Rapid Assessment of Access to Insulin and Care of Diabetes Patients in Kyrgyzstan

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Acronyms

GDP	Gross Domestic Product
WHO	World Health Organization
FGP	Family Group Practice
CED	City Endocrinology Dispensary
CVDs	Cardiovascular diseases
MoH	Ministry of Health
NSC	National Statistical Centre
NCMCH	National Centre for Mother and Child Health
MHIF	Mandatory Health Insurance Fund under the Government office
NCDs	Non-communicable diseases
PHC	Primary healthcare
SGBP	State Guaranteed Benefits Program
RAPIA	Rapid Assessment Protocol of Insulin Access
VHC	Village Health Committee
GPC	General Practice Centre
FMC	Family Medicine Centre
CEH	Centre for Electronic Health

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- Oblast FMC in Karakol.
- Oblast Merged Hospital in Karakol.
- Jeti-Oguz rayon FMC.
- Territorial Hospital in Jeti-Oguz Rayon.
- FMC of Issyk-Kul rayon.
- Territorial Hospital of Issyk-Kul rayon.
- FMC # 1, Bishkek.
- FMC # 7, Bishkek.
- FMC of Osh city.
- Osh Interregional Clinical Hospital.
- Osh Interregional Children's Hospital.
- FMC of Aravan rayon.
- Territorial Hospital of Aravan rayon.
- FMC of Kara-Suu rayon.
- Territorial hospital of Kara-Suu rayon.

1. Background and rationale

Similar to many other countries, Kyrgyzstan is facing the growing burden of non-communicable diseases (NCDs). The cardiovascular diseases (CVD), cancers, respiratory diseases and diabetes represent the leading causes of disability, morbidity and premature mortality in Kyrgyzstan, whereby cardiovascular diseases are the leading cause of death (51% of the total number of deaths, 2016).

Due to this high burden in Kyrgyzstan, NCDs, including diabetes, are considered a priority within the framework of the national health reform programs since 2006. The priority nature of health and the Government's commitment in recent years have enabled a slight improvement in the mortality rates due to CVD; however, there is still a significant gap between Kyrgyzstan and other countries in the European Region with a 10-fold difference in mortality and the reduction of this gap represents a significant challenge. Diabetes is one of the many risk factors for CVDs.

Despite all the challenges in the health system of the Kyrgyz Republic, people with diabetes receive special attention, with ensured free provision of all aspects of care, including insulin, certain oral medications, consultations and laboratory diagnostics.

In 2009, for the first time in Kyrgyzstan, the rapid assessment of access of diabetic patients to insulin and care (RAPIA) was conducted. This assessment aimed to identify the barriers diabetic patients in Kyrgyzstan to access the medicines and care, with objective to achieve sustainable changes and impacts on the health system and the diabetic patients.

The assessment was carried out by the Health Policy Analysis Center, in cooperation with the Ministry of Health, with technical and financial assistance of the International Insulin Foundation and the International Diabetes Federation, with application of the specific methodology.

The assessment pointed that the health system of the Kyrgyz Republic paid special attention to diabetic patients, in terms of access to healthcare, such as free provision of all aspects of care, including insulin, oral medications, counseling and laboratory tests. However, it was noted that serious measures were required to improve the management of diabetes, appropriately train the family doctors and nurses to practical skills, as well as provision of resources. In addition, a number of challenges were identified that called for improving the public awareness of the risks associated to diabetes and for addressing the awareness of diabetic patients to improve the treatment adherence. That assessment found the human resources management as one of the main barriers to diabetes management, in terms of training and limited roles of nurses in managing the diabetes cases.

In September 2017, the HAI project initiated the follow-up assessment using the RAPIA tool, to assess the changes that have occurred in the provision of diabetes services, procurement mechanisms and the distribution of insulin.

In addition, this assessment is relevant because Kyrgyzstan's health system is in need to develop a model to manage chronic diseases and related trends that are creating excessive loads to both the health system and the population.

This assessment, like the previous one, is focused on analyzing the 11 elements essential to create a 'positive diabetic environment'.

1. Organization of the health system
2. Data collection
3. Prevention
4. Diagnostic tools and infrastructure
5. Procurement and supply of medicines
6. Access to and affordability of medicines and medical care
7. Health professionals
8. Commitment of patients

9. Patient education and empowerment
10. Participation of the communities and diabetes associations
11. Positive legislative (political) environment

This assessment was also carried out by the Health Policy Analysis Center, in cooperation with the Ministry of Health, with the technical and financial assistance of HAI.

The assessment used the Rapid Assessment Protocol for insulin Access (RAPIA) tool, with data collected using the RAPIA questionnaires that were adapted to the specifics of the service provision in Kyrgyzstan.

2. Key findings

Health organizations

- Family doctors are not involved in the management of diabetes.
- Management of diabetes patients is entrusted to endocrinologists, whose availability in the regions is limited.
- Primary healthcare is not patient-centered.
- The hospitalization rate of children and teenagers with diabetes remains high and reaches 150%.
- At the same time, their out-of-pocket travel and living expenditures remain high since all of them are hospitalized at the central level (Bishkek and Osh)
- Patient flow remains complex, with patients having to seek care at different levels of the health system.
- The provision of outpatient services for diabetes in Bishkek is in the process of optimization.
- Schools of diabetes exist only at the central level, they do not work at PHC level.
- Preventive measures at the population level are suboptimal, and patient education is insufficient.

The Register of Diabetes Patients

- The Register of diabetes patients has been implemented in all regions of the country.
- The data in the register are not used for purposes of calculating the requirements of insulin and other medicines.
- The system of centralization and data collection under the Register remain complicated, the persons responsible for keeping the Register are not trained.
- The existing procedures do not assure the quality of data, with existing discrepancies in the indicators.
- The diabetes management has limited continuity.

Prevention

- The national health reform programs pay special attention to prevention of CVDs.
- Diabetes has become the focus of various preventive activities and programs.
- The country has committed to the Sustainable Development Goals (SDGs) that cover a wide range of issues of better nutrition, including the reduced overweight and obesity, more physical activity.
- By conducting the epidemiological survey of the prevalence of NCD risk factors (WHO STEPS), Kyrgyzstan has identified the baseline values of risk factors in the country.
- The health education for population is inadequate due to lack of sustainable financing arrangements.

- A number of campaigns were taken to prevent hypertension and diabetes.
- FMCs have the Health Promotion Units (HPUs); however, the functions of regular preventive measures for diabetes are not integrated.
- The early detection and prevention of diabetes are still hurdled due to lack of knowledge in family doctors.

Diagnostic tools and infrastructure

- The basic diagnostic tests are provided free of charge at PHC.
- There is poor availability of the laboratory equipment for testing glycated hemoglobin (HbA1c).
- The health organizations do not regularly purchase the consumables (test strips).
- Patients in the regions are not well equipped with glucometers and test strips.
- There is limited availability of diagnostic tools essential to manage complications associated with diabetes.
- The benefits program for provision of test strips for blood sugar is not enabling financial protection, and its coverage in the regions is poor.

Clinical guidelines and protocols

- Clinical guidelines and protocols for diagnostic and treatment of type 2 diabetes and its complications have been developed.
- However, these clinical guidelines and protocols are poorly implemented in practice, the family doctors are not trained and are not involved in diabetes management, including type 2 diabetes.
- There is lack of standards and indicators for monitoring and evaluating the diagnosis and treatment of diabetes against clinical guidelines and protocols.
- The clinical guidelines and protocols for management of type 1 diabetes and its complications are missing.

Purchase of insulins, distribution and storage

- The approved EDL complies with WHO criteria in terms of selecting hypoglycemic drugs, including insulin.
- The cost of human insulin is reduced by 1.5 as compared to 2009.
- The cost of analog insulin remains high.
- Purchases do not take into account the real needs for glucose-lowering drugs.
- The Law of Public Procurement was revised in relation to medicines, whereby the quality is added as a criterion for procurement on top of the lowest bid price.
- There are challenges with transportation of insulin to oblast and rayon healthcare providers.
- At the FMCs, the storage conditions of insulins are not always appropriate due to the large amount of stocks.

Access to medicines and access to treatment

- The country's pharmacy network is focused on the availability of first-line drugs for treatment of diabetes, metformin, in all regions.
- Metformin is purchased by the Ministry of Health budget in limited amounts.
- Average prices for antidiabetic drugs increased by 2 times as compared to 2009.
- Generic names of metformin are considered unaffordable with available minimum subsistence and an average wage.
- In the regions, not all medicines recommended by the clinical guidelines and protocols in the Kyrgyz Republic are available.
- The existing drug benefit programs do not ensure financial protection for diabetic patients (Metformin is not included, test-strips are inaccessible in regions).
- Clinicians are not committed to prescribe cheaper generics.
- Quality of generic medicines is not assured.

Healthcare professionals

- Family doctors are not managing diabetes at PHC settings, due to lack of training.
- Complications associated with diabetes are managed by other specialists.
- There are examples when nurses are involved in counseling and patient education.
- Doctors are not equipped with appropriate tools for diagnosis and management of diabetes and its complications.
- The use of standards is not monitored, and the quality of diabetes care is not assessed, which should be part of the quality improvement process.
- The training programs for family doctors have been integrated at the continuous medical education, with emphasis on counseling and training on healthy lifestyles.
- Nurses are involved in the training as part of implementation of the package of key interventions for NCDs (PEN) on diabetes.
- The implemented performance based financing contributed to better quality of health services.

Adherence to treatment

- There is poor adherence to treatment in patients with type 2 diabetes.
- Patients with type 2 diabetes are buying Metformin at their own expense.
- Adherence to treatment is not directly dependent on the financial burden of patients.

Participation of the public and diabetes associations

- Most of the activities of associations are concentrated in Bishkek.
- Diabetes issues are present on the policy agenda at the Ministry of Health.
- The activities of the associations are limited due to the lack of sustainable funding.

Legislation and regulations

- There is good political and legislative framework for prevention and control of NCDs.
- The government is not sufficiently involved in the intersectoral coordination.
- The SGBP guarantees free medical services for diabetic patients, including the provision of insulin. However, centralized procurements of Metformin and patients are not regularly provided with Metformin.
- Diabetes is prioritized in the agenda through adopting a separate program for diabetes.
- The Law of Diabetes needs revision.

3. Methodology of the assessment

3.1. Rapid Assessment Protocol for Insulin Access (RAPIA)

The specific methodology was used to conduct the assessment, which enables a quick assessment of the quality of care for people with diabetes and of insulin availability (RAPIA) in low- and middle-income countries.

The main objective of this method is to collect data, analyze and present data for assessment and inform on the status of health system in treatment of diabetes in the country.

The RAPIA methodology offers tools to collect information on the structure and functioning of services to provide insulin, and to assess the quality of services for diabetics.

This methodology offers a multi-level evaluation of the health system, identifies the existing barriers and challenges that build the basis for formulation of recommendations to address the challenges.

The proposed tools are designed to provide information on the following areas:

- The structure and functioning of health services in terms of procurement of medicines and diabetes management.
- Developed and approved policies in the field of diabetes.
- Practices of diabetes management - information obtained during observations and from reports.
- Availability of insulin, syringes and monitoring equipment.
- Distribution and transportation of insulin.
- Knowledge of people suffering from diabetes and their doctors about the supply of insulin and their attitude to the existing supply chain.
- Other challenges that prevent access to essential insulin and medical care.

The RAPIA method is not about assessment of statistics of the health system, but aims to conduct a rapid assessment of the situation with regard to the treatment of diabetes in an individual country. The purpose of the assessment is to obtain the global picture of the health system, in order to formulate practical recommendations for various stakeholders of medical care for people with diabetes.

3.2. Data collection

1. The data were collected using the RAPIA questionnaires that were adapted to the specifics of the service provision in Kyrgyzstan. The structured interviews based on questionnaires were conducted with medical personnel of health organizations and diabetic patients.

In addition, interviews were conducted with key informants to determine the effectiveness of interventions in the field of diabetes. When interviewing the key informants, the main attention was paid to the changes that have occurred since 2010, when the first assessment using the RAPIA methodology was carried out, as well as to the identification of areas requiring further efforts in the service provision for diabetes.

2. The statistical data sourced the Centre for Electronic Health (CEH) and the Register of Diabetes Patients.

3. The secondary sources of information used for analysis confined to the data from various studies and reports on NCDs, diabetes, legislative and regulatory documents governing the provision of health services in Kyrgyzstan, including services for diabetes.

3.3. Selection of regions

The study was conducted in three regions of the country: Bishkek - the capital of Kyrgyzstan, and two regions in the south and north of the country: Osh and Issyk-Kul oblasts.

In each region, the assessment was carried out at the oblast level and two rayons.

To study the prices of antidiabetic medicines and devices for blood glucose testing, two pharmacies located close to healthcare organizations (Territorial hospitals, FMCs, GPCs) were selected, where patients normally purchase the prescribed medications. In addition, the selected pharmacies were those having contracts with MHIF territorial departments for dispensing of medicines under the Additional Package of MHI. A total number of interviews is presented in Table 1.

Table 1. Surveyed health organizations by regions

Healthcare provider	**Number of conducted interviews**				
	Management	**Clinicians**	**Nurses/lab technicians**	**Pharmacies**	**Patients**
Bishkek city Endocrinology Centre Family Medicine Centre №1 Family Medicine Centre №7 City Clinical Hospital №1 NCMCH National Hospital	6	28	21	12	66

Osh oblast Osh Interregional Merged Clinical Hospital Osh Interregional Paediatric Clinical Hospital FMC №1 Territorial hospital of Kara-Suu rayon FMC of Kara-Suu rayon Territorial hospital of Aravan rayon FMC of Aravan rayon	4	47	22	8	24
Issyk-Kul oblast Merged Hospital Oblast FMC FMC of Issyk-Kul oblast Territorial hospital of Issyk-Kul rayon FMC Issyk-Kul rayon GPC of Jeti-Oguz rayon	7	38	34	7	33
TOTAL:	**17**	**85**	**77**	**27**	**123**

4. Organizations and partners involved in the assessment

4.1. Health Policy Analysis Centre (HPAC)

The HPAC was established to support the monitoring and evaluation in health reform in Kyrgyzstan, initiated by the Ministry of Health, with support from WHO and the UK Department for International Development (DFID).

In July 2009, the HPAC was reorganized into the Public Foundation. The main activities of HPAC are as follows:

• Analysis and monitoring of health policy through the provision of evidence;

• Policy recommendations and organization of dialogues;

• Conducting national and international trainings;

• Consulting services.

The HPAC actively participates in the organization of round table discussion and seminars on findings of research and relevant health policy issues, in order to exchange information, open discussion of issues to facilitate political dialogue at different levels.

The HPAC has already conducted app. 90 studies in the following areas (www.hpac.kg): poverty and equity, health financing, effectiveness of the health system functioning, provision of health services, human resources and public health.

4.2. HAI and the ACCISS Project

The innovative global study, Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS), began in 2015 to identify the causes of poor availability and high insulin prices,

and develop policies and interventions to improve access to this essential medicine, particularly in low- and middle-income countries. Now in its second phase, the ACCISS study, working with county partners, will pilot the tools and interventions at a country level while continuing to work globally to address inequities and inefficiencies in the insulin market.

ACCISS is managed by Health Action International, and co-led with the University of Geneva and Boston University. Health Action International is a non-profit organization that conducts research and advocacy to advance policies that enable access to medicines and rational medicine use for all people around the world. They pursue advocacy from the patient level up to the highest levels of government through the 'official relations' status with the World Health Organization and respected relationship with the European Medicines Agency. To safeguard the objectivity and integrity, this organization is resolutely independent of the pharmaceutical industry and protects itself from all conflicts of interest.

5. Health system in Kyrgyzstan

Kyrgyzstan (officially 'the Kyrgyz Republic') is a landlocked and highly mountainous country in Central Asia. The country covers an area of 199,951 km², with almost 90% of its territory at an altitude of 1,500 m above sea level. Bishkek is the capital of Kyrgyzstan and the largest city.

As of 1 January, 2013, the population of Kyrgyzstan was 6, 256,000. Of these, 33.7% live in cities, and the rest reside in rural areas (66.3%). 33.3% of the population is at age under 15, and 7% of population is at age over 65 (National Statistical Committee - NSC, 2018). The average population density is 31.1 persons per km².

According to the NSC, in 2016 Kyrgyzstan's gross domestic product (GDP) was 458 billion Kyrgyz Som, which is 3.8% more than in the same period of 2015. For reference, according to the World Bank, Kyrgyzstan's GDP in 2015 was 6.57 billion USD, and the annual GDP growth was 3.5% (source: World Development Indicators: Gross Domestic Product 2015).

Since 1996, the health reforms have been implemented through the programs of 'Manas', 'Manas Taalimi'. In 2018, the implementation of the third health reform program 'Den Sooluk' is coming to its end. Currently, the work is underway to develop the new program for further development of health system until 2030.

Since the early 2000s, Kyrgyzstan has achieved a number of significant health outcomes, as well as several significant health system reforms, despite profound economic and political upheavals.

One of the most important components of the health sector reform in recent decades has been the change in the financing system, whereby significant results have been achieved, such as the introduction of the Single Payer system and the creation of a single financial pool at the national level, the division of the sector into 'payer' and 'provider'.

New mechanisms of provider financing have been implemented, such as case-based payment to hospitals and capitation based financing of the primary healthcare; the health funding transformed to the 'single article' funding, which is a prerequisite for more effective use of the provider payment mechanisms.

The mandatory health insurance was introduced to draw additional resources, improve protection from financial risks, and improve mechanisms of service procurement to gain more efficiency. In 2001, the State Guaranteed Benefits Package (SGBP) was introduced, which includes the cost-sharing (co-payments) to ensure the guaranteed provision of basic healthcare services.

According to the MHIF database, as of 1 January, 2013, the PHC enrolled population was 5.9 million persons, of which 3.9 million people had mandatory health insurance, or 66%.

Several important achievements in terms of impacts on the health system have taken place since the launch of the 'Den Sooluk' program in 2012. Those are the reduced overall mortality from cardiovascular diseases in the age group 30-39 from 45.5 per 100,000 in 2012 to 31.1 per 100,000 in 2016. The death rate from strokes has reduced. Some achievements are attributable to the primary healthcare and to the focus of the 'Den Sooluk' program on prevention of NCDs.

Public spending on health in recent years has been maintained at the level of at least 13% of total public expenditures.

Despite these significant achievements, a few strategic challenges have remained.

The level of out-of-pocket expenditures had been significantly reduced during the implementation of previous health programs; however, during the latest program, 'Den Sooluk' (2012-2018), they grew again. By 2014, the share of out-of-pocket expenditures for medical services increased significantly and exceeded the level at 2003 for all income based household quintiles, ranging from 6% in the richest quintile to 8% in the poorest quintile.

