

# REPORT ON THE RAPID ASSESSMENT PROTOCOL FOR INSULIN ACCESS IN KYRGYZSTAN



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## Table of Contents:

List of Abbreviations .....	iii
List of Tables .....	iii
List of Appendices .....	iv
Executive Summary .....	1
Key Findings.....	1
Recommendations.....	3
Introduction.....	4
1. Background Information .....	5
1.1. Diabetes .....	5
1.2. Insulin .....	6
1.3. International Diabetes Federation.....	7
1.4. International Insulin Foundation.....	7
1.5. Health Policy Analysis Centre.....	7
1.6. Rapid Assessment Protocol for Insulin Access – method of assessment .....	8
1.7. Kyrgyzstan.....	8
1.8. Healthcare in Kyrgyzstan .....	9
1.9. Health profile .....	10
2. Situation Analysis of diabetes in Kyrgyzstan using the RAPIA.....	11
3. Diabetes in Kyrgyzstan .....	12
4. Results.....	17
4.1. Organisation of the Health System .....	17
4.1.1. Bishkek.....	21
4.1.2. Issyk-Kul and Osh Oblasts .....	21
4.1.3. Referrals, counter-referrals and yearly check-ups.....	21
4.2. Data Collection .....	22
4.3. Prevention .....	23
4.4. Diagnostic tools and infrastructure.....	24
4.5. Drug procurement and supply .....	24
4.6. Accessibility and affordability of medicines and care.....	31
4.7. Healthcare workers .....	34
4.8. Adherence issues .....	36
4.9. Patient education and empowerment.....	37
4.10. Community involvement and diabetes associations .....	37
4.11. Positive policy environment .....	38
5. Discussion .....	39
6. Recommendations.....	41
8. Acknowledgements.....	47
Appendices.....	48
References.....	50

## List of Abbreviations

CIP	Incoterm: Cost Insurance Paid
CVD	Cardiovascular Disease
DAK	Diabetes Association of Kyrgyzstan
DFID	Department for International Development
DOTS	Directly Observed Therapy, Short-course
FGP	Family Group Practice
FMC	Family Medicine Centre
GDP	Gross Domestic Product
HPAC	Health Policy Analysis Centre
IDDM	Insulin Dependent Diabetes Mellitus
IDF	International Diabetes Federation
IIF	International Insulin Foundation
KDF	Kyrgyz Diabetes Federation
MHI	Mandatory Health Insurance
MHIF	Mandatory Health Insurance Fund
NCD	Non Communicable Disease
NIDDM	Non Insulin Dependent Diabetes Mellitus
PAHO	Pan American Health Organization
PAL	Practical Approach to Lung Health
PPP	Purchasing Power Parity
RAPIA	Rapid Assessment Protocol for Insulin Access
TB	Tuberculosis
VHC	Village Health Committees
WHO	World Health Organization

## List of Tables

Table 1 – Levels of care in Kyrgyzstan .....	10
Table 2 – Detail of number of interviews of the RAPIA in Kyrgyzstan .....	11
Table 3 – Data on number of cases of diabetes in 2007 and 2008.....	13
Table 4 – Prevalence data comparing official statistics and RAPIA data .....	16
Table 5 – Prevalence and life expectancy estimates for Type 1 diabetes in the three areas of the RAPIA in Kyrgyzstan .....	17
Table 6 – Availability of diagnostic equipment at facilities visited .....	24
Table 7 – Data on insulin procurement from 1994-2001 (adapted from <sup>14</sup> ) .....	26
Table 8 – Comparison between WHO and Kyrgyz Essential Medicine Lists .....	27
Table 9 – Analysis of insulin purchases in 2009 .....	27
Table 10 – Types and price of insulin purchased in all three years from 2007-2009.....	29
Table 11 – Ratio of prices of medicines purchased by the Ministry of Health and International guidance prices.....	30
Table 12 – Comparison of treatment costs using vial, penfill and analog insulin .....	30
Table 13 – Use of insulin at a Rayon May-December 2008 .....	31
Table 14 – Average price per tablet for common oral medicines for diabetes .....	32
Table 15 – Cost per year for treatment with Metformin (assuming 1,500 mg per day) .....	34
Table 16 – Sources of funding for the MHIF.....	48

## List of Figures

Figure 1 – Number of people with diabetes in Kyrgyzstan from 2002 to 2008 .....	12
Figure 2 – Graph of prevalence of diabetes in adults .....	14

Figure 3 – Graph of prevalence of diabetes in children under 14 and teenagers.....	14
Figure 4 – Path of person with Type 1 diabetes in Bishkek .....	18
Figure 5 – Path of person with Type 1 diabetes in Osh Oblast.....	18
Figure 6 – Path of person with Type 1 diabetes in Issyk-Kul Oblast .....	19
Figure 7 – Path of person with Type 2 diabetes in Bishkek .....	19
Figure 8 – Path of person with Type 2 diabetes in Osh Oblast.....	20
Figure 9 – Path of person with Type 2 diabetes in Issyk-Kul Oblast .....	20
Figure 10 – Path of insulin supplies.....	28

### **List of Appendices**

Appendix 1 – Map of Kyrgyzstan.....	48
Appendix 2 – Sources of funding for MHIF.....	48
Appendix 3 – Statistics on cases of diabetes in Kyrgyzstan 2002-2008.....	49
Appendix 4 – Data on the prevalence of diabetes in Kyrgyzstan .....	49

## **Executive Summary**

Kyrgyzstan, a former Soviet State, is located in Central Asia bordering Kazakhstan to the North, Uzbekistan to the West, Tajikistan to the South and China to the East. The capital is Bishkek located in the North of the country. With a Gross Domestic Product per capita of US\$ 2,200 at Purchasing Power Parity, Kyrgyzstan is classified as a low income country. Life expectancy at birth is 69 years and Kyrgyzstan is ranked 120 out of 182 on the UNDP's Human Development Index. Following the collapse of the Soviet Union, Kyrgyzstan faced a severe economic recession which impacted its capacity to adequately fund its health system.

Despite many challenges for the Kyrgyz health system people with diabetes are given special attention with a Diabetes law that addresses the free provision of all aspects of care including insulin, oral medicines, consultations and laboratory tests.

The International Diabetes Federation estimates that the prevalence of diabetes in Kyrgyzstan for those aged from 20-79 will increase from 4.3% in 2003 to 5.8% in 2025. Data from the Ministry of Health show an increase in the number of cases of 26.9% from 2002-2008 with total cases in 2008 at 28,893 with 2,238 people requiring insulin. Prevalence rates vary greatly between regions in Kyrgyzstan with a range of 503.0-1,550.1 cases per 100,000 population. Rates of Type 1 diabetes in the capital city compared to those in a rural area in Children under 14 (2007) are 8.4 times higher.

Implementing the RAPIA in Kyrgyzstan had as its aim to clearly identify the barriers to medicines and care that people with diabetes in Kyrgyzstan face in order to affect sustainable change in addition to increasing the data on diabetes and its financial impact on the health system and people with this condition.

## **Key Findings**

### ***Organisation of the Health System***

- Varying patient pathways for Type 1 and Type 2 diabetes in the different regions visited were observed
- Consultations work well, but people face long waiting times and short time spent with the doctor
- Education is not included in the consultation
- Referrals and counter-referrals were described as working well
  - Some self-referrals were noted especially from the periphery to Bishkek
- Osh regional and Osh Children's Hospital were able to manage diabetes at quite a high level and therefore avoided referring patients to Bishkek
- Close collaboration at district level between the hospital and Family Medicine Centre
- Every year one or two inpatient stays at different levels of the health system are planned for patients

### ***Data Collection***

- Disease surveillance for Non Communicable Diseases is included in the National Health Programme
- A diabetes register is being developed which has been piloted in some areas of the country
- The data flow from facilities to the Ministry of Health works well, but issues were raised about the reliability of data and the use of data for planning

### ***Prevention***

- The National Health Programme includes the use of mass media to promote disease prevention, but only some awareness activities are organised around World Diabetes Day

- Early detection of diabetes due to lack of knowledge was a problem for both:
  - General population
  - Healthcare workers
- Some problems exist treating some complications due to:
  - Training
  - Diagnostic tools
- Lack of priority given to patient education

#### ***Diagnostic tools and infrastructure***

- Problems with the availability of some laboratory tools
- Problems with reagents and consumables were variable in the facilities visited
- Financial constraints were stated as the main problem for poor supplies of reagents and equipment
- Major lack of tools for the diagnosis of complications was present

#### ***Drug procurement and supply***

- Difference between recommendations from World Health Organization Essential Medicines List and Kyrgyz Essential Medicines List
- About US\$ 2 – US\$ 3 million spent on diabetes supplies representing 1.4-2.0% of total expenditure on health
  - Estimated 75% spent on insulin
  - High overall cost due the purchase of insulin in penfills and analog insulin
- High tender prices compared to international guidance prices
- Problems with quantification of needs for diabetes supplies
- The main problem with insulin was not the overall supply, but the distribution of this total amount throughout the country
- Committee comprising the Ministry of Health, Diabetes Association of Kyrgyzstan and Physicians responsible for preparing the tender, which is carried out by lots
- Procurement law states that tenders need to be carried out by lots
  - Issues raised whether State Procurement Law is adapted to the purchase of medicines
- No issues were reported with customs procedures
- Medicines in Kyrgyzstan are exempt of any Value Added Taxes and import duties
- The cold chain was stated as not being a problem
- Large quantities of insulin stored at some facilities at District level

#### ***Accessibility and affordability of medicines and care***

- Only one District visited at the time of this study did not have insulin (92% availability of insulin)
  - Insulin is available for free
- A problem however was noted with syringes with 75% of facilities visited not having syringes
- Oral medicines available in the public sector Glibenclamide and Repaglinide
  - However, Repaglinide is not included on the essential list
- Some facilities using their own funds or funds from City budgets bought some Metformin
  - Metformin first line of treatment in the clinical guidelines, yet not purchased centrally in sufficient quantities

#### ***Healthcare workers***

- Despite facing many challenges, low salaries and lack of access to proper tools for care, the level of knowledge, care and dedication provided by doctors in Kyrgyzstan should be commended

- National clinical practice guidelines are currently being developed
- Many regions and districts have an Endocrinologist
  - Not necessarily a specialist, but will serve as a focal point for diabetes and other endocrine disorders
- Family General Practitioners were not able to treat diabetes
  - “Scared” of treating diabetes, especially using insulin
- Nurses in Kyrgyzstan play no role in diabetes management
- Different training programmes have been initiated, but did not provide healthcare workers with the practical tools they needed to manage diabetes

#### ***Adherence issues***

- Poor adherence due to:
  - People with Type 2 diabetes needing to purchase Metformin
  - Poor knowledge

#### ***Patient education and empowerment***

- Diabetes schools and education centres have been established in some facilities
- Doctors are responsible for delivering education, but are often too busy to do this
- Information and education materials are sometimes present, but not adapted to the Kyrgyz context with regards to diet and socio-economic situation
- Patient education for Type 1 diabetes was extremely well delivered
- Education for people with Type 2 diabetes was extremely poor

#### ***Community involvement and diabetes associations***

- The Diabetes Association of Kyrgyzstan was established in 1998 with as its mission to protect the rights of people with diabetes
- Diabetes Federation created in 2008 by parents with children with Type 1 diabetes
  - Activities are focused on patient education
- Most of the activities of these associations are focused in Bishkek
  - Despite resource constraints they have been able to do some important work for people with diabetes in Kyrgyzstan

#### ***Positive policy environment***

- Included in the National Health Programme is cardiovascular disease
  - Common risk factors with diabetes
  - Diabetes risk factor for cardiovascular disease
- In 2006 a law on diabetes came into being
  - Primary prevention and a commitment to healthy lifestyles
  - Actions that are scientifically justified
  - Free provision of medicines and self-monitoring devices
  - Training of healthcare workers including in diabetes education and counselling
  - Social aspects

#### ***Recommendations***

##### ***Organisation of the Health System***

- Standardisation and organisation of patient pathways
- Include diabetes patient education as an integral part of the medical consultation
- Assess the use of yearly inpatient care for people with diabetes

##### ***Data Collection***

- Clearly define the role of the diabetes register and ensure it is used for planning and decision making
- Improve the use of all data collected (quality and reliability) and use this data for planning and reporting

### ***Prevention***

- Increase the use of socio-culturally adapted means of primary prevention
- Increase awareness of diabetes, its risk factors and symptoms for healthcare workers and population as a whole
- Improve patient education

### ***Diagnostic tools and infrastructure***

- Improve availability of diagnostic tools and tools for the management of diabetes related complications
  - Define the tools which should be present at different levels of the health system

### ***Drug procurement and supply***

- Follow WHO guidance for the types of insulin and medicines purchased
  - Link purchases with clinical guidelines
- Review State Procurement Law to see if this is adapted to the purchase of medicines
  - Make amendments if necessary
- Improve planning of purchases
- Improve distribution system of insulin and other diabetes supplies

### ***Accessibility and affordability of medicines and care***

- Link supply of syringes to supply of insulin
- Ensure main oral medicines required by people with diabetes, e.g. Metformin are purchased in sufficient quantities

### ***Healthcare workers***

- Increase practical training for healthcare workers at different levels of the health system
- Define the role of nurses in diabetes care
  - Provide appropriate training

### ***Adherence issues***

- Increase in appropriate patient education and improved availability of medicines especially Metformin

### ***Patient education and empowerment***

- Development of patient education materials
  - In Kyrgyz and Russian
  - Adapted to the socio-cultural context

### ***Community involvement and diabetes associations***

- Define and expand role of diabetes associations
- Link diabetes with Kyrgyz-Swiss Village Health Committees project

### ***Positive policy environment***

- Emphasise the link between cardiovascular disease and diabetes and the common risk factors
- Develop a diabetes action plan that is integrated with measures specific for the cardiovascular disease national plan

## **Introduction**

The International Diabetes Federation estimates that the prevalence of diabetes in Kyrgyzstan for those aged from 20-79 will increase from 4.3% in 2003 to 5.8% in 2025. Data from the Ministry of Health show an increase in the number of cases of 26.9% from 2002-2008 with total cases in 2008 at 28,893 with 2,238 people requiring insulin. Prevalence rates vary greatly between regions in Kyrgyzstan with a range of 503.0-1,550.1 cases per 100,000 population. Rates of Type 1 diabetes in the capital city compared to those in a rural region in Children under 14 (2007) are 8.4 times higher.

