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Quality of treatment and prevention of cardiovascular diseases in the Kyrgyz Republic

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Acknowledgements

This report is the outcome of a study on the quality of treatment and prevention of cardio-vascular diseases (CVD) in Kyrgyzstan. The study was initiated by the Ministry of Health of the Kyrgyz Republic (MH KR) and Mandatory Health Insurance Fund (MHIF). It was conducted by the Healthcare policy analysis department of the Center for Health System Development (CHSD) with the financial support of the World Health Organization (WHO) and the UK's Department for International Development (DfID).

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1. Introduction

Over the recent years cardio-vascular diseases (CVD) have been one of the major causes of mortality and morbidity in many countries. According to the WHO data, (2002)[1] 16.6 million people die every year around the globe with 80% of deaths occurring in developing countries. The number of CVD-related deaths in Kyrgyzstan grows with every passing year. Prevalence of risk factors of cardio-vascular diseases remains high and the situation is further exacerbated by the lack of actions. CVD are of significance both for the developed and the developing countries. Acute myocardial infarction and strokes are the main reason for CVD-related mortality. Kyrgyzstan is one of the top ten countries as regards coronary heart disease and it is the leading country from the perspective of stroke-related mortality.

In the national healthcare reform program "Manas Taalimi" (2006-2010) cardio-vascular diseases are one of the four priority areas within the framework of a comprehensive approach towards strengthening the general healthcare system of the Kyrgyz Republic. The study on quality of treatment and prevention of CVD in Kyrgyzstan, conducted by the Health policy analysis unit of the CHSD makes a contribution to the "Manas Taalimi" program having identified problems and promoted the development of future steps on the reduction of CVD in the Kyrgyz Republic.

One of the main ways of reducing CVD-related mortality and morbidity is improving the quality of the provided services both in the sphere of treatment and prevention. The results of the study have shown a heterogeneous picture where alongside with the strengths in service delivery there is a set of problems at all levels of healthcare service delivery that demands finding a solution to in the nearest future.

[1] WHO, 2002 Annual WHO report on the health status of the population "Reducing Risks, Promoting Healthy Life"

2. The situation with cardiovascular diseases in Kyrgyzstan

Cardiovascular diseases have been one of the leading reasons for mortality and morbidity in many countries. According to the WHO data, (2002)[2] every year 16.6 million people die of CVD globally that are about 30% in the causes of death structure, with 80% of deaths occurring in the developing countries. CVD remain of significance both for the developed and for developing countries. For example, mortality level in the USA remains high: 2,600 deaths every day and approximately 949 thousand annually. Coronary heart disease (CHD) results in 250 thousand deaths annually without hospitalization, where 50% of men and 63% of women that died suddenly of the CHD had not previous history of CHD. The main causes of deaths among the CVD are the **acute myocardial infarction** (AMI) and **strokes**.

Myocardial infarction — (infarct, infarction) – is an acute disease manifested in various disorders of heart activity and brought about by the atrophy of a part or the entire organ as a result of a sudden distortion of arterial blood flow. It is a clinical form of coronary heart disease. In most cases the reason for the distortion of blood supply is acute thrombosis – blockage of a vessel by a thrombus that emerges due to cholesterol plaques in the vessels. A classic sign of a myocardial infarction is a pain syndrome: intensive chest pain that may spread to the arms, shoulders, clavicles, neck, lower jaw, interscapular area. The pain is of compressing, pressuring, expanding or burning nature and reaches maximum intensiveness in a few minutes. Sometimes one can observe a symptomless variant, where the infarction is accidentally discovered by a physician during an ECG.

Stroke (Latin insulto — jump in) — an acute disorder of cerebral circulation (hemorrhage etc.) that causes atrophy of the brain tissue. It is known that the brain needs a constant inflow of oxygen-enriched arterial blood if it is to function. Brain cells are very sensitive to the lack of oxygen and die quickly in the situation of the lack of oxygen. A wide network of cerebral arteries ensures intensive blood supply. Blockage or rupture of these vessels result in a stroke, or the death of a section of the brain. There are two main types of strokes:

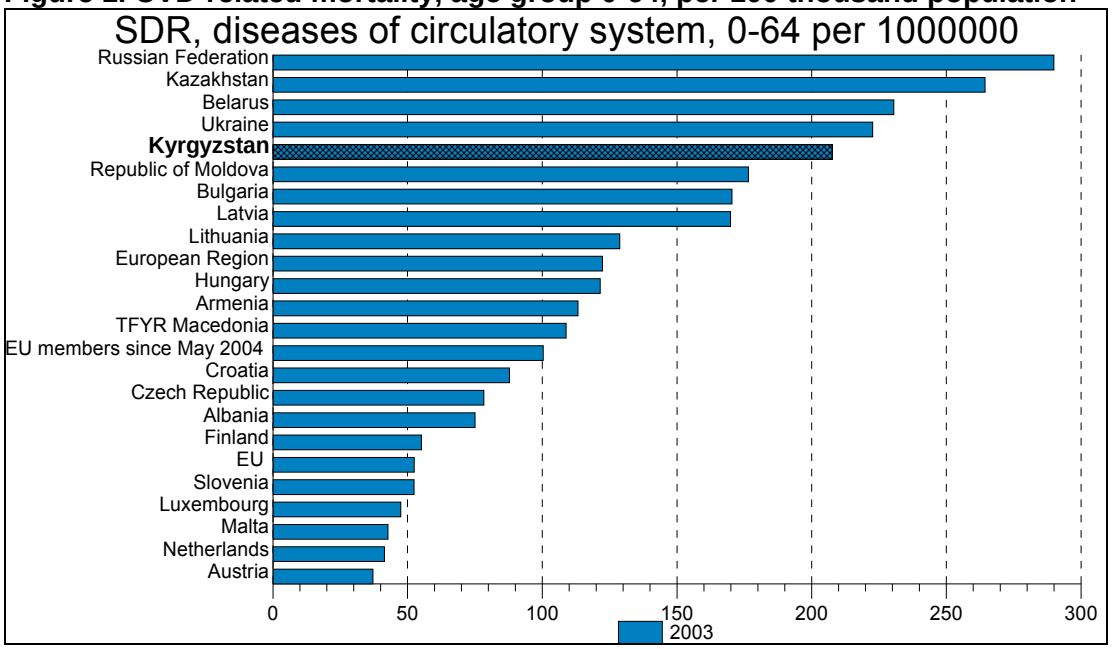
Hemorrhagic stroke (cerebral hemorrhage) (Greek. haimatos — blood and rhegnymi — break through). It is a complication of hypertension and the most acute type of strokes which is an extreme manifestation of the underlying diseases. As a rule it affects people with high arterial blood pressure, most frequently on the background of a hypertensive crisis.

Ischemic stroke (cerebral infarction) (Greek ischo — delay and haimatos — blood), or the brain infarction. This is the blockage by a thrombus of arteries that supply the brain with blood. Most frequently it occurs in case of atherosclerosis, but may also occur in case of hypertension as well as cardiac fibrillation. In this case the vascular walls remain undistorted but the blood flow is prevented by a spasm or the blockage of the vessel by a thrombus.

[2] WHO, 2002 Annual WHO report in the health status of the population "Reducing Risks, Promoting Healthy Life"

The indicator of CVD-related mortality in Kyrgyzstan grows with every passing year. Whereas in 1999 this indicator was 77 cases per 100 thousand population, in 2003 it went up to 86 per 100 thousand.[3]. (WHO, 2004). Thus Kyrgyzstan is among five CIS countries where CVD are the main cause of deaths among men in the age 0-64 (Figure 1).

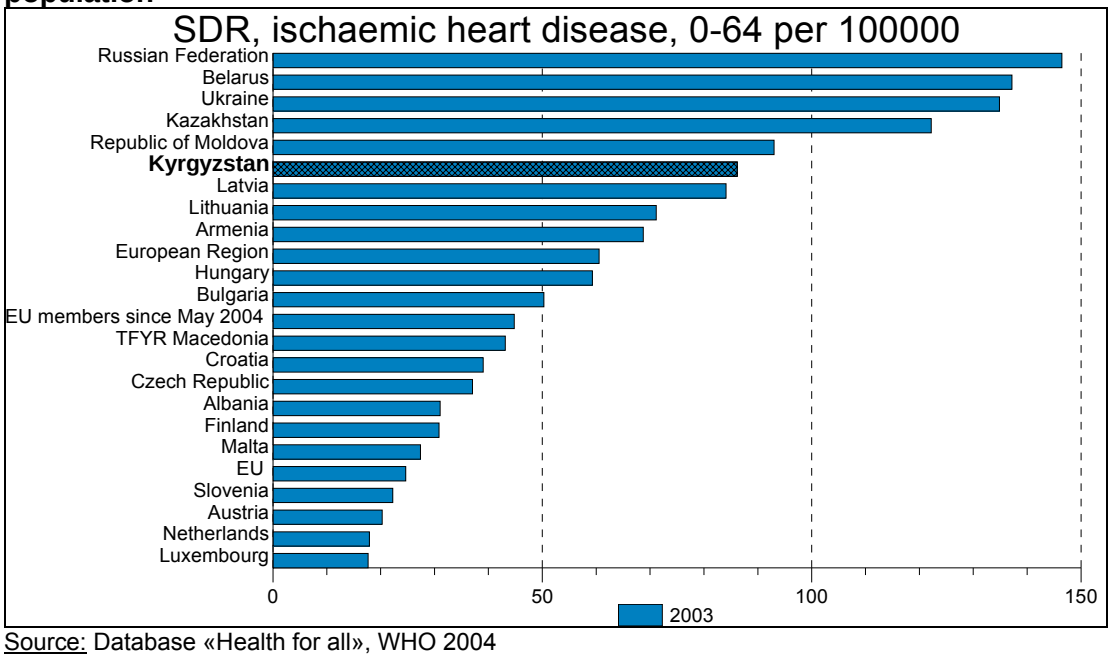
Figure 1. CVD-related mortality, age group 0-64, per 100 thousand population



Source: Database «Health for all», WHO 2004

Figure 2 shows that Kyrgyzstan is one of the top ten countries as regards mortality from coronary heart disease among the former Soviet Union countries. The mortality indicator from acute myocardial infarction is 389 cases per 100 thousand population (WHO 2004).

Figure 2. Mortality from coronary heart disease, age group 0-64, per 100 thousand population

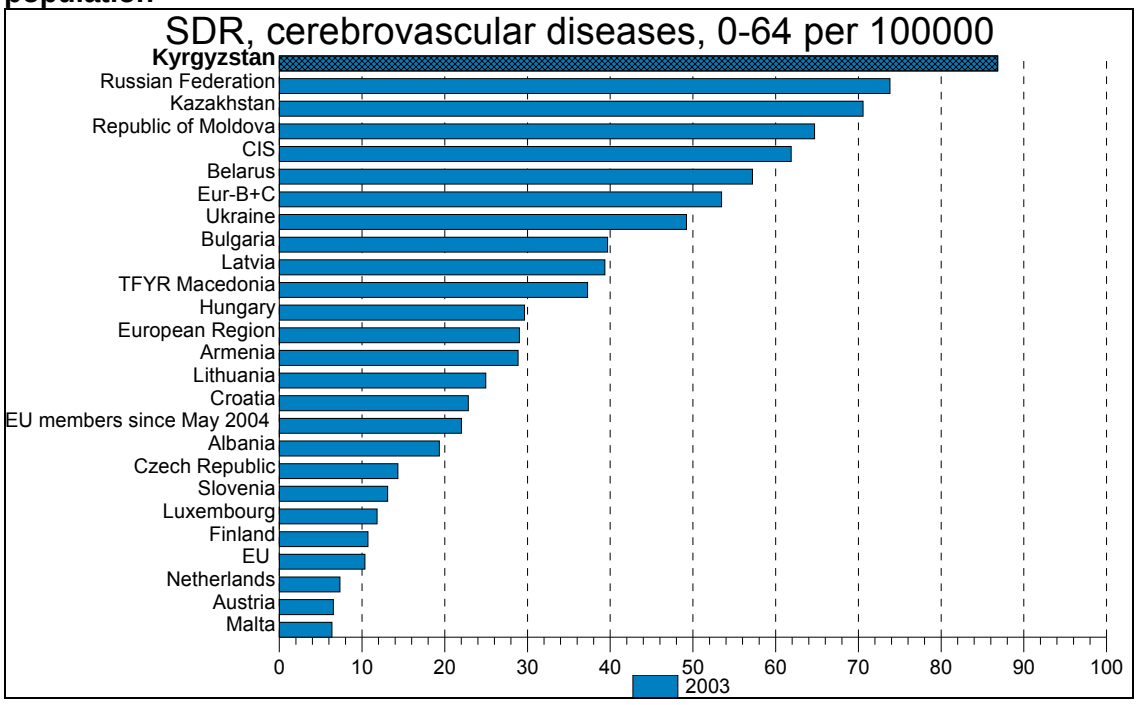


Source: Database «Health for all», WHO 2004

[3] WHO, 2004 “Health for all”

Kyrgyzstan is the leading country as regards stroke-related deaths among the CIS countries. This fact is reconfirmed at the Figure 3, that shows mortality indicators of cerebral and vascular diseases, both among men and women in the age group 0-64 per 100 thousand population. The stroke-related mortality indicator is 261 cases per 100 thousand population (WHO BO3 2004).