Some key results of health interventions and performance indicators of the health system have not yet been achieved. Significant gaps are in place in the competence quality in the primary and secondary prevention of NCDs, and the quality of medical care still needs to be improved.

The CVDs, diabetes, and risk factors (use of tobacco, alcohol, unhealthy diets and lack of physical activity) are a growing public health concern in Kyrgyzstan. The NCDs accounts for 80% of all deaths in the country, and the likelihood of premature death (under 70 y.o.) from the four major NCDs in 2015 is 25%. About 80% of adults with elevated blood pressure were found not taking medication and not controlling the level of blood pressure.

The premature mortality, morbidity and disability associated with NCDs have affected the country's social and economic development and caused the sharp increase in expenditures for health and costs of social support. Estimated 3.7 billion Kyrgyz Som were spent in 2015 for treatment of the main 4 NCDs (oncological, cardiovascular, diabetes and chronic respiratory diseases). The economic losses attributed to poor performance are almost 4 times higher than the amount of allocated public resources, and amount 14.6 billion Kyrgyz Som. In general, the current annual economic impact attributable to NCDs is estimated to be 17.1 billion Kyrgyz Som, equivalent to 3.9% of the country's annual GDP.

Kyrgyzstan has strong political commitment to health in general. The problem of NCDs, including CVD and diabetes are considered particular in the agenda of the Ministry of Health. However, the health policy is generally considered to be only the MoH's area of responsibility. Despite the fact that the Government is involved in intersectoral coordination issues, the intersectoral cooperation is one of the significant barriers to interventions at the population level[1].

The priority health programs are a driving force for policies and actions to strengthen the health system under the current health program and, therefore, are important. However, due to tight budget constraints, many of the planned activities at the population level remain without funding, and, accordingly, are not fully implemented.

[1] Better non-communicable diseases outcomes: challenges and opportunities for health systems. Kyrgyzstan country assessment: focus on cardiovascular diseases. Melitta Jakab et al.

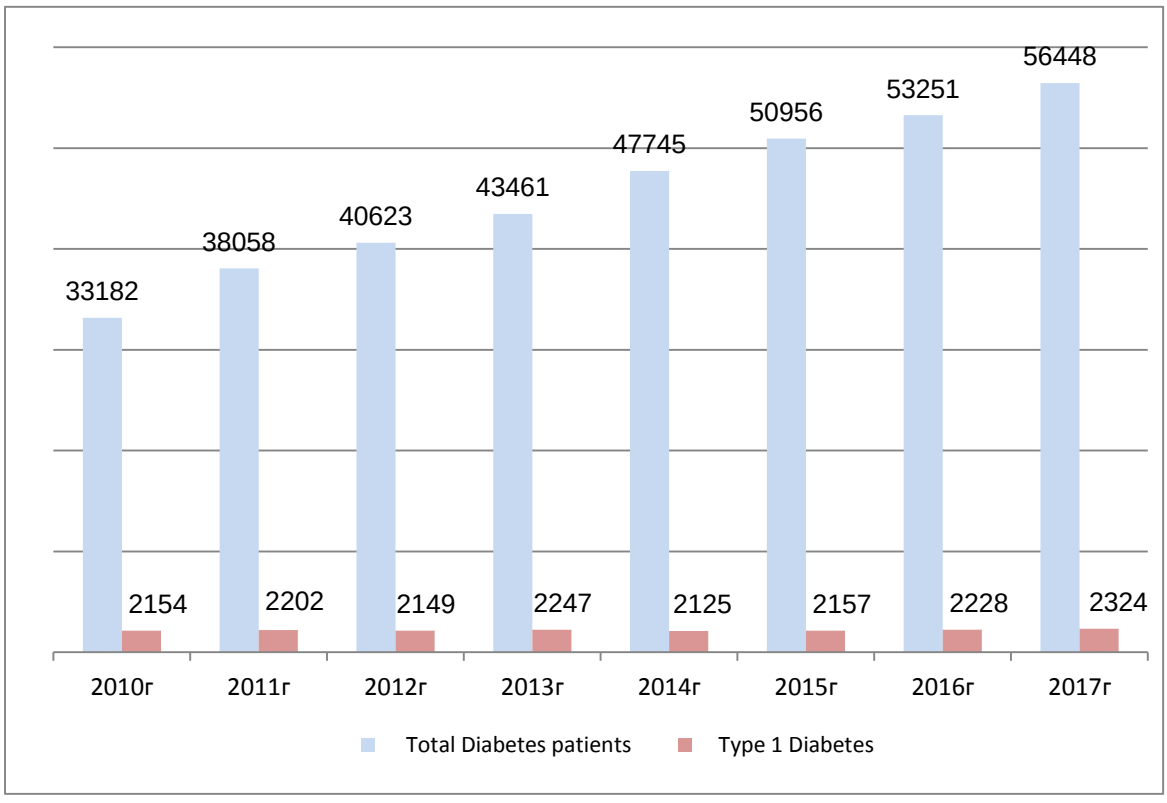
5.1. Analysis of prevalence of diabetes

As of 1 January, 2018, according to official data, the Center for Electronic Healthcare (CEH) registered only 56,448 persons diagnosed with diabetes mellitus (DM). Thus, the offical figure is less than 1% of the total population (0.9%). However, real number is apparently higher, since many people with signs of this disease, in particular in rural areas, do not undergo the appropriate examination and are not registered. According to IDF estimates, the incidence of diabetes in the country should be approximately 180,200 persons[2] which is over 3 times the number of people registered within the system.

Of the total number of registered patients, about 4% are patients with diagnosis of type 1 diabetes – 2,324 persons, including 380 children under 14 y.o. and 171 adolescents at age of 14 to 18 y.o. The remaining number of registered patients are those with type 2 diabetes – 54,124 persons.

It should be noted that the number of cases with diabetes mellitus is increasing annually, with the number of cases of type 2 diabetes increasing by 42% since 2010. The increase in the number of cases of type 1 diabetes was 7%.

Figure 1. Number of registered diabetic patients in 2010-2017



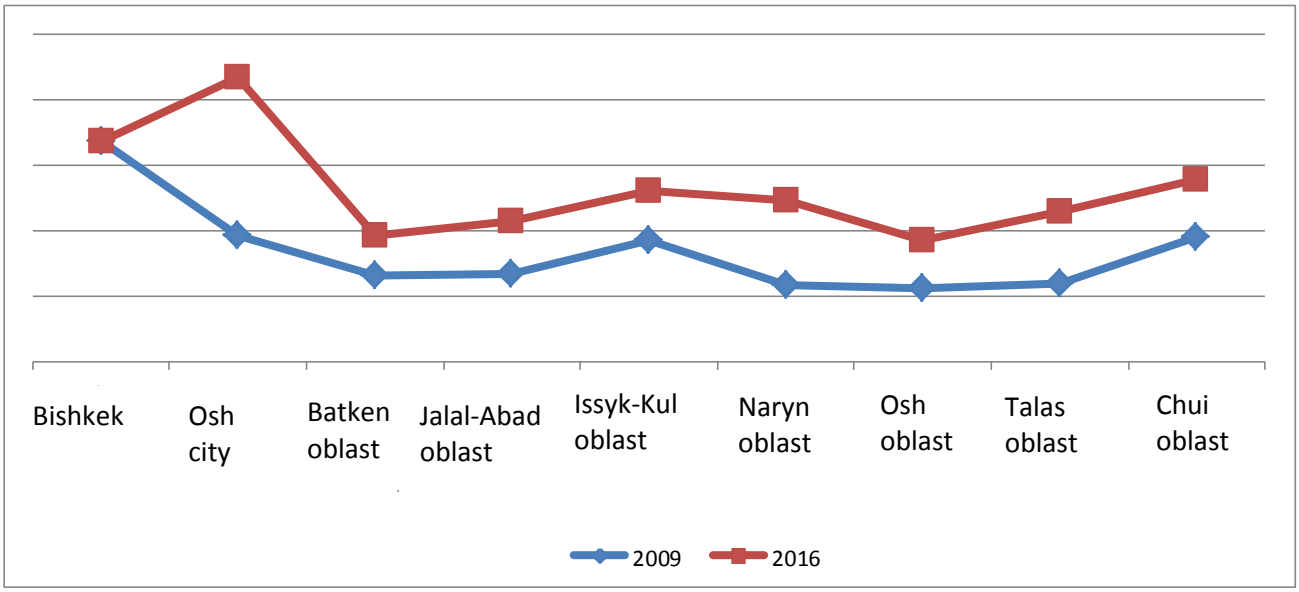
Source: Centre for Electronic Health

The prevalence of diabetes in adults and adolescents (aged 14 to 18 y.o.) per 100,000 population (as of 01.01.2017) varies significantly, with the highest prevalence observed in the cities of Bishkek and Osh (1,682.0 and 2,166.5 respectively). At the same time, the prevalence of diabetes in Osh by 2017 increased sharply compared to 2009, when the prevalence in Bishkek was the highest.

[2] IDF Diabetes Atlas 7th Edition. Brussels, 2015

In 2009, the lowest prevalence of diabetes was in Osh and Naryn oblasts (563.10 and 579.9 respectively); in 2017, the lowest prevalence was still in Osh (926.5) and Batken oblasts (958.7).

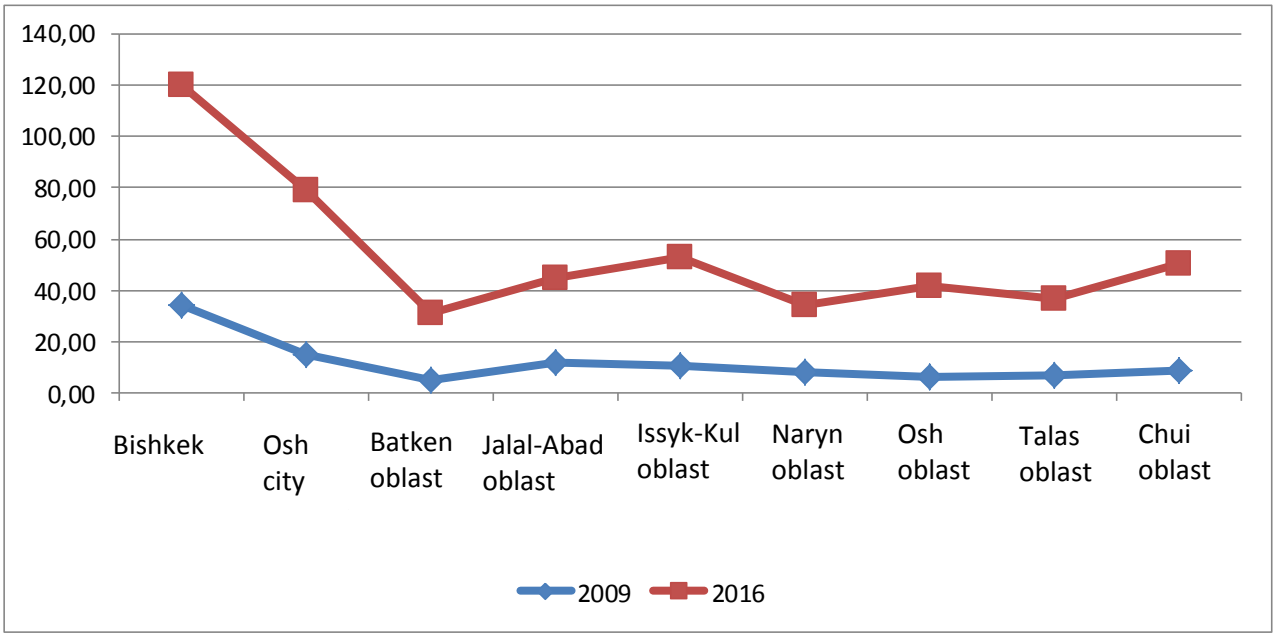
Figure 2. The prevalence of diabetes in adults and adolescents by regions (per 100,000) in 2009-2017.



With regard to the prevalence of type 1 diabetes in children under 14 years per 100,000 population, there is also variation across regions. In Bishkek, this indicator is 85.6, in Osh it is 64.3. The lowest prevalence is in Naryn Oblast is 26.0.

It is worth noting that in 2017 the variation by regions reduced to 3.2 times, while in 2009 the prevalence of diabetes in children under 14 in Bishkek was 6.4 times higher than in Batken oblast.

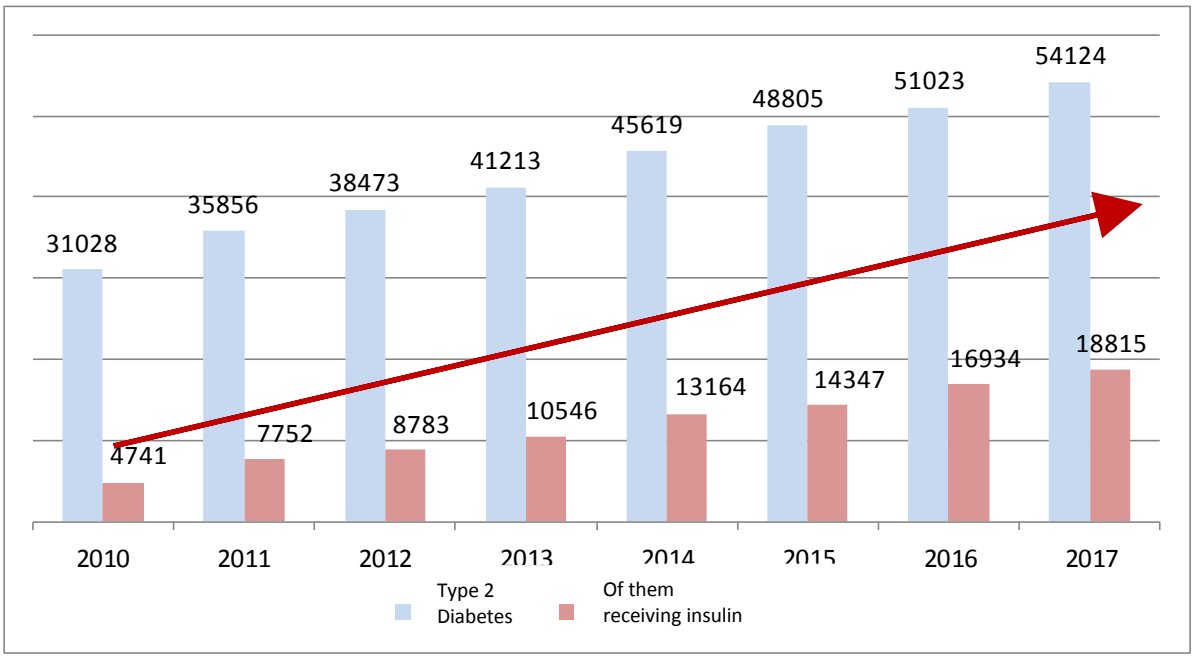
Figure 3. The prevalence of type 1 diabetes in children under 14 years by regions (per 100,000 in 2009-2017.



The number of patients with type 2 diabetes is growing annually. The growth is mainly due to the detection of new patients with type 2 diabetes. This is facilitated by interventions to NCDs at the country level that focus on identifying and recording patients with hypertension and type 2 diabetes. Annually, the number of newly diagnosed patients ranges is from 8 to 13% of the total number of registered patients with type 2 diabetes.

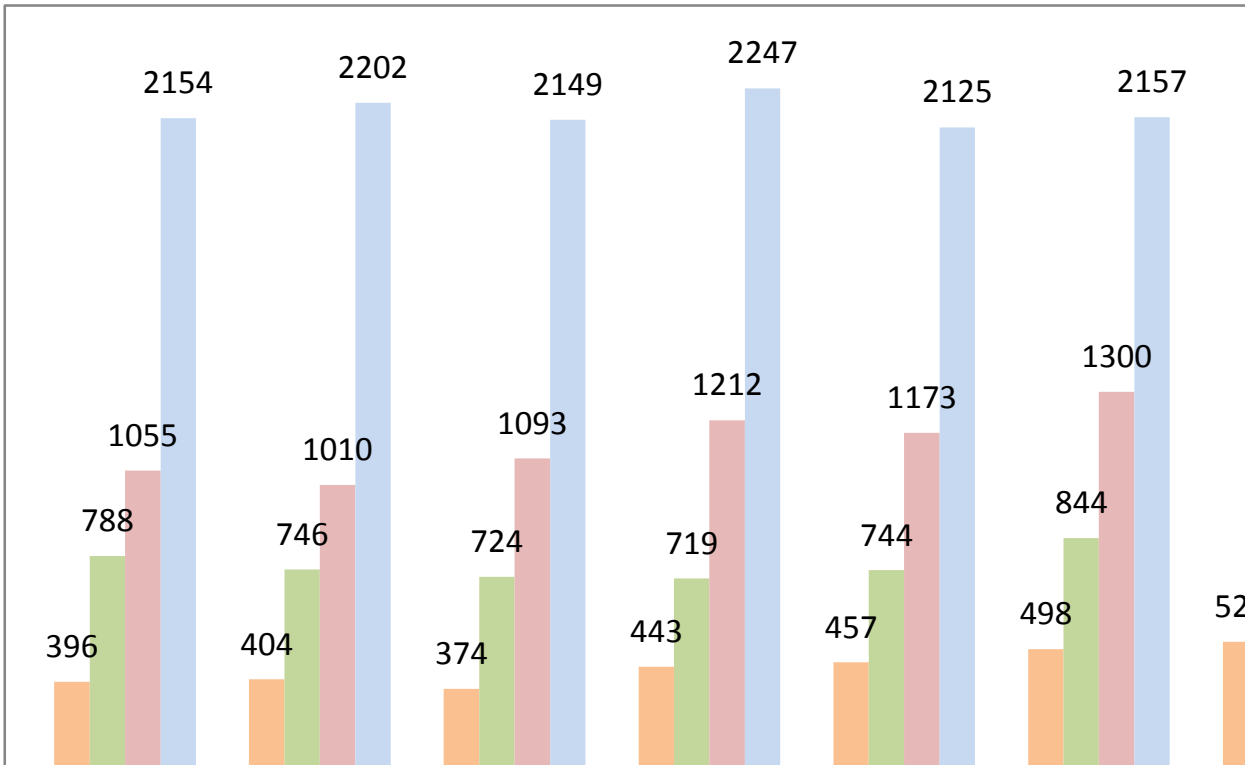
At the same time, the number of diabetic patients who receive insulin is increasing yearly. While in 2010 only 15% of these patients received insulin, then in 2017 over a third of patients with type 2 diabetes, that is 35%. Such a sharp increase in the number of patients receiving insulin can be explained, on the one hand, by inadequate management of diabetes with oral glucose-lowering agents, which also depends on the patient's adherence to treatment. Another reason may be the unjustified prescription of insulin, due to its free access as opposed to oral medications that are bought by patients at their own expense.