Kyrgyzstan despite being considered a resource poor country with many health challenges has given diabetes a special status with the implementation of a diabetes law. This law provides care, medicines, consultations and laboratory tests. However, many challenges remain and this report aims to present these using 11 elements seen as key to a “positive diabetes environment”.

1. Organisation of the Health System
2. Data Collection
3. Prevention
4. Diagnostic tools and infrastructure
5. Drug procurement and supply
6. Accessibility and affordability of medicines and care
7. Healthcare workers
8. Adherence issues
9. Patient education and empowerment
10. Community involvement and diabetes associations
11. Positive policy environment

Implementing the RAPIA in Kyrgyzstan had as its aim to clearly identify the barriers to medicines and care that people with diabetes in Kyrgyzstan face in order to affect sustainable change in addition to increasing the data on diabetes and its financial impact on the health system and people with this condition.

## **1. Background Information**

### ***1.1. Diabetes***

Diabetes is a chronic disease defined by high blood glucose levels. This high level of glucose is because people with diabetes cannot use the glucose from digested food as energy for their cells. Insulin is the key molecule allowing glucose to be used by the body’s cells.

Type 1 diabetes (formerly Insulin Dependent Diabetes Mellitus, IDDM or child onset diabetes) is a life-long condition, affecting children, young people and adults worldwide. The disease is recognised by a loss of control over the use of the body's glucose and other fuels and is due to the destruction of insulin producing cells in the pancreas (pancreatic islet beta cells).

Insulin is vital for the survival of people suffering from Type 1 diabetes and in some people suffering from Type 2 diabetes (formerly Non Insulin Dependent Diabetes Mellitus, NIDDM). Type 2 diabetes can be managed with a combination of diet and lifestyle modifications, as well as oral medications and in some cases insulin.

However, also of central importance for the management of diabetes are the means to administer insulin (syringe/needles), the means to monitor the effectiveness of insulin (blood/urine tests) and an understanding of the interaction between insulin and life and work of the individual and vice-versa (training of healthcare workers and patient education).

In both Type 1 and Type 2 diabetes the result of inadequate care (elevated levels of blood glucose) lead to serious health complications such as blindness, kidney failure, nerve disease, limb amputation, heart attacks, strokes and premature death.

In Type 2 diabetes the pancreas does not produce enough insulin or peripheral organs do not use the insulin properly. Type 2 diabetes is closely linked with a sedentary lifestyle and obesity. This

form of diabetes once referred to as adult onset diabetes, as it appeared in people above the age of 40, has now been found to occur in extremely obese children and young adults.

Due to the increase in “Western” lifestyles the prevalence of Type 2 diabetes is becoming a major Public Health concern in many developed and developing countries. “Diabetes is a major threat to global public health that is rapidly getting worse, and the biggest impact is on adults of working age in developing countries. At least 171 million people worldwide have diabetes. This figure is likely to more than double by 2030 to reach 366 million.”<sup>1</sup> On the 20<sup>th</sup> of December 2006, the United Nations’ General Assembly passed a Resolution recognising diabetes as a chronic, debilitating and costly disease associated with major complications that pose severe risks for families, countries and the entire world and calls on Member states to “develop national policies for the prevention, treatment and care of diabetes in line with the sustainable development of their health-care systems, taking into account the internationally agreed development goals including the Millennium Development Goals”.<sup>2</sup>

### ***1.2. Insulin***

Insulin is a hormone, normally made by the pancreas, which regulates glucose metabolism. Insulin is a treatment for diabetes and not a cure and is administered by daily injections throughout the life of the person. Dosage of insulin injected by the individual varies from person to person based on, age, nutritional status and activity.

Without insulin, people with Type 1 diabetes die very quickly; meaning multiple daily injections of insulin are necessary for life. Some people with Type 2 diabetes need insulin for good metabolic control, but there is not the same urgency.

Insulin can be produced through the extraction and purification of animal pancreases or nowadays through bioengineering.

By different chemical preparations or genetic engineering, four basic types of insulin with their respective onset, peak and duration of action, are currently produced. These are:

- **Rapid-acting (Rapid insulin analogs):** begins to work after 15 minutes, peaks in 30 to 90 minutes, and has a duration of three to four hours.
- **Short-acting (Regular insulin):** begins to work in 30 to 60 minutes, peaks in two to three hours, and has a duration of three to six hours.
- **Intermediate-acting (NPH):** begins to work in 90 minutes to six hours, peaks in four to 14 hours, and has a duration of up to 24 hours.
- **Long-acting:** begins to work after 1 hour, has no peak, and remains effective for 24 to 36 hours.

Many people with diabetes use combinations of these different types of insulin to better control and manage their condition.<sup>3</sup>

Leonard Thompson, a Canadian child, was given his first injection of insulin on 11 January 1922. He was the first patient to be treated with insulin for Type 1 diabetes. Having survived some 2½ years from his diagnosis, he had done better than most people with Type 1 diabetes in the pre-insulin era. Insulin was discovered by Banting and Best in 1921 and became widely available in the “West” from 1922 onwards. Many studies have found that people requiring insulin in resource poor countries face restricted availability.

### ***1.3. International Diabetes Federation***

The International Diabetes Federation (IDF) is a worldwide alliance of over 200 diabetes associations in more than 160 countries, who have come together to enhance the lives of people with diabetes everywhere. The Federation is committed to raising global awareness of diabetes, promoting appropriate diabetes care and prevention, and encouraging activities towards finding a cure for the different types of diabetes. It is the mission of IDF to promote diabetes care, prevention and a cure worldwide.

IDF's working bodies bring together the most important stakeholders from the global diabetes community in a collaborative effort to set common goals and co-ordinate activities towards the attainment of these goals. These stakeholders include: people with diabetes and their families; professionals involved in diabetes healthcare and related fields; diabetes representative organizations, and partners from commercial organizations with concerns which align with our mission. IDF is associated with the Department of Public Information of the United Nations and is in official relations with the World Health Organization (WHO) and the Pan American Health Organization (PAHO).

The Task Force on Insulin, Test Strips and Other Diabetes Supplies was established by IDF to meet the challenges posed by the lack of access to and availability of insulin and diabetes supplies in many countries of the world. The remit of the Task Force is to provide support to member associations with regard to access, affordability and other issues relating to insulin, test strips and other diabetes supplies at national and international levels. To fulfil its remit, the Task Force is working with the International Insulin Foundation (IIF) to carry out country assessments in order to identify the challenges, recommend targeted solutions and seek sustainable ways of implementing these solutions.

### ***1.4. International Insulin Foundation***

The IIF was established by leading academics and physicians in the field of diabetes with the aim of prolonging the life and promoting the health of people with diabetes in resource poor countries by improving access to diabetes care.

In order to achieve these objectives, a clear analysis of the constraints to insulin access and diabetes care is needed. The IIF's view is that increasing the supply of insulin through donations or other means, however generous, offers only temporary relief and that the root of the problems of insulin supply and diabetes care need to be identified and tackled. This led the IIF to develop the Rapid Assessment Protocol for Insulin Access (RAPIA).<sup>4</sup>

Mozambique was the first country where the RAPIA was implemented. Since this implementation the RAPIA has been carried out in Mali, Nicaragua, Vietnam, the Philippines and Zambia.

Past implementations of the RAPIA have led to improved supplies of insulin, development of diabetes associations, improved education and development of Non Communicable Disease (NCD) policies. The IIF always works closely with local partners in implementing the RAPIA and developing adapted recommendations. For this work in Kyrgyzstan the IIF worked with the Health Policy Analysis Centre (HPAC).

### ***1.5. Health Policy Analysis Centre***

The HPAC was established in 2003 to support monitoring and evaluation of health reforms in Kyrgyzstan. It was initiated by the Ministry of Health with the support of WHO and Department

for International Development (DFID). In July 2009 HPAC became a Public Foundation with the following activities:

- Policy Analysis and Monitoring
- Policy advice and dialogue
- National and international training
- Fund raising
- Consultancy

### ***1.6. Rapid Assessment Protocol for Insulin Access – method of assessment***

The aim of the RAPIA<sup>4</sup> is to serve as a practical field guide to assist teams in the collection, analysis and presentation of data to evaluate and inform the development of health care services for diabetes management in low and middle income countries.

The RAPIA is structured as a multi-level assessment of the different elements that influence the access to insulin and care for people with diabetes in a given country.

The RAPIA is divided into 3 components:

- Macro – aimed at the Ministerial levels, Private Sector, National Diabetes Association, Central Medical Store and Educators
- Meso – Provincial Health Officers, "Health Care Settings" (Hospitals, Clinics, Health Centres, etc.) and Pharmacies/Dispensaries
- Micro – Carers (Healthcare Workers and Traditional Healers) and people with diabetes.

The RAPIA provides information in the categories of:

- Health service structure and functioning with regards to procurement of medicines, diabetes management
- Diabetes policies written and enacted
- Reported and observed practice for diabetes management
- Availability of insulin, syringes and monitoring equipment
- Existence of distribution networks for insulin
- Insulin supply-related knowledge and attitudes amongst people with diabetes and their carers.
- Other problems that hamper the access to proper insulin and care

The RAPIA is not a statistical assessment of the health system, but has as its aim to assess in a short time the situation with regards to diabetes care in a given country. Its aim is to get a picture of the health system in order to provide different stakeholders involved in diabetes in a given country recommendations for action.

### ***1.7. Kyrgyzstan***

Kyrgyzstan, a former Soviet State, is located in Central Asia bordering Kazakhstan to the North, Uzbekistan to the West, Tajikistan to the South and China to the East. The capital is Bishkek located in the North of the country. A map of Kyrgyzstan can be found in Appendix 1. Kyrgyzstan is divided into 7 Oblasts (regions) and further divided in Rayons (districts).

Kyrgyzstan's total population is 5,431,747 (2009 estimate) with 29.7% aged from 0-14, 64.5% aged from 15-64 and 5.8% aged above 65.<sup>5</sup>

With a Gross Domestic Product (GDP) per capita estimated at US\$ 2,200 at Purchasing Power Parity (PPP), Kyrgyzstan is classified as a low income country.<sup>5</sup> Life expectancy at birth is 69

years and Kyrgyzstan is ranked 120 out of 182 on the UNDP's Human Development Index, highlighting the many challenges this country faces with regards to health, education and income.<sup>6</sup>

After independence Kyrgyzstan focused on developing a market economy and democracy, however due to the collapse of the economic system established during Soviet times the country faced a severe economic recession. All sectors including the health sector had insufficient funds allocated to them. This meant that the health system was unable to maintain the infrastructure and excess specialist capacity established during the Soviet era and the health system was seen as failing.<sup>7-8</sup>

### ***1.8. Healthcare in Kyrgyzstan***

From 1996-2005 the Ministry of Health implemented its National Health Care Reform Programme "Manas" with a focus on the principles of equity, affordability and accessibility to health for the Kyrgyz population. Following the "Manas" Programme the "Manas Taalimi" Programme was established for the period 2006-2010. The focus of this new programme was to achieve the health Millennium Development Goals through the following improvements in the health system:<sup>9</sup>

1. Achieve equity and accessibility
2. Decrease financial burden on population
3. Increase efficiency
4. Improve quality
5. Increase responsiveness

During these reforms fundamental changes have taken place in the health financing system. Tax revenues received by the government have served as the main source of health funding. In 1997 a Mandatory Health Insurance (MHI) was introduced with a view of attracting additional sources of funding to the health sector and ensuring social protection of population. This led to the establishment of the Mandatory Health Insurance Fund (MHIF) in 1996. The MHIF acts as a single payer in Kyrgyzstan for health. It pools the resources available and purchases health services. Funds for the MHIF are received from the Social Fund and the Republican (National) Budget depending on the person to be covered. This information is detailed in Appendix 2. Funds are pooled at the Oblast level. As of 2004, 84% of the population were covered.<sup>8</sup>

Once insured through the MHIF the person is entitled to a package of free primary care from a specific Family Group Practice (FGP) at which the individual is registered. Inpatient care is covered if the person is referred from their FGP, but a copayment is necessary. Depending on the category of the population the person falls in referrals are free or nearly free. For people with diabetes these are free.<sup>8</sup> Total expenditure on health per capita at PPP is estimated at US\$ 127 with 6.4% of GDP being spent on health.<sup>10</sup>

The Kyrgyz health system is trying to devolve care to FGPs and special training and programmes have been developed to strengthen this level.

With regards to medicines the Additional Drug Package of the MHIF was introduced during the period from 2000-2003 for outpatients. Under this package a proportion of the costs of medicines necessary for the management of conditions at the Primary Care Level are covered through the MHIF. These medicines are sold in private pharmacies that have a contract with the MHIF.<sup>9</sup>

The Ministry of Health only has a supervisory role over the quality of the health provided to the Kyrgyz population except for some Tertiary facilities in Bishkek. Its responsibility is implementing the National Health Policies and coordinates and controls territorial health organisations (at Oblast level) through coordination commissions on health management.<sup>8</sup>

Health facilities are managed and owned by local governments. Through the coordination commissions on health management these organisations implement national health policy as determined by the Ministry of Health.<sup>8</sup>

The organisation of the health system and its levels of care are described in the table below.