Figure 3. Mortality from cerebral-vascular disease, age group 0-64, per 100 thousand population



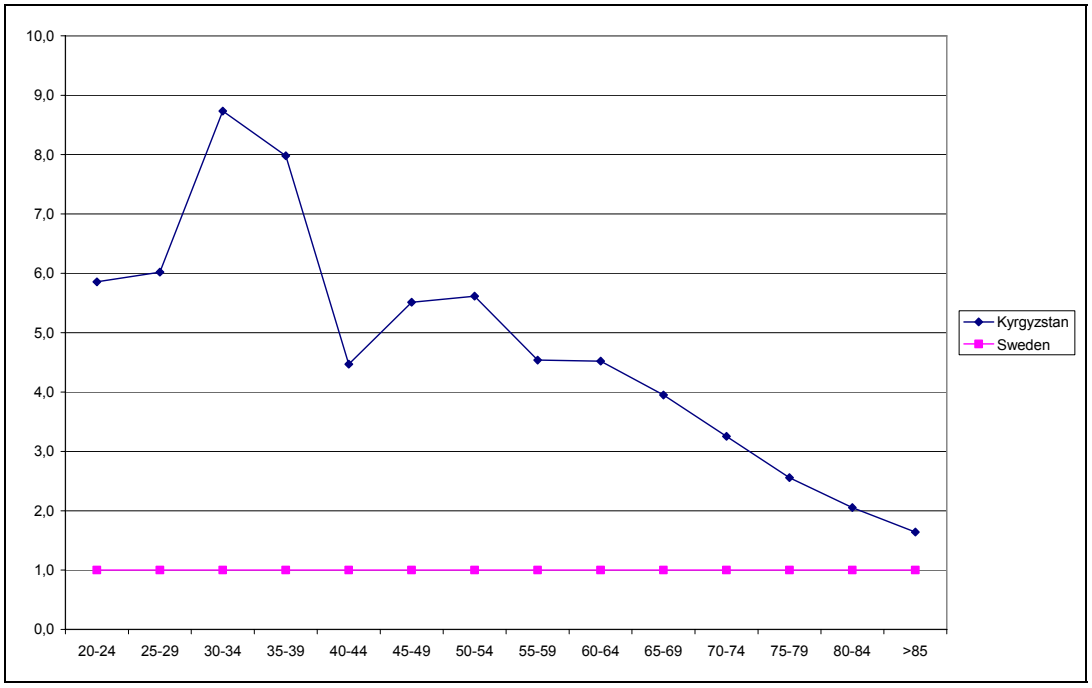
Source: Database «Health for all», WHO 2004

The recent publication of the World Bank (2005)[4] gave a comparison of the health indicators in the countries of Eastern Europe and Central Asia and provided lessons learnt from the accomplishment of the classic MDGs for health, in particular in the area of reduction of CVD down to the European levels. It was calculated that Kyrgyzstan could gain 4.5 extra years for the average life expectancy by reducing the CVD down to the European levels in comparison to the 3.92 years from the reduction of child and maternal mortality (WB, 2004). Such a gain in average life expectancy is related to the age structure of CVD-related morbidity. On the whole it is mostly adults that are prone to these diseases in active working age. Whereas in 1990 CVD-related mortality among people in the age 30-39 was 47,4 cases per 100 thousand population, in 2004 it went by 19.6% to 56,7 cases per 1000 population .

[4] WB, 2005 “Millennium development goals for health for Easter Europe and Central Asia”

The burden of disease in Kyrgyzstan is worst for young people of working age. This is reflected at Figure 4 that provides comparative profiles of age-based CVD-related mortality indicators in Sweden and Kyrgyzstan. At this diagram one can see that the difference is greatest for young working age population among the people in 20-50 age group and reaches almost 9 times for Kyrgyzstan for the age group 30-35. In the older age group mortality is closer to the same Sweden indicator.

Figure 4. Age-based CVD-related mortality in Sweden and Kyrgyzstan



Source: National statistical committee (NSC) Kyrgyz Republic and the World Bank Institute for Sweden, 2002

The consequences of this problem may be catastrophic – households lose breadwinners due to premature deaths as a result of strokes or myocardial infarction, which in its turn leads to a major economic burden due to the loss of income. In cases when patients do survive, direct healthcare expenditure may be very high, which may impoverish the household.

International experience shows that there are effective and cost-effective methods of CVD prevention and treatment. Such interventions have reduced CVD-related mortality in many developed countries over a relatively short period of time. The USA have managed to reduce cerebral hemorrhage-related mortality by 57% and coronary heart disease-related mortality – by 50% thanks to effective activities aimed, firstly at controlling an acceptable blood pressure, reduction of obesity, smoking cessation and alcohol abuse as well normalization of cholesterol and sugar levels in blood, secondly to improvement and introduction modern medical technologies while treating stroke and CHD. Due to the introduction of the national program against cerebral hemorrhage in 1968 – 1981 Japan

managed to reduce mortality from acute cerebral circulation disorders by 46%. Major success has been accomplished also in clinical medicine thanks to the development of secondary CVD prevention. For example, prescription of aspirin and beta-blockers as a form of antiplatelet therapy for discharged patients with CVD enabled a reduction of mortality within one year after discharge[5]. Secondary and tertiary level organizations play a leading role in the treatment of CVD complications. Due doctor recommendations to the discharged hospital patients are a guarantee of effectiveness of secondary CVD prevention. However one should not underestimate the role of primary care in controlling CVD especially in ensuring continuity of treatment both at the secondary and at the primary levels of healthcare.

Over the last five years a number of studies of hypertension have been conducted in Kyrgyzstan. One of such studies was organized as part of the annual monitoring of the quality of primary care – in 2003 and 2005, where an assessment of conformity of treatment with the clinical protocols at the primary level was assessed. The results have shown a high ration of compliance of the hypertension treatment with the clinical protocols (77%) in 2003 after their introduction at the primary level. In 2005 a certain decline took place which points at the need for permanent attention to the issues of introduction and strengthening of the clinical protocols. Another study on hypertension prevalence was conducted in two oblasts – the Naryn and the Talas oblasts – and its results discovered a high share of population with high arterial blood pressure – 38% and 34% respectively. This is one of the highest indicators in the world. However results of these studies do not let us to answer the question on how the quality of CVD prevention and treatment is provided in Kyrgyzstan.

The national healthcare reform program “Manas Taalimi” (2008-2010) identifies the problem of CVD as one of the four priority areas within the framework of the comprehensive approach to the strengthening of the general healthcare system. This study makes it possible to understand and identify problems in the sphere of CVD control, develop strategies to consequently address them and improve the quality of CVD treatment and prevention in Kyrgyzstan which in its turn will lead to a positive economic effect for the country as a whole.

[5] ISIS-2 Collaborative Group. Randomized trial of intravenous streptokinase, oral aspirin, both, or neither among 17 187 cases of suspected acute myocardial infarction: ISIS-2. Lancet 1988;2:349—60.

3. GOAL OF THE STUDY

The purpose of the study is to conduct a comprehensive assessment of the quality of treatment and prevention of cardio-vascular diseases in Kyrgyzstan to identify future areas of action and recommendations for the “Manas Taalimi” strategy (2006-2010). The main aim of the study is a situation analysis of the content of the clinical practice in cases of AMI and strokes, their prevention, rehabilitation and the provision of drugs at all levels of healthcare – primary care, hospital care and the tertiary level, where highly specialized healthcare services are provided. Two main causes of deaths in Kyrgyzstan were selected for the study – acute myocardial infarction and strokes. Four main questions were identified for the study.

1. **What is the algorithm of AMI/Stroke patients management once the first symptoms of the disease occur till hospitalization?**

The first question in the study is aimed at the assessment of the pre-hospital stage, i.e. the first few hours of the disease and the process of hospitalization of patients. It is very important to receive information on what happens to the patient from the time he/she feels ill. Was the patient delivered by an ambulance or did he/she arrive at the hospital themselves? What diagnostic and treatment activities were offered to the patient before their arrival at the hospital? In what time was the patient hospitalized after the occurrence of the first symptoms of the disease?

2. **Do the AMI and stroke treatment approaches comply with local and international standards at the secondary and tertiary level?**

This question will make it possible to assess the content of clinical practice at the hospital level as well as the provision of main drugs for the treatment of AMI and strokes in the hospitals of the secondary and tertiary levels. Furthermore it is necessary to conduct a comparative analysis of the local clinical protocols with the international ones since this analysis has not been yet conducted.

3. **What is the algorithm of AMI/stroke patients management after their discharge from the hospital?**

Another important stage in the management of patients with AMI and strokes is the secondary prevention and rehabilitation. It is necessary to discover what happens to the patient after his/her discharge from the hospital. Does the rehabilitation take place? Answers to these questions may be derived from qualitative data, interviews with the

patients after AMI and strokes.

4. What is the primary prevention of cardiovascular diseases in Kyrgyzstan?

"It is easier to prevent a disease than to cure it" – in the developing countries healthcare systems are orientated first and foremost at the prevention of these diseases[6]. Starting from here, it would be interested to find out whether primary prevention of CVD in Kyrgyzstan actually takes place and just how effective it is.

[6] de Koning JS., Klazinga NS. ("Quality of care in stroke prevention: results of an audit study among general practitioners."), «Preventive medicine», chapter 38, issue 2, 2004

4. METHODOLOGY OF THE STUDY

This part of the report describes the design of the study including research instruments and the sample – the share of the treated cases that needed to be studied to ensure representative results.

4.1 Structure of the study and information collection

To identify methodological approaches and indicators of the study that would be adapted to the local peculiarities a review of literature on this topic was conducted. International experience shows that for such studies one uses the data of the existing statistical resources, a comparative analysis of local and international clinical guidelines/protocols, a retrospective analysis of patient's records, surveys among patients who had AMI and strokes, economic analysis etc. Having studied the materials found during the review of the literature (see Appendix 4) and taking into account the local context the following main areas were identified to answer the questions of the study:

(a) *mapping of AMI and stroke morbidity and mortality;*

(b) evaluation of clinical aspects of CVD treatment, prevention and rehabilitation;

(c) evaluation of drug provision;

(d) opinions of doctors regarding the healthcare services provided to the patients after AMI and strokes;

(e) opinions and satisfaction of the patients after AMI and strokes.

The main sources of data for a comprehensive assessment of the quality of CVD treatment and prevention are the patient records and outpatient records as well as interviews with doctors and patients. The collection of data was conducted with the use of research instruments which had been developed on the basis of the review of the literature and with the assistance of international experts and later in the course of the discussions within working groups they were adapted to the local peculiarities. A working group was established for the purposes of this study and included specialists from the National Center of Cardiology and Therapy (NCCT) and the National Hospital (NH) of the MH KR.

(a) Mapping morbidity and mortality of AMI and strokes

The Republican medical information center calculated morbidity and mortality of AMI and strokes for 2005-2006 by oblasts upon a request of the healthcare policy analysis department of the CHSD since the official statistics provided by the RMIC for broad-based circulation provides aggregated data for morbidity and mortality of CVD in general.

To draft the maps of morbidity and mortality of AMI and strokes the «DevInfo 5» software was used with the entry of routine statistical data into it.

(b) Assessment of clinical aspects of treatment and prevention of CVD and rehabilitation

First of all, prior to the assessment of the clinical aspects in health facilities it was necessary to conduct a comparative analysis of the standards of treatment and prevention of AMI and strokes in Kyrgyzstan with the international standards on methodological quality and clinical content. For these purposes a review of the literature was conducted which resulted in the discovery of the relevant documents for the purposes of comparing Kyrgyz clinical guidelines for AMI and strokes with the international ones. Appendix 3 provides a more detailed report on the comparative analysis – "Comparative analysis of clinical guidelines", prepared by the health policy analysis unit of the CHSD in March 2007.

Secondly, a retrospective analysis of patient records and outpatient records was conducted in the regions. Four questionnaires were developed for the purpose of this analysis: two for the patients with AMI and strokes at the hospital level (secondary and tertiary) and two for the patients after AMI and strokes at the outpatient monitoring level (see Appendix 2).
All four questionnaires included main indicators, such as age, sex and social status. The main sections of the **questionnaires for the hospital level** both for AMI and stroke patients are as follows:

- General section, including information about patient, types of referrals and the time from the start of the disease till hospitalization
- Pre-hospital management of the patient
- Diagnosis of the disease at pre-hospital and hospital stages
- Treatment at pre-hospital and hospital stages
- Recommendations upon discharge from the hospital
- Recommendations for secondary prevention and rehabilitation

For the **primary level** the main sections of the questionnaires include the following: diagnostic of risk factors and their control prior and after the AMI/stroke, evaluation of secondary prevention and rehabilitation.

(c) Assessment of the drug provision

To assess the provision of main drugs for the treatment of AMI and strokes to the hospitals as well as the availability of drugs for the treatment of CVD in the pharmacy closest to the healthcare institutions a questionnaire on drug provision was developed (see Appendix 2).

(d) Opinions of doctors on the healthcare services provided to the patients after AMI and strokes (Focus-groups with physicians)

Mixed focus groups were organized to study the opinions of doctors including specialists of the primary and secondary level with different profiles. A guideline for the conduct of discussions in focus groups with doctors was developed including the following main components (see Appendix 2):

- Assessment of the situation in the sphere of primary prevention in the region
- Issues and problems in the AMI/stroke diagnosis
- Issues and problems in the AMI/stroke treatment
- Issues and problems of secondary prevention and rehabilitation

(e) Opinions and satisfaction of the patients

To obtain qualitative data (opinions of the population on the quality of treatment and prevention of CVD) the team developed guidelines for the conduct of semi structured interviews with the patients after a stroke and guidelines for the conduct of focus group discussions with the patients after acute myocardial infarction (see Appendix 2).

Identification of quality indicators to assess the opinions of the patients on the healthcare services is quite a difficult task due to the multifaceted concept of the quality of healthcare services. Quality embodies such aspects as the accomplishment of better outcomes after the disease, financial and physical access, effectiveness, equity, suitability, conformity of treatment and the patient's choice – all the facets that contribute to healthcare services.

Thus the main sections of the guidelines for the conduct of **semi structured interviews with the patients after a stroke** were as follows:

- Risk factors
- Pre-hospital period
- The process of hospitalization and time in the hospital
- The process of discharge from the hospital
- Medical treatment after the discharge from the hospital
- Rehabilitation process
- Family involvement

In the guidelines on **focus group discussions with patients after AMI** the emphasis was on primary prevention (identification of risk factors and its control), diagnosis of the disease, time in the hospital and secondary prevention and rehabilitation.

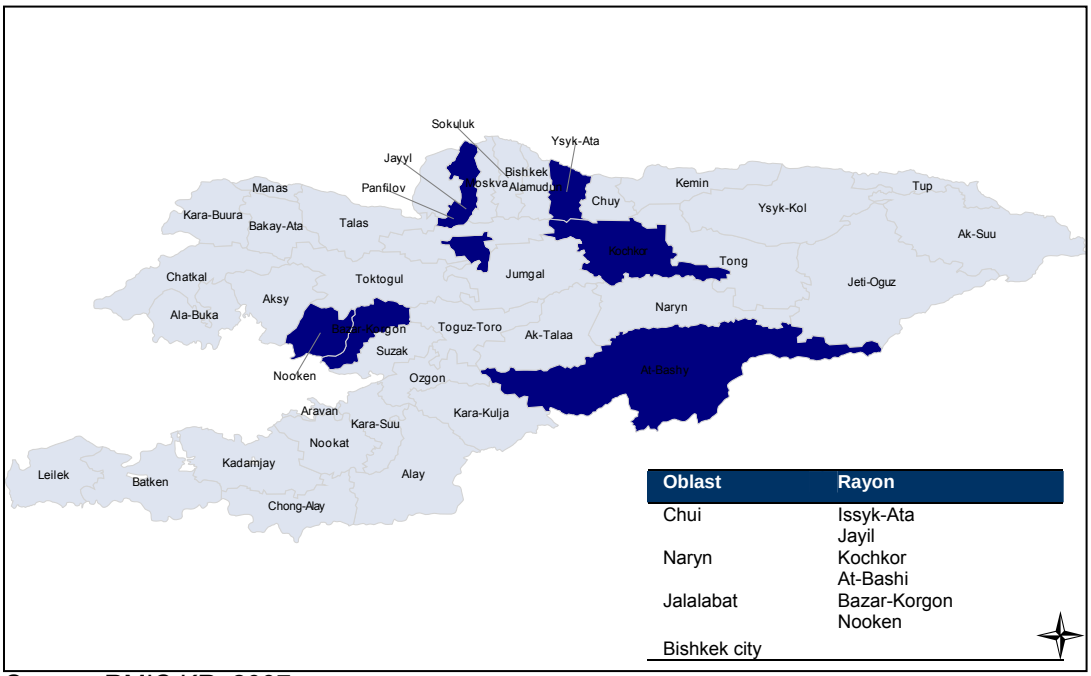
All research instruments were tested in the Moscovsky district in the territorial hospital and the district FMC and later further polished to remove the drawbacks identified in the piloting of all questionnaires and guidelines.

