Кыргызской Республики «О судебной практике по уголовным делам о преступлениях против здоровья», которые более полно разъяснят сущность медицинских критериев при квалификации преступлений против здоровья.

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Reform of the Public Health Sector of the Kyrgyz Republic: Case Profile of the Preventive Maintenance of Diabetes 2

The Kyrgyz Republic has faced many challenges after gaining independence in 1991. The labor recourses – its human capital – have changed. The current situation is regulated greatly by internal and external factors such as demographic situation, social and economical development, technical base of production, and the demands of internal and international labor markets. The market economy and processes of globalization mandate a careful study of

human potential, since it is the main prerequisite for the sustainable development of a country and its competitiveness during a transition period.

The main feature that reforming the public health sector has in connection with the strengthening of the relations of production is that the strengthening of productive forces contributed to specialization and collaboration in division of labor. Thus, the reform of the public sector of the national economy, including the public health sphere, in a more efficient way leads to steady economic growth.

Since human resources are increasingly seen as valuable assets at any company, the place and role of the individual in the country's development is of even a greater importance. Stable human development fosters efficient labor resources that are necessary for the Kyrgyz Republic. The country has few natural, financial, or other types of material resources, which necessitates the development of human capital. Qualified and skilled human resources with a strong educational background are always in demand on the global labor market. The potential of the Kyrgyz Republic in this sphere can be characterized as great and valuable. It is necessary to establish a certain framework for the formation of human capital in the Kyrgyz Republic.

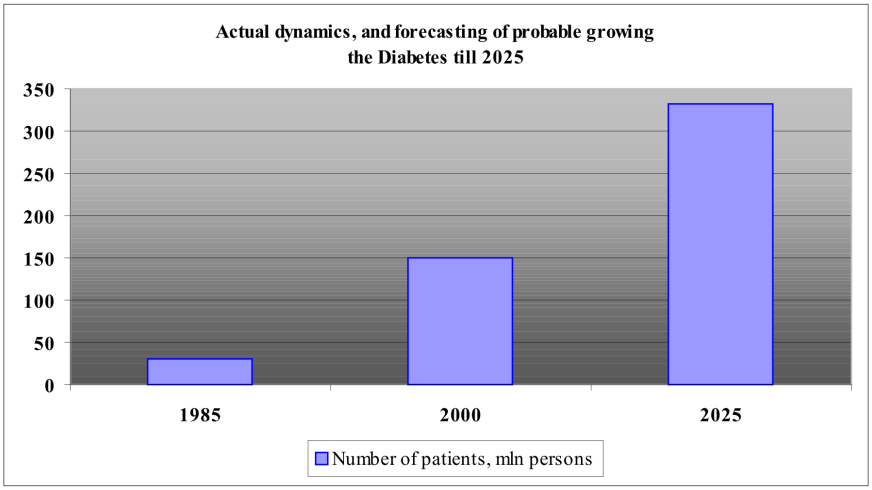
Within the framework of the Human Development Policy of the Kyrgyz Republic, a central role has been given to human recourses as the main means for labor productivity. It is very important to create social and economic conditions that will provide for the development and application of the abilities of each individual.1 Human development policies should be aimed at the improvement of quality of life, not just at the increase of productivity. The sustainable development of human capital is of a vital importance for the country's development, and can be achieved though the effective management of improvements in the country's economic, educational, and health care systems. Based on these needs, priorities in the public health sector should be articulated with a focus on the medical and ecological development, which directly impact the labor force. How many employees will lose their capability to work due to poor health conditions or dangerous ecological situations? A careful analysis is required. Thus, for the purpose of prospective country development, a shortlist should be composed outlining existing diseases that present serious potential threats, with the purpose of predicting any probable demographic crisis which might decrease the human capital of the country. In our opinion, the first priority in such a shortlist should be given to Diabetes Mellitus type 2.

Due to the absence of any screening and/or monitoring system in the public health system, which instead relies on the method of recording the number of patients in accordance with their formal requests only, the exact number of patients suffering from Diabetes Mellitus type 2 is unknown. However, it is estimated at 30 thousand people currently, including 1.8 thousand children.