Figure 4. Patients with type 2 diabetes who receive insulin



It is well known that the diabetes is associated to hazardous systemic vascular complications - nephropathy, retinopathy, damage to the coronary vessels of the heart, brain, peripheral vessels of the lower extremities. The Register of diabetes patients demonstrated that the frequency of complications in patients with type 1 diabetes is constantly increasing every year. The analysis of the prevalence of complications of type 1 diabetes showed high incidence of polyneuropathy. According to the Register, the diabetic sensory neuropathy was registered in 58% of patients, and diabetic foot syndrome was in 5.2% patients, and most of these patients had foot amputation (84.9%) performed. A relatively high percentage of complications was attributed to diabetic retinopathy (42%), which often results in blindness. 23% of patients with type 1 diabetes had nephrotic complications. According to the Unified Republican Registry of Patients with Chronic Renal Insufficiency (2015), over a quarter of patients (26%) at the terminal stage and receiving hemodialysis were patients with type 1 and type 2 diabetes.

Figure 5. Prevalence of complications of type 1 diabetes mellitus, 2010-2017



Source: Register of diabetes patients in the Kyrgyz Republic, 2017

The analysis of the statistics found possible data errors or a high level of losses due to the fact that patients were eliminated and erased from the register in case of death or other reasons.

Data for 2016 and 2017 illustrate the 6.2% difference between the number of actual cases registered and the expected number.

The percentage of lost patients (i.e. those who died or moved to other countries etc) with type 2 diabetes is 4.4%, with the number of insulin-dependent patients actually receiving insulin is 3.9% higher (703 patients).

Table 2. Number of diabetes cases in 2016 - 2017.

Diabetes	Number in 2016	New cases, 2017	Expected number 2017*	Actually registered cases 2017	Difference	% lost cases
Total diabetes	53251	6960	60211	56448	3763	6,2%
Type 1 diabetes	1690	102	1792	1773	19	1,1%
Children under 14 y.o.	354	72	426	380	46	10,7%
Adolescents at 14-18 y.o.	184	27	211	171	40	19%
Type 2 diabetes	51023	5581	56604	54124	2480	4,4%

Type 2 diabetes insulin-dependent	16934	1178	18112	18815	**703***	**(+)3,9%***

*Number of patients with type 2 diabetes who were receiving insulin prevails over the expected number with account to newly detected cases

5.2. Legislation and regulatory acts

Along with the development and approval of long-term comprehensive national health programs in Kyrgyzstan, there is good practice of implementation of various specific programs.

Kyrgyzstan has a political and legislative environment to support NCDs prevention and control. In November 2013, the Government approved the comprehensive program for prevention and control of non-communicable diseases in the Kyrgyz Republic for 2013-2020. This program was developed and approved in the framework of the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020.

This NCDs prevention and control program in the Kyrgyz Republic embraced the WHO recommendations on the need for coordinated and coordinated actions, integration in countering the NCDs at the national level, based on the Political Declaration of the UN High-Level Meeting on NCDs.

The program expected results have an objective to stabilize the indicators for CVDs, cancers and diabetes, and to improve the provision of medicines. Through an epidemiological survey on the prevalence of NCD risk factors (WHO STEPS), Kyrgyzstan has identified baseline indicators for risk factors in the country. However, to date, the implementation of this program is of mixed nature.

The policy dialogue on strengthening the primary healthcare includes the developed plan of action to improve the effectiveness of primary health care in 2016-2018.

The Law of Diabetes Mellitus, which was adopted in 2006, provides that treatment of diabetic patients should be free of charge, and insulin, oral medications and blood sugar monitoring services should be provided free of charge. This law has created the grounds for determining the government's responsibility towards diabetic patients and played an important role in creating special conditions for centralized procurement of insulin and selected oral antidiabetics, and the management of this issue by the Ministry of Health. At present, special attention is paid to diabetic patients, and the government budget covers the centralized purchases of insulin, glucose-lowering oral medications, syringes, insulin syringes.

The SGBP provides patients with type 1 and type 2 diabetes with medicines free of charge. Medicines and medical devices are subject to free of charge dispensing, according to the dispensing standards.

It is worth noting that over the recent years, the oral glucose-lowering preparations for type 2 diabetes patients have been purchased at the expense of the national budget in limited quantities.Therefore, patients with type 2 diabetes have to purchase oral glucose-lowering preparations using own funds.

This law also regulates the free provision of inpatient medical care, consultations and laboratory tests to diabetic patients, as well as the enforcement of the right to disability benefits.

However, this law was adopted over 10 years ago, and many components of this law remain unimplemented due to the insufficient budget funds allocated for healthcare. In this regard, the Ministry of Health has now initiated the revision of this law. It is planned to create an intersectoral working group that will be propose amendments to the Law of Diabetes Mellitus. It is planned that

by the end of 2018 the amended draft law will be submitted for consideration to the Government and Parliament.

In October 2017, the Ministry of Health approved the program of 'Diabetes in the Kyrgyz Republic for 2018-2022 years'. Attempts to approve this program at the Government level to ensure the enforcement of intersectoral issues have been taken for the past 5-6 years. However, the Government did not support these measures and it was decided to adopt this program at the level of the Ministry of Health. In order to implement this Program, the Ministry of Health is actively attempting to involve all stakeholders and departments in this process.

The expected results of this program focus on reducing the number of hospitalizations for vascular complications by 30%, reducing by 33% of the number of patients with advanced stages of renal failure, reduce by 33% the number of patients with blindness due to diabetic retinopathy, and reduce by 50% the number of limb amputations in diabetic patients.

The State Guaranteed Benefits Program (SGBP), approved by the Government's Resolution # 790 dated 20 November, 2015, stipulates the guaranteed scope, types and conditions of provision of care to citizens and enforcement of their rights to healthcare in health organizations, regardless of ownership, participating in the SGBP. Volumes of healthcare under the State Guaranteed Benefits Program are determined by the health funding from the republican budget and the mandatory medical insurance.

According to the SGBP, the inpatient care for people with diabetes is free of charge (2 scheduled hospitalizations per year are free, with subsequent scheduled hospitalizations of citizens of exempted categories with average co-payment).

The consultations and medical services, basic laboratory tests and diagnostic examinations at the PHC for the enrolled population are provided free of charge, including hematology test, urine test and urinary sediment microscopy, blood and urine glucose tests, ECG, blood cholesterol. It should be noted that the blood cholesterol is a new item in basic tests to be provided free of charge starting in 2015.

6. Findings of the assessment

6.1. Organization of health care for diabetes patients

Health care for diabetic patients at the primary healthcare level is provided by the Family Medicine Centers (FMCs) and the General Practice Centers (GPCs) at the municipal and rayon levels.

In Bishkek, the basic services for all type 1 diabetes patients and insulin-dependent patients with type 2 diabetes are continued to be provided only by endocrinologists at the Endocrinology Center. Previously this center was named the City Endocrinology Dispensary (CED). Based on the MoH order, this center was renamed the Endocrinology Center under the Ministry of Health in November 2017. It is planned to give this center the functions of the republican methodological and advisory body that will be in charge of the provision of endocrinological care throughout the country.

To date, changing the functions of this Center and addressing its financing are under consideration. At the same time, the MoH decided to transfer all diabetic patients registered with this center to be followed by the FMCs in Bishkek.

There are 19 FMCs in Bishkek; they are still providing care to type 2 diabetes patients who do not receive insulin. The regular follow-up consultations for these patients are mandatory to be provided in the CED. Also, other specialists for in diabetes management and related complications (ophthalmologist, neuropathologist) are working in the CED.

The consultations and management of diabetes patients, who are receiving insulin therapy in the FMCs and GPCs at rayon level, are also assigned only to endocrinologists. Often the endocrinologists also follow the type 2 diabetes patients who take only glucose-lowering oral tablets.

It is worth noting that at the moment in Kyrgyzstan, the reforms are focused on strengthening the PHC. In the regions at the primary healthcare, the basic NCD services are provided by family doctors. However, the family doctors tend to believe that monitoring and managing the diabetic patients is the responsibility of only endocrinologists. Each FMC has an endocrinologist, therefore the family doctor always refers the diabetic patients to the endocrinologist, and they often refer the patients to hospitals to confirm the diagnosis, adjust the treatment regimens and receive regular follow-up consultations.

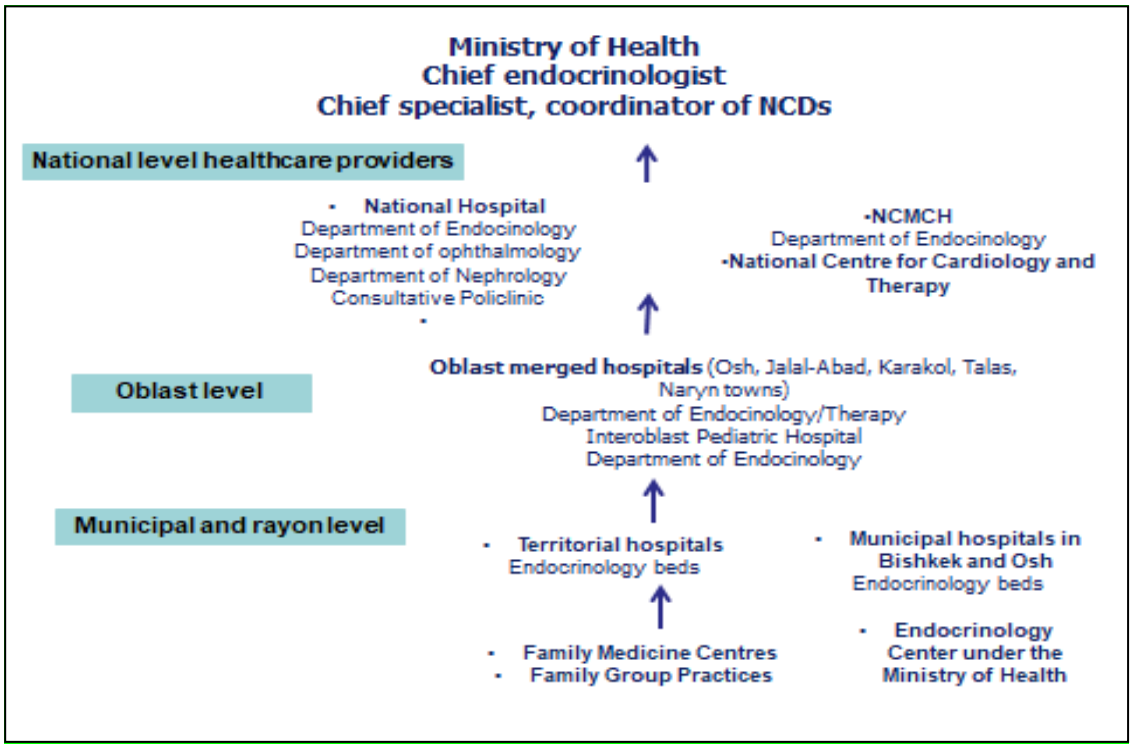
The RAPIA in 2009 also noted the poor involvement of family doctors in the diabetes management. Since then, a number of activities have been carried out to strengthen the role of family doctors in management of NCDs; namely, in some regions the family doctors and nurses were trained in the management of type 2 diabetes guided by the clinical guidelines and protocols. In some regions, this has facilitated the family doctors to manage the type 2 diabetes patients; however, the management of insulin-dependent patients remains with only endocrinologists, and the role of family nurses in diabetes management has also remained limited. At the same time, the patient tend to stay away from family doctors, likely due to poor confidence.

Occasionally in some regions, the endocrinologist's nurses were involved in the management of diabetic patients and keeping the Register.

Diagnosis and follow-up of diabetes complications (diabetic nephropathy, retinopathy, neuropathy, etc.) are also with specialized clinicians (nephrologists, ophthalmologists, neuropathologists, etc.).

> Extract of the interview with an FMC endocrinologist: 'There are loads of diabetic patients. Family doctors and internal medicine doctors tend not to even want to examine the diabetic patients. And the patients themselves do not visit them, as they think that they are not specialized in diabetes. Apart from prescribing the treatment, I also need to provide explanations on diets, physical exercises, and many other things. But I do not have time to do this. In addition, you need to fill in the medical card, and at the end of the working day you also need to enter all the data in the Register. I have a nurse who suffers from type 2 diabetes; I have trained her and now she instructs the patients on lifestyles....'.

Figure 6. Structure of medical care to diabetic patients



The inpatient specialized care for diabetic patients is provided in the endocrinology departments: the tertiary level care is provided in the National Hospital (40 beds), NCMCH (25 beds) for children, oblast merged hospitals in all regions; the secondary level care is provided in the City Clinical Hospital # 1 in Bishkek (30 beds) and in the therapeutic departments of territorial hospitals (THs) in cities and rayons (5-10 beds).

Currently the endocrinology department at the National Hospital (NH) is providing tertiary level care to patients from the regions, running scientific and clinical training processes. In addition, the NH is running the outpatient admissions for patients from all over the country. Before hospitalization, the patients are subject to consultation in this clinic and be referred by the endocrinologist for hospitalization.

The inpatient care for diabetic patients is free of charge, patients can be hospitalized 2 times a year for free, with the subsequent scheduled hospitalizations made through the average co-payment.

As part of this assessment, the performance of the health system in relation to the organization of treatment of type 1 and type 2 diabetes was examined in detail in the three selected regions – Bishkek city, Osh and Issyk-Kul oblasts.

It is worth noting that since the RAPIA assessment in 2009 the service delivery system for diabetic patients has not substantially changed. After diagnosis, the diabetic patient's pathways continue to be complicated.

The majority of type 2 diabetes patients find out about their diagnosis by accident, when they receive services for other diseases, most often in the hospitals where a hematology test is performed, including blood glucose test that is mandatory during hospitalization.

During the assessment in 2009, 52% of patients were diagnosed at the FMCs, and the rest of the patients found out their diagnosis mainly when receiving hospital services for other diseases. According to the data obtained during the interview under this assessment, 42% of patients were diagnosed at the FMCs. Most of them were diagnosed when hospitalized for other conditions.

When diagnosed, all children with type 1 diabetes are subject to referral for hospitalization, in order to confirm the diagnosis at the oblast or national level inpatient settings. At this level, all necessary diagnostic tests are performed, including glycated hemoglobin test and adjustment of the insulin dosages. Following that, when the patient is followed at the place of residence in rayons, the endocrinologists stick to the prescribed treatment.

In the Osh oblast, the Interregional Pediatric Hospital is central for the three southern oblasts. Children receive services mainly at this clinic. If the child's parents are capable to be admitted in national level hospitals in Bishkek, in the NCMCH, then the child is referred to this clinic.

Children with type 1 diabetes in the Issyk-Kul oblast are initially referred to the National Center for Maternity and Child Health (NCMCH), since there is no specialized children's hospital in the region. Subsequently, all children with type 1 diabetes are permanently hospitalized once or twice a year in the hospital.

The endocrinologists in rayons and the patients themselves by phone agree with the doctors of the oblast and national level on the scheduled hospitalization, provided that beds are available.

During the interview, the parents of children with type 1 diabetes reported that hospitalization for them was financially burdensome since they spend cash to come to an oblast or a national hospital. In addition, they need to spend cash for food, diagnostics, etc. throughout the duration of hospitalization (app. 10 days). **Over a half of the interviewed patients (64%) reported that hospitalization cost 10,000 to 15,000 Som (equivalent to 150-200 USD).**

However, most parents are committed to hospitalizations at least once a year, because, primarily, their doctors recommend this and, secondly, during hospitalization they receive glycated hemoglobin test, which is paid. Thirdly, only during hospitalization, the parents can be trained on diabetes self-management in Diabetes Schools that continuously operate for children only at the central level, in NCMCH.

In the Osh Interregional Pediatric Hospital, there are no diabetes schools, although the doctor of the department has received a two-month training in NCMCH. The reasons reported were limited to the lack of adequate facilities in the department. The parents of children are referred to the oblast hospital for adults, where they can be trained in the School of Diabetes.

Adult patients who are diagnosed with diabetes in other [non-endocrinological] departments of inpatient settings (of national, obalst, or rayon levels) are also often referred to the endocrinology department for diagnosis and confirmation of the diagnosis.

After confirming the diagnosis, the patients are referred to the primary healthcare settings for follow-up and registration.

Even if patients were identified at the primary healthcare setting, they are still referred to a hospital for diagnosis and confirmation of the diagnosis. The interviewed doctors reported that, when diagnosed with diabetes, patients in most cases demand referral to hospitalization. The patients pressure the doctors demanding the referral to a hospital; some patients on their own negotiate hospitalization at the oblast or national level.

> *Extracts from interviews of doctors, Osh oblast: "Generally, people with complications or those who wish to confirm the diagnosis are hospitalized. FMCs do not diagnose diabetes on their own and refer for hospitalization when primarily detect elevated blood glucose. However, there are some individuals who want to be hospitalized every year even if there is no indication for hospital admission. The settled mode of thinking makes people to believe that hospitalization at least once a year will enable them to be healthy during a year. Therefore, in every possible way they try to be taken to the hospital at least once a year. In addition, they are looking for contacts with raion officials who give phone calls to the director of the hospital and insist on hospitalization. The MHIF fine us for these unnecessary cases so that we have to falsify tests and ascribe severe complications in order to avoid penalization by the MHIF".*

The interviewed hospital doctors noted this situation is very difficult for them, since the unjustified hospitalizations expose the hospital to administrative penalties. At the same time, the interviewed doctors noted that patients have chances to be examined by specialists for diabetes complications only during scheduled or emergency hospitalizations, because not all regions have relevant specialists.

Given the scheduled hospitalization for diabetic patients is free of charge at all levels of health care, the patients remain committed to hospitalization. In addition, according to the regulations of diabetes related disability, in order to confirm eligibility to benefits or change the degree of disability, the patients are annually required to present the conclusions [evidence] of hospitalization to the relevant authorities. This is also one of the reasons why patients are forced to be hospitalized at least once a year.

The analysis of hospitalizations of diabetic patients demonstrates that hospital admissions of adults has remained high since 2010, with range from 34 to 39%. At the same time, the interviewed hospital doctors reported that over 90% of hospitalizations were due to diabetes complications, while the rest were due to first time detected high blood glucose as found by FMCs.

The hospitalization rates of children under 14 years in 2017 reached 150%, which means that half of the registered children are hospitalized twice a year. It is worth noting that children are hospitalized only at the central level - in the Oblast Pediatric Hospital in Osh city and in NCMCH in Bishkek.