4.2 Sample for the study

Based on the mapping data the highest mortality of AMI in 2005 was observed in the Chui and Naryn oblasts as well as in the Bishkek city. Mortality from strokes were also highest in the Naryn oblast (209,2 per 100 thousand population) and Chui oblast (165,4 per 100 thousand population). This justified the selection of these very regions for further study. It was also interesting to study the content of the clinical practice and prevention in the oblast with lower mortality rates. In this connection Jalalabat oblast, where mortality from AMI and strokes is significantly lower than in other oblasts, was also included in the study for comparison of the more favorable and the less favorable regions. Appendix 1 contains a detailed mapping report *"Morbidity and mortality from strokes and acute myocardial infarction in the Kyrgyz Republic"*.

Two districts were studied in every oblast, selected on the basis of the number of treated cases. The dark blue color is used on Figure 5 to show the oblasts and districts selected for the purposes of this study.

Figure 5. Regions, selected for the study



Source: RMIC KR, 2007.

There were studied medical records of AMI/stroke patients discharged from hospitals in 2006. Since the medical outpatient records were mainly at the hands of the patients but not

in the health facility there were studied all available records for the last three years. In accordance with the statistics norms to ensure representative data it is necessary to cover 20% of the total number of treated cases. Table 1 reflects the percentage of the treated cases sample by regions.

Table 1. Sample size of treated cases necessary for the study

Oblast	Number of treated cases in 2006		Sample size		%	
	AMI	Strokes	AMI	Strokes	AMI	Strokes
Chui	227	421	52	88	23%	21%
Naryn	53	104	26	49	49%	47%
Jalalabat	114	318	36	74	32%	23%
Bishkek	790	756	158	160	20%	21%
Total	**1 184**	**1 643**	**272**	**371**	**23%**	**23%**

In general 23% of all medical records were studied. Due to the low number of treated cases in the Naryn oblast (53 cases of AMI and 104 cases of strokes) a decision was made to select half of the cases. To select the patient records a random method was used.

Thus altogether 863 primary documents were studied, of which:

- 643 patient records (371 strokes, 272 AMI)
- 220 outpatient records (155 strokes, 65 AMIs)

It is noteworthy that the testing of the questionnaires led to the discovery of a problem in relation to the collection of data from the outpatient records. Firstly, at present most of the outpatient records are in the hands of the patients, and this is why their sampling is difficult. Secondly, due to the lack of a format similar to the patient's record, lack of a uniform style of filling out these documents that would reflect main parameters of the course of the disease, risk factors and treatment, the use of the outpatient records as a source of information appears to be difficult.

Also the provision of drugs for the treatment of strokes and AMI in 11 hospital pharmacies and 11 pharmacies closest to FMCs was studied.

During the study one focus group with doctors per oblast and district was organized. Furthermore, on the whole across the regions 25 semi-structured interviews with patients after strokes and 13 focus groups with patients after AMI were conducted.

5. FINDINGS OF THE STUDY

This part of the report reflects the findings of the study as per AMI and strokes. Section 5.1 is dedicated for AMI and section 5.2 – stroke. Each of the sections starts with statistical data analysis then it follows with comparative analysis of the clinical protocols and finishing with analysis of the clinical aspects at the different levels of health care provisions including primary and secondary prevention.

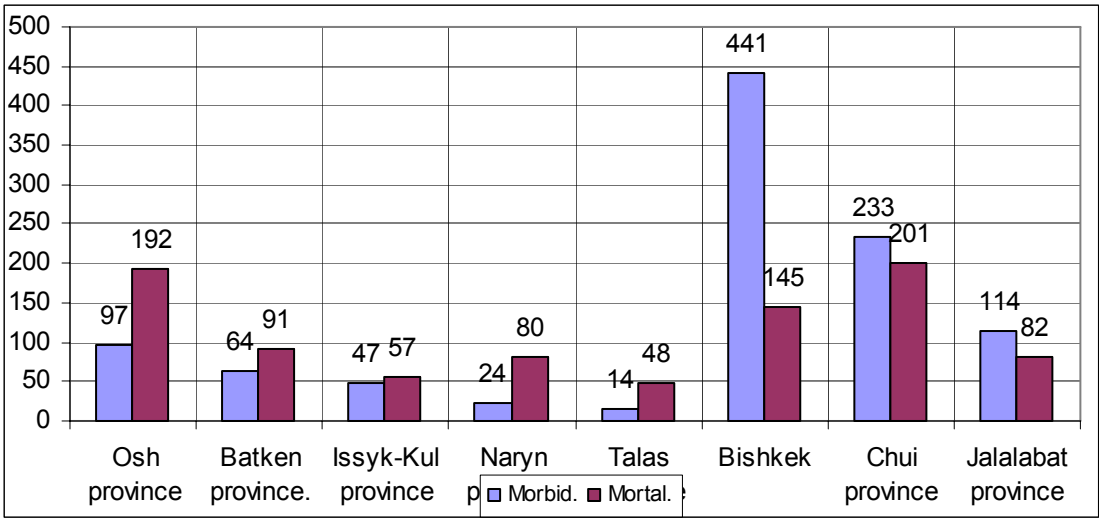
5.1 ACUTE MYOCARDIAL INFARCTION

5.1.1 Statistical data

The Republican medical information center provided data on mortality and morbidity in relation to each other by oblasts (Figure 6). As it can be seen, in all regions with the exception of Chui and Jalalabat oblasts as well as Bishkek the number of deaths exceeds the number of those with the disease. However in accordance with the definition of morbidity the number of those with the disease (ill people) has to exceed the number of deaths or at least be equal to it. This is why this situation in the area of statistics can be considered an example of underreporting of the number of ill people.

Mortality — an indicator evaluating the number of deaths. It is calculated as the ratio between the number of those that die of a particular disease and the average number of the population.
Morbidity – a medical statistical indicator defining the totality of the number of cases of a disease registered in a calendar year among the population residing in a particular territory. It is one of the criteria for assessing health status of the population
Source: Wikipedia – a free encyclopedia

Figure 6. Number of cases and mortality of AMI, 2005



Source: RMIC 2006

According to the above definition a recalculation of the morbidity rate for the two scenarios was conducted. Under the first scenario it was assumed that the morbidity rate may not be

lower than the mortality rate – consequently, the assumed morbidity rate for the first scenario had be equal to the mortality rate. Thus AMI morbidity exceeds the official data by 21.5% (Table 2).

Table 1. Assumed AMI morbidity, number of cases

Oblast	Statistical data		Assumed morbidity	
	Mortality	Morbidity	Scenario-1	Scenario-2*
Naryn	80	24	80	147*
Talas	48	14	48	88*
Osh	192	97	192	353*
Issyk-Kul	57	47	57	105*
Batken	91	64	91	168*
Jalalabat	82	114	114	114
Chui	201	233	233	233
Bishkek	145	441	441	441
Total	**896**	**1 034**	**1 256**	**1 649**
Underreporting in the statistical data			***21,5%***	***59,5%***

Source: RMIC 2006 *Note: P=mort/Cfat

Under the second scenario the assumed morbidity was calculated using the formula *P=mort/Cfat* with the use of a mortality coefficient (Cfat.). The latter was a ratio between the data on the mortality and the data on morbidity in the districts where the abovementioned indicators are in accord with each other. Cfat= mort/morb.

Thus under the second scenario the number of AMI cases must be much higher than the official data – by 59,5%. One may explain this discrepancy by the fact that at present RMIC does not have a single reporting form that would reflect the main indicators – mortality and morbidity.

Conclusions:

- Underreporting of the morbidity rate in the official statistics does not make it possible to use it for the evaluation of the epidemiological situation with acute myocardial infarctions.
- At present it is only possible to evaluate the mortality rate.

Recommendations:

It is necessary to revise and improve the system of registration and reporting forms for AMI for healthcare institutions.

5.1.2 Comparative analysis of clinical guidelines (CGs)

Within the framework of the study a comparative analysis of the Kyrgyz clinical guidelines on AMI with the international clinical guidelines was undertaken. The main purpose of this analysis has been to assess the conformity of their methodological quality and clinical content (see Appendix 3). The following Clinical guidelines were selected for the comparison:

- "Clinical guidelines for the treatment of patients with instable angina pectoris and myocardial infarction without the elevation of the ST segment." American cardiology college/American heart association 2002.

- "Diagnosis and treatment of chest pain and acute coronary syndrome "ACS". NGO clinical system improvement institute, 2004.

- "Diagnosis and treatment of acute coronary syndrome without the elevation of the ST segment at the ECG". Association of doctors of internal medicine of the Kyrgyz Republic, 2005.

Comparison of the development methodology: all compared clinical guidelines are written in accordance with the international CG writing methodology (SIGN – Scottish Intercollegiate Guideline Network- SIGN 50).

Comparison of the clinical content: main and additional aspects of diagnosis and treatment of ACS were used for comparison purposes (Table 4).

Table 2. Main provisions for the diagnosis and treatment of ACS in comparison

Criteria	"Diagnosis and treatment of chest pain and acute coronary syndrome 9ACS)" NGO clinical system improvement institute, 2004.	"Clinical guidelines on the treatment of patients with instable angina pectoris and myocardial infarction without the elevation of the ST segment". American cardiology college/American heart association 2002	"Diagnosis and treatment of acute coronary syndrome without the elevation of the ST segment at the ECG". Association of doctors of internal medicine of the Kyrgyz Republic, 2005.
Diagnosis			
ECG	ECG should be done immediately after hospitalization (recommendation level A, C)	ECG in the 12 leads shall be done within 10 minutes from the start of chest pains or discomfort (recommendation level C)	ECG in the 12 standard leads shall be done within 10 minutes from the start of chest pains or discomfort (recommendation level C)
Myocardium damage markers		Myocardium damage markers need to be defined for all patients with ACS. The main marker is troponin. CFK-MV fraction is the main most accessible marker of myocardial damage (level C).	Myocardium damage markers need to be defined for all patients with ACS. The main marker is the blood serum troponin. CFK is the most accessible myocardial damage marker (recommendation level C).
Treatment			
Main drug groups	Early treatment of patients with ACS implies the prescription of aspirin, heparin or low-molecular heparin, nitrates, beta-blockers, morphine and clopidogrel (recommendation level A, C, M, R)	Nitroglycerine tablets sublingually or spray after intravenous (i/v) drip-feed injection (level C). Morphine sulphate is prescribed i/v for pulmonary edema relief and/or in case of apparent excitement (level C). Beta blockers are prescribed i/v in case of no counter indications (level B). In case of counter indications to beta blockers and repeated ischemia one prescribes nondehydroperidine calcium antagonists verapimil or diltiazem given there is no dysfunction of the left ventricle (level B). Antiplatelet therapy (aspirin) is prescribed as soon as possible after the start of the symptoms (level A). Anticoagulants should be added to the Antiplatelet therapy (level A). Depending on the class of severity one prescribes combinations of the above types of therapy.	There are different combinations of treatment depending on the class of severity. Nitroglycerine tablets sublingually or spray after intravenous (i/v) drip-feed injection (level C). Morphine sulphate is prescribed i/v for pulmonary edema relief and/or in case of apparent excitement (level C). Beta blockers are prescribed i/v in case of no counter indications (level B). In case of counter indications to beta blockers and repeated ischemia one prescribes nondehydroperidine calcium antagonists verapimil or diltiazem given there is no disfunction of the left ventricle (level B). Antiplatelet therapy (aspirin) is prescribed as soon as possible after the start of the symptoms (level A). Clopidogrel is prescribed in case of intolerance to aspirin (level A). Anticoagulants should be added to the Antiplatelet therapy (level A).