**Table 1 – Levels of care in Kyrgyzstan**

Level of care	Description
Primary	Feldsher Midwife Posts Family Group Practices Family Medicine Centres
Secondary	General Hospitals (City and Rayon Hospitals)
Tertiary	Republican Hospitals Specialised Dispensaries

Adapted from<sup>8</sup>

In 2006 there were 30,824 nurses and midwives (58.0 per 10,000 population) and 12,710 physicians (24 per 10,000 population) in Kyrgyzstan. A clear shortage of pharmacy personnel was noted with less than 1 pharmacist per 10,000 population.<sup>10</sup>

### **1.9. Health profile**

Life expectancy at birth in Kyrgyzstan is estimated to be 63 years for men and 70 years for women.<sup>10</sup> the main cause of mortality is Ischemic Heart Disease representing 24% of total deaths.<sup>10</sup> Kyrgyzstan could gain 4.5 extra years of average life expectancy if it was able to reduce death rates of Cardiovascular Disease (CVD) down to European levels. This would be compared to 3.9 years for a reduction of child and maternal mortality.<sup>11</sup> CVD in Kyrgyzstan impacts those of working age. In 1990 CVD related mortality among people in the age 30-39 was 47.4 cases per 100,000 population, whereas in 2004 it increased to 56.7 cases per 100,000 Population.<sup>12</sup> In comparison this rate for Sweden was 11 cases per 100,000.<sup>11</sup>

It was found that this high level of mortality could be explained by low awareness of the population and the financial barriers to treatment.<sup>13</sup>

Hopkinson et al.<sup>14</sup> found that one of the main barriers to healthcare utilisation for diabetes was the lack of money for treatment with barriers to diabetes care including problems with supplies, healthcare workers and high cost of treatment. In parallel to this Kyrgyzstan is facing an ageing of its population as well as a transition to a larger burden of NCDs. A study by Young et al.<sup>15</sup> found an age adjusted rate of hypertension of 39%. In a study by Jakab et al.<sup>13</sup> awareness, treatment and control of hypertension in Kyrgyzstan were found to be low, with respective values of 27%, 17.1% and 14%.

This is recognised in Kyrgyzstan with the presence of a diabetes association and a national diabetes programme that was initiated in 1998.<sup>14</sup> This same work highlighted the high levels of complications, especially with regards to eyes and feet, during discussions with patients.

## **2. Situation Analysis of diabetes in Kyrgyzstan using the RAPIA**

Implementing the RAPIA in Kyrgyzstan had as its aim to clearly identify the barriers to medicines and care that people with diabetes in Kyrgyzstan face in order to affect sustainable change in addition to increasing the data on diabetes and its financial impact on the health system and people with this condition. Following this initial assessment the information provided will allow specific projects to be developed to address problems identified in order to improve diabetes care and access to medicines for this condition in a sustainable manner. It will also help develop a health system capable of tackling the growing challenge of chronic diseases in Kyrgyzstan.

Past implementations of the RAPIA have lead to:

- Improved access to insulin and other medicines for diabetes
- Improved purchasing measures and decreased prices for insulin and medicines for diabetes
- Development of diabetes associations
- Development of national policies for diabetes and non communicable diseases
- Funding for diabetes projects
- Improvement in care for people with diabetes
- Increased awareness within the country where the RAPIA was implemented and internationally about the problems of diabetes

This was the first implementation of the RAPIA in Central Asia and this will help to see if the lessons learned from implementations in sub-Saharan Africa, Latin America and Asia are valid in the Central Asian context.

Recommendations from work in 2004 by Hopkinson et al. <sup>14</sup> stated that what is needed in Kyrgyzstan is to “improve access to physical resources, such as glucometers and test strips, and to ensure a stable supply of insulin, especially in rural areas. This study suggests that it may be helpful to reassess the separate system for procurement and distribution of insulin.” This is why it has been proposed to implement the RAPIA in Kyrgyzstan to assess the current barriers to care to assist the diabetes association and national diabetes programme improve the prevention of diabetes, care for people with diabetes and help prevent complications and premature mortality.

It has been proposed <sup>16-17</sup> that Type 1 diabetes can be used as a tracer condition to measure the ability of a health system to provide care for all chronic conditions. This would mean that this research would also have an impact for all chronic conditions and on the large and increasing burden of people with Type 2 diabetes.

There is a need for the Kyrgyz health system to develop models for managing chronic disease in order to address the potential human and economic impact of the rising trend of chronic diseases, which may overburden both the health system and households and therefore impact development. The implementation of the RAPIA will result in concrete recommendations for the health system in Kyrgyzstan to ensure that economic development is not jeopardized by increasing levels of chronic conditions.

The RAPIA in Kyrgyzstan was carried out in Bishkek (city), Issyk-Kul Oblast (3 Rayons) and Osh (3 Rayons) with a total of 192 interviews, detailed in Table 2.

**Table 2 – Detail of number of interviews of the RAPIA in Kyrgyzstan**

	MACRO	MESO	MICRO	Total
<b>Bishkek</b>	10	15	58	<b>83</b>
<b>Issyk-Kul</b>		12	35	<b>47</b>
<b>Osh</b>		15	47	<b>62</b>
<b>Total</b>	<b>10</b>	<b>42</b>	<b>140</b>	<b>192</b>

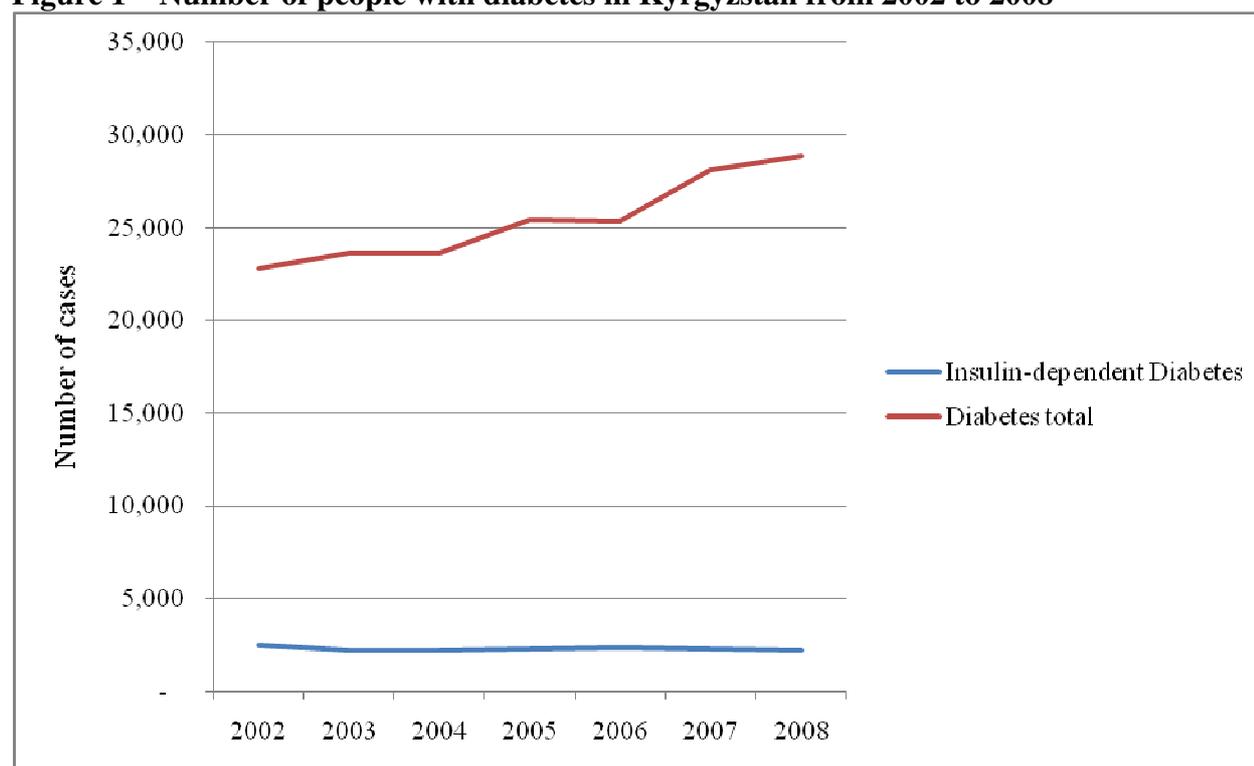
### 3. Diabetes in Kyrgyzstan

CVD is the main cause of adult mortality in the Kyrgyz Republic and mainly impacts men of working age.<sup>9 13</sup> Diabetes is a risk factor for CVD and both diseases share the same risk factors. Due to this high burden it is viewed as a priority disease within the “Manas Taalimi” Programme, which is further described in Section 4.11. Positive policy environment.

As stated by many health professionals, “endocrinology in Kyrgyzstan is mainly diabetes and goitre.” Data from one hospital visited showed that diabetes represented 93.9% of the patient load in the endocrinology department. The IDF estimates that the prevalence of diabetes in Kyrgyzstan for those aged from 20-79 will increase from 4.3% in 2007 to 5.8% in 2025.<sup>18</sup>

Data from the Kyrgyz Ministry of Health are presented in the graph below.

**Figure 1 – Number of people with diabetes in Kyrgyzstan from 2002 to 2008**



The precise numbers used for this graph are detailed in Appendix 3. These statistics show an increase in the number of cases of 26.9% over the period. A specific example from a Family Medicine Centre with regards to new diagnoses showed that in 2008 out of a cohort of 835 patients, 111 were new diagnoses representing 13.2%.

Closer analysis of data from the Ministry of Health from 2007 and 2008 shows possible errors in data or a high level of loss to follow-up and deaths.

**Table 3 – Data on number of cases of diabetes in 2007 and 2008**

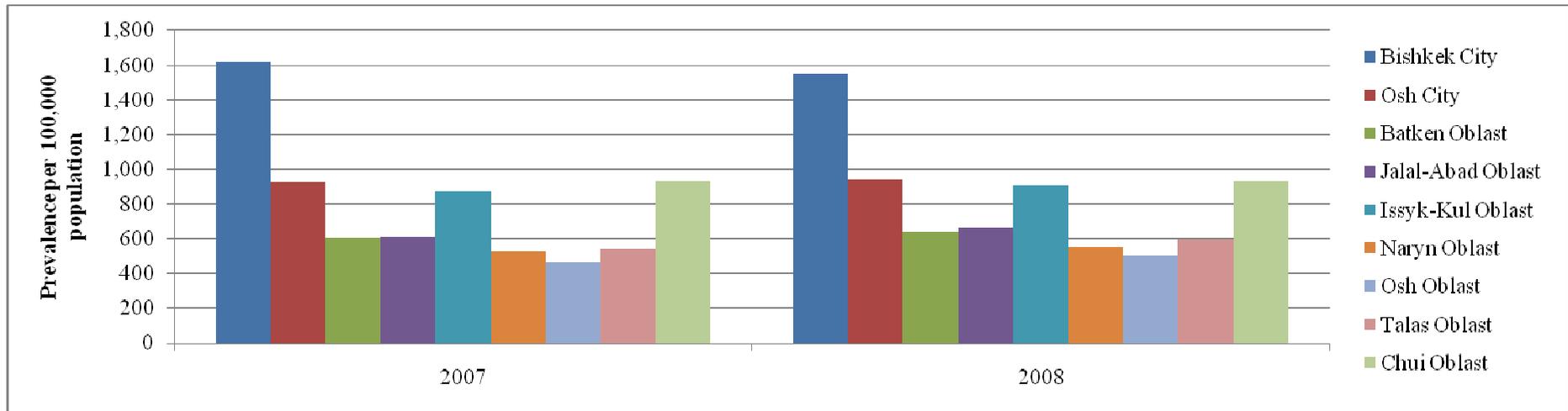
	<b>2007</b>	<b>New cases 2008</b>	<b>Expected total 2008*</b>	<b>Actual reported cases 2008</b>	<b>Difference</b>	<b>% age loss to follow-up/deaths</b>
Diabetes total cases	28,077	2,960	31,037	28,893	2,144	6.9%
Diabetes insulin dependent	2,322	182	2,504	2,238	266	10.6%
Children under 14	178	46	224	193	31	13.8%
Teenagers	90	6	96	74	22	22.9%
Adults (total cases)	27,787	2,897	30,684	28,569	2,115	6.9%
Adults (insulin-dependent)	2,054	130	2,184	1,971	213	9.8%

\* = Total from 2007 + new cases in 2008

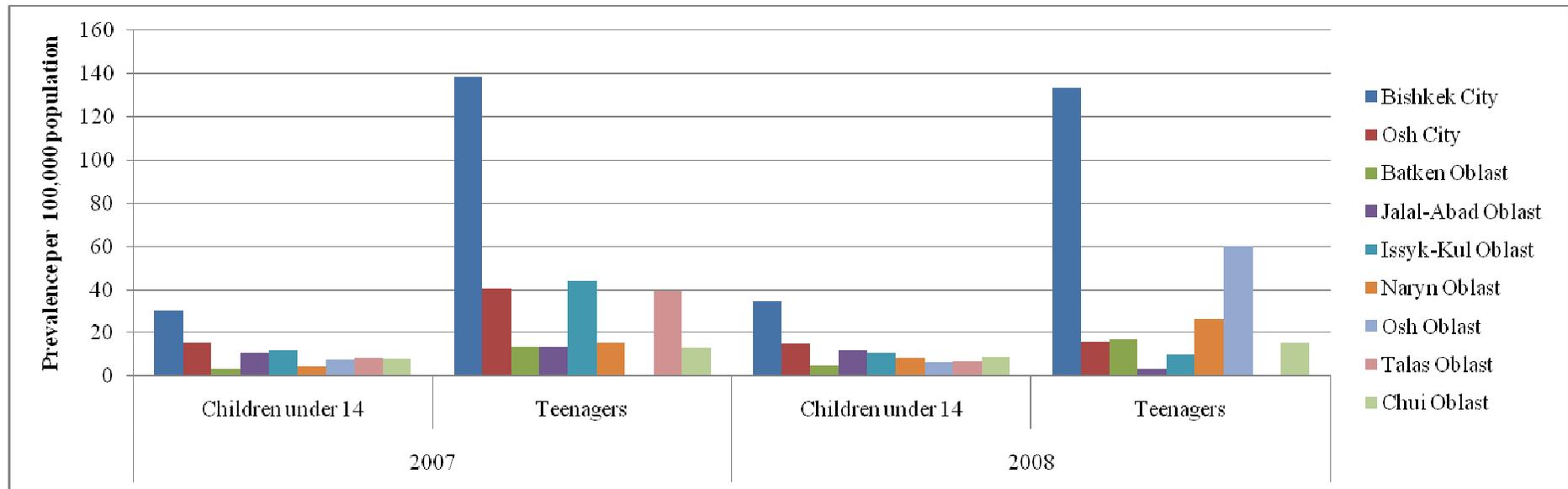
Assuming that the difference is linked to loss to follow-up/death it is clear that this rate is higher for those requiring insulin.