Doctors explain high hospitalization of children with availability of complications. Such a high level of complications could be an evidence of poor diabetes control. However, interviews with parents showed that doctors recommend to be hospitalized twice a year, even in the absence of complications, for a preventive examination.

> *Extracts from interviews with parents having children with type 1 diabetes: «My daughter is 11 years old, type 1 diabetes was diagnosed when she was 7 y.o. We live in Bosstery village of Issyk-Kul oblast. Every six months we come to Bishkek for hospitalization. Four years ago, when we had been hospitalized for the first time in the NCMCH, a doctor said that we must come for hospitalization every six months or once a year. The doctor gave*

her phone number. During summer and spring holidays I call her and agree upon the availability of a place (bed) and then come for hospitalization. During our stay in the hospital we get advices of an ophthalmologist, do ultrasound examination of kidneys and testing the glycated hemoglobin (HbA1c). Also, my daughter gets massage and resting. Every hospitalization comes at a price of around 15000 kyrgyz som, because we take a taxi to Bishkek. In addition, every day I visit my daughter in the hospital and bring food for her. I live with a relative. Urine and blood tests are free of charge, but test for the glycated hemoglobin (HbA1c) and ultrasound examination should be paid as we are usually referred to a private laboratory».

«I live in Khaidarken village of Batken oblast, my child is 6 years old, diabetes was diagnosed when he was 4. This is the third time when I arrive in Osh oblast hospital for hospitalization. We have been told that there is no a special hospital for children in Batken so our doctors refer us to Osh for hospitalization. I have three more children at home and it's hard for me to come to Osh. Last time my husband was staying with the child. During our stay in Osh hospital, doctors tell us how to properly inject insulin, what a child should eat. In Batken, this information is not provided to us. They say that in Osh they will tell everything».

Table 3. Hospitalization of diabetic patients in 2010-2017.

Year	Total patients (absolute numbers)	Hospitalized, adults and adolescents	%	Total children with diabetes (absolute numbers)	Hospitalized, Children under 14 y.o.	%
2010	32975	12893	39,0	208	104	50
2011	37849	14456	38,2	209	238	113
2012	40383	15488	38,4	240	293	122
2013	43178	16135	37,4	283	285	100,7
2014	47455	16826	35,5	290	330	113,7
2015	50626	17491	34,5	331	385	116,3
2016	52897	18622	35,2	354	457	129
2017	56068	19597	35,0	380	570	150

Source: Register of diabetes patients, 2017

6.2. Diagnostic tools and infrastructure

According to the current State Guarantees Benefits Program (SGBP) as approved in November 2015, the basic laboratory tests and diagnostic examinations for diabetic patients at PHC settings are free of charge, such as blood count, urine test and urinary sediment microscopy, blood and urine glucose, cholesterol, electrocardiography (ECG). It should be noted that the testing the blood cholesterol is a new item in the basic tests package provided free of charge by healthcare organizations under this SGBP starting in 2015.

Almost all government owned health organizations that run blood glucose tests are using semi-automatic analyzers. Most health organizations noted that in the last 5 years, nearly all analyzers were modernized or purchased additionally.

The challenges are remaining in relation to the availability of reagents and consumables for these analyzers, although most health organizations regularly purchase reagents and consumables. The laboratory staff prepares lists of required materials that are provided to the administration that then runs tenders to purchase the reagents and equipment.

During the assessment, there were cases noted when health organizations did not conduct tests for blood glucose due to the lack of reagents. To illustrate, in the Osh Interregional Hospital for 2 months there were no reagents for blood and urine glucose due to lack of funding, and the patients were referred to private laboratories.

The test strips for microalbuminuria and acetone in urine are nearly not purchased. The laboratory managers noted that the administration does not purchase them because of lack of funds in the budget.

None of the visited health organizations that had with laboratories had glucometers for rapid diagnostic present. The main problem with glucometers is related to the access to specific test strips. Often the endocrinologists have their own personal glucometers, and they noted that they buy test strips with their personal funds.

To date, out of government owned health organizations, only the endocrinological center in Bishkek is running tests of glycated hemoglobin HbA1c. This test is free of charge only for children with type 1 diabetes and some vulnerable adult patients. The set of reagents for this type of test is limited, due to the limited budget and high cost.

Only 11% of adult diabetic patients who were registered in Bishkek responded that they were tested for glycated hemoglobin HbA1c. When interviewing parents of children who were registered with the Endocrinology Center in Bishkek, none of them reported this type of test was conducted free of charge.

The glycated hemoglobin (HbA1c) tests are carried out only in private laboratories, whereby the average cost is 650 Som (equivalent to 10 USD). In all visited regions, including at the rayon level, there were private laboratories that conduct tests for glycated hemoglobin. Also in Bishkek, the patients with newly diagnosed type 1 diabetes are often referred to private laboratories for C-peptide testing, and the cost of the tests is about 1,000 Som (equivalent to 15.3 USD).

The blood and urine glucose tests in laboratories operating under [government owned] health organizations are conducted daily, with tests for cholesterol and glycated hemoglobin (in Bishkek) conducted only on certain days, often 1-2 times a week.

Syringes for insulin administration are given to patients free of charge when insulin is received. The children and adult patients who use syringe pens / cartridges are given needles. The interviewed patients reported that on average they receive about 20-30 syringes for 2 months. This amount was reported not be sufficient, so patients have to do several injections with the same syringe, they use 4 syringes on average for 4-5 days.

Some interviewed patients noted that there were interruptions in the provision of syringes, they had to buy syringes in the pharmacies for cash. Not all visited pharmacies had insulin syringes. Only about 30% of pharmacies at the time of assessment had them in stock. The pharmacists reported they did not have insulin syringes for sale because they are not in demand. The patients rarely ask for these syringes. If necessary, if there is demand, the interviewed pharmacists reported they were ready to ensure the availability of insulin syringes in the pharmacies. The cost of insulin syringes in the pharmacies ranges from 5 (0.07 $) to 15 Som (0.2 $).

In 2016, the Ministry of Health purchased 125 pieces of syringe-pens 3 ml for total of 6,641 USD. The Ministry of Health did not purchase the glucometers.

Out of the total number of interviewed patients (123 patients), 42% had glucometers. They were mainly residents of Bishkek and oblast administrative centers - in Osh and Karakol. Patients usually purchase glucometers on their own. There were several cases when children were given glucometers free of charge as part of some events held by civil society organizations. The patients reported the of purchased glucometers ranged from 2,200 to 3,800 Som, and the cost of test strips ranged from 1,100 Som to 3,000 Som for 50 pieces.

There are benefit programs for purchasing the test strips (see details in Section 6.9.1. 'Drug benefit programs'.

The coverage of patients of the drug benefit programs is very poor, and most patients are not aware of it. Many patients reported they did not regularly monitor blood glucose due to the lack of test strips. At the time of interviews, some patients reported they were purchasing the test strips and glucometers from doctors in health organizations.

6.3. Organization of preventive measures

The national health reform programs are paying special attention to the prevention of NCDs. With the launch of the current health reform program 'Den Sooluk' (2012-2018), special attention was paid to comprehensive prevention of NCDs. The Government's Program for Control of NCDs for 2013-2020 has been approved. Diabetes mellitus and lung diseases are also the focus of various preventive activities and programs.

Currently, as part of Kyrgyzstan's commitments for sustainable development until 2030, which is based on the Sustainable Development Goals (SDGs), a wider range of issues of children nutrition is covered, including reduction of overweight and obesity. For this purpose, some intersectoral programs are being implemented, which are supported by international organizations, to reduce overweight and obesity in children, and to address the lack of physical activity.

However, it is worth noting that in general, the preventive measures in the field of nutrition are poorly organized, and public awareness on healthy nutrition is poor.

The PHC providers are offering a minimal set of nutrition related services: the nutrition status is assessed, counselling on dietary changes for patients with CVDs or diabetes is provided; however, the follow-up actions to assess the progress achieved by patients are limited.

There is no standard screening of all polyclinic patients for tobacco smoking status, and PHC providers are not trained in providing counselling on smoking cessation. Nevertheless, in 2012, the clinical guideline to smoking cessation was developed and implemented, and training of PHC providers in the screening for tobacco addiction and provision of counselling was conducted.

Over the past 8-10 years, a number of efforts have been made to improve the detection and prevention of hypertension, including annual screening campaigns of households conducted by representatives of village health committees (VHCs), continuous quality improvement cycles at PHC facilities that focus on essential hypertension, including standard measurement of blood pressure in adults aged over 40 years at each visit to the clinic. The initiatives have been implemented; however, the sustainability of the impact remains ambiguous.

In general, it should be noted the interventions at the population level are a relatively low priority in the national health system, they are provided with limited funding from the national budget. Currently, the implementation of disease prevention and health promotion are mostly dependent on the availability of funding from international donors. The government funding and donor

funding provided through the Sector Wide Approach (SWAp) are mainly focused on individual health services, rather than on activities for the population.

One of the key factors explaining the poor public awareness and preventive care is the insufficient attention paid to health education. A number of patient education initiatives have not been fully implemented as part of health reform programs, because of the lack of sustainable financing mechanisms, poor commitment of doctors and poor patient adherence to treatment regimens.

The FMCs have Health Promotion Units (HPUs) that have mandate to carry out preventive activities and improve awareness on health issues. However, these units are lacking funding, and their work to date has largely confined to training and coordination of the activities of the village health committees. As a result, there has not been a complete integration of health promotion units in PHC activities.

The PHC doctors are responsible for conducting the awareness building and preventive activities; however, their workloads is continued to be excessive. The role of nurses in public awareness building on health issues is not sufficiently developed. As a result, patients are not well familiar with the essential measures in relation to their diseases, and patients do not have common understanding of their rights within the health system.

The main issue raised in relation to the diabetes prevention is the early diagnostics of diabetes and related complications. The reasons that determine the current state of affairs are related to the fact that patients seek care too late because of insufficient knowledge.

One of the key factors explaining the poor state of prevention is that little attention has been paid to patient education. Despite the annual increase in identified patients with diabetes, the primary prevention is still inadequate; often patients are already diagnosed with complications. The rate of diabetes complications is also growing, which also suggests poor state of secondary prevention.

The PHC providers have taken measures to establish diabetes schools. However, these schools continue to function only at the central level, with the support of civil society organizations. The attendance of these schools is poor; health professionals have little incentive to carry out such activities in the long term. The interviewed doctors at rayon FMCs reported the managers of the FMCs have little interest in facilitating the establishment of the diabetes schools (allocation of premises, additional payment, funds for information materials, etc.)

Some awareness building activities are organized on the eve of the World Diabetes Day, with various diabetes forums and conferences, with the support of NGOs and pharmaceutical companies. Occasionally, during such events the patients are examined and tested for blood glucose.

The prevention and early diagnosis of diabetes is also poorly effective, due to poor professional knowledge and the lack of commitment of family doctors in primary health care (PHC) to manage diabetes patients. The family doctors are not involved in the control of patients with diabetes, these functions are entirely entrusted to endocrinologists, who are available only in cities or rayon FMCs. In rural areas and remote FGPs, the access to endocrinologists is limited.

6.3.1. Individual initiatives for identification of prevalence of the diabetes and implementation of the Package of NCDs prevention measures

Under the WHO initiative, over the past few years, a number of diabetes identification and prevention activities have been undertaken.

In 2013, the STEPS study was conducted using the World Health Organization's tool for survey of the prevalence of risk factors for non-communicable diseases, including diabetes and obesity. The study demonstrated that 94.2% of the surveyed individuals at the age of 24-64 had risk factors. Of these, the elevated blood pressure was observed in 48.7%, the elevated level of cholesterol (above 5.0 mmol / l) was found in 23.6%, the elevated glucose (above 6.0 mmol / l) was detected in 4.5%, and 8.8% of those taking glucose-lowering therapy were found with elevated blood glucose, with overweight and obesity being 56.2% of the surveyed population.

Starting from 2014, the Package of main measures for non-communicable diseases - the PEN protocol[3] - was introduced to optimize the detection and diagnosis of diabetes as part of a pilot in Kyrgyzstan. This protocol contains a set of priority-ranked and cost-effective interventions for non-communicable diseases (NCDs) to strengthen national capacities, with an objective to scale up the provision of integrated medical care for the risks of developing cardiovascular diseases and chronic obstructive pulmonary disease. These measures will enable health professionals to collect the required data to more effectively identify people at risk for diabetes and run prevention, even if they have other diseases, as well as to diagnose diabetic patients and provide them with counselling on early treatment options to prevent complications.

The PEN protocol was initially implemented in Bishkek, the capital of Kyrgyzstan, and in two regions of the country; in total 10 family medicine centers. The implementation began with the postgraduate training of clinicians and nurses to skills of measuring the indicators included in the PEN protocol. The trained health workers began to measure the indicators guided by the protocol in patients who visited their medical facilities. The results of the six-month pilot project for implementation of the PEN protocol demonstrate that in the two regions the number of reported diabetes cases increased by average 25%. In one of the institutions where the PEN protocol was implemented, the number of diagnosed diabetes cases during 6 months was twice as high as in previous periods. Such an increase in the number of diagnosed diabetes cases was the result of obtaining the essential knowledge and practical skills for detection of diabetes in patients by nurses and doctors. The data obtained as a result of the protocol implementation confirmed the correctness of the approach implemented by the health system and became a strong argument for the wider use of the PEN protocol in other parts of the country.

The questionnaire circulated in the pilot regions among doctors and nurses showed that before the PEN protocol implementation, approximately 60-70% of them had knowledge of the risk factors for diabetes and could give patients medical counselling on treatment and care. After the PEN protocol implementation, the completed questionnaire testified that 80-90% of health workers could give proper recommendations to diabetic patients. In addition, from now on, the medical information collected under the PEN protocol can be shared using an electronic database. This powerful monitoring tool not only enables the health system to track diabetes cases and analyze major trends, but also provides an overview of, for example, the coverage of patients and the completeness of the collected clinical data. In addition, thanks to the PEN protocol, the health system is able to compare the performance of health organizations.

Kyrgyzstan is moving forward and expanding the use of the PEN protocol in other parts of the country and began its implementation in three other regions of the country.

6.4. Register of diabetes patients

Beginning from 2009, the register of patients with diabetes mellitus was introduced as a pilot in Bishkek and the Chui oblast. By 2015, the software of this register has been gradually introduced throughout the country.

[3] Kyrgyzstan: Implementation of PEN protocol for optimization of the diagnostic of diabetes (http://www.euro.who.int/ru/health-topics/noncommunicable-diseases/diabetes/activities/)

The register provides an opportunity to receive systematic information about patients with diabetes, complications and disabilities, provision of insulin and oral glucose-lowering drugs, etc.

Currently, the Registers are run in all primary healthcare organizations in the regions - FMCs, as well as in the MED in Bishkek. At each oblast, there is a person responsible for data generation at the oblast level, who collects all the data from the rayons and transmits the data to the national level to the CEH. In the CEH, there is a person responsible for the formulation, collection and analysis of the Register data for the country.

At PHC facilities, the Register us run by endocrinologists. Some endocrinologists have been specifically trained in running the register in Bishkek, other endocrinologists independently run this register, and they constantly consult with oblast specialists responsible for register management. In one of the visited rayons of the Issyk-Kul oblast, the register was administered by a nurse.

During the interview, many endocrinologists reported they run the Register irregularly, because they had a large number of patients. Most often once a week, on the basis of outpatient cards, which are administered when patients are admitted, the endocrinologists enter data into the Register.

In addition, when conducting interviews with rayon health organizations, all endocrinologists who run the register reported the problem of reporting data. On quarterly basis the endocrinologist carries the computer processor, where the Register is installed, to the oblast centre to the responsible person. At the oblast centre, the specialist cleans the database and generates reports for further reporting flow for the oblast. It turned out that, due to the fact that endocrinologists in the field cannot generate reporting outputs that could be sent by e-mail, they occasionally have to go with the computer to the oblast centre.

It is worth noting that some endocrinologists consider the running of the Register an additional workload and a sort of obligation in the face of higher level organizations. In fact, most endocrinologists do not know how to produce reports from the register, except for the number of registered patients. The capabilities of the register enable taking into account all complications in patients, analyzing the frequencies, dosages, types of insulin received by patients and using this data to predict and determine the requirements of insulin and glucose-lowering oral medications.

To date, the role of the Register in using data for monitoring, effective procurement and distribution of insulin is poor. The requirements of insulin to be purchased at the Ministry of Health is mainly formulated based on the purchased volumes and types of insulin in the previous year.

6.5. Clinical guidelines and protocols for diagnosis, prevention and management of diabetes

Since 2006, the country has been using clinical guidelines and protocols of diagnosis, prevention and use of medicines for type 2 diabetes.

The Ministry of Health develops the clinical guidelines and protocols, and significant role is played by professional medical associations in this process. Many associations already have good experience in setting up the clinical guidelines and protocols, but their coordinating role is not backed up by sufficient powers. The working groups are created by the MoH orders and include specialists from different fields. Development of the clinical guidelines and protocols is not financed from the national budget.

When developing the clinical guidelines, the clinical recommendations of the most advanced countries are normally adapted, with account to specifics of care provision in the Kyrgyz Republic.

Since 2009, the clinical guidelines and protocols for the diagnosis and treatment of type 2 diabetes and its complications have been developed, and in 2016 they were revised.

The clinical guidelines and protocols for diagnosis and treatment of type 1 diabetes are not in place.

Table 4. The list of approved clinical guidelines and protocols for type 2 diabetes

Clinical guideline/protocol	Name	Approvals
Clinical guideline	Diagnostic and treatment of type 2 diabetes at primary healthcare	MoH Order № 325 dated 08.06.09.
Clinical protocol	Type 2 diabetes	MoH Order № 325 dated 08.06.09.
Clinical protocol	Diabetic nephropathy	MoH Order № 325 dated 08.06.09.
Clinical protocol	Diabetic neuropathy	MoH Order № 325 dated 08.06.09
Clinical guideline	Diagnostic and treatment of type 2 diabetes	MoH Order №691 dated 09.09.2016, Annex 1
Clinical protocol	Emergency (acute) conditions and chronic complications of type 2 diabetes	MoH Order №691 dated 09.09.2016, Annex 3
Clinical protocol	Diagnostic, prevention and treatment of type 2 diabetes	MoH Order №691 dated 09.09.2016, Annex 2
Clinical protocol	Training and self-control of patients with type 2 diabetes	MoH Order №691 dated 09.09.2016, Annex 4

These clinical guidelines and protocols are designed for primary health care.