Source: Report "Comparative analysis of clinical guidelines and protocols on strokes and acute myocardial infarction (AMI) existing in the Kyrgyz Republic with the international guidelines". (Appendix 3)

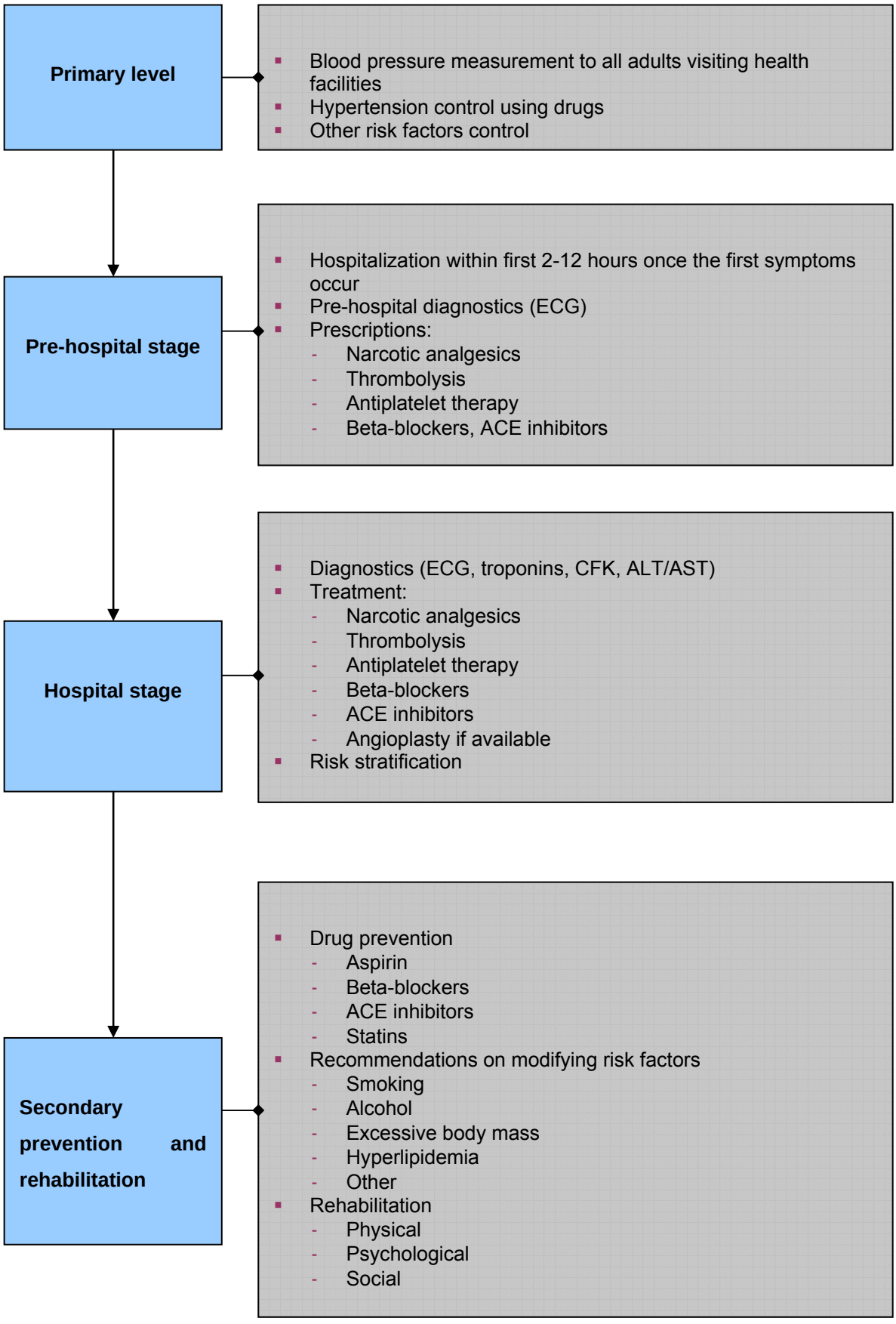
Conclusions:

- Clinical guidelines on the diagnosis and treatment comply with the international standards.
- No differences of approaches to diagnosis and treatment have been identified.
- Clinical guidelines “Diagnosis and treatment of acute coronary syndrome without the elevation of the ST segment at the ECG” (Kyrgyzstan) have been adapted from the “Clinical guidelines on the treatment of patients with instable angina pectoris and myocardial infarction without the elevation of the ST segment”. American Cardiology College/American Heart Association 2002.

Recommendations:

Further large-scale introduction and use of the Kyrgyz Clinical guidelines on Acute coronary syndrome is needed.

Algorithm of AMI patients' management



5.1.3 Profile of the patients with AMI

Within the framework of the study 272 patients' records and 65 outpatient records of patients with AMI were studied.

Average age of the patients at the hospital level was 60,1 years (from 31 to 90 years) and 58,1 years at the outpatient level (from 33 to 80 years). The share of men was 66,9% (182 people) at the hospital level and 75,3% (49 people) at the primary care level (table 4).

Table 3. Age and gender indicators

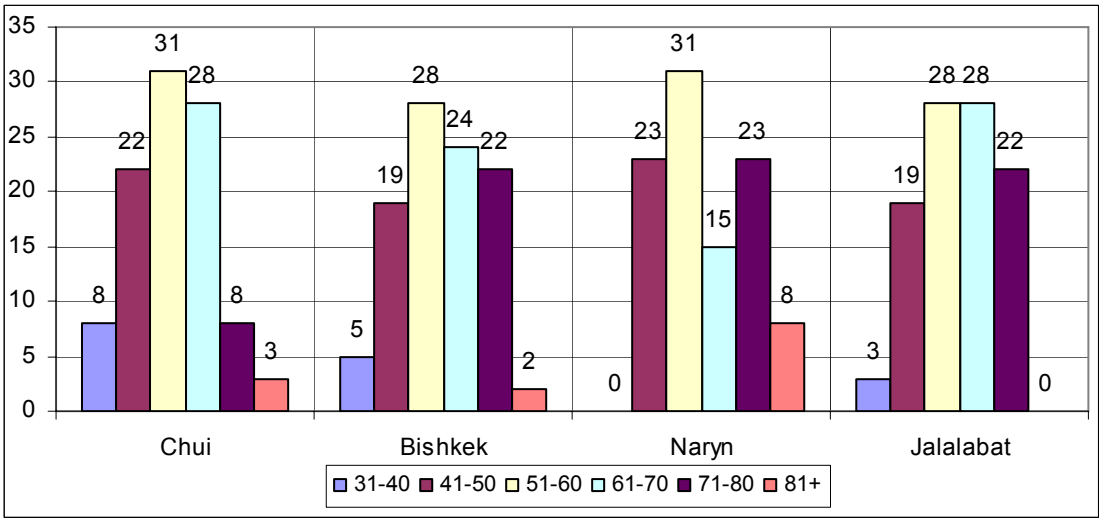
Indicator	AMI (N-272) Hospital	AMI (N-65) Primary care
Average age	60.1 (31 - 90)	58.1 (33-80)
Men	182	49
Women	90	16

Figure 7 shows the breakdown of the patients by age groups and regions. As it can be seen, patients in the age group 41-50 and 51-60 years of age prevail, accounting for approximately 50%. In particular, in the Naryn oblast – 54%, Chui oblast – 53%, Jalalabat oblast – 47%, Bishkek city – 47%. On the whole nationwide more than half of the patients after AMI are people of working age. This fact is further reconfirmed by international studies that showed that in developed countries approximately 80% of deaths of CVD occur among people above 60, whereas in developing countries this is 42%[7].

In the Chui oblast of interest is the same share of patients (8%) in the age groups 31-40 and 71-80 compared to all other regions, where the share of the elderly patients in the age 70-80 is on average more than 20%. This is connected to the fact that Chui oblast is economically most developed in comparison to the other oblasts, and this is where the youngest population of the country is concentrated.

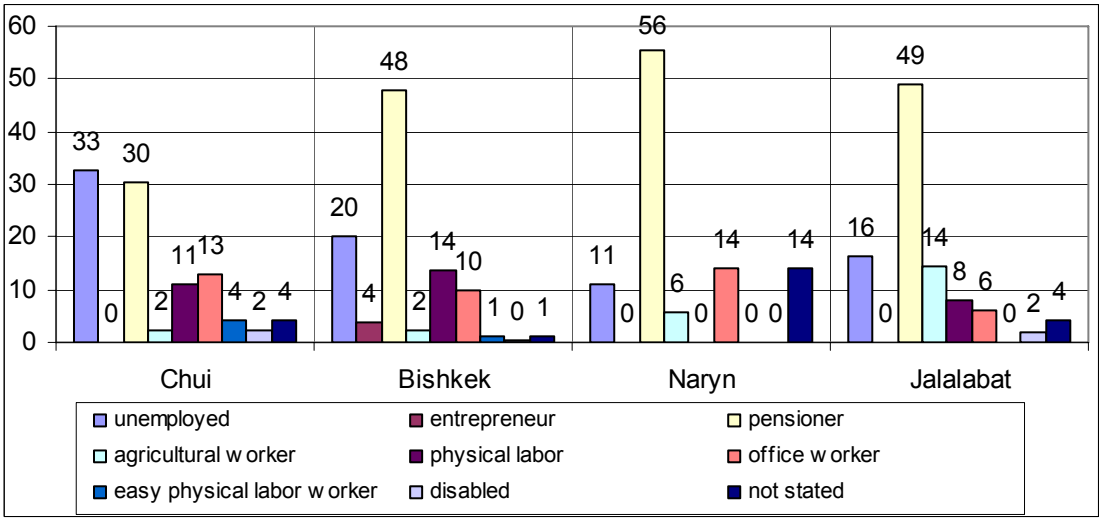
[7] Thomas A. Gaziano «Reducing The Growing Burden Of Cardiovascular Disease In The Developing World» Health Affairs, January 2007, Volume 26, Number 1, pp. 13-24

Figure 7. Breakdown by age by regions, %



From the point of view of social status the prevailing categories in all regions were the unemployed, pensioners and office workers (Figure 8). This picture was noted during the discussions in focus groups and individual interviews, where these categories also prevailed. In the Chui oblast the share of unemployed was somewhat higher than the share of pensioners, and this makes this region different from the others, where pensioners are much more numerous than the other categories. This is connected to the process of internal migration to the Chui oblast when working age population move to more favorable regions in search of employment.

Figure 8. Social status of the patients, %



Conclusions:

- The main burden of AMI-related disease is on the working age population in Kyrgyzstan.
- People from socially vulnerable groups, in particular pensioners and unemployed, are most susceptible to AMI.

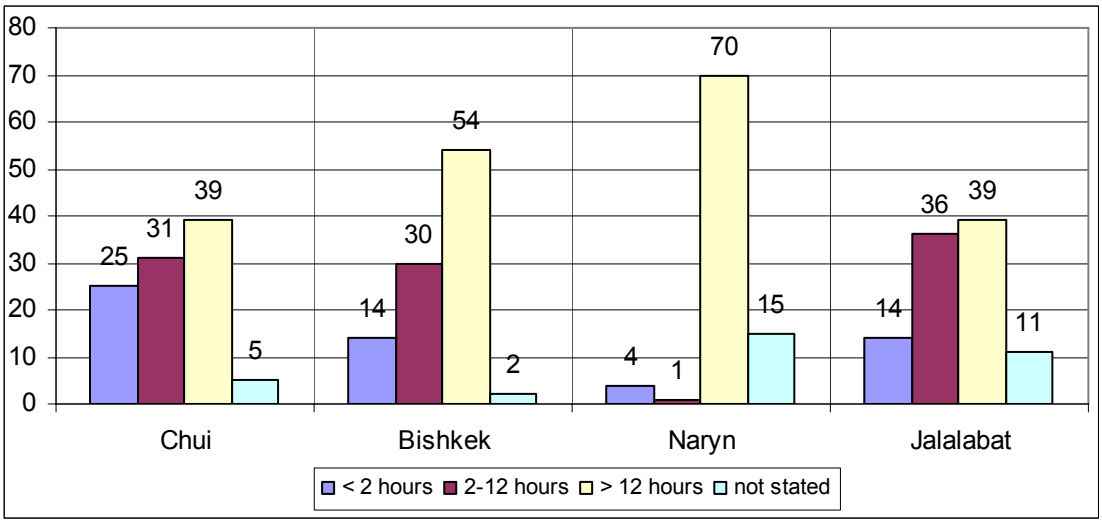
5.1.4 Pre-hospital stage

Hospitalization in the first 12 hours from the occurrence of symptoms has a significant impact on the prognosis of acute myocardial infarction if emergency medical activities are started during this period, such as the prescription of a thrombolytic therapy, narcotic analgesics, aspirin and beta-blockers. In this period the first 2 hours are most important, since the prescription of thrombolytics in this very period is the most effective intervention that increases chances of survival of patients with AMI. This drug-based therapy may be implemented in our conditions only by two services: ambulances and hospitals.

Time from the occurrence of symptoms to hospitalization

In all regions most of the patients are hospitalized later than within 12 hours, which is considered late hospitalization. The share of late hospitalizations is the highest in the Naryn oblast and Bishkek city (70% and 54% respectively) (Figure 9). Less than one quarter of patients are hospitalized in the first two hours. This rate varies from 25% in the Chui oblast to 4% in the Naryn oblast.

Figure 9. Time from the beginning of pain to hospitalization, %



International experience in the sphere of management of patients with AMI shows that pain does not always occur. In approximately 15-20% of cases, and apparently even in a larger share of cases of patients acute myocardial infarction develops painlessly, and such

patients may not even seek medical assistance. Most frequently painless myocardial infarction is registered in cases of patients with pancreatic diabetes and elderly patients. In case of elderly patients myocardial infarction is manifested by sudden breathlessness that may transform itself into pulmonary edema. In other cases myocardial infarction, both painful and painless, is characterized by sudden unconsciousness, sudden weakness, arrhythmia or unexplainable drop of arterial blood pressure[8].

In course of discussions with patients it was discovered that many of them, when faced with the pain syndrome, tried to first overcome the pain on their own and took different drugs. Only some time thereafter they had to seek medical assistance due to further deconditioning. The fact of late arrival at the hospital was also confirmed by the doctors: *"..patients try to get rid of the chest pain on their own by taking analgesics…" .*

Another possible factor in late hospitalization is the atypical AMI. In six focus groups there were 2-3 persons who did not note the presence of characteristic symptoms of AMI. For example, one man 50 years of age residing in the Chui oblast noted: *"For a week I suffered from chest pain… I was even screened for tuberculosis, but in the end they did an ECG and diagnosed me with a heart attack …».*

Conclusion:

Late hospitalization (more than 12 hours) of patients with the chest pains is related to the late seeking of medical assistance.

Recommendations:

It is necessary to supply the population with information on AMI risk factors and the first signs of this disease as well as the importance of timely seeking of healthcare services. Work of healthcare professionals with the population at the primary level is important whereas the mass media may be more effective and have a greater coverage.

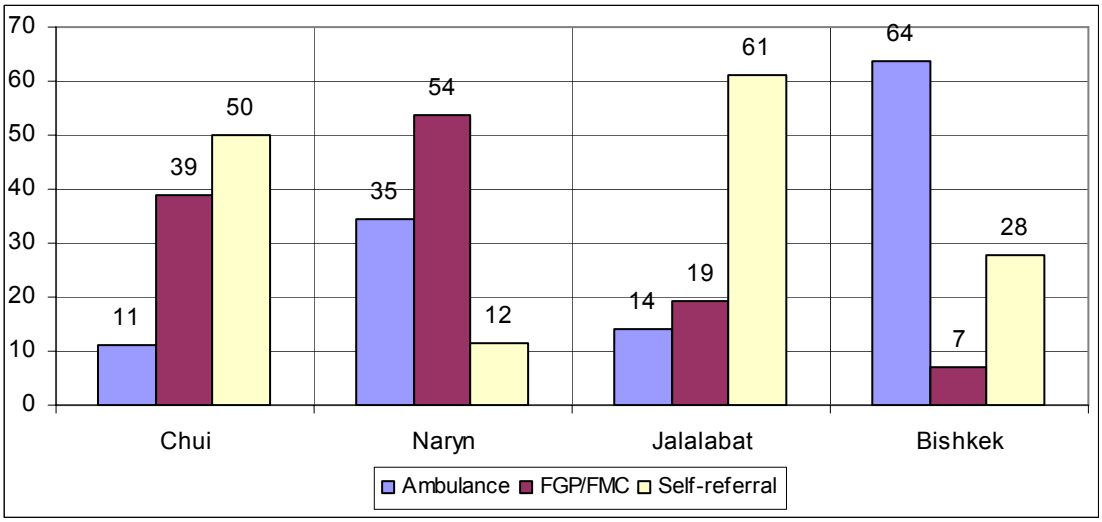
Type of referrals

Taking into account the fact that interventions in the first two hours of AMI have in impact on the prognosis of the disease and the fact that ambulances have an opportunity to perform such interventions, it is the ambulance service that should be the main referral type.