In the last several decades, Diabetes Mellitus (DM) has achieved the scale of a global non-infectious epidemic; the quantity of its victims doubles every 10-15 years. According to the data of World Health Organization, there were 80 million cases of DM in 1990, and 160 million in 2000. The official records of the International Diabetic Federation estimate the total number of persons with DM at 194 million currently. According to such forecasts, numbers are expected to reach up to 330 million persons by 2025 due to a number of reasons such as the growth and aging of the population, as well as the general maintenance of an inactive lifestyle. These figures, the outcome of research conducted for the purpose of predicting the condition of the potential labor force, are presented in Figure 1 below.

The basic argument here regards the probable condition of the labor force in the 21st century. Scientific research on DM type 2 is especially important because DM type 2 comprises 85-95% of all cases of diabetes. Moreover, this concrete considering kind of disease has been officially defined as a real threat for labors potential..

Figure 1



Source: Standards of American Medical Care in Diabetes–2008. Diabetes Care 31: pp. 3-4, 2008.

Considering the fact that DM type 2 is prevalent mostly among adults, we can considered the disease to be a significant threat for the effective development of the labor force, namely, the potential of the able-bodied part of country population. More than 50% of people with diabetes are still not informed about their condition.2 In some countries, the percent of patients who lack information about their conditions reaches up to 80%.3 This fact underpins the importance of preventive methods, such as evaluating the condition of the able-bodied population of a given country.

Diabetes is a common cause of death in developed countries, and occupied the 4th position in a short list of terminal illnesses across the world. According to the data of the World Health Organization, the actual quantity of deaths caused by diabetes reaches 3.2 million annually. Stated differently, approximately six people suffering from diabetes die every minute. These simple calculations reveal the scope of the threat presented by diabetes for the population as a whole and for the probable economic development of a given country.

Diabetes is a disease of metabolic infringements, namely, infringements on the carbohydrate exchange due to a patients' deficiency of insulin - the hormone produced by the pancreas which regulates the basic parameter of a certain exchange in the production of glucose. The majority of cases of this illness are predetermined genetically, which mandates that the probability and scope of the threat presented by diabetes must be considered on a national level with regard to the development of a given country. The condition of insulin resistance – when the cells of various tissues and organs of a patient become tolerant to its own insulin – is transmitted to future patients through inheritance, and, thus, a relative deficiency of insulin develops, leading to

various symptoms of illness. This disease is detrimental to a number of organ systems, indicated in Figure 2 below. First of all, there are vascular and neurological complications – so-called micro-and macroangipathy. The condition known as Atherosclerosis also results, in which in arteries on walls of fat are constricted, causing a narrowing of the gleam of vessels and a decrease in the appetite of a patient. Diabetics also develop prematurely, much earlier, than the common population of people.

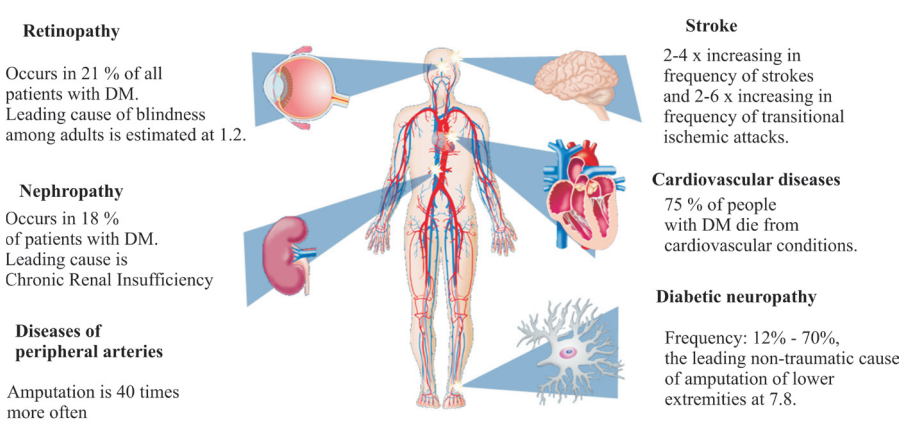
About 65-75% of people suffering by DM type 2 die of cardiovascular disorders, such as heart attacks of the myocardium and sharp constrictions of blood circulation to the brain. Thus, taking into consideration the symptoms of DM, an analysis of common health problems reported among the adult part of the population shows a high frequency of late complications of diabetes. Basically, such health problems commonly indicate the presence of infringements on carbohydrate exchange over the last 5-7 years at least.