Data looking at each Oblast for the years 2007 and 2008 show the following prevalence rates for diabetes in different age groups.

**Figure 2 – Graph of prevalence of diabetes in adults**



**Figure 3 – Graph of prevalence of diabetes in children under 14 and teenagers**



A table detailing the data from Figure 2 and Figure 3 is included as Appendix 4. As can be seen prevalence rates vary greatly, with Bishkek having the highest prevalence. In 2007 the range: of prevalence throughout Kyrgyzstan was 466.5- 1,616.9 per 100,000 population with a median of 610.8. This range was 503.0-1,550.1 per 100,000 population in 2008 with a median of 667.8. For Type 1 diabetes this variation also exists with 8.4 times more cases of Type 1 diabetes in Bishkek than Batken Oblast in Children under 14 in 2007.

Data collected from different sources during the RAPIA detailed in Table 4 shows the prevalence of Type 2 diabetes in the different areas compared to official statistics.

**Table 4 – Prevalence data comparing official statistics and RAPIA data**

Region	Prevalence of Type 2 diabetes per 100,000 population	
	2008 Ministry of Health Statistics	2009 data collected through the RAPIA*
Bishkek City	1,550	1,315**
		1,467***
Issyk-Kul Oblast	912	1,176
Osh Oblast	503	862

\* - these estimates use data on the number of people with diabetes from statistics at different facilities divided by the total population above 25 years of age

\*\* - uses the statistics from the City Endocrinology Dispensary with the denominator being the total population of Bishkek. This is done despite knowing that some people with Type 2 diabetes will be seen at FMCs and that some people seen at the City Endocrinology Dispensary are from outside of Bishkek

\*\*\* - uses data from one FMC on the number of people with Type 2 diabetes and the adult population served

From discussions during the RAPIA it was clear that many people with diabetes were diagnosed because of being seen by a healthcare worker for another condition or with complications. Many doctors stated that most people with Type 2 diabetes were elderly patients and they came with a “package of diseases”, mainly CVD.

This situation places a large burden on hospitals. Average stays were about 10 days and in one major hospital diabetes represented 16.7% of total bed days. As stated by a director of a Rayon Hospital, “we always have people with diabetes”. Precise data was lacking on the reasons for admission, but high levels of blood glucose and complications were stated as the most common causes.

Data on complications was also not present. Information provided from one hospital showed that in the cohort of patients that were followed 15.0% had Retinopathy, 90% Neuropathy and 15.9% had Nephropathy. Of the people with Nephropathy, 33.1% had chronic renal failure with 5.0% in terminal stage.

A proxy measure for how a system is doing with regards to diabetes management can be seen to be the life expectancy of children with Type 1 diabetes. The calculations in the table below use the prevalence data from the Ministry of Health, data from the RAPIA and incidence data from the IDF<sup>18</sup>.

**Table 5 – Prevalence and life expectancy estimates for Type 1 diabetes in the three areas of the RAPIA in Kyrgyzstan**

Region	Prevalence of Type 1 diabetes per 100,000 population		Life expectancy (years)	
	2008 Ministry of Health Statistics	2009 data collected through the RAPIA*	Ministry of Health data	RAPIA data
Bishkek City	34.5	31.1	28.8	25.9
Issyk-Kul Oblast	10.9	12.0	9.1	10.0
Osh Oblast	6.3	8.0	5.3	6.7

\* - these estimates use data on the number of people with Type 1 diabetes from statistics at different facilities divided by the total population from 0-15

These differences in life expectancy may be explained by different factors which are detailed in the results below with regards to access to insulin and care in the different areas of Kyrgyzstan. It should be noted that some of these differences can possibly be explained by some “migration” of people to Bishkek for care for Type 1 diabetes.

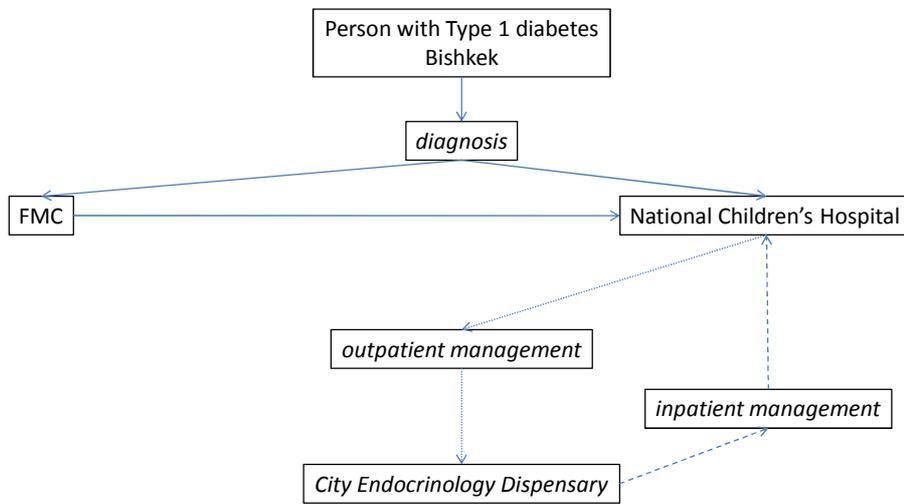
## **4. Results**

### ***4.1. Organisation of the Health System***

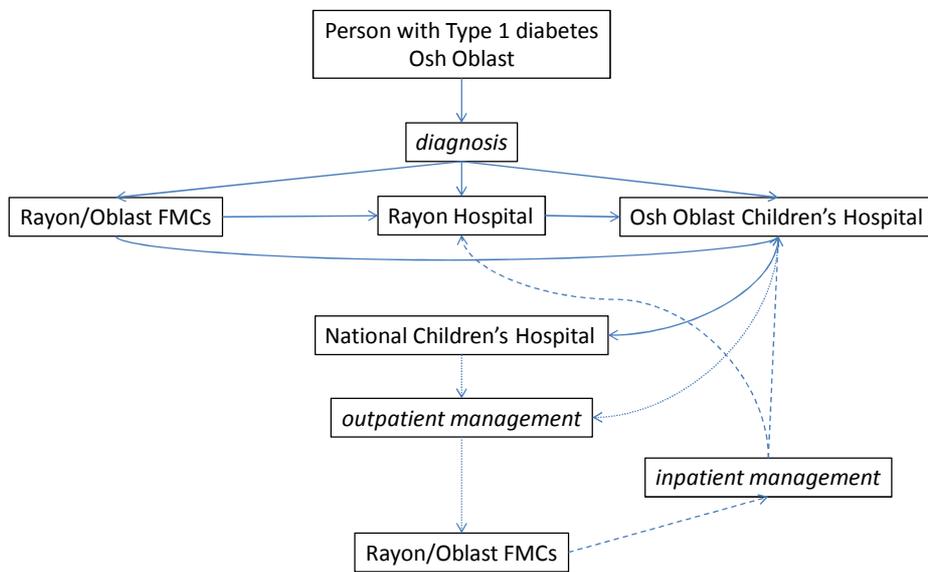
In order to see how the health system works with regards to the management of diabetes it is important to look at the situation in Bishkek, Osh and Issyk-Kul separately as well as for Type 1 and Type 2 diabetes. From interviews with people with diabetes during the RAPIA 52% were diagnosed at FMCs. 67% of people interviewed were referred to another health facility after their initial diagnosis with 33% being sent to Oblast Hospitals and 26% referred to the City Endocrinology Dispensary.

The patient pathways, as described during the implementation of the RAPIA are detailed in the diagrams below.

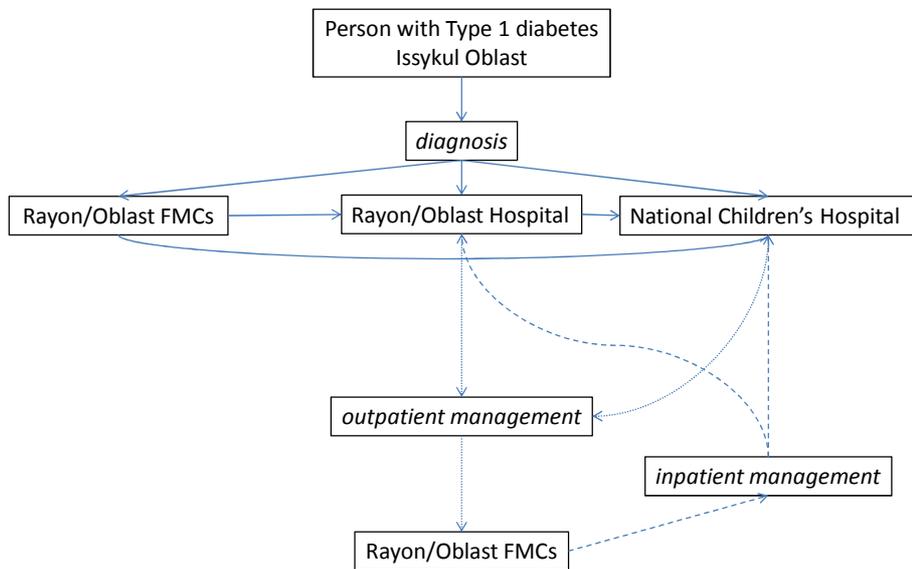
**Figure 4 – Path of person with Type 1 diabetes in Bishkek**



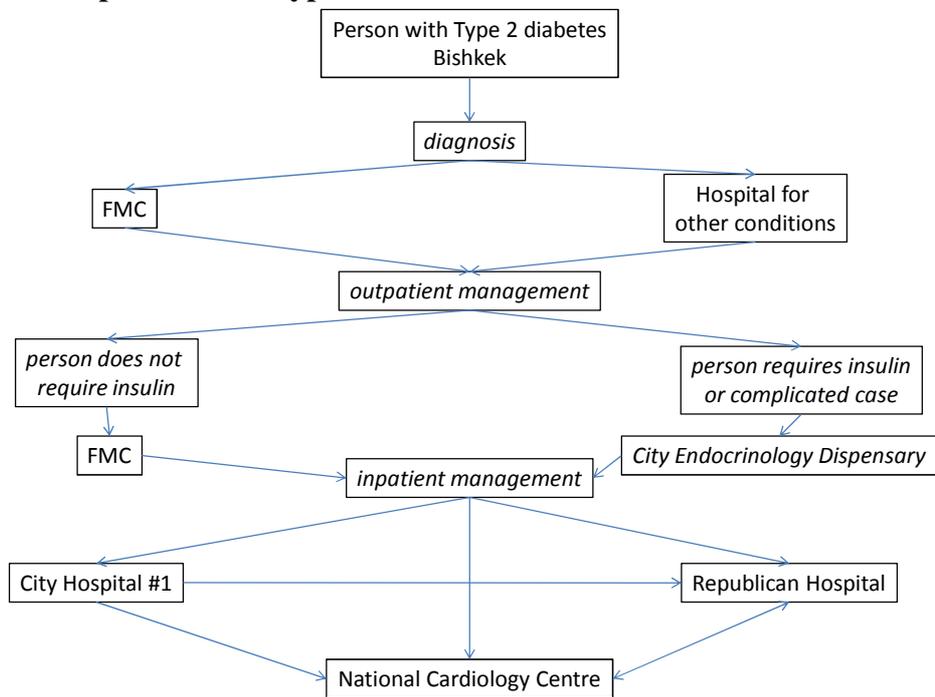
**Figure 5 – Path of person with Type 1 diabetes in Osh Oblast**



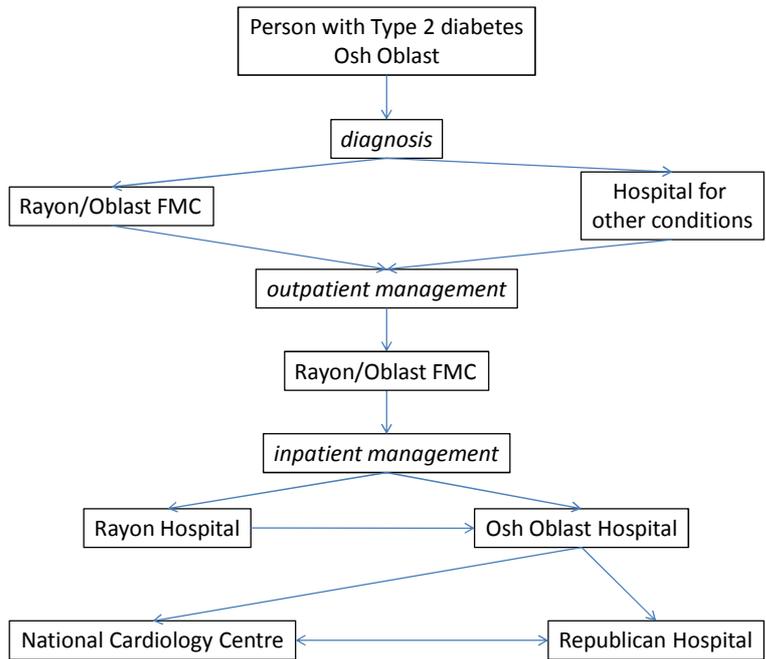
**Figure 6 – Path of person with Type 1 diabetes in Issyk-Kul Oblast**