Main types of referrals vary by regions. In Bishkek, for instance, it is the ambulance (63,8%), in Naryn – FGP/FMC (53,8%), and in Chui and Jalalabat oblasts – self-referral (50 and 61,1% respectively) (Figure 10).

[8] Richard C. Pasternak, Eugene Braunwald, Joseph S. Alpert, «Disease, disease treatment», Chapter 190, «Acute Myocardial Infarction», 2006, http://www.rusmedserver.ru/med/haris/174.html

Figure 10. Types of referral, %



In some regions it was noted that in case of AMI patients go directly to the hospital since the sharp pain does not let them wait for the ambulance. For example, a woman 60 years of age residing in the Chui oblast mentioned: *"… it is simpler to get to the hospital on your own than wait for the ambulance…".* The wife of another patient 55 years of age residing in the Jalalabat oblast noted*: "… the ambulance arrived approximately in 30 minutes, and without the doctor – just the driver…".* In Bishkek the situation with ambulances is a bit better – patients know that the ambulance service can offer qualified and timely services.

In the regions the doctors noted that *"over the last few years the functions of the ambulance service boiled down to the mere transportation of patients. Whereas previously we had cardiologic brigades that offered qualified pre-hospital assistance, now all calls are serviced by a paramedic (feldsher) who cannot read an ECG even if he/she can perform one".*

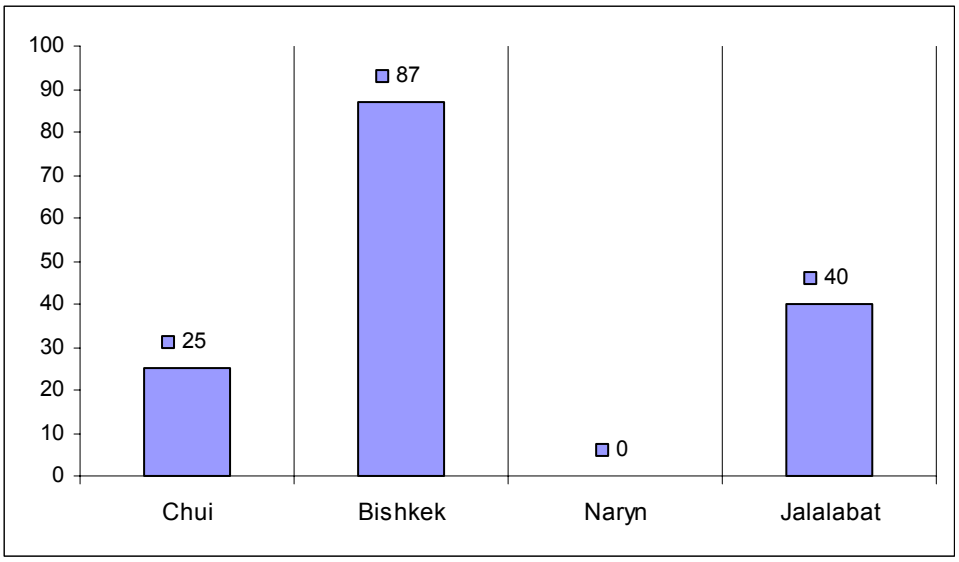
Ambulance-based diagnosis

The main type of AMI diagnosis at the pre-hospital level is ECG. Figure 11 shows the share of ECGs conducted by the ambulance service among hospitalized patients. In Naryn oblast out of 9 patients hospitalized with ambulance none of them had ECG done.

The high percentage of ECGs (87%) in Bishkek may be explained by the availability of specialized cardiologic brigades in the structure of the ambulance service, equipped with both equipment and qualified staff – cardiologists. This indicator could be even higher because in some patient's records, the information sheets of the ambulance service which should be attached to the patient's record, did not contain any information on the diagnosis and emergency activities conducted by the ambulance teams. Low ECG rates in Chui and Jalalabat oblasts reflect the general state of the ambulance service in these regions (low

number of automobiles, poor equipment, lack of trained staff etc.).

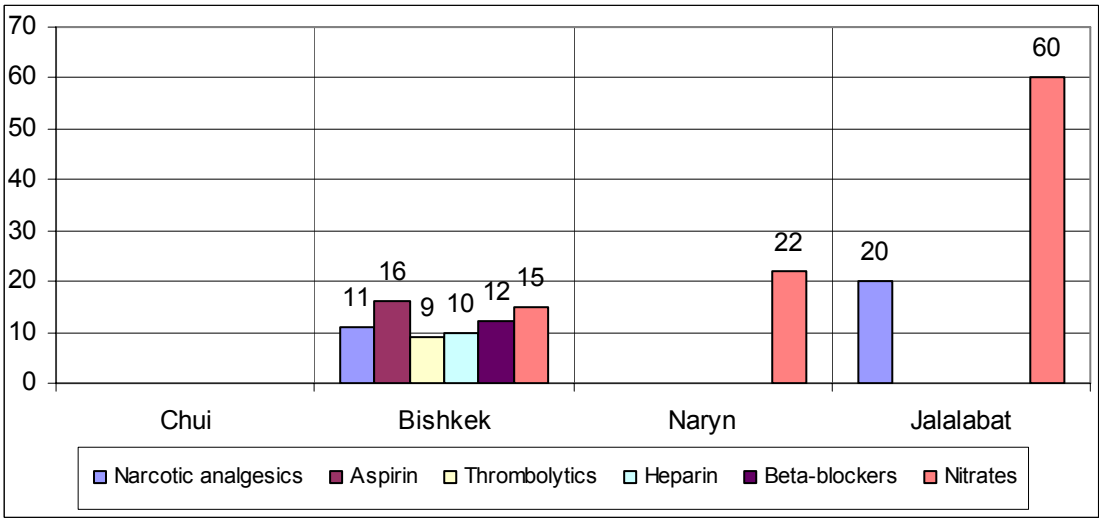
Figure 11. Ambulance-based ECGs, %



Ambulance-based treatment

Figure 12 shows the main trends in the prescription of drugs to patients with AMI at the ambulance level. Emergency care conforming to the international standards at the pre-hospital level is provided mostly in the city of Bishkek. In the Jalalabat and Naryn oblasts nitrates are most widely used, 60% and 22% respectively. It is noteworthy that at present nitrates are not used in international practice as widely due to the availability of other more effective drugs. However such drugs are not being sufficiently prescribed in the regions at the pre-hospital level.

Figure 12. Ambulance-based treatment by the regions, %



Conclusion:

The problems persisting in the ambulance system (organizational, technical, staffing etc.) prevent the provision of sufficient and qualified pre-hospital services.

Recommendations:

Strengthen the ambulance system to increase coverage of the population and the volume of services in the areas of diagnosis and treatment at the pre-hospital level.

5.1.5. Hospital stage

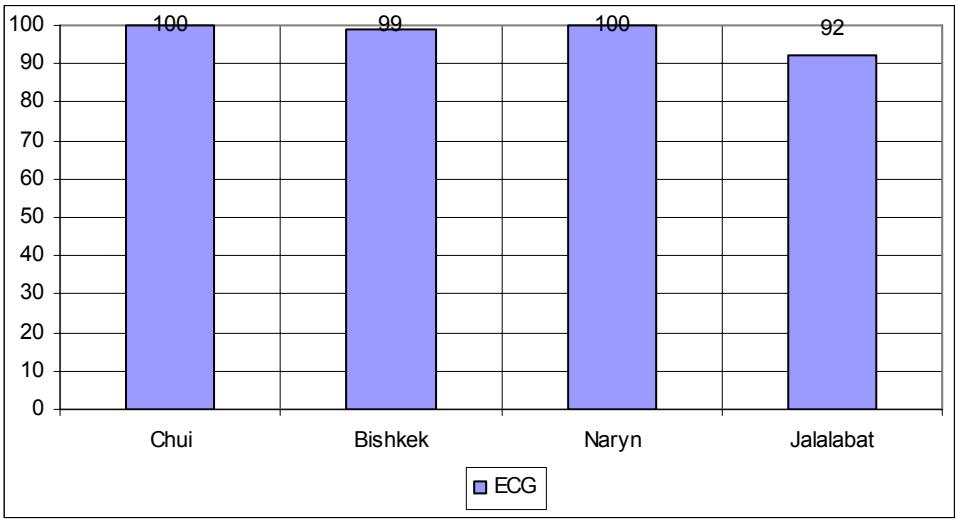
Main diagnosis and treatment activities are provided at the hospital stage.

AMI diagnosis

In accordance with the evidence-based medicine principles, instrumental (ECG) and laboratory methods are used. The latter include the detection of "cardial" ferments of the blood serum, such as troponins, creatine phosphokinase (CFK) and amonitransaminase (ATM) to reconfirm the diagnosis. Furthermore, to identify risk factors it is necessary to identify sugar and cholesterol levels.

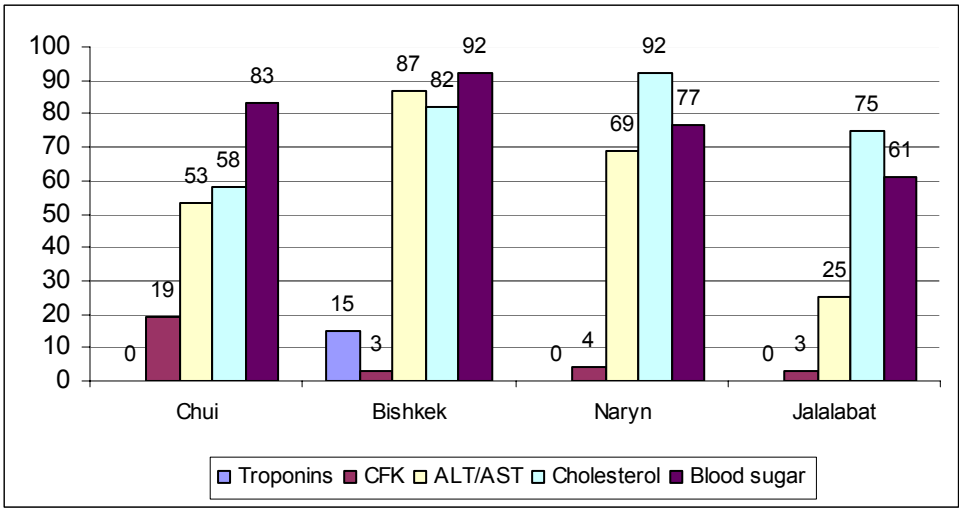
Figure 13 shows that in all surveyed regions ECG is the main method for AMI diagnosis, conducted in almost 100% of cases in all observed oblasts.

Figure 13. Performance of ECG at the arrival at the hospital, %



The main diagnostic test across all the regions is the identification of the level of aminotransaminase ALT/AST (Figure 14). This rate varies from 25% (Jalalabat oblast) to 87% (Bishkek). The identification of the CFK is used in 3-4% of cases with the exception of Chui oblast, where this rate is 19%. Identification of troponins in the blood serum, which is the most sensitive test, is only done in Bishkek and in 15% of cases only.

Figure 14. Diagnostic laboratory tests performed in the hospitals



Furthermore, to identify risk factors, such as pancreatic diabetes and hypercholesterolemia, two diagnostic tests are done – identification of the blood sugar level and cholesterol. As it can be seen, these tests are performed in more than 60% of cases. Such high rates reflect the commitment of doctors to the identification of risk factors, which is a positive aspect of the diagnosis.

Despite the commitment of doctors to the conduct of diagnostic tests, there are still some problems with their implementation. Physicians explained the insufficient percentage of main laboratory tests by the fact that they are *"… ready to do all types of analysis, but frequently lack reagents…"*

Conclusions:

- ECG is the main method of AMI diagnosis, it is performed everywhere and in all cases;
- Of the laboratory tests to identify the "cardiac ferments" one mostly uses low sensitivity methods – ATM.

Recommendations:

It is necessary to increase the use of sensitive methods of diagnosis, such as troponins and CFK everywhere.

AMI treatment

Pursuant to the evidence-based medicine principles, when treating acute myocardial infarction, one should use the following drug groups:

- Thrombolytics
- Antiplatelets
- Anticoagulants

- Beta-blockers
- Angiotensin-coverting enzyme inhibitors (hereinafter APF inhibitors)

One of the most important interventions is the prescription of thrombolytics in the first few hours of the disease. This treatment method is an intervention with proven effectiveness as the results of a cumulative meta-analysis show[9] (Figure 15). This analysis includes the results of thrombolytic therapy usage in 48000 AMI patients during 30 years. The results show the high effectiveness of thrombolysis in AMI treatment.