Diabetes has been identified as the most widespread cause of death by angina pectoris, as well as by heart attack of the myocardium. Furthermore, this disease is a principal cause of the development of blindness and renal insufficiency among the populations of developed countries, despite the effective use of preventive methods of diagnosis, backed by strong assistance and financing from governments.

For example, about 21% of DM patients exhibit damage to the vessels of the retina – the leading cause of blindness among adults 20-74 years of age [4].

Figure 2

DM type 2 correlates with serious complications



Failure of the kidneys occurs in 18% of cases, and the leading cause of chronic renal insufficiency is the same diabetes. Moreover, across the world, 80% of patients with renal insufficiency who rely on artificial kidneys are diagnosed with DM type 2. [5].

People with diabetes require the amputation of their lower extremities at a rate15-40 times more frequent than those not suffering from diabetes. [6, 7]. Approximately 75% of patients with diabetes type 2 die of cardiovascular complications.[8] It is known that diabetics receive care

at the expense of the government, and the growth in the number of patients with diabetes, as well as in the proportion of treatment of patients with complications, demands increases in the financing of this contingent of patients. Governmental financing has therefore become a leading problem, especially for countries with transitioning economies because of their highly limited budgets for reform of the public health sector. As for effectively organizing preventive medical services within public health institutions, only the technical assistance of international organizations can be considered a key source of financing. Regarding the conditions in the Kyrgyz Republic, currently, the government finances the treatment of children suffering from diabetes type 1, subsidizing diagnostic sets (i.e., performing tests to determine blood sugar level), as well as medical treatment and materials such insulin, and syringes. Adults have the opportunity to be regularly treated only at the stage in which complications develop and it becomes necessary for treatment with insulin, which is then provided free of charge by the republican Endocrinology clinic. Other patients can expect to receive only one preparation of Manninil free of charge.

These circumstances highlight the importance of early diagnostics of DM type 2, and the possibility of studying its clinical picture at an early stage, when carrying out intensive measures of secondary preventive treatment is possible, which in turn make it possible to increase the duration and quality of the lives of patients. Preasently, international experience in early detection includes many effective methods of ***screening*** that actively reveal new cases of disease. This preventive method has been actively used in public clinics, and produces results by revealing the presence of DM 2 among patients who do not yet demonstrate symptoms. Under screening, the probable threat for a nation's population become more manageable, and labor capital can be protected on a national level.

It is known that the risk of developing DM type 2 increases with the age, increase in body weight, and insufficient physical activity. DM type 2 most often develops in people with a family history of diabetes, in certain racial/ethnic groups, in women with policystosis of the ovaries, and also in persons with arterial hypertension, dislipidemy, or reduced tolerance to glucose. Based of the outcomes of medical research, the American Diabetic Association has outlined factors that contribute to the risk of developing DM 2, and has defined groups of persons that, although displaying no symptoms, require screening tests as a high priority.

High risk factors for DM type 2

- Extensive family history of Diabetes Mellitus
- Excess body mass (BM ≥ 25 kg/m^2)
- Inactive way of life or hypodynamy
- Arterial hypertension (BP ≥ 140/90 mm. Hg)
- High density of cholesterol: lipoproteins of 5 mg/dl (1.1-1.3 mmol/l) and/or triglycerides ≥ 250 mg/dl (2.82 mmol/l)
- Birth weight of more than 4.5 kg
- Policystosis of the ovaries

High risk population categories for DM type 2

- Certain ethnic/racial groups with high case rates of DM (Indians of the Pyma tribe, Native Americans, African Americans, Spanish-Americans, Asians-Americans, and the Landers of the Pacific Ocean)

- People who have a normal tolerance to glucose at the time of testing, but in whom hyperglycemia or a low tolerance to glucose were previously noted (e.g. women who had DM during pregnancy, but in whom tolerance to a glucose normalized after childbirth, indicating that their diabetes went into remission)
- Patients who suffered from DM while obese, but whose tolerance to glucose normalized after lowering their body mass