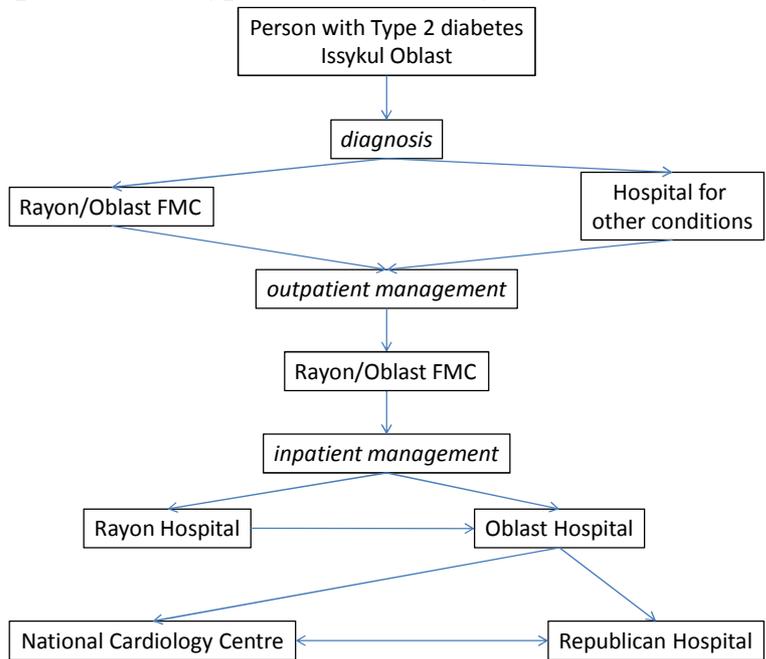
**Figure 7 – Path of person with Type 2 diabetes in Bishkek**



**Figure 8 – Path of person with Type 2 diabetes in Osh Oblast**



**Figure 9 – Path of person with Type 2 diabetes in Issyk-Kul Oblast**



As can be seen in the diagrams above the pathways outside of Bishkek can be quite complex. Also these pathways represent theoretical general pathways, with of course each patient having their own unique pathway. For example some children with Type 1 diabetes were referred to the infectious disease department of the National Children’s Hospital before their diabetes was diagnosed as well as adults being diagnosed in other departments of hospitals (Republican, Oblast or Rayon) before being sent to the Endocrinology department.

#### *4.1.1. Bishkek*

FMCs in Bishkek will only manage people with Type 2 diabetes not requiring insulin. People requiring insulin will be sent to the City Endocrinology Dispensary. This facility acts as a secondary level facility with regards to diabetes in Bishkek with Family Medical Centres referring complicated cases of diabetes and people on insulin.

People with diabetes requiring inpatient care will be sent to City Hospital #1.

There is no National Hospital of Endocrinology, but within the Republican (National) Hospital there is a Department of Endocrinology acting as the Tertiary level of care for the country. As well as the care provided by the Department of Endocrinology at the Cardiology Institute there was an Endocrinologist providing Tertiary level care for people with diabetes which was comparable to the care provided at the Endocrinology Department. Both these departments will see patients from all of Kyrgyzstan.

People with Type 1 diabetes are managed as outpatients at the City Endocrinology Dispensary. There is a Paediatric Endocrinologist present at this facility. Other specialists for diabetes management and its related complications are also present at the City Endocrinology Dispensary.

#### *4.1.2. Issyk-Kul and Osh Oblasts*

In Issyk-Kul and Osh Oblasts both at an Oblast and Rayon level FMCs had endocrinologists or specific people identified to care for people with diabetes FMCs provided diabetes care mainly for Type 2 diabetes. People with Type 2 diabetes using insulin will only be seen by the Endocrinologists at these facilities. Family doctors (Generalists) will see people with Type 2 diabetes not on insulin. Sometimes one person was responsible at both FMC and Hospital level for diabetes care. A close collaboration at Rayon level between the hospital and FMC was noted. Specific beds at Rayon and Oblast hospitals were identified for Endocrinology care.

Osh Oblast and Osh Children's Hospital were able to manage diabetes at quite a high level and therefore avoided referring patients to Bishkek.

In theory children diagnosed outside of Bishkek with Type 1 diabetes will be sent to Bishkek for initiation of treatment and sent back to the doctor at their Family Medical Centre with guidance on insulin administration. This was more common in Issyk-Kul than in Osh as in Osh Children were sent to Osh Children's Hospital.

#### *4.1.3. Referrals, counter-referrals and yearly check-ups*

From a health systems perspective referrals and counter-referrals were described as working well. These are detailed in the figures above. At each facility detailed patient notes are taken in a patient file (described in Section 4.2. Data Collection). Patients are referred with their patient notes and then when they are discharged a discharge note is sent to the person's doctor at their FMC. These notes include detailed indications regarding treatment, instructions and diet.

Every year patients are sent for one or two inpatient stays. During these stays, and any other period as an inpatient, patients are reviewed by different specialists for most diabetes related complications. The more peripheral hospitals lack the variety of specialists and therefore people with Type 2 are referred on an annual basis to the Republican Hospital or Oblast Hospital. Some

people self-refer to both Oblast level and Bishkek. For Type 1 diabetes referral for inpatient care seems to be dealt with more on a case by case basis.

In this annual review the following are included:

- Lab tests
- Urine tests
- Eye check with specialist
- Neurology consultation
- Expert opinion and recommendations

Patients from rural areas and regions arrive and see a doctor responsible for triage at the Republican Hospital before being admitted. They need to meet certain criteria for admission, these are:

- High blood sugar over 10 mmol/dl
- Complications
- Albuminuria
- Eye problems

The average stay for inpatients was 10 days at all Hospitals. At some hospitals (Rayon and Oblast) in Issyk-Kul it was stated that changes in insulin treatment were only done at Republican level for children with Type 1 diabetes. This meant that children were sent to Bishkek. Ideally it was stated that children with Type 1 diabetes were seen by a doctor once per month. For Type 2 this was more variable with regards to control, being on insulin or not and any existing complications.

#### **4.2. Data Collection**

Disease surveillance for NCDs is included in the National Health Programme.<sup>9</sup> The “Manas Taalimi” Programme aims to use data and information in order to influence policy and decision making, monitoring and evaluation.<sup>9</sup>

A diabetes register is being developed to help with the monitoring of the distribution of insulin as well as future tendering. It is not clear what role the register will have, whether it is to control supplies of diabetes medicines and insulin or to collect data on diabetes and diabetes related complications. Based on seeing the pilot version of this tool it seems as though it will try to play both roles. This pilot has been established in 2 FMCs, the City Endocrinology Dispensary and Chui Oblast FMC.

Each patient will have their own patient file which is taken by the patient to the different facilities they may visit. This data is then amalgamated at facility, Oblast and finally national level. Form 51, “Report on prevalence on Endocrine Pathologies” collects information once per year on people with diabetes and is used in planning for tenders in the next year. The data flow from facilities to the Ministry of Health works well, but the use of this data for planning at different levels of the health system seems weak.

In the patient file, doctor’s notes, test results and referrals are detailed. For example after being discharged recommendations will be written in the patient file with regards to:

- Changes in treatment
- Dietary recommendations

In addition to these formal data collection tools there is also a list of people using insulin and penfills. This is sent to the Chief Endocrinologist.

In discussions at different levels there seem to currently be a few problems with data collection. These were stated as being:

- Data collection is done manually, with possible errors and omissions
- Patients who have not come to see doctor in quite some time are still included in register
- Time consuming due to manual data entry
- Few FMCs are computerised
- Another form is used for registering deaths

### **4.3. Prevention**

Under the first component of the “Manas Taalimi” Health Programme there is the inclusion of the use of mass media to promote disease prevention.<sup>9</sup> However, no primary prevention programmes for diabetes were visible. Some awareness activities are organised around World Diabetes Day.

The main issue raised with regards to prevention was the problem of early detection of diabetes and its related complications. The reasons mentioned for this were people seeking care too late due to:

- Lack of knowledge
- Financial issues, especially transportation costs to Bishkek

Only people with hypertension are actively screened for high levels of blood glucose, those with other risk factors are not.

Another issue raised was with regards to the attitudes of people in Kyrgyzstan and how this impacted their use of the health system. Many people were said to “close their eyes on the disease” and only visit health facilities when the particular condition starts impacting daily life.

Some problems exist treating some complications, of which Neuropathy, Retinopathy and diabetes foot were mentioned as the most common. In addition there is a serious lack of tools and training for the diagnosis of complications, as well as problems with adherence.

One key factor linked to prevention is the lack of priority given to patient education. Within the clinical protocol on diabetes clear indications for diet and physical activity are given. These guidelines have yet to be distributed, but will need to assist healthcare workers in being able to deliver these recommendations in practical terms.

Every year people with diabetes will be hospitalised for a full check-up at Rayon, Oblast or National level. The aim of this inpatient treatment is to identify any complications and also adjust the management of medication.

Some screening of people with risk factors takes place, but it was not clear how often this happened. Some screening programmes were also organised around World Diabetes Day.

#### 4.4. Diagnostic tools and infrastructure

All facilities visited had the tools necessary for blood glucose testing. Some had the means to also do urine glucose tests. No facilities, even the National Hospital had the facilities for HbA1c testing. This was only available in the private sector at a cost of 200 Som<sup>1</sup> (US\$ 4.62).

Details of the availability of different laboratory equipment in the facilities visited are shown in Table 6.

**Table 6 – Availability of diagnostic equipment at facilities visited**

	<b>Glucometer</b>	<b>Strips for Glucometer</b>	<b>Biochemistry to measure blood glucose</b>	<b>Spectrophotometer to measure blood glucose</b>	<b>Urine strips</b>	<b>Ketone strips</b>
Availability at facility visited	67%	38%	33%	95%	71%	38%

Most testing was done using a spectrophotometer. The main problem with glucometers was the availability of the specific strips for the models of glucometer present as well as in some cases batteries for these. The glucometers at facilities were relatively old models, therefore most likely the manufacturers were no longer manufacturing the strips needed. Problems with reagents and consumables were variable in the facilities visited. Tenders for laboratory equipment took place once or twice per year. Staff in the laboratory will prepare a list of their requirements and send these to the administration of their facility. A tender is then prepared for these reagents and equipment.

Those facilities only using spectrophotometers did not report any problems as reagents were readily available and maintenance of the equipment was relatively simple. A few facilities visited with biochemistry analysers had had or were currently experiencing problems with these machines due to the expense of reagents or the equipment being out of order.

Financial constraints were stated as the main problem for poor supplies of reagents and equipment. In parallel to a lack of tools to test blood glucose levels, a major lack of tools for the diagnosis of complications was present, even at the Republican Hospital.

Another problem was the length of time for testing with most results being able to be obtained in 30 minutes. This was a problem in hospitals where for emergencies lack of a rapid test was available.

Testing for inpatients will be done twice per day once before breakfast once after breakfast. However, they will not get tested every day.

#### 4.5. Drug procurement and supply

Diabetes medicines have a special status in Kyrgyzstan as they are bought centrally by the government. Other medicines are distributed through the Private Sector.

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<sup>1</sup> For the purpose of this report the rate of US\$ 1.00 = Kyrgyz Som 43.33 will be used

In the past problems with the supplies of insulin have been reported.<sup>14</sup> Data from this report are detailed in the table below and show varying quantities of insulin purchased each year from 25,010 vials in 1995 to 572,250 in 1997.

**Table 7 – Data on insulin procurement from 1994-2001 (adapted from<sup>14</sup>)**

<b>Year</b>	<b>Quantity (vials)</b>	<b>Total cost (US\$)</b>	<b>Cost per vial (US\$)</b>
1994	60,000	\$198,444.00	\$3.31
1995	25,010	\$138,685.00	\$5.55
1996	102,198	\$348,531.00	\$3.41
1996	34,000	\$137,963.00	\$4.06
1997	572,250	\$200,741.00	\$0.35
1998	28,163	\$99,999.00	\$3.55
1998	22,000	\$50,000.00	\$2.27
1998	13,900	\$141,600.00	\$10.19
1998	8,000	\$39,600.00	\$4.95
1999	40,000	\$162,500.00	\$4.06
1999	8,096	\$64,768.00	\$8.00
1999	66,500	\$231,315.00	\$3.48
2000	26,000	\$158,545.00	\$6.10
2000	31,800	\$195,010.00	\$6.13
2001	39,600	\$374,020.00	\$9.44
<b>Total</b>	<b>1,077,517</b>	<b>\$2,541,721.00</b>	
<b>Average</b>	<b>134,690</b>	<b>\$317,715.13</b>	<b>\$4.99</b>

Most people interviewed during the RAPIA stated that insulin supply was stable and there were few problems compared to the past

The tender takes 6 months to prepare. Insulin and other medicines for diabetes are purchased through a tender once a year. Local wholesalers represent international companies and provide CIP (Cost Insurance Paid to Bishkek) prices. No issues were reported with customs procedures for medicines and the main requirement is that these medicines be registered in Kyrgyzstan. Medicines are exempt of any VAT and import duties.

A committee comprising the Ministry of Health, Diabetes Association of Kyrgyzstan and Physicians were responsible for preparing this tender. The tender in Kyrgyzstan is carried out by lots of specific types of insulin. The cheapest type of insulin should be bought in the lot. For example Levemir® and Lantus® fall within the same lot. However due to pressure from people with diabetes and doctors stating that their patients needed a specific type of insulin both types were purchased. This tender by lots is determined by a procurement law that many felt was not adapted to the purchase of insulin and medicines.

Table 8 below shows the different medicines and formulations that are on the Kyrgyz Essential Medicines List versus the WHO Essential List.