Figure 15. Use of thrombolytic therapy for AMI

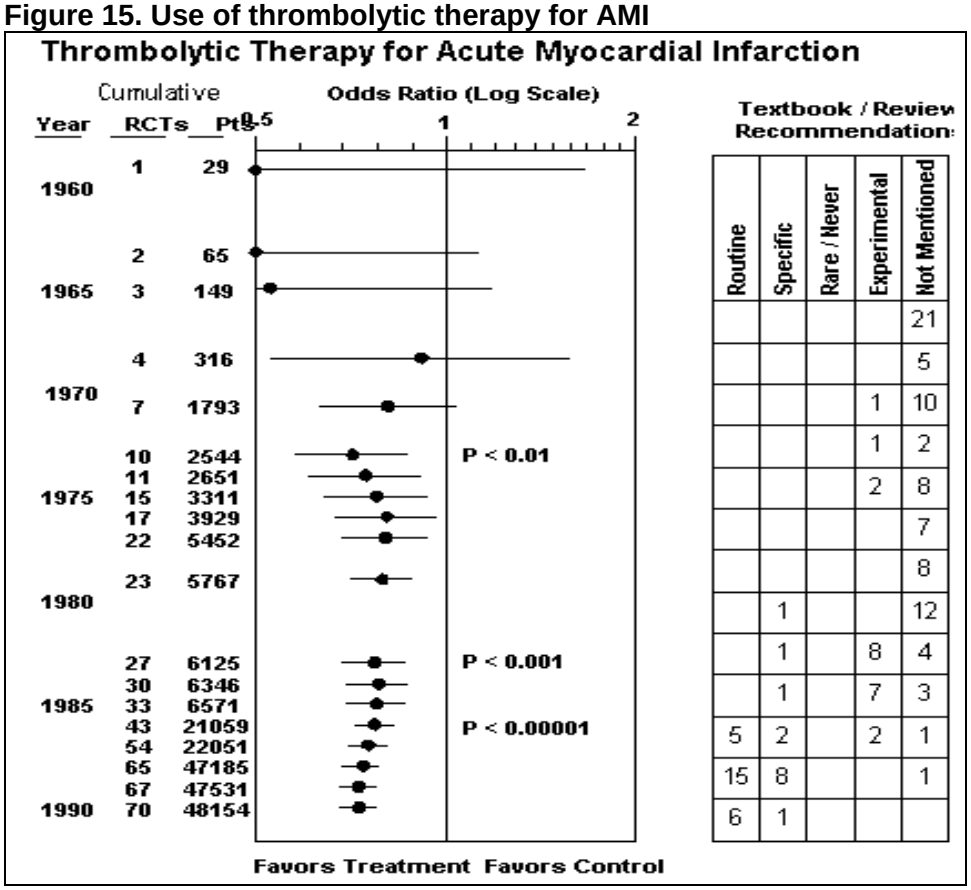
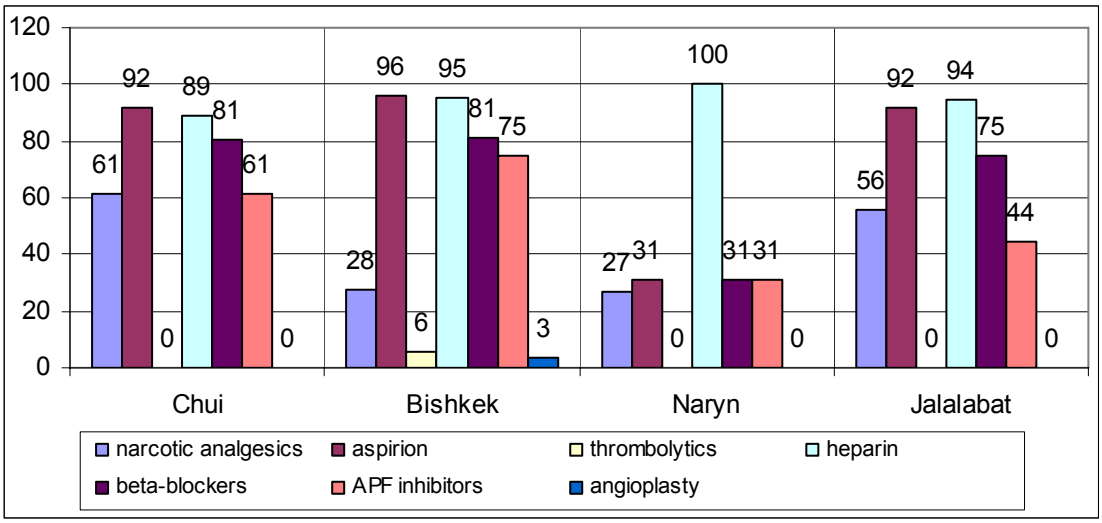


Figure 16 shows the main drug groups used for the treatment of AMI in Kyrgyzstan by the regions. The use of thrombolytics in Kyrgyzstan has not been widespreaded yet despite the recommendations in the local clinical guidelines. At present thrombolytic therapy is only prescribed in Bishkek (6%). Narcotic analgesics remain the main group of drugs for the relief of the pain syndrome. The share of prescriptions of narcotic analgesics varies by regions. The greatest share is noted in the Chui oblast (61%) and it may be explained by

[9] J Lau , E M Antman , J Jimenez-Silva , B Kupelnick , F Mosteller , T C Chalmers "Cumulative meta-analysis of therapeutic trials for myocardial infarction." N Engl J Med. 1992 Jul 23;327:248-54 1614465

the fact that narcotic analgesics are not used at pre-hospital stage in this oblast but it prescribes at hospital stage (Figure 16). The physicians noted that *"…access to narcotic analgesics is restricted both at the ambulance level and at in the wards. One needs a permission of the management. We do not prescribe thrombolytic therapy since we have no experience of using such drugs…".*

Figure 16. Prescription of drugs in the hospitals, %



Antiplatelet therapy (aspirin) is widely used in all regions, exceeding 90%, with the exception of the Naryn oblast, where this indicator is 31%. At the same time anticoagulant therapy (heparin) in the Naryn oblast was undertaken in all cases. The situation in this oblast in contrast to the other regions shows that doctors are committed to methods that had been introduced earlier than the other methods, for example anticoagulant therapy, and less committed to more modern approaches to the management of AMI patients (prescription of thrombolytics, aspirin and beta-blockers). One of the reasons mentioned by the doctors is low awareness of the new methods of treatment: *"…last time I went to Bishkek for a training was 5 years ago, and at my own expense. Not everyone can afford this… This is why we don't know new treatment methods… Doctors at the primary level are trained much more frequently than we are…".*

A modern treatment method for AMI is the balloon angioplasty which was recently introduced in Bishkek at the tertiary level at the National center of cardiology and therapy. This method was used in 3% of cases in Bishkek.

Conclusions

- AMI treatment standards reflected in the clinical guidelines on the treatment of acute coronary syndrome have not yet been broadly introduced in the day-to-day practice
- There are significant variations in the treatment across the regions and levels of healthcare provision.

Recommendations

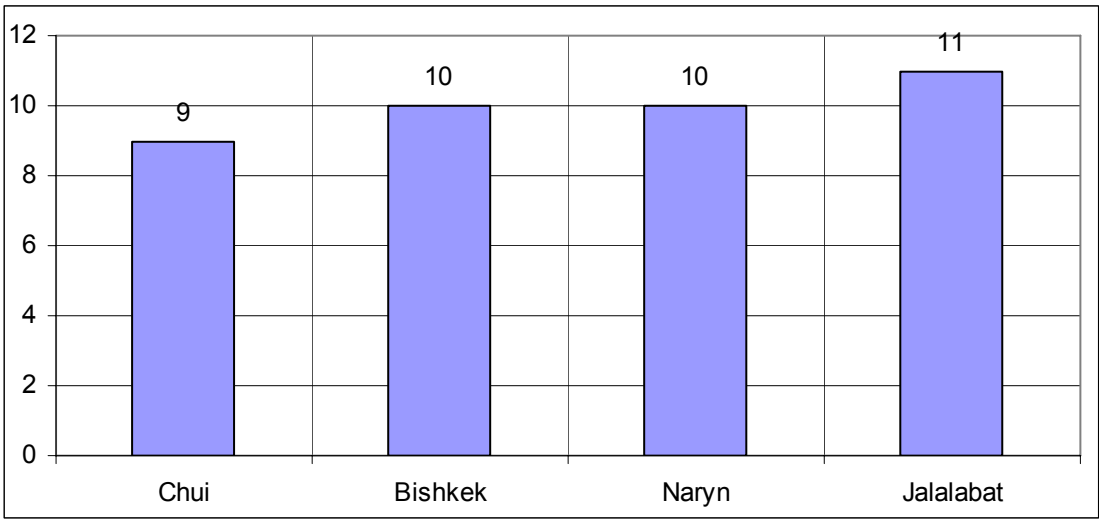
It is necessary to smooth over the variations in treatment and improve the commitment of doctors to following clinical guidelines. It is necessary to improve the coverage of specialists with trainings and pursue regular monitoring to check the quality of treatment and doctors' commitment to clinical guidelines

Average length of hospital stay

At present diagnosis-related groups (DRGs) and clinical guidelines for the treatment of AMI do not explicitly determine the average length of hospital stay. The following question presents itself: does the length of stay of a patient in the hospital indeed have an impact on the prognosis and the course of acute myocardial infarction? The existing clinical guidelines for AMI note the need for diagnostic activities, such as veloergometry (VEM) on days 14-21 and repeated identification of the level of troponins in the blood serum on day 14 to define the prognosis and further treatment tactics. Another question emerges: should one perform these diagnostic tests in the conditions of a hospital? International experience shows various attitudes towards the duration of hospital treatment, which on average in the cases of a non-complicated myocardial infarction is 7-12 days. However some doctors still believe it is necessary to hospitalize patients with Q-wave myocardial infarction for 3 weeks. Patients with severe forms may indeed need hospitalization for a period of 3 weeks or even longer. On the whole one may think that the duration of hospital treatment should depend on the speed of diminishment of the hart failure and what home conditions the patient may expect after the discharge.

During the course of the review of patients records it was discovered that on average patients spend 10 days in the hospital with the maximum number of days – 10,8 – discovered in the Jalalabat oblast, and the minimal – 8,9 days – in the Chui oblast (Figure 17).

Figure 17. Average length of stay of AMI patients, days



These indicators were also confirmed by the doctors: *"In the majority of cases AMI patients are hospitalized for 10-12 days only…".* This may be explained by the fact that hospitals are not interested in a lengthy stay of the patient because they receive case-based payment. The doctors point at a different reason though: *"…we are ready to treat patients longer, as in the previous times, but MHIF penalizes us if our patients stay for more than 15 days…".* One comes of the impression of a persisting stereotype on part of the doctors in relation to the dependence of the disease prognosis on the duration of the patient's treatment in the hospital, i.e. the longer the patient stays in the hospital, the better the outcomes of the treatment.

The share of recurrent AMI cases

Recurrent AMI cases may be related to the insufficient secondary prevention as a consequence of:

(1) low commitment of patients to the intake of drugs to treat the main diseases – risk factors (pancreatic diabetes, hypertension);

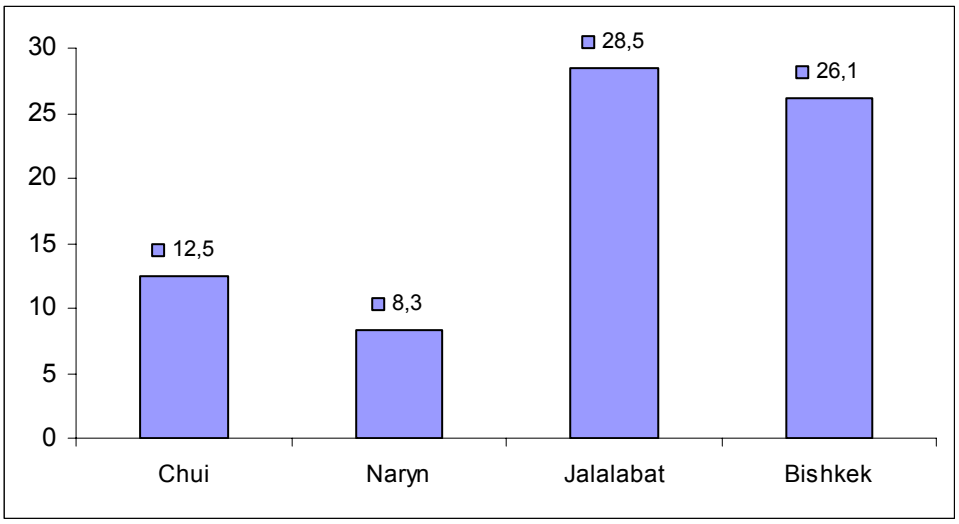
(2) insufficient correction of modifiable risk factors (smoking, alcohol abuse, hypercholesterinemia etc.).

This is predefined by the low economic access to drugs, low commitment of doctors to the guidelines' provisions upon discharge and at the stage of outpatient treatment as well as psychological peculiarities of patients that do not realize the importance of following the doctors' recommendations.

Figure 18 shows the share of recurrent AMI cases by regions. It can be seen that the greatest number of recurrent AMI cases is in the Jalalabat oblast – 28,5%. Taking into

account the geographic remoteness of the Jalalabat oblast from the tertiary level (Bishkek) patients with recurrent AMI undergo treatment there, in contrast to the Naryn (8,3%) and Chui (12,5%) oblasts that refer part of such patients to Bishkek.

Figure 18. Recurrent AMI cases, %



These facts were also confirmed by doctors in the regions: *"…patients do not trust us, local doctors, and therefore try to use every opportunity to go to Bishkek for treatment…".*

5.1.6 Drug provision

Drugs used to treat AMI defined by the working group comply to 85% with the list of vital drugs (LVD) approved by a decree of the government of the KR in 2006.

Moreover, after the study of the drug provision it was discovered in the hospitals that the wards have the main drugs to treat AMI at a level of 75%. Provision of drugs to pharmacies closest to the hospitals and FMCs was also 75%.

Thus one can make a conclusion that main drugs for the treatment of AMI in Kyrgyzstan are physically accessible which is a positive factor.

5.1.7 Prevention and rehabilitation

This section will consider primary and secondary prevention of coronary heart disease (CHD) pursued at the primary and hospital levels.

Primary prevention

Primary preventin is geared towards the identification of risk factors and the development of strategies for their modification. It is known that there are two groups of risk factors for

coronary heart disease – manageable (arterial hypertension, pancreatic diabetes, smoking, hypercholesterinemia, alcohol abuse) and unmanageable (sex, age, heredity).

Risk factors

The leading risk factor noted by the doctors in medical documentation is hypertension, other risk factors were noted rarer. At the hospital level of 272 records risk factors were noted in 234 (86,0%) cases, where the main factor was hypertension (163/69,7%)

In case of outpatient records both types of prevention were assessed – primary and secondary, which means that risk factors were identified prior to the AMI and after it.
It turned out that at the primary level hypertension was the main risk factor both prior to and after the AMI and came up to 44,6% and 58,4% consequently.

It was discovered that risk factors related to lifestyle (nutrition, body weight, physical exercises, smoking and alcohol consumption) do not receive due attention. Despite the fact that hypertension is the main risk factor, counseling and control of other risk factors is also important in the prevention of acute myocardial infarction.

Secondary prevention

The final and the most important stage of AMI patient management is secondary prevention and rehabilitation. Secondary prevention is geared towards the prevention of recurrent infarction and its complications.

Recommendation upon discharge

In the course of the analysis of the patients records one assessed both non-drug-related recommendations and the drug therapy.