Recommendations in the clinical guidelines and protocols as approved in 2016 for the treatment of type 2 diabetes include a large number and new groups of oral glucose lowering medicines. In addition, the use of combinations of glucose lowering agents with metformin monotherapy is envisaged.

Notably, some medicines recommended for use in the clinical guidelines and protocols are not yet all physically accessible to patients. For example, the Repaglinide and Sitagliptin are physically accessible only in Bishkek, in the pharmacies in the regions these medicines are not available.

To date, the country's pharmacy network has a large number of trade names of Metformin (Syophor, Glucophage, Metfogamma, etc.) and sulfanylurea derivatives (Glibenclamide, Glyclazide, Glimepiride, Glikvidon).

In addition, according to approved clinical guidelines and protocols for diabetes type 2, a number of analog insulins are recommended for use. However, to date, the Ministry of Health is purchasing only human insulin for adult patients, while insulin analogues are purchased only for children with type 1 diabetes.

Table 5. Comparison of medication therapy set out in clinical guidelines and protocols for treatment of type 2 diabetes

Clinical guidelines and protocols, 2009 г.	Clinical guidelines and protocols, 2016 г.
Step 1: First line medicines: Metformin	**1 stage:** initial therapy Metformin OR If contraindications to metformin are present, one of the following groups is recommended: DPP-4 inhibitors, GLP-1 agonists, inhibitors of alfa-glucozidase, NGLT-2 inhibitors and with caution Pyoglitazone, PSM, Glynides. If metformin is ineffective, use the combinations of oral glucose lowering medicines (see table below) OR In type 2 diabetes patients who did not reach the glycaemic target on oral medicines, the insulin therapy should not be delayed
Step 2: Metformin + basic insulin OR Metformin + one of medicines of sulphonilurea (glybenclamide, glimepiride, glyclazide, glipizide, glycvidone)	**2 stage:** optimized therapy MF + DPP-4 Inhibitors, MF + PSM or MF + Glynide. In any combination of medicines, in absence of contraindications, the MF is recommended. Insulin can be administered in monotherapy or in combination with MF.
Step 3: Metformin + intensified insulin therapy	**3 stage:** intensified therapy Any combination of three medicines, in the absence of contraindications the MF is recommended, intensified insulin therapy

Note: MF - Metformin, DPP-4 Inhibitors, Inhibitors of dipeptidylpeptidase-4, SD - derivatives of sulfonylureas, TZD - thiazolinediones, glynides (meglinides), GLP-1 Agonists - agonists of glucagon-like peptide-1, and SGCT-2 - inhibitors of sodium glucose cotransporter of type 2.

The approved clinical guidelines and protocols for diagnosis and treatment of type 2 diabetes were printed in the form of brochures and distributed to health professionals. The assessment found that not all doctors in the visited organizations had the clinical guidelines and protocols.

Only 28% of family doctors out of the total number of respondents had the clinical guidelines and protocols at the time of the visits for this assessment. 92% of family doctors who had the clinical guidelines and protocols did not know for what conditions and what type of diabetes the clinical guidelines and protocols should be used for. Nearly all interviewed family doctors (100%) reported they did not have any training related to the clinical guidelines and protocols. The family doctors often, in particular in the presence of an endocrinologist in the respected FMC, do not manage diabetic patients, even the type 2 diabetes, as they believe they are not expected to use the clinical guidelines and protocols.

86% of family doctors noted that they could manage patients with type 2 diabetes if they were appropriately trained.

Most endocrinologists are aware of the clinical guidelines and protocols and have them. About 90% of the surveyed endocrinologists working at PHC settings had the approved clinical guidelines and protocols in hands. However, most of them noted that they had not read them yet, since they only recently received them. Over a half of the interviewed endocrinologists, 53%, reported they received the clinical guidelines and protocols as handouts during the conference dedicated to the day of diabetes conducted in 2017.

The clinical guidelines and protocols are notably not supported by relevant standards and indicators for monitoring and evaluation of the quality of treatment of type 2 diabetes patients.

The lack of such control makes it possible for doctors not to stick to medical treatment as established by the clinical guidelines and protocols, which contributes to the growth of aggressive influence of pharmaceutical companies on doctors. Most doctors consider the clinical guidelines and protocols poorly applicable in certain situations, in particular for some individual characteristics of patients.

6.6. Antidiabetic medicines approved for use in the Kyrgyz Republic and included to the Essential Medicines List

In accordance with the legislation of the Kyrgyz Republic, medicinal products can be used in the Kyrgyz Republic if they have been registered and recorded in the State Register of Medicines.

To date, the following antidiabetic drugs have been registered and approved for use in the country: human insulins, insulin analogues, preparations of Metformin, Glibenclamide, Glyclazide, Glimepiride, Repaglinide, fixed combinations (Metformin + Sitagliptin, Metformin + Glyclazide, Metformin + Glimepiride).

At the moment, 16 names of human insulins of different durations of action from 4 manufacturers and 9 names of insulin analogues from 3 manufacturers are recorded in the State Register of Registered Medicines and authorized for use in Kyrgyzstan.

Table 6. The list of human insulins registered in the State Register of Medicines, 2018.

№	Trade name	Formulation	Manufacturer	Pharmacological group
1	Actrapid® HM Penfill®	solution for injections, 100 IU/ ml, cartridge 3 ml №5	Novo Nordisck A/C	Human insulin of medium duration
2	Actrapid® HM	solution for injections, 100 IU/ ml, vial 10 ml №1	Novo Nordisck A/C	Human insulin of short duration
3	Mixtard® 30 HM	suspense for subcutaneous injection, 100 IU / ml, vial 10 ml №1	Novo Nordisck A/C	Human insulin of medium duration
4	Milisulin® H	solution for injections, 100 IU / ml 3 ml, №5	Pharmac PAO, Ukraine	
5	Milisulin® H	100 IU / ml 10 ml, №1	Pharmac PAO, Ukraine	
6	Milisulin® 30/70	suspense for injection in cartridges, 100 IU / ml 3 ml, №5;	Pharmac PAO, Ukraine	
7	Milisulin® 30/70	100 IU / ml 10 ml, №1	Pharmac PAO, Ukraine	
8	Milisulin® HNP	suspense for injection in cartridges, 100 IU / ml 3 ml, №5; 100 IU / ml 10 ml, №1	Pharmac PAO, Ukraine	
9	Humulin® M3	suspense for subcutaneous injection, 100 IU / ml, 10 ml №1;	Eli Lilly & Company, USA	Human insulin of medium duration
10	Humulin® M3	suspense for injection, 100 IU / ml 3 ml, №5	Lilly France C.A.C, France	
11	Humulin® Regular	solution for injections, 100 IU / ml 3 ml, №5;	Eli Lilly & Company	Human insulin of short duration

12	Humulin® Regular	100 IU / ml 10 ml, №1		
13	Humulin® NPH	suspense for injection, 100 IU/ ml 3 ml, №5; 100 IU / ml 10 ml, №1	Lilly France C.A.C	Human insulin of medium duration
14	Protafan HM Penfill	suspense for subcutaneous injection, 100 IU / ml 3 ml, №5	Novo Nordisck A/C	Human insulin of medium duration
15	Protafan® HM	suspense for subcutaneous injection, 100 IU/ ml, vials 10 ml №1	Novo Nordisck A/C	Human insulin of medium duration
16	GensulinP	solution for injections, 70% 100 ml, №1	Bioton S.A.	Human insulin of short duration

Out of the insulin analogues, 9 names from 3 manufacturers have been registered and approved for use: Novo Nordisk (5 names), Lilly France (2 names), Sanofi (2 names).

Table 7. The list of insulin analogues registered in the State Register of Medicines, 2018.

№	INN	Trade name	Formulation	Manufacturer	Pharmacological group
1	Insulin detemir	Levemir® Penfill®	Solution for subcutaneous administration, 100 UNITS/ml, cartridge 3 ml №5	Novo Nordisck A/C	Long acting human insulin analogue
2	Insulin Lizpro	Humalog®	Solution for intravenous and subcutaneous administration, 100 ME/ml 3 ml, №5	Lilly France C.A.C	Short acting human insulin analogue
3	Insulin Lizpro	Humalog® Mix 25	Suspense for subcutaneous injection, 100 ME/ml, cartridge 3 ml №5	Lilly France C.A.C	Combination of short and medium acting insulin analogues
4	Insulin aspart	NovoRapid® Penfill®	Solution for injections, 100 ME/ml, cartridge 3 ml №5	Novo Nordisck A/C	Short acting human insulin analogue

5	Insulin aspart	NovoMix® 30 Penfill®	Suspense for subcutaneous injection, 100 UNITS/ml, cartridge 3 ml №5	Novo Nordisck A/C	Combination of long and medium acting insulin analogues
6	Insulin degludek	Tresiba® FlexTouch®	Solution for injections, 100 UNITS/ml 3 ml, №5	Novo Nordisck A/C	Long acting insulin analogue
7	Insulin degludek+insulin aspart	Raisodeg® FlexTouch®	Solution for injections, 100 UNITS/ml 3 ml, №5	Novo Nordisck A/C	Combination of long and short acting insulin analogues
8	Insulin glulizin	Apidra® SoloStar®	Solution for subcutaneous administration in syringes, 100 UNITS/ml 3 ml, №5	Sanofi-Aventis-Deuchland Gmbh	Short acting human insulin analogue
9	Insulin glargin	LANTUS® SoloStar®	Solution for subcutaneous administration in syringes, 100 UNITS/ml 3 ml, №5	Sanofi-Aventis-Deuchland Gmbh	Long acting insulin analogue

The list of names of oral glucose lowering agents that are registered in the Kyrgyz Republic and authorized for use comprises of 8 international non-proprietary names.

Each name is represented by a number of generics under trade names. Metformin is represented by 56 names with different doses from 15 manufacturers, Glibenclamide has 3 names from 2 manufacturers, Glyclazide has 9 names from 6 manufacturers, Glimepiride has 18 names with different doses from 7 manufacturers, Repaglinide has 11 names with different doses from 2 manufacturers, Sitagliptin + Metformin is represented by 2 names with different doses from 1 manufacturer, Metformin + Glyclazide has 1 name from 1 manufacturer, Metformin + Glimepiride is represented by 2 names from 1 manufacturer.

Table 8. Oral glucose-lowering agents registered in the Kyrgyz Republic, 2018.

№	INN	Trade name	Formulation	Manufacturer	Pharmacological group
1	Metformin	Metformin, Metfogamma, Insufor, Glucofage, Formetin, Siofor, Rodformin	Tablets, 500 mg, 850 mg, 1000 mg	Dragenopharm Apoteker Puschle Gmbh, Germany Pharmac PAO, Ukraine Ilko Ilach San ve Tij. A.Sh.,Turkey Borisov plant of medicinal products,	Biguanides

				Belorus Мерк Сантэ c.a.c, France Ridsburg Pharmaceuticals Ltd, India Berlin Chemie AG/Menarini Group, Germany	
2	Glibenclamide	Glibenclamide Maninil® 5	Tablets, 3,5 mg, 5 mg	Biovit, Kyrgyzstan Berlin Chemie AG/Menarini Group, Germany	Sulfonylurea derivatives
3	Glyclazide	Diabeton® MR Insuton Glyclazide	Tablets with modified release 30 mg, 60 mg	Pharmac PAO, Ukraine GM Pharmaceuticals Ltd, Georgia Les Laboratories Servier Industrie, France Abdi Ibrahim Ilach San ve Tij A.Sh., Turkey Borisov plant of medicinal products, Belorus	Sulfonylurea derivatives
4	Glymepiride	GlucoNovex Amaril® Guardenes Diapiride Insupiride	Tablets, 1 mg, 2 mg, 3 mg, 4 mg	Barrett Hogson Pakistan Pvt Ltd Sanofi-Aventis SPA, Italy Akums Drugs&Pharmaceuticals Ltd, India Pharmac PAO, Ukraine World Medicine Ilach san ve Tij A. Sh, Turkey	Sulfonylurea derivatives
5	Repaglinide	NovoNorm® Insvarda	Tablets, 0,5 mg, 1 mg, 2 mg	Novo Nordisck A/C, Denmark Rivopharm CA, Switzerland	Meglitinides
Fixed drug combinations					
6	Sitagliptin+ metformin	SITA Met	Tablets, 50/500	CCL Pharmaceuticals Pvt Ltd, Pakistan	

			mg, 50/1000 mg		
7	Metformin+ Glyclazide	Diabezide	Tablets, 500/80 mg	Rathamani Healthcare Pvt. Ltd., India	
8	Metformin+ Glymepiride	Ilet B1 Ilet B2	Tablets 500/1 mg, 500/2 mg	MSN Laboratories Limited, India	

One of the first steps in the country to promote policy to curb costs of medicines and improve their supply was the introduction of the Essential Medicines List (EML).

The medicines included in the EML have a few advantages over medicines outside EML in terms of preferential taxation (exempt from 20% VAT) and are prioritized in public procurements both at the central level of the MoH and at health organizations of all levels .

In addition, the current drug benefit programs (Additional Package of Mandatory Health Insurance, Drug Package for SGBP) are mainly based on EML (include 80% of medicines from EML).

The first EML was approved in 1996, according to WHO recommendations, and it is reviewed every 2 years and approved by the Government (1996, 1998, 2001, 2004, 2006, 2009, 2012). In 2017, the 8th revision of the EML was conducted.

The draft EML update has been submitted to the Government for approval, its approval is expected in May 2018.

Table 9. Comparison of glucose-lowering medicines from the Essential Medicines List in the Kyrgyz Republic and the WHO Model List of Essential Medicines[4]

Name	WHO[20]	EML 2009	EML 2012	EML 2017
Insulin	Soluble insulin and insulin of medium duration, in vials of 40 UNITS/ml, 100 UNITS/ml in 10 ml vials	Specifications not available 40 IU and 100 ME in vials and cartridges	Insulin Suspension for injections 40 IU/ml, 100 IU/ml, vials of 10 ml, cartridges 1,5 ml, 3 ml	Solution for injections 100 IU/ml in 10 ml vial
Glibenclamide	Tablets 2.5 mg and 5 mg Specified as an alternative to Glyclazides, not recommended to	Tablets 1.75 mg, 2.5 mg, 3.5 mg and 5 mg	Tablets 1.75 mg, 2.5 mg, 3.5 mg and 5 mg	Specified as an alternative to Glyclazides, not recommended to patients at age over 60

[4] http://www.who.int/medicines/publications/essentialmedicines/20th_EML2017.pdf

	patients at age over 60			
Metformin	Tablets 500 mg	Tablets 250 mg, 500 mg and 850 mg	Tablets 250 mg, 500 mg, 850 mg, 1,000 mg	Tablets 500 mg, 850 mg, 1000 mg
Glyclazide	Tablet with modified release 30 mg, 60 mg, 80 mg	Tablets 30 mg, 40 mg and 80 mg	Tablets 30 mg, 40 mg and 80 mg	Tablet with modified release 30 mg, 60 mg, 80 mg
Rosiglytazone	Not included	Tablets 2 mg, 4 mg and 8 mg	Not included	Not included
Glymepiride	Not included	Tablets 1 mg, 2 mg, 3 mg, 4 mg and 6 mg	Tablets 1 mg, 2 mg, 3 mg, 4 mg and 6 mg	Tablet: 1 mg, 2 mg, 3 mg, 4 mg * as alternative to Glyclazidea and Glibenclamide
Glucagon	Injections 1 mg /ml	Not included	Not included	Injections 1 mg/ml

6.7. The insulin purchases and distribution

In Kyrgyzstan, insulin is centrally procured by the Ministry of Health of the Kyrgyz Republic using budget funds and is provided to all patients with diabetes for free.

In accordance with the ‘Law of Public Procurement’, the insulins are purchased through tenders, most often once a year. Starting from 2018, the tender purchases are planned to be held in electronic format.

Currently, the insulin purchasing procedures have not changed substantially since the assessment in 2009. For procurement of insulins, a commission is established that includes the Ministry of Health, representatives of professional diabetic associations and the patient groups that form the specifications for the procurement of insulins. These data are presented in lots that guide the local wholesale pharmaceutical companies, majority of which are foreign pharmaceutical companies offer the bid prices on the terms of CIP (freight charges and insurance paid through Bishkek). The main requirement is that the purchased medicinal product must be registered in Kyrgyzstan.

Based on the bidding results, the awarded company delivers the insulins to the central warehouse of the Ministry of Health in Bishkek. The purchased volumes of insulins normally exceed the capacity of the Ministry of Health's warehouse; therefore, some portion of the insulin purchased is stored in the warehouses of private pharmaceutical companies under contract arrangements.

The Ministry of Health the most often pays after the insulins are delivered, and the payment term can exceed 6 months, which happens due to the uneven opening of the MoH financing by the government's financial bodies.

Starting from 2015, by the Ministry of Health's order, the insulin analogues (in cartridges) have been purchased only for children and adolescents under the age of 18 y.o., and the adult diabetic patients have been taking the human insulin in cartridges and vials.

Despite the fact that, according to the Order, analogue insulin should be given to children under 18 years old, during the assessment, some health organization representatives reported they were giving analog insulins only to children under 14 y.o. When interviewing patients, about 30% of patients noted that they received analog insulin only up to 14 years.

Since 2014, the volumes of purchased insulin notably have not changed. Most often, the requirements are calculated based on the previous year and for the last few years they have remained the same. In 2016, the both analogue and human insulin purchases were in higher volumes.

Table 10. Volumes of insulin purchases within 2014-2017.

Type of insulin	**Formulation**	**2014**		**2015 г.**		**2016 г.**	
		Number of packs	**Total cost, USD**	**Number of packs**	**Total cost, USD**	**Number of packs**	**Total cost, USD**
Insulin analogues							
Humalog®	100 IU cartridge 3 ml 5 pieces	2,000	98,000	2,000	98,000	1,500	74,430
NovoRapid®	100 IU cartridge 3 ml 5 pieces	2,000	80,000	2,000	80,000	1,500	63,870
Levemir®	100 IU cartridge 3 ml 5 pieces	1,500	82,500	1,500	82,500	7,100	379,282
LANTUS®	100 IU cartridge 3 ml 5 pieces	1,500	99,000	1,500	99,000	n/a	n/a
Total insulin analogues		**7,000**	**359,500**	**7,000**	**359,500**	**10,100**	**517,582**
Human insulin							
Humulin regular®	100 IU cartridge 3 ml 5 pieces	2,000	22,000	2,000	22,000	1,200	12,000

Humulin regular ®	100 IU vial, 10 ml	62,000	303,800	62,000	303,800	80,000	264,000
Humulin NPX ®	100 IU cartridge 3 ml 5 pieces	2,500	27,500	2,500	27,500	1,500	18,000
Humulin NPX ®	100 IU vial, 10 ml	120,000	588,000	120,000	588,000	170,000	561,000
Humulin M3® 30%, 70%	100 IU vial, 10 ml	5,000	16,500	5,000	16,500	10,550	39,031
Total human insulin		**191,500**	**957,800**	**191,500**	**957,800**	**263,250**	**894,031**
TOTAL		**198,500**	**1,317,300**	**198,500**	**1,317,300**	**273,350**	**1, 411, 613**

In the period from 2014 to 2016, the Ministry of Health purchased a total of 12 types of various insulin formulations at the expense of the national budget.