**Table 8 – Comparison between WHO and Kyrgyz Essential Medicine Lists**

	WHO <sup>19</sup>	Kyrgyzstan
Insulin	Soluble and Intermediate acting <ul style="list-style-type: none"> <li>Vials</li> </ul>	No specification of formulations <ul style="list-style-type: none"> <li>40IU and 100 IU in vial and cartridge presentations</li> </ul>
Glibenclamide	2.5 mg and 5 mg tablets	1.75 mg, 2.5 mg, 3.5 mg and 5 mg tablets
Metformin	500 mg tablets	250 mg, 500 mg and 850 mg tablets
Gliclazide	Not included	30 mg, 40 mg and 80 mg tablets
Rosiglitazone	Not included	2 mg, 4 mg and 8 mg tablets
Glimepiride	Not included	1 mg, 2 mg, 3 mg, 4 mg and 6 mg tablets

In looking at insulin purchased by Kyrgyzstan, 71% of units purchased in 2009 met the WHO guidance. This 71% represented 43% of total expenditure on insulin. Therefore 29% of the volume of insulin cost 57% of total expenditure as these were analog insulins, other formulations not on the WHO Essential list or in penfill form. Following WHO guidance would have lowered costs of insulin purchases by US\$ 740,000 or around 40% of total insulin costs. This is detailed in the table below.

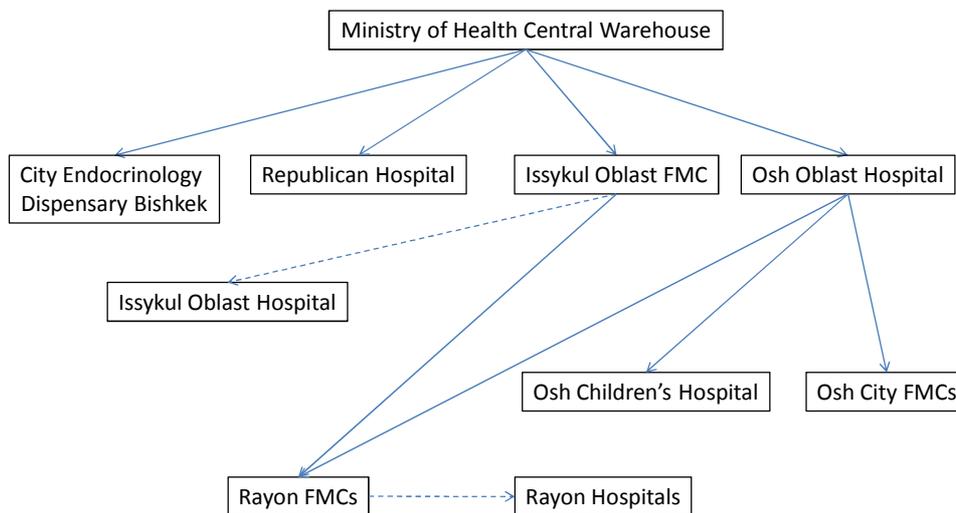
**Table 9 – Analysis of insulin purchases in 2009**

Insulin	Total units (10ml 100IU vial equivalent)	Percentage of total volume	Cost per 100IU 10ml vial equivalent (US\$)	Total cost (US\$)	Percentage of total cost
Meeting WHO criteria	160,000	71%	5.12	818,400	43%
Not meeting WHO criteria	64,150	29%	16.65	1,068,184	57%
<b>Total</b>	<b>224,150</b>			<b>1,886,584</b>	
All insulin purchased using WHO criteria	224,150		5.12	1,147,648	
<b>Potential saving by purchasing using WHO criteria</b>				<b>738,936</b>	

In Kyrgyzstan there is no centralised purchasing of medicines except for insulin and some oral medicines for diabetes. From the Central Ministry of Health warehouse insulin is supplied to the

Oblast FMC in Issyk-Kul-Kul and Oblast Hospital in Osh. These organisations are then responsible for distributing this throughout the Oblast. Each level needs to go and get insulin from the higher level of the health system. Oblast levels need to get insulin in Bishkek, Rayon levels need to go to Oblast level. This is detailed in Figure 10. From the central level these facilities come once per quarter to get their supplies. It is their responsibility to go to Bishkek to get supplies by vehicle. In Osh it was stated that the transportation was a large issue.

**Figure 10 – Path of insulin supplies**



As there are no public pharmacies in health facilities head nurses are responsible for the management of diabetes supplies. They work closely with the main person responsible for diabetes care to organise supplies.

Requests are prepared by the Oblast FMC in Issyk-Kul and Oblast Hospital in Osh for the whole Oblast and then sent to the Central level. These requests include syringes, penfills and needles as well as the types and presentations (vials versus cartridges) of insulin. How requests are prepared is not clear. Some use of data from patient files and Form 51 is used for the calculation of requirements, but many sheets showing quantities of insulin and tablets needed used fixed percentages. For example one Oblast assumed that 33% of all people with Type 2 diabetes needed insulin.

The cold chain was stated as not being a problem. However, in one FMC insulin was not stored in a fridge as well as the different times when insulin is transported from Central to Oblast level and then Oblast to Rayon level. Some cold boxes were available at facilities for this, but it was not the norm.

In Bishkek FMCs do not have insulin, this can only be found at the City Endocrinology Dispensary. In the Oblasts visited insulin was available at all FMCs. In Issyk-Kul and Osh Oblasts insulin was not available at Rayon and Oblast Hospitals. This was obtained on a case by case basis from the FMC or people brought their own insulin. Only one Rayon visited at the time of this study did not have insulin (92% availability of insulin).

The funds to procure insulin were provided by the World Bank. In 2009 \$1,886,584 (representing 90% of expenditure on diabetes medicines and supplies) was spent on 224,150,000 units of insulin for an average cost per 100 IU 10 ml vial of US\$ 8.42. This quantity of insulin is sufficient for 17,546 people requiring insulin<sup>2</sup> compared to 2,238 stated as needing insulin. (Refer to Table 3) That said during discussions with clinicians at different facilities it was estimated that approximately 45% of people with Type 2 diabetes used insulin. This would mean that there would be a total of 13,123 people requiring insulin (45% of the 28,569 people with Type 2 diabetes and the 267 people with Type 1 diabetes) which is closer to the total quantity purchased.<sup>3</sup>

Using standard treatment guidelines there are only enough oral medicines for 14,548 people. This shows a possible over supply of insulin in contrast to a shortage of oral medicines, especially Metformin with the quantity purchased in 2009 being sufficient for only 493 people assuming a daily consumption of 1 tablet.<sup>4</sup> These numbers just confirm though that proper mechanisms for the quantification of needs are not in place.

During the period 2007-2009 Kyrgyzstan purchased a total of 24 different insulin formulations or presentations from 4 different companies. Only 11 types were bought in all three years. These types and their price are detailed in the table below.

**Table 10 – Types and price of insulin purchased in all three years from 2007-2009**

Type of insulin	Formulation	Price in US\$		
		2007	2008	2009
Humalog®	100 IU 5 3ml cartridges	56.0	56.0	50.1
NovoRapid®	100 IU 5 3ml cartridges	53.0	53.0	45.6
Humulin Regular®	100 IU 5 3ml cartridges	22.0	22.0	15.1
Humulin NPH®	100 IU 5 3ml cartridges	22.0	22.0	15.1
Levemir®	100 IU 5 3ml cartridges	58.5	58.5	62.0
Humulin Regular®	100 IU vial	11.0	11.0	5.1
Actrapid®	100 IU vial	9.7	9.7	5.1
Humulin NPH®	100 IU vial	11.0	11.0	5.1
Novo-Mix Penfill®	100 IU 5 3ml cartridges	59.4	59.4	45.8
Humulin M3® 30%, 70%	100 IU vial	11.0	11.0	5.1
Mixtard HM®	100 IU vial	9.9	9.9	5.2

US\$ 30,449.80 was spent on delivery devices (pens and needles) in 2009. No syringes were purchased in the initial tender. This meant that 75% of facilities visited did not have any syringes. In past tenders in 2007 and 2008 syringes purchased centrally by the Minister of Health cost US\$ 0.03 per unit. Compared to the 2009 price of a pen (US\$ 30.19) and needles (US\$

<sup>2</sup> This assumes a consumption of 35 units per day per person

<sup>3</sup> This estimate uses a quantity of 35 units per day per person even though people with Type 2 diabetes would need larger doses than this

<sup>4</sup> Using 1 tablet per day clearly shows the shortage of Metformin as usually people requiring this medicine would take 3 tablets per day

0.09) using syringes is 8.6 times cheaper than using a pen per injection only looking at the delivery device<sup>5</sup>.

The oral medicines purchased centrally were Glibenclamide and Repaglinide. Repaglinide is not included on the WHO or national essential lists and therefore it is unclear why this medicine was purchased instead of Metformin. The total amount spent on oral medicines was US\$ 185,780.00.

Metformin was the main medicine prescribed yet was not readily available in the public sector this represents a substantial financial burden on people requiring this medicine.

Health facilities carried out their own tenders to purchase oral medicines when needed. Some facilities using their own funds or funds from City budgets bought some Metformin. The tablets purchased centrally were estimated to be enough to cover 30-40% of total needs. The remainder being covered by City health budgets (estimated to cover another 40% of total needs) or purchased by patients directly.

The Glibenclamide and Metformin purchased by the Ministry of Health are respectively 5.4 and 10.3 times more expensive than international market prices available as detailed in the table below. This is due to the presentation, blister versus bulk and also company this medicine is sourced from.

**Table 11 – Ratio of prices of medicines purchased by the Ministry of Health and International guidance prices**

Item	Dosage	Cost per unit tablet or unit of insulin (US\$)	International guidance price	Ratio
Actrapid®	10ml	0.005	0.004	1.2
Protophane®	10ml	0.005	0.004	1.2
Actrapid®	3ml	0.009	0.004	2.2
Protophane®	3ml	0.011	0.004	2.5
Glibenclamide	5mg	0.014	0.003	5.3
NovoMix®	3ml	0.031	0.006	5.4
Metformin	850 mg	0.071	0.007	10.3

Penfill form of insulin was twice as expensive as vial presentation. Also the most expensive insulin purchased in Kyrgyzstan was 13 times more expensive than the WHO recommended long-acting insulin. The table below shows that for a given treatment regimen the higher costs paid in Kyrgyzstan due to the use of penfill and analog insulin.

**Table 12 – Comparison of treatment costs using vial, penfill and analog insulin**

	Monthly cost	Ratio
Vial	5.84	1.0
Penfill	14.51	2.5
Analog	49.45	8.5

- Assumptions:
  - 15 units long acting per day

<sup>5</sup> This assumes that the pen is amortised over 12 months, 2 injections per day, and use of a needle for a pen or syringe for 4 injections

- 20 units short acting per day
- 5 injections with one syringe or needle for pen
- Pen amortised over 12 months

The main problem with insulin was not the overall supply, but the distribution of this total amount throughout the country. It was often said that facilities got not what they ordered, but what was available.

In Osh a problem was also mentioned that the quantities and types ordered at Rayon level were not always supplied. This meant that for example penfill insulin was used with a regular syringe and that often people with diabetes had to switch insulin regimens.

Another factor was the large quantities of insulin stored at some facilities at Rayon level. This was explained by the irregular supply, supplies sent only 4 times per year and the need to ensure that there was never any lack of insulin at Rayon level. The table below shows the consumption of insulin over 9 months in 2008.

**Table 13 – Use of insulin at a Rayon May-December 2008**

Type of insulin	Vials used	Vials available	Proportion used
Humalog®	6	29	21%
NovoRapid®	7	27	26%
Actrapid® 3 ml	68	327	21%
Actrapid® 10 ml	56	403	14%
Protophane® 3 ml	36	144	25%
Protophane® 10 ml	40	260	15%
Mixtard® 10 ml	15	108	14%
NovoMix®	2	10	20%
Humulin®	6	29	21%

This data shows that the amount of insulin stored at this facility is much higher than the actual needs.

Most healthcare workers stated that the most common insulin types used were Protophane® and Actrapid®. More complex insulin regimens are developed in Bishkek, but different types of insulin were available at different levels of the health system. Penfills are mainly kept for children, teenagers and people with problems with their eye sight. Prescriptions provided to people needing insulin will specify the type of insulin as well as the number of syringes.

#### **4.6. Accessibility and affordability of medicines and care**

Work in Kyrgyzstan, in 2005, using the World Health Organization – Health Action International medicine price survey methodology found that approximately 30% of the total amount of medicines in Kyrgyzstan enters the country illegally and from 2000 to 2003 there was a decrease in the use of branded medicines from 40.2% to 11.7%. Prices in the private sector were found to be high in comparison to international guidance prices. Using the lowest government worker salary it was found that the monthly treatment for hypertension would cost between 1 to 3 days of wages. Availability was found to be good with lowest priced generics in the medicines surveyed found in 80% of pharmacies surveyed.<sup>20</sup>

88% of people with diabetes interviewed during the RAPIA lived within 1 hour of the facility where they received their care and medicines, meaning that most people paid less than 100 Som (US\$ 2.31) for travel costs. Transportation costs were not viewed as a problem by healthcare workers. They stated though that financial issues were related more to diet and transportation to Bishkek when the person needed to go either for their yearly consultation or for specialised attention.

Custom duties and Value Added Tax were removed in 2001 and 2003 respectively from medicines in Kyrgyzstan. Despite this medicines still remain extremely expensive and there is the issue of access in the most rural areas of the country.<sup>8,21</sup>

Work by Hopkinson et al.<sup>14</sup> in 2004 found problems with insulin supplies. During the assessment using the RAPIA this was not found to be a problem. Insulin was available in all facilities visited, except for one, and was free of charge to people requiring it. Some oral medicines were also available free of charge, but some needed to be purchased in the private sector. Access to the private sector was not viewed as a problem due to the large number of private pharmacies present throughout most of the country.

Although affordability of insulin was not a problem, poor availability of syringes in the public sector meant that many people had to purchase these in the private sector. Private pharmacies are allowed to sell items which are viewed of medical nature, this includes syringes, glucometers and strips. Oral medicines were sold in private pharmacies, but insulin was not.