Criteria for testing for Diabetes among asymptomatic adults

- Individuals above the age of 45, should be tested for diabetes (given a normal blood sugar level, tests should be repeated every three years)
- Young people who have risk factors for DM type 2 or other clinical conditions that are associated with insulin resistance (i.e. lethargy, obesity, and arterial hypertension) should be subjected to more frequent testing

Currently, obesity, arterial hypertension, and an inactive lifestyle are the typical clinical conditions known to be connected with the development of insulin resistance. Considering the fact that the Kyrgyz Republic has occupied, unfortunately, the first place in the world in terms of death rate from strokes (i.e., hemorrhages in the brain), and also, that every fourth citizen of our country has high blood pressure, although they are unaware of it, we can conclude that arterial hypertension thrives in the bodies of the population. Features of a meal of the Kyrgyz population like the food rich with cholesterol (bad fats) and propensities to an inactive way of life on a background of the raised weight increase expected results of infringements of a metabolic exchange and insulin resistance. Despite all of the above-mentioned points, a national program for early detection and preventive treatment of the cardiovascular complications associated with diabetes type 2 has still not been introduced in the Kyrgyz Republic. Productive methods for preventive treatment of the complications resulting from DM are being used effectively in other countries; the efficiency of such programs has been confirmed by randomized, polycentric clinical researches.

Basic approaches in the organization of preventive treatment of such complications include the normalization of sugar in blood, normalization of blood pressure (arterial hypertension), dislipidemy – the reduction of triglycerides and increase in protective high density "good" fats), and improvement of the rheological properties of the blood. The purpose of such treatments is the prolongation of the health of organs.

Currently, in an effort to combat the disease, the local government provides free of charge tests of blood sugar level in the morning on an empty stomach. For patients with DM type 2, however, it is more expedient to test the level of blood sugar two hours after a meal to isolate the so-called glycolized hemoglobin (HbA1C). This parameter testifies to the true advancement of diabetes, as it shows the maintenance of sugar in erythrocytes, red blood bodies, and should be defined once every three months. These analyses should be provided for the sake of control over the condition of patients, i.e. in order to prevent the development and progress of complications. Such testing should be supplemented by annual surveys by experts: optometrists, neuropathologists, and vascular surgeons, as well as analysis of urine with regard to microalbuminuria – an early marker of the development cardiovascular and renal complications. The parameter of glycolized hemoglobin should be less than 6.5% of the

maximum that can be reached, maintaining a level of glycemy of 5.5 mmol/l on an empty stomach, up to 7.5 mmol/l after a meal.

A very important focus of preventive care against complications of DM is the control of arterial pressure. The presence of DM automatically includes patients in the group of those people at high-risk of cardiovascular complications, even with only a slight increase blood pressure. The presence of DM in a person is comparable to the presence of three other risk factors, including dislipidemy, smoking, and adiposity. Adequate antihypertensive therapy reduces the death rate, lowers the risk of the development of cardiovascular diseases, and prevents the progressive defeats of the kidneys at different stages of the development of nephropathy.

Antihypertension therapy should be provided more aggressively among patients with even minor hypertension (140/90 - 159/99 1mm hg), as it is necessary for achieving target blood pressure values and maintaining the effectiveness of the kidneys. In such situations, blood pressure should not exceed the level of 130/80 mm hg. Medical researches has shown that in cases of microalbuminuria, even patients demonstrating a normal level of blood pressure require regular medication to control their blood pressure for the purpose of protecting the vessels of the heart and kidneys. This goal can be achieved through the following means: ACE inhibitors and drugs that block the receptors of angiotensin II, selective beta-inhibitors, inhibitors that block calcium channels, and small dozes of thiasid diuretics.