As compared to procurements in 2009, prices for being purchased human insulin have decreased.

Table 11. Types and prices of purchased insulin, 2014 - 2017.

Type of insulin	**Formulation**	**Price per pack (USD)**			
		2009	**2014**	**2015**	**2016**
Humalog®	100 IU cartridge 3 ml 5 pieces	50.1	49	49	49,98
NovoRapid®	100 IU cartridge 3 ml 5 pieces	45.6	40	40	42,58
Humulin regular®	100 IU cartridge 3 ml 5 pieces	15.1	11	11	10
Humulin NPH®	100 IU cartridge 3 ml 5 pieces	15.1	11	11	12
Levemir®	100 IU cartridge 3 ml 5 pieces	62.0	55	55	53,4
Humulin regular ®	100 IU vial	5.1	4,9	4,9	3,30
Actrapid®	100 IU vial	5.1	4,9	4,9	-
Humulin NPH ®	100 IU vial	5.1	4,9	4,9	3,30

Ново-MixPenfill®	100 ME cartridge 3 ml 5 pieces	45.8	-	-	-
Humulin MZ® 30%, 70%	100 ME vial	5.1	4,9	4,9	3,30
Mixtard HM®	100 ME vial	5.2	-	-	-
LANTUS®	100 ME cartridge	-	66	66	-

Source: Ministry of Health of the Kyrgyz Republic

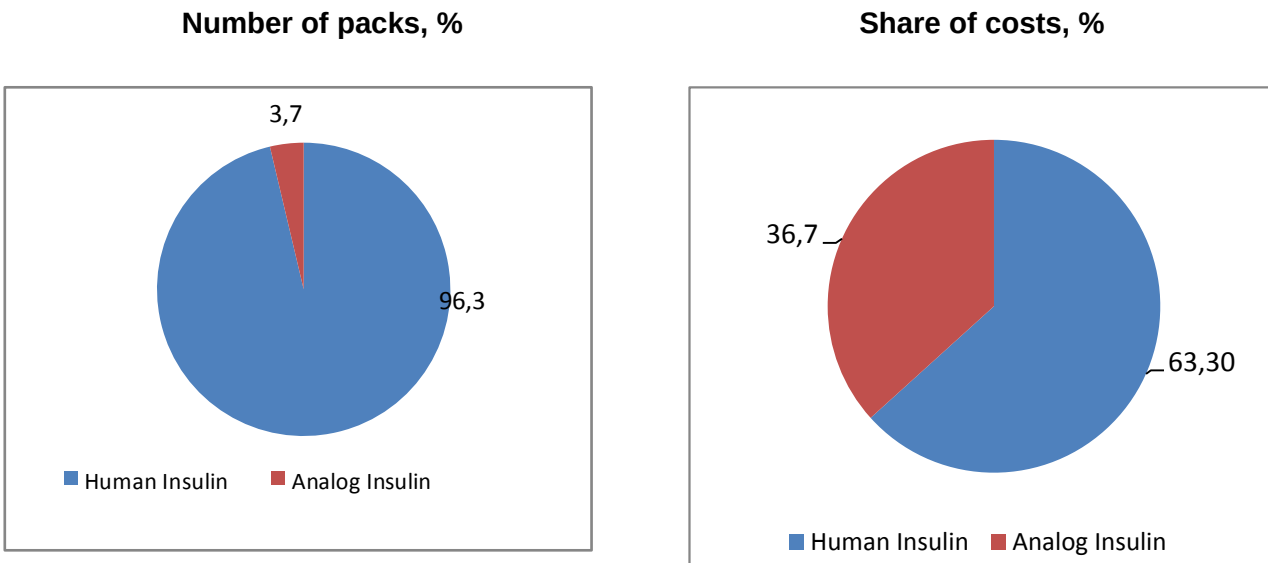
Insulin is purchased in two formulations - in cartridges for injection pens and in vials. The cost of a monthly treatment course varies depending on the insulin form. The cost of treatment with insulins in different forms is calculated on the basis of 40 units per day (recommended maximum daily dose as recommended by WHO)[5]. Due to the reduced prices for human insulins as compared to 2009, the cost of a monthly treatment became cheaper by 1.5 times.

Table 1. The cost of a monthly treatment cost using vials and cartridges

Types of insulin	Cost per month, 2009, $	Cost per month, 2016, $
Human insulin, in vials	5,84	3,9
Human insulin, in cartridges	14.51	9,6
Analogue insulin, in catridges	49.45	54,4

In general, the analysis of insulin purchases for 2016 found out that the share of purchases of human insulin was 96,3% (in packaging), and the insulin analogues comprised 3,7%. However, the share of costs for analog insulins makes up more than a third of the total budget allocated for the purchase of insulins - 36.7% (Figure 7).

Figure 7. Ratio of purchased insulin in packs and share of costs, 2016



[5] http://www.whocc.no/atc_ddd_index

6.8. The insulin distribution and storage

All diabetic patients, including children and adolescents under 18 y.o. are provided with free analog insulins, the rest patients are provided with free analogue inslulins. The insulin is not sold in the retail pharmacies.

The insulin and individual oral medicines are purchased centrally by the Ministry of Health, and delivered to the central warehouse of the Ministry of Health in Bishkek that is administered by the Department of Drug Provision and Medical Equipment, which is the structural unit of the Ministry of Health.

From this warehouse, the insulin is distributed to the health organizations of the national and oblast level and in Bishkek, following the MoH order. At the oblasts, the insulin is further distributed by rayon FMCs where the endocrinologists then dispense to patients.

Currently, the responsibility for transportation from Bishkek to the oblasts vests in the oblast health coordinators (they are directors of oblast FMCs, except for Osh oblast). The oblast health coordinators or persons in the oblasts who are responsible for the endocrinology services in the oblast, then will be in charge of distribution across the entire oblast to reach the rayons. The rayon FMCs come to the oblasts and independently take out insulin to the rayon FMCs.

The RAPIA assessment in 2009 marked the transportation at the time as a serious challenge. This assessment found this problem remains relevant and the situation has not changed. The health coordinators in the oblasts are themselves forced to organize the transportation of insulin from the warehouse in Bishkek.

Although key officials of the Ministry of Health reported there is an agreement with the Republican Centre for Immunoprophylaxis for this to regularly deliver the insulin as it has refrigerators for vaccine transportation. In fact, these machines were notably not always available. Even in the presence of such machines, the regional coordinators have to arrange payment for transportation costs, including gasoline and oil, driver’s service and other expenses.

At the same time, there are no designated funds to cover the transportation in the budgets. During the interviews for this assessment, the healthcare managers reported they are forced to collect money from the doctors' pockets to arrange the transportation. The price of one transportation, for example to the Osh oblast, was around 35,000 Som (equivalent to 500 USD).

The distribution of the amount and type of insulin at the rayon level is based on requests from FMCs. The rayon FMCs receive insulins from oblast FMCs based on the requests. In FMCs, most often the chief nurses are responsible for the distributing the insulins to diabetic patients, which she dispenses based on the endocrinologist prescriptions.

The chief nurse regularly receives the insulin in the pharmacy at the FMC, if the pharmacy is available. In the absence of the pharmacy and the pharmacist, the chief nurse is fully liable for the whole amount of insulin and medicinal products received by the FMC.

There are no limitations in the amount of insulin for diabetic patients. Patients are normally given insulins for 2-month use, and after finishing this amount they receive new stocks. When receiving the insulin, the patients are also given the syringes in amount of 20-30 pieces for 2 months. When a diabetic patient who needs insulin is hospitalized, the territorial hospital places a request to the FMC for the delivery of insulin.

In the capital of Kyrgyzstan, Bishkek, the Republican Endocrinology Center (formerly the Municipal Endocrinology Centre which has been reorganized in November 2017), is responsible for the distribution of the insulin that they receive from the Ministry of Health. There are no insulin stocks in the FMCs in Bishkek.

The main problem with insulin, just like in the assessment in 2009, remains the same and is not related to general supplies, but to the distribution of the total volume throughout the country. The interviewees often noted that health organizations do not receive the types of insulin they requested.

These factors suggest the challenges vest in determining the requirements, distribution and accounting of insulin at all levels of healthcare and these challenges have remained relevant.

As noted earlier, insulin purchases are not made based on requirements. This role was supposed to be performed by the Register of diabetes patients, which at the moment has already been introduced throughout the country. Different reasons related to the implementation of this Register and to the data reliability have prevented its use for planning and reporting in the insulin procurement.

During the assessment, all the visited rayon FMCs were observed to have large insulin stocks. As healthcare managers noted, in most cases those were stocks to cover over half-year or annual requirements intended for the rayon FMC. Since the transportation is problematic, the oblast coordinators collect the entire purchased annual supply from Bishkek in one trip. At the oblast level, there are no conditions for insulin storage either. The oblast Immunization Centers, which store the vaccines and are equipped with refrigerators, tend to provide the refrigerators for several days during which all rayon FMCs are obliged to take out the entire amount of insulin intended for the FMCs. The rayon FMCs also transport the insulin on their own.

Since the rayon FMCs have large insulin stocks, the storage of insulin is not always proper. There are no corresponding storage facilities and refrigerators in the FMCs. Most often the rayon FMCs have maximum two refrigerators. Therefore, part of the insulin is stored not in refrigerators but on shelves or on the floor in boxes. Often the refrigerators are not designed to store medicines. So the MSFs often use glass made showcases, although the insulins should be stored in the area protected from direct sunlight, because insulin can be crystallized and inactivated under direct sunlight.

In none of the visited FMC we observed cold chain bags for the transporting the insulin, although the specialists responsible for storage reported that during the transportation they, when feasible, rent the cold chain bags from the relevant services.

In Bishkek, the insulin stocks are located in the Endocrinology Center under the Ministry of Health. This center distributes the insulin to all patients residing in Bishkek. There is no insulin in the FMCs in Bishkek.

In addition, the insulin stocks are available in hospitals of the national and city levels in Bishkek – the NCMCH, Municipal Hospital # 1, National Hospital.

The insulin in hospitals is intended only for emergency cases; so during scheduled hospitalizations the diabetic patients use their own insulin that they were given at the place of registration in the FMC or the MED.

At the oblast level, the reserve stocks of both human and analog insulins are available in the Osh Interregional Clinical Merged Hospital, while the Oblast Pediatric Clinical Hospital does not have analogue insulin stocks that are designed for children.

The administration of this hospital identified this issue as a problem, because in emergency cases in children the doctors are not able to prescribe the analog insulins.

In the Issyk-Kul oblast, the Oblast Merged Hospital had stocks of human insulin for emergency cases.

At the rayon level, both human and analog insulin stocks are stored in the FMCs, which distribute the insulin to patients according to the endocrinologist prescriptions.

The rayon territorial hospitals receive only human insulin in vials for emergency cases from FMCs based on requests, and the stocks comprise of 5 to 10 bottles.

As part of the assessment, none of the pharmacies visited had insulin in retail sale.

Table 13. Availability of insulin in the visited health organizations, 2018.

Name	MED/ Oblast FMCs/FMCs/ GPCs	National hospital	NCMCH	Territorial/municipal hospitals	Oblast merged hospitals	Private retail pharmacies
Human insulins						
Short acting	+	+	+	+	+	-
Medium duration	+	+	-	+	+	-
Combined (Mixinsulins)	+	-	-	-	-	-
Insulin analogues						-
Short acting	+	-	+	-	+	-
Long acting	+	-	+	-	+	-
Combined (Mixinsulins)	-	-	-	-	-	-

It is worth noting that, with the available insulin reserve stocks, some interviewed patients told that rayon FMCs occasionally dispensed expired insulin.

> 'Observation in a healthcare organization: A child of 10 years old was first identified [with diabetes] in September 2017, was hospitalized in February 2018 in NCMCH. He is in the department of endocrinology for 14 days. After the diagnosis of type 1 diabetes at the rayon FMC he was referred to the oblast level hospital where the diagnosis was confirmed. In the oblast FMC, about half a year's supply of analog insulin was dispensed with expiry date in August 2014. The child received this insulin from September 2017 and did not reach the compensation state, due to which he was hospitalized at the national level. Doctors on 10th day of hospitalization accidentally found the use of the expired insulin.'

> 'A 63-year-old patient suffers from type 2 diabetes. When diagnosed with diabetes, the endocrinologist immediately prescribed insulin and dispensed it. The patient brought insulin home, but did not use it, but later found out that it had expired 1 year ago. However, the patient did not place any claims, he just stopped attending that endocrinologist.'

There remain problems with the use of insulin by types. By the MoH order, the analogue insulin is given free of charge only to patients under 18 y.o.; after reaching this age the patients are transferred to the human insulin. Many patients tend not to want to switch to this type of insulin dispensed free of charge and buy it for their own money. The interviewees mainly reported the patients buy insulin in nearby countries - in Kazakhstan and Russia. Therefore, many patients reported it would be good if insulin was sold in the retail pharmacies in Kyrgyzstan.

The interviewed doctors did not have consistent views over this situation. At the central level in Bishkek, the interviewed specialists considered the analogue insulin was relatively more

advantageous, but none of the endocrinologists has not filled the yellow card to identify the side effects of human insulin. In the regions, the majority of doctors noted that many patients opt out to human insulin, and they do not observe remarkable changes in complications or worsening of decompensation state. The difference is only in the increasing the number of daily injections. At the same time, some of the interviewed patients noted that increased number of injections made it much more difficult to use human insulin.

6.9. Access to medicines

To date, the market of antidiabetic oral medicines is quite wide. 8 names are allowed for medical use, many of which are generics under different trade names. Prices of drugs vary considerably and often tend to determine the choice, prescriptions, and use.

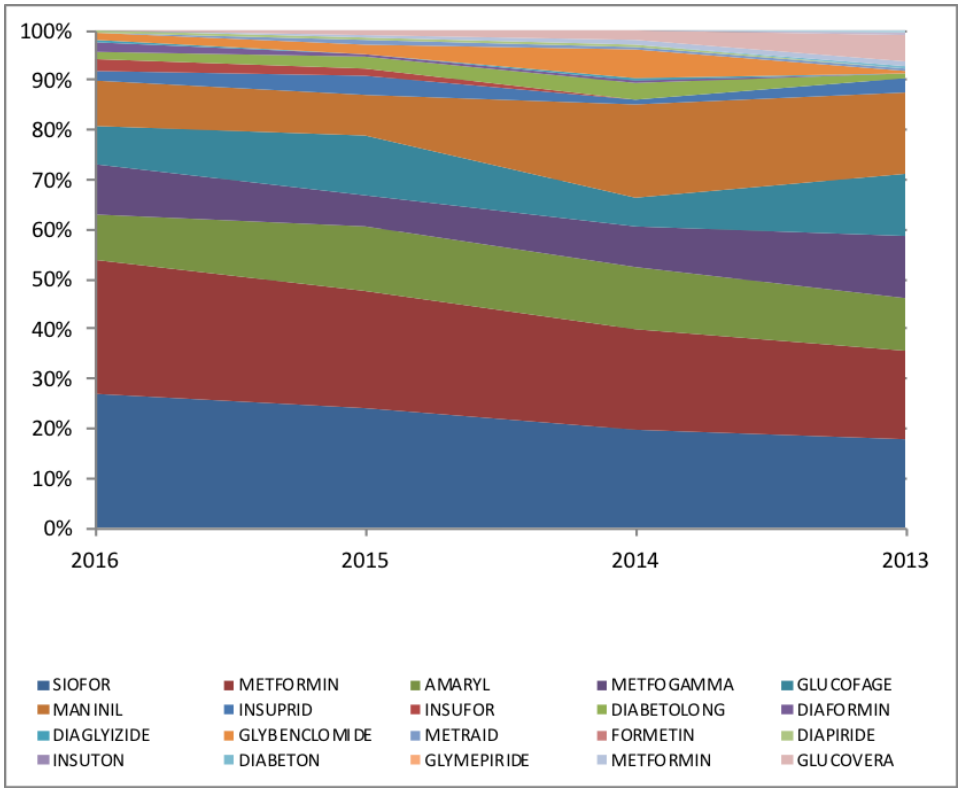
At the moment, the purchases of oral glucose-lowering agents from the national budget are limited.

The diabetic patients are left to buy the glucose-lowering oral medications at their own expense. The currently available subsidized medicines do not include any benefits for glucose-lowering agents. There are benefits applied to test strips for blood glucose.

The pharmaceutical sector in the country is part of the health system, although the entire pharmacy network is privately owned with its activities regulated by the Ministry of Health. The country has a wide network of retail pharmacies where patients purchase medicines. The public regulation of prices is not in place, and pricing follows the supply and demand.

The date of the wholesale sales for 2017 demonstrate there were 6 names of oral glucose-lowering agents that are most often used in Kyrgyzstan: these are metformin preparations under trade names (Siofor, Metformin, Metfogamm, Glucophage), as well as sulfonylurea derivatives - Amaryl and Maninil.

Figure 8. Volumes of oral glucose-lowering agents by the number of sold packages (in wholesales), 2017



Source: Independent database of wholesale sales of medicines in the Kyrgyz Republic (IMS, 2017)

The data on the prices were obtained from a survey of pharmacies located next to health organizations. The analysis of medicine prices in the regions also found variations in prices. The prices of medicines sold through the pharmacy network were lowest in Bishkek. The diffrence of minimum and maximum prices also varied by trade names and the manufacturers.

Table 14. Retail prices of glucose-lowering oral agents by regions, February 2018.

Name of product	Dose mg	Number of tablets	Bishkek city,		Chui oblast		Osh oblast		Issyk-Kul oblast	
			Minimum price (Som)	Maximum price (Som)	Minimum price (Som)	Maximum price (Som)	Minimum price (Som)	Maximum price (Som)	Minimum price (Som)	Maximum price (Som)
Siofor	500	60	320,5	461,6	325,6	470,9	380,2	510,4	400,3	540,2
Metfogamma	500	30	126,6	160,2	156,1	172,6	230,1	320,7	180,8	270,3
Metformin	500	30	305,4	365,3	n/a	n/a	n/a	n/a	n/a	n/a
Glucofage	500	30	290,9	435,1	320	541,4	n/a	n/a	n/a	n/a
Glibenclamide	5	50	44	75	38	90	n/a	n/a	n/a	n/a
Glimepiride	2	30	90	150	n/a	n/a	n/a	n/a	n/a	n/a
Amaril	2	30	632,4	780,2	665,7	810,7	n/a	n/a	n/a	n/a
Maninil	5	120	145	190,5	152,6	205,5	200	248,6	198	211

Affordability of oral medicines is a problem for patients with type 2 diabetes, particularly affordability of the first-line drugs used to treat diabetes - Metformin.

