European countries reaches from 11.5% in

Germany and up to 4.5% in Portugal [31]. That means for. health system improvements need to be allocated and sufficient funds as in OECD countries.

According to the Ministry of Health of Kazakhstan, the development of noncommunicable diseases is influenced by such risk factors as: high blood pressure, tobacco, alcohol, high blood cholesterol, overweight, inadequate consumption of fruits and vegetables, and a sedentary lifestyle. So among Kazakhstani teenagers (children from 10 to 19 years) 5% are obese and 20% of children are overweight. Salt consumption in Kazakhstan exceeds the recommended WHO indicator, according to some data, four times. The daily consumption of fruits and vegetables by Kazakhstanis is lower than the average European indicator.

According to estimates in 2015, 28% of men and 25% of women over 18 had high blood pressure. Recent cholesterol estimates indicate that 46% of people 25 years of age and older have elevated total cholesterol. The prevalence of smoking is 42.4% among men and 4.5% among women. Alcohol use remains one of the main risk factors in the overall disease burden in Kazakhstan. In 2016, almost 74% of male mortality from cirrhosis and 34% of injuries were attributable to alcohol consumption, for women these figures were 45% and 31%, respectively.

In general, the current damage caused by non-communicable diseases to the economy of Kazakhstan is 2.3 trillion. tenge per year, which is equivalent to 4.5% of the country's annual gross domestic product for 2017 [32].

To regulate the situation, in June 2018, they announced a new model of the guaranteed volume of free medical care (GVFMC). Medical care for CVD patients is provided in accordance with the Order of the Minister of Health and Social Development of the Republic of Kazakhstan dated June 6, 2016 No. 479 "On approval of the Standard for the Organization of Cardiac and Cardiac Surgery in the Republic of Kazakhstan". In addition, acute myocardial infarction (first 6 months) by the Order of the Minister of Health and Social Development of the Republic of Kazakhstan "On approval of the list of socially significant diseases and diseases posing a danger to others" dated May 21, 2015 No. 367 was included in the list of socially significant diseases in The Republic of Kazakhstan.

Prevention of citizens for the early detection of CVD diseases is carried out on the basis of the Order of Acting Minister of Health of the Republic of Kazakhstan dated November 10, 2009 No. 685 "On the establishment of target groups of persons subject to preventive medical examinations, as well as the rules and frequency of these examinations." According to the order of a man and a woman aged 30-70 years, they undergo a preventive medical examination for the early detection of arterial hypertension, coronary heart disease, diabetes, glaucoma, oncopathology, which consists of two stages:
1) The first stage is carried out by the paramedical staff of the organization of primary health care (PHC) or the person in charge of the organization of primary health care, is intended for the entire target group (anthropometric measurements, two-fold measurement of

blood pressure with an interval of 1-2 minutes in a sitting position, express -diagnosis of total cholesterol and glucose);
2) At the second stage, the primary care physician or primary care provider uses the SCORE scale to determine cardiovascular risk and decide on further management of the subject.

If the patient reveals diseases of the circulatory system (BSC), the general practitioner or local therapist puts the subject under dynamic observation, in the absence of BSC, he is sent to a health school to reduce cardiovascular risk [33].

The School of Health is a medical preventive technology based on a combination of individual and group exposure to patients and aimed at increasing their knowledge, awareness and practical skills in integrated disease prevention, rational treatment of a disease, increasing patient adherence to treatment for the prevention of disease complications , improving prognosis and improving quality of life. This school of health is a key form of work in medical structures, primarily primary health care. When these goals are achieved, schools ensure the quality of preventive care to the population, which contributes to the implementation of the preventive orientation of the health service and is a fundamental principle of its reform. The objectives of organizing schools are to increase the coverage, increase the availability and quality of preventive medical care, both for the healthy population and for patients with noncommunicable diseases.

The Government of the Republic of Kazakhstan also adopted Decree No. 982 of December 26, 2019 "On the approval of the State Program for the Development of Health of the Republic of Kazakhstan for 2020 - 2025". The program provides for reducing the risk of premature mortality from 30 to 70 years from cardiovascular, oncological, chronic respiratory diseases and diabetes from 19.67 to 15.43% by 2025. Also develop disease management programs for three diseases: arterial hypertension, chronic heart failure, and diabetes. The disease management program allows people to form a joint responsibility for their health and manage the disease in order to prevent complications and unjustified hospitalizations. More than one and a half million people were covered by dynamic monitoring, of which 462.5 thousand people (28.4%) were involved in the health care facilities [32]. The development of dynamic surveillance is due to the fact that government programs are unilaterally effective in combating CVD. A feature of dynamic observation is the management of the disease, which involves involving the patients themselves in the process of monitoring and improving their well-being, together with the doctor of the primary medical organization. In contrast to passive medical examination with low efficiency, self-management of patients will reduce the risks of complications and disability. It is expected that the emphasis on the prevention, timely diagnosis and treatment of these diseases will lead to a decrease in the mortality rate.