It is often recommended that patients with diabetes utilize a combination of several antihypertension medicines. About 30% of patients with diabetes require the prescription of three or more antihypertension medications simultaneously, which also demands material inputs. Therefore, if a patient with diabetes has elevated blood pressure and is treated only through the prescription of glucose reducing medicines, but not other methods, the patient can not be considered to have receive full preventive care for the risks of developing cardiovascular complications. Thus, if in 1997 only 18% of all diabetes patients received three antihypertension medications in combination, in 2002 combinations of three or more medications were received by 36% of the total number of patients. Most likely, this number will increase in the future.

It is crucial to strive toward target parameters of lipid exchange: The level of low density cholesterol should be less 2.6 mmol/l; 1.8 mmol/l for patients with the a history of cardiovascular disease. The level of triglycerides should be less than 1.7 mmol/l, and high density cholesterol lipoproteins –should be more than 1.1 mmol/l for men, and above 1.3 mmol/l for women. The level of common cholesterol in patients with the DM should not surpass 4.5 mmol/l, where as in our practice the level at 5.5-6 mmol/l is hardly ever reached. Both the presence of "bad fats" (i.e. low density lipids and triglycerides), as well as a shortage of "good fats" (i.e. high density lipids) promote sclerosis of renal tissue, cardiac muscle, and other tissues to the same degree.

Numerous studies have convincingly proved the possibility to significantly reduce the risk of diabetic complications by normalizing the level of blood sugar. Glycemy at the DM type 2 are applied to the control medications of several groups. The Manninil is not the first choice of medication currently, which is still included into the list of the vital medications for the diabetics. Another medicine from other group of glucose decreasing means is the Methmorfinum (it is obligatory in a combination with change of a way of life diet and physical activity), especially, at persons with adiposity. Patients are forced to buy and as it is necessary to accept are long, patients because of dearness constantly break treatment.

The DM type 2 is a disease that continually progresses, gradually decreasing the synthesis of insulin. Even with vigilant testing, only 50% of the β-cells of the pancreas may be functioned in a patient at the time of diagnosis of DM type 2. If treatment by one medicine does not achieve target values of glycemy, and the level of glycolized hemoglobin exceeds 6.5%, it is necessary to administer Manninil or medication from other groups (in particular, glitazons), or insulin. In the latter case, certainly, it is a already question of a preventing complications.

Research of Steno-2 (Gaede et al., 2003), has shown that complex multipronged therapy of DM leads to a reduction in cases of cardiovascular diseases by 53%, and reduces the quantity of new cases of retinopathy by 58%, nephropathy by 61%, and neuropathy by 63%. Thus, it is possible to prevent more than in half of the major complications of DM effectively , as well as to lower considerably the expressiveness of treatment in the event of their occurrence. Such an approach would certainly lead not only to a decrease in the temporary disability of patients with diabetes type 2, but also prevent cases invalidity, in which patients should demonstrate a series of physical disabilities with all of the following circumstances.

Currently, the public health care of patients with diabetes (especially type 2) in the Kyrgyz Republic has been reduced to prophylactic medical examination even in the case of patients with advanced, insulin-requiring diseases – when the ingestions of sugar decreasing tablets becomes inefficient. The state provides insulin for patients free of charge. Certainly, the support of those ailing from diabetes by this method, as well as through the supply of syringes for insulin injections, has changed the destiny of many otherwise doomed to an early death, and provided the majority of them with a relatively high quality of life. It is difficult to name any other treatment, which would save lives of millions people with this illness. Today, lifelong daily injection of insulin is still remains the one and only method of a survival for many patients with Diabetes Mellitus type 2.

However, during the last few decades, the strides for the perfection of the diagnosis and treatment of diabetes have been directed toward the improvement of patents' "quality of life," particularly through the implementation of one basic goal of treatment: namely, to reach a stable inhibition of the illness, which has provided a relatively high quality of life for such patients.

The results of contemporary research have convincingly shown a direct relationship between the impact of treatment (i.e., the quality of life of a patient), and the degree to which it successfully inhibits the progressive damage to the blood vessels caused by diabetes, i.e. the cardiovascular complications that often define the destiny of the patient.

In conclusion, examining the contemporary problems of reforming the public health sector of the Kyrgyz Republic, it is necessary to concentrate on the resolution of several main problems, articulated as follows:

(1) Development of a new economic and financial policy for the Kyrgyz Republic in the field of public health services;
(2) Reform of the public health sector in the economic system of the public sector of the Kyrgyz Republic;
(3) Support for entrepreneurship in the health sector of the Kyrgyz Republic, and promote the mutual relations of state and private medical institutions;
(4) Reform of the system of financing services within the public health sector of the Kyrgyz Republic.