Purchases of Metformin using the state budget funds are limited. It has not been purchased over the past two years that is why patients with type 2 diabetes buy this medicine at their own expense.

Compared to 2009, average prices for peroral antidiabetic medicines including Metformin increased up to 2 times. Metformin is not included in the state-subsidized medicinal programs at the outpatient level.

Table 15. Average price for one tablet of widely used oral medicines for diabetes

Generic name of a medicine	Average price per 1 tablet, som (USD), 2009	Average price per 1 tablet, som (USD), 2018 (February)
Glibenclamide 3.5 мг	1.3 (0.03)	1,63 (0,02)
Glibenclamide 5 мг	1.2 (0.03)	1,2 (0,02)
Gliclazide 30 мг	9.8 (0.23)	19,3 (0,28)
Metformin 500 мг	5.0 (0.12)	9,6 (0,14)
Metforminн 850 мг	6.3 (0.14)	10,7 (0,16)
Metformin 1,000 мг	9.7 (0.22)	14,9 (0,2)

The affordability of treatment of type 2 diabetes was assessed according to the methodology developed by the WHO and the Health Action International. The median price of medical treatment in a standard mode was compared with the minimum daily wage - 40 Som (about USD 0.6) and the average daily wage of 494 Som (approximately USD 7.3).

The chronic disease management is not considered affordable if a patient spends more than one-day wage on the treatment to buy the necessary medication for a 30-day course of treatment. According to the National Statistics Committee of the Kyrgyz Republic, as of 01.01.2018 the minimum monthly wage is 1,200 som (17 $) and the average monthly wage is 14,847 som (215 $).

The cost of a monthly dose of metformin medicines is equivalent to the minimum wage for 15 -30 days or the average wage for 1.2 to 2.4 days.

Table 16. The affordability of Metformin under different names

Metformin drugs	Dose	Number of days to work with the minimum wage to buy Metformin for a monthly course of treatment	Number of days to work with the average wage to buy Metformin for a monthly course of treatment
SIOFOR	500	15,9	1,3
METFOGAMMA	500	15	1,2
GLUCOFAGE	500	30	2,4
METFORMIN	500	25,4	2,0

6.9.1. Drug benefit programs

To ensure the affordability of medicines in the Kyrgyz Republic, two drug benefit programs have been operating since 2003.

The drug benefit package for the SGBP is designed to dispense medicines free of charge for the registered population for 4 priority diseases.

The Additional Package of the Mandatory Health Insurance for the insured citizens at PHC level is designed to provide medicines through pharmacies that have contracts with the territorial departments of the MHIF, with medicines dispensed based specially designated prescription forms.

When a medicine is dispensed from a pharmacy, the patient pays only part of the price, and the MHIF reimburses the remaining part of the price. Currently, the list of reimbursable medicines includes approximately 70 medicines that can be bought by patients at a discount of up to 50%, depending on the name of the medicine.

Starting from April 2012, the program covered the test strips for blood glucose. The dispensing standards are 200 strips per patient per year. Most often, the doctors issue one prescription for 1 pack of test strips with 50 items.

For past 5 years, the number of dispensed prescriptions of test strips has increased 8-fold, from 457 recipes to 3,860 in 2017. The amount of the reimbursed amount has also increased, in 2017 amounting 3,830,8 thous. som. Within the framework of this Program, at average a patient pays about 992 soms out of his pocket for one pack of test strips (50 units), i.e. 50% of the cost of the test strips and 50% is refunded to the pharmacy from the MHIF funds.

However, in general, the coverage of the population eligible to benefits has remained poor, in particular in some regions.

Table 17. The number of dispensed prescriptions for test strips and the amount of reimbursements, 2013-2017.

Region	**Number of prescriptions for test strips**				
	2013	**2014**	**2015**	**2016**	**2017**
Batken oblast					1
Bishkek	110	147	429	646	998
Jalal-Abad oblast	16	31	194	277	559
Issyk-Kul oblast	29	45	53	157	298
Naryn oblast	39	73	116	179	251
Osh oblast	31	19	40	56	141
Talas oblast	7	6	37	105	160
Chui oblast	225	533	881	1331	1452
Total prescriptions	**457**	**854**	**1750**	**2751**	**3860**
Total amount of reimbursement (Kyrgyz soms)	**412 964,5**	**760 226,5**	**1 903 038,1**	**3 011 123,3**	**3 830 826,1**

It is worth noting that this program is appropriately working only in Bishkek city and in Chui oblast. In other regions, the allocated funds under this program are underspent.

The assessment found several reasons why the program is failing to provide access and financial protection.

First, endocrinologists cannot issue prescriptions for test strips under reduced price. The interviews with doctors in the Osh and Issyk-Kul oblasts reported that prescriptions for test strips can be issued only by family doctors. Since diabetic patients are mainly followed by endocrinologists, they do not attend the family doctor for these prescriptions.

Secondly, most patients, in particular in the regions, do not have glucometers to determine the blood sugar; thus, they are not using their entitlements to test strips at reduced prices. In the regions, 86% of patients did not have glucometers. The reasons for lacking the glucometers were as follows: 38% noted the high prices, 53% reported the strips were not available at pharmacies, 26% reported they bought the devices long time ago and there were no corresponding test strips.

The interviewed doctors in the regions explained they did not issue the prescriptions for test strips because the patients either lacked glucometers or the pharmacies lacked the required test strips. Often the patients purchase glucometers in the Russian Federation (through relatives or children who are working there), and the pharmacies in Kyrgyzstan not always have the appropriate test strips.

In addition, the patient interviews found out they were not aware of their entitlements under this program. In Osh and Issyk-Kul oblasts, none of the interviewed patients knew that they could buy the test strips at reduced prices. Despite the fact that the implementation of benefit prescriptions for test strips in Bishkek and Chui oblast is the highest, the majority (82%) of interviewed patients in Bishkek were also not aware of their entitlements to benefits for test strips.

Most of the interviewed healthcare managers and endocrinologists noted it is necessary to include glucose-lowering medicines in the Additional Package of MHI, for example, Metformin, because it is not affordable in the pharmacies for some patients.

Doctors noted that due to poor affordability of Metformin, the patients are transferred to cheaper preparations of the sulfanylurea group - Glibenclamide or Insulin that are given for free.

6.10. Healthcare professionals

The country assessment conducted in 2013 in Kyrgyzstan by a team of experts from the national health sector and WHO demonstrated that human resources were one of the most significant barriers to the provision of basic individual services in the management of CVDs[6].

Over the past decade, Kyrgyzstan has faced the health workforce crisis, in particular at the primary health care in rural areas, where the proportion of retired and pre-retirement age doctors has grown and, at the same time, there is practically no inflow of young professionals.

The country has made a few attempts to attract and retain doctors in rural areas, but they lacked sustainable effect.

Currently, the medical education is in the active reform process that is implemented with an emphasis on training of general practitioners for the primary health care.

Special emphasis in the education reform is on the decentralization of postgraduate and continuous education and improving the practical skills. In this regard, the terms and curricula of postgraduate education have been revised.

In May 2018, the first graduation of students is expected who have studied under the new curricula oriented to training the GPs. These students will have to undergo two-year residency in

[6] Better non-communicable diseases outcomes: challenges and opportunities for health systems. Kyrgyzstan country assessment: focus on cardiovascular diseases. Melitta Jakab et al.

the specialty of General Practitioner, and only after that they can continue their education in a specialty that would last from 3 to 5 years.

Earlier the postgraduate education in all specialties lasted for two years. Until 2011, to practice as a doctor, it was sufficient to undergo one-year training in any specialty.

The impact of the ongoing reforms and the improvement of the situation with provision of personnel, in particular in rural areas, is expected only in the long term, at least in 6-8 years.

Currently, all regions in Kyrgyzstan have continued experiencing the shortage of endocrinologists and specifically trained nurses. While most primary healthcare providers, FMCs (GPCs), are equipped with endocrinologists, not all of them have the qualification category on endocrinology.

Most endocrinologists are concentrated at the central level in Bishkek (32) and in the national health centres (23). In general, there are 49 endocrinologists in different oblasts, of which only 22 have postgraduate education in endocrinology. Approximately 40% of specialists working as endocrinologists in the regions are family doctors or doctors of other specialties. After a two-month specialization in endocrinology they work as endocrinologists at the PHC settings.

In general, the coverage with endocrinologists in the country does not exceed 0.2 per 10 000 population.

Table 18. Staffing of endocrinologists by regions per 10,000 population, 2017

Regions	Number of individuals	per 10,000 population
Kyrgyz Republic	107	0,2
Bishkek	32	0,3
Osh	3	0,1
Batken oblast	7	0,1
Jalal-Abad oblast	12	0,1
Issyk-Kul oblast	4	0,1
Naryn oblast	3	0,1
Osh oblast	16	0,1
Talas oblast	2	0,1
Chui oblast	5	0,1
National level healthcare organizations	23	-

Source: Centre for Electronic Health

The Kyrgyz State Medical Institute for Postgraduate and Continuous Medical Education, the body responsible for the continuous training of medical specialists, conducts regular 2-week trainings of continuing education in endocrinology for family doctors and endocrinologists. In addition, it runs the 3-month primary specializations for doctors on endocrinology. Within 2013 to 2017, total 89 physicians and family doctors and 51 endocrinologists were trained.

In addition, starting from 2016, after the new clinical guidelines and protocols were approved, the on-site trainings have been conducted in some regions of the republic.

Over the past few years, the electronic distance education for both doctors and nurses has been launched. The implementation and dissemination of this initiative was facilitated by the development partners. Since September 2016, webinars have been available, and the full list of lectures is available on the websites.

At the same time, family doctors or general practitioners do not manage the type 2 diabetes cases appropriately. The family doctors are not paying enough attention to patient education, in particular patients with type 2 diabetes. Often the type 2 diabetes is managed only by endocrinologists, and the insulin-dependent cases, that is type 1 diabetes cases are managed by endocrinologists only.

The role of nurses in the management of diabetes is very limited. As part of the ongoing reforms, the emphasis is on strengthening the role of nurses in the management of NCDs. This is also relevant from the point of view of the lack of doctors and the overabundance of nurses.

Interventions in relation to nurses in the management of diabetes were made only at pilot organizations as part of the project of reforming the medical education (health providers in Naryn oblast). With the support of the Project, the Standards for Nursing Practice for Type 2 Diabetes were developed that were based on the nursing process; these standards were implemented in several organizations of the pilot area where the nurses were trained. However, the impact of these measures has not yet been evaluated.

In the visited FMCs, the standards of nursing practices for diabetes management have not been introduced nor used.

At the hospital level, the functions of the nurses of endocrinological or therapeutic departments, where patients with diabetes are managed, are limited only to the performing the prescriptions and instructions made by doctors.

7. Adherence of patients

As part of the implementation of the health reform program ‘Den Sooluk’, various measures have been taken to improve the detection of hypertension, including diabetes, since most people with hypertension often have diabetes. These measures include the annual screening campaigns of the households conducted by village health committees (VHCs), continuous quality improvement cycles at the PHC facilities that are focused on hypertension and diabetes, blood pressure measurement in adults aged over 40 y.o. at each visit to policlinic, the survey of the prevalence of NCD risk factors (STEPS) whereby blood glucose and cholesterol measurement, etc.

A number of studies initiated by development partners suggest that these interventions did have effects, but the detection of hypertension and diabetes has surprisingly remained poor, whereby 4% are registered patients with hypertension and 0.9% patients with diabetes.

Accordingly, the poor detection is significantly affecting the awareness of patients about their illness and adherence to treatment. The studies conducted in recent years with focus on the adherence of patients with hypertension and diabetes found that adherence to treatment in these patients remained poor, which undermined the overall treatment effectiveness. To demonstrate, only 14% hypertension patients were taking the medications regularly, and only about 3% of them reported reaching the target blood pressure level[7]. An elevated blood glucose (above 6.0 mmol

[7] National Statistical Committee (2010), Kyrgyz Integrated Household Survey. Module for Health

/L) was detected in 4.5% of the surveyed population, and 8.8% of people with diabetes and taking glucose-lowering therapy were found with elevated glucose[8].

Factors for these findings are complex, but in general they confine to poor awareness and lack of understanding of patients with hypertension and diabetes, the quality of cheap generic medicines, and the financial problems associated with diets.

Interviewed physicians also reported that patients with type 1 diabetes are more likely to follow doctor's recommendations, follow diet prescriptions and monitor their condition.

In diabetic children under 14 y.o. and adolescents under 18, the treatment situation depends mainly on the parents. As doctors noted, most parents follow doctors' prescriptions and diets. However, there are around 10-15% of parents, most often from families with low incomes and education, who do not pay enough attention to adherence to treatment and diets.

Most parents monitor the food intake calories in children and make calculations of carbohydrates. When visiting hospitals, the children aged 10 to 15 y.o. who were in hospitals without parents reported they were able to independently calculate the amount of carbohydrates consumed.

Almost all interviewed parents of children under 18 y.o. reported that the child's diet is the most complex issue for them when controlling the disease. Another reason that causes difficulties was related to schoolchildren who are taking insulin. To peers at schools did not know about receiving insulin, they do not inject insulin during school hours, even when necessary.

> *An extract from interviews with parents of children with type 1 diabetes: «My child is 7 years old, she was 3 when type 1 diabetes was diagnosed. The most difficult for my child is to keep diet. I know that she always wants eating sweets, especially at school where in the school buffet lots of sweets and drinks are sold. Her teacher only knows about the child's illness, since we hide this fact from peers and their parents. Therefore, she does not make insulin at school and always comes home with the glucose level over 16-18»*

Adult patients with type 1 diabetes (about 60%) also noted that they are trying to maintain the diets and monitor the consumption of carbohydrates. However, most of them also note that compliance with the diet is the most difficult for them when controlling their disease.

It should be noted that in Kyrgyzstan, the tradition food is characterized by high contents of fats and carbohydrates. Despite the fact that the country has a large number of vegetables and fruits, the population, particularly in rural area, is traditionally not committed to using them.

The recent WHO study (2016) on the chemical composition of food products sold in markets and public settings found an extremely high content of trans fat acids and salts in common food products[9].

According to the STEPS study carried out in 2015 by WHO, the overall level of fruit consumption in the country is low and makes 4.9 days per week amongst respondents of both genders. In addition, there is a low consumption of fruits and vegetables. Thus, with a proven need to take 5 servings per day, the average number of servings of fruits per day is on average 1.7 for men and 1.9 - for women. In rural areas, this rate is on average 1.6.

Most diabetic patients reported that family participation and support would improve adherence to diet and exercise. Under 10% of the interviewed patients reported the improvements in financial situation and the status of the doctor.

[8] STEPS survey based on WHO tool on prevalence of risk factors of NCDs, 2013
[9] Project FEEDcities Nutrition environment in Eastern Europe and Central Asia, Kyrgyzstan 2017

The interviewed doctors constantly noted the patients with type 2 diabetes had lower adherence to treatment and compliance with doctor recommendations as compared to patients with type 1 diabetes.

Most of the respondents with type 2 diabetes are aware of the diabetes complications and consequences, while they not adherent to the doctor recommendations, continuous intake of glucose-lowering medicines and diets. The majority of patients with type 2 diabetes who receive insulin believe that the constant administration of insulin is harmful to health and are afraid of becoming used to it. Also, most patients note they themselves stop taking glucose-lowering oral medications because they do not feel worse. Many patients with type 2 diabetes change their behavior only after the initial diagnosis or at the time of hospitalization, but once they get better, they again stop following the diet and treatment instructions.

However, the majority of patients taking glucose-lowering tablets noted their high prices, but only 5% of them reported they do not take them regularly because of financial problems.

One of the key factors explaining the poor adherence, in particular in patients with type 2 diabetes, is that little attention has been paid to patient education.

At the PHC level, the diabetes school have been established. However, these schools continue to remain only at the central level, with the assistance of civil organization organizations. Currently, the regularly functioning diabetes schools are available at the endocrinological center of Bishkek and in one FMC in Bishkek.

At the hospital level, there is a school of diabetes in NCMCH for children and their parents and one in the Osh Interregional Hospital.

The availability of these schools at the primary healthcare in the rayons is at a low level, and doctors have little incentive to carry out similar activities in the long term. The interviewed doctors reported most of the information is provided by doctors to patients during consultations, which provide insufficient time for effective education.

Most patients from the regions attend the diabetes schools only when they are hospitalized at the central level. So the children and their parents have the opportunity to visit the school of diabetes when they are hospitalized in the NCMCH and at the oblast level in the Osh Interregional Hospital. In these organizations there are diabetes schools, there is 1 paid staff. The interviewees noted it would be good to increase the number of paid employees who could run these schools.

Information and educational materials for patients are provided by civil society organizations or by pharmaceutical companies. Sometimes healthcare organizations allocate little money for reproduction of these materials, but this was only in a few cases. If possible, the employees attempt to translate materials into Kyrgyz, because many patients from the regions need materials in the Kyrgyz language.

The patients find benefits of the ‘diabetes schools, but consider relatives of patients need to be invited so that they can then help and support. Many patients need to attend the ‘diabetes schools’ several times, because of change in the age, the patient's general health, the treatment regimen, and emerging complications.

The interviews with patients found some patients seek care in traditional healers, approximately 10% (those who reported at least one visit to traditional healers). This was more common in residents of the regions. A few type 1 diabetes patients noted that the traditional healers advised to refuse insulin.

The patient adherence to treatment is also influenced by the existing system of service provision, in particular the primary healthcare. The organization of service delivery is not patient-centered. There is no system of appointments; therefore, the waiting rooms of the FMCs were always found

full. The interviewed patients reported they were waiting to see a doctor from 30 minutes to 4 hours. Visiting the doctor, passing laboratory and diagnostic tests, and then returning with this lab test results back to the doctor can take considerable time. Most patients who were employed reported they do not visit the doctor regularly and do not regularly monitor the blood glucose, as they cannot always visit health care organizations during working hours.

In general, at the primary healthcare, insufficient attention is paid to training the patients and their involvement in the decision-making regarding the treatment and services, which then affects the patient adherence to treatment. Also, patients often do not have access to reliable information about the standards of services provided and standards of treatment, the doctor's prescriptions are taken without doubts. Most patients do not have a common understanding of their rights within the existing health system.