Affordability of medicines was only an issue for those needing to purchase their medicines in the private sector. Diabetes care and medicines procured with government funds were provided for free to people with diabetes.

Looking at oral medicines, despite Metformin being the first line of treatment in the clinical guidelines, many people with diabetes interviewed and healthcare workers stated this was available in short supply in the public sector meaning patients had to buy this in the private sector, impacting adherence. Often these medicines were sold in branded versions making them expensive. This “preference” to branded medicines is because these are prescribed by doctors, sold by pharmacists over the generic versions and also viewed as higher quality and more effective by patients. The table below details the cost per tablet in the private sector for some common oral medicines for diabetes.

**Table 14 – Average price per tablet for common oral medicines for diabetes**

<b>Generic name of medicine</b>	<b>Average cost per tablet Som (US\$)</b>
Glibenclamide 3.5 mg	1.3 (0.03)
Glibenclamide 5 mg	1.2 (0.03)
Gliclazide 30 mg	9.8 (0.23)
Metformin 500 mg	5.0 (0.12)
Metformin 850 mg	6.3 (0.14)
Metformin 1,000 mg	9.7 (0.22)

In combining this information with the guidelines from the clinical protocol Table 15 shows the cost per year for treatment with Metformin, suggested first line of treatment, at the maximum suggested daily dose of 2,000 mg as per the clinical guidelines being developed in Kyrgyzstan.



**Table 15 – Cost per year for treatment with Metformin (assuming 1,500 mg per day)**

Strength of Metformin	Cost per tablet	Cost per year (Som)	Cost per year (US\$)	Total cost as % age of GDP per capita
500 mg	5.0	5,200	120.00	5.4%
850 mg	6.3	3,854	88.95	4.0%
1,000 mg	9.7	5,044	116.41	5.3%

Another factor impacting affordability of care was the cost of medicines for diabetes related conditions. These are often provided for free when the person is being treated as an inpatient and then once they are discharged will need to pay for these. On average the people interviewed spent 1,429 Som (US\$ 32.97) per month on diabetes care which is equivalent to 43% of GDP per capita in real terms.

For those wishing to purchase a glucometer affordability of the actual machine and strips is a problem. The price range of glucometers was Som 1,500 (US\$ 34.62) to Som 5,000 (US\$ 115.39). Individual strips for these machines cost on average Som 24.67 (US\$ 0.57). Only 18% of people interviewed had their own glucometer including children who had received these as donations.

Access to syringes was extremely problematic both because of quantity and quality. Quality issues were related to the needles, the actual markings on the syringes and also improper syringes for insulin administration being purchased through the Central Government tender. Doctors said that they provided a varying number of syringes for each patient, on average though this was about 10-20 syringes per month.

Needles for penfills were also readily available, but some problems were noted with the availability of the actual pens. The issue was the quantity ordered and the people who were entitled to receive them. This meant that people had to buy syringes in the private sector. With syringes not being readily available in the public sector people requiring them need to purchase them in the private sector at an average cost of Som 5.00 (US\$ 0.12; range Som 2.00 – Som 7.00, US\$ 0.05 – US \$ 0.16).

Consultations and inpatient care are provided for free. People with diabetes having a diabetes related illness will not need to pay anything. They will only have to pay should they have a non-diabetes related illness. Laboratory tests are also provided for free.

#### **4.7. Healthcare workers**

Despite facing many challenges, low salaries and lack of access to proper tools for care, the level of knowledge, care and dedication provided by doctors in Kyrgyzstan should be commended.

Within the “Manas” Health Programme specific clinical guidelines were developed to enable management of conditions at the Primary Health Care level. It was shown that for two chronic conditions hypertension and asthma there was a reduction in admission due to this implementation. In parallel to these guidelines a focus within the programme is both strengthening the training of under and post graduate healthcare workers.<sup>9</sup> Training of healthcare workers in Kyrgyzstan is provided by the Kyrgyz State Medical Academy and 6 other medical

schools. 10 Medical Colleges and a School of Nursing provide training for nurses and ancillary health personnel.<sup>8</sup>

Within their medical training in the 4<sup>th</sup> year 57 hours on endocrinology are included. In years 5 and 6 endocrinology is included in general therapy sessions. After graduation students have clinical internships for 2 years, but few choose training in endocrinology. Some specialists go to Moscow for training with funding provided by pharmaceutical companies. Every 5 years doctors go for retraining in Bishkek.

There are 43 Endocrinologists in Kyrgyzstan, but there is no real specialisation in paediatric endocrinology. Many Oblasts will have an Endocrinologist. This person is not necessarily a specialist, but will serve as a focal point for diabetes and other endocrine disorders. With a “focal point” for Endocrinology at FMCs at Rayon level this provides the basis for the management of diabetes even at the Rayon level. Many people interviewed stated that FGPs were not able to treat diabetes or that they were even “scared” of treating diabetes, especially when it came to using insulin. Only 43% of FGPs interviewed treated people with diabetes. Some people met felt that the focus on family medicine has meant a lack of attention for diabetes and a lack of developing specialists to deal with this condition. This led some doctors at the Central level to state that this had an impact on timely diagnosis.

Of the healthcare workers interviewed 64% did not feel adequately trained to treat someone with Type 1 diabetes. However, 64% did feel adequately trained to treat someone with Type 2 diabetes.

Doctors at the Primary level should be trained and be able to diagnose diabetes and manage uncomplicated Type 2 diabetes not requiring insulin. Their approach should also include a risk factor based diagnosis and treatment. This was done for hypertension with training and equipment provided. However, many doctors and administrators mentioned that the training delivered was always very theoretical and did not provide doctors with practical knowledge to impact their daily practice.

Nurses in Kyrgyzstan play no role in diabetes management. Most of their role is administrative and following directions given by doctors. Some nurses in more specialised settings have had on the job training, but nothing specific with regards to diabetes. A special nurse training and re-training programme has been initiated, to date nothing has been done with regards to diabetes.

Different training programmes have been initiated by different organisation at different levels of the health system. The Diabetes Association of Kyrgyzstan (DAK) has developed training for doctors and has carried out this training for 40 doctors in Bishkek. Training focused on insulin, use of the different oral medicines, what is diabetes, chronic and acute complications of diabetes. For this they closely collaborated with the Association of Internal Medicine. Other training was delivered by Pharmaceutical companies and did not provide healthcare workers with the practical tools they needed to manage diabetes.

Some training for nurses has been organised, but was not viewed as a success as once they returned to their facilities they were not given the support they needed. Despite at a national level being told that courses at Oblast level had been organised, the results of these were not visible. Many administrators stated that despite many courses being organised no practical results were visible.

Clinical protocols on different aspects of diabetes have been developed. These are based on “gold standards” from the American Diabetes Association and the European Association for the Study of Diabetes. These guidelines are well developed and detailed providing diagnostic, treatment and management advice. These guidelines have yet to be distributed. Some of the diagnostic tools and tests detailed are not available in Kyrgyzstan. In addition healthcare workers may need to be trained on new techniques and some of the information about prevention regarding diet, exercise and foot care will need to be adapted to be delivered as education to people with diabetes. Also what became clear during discussions with healthcare workers is that many did not know the different types of insulin and their effects, how to initiate insulin therapy and also how to explain to people requiring insulin the balance between insulin dosage and carbohydrate content of their meals.

Based on the clinical protocol prepared for Kyrgyzstan the first line of medicine treatment for diabetes should be Metformin. These guidelines had yet to be distributed, but as per the findings described above Metformin was not available in health facilities surveyed which meant that people requiring this medicines needed to purchase it in the private sector.

The large burden of patients that each doctor sees means that a small time allocated to each patient, which has an impact on patient education in addition to training and materials.

#### ***4.8. Adherence issues***

Adherence is often said to be impacted by two main factors, patient education and cost of treatment.

The issue of discipline was raised by most doctors as the reason for poor patient adherence. Of course most of these factors were intimately linked to poor knowledge and therefore poor education. The issue of patient education is addressed in the section below.

In looking at the issues mentioned for poor discipline doctors stated that people did not want to take medicines for a long time, financial aspects around diet, low understanding, low general education levels and the impact of other conditions the person may have, both for treatment adherence and overall cost.

The threat of complications was used to enforce adherence and doctors said that only when they have complications do they start adhering.

Doctors stated that people with Type 1 diabetes were more adherent and that well managed patients are those who follow recommendations and follow diet and take care of themselves. Also people with higher financial means were more adherent. Many people also switch their behaviour either after their initial diagnosis or during a hospitalisation, but once they feel better they go back to not following their diet and treatment.

The problem with regards to diet is that the traditional Kyrgyz diet is high fat and high carbohydrate. Advice given from healthcare workers does not reflect the reality of the conditions that most people with diabetes face.

People with Type 1 diabetes under 15 are usually well managed as parents play a main role in treatment. However as the children get older many psychological issues become problematic and impact adherence. It was stated that many adolescents get “fed up” of taking insulin.

With regards to the financial aspect, the problem was mainly for people with Type 2 diabetes needing to purchase Metformin in the private sector, with treatment representing up to 7.4% of per capita GDP.

#### **4.9. Patient education and empowerment**

Diabetes schools and education centres for diabetes education, have been established at the City Endocrinology Dispensary and in the Department of Endocrinology at the National Children's Hospital, by the DAK and Kyrgyz Diabetes Federation (KDF). Education facilities are also present at the National Hospital.

In different facilities the doctor is responsible for delivering education, but it was said that they were often too busy to do this.

Some information and education materials for patients are provided by the pharmaceutical industry and often these materials are only in Russian, when many people especially outside of Bishkek can only speak and understand Kyrgyz. Also it is questionable if these materials are adapted to the Kyrgyz diet and socio-economic situation.

Patient education for Type 1 diabetes was extremely well delivered by the "Diabetes School" at the National Paediatric Hospital and also Osh Oblast Children Hospital. This education was for both the child and family and was initiated at the time of diagnosis and included aspects on where to inject, how to inject, dosage determination and diet.

Education for people with Type 2 diabetes was extremely poor and not adapted to local socio-cultural factors, especially with regards to diet. Most of this education is delivered during the consultation and therefore there is little time to do this effectively.

#### **4.10. Community involvement and diabetes associations**

Within the government's National Health Programme there is a clear will for the involvement of the Kyrgyz population in health issues and the role of "social mobilisation to empower communities to resolve health needs at a local level".<sup>9</sup> This is included under the first component of the "Manas Taalimi" Programme.

DAK (IDF member association) was established in 1998 with and has its mission to protect the rights of people with diabetes. It is mainly based in Bishkek and is developing activities in other regions of Kyrgyzstan. Activities include training of doctors and patients. It has about 500 members. DAK has developed many international links with other NGOs with a constant focus on increasing awareness of diabetes mainly with the authorities. For example it received a donation of glucometers for children from a German NGO, but this support has ceased. Activities for World Diabetes Day and fundraising have also been organised. DAK's main activities have also focused on ensuring the implementation and proper application of the government's law on diabetes.

The Association is involved in advocacy and was a key player in raising the issue of the wrong syringes being purchased for insulin and in ensuring implementation of the government's diabetes law. DAK's current focus is also more on advocacy than other activities.

KDF was created just over year ago. It was established by parents with children with Type 1 diabetes. Activities are focused on patient education. Besides establishing the school of diabetes at the National Children's Hospital it has also set-up a telephone hotline in coordination with a

doctor. It tries to address some of the social and psychological issues that young people with Type 1 diabetes face.

Most of the activities of these associations are focused in Bishkek and despite resource constraints they have been able to do some important work for people with diabetes in Kyrgyzstan.

Another project that involves the community with regards to improving health is a project run by the Swiss Red Cross in developing Village Health Committees (VHC). The health problems that impact communities most are determined locally through discussions within communities. Priorities are based on a mix of what comes from these community discussions and burden of disease from statistics.

This priority setting occurs at villages and is then amalgamated at an Oblast level. Within this project hypertension has been identified as one of the main problems. Once the priorities are determined the Red Cross then provides support in developing projects to address these problems. For example for hypertension screening using an automatic sphygmomanometer has been implemented with people found with high blood pressure being sent to health facilities and VHCs referring people to facilities and also checking people's adherence to treatment. Within the hypertension project diet is addressed. Culturally adapted educational materials are also developed and the project has been successful in modifying alcohol consumption behaviour through community decisions.

#### ***4.11. Positive policy environment***

Four priority programmes exist within the overall framework of the "Manas Taalimi" Health Programme. These are:<sup>9</sup>

1. Reduce maternal and child mortality rates through increased coverage of evidence based health care services
2. Reduce morbidity and mortality from Tuberculosis (TB) and respiratory diseases through effective implementation of Directly Observed Therapy, Short-course (DOTS) and Practical Approach to Lung Health (PAL) strategies
3. Prevent and better treat CVD
4. Limit transmission of HIV/AIDS, STDs, and drug addiction

Of particular interest is priority number 3 due to the close relationship and shared risk factors between CVD and diabetes. The two main ways the National Programme plans to tackle CVD is through:<sup>9</sup>

1. Implementation of effective preventive measures in the general population, communities, local authorities and NGOs (Primary Prevention)
2. Improvement of service delivery to increase the prevention and treatment of CVD.(Primary and Secondary Prevention)

It is interesting to note that of the 4 Priority Programmes 3 are for chronic diseases, CVD (chronic NCD) and TB and HIV/AIDS (chronic Communicable Diseases). However there is no inclusion of diabetes within this national strategy.

In 2006 a law on diabetes<sup>22</sup> came into being. The law states that treatment for people with diabetes should be free and that insulin, oral medicines and blood glucose monitoring should be available for free. The law has as its aim to regulate the management and implementation of the system of state guaranteed economic, social, legal and medical measures to prevent diabetes

among the citizens of Kyrgyzstan.