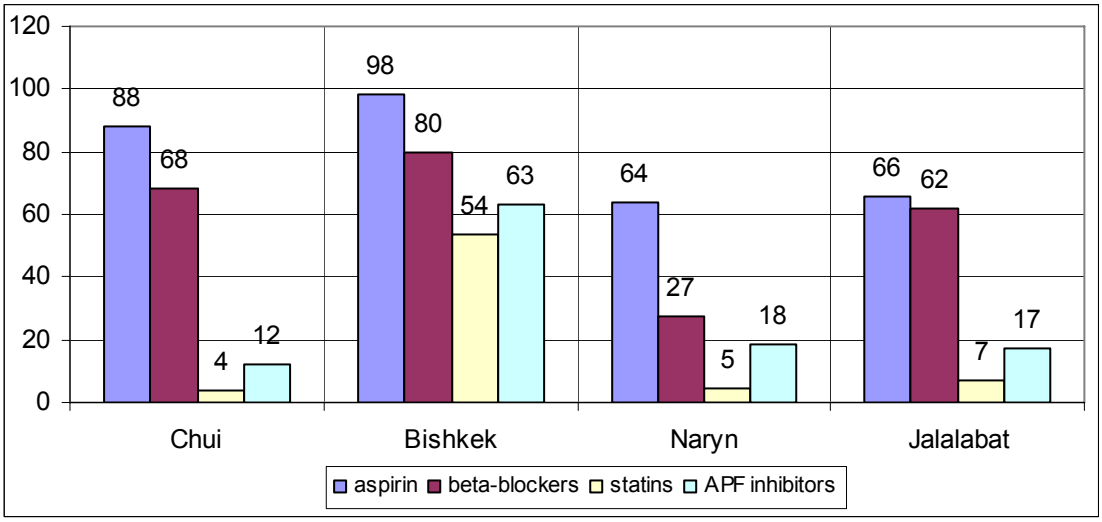
Main recommendations for the **non-drug treatment** pertaining to the following aspects of the lifestyle of the patients were represented in the following manner in descending order of importance: healthy nutrition, physical activities, saying no to bad habits (78,5%, 59,7%, 2,1% consequently)

Upon discharge from the hospital of special importance is changing the patient's behavior in relation to their lifestyle and compliance with the doctor's recommendations. In the course of the discussions with patients after AMI almost all patients noted that their lifestyle has changed after the infarction to a lesser or greater degree. For example, a 47-year old man from the Jalalabat oblast said: *"… before the AMI I consumed alcohol to relieve stress and smoked 1-2 packs of cigarettes per day. After the infarction however following doctor's recommendations I quit drinking and smoking. Once I tried to have 100 gram, but I felt bad*

after that and decided not to experiment anymore and quit drinking altogether …".

In relation to the recommendation on drug treatment upon the discharge from the hospital it was discovered that the principles of drug therapy recommended after the discharge are similar to the treatment principles in the hospital. Aspirin and beta-blockers were recommended to the majority of patients in all oblasts, but there were significant variations across the regions. In Bishkek 98% of patients received aspirin and 80% - beta-blockers, whereas in Naryn the rates were 64% and 27% respectively. APF inhibitors were prescribed in a small number of cases (Figure 19). A relatively new group of drugs for cholesterol reduction – statins – are recommended at discharge in all surveyed regions, but the commitment of doctors to their prescription in Bishkek is higher than in the other regions.

Figure 19. Recommendations upon discharge, %



Conversations with the patients revealed that after the discharge from the hospital they do not always take the drugs prescribed by the doctors, since *"…drugs are expensive and my pension is not enough. I thank my son who sends money to buy drugs…".* Another reason was that *"… cheap drugs do not help and we cannot afford expensive medications…"*

Conclusions:

- Prevention of coronary heart disease is not efficient enough due to:
  - low commitment of doctors and patients;
  - low awareness of specialists in the regions
- There is no holistic approach to prevention; risk factors are not considered in their totality.

Rehabilitation

Restoration of working abilities of patients after AMI is not only a medical problem but also a social one due to its great social significance since most of them are people of working age, of value to the state. Their ability to go back to work and have satisfaction from life is of great importance both for themselves and for the society at large. Medical rehabilitation of patients after AMI requires specific diagnostic and treatment activities. It is best when it is done in specialized sanatoriums and continues at the outpatient level. Patients should be transferred to such institutions 3-4 weeks after the myocardial infarction. In accordance with various aspects of rehabilitation as a comprehensive program one always uses a set of various treatment methods including drug therapy, kinesitherapy, psychotherapy and psychological correction, physiotherapy, diet therapy, climate therapy etc.

At present rehabilitation of patients after AMI is realized at the primary level, and mostly in Bishkek. After discharge from the hospital patients are referred to the family medicine center (FMC) at the place of residence, where a cardiologist does the rehabilitation. However access to such rehabilitation does not exist everywhere. In Bishkek such rehabilitation is only provided at two FMCs. As a result the vast majority of such patients can only afford drug-based treatment, without the other important methods of rehabilitation. In the regions rehabilitation provided by healthcare professionals is practically nonexistent. Sanatorium and resort-based restorative treatment is also inaccessible for the majority of citizens due to economic reasons. This is why patients rehabilitate themselves, using the experience of their relatives, acquaintances and other people.

Conclusions:

- Prevention in the primary institutions is focused on hypertension, and this focus is justified due to high prevalence of high arterial blood pressure in the Kyrgyz Republic.
- Rehabilitation of patients after acute myocardial infarction is not pursued at the due level and is provided in the form of fragmented services.

Recommendations:

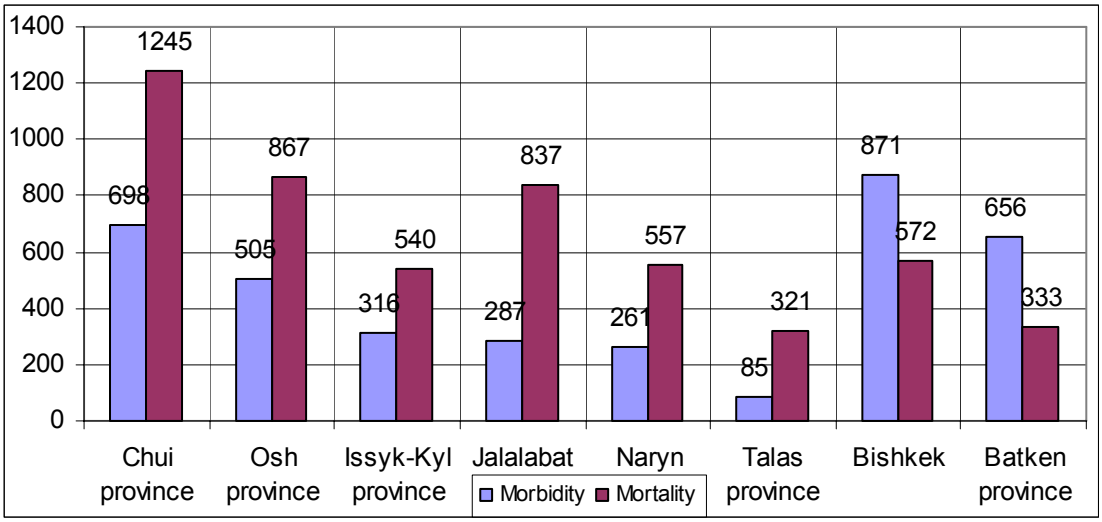
- Strengthen primary prevention of CVD including the development of strategies to fight risk factors.
- Develop a system of rehabilitation for AMI patients including physical, psychological and social rehabilitation to return the patients to full-fledged life as soon as possible

5.2. STROKES

5.2.1 Statistical background

Situation with the statistical data on strokes is similar to that with the AMI. As it can be seen from Figure 20 in all oblasts with the exception of Batken oblast and Bishkek city the number of deaths exceeds the morbidity level. However as it was noted earlier in accordance with the definition of the term “morbidity” the rates should exceed the mortality rate or at least be equal to it. This is why also in the case of registering strokes the situation reflects underreporting in the statistics.

Figure 20. Morbidity and mortality rates for strokes, 2005



Source: RMIC 2006

According to the definition of the term “morbidity” following the same methodology described in the AMI chapter a recalculation of the morbidity rate for the two scenarios was conducted.

For the first scenario it was assumed that the morbidity level may not be below the mortality rate, consequently the assumed morbidity rate for the first scenario has to be equal to the mortality rate. Thus stroke morbidity exceeds the official data by 60,2% (Table 5) .

Table 4. Assumed cerebral hemorrhage rate, number of cases

Oblast	Statistical data		Assumed morbidity	
	Mortality	Morbidity	Scenario-1	*Scenario-2
Naryn	557	261	557	940
Talas	321	85	321	542
Osh	867	505	867	1463
Issyk-Kul	540	316	540	911
Jalalabat.	837	287	837	1412
Chui	1245	698	1245	2100
Batken	333	656	656	656
Bishkek city	572	871	871	871
Total	**5272**	**3679**	**5894**	**8895**
Underreporting of the statistical data			***60,2%***	***141,8%***

Source: RMIC 2006 *Note: P=mort/Cfat

In the second scenario the assumed morbidity was calculated using the same formula P=mort/Cfat, described in the AMI chapter with the use of the morbidity coefficient (Cfat.). Thus, in accordance with the second scenario, estimated stroke-related morbidity should exceed the official data by 141,8%.

Conclusions:

- Underreporting of the morbidity rate in the official statistics does not make it possible to use it to evaluate the epidemiological situation for strokes.
- At present an evaluation of the epidemiological situation is only possible based on stroke mortality rate

Recommendations:

It is necessary to revise and improve the system of registration and reporting forms on stroke for healthcare facilities.

5.2.2 Comparative analysis of clinical guidelines (CGs) and clinical protocols (CPs) for the treatment of strokes

For the purposes of comparison the following Clinical guidelines and protocols were selected:

1. “Clinical guidelines for early management of patients with ischemic stroke”, 2005 The stroke council of the American heart association/American stroke association
2. “National guidelines for strokes”, 2004, Intercollegial working group on strokes, Royal medical college, London
3. Clinical protocol for primary level “Acute cerebral circulation disorders (ACCD)”
4. Clinical protocol for secondary level “Acute cerebral circulation disorders (ACCD)”

Comparison of the development methodologies

Clinical protocols for acute cerebral circulation disorders (ACCD) for primary and secondary levels were developed and approved by the Ministry of health of the Kyrgyz Republic in 2002. It is noteworthy that at that time no adopted methodology existed for the development of Clinical Guidelines, and these Clinical Protocols were developed as the first stage of institutionalization of the process of development of CGs/CPs in Kyrgyzstan. Since methodological approaches in the Kyrgyz clinical protocols were not described in detail, comparison of the methodology with the international clinical guidelines may be considered arbitrary.

Comparison of the clinical content

The following differences in the clinical content were identified:

Diagnosis of strokes:

- International clinical guidelines recommend using the “golden standard” of stroke diagnosis – computer tomography and/or magneto-resonant tomography (CT/MRT).
- Stroke diagnosis for clinical guidelines for the primary level is only based on the data of physical screening.
- Clinical protocol for secondary level defines CT/MRT as the main diagnosis methods alongside with some alternative methods provided thereto (with lower sensitivity), such as lumbar puncture and others. This fact is explained by low physical access to CT/MRT since the republic only has 2 CTs and one MRT

Treatment:

- Treatment of arterial hypertension (evidence class A): no principal differences in the treatment tactics, but some differences in the choice of drugs do exist:

  - British CG, American CG – tiaside diuretics (indalanid and bendrofluazid) or APF inhibitors (perindopril or ramipril) or their combination
  - Kyrgyz CP - β-blockers (atenolol) and calcium antagonists (nifedipin)
- Thrombolysis (evidence class A): no principal differences in the treatment tactics, but some differences in the choice of drugs:
  - British CG - alteplaza
  - American CG and Kyrgyz CP for secondary level – recombinate tissue pasminogene activator, urokinase
- Anticoagulants: (not recommended – evidence class A):
  - British CG, American CG – not recommended
  - Kyrgyz CP for secondary level – fraksiparin recommended (choice based on the expert opinion as well as physical and economic accessibility of the drug)
- Neuroprotectors (not recommended – evidence class A):
  - British CG, American CG – not recommended
  - Kyrgyz CP for secondary level recommends tokoferol, ascorbic acid, cytochrome C (choice based on the expert opinion as well as physical and economic accessibility of the drugs).
- Antiplatelets (aspirin) (evidence class A) – no differences.
- Surgical interventions (evidence class B) – no differences.

Prevention:

On the whole there are no differences in approaches to prevention, but:

- British CG – recommendations both for primary and secondary prevention
- American CG – prevention is not described since it is only intended for patients with acute phase of the disease
- Kyrgyz CP for primary level – contains recommendations for secondary prevention. (Note: primary prevention is reflected in the CPs for the relevant nosologies, such as hypertension, diabetes, which are risk factors for the development of cerebral hemorrhage).
- Kyrgyz CP for secondary level – prevention is not described since this CP is intended for the management of patients at the hospital level

Additional aspects of diagnosis and treatment of strokes were also used for comparison purposes. A more detailed comparative analysis is provided in Appendix 3.