Also in Kazakhstan, within the framework of intersectoral interaction, based on the WHO recommendation "Health in

all policies", the project "Healthy cities, regions" will be implemented in the regions of the country; "Schools that promote health"; "Healthy universities."

In order to reduce the spread of NCDs, according to WHO recommendations, the following activities were introduced in Kazakhstan:

- To reduce alcohol consumption, excise taxes on beer were increased from 2011, and vodka in 2014. However, these increases in alcohol excise taxes were not systematic or stable. There are restrictions on the content and volume of advertising, sponsorship and promotion of alcoholic beverages (WHO Regional Office for Europe, 2018b). These restrictions apply to both direct and indirect marketing, but they are not effectively enforced. The sale of alcoholic beverages is limited in state institutions and prohibited in educational institutions, but compliance monitoring can be improved [15].

- Since 2009, there is a partial ban on smoking. Three of the eight categories of public places (restaurants, public transportation and all other enclosed public places) were not completely smoke-free by 2017 (WHO, 2017d). The ban on smoking is valid in all medical, educational (including universities) and government agencies, closed workplaces and cafes. Violations of the smoking ban entail a fine on both the smoker and the institution, but no funds are allocated to enforce the law (WHO Regional Office for Europe, 2017a); the fines reportedly are too low to effectively stop violations (≈20 US dollars for smokers and ≈300 US dollars for institutions). Smoking is prohibited in school premises and on school grounds. The use of hookah in public places is prohibited by law, but it is usually not respected. Since 2016 (in Kazakhstan - in the first among the countries of the former USSR) large graphic warnings about the dangers of smoking with all relevant characteristics have been accepted and placed on the packaging of tobacco products (WHO, 2017d). However, the size of the graphic warnings is still below the global best practice standard (80-85% of both sides of the package); standardized packaging has not yet been introduced. Health warnings are also provided for smokeless tobacco products. The tobacco industry promotes electronic cigarettes, which are not regulated in Kazakhstan [15]. To reduce cigarette consumption among young people in Kazakhstan, a bill is being developed that provides for the sale of cigarettes only to people over 21 years of age.

5. Conclusion

As research shows at the national as well as international level, research is being conducted to improve the prevention and treatment of cardiovascular disease. As the practice of developed countries shows, it is possible to achieve a reduction in the level of patients and deaths from CVD if states reduce the risk factors causing CVD. In this regard, Kazakhstan follows WHO guidelines for reducing the risk factors for CVD. You can also apply the experience of Ireland to reduce exposure to hazardous particles, which also includes a ban on the use of coal.

According to the Ministry of Health of Kazakhstan, financing of the health care system is lower than in developed countries in Europe, which is manifested in the shortage of medical facilities for CVD. In addition, compliance with regulatory legal acts at the state level is not carried out or functions very poorly, since funding is not provided.

In addition, many citizens do not understand the whole danger of their diseases, because they do not understand the meaning of special terms that characterize CVD. The main problems on the part of citizens are not compliance with preventive measures, this is not sufficient consumption of vegetables and fruits, as well as alcohol abuse. Also, the untimely passage of medical examinations and the lack of an active lifestyle.

The recommendations of the WHO, as well as other regional organizations, generally recommend that all citizens follow a diet, lead an active lifestyle, play sports and follow the doctor's prescription. The fight against cardiovascular diseases is very hard work, and unfortunately, it is almost impossible to exclude the disease, but coordinated, multicomponent measures can turn the tide. Everyone can help reduce the adverse effects of SPZ. The main thing is that patients with CVD, a medical institution, a state, a health school, and pharmaceutical companies must work together, only then can a reduction in the number of CVD patients be avoided and complications of this disease can be avoided. This article was prepared according to the grant project AR05133611 "Political, legal and medico-social aspects of public health: modern approaches to the prevention of socially significant diseases".

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Author Profile

ZH.T. Sayrambayeva- Professor, Head of the Department of International Law of al-Farabi Kazakh National University, Almaty, Kazakhstan.

A.B. Otarbayeva- Master of Law, Senior Lecturer of Department of International Law of al-Farabi Kazakh National University. Almaty, Kazakhstan.