The development of new economic and financial policies for the state in the field of public health services should be directed toward the planning and introduction of a number

of national projects for long-term strategic development. Priority should be given to the following national projects:

- "Preventive care and accessibility of health services"
- "Monitoring the contemporary condition of the health of the population of the Kyrgyz Republic, integrating medical and demographic policies and methods"
- "Legislative and normative regulation of the health conditions of the population of the Kyrgyz Republic"
- "Legal regulation of the performance of public and private health care institutions".

The process of reforming the public health care sector in the economic system of the public sector of the Kyrgyz Republic should include the following basic components:

1) The strengthening of preventive services within the public health sector through the introduction of a system for monitoring and evaluating the health conditions of the population of the Kyrgyz Republic
2) The implementation of personnel policy in the public health services system, aimed at the preparation of medical staff for the resolution of health problem among the citzens of the Kyrgyz Republic
3) The re-structuring of the system of public health services and medical research via the introducing of up to date managerial techniques
4) The overcoming of the threat of demographic crisis in the Kyrgyz Republic, with regard to the progressive growth of cardiovascular complications resulting from diabetes type 2 – the most typical disease for the country's population

Thereupon, it would be important to direct the efforts of doctors of all levels toward carrying out such national program on diabetes prevention with the purpose of avoiding cardiovascular complications. Such efforts would namely involve:

- The development of a national program for the struggle against factors contributing to diabetes to prevent probable cardiovascular complications
- The coordination of groups of family doctors to conduct systematic screening focused on the early detection of cases of Diabetes Mellitus type 2, as well as on the identification of groups of people demonstrating risk factors for the development of diabetes (i.e., so-called Metabolic syndrome)
- The provision of training for patients with Diabetes Mellitus type 2 twice a year within the first year of diagnosisd
- The replacement of Manninil by Methmorfinum in the list of the preferred medications,
- The monthly conduction of controlled tests of blood sugar among Diabetics, to be carried out first on an empty stomach and then again two hours later after food intake
- The semiannual conduction of research based on the analysis of urine for Microalbuminuria
- The provision of at least one treatment with medication from the group of ACE inhibitors for patients with diabetes type 2.

Evaluation of the advantages of the development of entrepreneurship in the public health sector and the prospect of mutual relations between the state and private medical institutions can be accomplished through the following steps:

1) Provision of care for the population of the Kyrgyz Republic with hi-tech medical aid and monitoring, concerning , first of all, the economically active population of the Kyrgyz Republic

2) Improvement of the material and technical bases of public health services through the objective distribution of the available financial resources intended for the technical maintenance of medical institutions
3) Creation of hi-tech centers for administering medical aid on the territory of the Kyrgyz Republic, partially through contributions of private investors
4) Regulation of public health services through the implementation of national programs of screening for diseases that presenting paramount threats for the population of the Kyrgyz Republic, including one dedicated program of screening for the conditions of cardiovascular complications associated with diabetes type 2.

Conceptually, the current mechanisms for financing the public health services of the Kyrgyz Republic can be characterized as a system of budgetary-insurance financing. However, the state budget of the Kyrgyz Republic cannot realistically provide the necessary financing for the care of all those ailing with diabetes. Despite the progressive development of entrepreneurship in the sphere of administering medical services to the population, the overwhelming majority a sample of patients with diabetes type 2 are not able to get regular health care because of the extremely low level of their incomes. On the other hand, private medical institutions are absolutely thwarting the possibility of diversifying the medical service industry in the prescribed direction because of its non-profitability. Hence, it is crucial that interaction between the public and private health sectors strengthen in the direction of the optimal balance between the state budgeting and private investments under the guarantee of the government.

In the conclusion, it would be desirable if the system of the public health service combined both traditions and innovations in the 21st century , whose integration might truly provide national economic security through a key principle: "healthy way of life → preventive care for diseases → healthy nation → secure future!"

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