The law includes:

- A focus and priority on primary prevention and a commitment to healthy lifestyles
- Social equity and fair access to prevention, treatment and rehabilitation services
- Actions that are scientifically justified
- Free provision of medicines and self-monitoring devices to people with diabetes
- Training of healthcare workers including in diabetes education and counselling
- Availability of equal opportunities for all people with diabetes, in all areas, including education, sports and professional activities
- Disability benefits

This law led to the special situation for insulin being purchased centrally and managed by the Ministry of Health. However, many of its other elements are not implemented, such as the free provision of glucometers. That said this law lays the groundwork for the responsibilities the government has with regards to people with diabetes.

In addition to this law, people with diabetes are entitled to invalidity certification which allows them to obtain disability benefits.

## **5. Discussion**

This report raises many issues about the organisation of the health system for the management of diabetes, and other chronic conditions and the role of each level of the system with regards to diabetes care. With the importance being put on FGP's the role of these healthcare workers in diabetes needs to be determined with appropriate practical training and resources provided to them. Clearly the lack of diagnostic tools needs to be addressed, with the appropriate tools being supplied to the suitable levels of the health system. This includes the necessary tools for managing complications.

Besides the overall organisation of the health system there needs to be an organisation of each consultation in such a way that education becomes an integral part of this interaction between the person with diabetes and the health system. This will require specific training of healthcare workers in patient education, including nurses, and the development of socio-culturally adapted materials. Creative means are needed for this by involving a variety of health personnel, communities and also the diabetes associations.

Diabetes associations can play an important role in helping to improve the management of diabetes. In Kyrgyzstan despite many challenges both organisations present have helped put and keep diabetes on the agenda. Most of their activities are focused in Bishkek and on advocacy and their role with regards to advocacy, patient education and support to the health system need to be defined.

Another specific organisational aspect is the use of inpatient care for people with diabetes. People with diabetes are in theory supposed to have 1-2 inpatient stays per year. The necessity of this needs to be determined with clear criterion for hospitalisation and linked with treatment guidelines developed.

Data collection is an integral part of this reorganisation of the health system. A diabetes register is being developed, but as of the time of preparing this report is not clear what role this will play. One key role will be in managing supplies of medicines and other diabetes supplies.

In looking at the medicines Kyrgyzstan needs to analyse its purchases of both the types of oral medicines and insulin. Substantial savings may be possible should WHO and other international guidelines be followed. These decisions of course need to be in line with the clinical guidelines developed. As well issues around the distribution and cold chain need to be addressed.

Lastly, Kyrgyzstan's National Health Policy focuses on primary prevention. Prevention measures for diabetes will have benefits for many other NCDs as they share many risk factors, but these prevention measures need to be integrated into policies from different areas of government (trade, finance, agriculture, education, etc.) and also adapted to the socio-cultural context of Kyrgyzstan.

One possible way of addressing these challenges is the development of a Twinning Programme under the auspices of the IDF, as the IIF managed in Mozambique with the support of Diabetes UK.<sup>23</sup>

The recommendations presented in the table below aim to provide practical ways of addressing these challenges taking into account Kyrgyzstan's limited resources.

## 6. Recommendations

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
<b>Organisation of the Health System</b>	<ul style="list-style-type: none"> <li>Varying patient pathways in the different regions visited</li> <li>Some self-referrals were noted especially from the periphery to Bishkek</li> </ul>	Standardisation and organisation of patient pathways	<ul style="list-style-type: none"> <li>Clearer pathways to appropriate care</li> <li>Less waiting time</li> <li>Increased information on diabetes</li> <li>Less complications</li> <li>Decreased cost (transportation, inpatient stay, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Decrease in patient burden</li> <li>Patient seen at the appropriate level of the health system (specialists not seeing routine cases)</li> </ul>
	Education is not included in the consultation	Include diabetes patient education as an integral part of the medical consultation		
	Every year one or two inpatient stays at Rayon, Oblast or Republican level	Assess the evidence base for yearly inpatient care for people with diabetes		
<b>Data Collection</b>	A diabetes register is being developed which has been piloted in some areas of the country	Clearly define the role of the diabetes register and ensure it is used for planning and decision making	<ul style="list-style-type: none"> <li>Improved access to care and medicines</li> <li>Better care as healthcare worker has all patient information</li> </ul>	<ul style="list-style-type: none"> <li>Improved planning and decision making for: <ul style="list-style-type: none"> <li>Medicines</li> <li>Consultations</li> <li>Staffing</li> </ul> </li> <li>Better quality data for reporting</li> </ul>
	Reliability of data and the use of data for planning	Improve the use of all data collected (quality and reliability) and use this data for planning and reporting		

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
<b>Prevention</b>	Lack of primary prevention campaigns	Increase the use of socio-culturally adapted means of primary prevention building on activities organised around World Diabetes Day	<ul style="list-style-type: none"> <li>• Increased knowledge about diabetes and its risk factors</li> <li>• Early detection of diabetes</li> <li>• Increased knowledge on how to manage diabetes</li> <li>• Early diagnosis of diabetes related complications</li> </ul>	<ul style="list-style-type: none"> <li>• Decreased burden of diabetes (long-term)</li> <li>• Early detection of people with diabetes</li> <li>• Early detection of diabetes related complications</li> <li>• Overall decrease in disease and diabetes related complication burden</li> </ul>
	Problem of early detection of diabetes due to lack of knowledge <ul style="list-style-type: none"> <li>○ General population</li> <li>○ Healthcare workers</li> </ul>	Increase awareness of diabetes, its risk factors and symptoms for healthcare workers and population as a whole		
	Lack of priority given to patient education  Some problems exist treating some complications <ul style="list-style-type: none"> <li>○ Training</li> <li>○ Diagnostic tools</li> </ul>	Improve patient education and integrate into diabetes consultation  Increase healthcare worker training and improve supplies of necessary equipment adapted to each level of the health system		
<b>Diagnostic tools and infrastructure</b>	Availability of some laboratory tools  Problems with reagents and consumables were variable in the facilities visited  Major lack of tools for the diagnosis of complications	Improve availability of diagnostic tools and tools for the management of diabetes related complications  Define the tools which should be present at different levels of the health system (development of a	<ul style="list-style-type: none"> <li>• Early detection of diabetes</li> <li>• Better management of diabetes</li> <li>• Early diagnosis of diabetes related complications</li> </ul>	<ul style="list-style-type: none"> <li>• Early detection of people with diabetes</li> <li>• Early detection of diabetes related complications</li> <li>• Overall decrease in disease and diabetes related complication burden</li> </ul>

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
		diabetes toolkit)		
<b>Drug procurement and supply</b>	Difference between recommendations from World Health Organization Essential Medicines List and Kyrgyz Essential Medicines List	Follow WHO guidance for the types of insulin and medicines purchased  Link purchases with clinical guidelines	<ul style="list-style-type: none"> <li>Improved access to medicines</li> </ul>	<ul style="list-style-type: none"> <li>Decrease in financial burden of total expenditure on medicines</li> <li>Better use of resources</li> </ul>
	High overall cost due the purchase of insulin in penfills and analog insulin			
	Problems with quantification of needs for diabetes supplies	Improve planning of purchases		
	Procurement law states that tenders need to be carried out by lots	Review State Procurement Law to see if this is adapted to the purchase of medicines		
	Issues raised whether State Procurement Law is adapted to the purchase of medicines	Make amendments if necessary		

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
	<p>High cost of medicines compared to international guidance prices</p>	<p>Bulk tendering of generic drugs from quality-assured manufacturers</p>		
	<p>The main problem with insulin was not the overall supply, but the distribution of this total amount throughout the country</p> <p>Large quantities of insulin stored at some facilities at Rayon level</p>	<p>Improve distribution system of insulin and other diabetes supplies</p>		
<p><b>Accessibility and affordability of medicines and care</b></p>	<p>Problems with supply and distribution of syringes</p> <p>Oral medicines available in the public sector Glibenclamide and Repaglinide</p> <p>Metformin first line of treatment in the clinical guidelines, yet not purchased centrally in sufficient quantities</p>	<p>Link supply of syringes to supply of insulin</p> <p>Ensure main oral medicines required by people with diabetes, e.g. Metformin are purchased in sufficient quantities</p>	<ul style="list-style-type: none"> <li>• Improved access to medicines</li> <li>• Decreased financial burden</li> </ul>	<ul style="list-style-type: none"> <li>• Better use of resources</li> <li>• Improved patient management</li> </ul>

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
<b>Healthcare workers</b>	<p>General Practitioners were not able to treat diabetes</p> <p>Nurses in Kyrgyzstan play no role in diabetes management</p> <p>Different training programmes have been initiated, but did not provide healthcare workers with the practical tools they needed to manage diabetes</p>	<p>Provide appropriate training</p> <p>Increase practical training for healthcare workers at different levels of the health system</p> <p>Define the role of nurses in diabetes care</p>	<ul style="list-style-type: none"> <li>Improved care</li> </ul>	<ul style="list-style-type: none"> <li>Higher skilled workforce</li> <li>Improved management of diabetes</li> </ul>
<b>Adherence issues</b>	<p>Poor adherence due to:</p> <ul style="list-style-type: none"> <li>People with Type 2 diabetes needing to purchase Metformin</li> <li>Poor knowledge</li> </ul>	<p>Increase in appropriate patient education and improved availability of medicines especially Metformin (see other related recommendations with regards to patient education and improving accessibility and affordability of medicines)</p>	<ul style="list-style-type: none"> <li>Improved knowledge of diabetes</li> <li>Improved access to medicines</li> <li>Decreased financial burden</li> <li>Decrease in complications and hospitalisations</li> </ul>	<ul style="list-style-type: none"> <li>Better management of diabetes by patients</li> <li>Decrease in patient load</li> <li>Decrease in patients with complications</li> </ul>
<b>Patient education and empowerment</b>	<p>Doctor is responsible for delivering education, but is often too busy to do this</p> <p>Information and education materials are sometimes</p>	<p>Involve nurses in patient education</p> <p>Integrate education into the consultation</p>	<ul style="list-style-type: none"> <li>Improved knowledge of diabetes</li> </ul>	<ul style="list-style-type: none"> <li>Better management of diabetes by patients</li> <li>Active involvement of</li> </ul>

	Findings	Recommendations	Expected impact on:	
			Person with diabetes	Health system
	present, but not adapted to the Kyrgyz context	Development of patient education materials in Kyrgyz and Russian and adapted to the socio-cultural context		nurses in diabetes care
<b>Community involvement and diabetes associations</b>	<p>Most of the activities of associations are focused in Bishkek</p> <p>Village Health Committees developed by the Kyrgyz-Swiss Project addressing hypertension</p>	<p>Define and expand role of diabetes associations</p> <p>Link diabetes with Kyrgyz-Swiss Village Health Committees project</p>	<ul style="list-style-type: none"> <li>• Development of community based support and activities</li> </ul>	<ul style="list-style-type: none"> <li>• Development of community based support and activities</li> <li>• Partner to address growing burden of diabetes</li> </ul>
<b>Positive policy environment</b>	<p>CVD included in National Health Strategy</p> <p>Existence of diabetes law</p>	<p>Emphasise the link between CVD and diabetes and the common risk factors</p> <p>Develop a diabetes action plan</p>	<ul style="list-style-type: none"> <li>• Appropriate policy and legal framework</li> <li>• Government attention on the issue</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate policy and legal framework providing a guide nationally and internationally (donors)</li> </ul>

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## Appendices

### Appendix 1 – Map of Kyrgyzstan



### Appendix 2 – Sources of funding for MHIF

**Table 16 – Sources of funding for the MHIF**

Population Group	Funding Source
Employees, including employees in the formal sector	2% payroll contribution by employer
Civil servants and public enterprises	
Self-employed	Purchase of mandatory health insurance policies
Private farmers	6% of the basic rate of land tax
<ul style="list-style-type: none"> <li>Children under 16</li> <li>Children enrolled in school under the age of 18</li> <li>Students enrolled in basic, secondary and higher education under the age of 21</li> </ul>	Value of 1.5 x minimum salary – paid for by Republican Budget
People with disabilities since childhood and persons receiving social and state benefits	
Pensioners	
Registered unemployed	

Adapted from <sup>8</sup>

**Appendix 3 – Statistics on cases of diabetes in Kyrgyzstan 2002-2008**

<b>Year Total Cases</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Insulin-dependent Diabetes	2,525	2,202	2,192	2,288	2,366	2,322	2,238
Diabetes total	22,775	23,605	23,626	25,420	25,338	28,077	28,893
%age Insulin dependent	11.1%	9.3%	9.3%	9.0%	9.3%	8.3%	7.7%
%age increase Total		3.6%	0.1%	7.6%	-0.3%	10.8%	2.9%
%age increase insulin-dependent		-12.8%	-0.5%	4.4%	3.4%	-1.9%	-3.6%
Overall increase (total)							26.9%
Overall increase (insulin-dependent)							-11.4%

**Appendix 4 – Data on the prevalence of diabetes in Kyrgyzstan**

<b>Oblast</b>	<b>Total 2007</b>			<b>Total 2008</b>		
	<b>Adults</b>	<b>Teenagers</b>	<b>Children under 14</b>	<b>Adults</b>	<b>Teenagers</b>	<b>Children under 14</b>
Bishkek City	1616.9	138.2	30.3	1550.1	133.5	34.5
Osh City	928.1	40.6	15.4	940.4	16	15
Batken Oblast	601	13.3	3.6	641.4	16.8	5
Jalal-Abad Oblast	610.8	13.2	11	667.8	3.4	12
Issyk-Kul Oblast	869.8	43.8	11.8	912	10.1	10.9
Naryn Oblast	530.5	15.6	4.6	553.3	26.6	8.2
Osh Oblast	466.5	0	7.6	503	60.1	6.3
Talas Oblast	543.7	39.5	8.3	595.6	0	6.9
Chui Oblast	935.6	12.8	8	937	15.2	8.9

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