8. Engagement of communities and diabetes associations

Currently in Kyrgyzstan, there are two public non-governmental organizations that run activities on diabetes: the Diabetic and Endocrinology Association of Kyrgyzstan (DEAK) and the public association of ‘Diabetes Children free diabetes’.

DEAK is active since 1998 and is a member of the IDF. The DEAK includes both patients with diabetes and medical workers. The DEAK also has regional societies in four regions of the country (Issyk-Kul, Naryn, Talas and Osh oblasts).

The DEAK interacts with state agencies, medical, public organizations, manufacturers, charitable foundations and is actively working to find sponsors to help the diabetic patients.

In addition, the DEAK is involved in the development of legislation on diabetes, the development of standards of treatment. The DEAK representative is a member of the tender commission of the Ministry of Health for the purchase of insulin.

The DEAK supports organizing the diabetes schools for patients in the MED in Bishkek, organizing the annual Diabetes Day on the eve of World Diabetes Day. In these days, conferences are organized for doctors, events are held where individuals with various diabetes risk factors can take tests for blood glucose.

The public association ‘Diabetes free children’ was established in 2013 by parents of children suffering from diabetes, to carry out activities to help solving problems associated with the disease.
Permanent members (about 30 people) of the association are parents of children and young people with diabetes aged 18-30 years.

The association supports parents in protecting the rights and interests of children with diabetes, promoting pre-school education for children with diabetes. The Association also has implemented a number of charity and awareness building events, with support of the World Diabetes Foundation in the framework of the project ‘Better Future for Our Children’, and has organized the resource center in Bishkek and in the south of the country in the Jalal-Abad oblast.

This organization is very active in the drawing attention of the public and government agencies to the challenges related to diabetes. The head of this association is currently a member of the public Steering Board of the Ministry of Health.

In Osh oblast in 2017, another public association of 'Osh diabetic society' was established. The organization consists of 5 doctors and 2 patients of the founders. This organization is mainly supporting the diabetes school that is running under the Osh Interregional Hospital.

From 2008 to 2013, established by the parents of children with type 1 diabetes, the Kyrgyz Diabetes Federation (KDF) was active with focus on the education of parents. This Federation ceased its activities for various objective reasons, but the mother of a child, who was the head of this Federation, is continuing to provide private assistance to the diabetes school at the National Center for Maternal and Child Health through replicating information materials for children.

Most of their activities continue to be only at the central level in Bishkek, and the role of existing associations in advocacy is limited.

9. Key conclusions

The objective of this assessment was to identify the key barriers to access to medicines and medical care for people with diabetes in Kyrgyzstan, in order to achieve sustainable changes and impact on the health system and people affected by this diagnosis. This evaluation also aimed to identify the changes that have occurred since the first RAPIA in 2009.

The main changes were some stabilization of health indicators, including CVDs, although the difference from other countries in the European Region remains significant. The focus of many activities on NCDs, including diabetes, has led to more focus on preventive measures, including at the population level.

In recent years, the political and legislative framework for prevention and control of NCDs has been significantly strengthened in Kyrgyzstan, and the Government is involved in intersectoral coordination issues, although the intersectoral cooperation remains limited in relation to population interventions.

Through the large-scale survey in the country, the prevalence of hypertension and diabetes and related risk factors have been determined.

In this regard, it is necessary to further strengthen the intersectoral cooperation on NCD prevention, including prevention of diabetes, through safety and culture of diets, physical activity, restriction of harmful food advertising, and building the public awareness. These activities can be carried out with the involvement of local authorities, which requires decentralization of management and transfer of responsibility to local authorities to create environment for more responsibility of other sectors and of the public for health.

Diabetes is prioritized through the adoption of a separate program to tackle the diabetes, but it is necessary to improve the legislation in the field of diabetes, including the revision of the Law of the Diabetes' and the implementation of the Ministry of Health's program for the prevention of diabetes.

Free provision of insulin is also supported from the national budget, and the budget is constantly increasing. However, the use of resources remains inefficient, which signifies the agenda of possibilities of more efficient use and evidence based allocation of resources. The effectiveness of procurement and the pricing regulation of insulin and oral medicines procured at the expense of the government funds can be improved through direct negotiations with manufacturers or through the improvement of contractual relations with pharmaceutical service providers, or

through the introduction of co-payment mechanisms (reimbursement) for insulin at the outpatient level.

At the same time, it is necessary to improve the data collection systems, improve the Register of diabetes patients to use it in the planning and reporting, and the insulin purchases should be strengthened.

Few changes notably occurred in the provision of services to people with diabetes at all levels. The diabetic patient pathways have remained complex. The health reforms in Kyrgyzstan in recent years have focused on strengthening the PHC and, despite this, the commitment of family doctors to manage diabetes at the primary healthcare is poor, so prevention and early detection of diabetes is not up to par. The high rates of complications of diabetes suggest the diagnostic is lagging behind, the risk factors are poorly controlled, which is resulting in complications and insufficient secondary prevention.

In this regard, it is necessary to improve the quality of medical care for diabetic patients at all levels of healthcare, through the development of standards for treatment of type 1 diabetes, continuous education of medical specialists, patients, and regular monitoring of the application of the clinical guidelines and protocols.

At the same time, it is necessary to use the existing opportunities for education on the diabetes prevention, with focus on family doctors and nurses, as part of the package of basic interventions for NCDs (PEN) at the primary healthcare, whereby the course has been developed on education and management of NCDs, including diabetes, counseling on healthy lifestyles, since this program has been incorporated into the programs of continuous training of family doctors at the Kyrgyz State Medical Institute of Postgraduate and Continuing Training.

Actions to support the practices based on actual data, however, are limited and fragmented, mainly focused on the management and control of NCDs, and to less extent focused on building awareness and educating patients.

The available clinical guidelines and protocols for diagnosis and management of type 2 diabetes patients are not implemented adequately, the adherence to the recommendations set out in them has remained suboptimal, and prevention and patient education is not part of the counselling.

The lack of the quality assessment diabetes care is obvious, which should be a part of the process of quality improvement. Even when medical specialists have the necessary knowledge to manage the diabetes, the healthcare system, in particular the primary healthcare lacks up-to-date medical technologies, equipment and medicines.

Given that planned hospitalization for diabetics is free at all levels of healthcare, the patients remain committed to hospitalization that reaches 150% rates. This is facilitated by a few contradictions in the legislation that, in unjustified cases, force patients to be hospitalized in order to receive disability and the related benefits. The need for hospitalization should be determined guided by the developed clinical guidelines / protocols.

In general, the population is not sufficiently informed and motivated in the matters of healthy lifestyle and disease prevention. Insufficient attention is paid to the education of diabetic patients. The diabetes schools are developed only at the central level, with the assistance of civil society organizations. There are two active civil society organizations that are involved in the patient education and are trying to promote diabetes issues at higher levels, but their activities are still limited. The diabetes associations and community organizations can play an important role in helping to improve the management of diabetes care and prevention.

Table 19. Findings of assessments in 2009 and 2017

Intervention	Assessment in 2009	Assessment in 2017
Organization of the health system	Improvements are required	Moderate changes, prioritization of NCD programs, strengthening role of PHC, restructuring of PHC and city endocrinology dispensary in Bishkek started
Implementation of the Register of Diabetes Patients and data collection	Some improvements are required	Positive changes, the Register has been implemented countrywide, it is required to use data for planning
Prevention	Serious work is required to improve activities	Positive changes, a number of measures aimed at hypertension and diabetes prevention have been taken
Diagnostic tools and infrastructure	Serious work is required to improve activities	Moderate changes, benefits to purchase test-strips have been introduced
Clinical guidelines and clinical protocols (CG/CP)	Serious work is required to improve activities	Moderate changes, CG/CP have been implemented for type 2 diabetes
Purchase of insulins, distribution and storage	Serious work is required to improve activities	Positive changes, the EML has been revised and meets WHO criteria, the cost of human insulin is reduced by 1.5
Access to and affordability of medicines and medical care	Strength, some changes are required	Strength, some changes are required
Health professionals	Strength, some changes are required	Strength, some changes are required
Patient education and empowerment	Weakness, serious work is required to improve activities	No change
Adherence to treatment	Weakness, serious work is required to improve activities	No change
Legislation and regulations	Strength, some changes are required	Moderate changes, the Diabetes Mellitus Program is adopted

Engagement of communities and diabetes associations	Strength	Strength, changes are required to improve communications and educational activities

10. Recommendations

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
Organization of the health system	- Family doctors are not involved in the diabetes management - Management of diabetic patients is entrusted to endocrinologists - Not all regions have available endocrinologists - The primary healthcare is not patient-centered - Hospitalization rates of diabetic patients remains high and reaches 150% - Out-of-pocket expenditures during hospitalization remain high - Long queues to hospitalization - Patient pathways for provision of medical care remain complex - Diabetes schools are operational only at the	- Strengthening the role of PHC in the diabetes management through training of family doctors and expanding the role of nurses in counselling on risk factors and other aspects of patient education, including those with diabetes. - Further integration of services provided by village health committees (VHCs) in the family medicine. - Combination of the existing capitation based PHC financing mechanism with payment of incentives for performance against indicators to improve the detection, registration and management of diabetes - Preparation of clear and evidence based standards	Improving access to treatment at PHC settings: - provision of patient-centered services - more information on diabetes - fewer complications - reduction of out-of-pocket expenditures during hospitalization	- Reducing the burden of patients with type 2 diabetes. - Reducing the burden during hospitalization.

	Results	Recommendations	Expected impact on:	
			Patients	Health system
	central level, and they do not work in PHC settings - Preventive measures at the population level are poor level	of indications for hospitalization. - Introduction of mechanisms of public regulation of pricing of medicines that are used for common diseases. - Improvement of selection of medicines to drug benefits programs. - Improve the public awareness on patient rights under the drug benefit programs - Include the education of diabetic patients in the package of medical consultations		

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
Data collection/ register of Diabetes Patients	- Register of Diabetes Patients is introduced in all regions of the country. - The data of the Register are not used for calculation of requirements of insulin and drugs. - The system of centralization and data collection of the Register remains complex. The persons responsible for keeping the Register are not trained in data collection.	- Improving the reliability and quality of statistical data through the improved procedures and software of the Register - Using the Register data for calculating the requirement of insulin and medicines, to plan the procurement and reporting.	- Improving the quality of treatment, continuity in the diabetes management, regardless of the location of the patient - Improving the access to insulin and medicines for the patient.	- Improved planning and decision-making on the procurement of insulins and medicines. - Reliable and good quality data to use for reporting - Open access to information about the patient and medicines.
Prevention	- The public awareness remains poor due to lack of sustainable financing mechanisms - A number of prevent campaigns for hypertension and diabetes were taken - FMCs have Health Promotion Units (HPUs), but the functions of continuous preventive measures for diabetes are	- Integration of preventive measures for diabetes in primary care through the use of HPUs. - Building public awareness on diabetes and its associated risk factors and symptoms - Train family doctors on prevention of diabetes and its complications	- Improved knowledge of diabetes and risk factors - Early detection of diabetes - Improved knowledge on diabetes management - Early diagnosis of diabetes and related complications - Reduce rates of complications associated with diabetes	- Reduced burden of diabetes, in particular the type 2 diabetes (in the long run); - Early detection of patients with diabetes and related complications

	Results	Recommendations	Expected impact on:	
			Patients	Health system
	not integrated. - There are challenges in early detection and prevention of diabetes due to lack of knowledge in family doctors - Complications of diabetes are managed by individual specialists. - Secondary prevention is insufficient, high rates of complications			
Diagnostic tools	- Basic services and diagnostic tests are provided free of charge. - Availability of laboratory equipment for tests of glycated hemoglobin is poor. - The healthcare providers purchase the test strips for blood glucose, microalbuminuria and acetone in the urine in limited amounts. - Patients in regions have	- Improve the availability of diagnostic tools to manage the complications associated with diabetes. - Ensure the availability of tests for glycated hemoglobin in healthcare organizations (through contracts with private laboratories, co-payment). - Improve patients' awareness of rights to benefits in purchasing the consumables for glucometers.	- Early detection of diabetes and diagnosis of complications associated with diabetes. - Improving the self-monitoring in patients. - Regular tests for glycated hemoglobin	- Early detection of patients with diabetes and diagnosis of complications associated with diabetes. -Regular monitoring and improvement of treatment quality. - Overall reduction of the burden of diabetes and complications associated with diabetes.

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
	limited availability of glucometers and test strips	- Procurement of syringes must correspond to the supply of insulin. - Informing the patients on benefits for test strips.		
Clinical guidelines and protocols	- Clinical guidelines and protocols have been developed for type 2 diabetes and its complications. - Implementation of the clinical guidelines and protocols is poor, the family doctors are not involved in the management of diabetes, often including 2 type diabetes. - Lack of standards and indicators in the clinical guidelines and protocols for monitoring and evaluation. - Missing clinical guidelines and protocols for management of type 1 diabetes and its complications.	- Develop standards and indicators for clinical guidelines and protocols on management of type 2 diabetes. - Develop clinical guidelines and protocols on management of type 1 diabetes and its complications. - Training of family doctors on diabetes management in the Kyrgyz Republic. -Introduction of clinical guidelines and protocols in postgraduate education curricula.	- Improving the quality of diabetes care. - Early detection and diagnosis of complications.	- Early detection of patients with diabetes and diagnosis of complications associated with diabetes. - Assessment of the quality of provided care guided by the clinical guidelines and protocols. - Overall reduction in the burden of diabetes and complications associated with diabetes.

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
Purchases of insulins, distribution and storage	- The approved EDL complies with WHO criteria in terms of selecting hypoglycemic drugs, including insulin. - The cost of human insulin is reduced by 1.5 as compared to 2009. - The cost of analog insulins remains high. - Transportation issues are still challenging. - The Law on Public Procurement has been revised in relation to procurements of medicines, with quality considered a factor for procurement in addition to the lowest price. - The main problem with insulin is not related to general supplies, but to the distribution of the total volume across the country. - Because of excess stocks, the insulins are stored at	- Follow the WHO guidelines for purchasing insulins and medicines. - Improve the procurement planning in accordance with the Register of Diabetes Patients. - Improve the efficiency of public procurements and the pricing regulation of insulins and oral medicines, through direct negotiations with manufacturers or improved contractual relations with suppliers, or through introduction of co-payment mechanisms for insulin at the outpatient level. - Distribution of insulin should be carried out on the basis of the Register of Diabetes Patients, which, in turn, should be improved. - Find solutions to the issues of transportation of	- Improved access to insulins and medicines. - Commitment to treatment and reduction of complications.	- Reducing the financial burden in terms of the total cost of purchasing medicines. - More efficient use of funds - Through efficiency gains, redistribution of funds for purchasing of equipment, including for the diagnosis of complications.

	Results	Recommendations	Expected impact on:	
			Patients	Health system
	the rayon FMCs incorrectly. - There are cases when patients use poor quality expired insulins. - Some patients, after reaching the age of 18 buy analogue insulins in nearby countries using own funds.	insulins to healthcare organizations, through assigning these functions to insulin suppliers. - On the level of FMC, provide conditions for appropriate storage of insulins on the basis of contractual relations with pharmaceutical organizations. - Implement the retail sale of insulin in the pharmacy chain		
Access to medicines and medical care	- The pharmacy network is focused on the availability of first-line medicines for treatment of diabetes – metformin. - The national budget funds are used for purchasing the metformin, but in limited amounts. - Metformin is not included	- Adding Metformin to the drug benefit programs at the primary healthcare - Through more efficient insulin purchases and implied savings, ensure the procurement of oral medications - Stimulate clinicians to make prescriptions of	- Improved access to medicines - Reduced financial burden - Improve adherence to regular intake of prescribed medicines	- More efficient use of resources - Improved patient management - Reduction of diabetes complications

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
	in the subsidized drug programs at the outpatient level. - Metformin is considered to be unaffordable with minimum and average salary.	cheaper generic names of metformin		
Health workers	- Family doctors are not managing diabetes cases - The role of nurses is limited - Complications associated with diabetes are managed by other specialists - Doctors are not provided with appropriate tools for diagnosis and management of diabetes and its complications - Application of clinical guidelines and protocols is not regularly monitored, and quality of diabetes care is not evaluated as part of the quality improvement process	- Review the continuous training curricula for family doctors, with focus on counseling and training on healthy lifestyles - Shortening the patient's pathway of receiving care - Involving nurses in training as part of the package of key interventions for NCDs (PEN) on diabetes - Strengthen the activities carried out by the Quality units in the healthcare organizations, in order to assess the quality of diabetes care	- Improving the quality of patient care - Reducing the patient's pathway of receiving services - Reduction of costs associated with complications, hospitalization	- Healthcare workers are trained and family doctors are motivated - Motivation of employees through performance based financing - Management of diabetes in PHC - Reduction of complications from diabetes - Reduction of the hospitalizations rates

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
Patient adherence	- Poor adherence of patients with type 2 diabetes, due to low awareness - Patients with type 2 diabetes are having to buy Metformin at their own expense - Commitment to treatment does not directly depend on the financial situation of patients	- Strengthen the patient education and improve access to Metformin - Public awareness on the consequences of diabetes - Training of patients to regular self-monitoring, delivering these trainings as a standard part of counseling - Development of the Diabetes Schools - Development of official registration of side effects of insulin and medicines	- Improved knowledge of diabetes - Improved access to medicines - Reduction of financial burden - Reduction of the complication rates and hospitalizations rates	- Improved treatment and management of diabetes from patient's perspective - Reduced hospitalization rates and burden of patients - Reduction in the complications rates
Involvement of communities and diabetic associations	- Most activities carried out by associations are concentrated in Bishkek - Diabetes issues are discussed at higher levels - Activities of associations are limited due to lack of funding	- Development and strengthening of the role of associations in patient education - Define the role of diabetes associations in advocacy and training	- Development of community support and awareness-building activities	- Development of community support and related activities - Discussion of diabetes issues at the political level

	Results	Recommendations	Expected impact on:	
			Patients	**Health system**
Legislation and regulations	- Good political and legislative framework for prevention and control of NCDs - Intersectoral coordination is limited - SGBP provides for free medical services for diabetic patients, including provision of insulin - Diabetes is prioritized by adopting a separate diabetes program - The Law of Diabetes needs revision	- Develop an action plan for implementation of the diabetes program - Further strengthening of intersectoral cooperation on prevention of NCDs, including prevention of diabetes - Review the Law of Diabetes with the involvement of all stakeholders	- Relevant strategic and legislative framework - Focus of the Government on NCDs - The availability of guaranteed medical services	- Relevant strategic and legislative framework

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