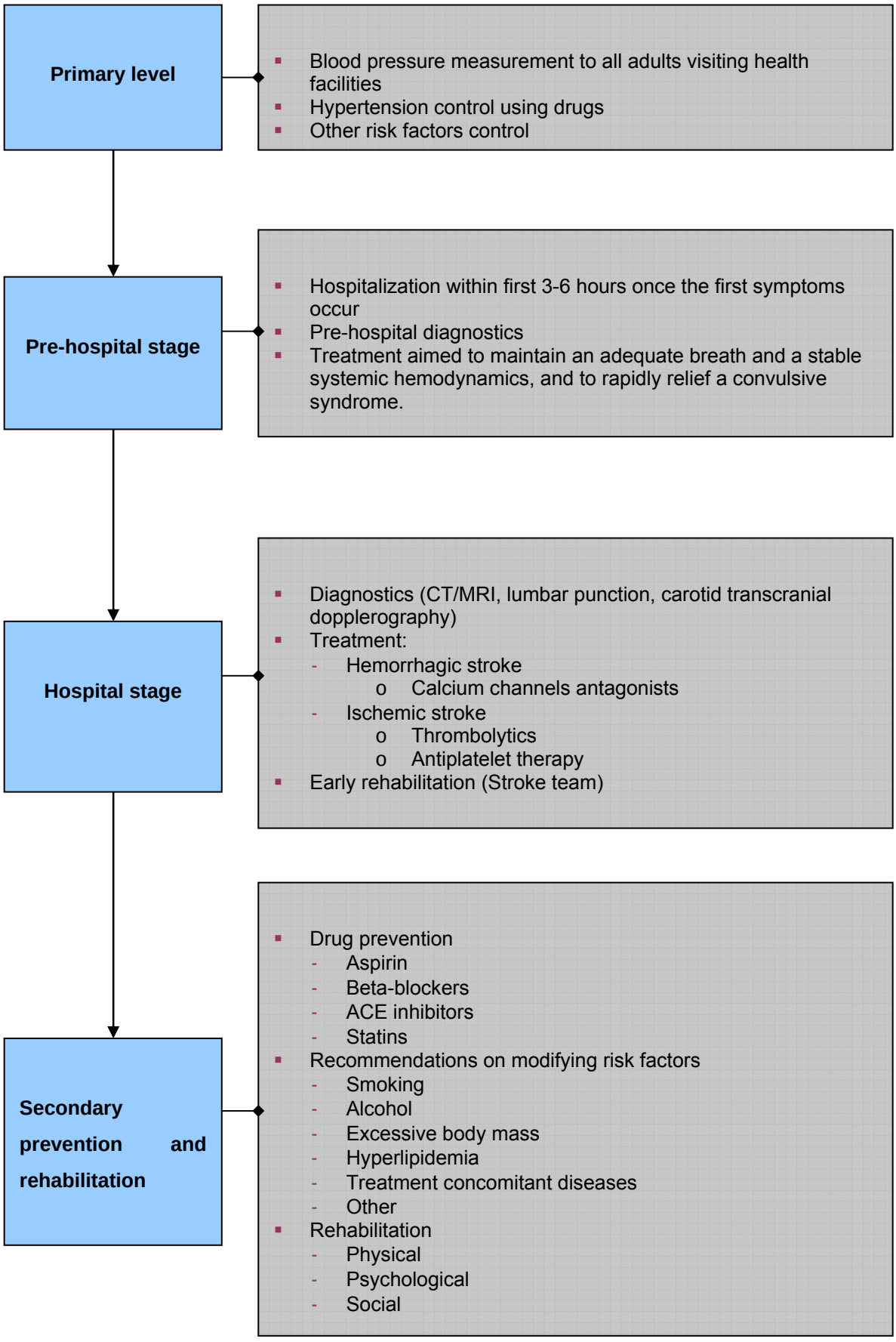
Conclusions:

- Clinical protocols for primary and secondary levels (Kyrgyzstan) were developed without the use of international methodology (systematic approach was not used).
- Clinical content of Kyrgyz protocols does on the whole comply with the international Clinical Guidelines, with the exception of recommendations on the use of anticoagulant therapy and neuroprotectors, which are not recommended by international CGs.

Recommendations:

- To continue the use of the existing Clinical protocols on ACCDs for primary and secondary levels.
- It is necessary to start parallel development of the Clinical guidelines for the management of patients with strokes at all healthcare levels in accordance with international methodology.

Algorithm of Stroke patients' management



5.2.3 Profile of a stroke patient

Within the framework of the study 371 patient's records and 155 outpatient records of stroke patients were studied.

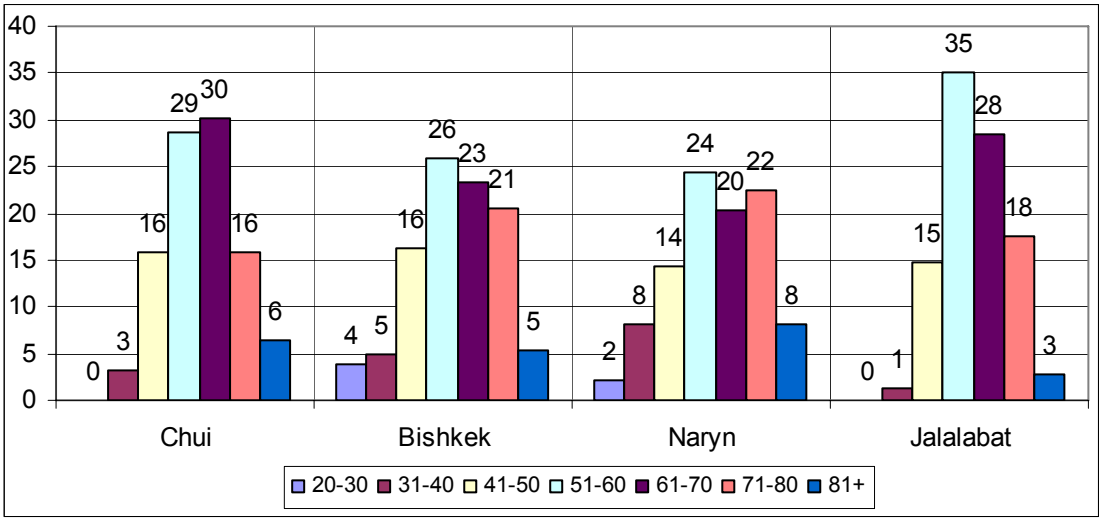
Average age pf patients was 50 years at the primary level (between 25 and 92 years) and 60,6 years at the hospital level (from 21 to 89 years) (Table 7). From the point of view of gender 53,1% of patients were men (197 people) at the hospital level and 60,6% (94 persons) at the primary care level.

Table 5. Age and gender distribution

Indicator	Stroke (N-155) primary care	Stroke (N-371) hospital
Average age	50 (25-92)	60,6 (21-89)
Men	94 (60,6%)	197 (53,1%)
Women	61	174

As it can be seen, most of the patients faced stroke in the age under 60, and it is noteworthy that in Bishkek and Naryn oblast part of the patients faced stroke in a very young age between 20 and 30 (4% and 2% respectively) (Figure 21). This may be considered as quite a worrisome fact that demands further studies. Physicians in Naryn noticed in their practice that stroke patients are getting younger in the last decade.

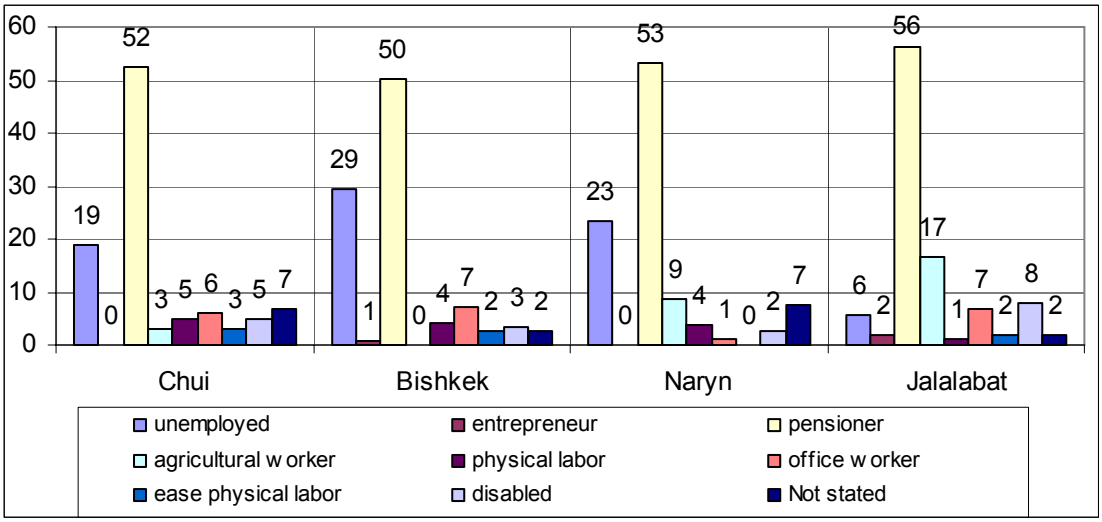
Figure 21. Breakdown by age, stroke, %



From the point of view of social status, in all studied regions with the exception of Jalalabat oblast the greatest share of patients is comprised of the unemployed, housewives and pensioners, including medically disabled persons. This is a common feature of patients from various regions and it is not related to their peculiarities (urban vs. rural areas, agricultural workers vs. office workers etc.). In the primarily agricultural regions (Jalalabat oblast) for

natural reasons approximately one fourth of the sample comprised people involved in agriculture (Figure 22).

Figure 22. Social status of stroke patients, %



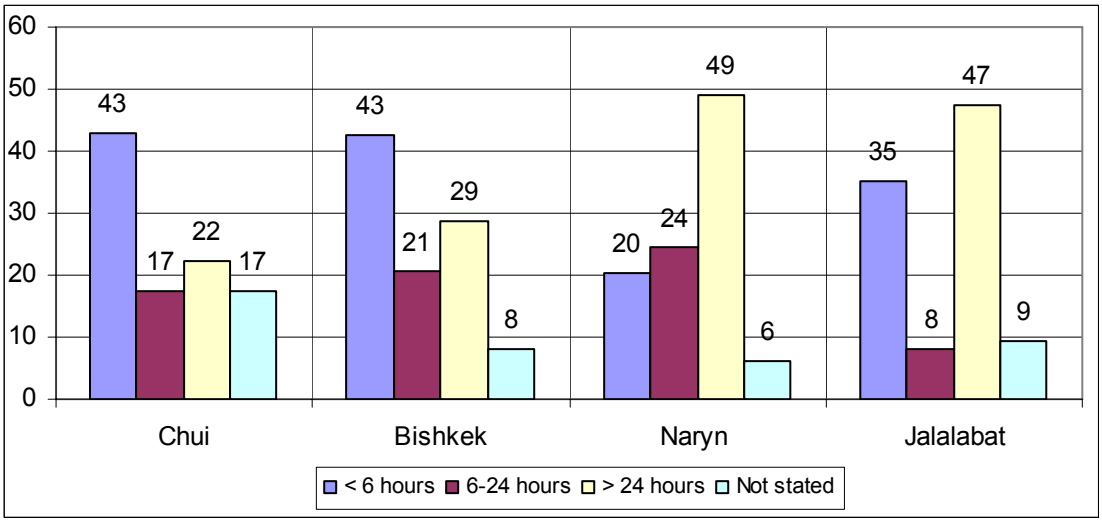
5.2.4 Pre-hospital period

Hospitalization of stroke patients in the first 6 hours after the occurrence of stroke symptoms has a significant impact on the stroke prognosis if during this period emergency diagnostic and treatment interventions are started. At the pre-hospital stage it is necessary to start emergency treatment interventions aimed at maintaining adequate breathing and stable systemic haemodynamics as well as relieving the convulsive syndrome.

Time between the occurrence of the first symptoms and hospitalization

Of the studied regions only in Chui oblast and Bishkek less than half of the patients (43%) were hospitalized within the 6-hour period. In the other 2 oblasts (Naryn and Jalalabat) more than half of the patients were hospitalized later than in 24 hours (Figure 23). A possible reason for late hospitalization is the insufficient awareness of the patients and their relatives of stroke signs as well as this disease as such. As a consequence patients do not realize the importance of urgent measures should such symptoms occur, and the impact this may later have on the disease prognosis.

Figure 23. Time between the first symptoms and hospitalization, %



The population is also demonstrating a persisting stereotype that in case of a stroke one should not move the patient, and they are afraid to independently transport the patient to the hospital: *"…when my wife had a stroke, she fell in the backyard, and I was even afraid of moving her to the house to lie on the bed, because I heard that one should not move people with palsy…".*

Conclusion:

Late hospitalization (more than 24 hours) is related to late visits to doctor by stroke patients for medical assistance.

Recommendations:

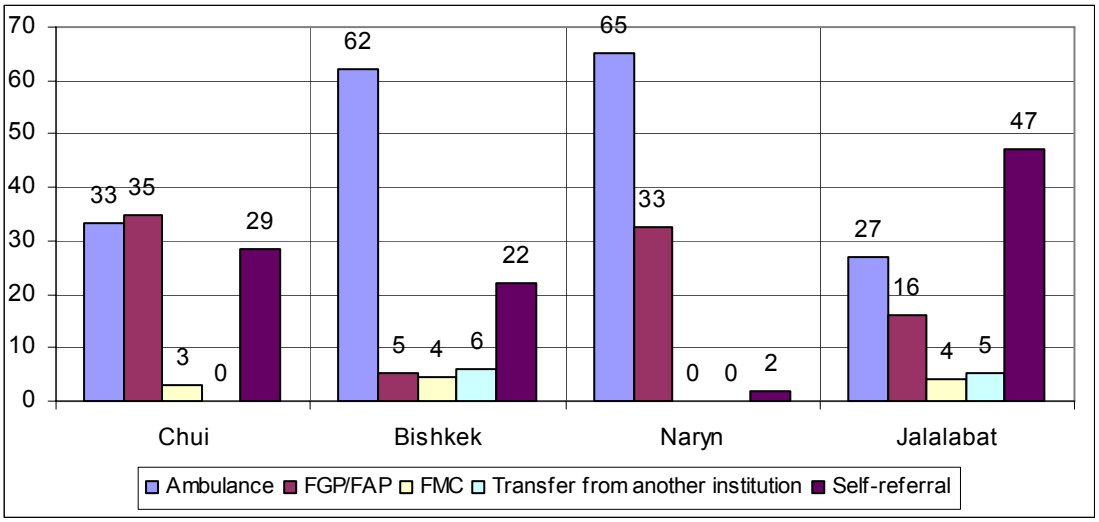
It is necessary to make the population aware of the risk factors for strokes, of the first signs of this disease, and the importance of timely medical assistance-seeking. Work of staff with the population at the primary level is important, at the same time the mass media could be more effective and ensure greater coverage.

Types of referrals

It is well-known that the intervention with proven effectiveness in cases of stroke is hospitalization in specialized institutions, as early as possible (as mentioned above, within 6 hours from the first symptoms of a stroke), this is why the role of the ambulance as the method of transportation of the patient to the hospital is the leading one.

In Chui and Jalalabat oblasts ambulance service transported only 33% and 27% of stroke patients to the hospital respectively (Figure 24).

Figure 24. Types of referrals, stroke %



The situation is the worst in Jalalabat oblast, where self-referrals account for 47% of all referrals, and that on the background of late hospitalization, where 47% of patients were delivered to the hospital later than 24 hours (Figure 23). Naryn oblast is significantly different from the other oblasts, with the share of self-referrals is the smallest in the country (2%) and ambulance service, the way it should be, accounting for 65%, being the leader among referrals. At the same time, this indicator is the highest in the country as a whole. However at the same time the share of late hospitalizations in the Naryn oblast is the highest in the country at 49% (Figure 23). During the analysis of patients' records it was discovered that the time between a screening by a doctor and hospitalization was on average 1-2 hours. Low share of hospitalizations via the ambulance service in some regions is explained by the doctors by the fact that over the recent years the ambulance service has been poorly equipped, poorly staffed with qualified people, and has in general been a mere transportation service. In this relation urgent treatment at the ambulance is difficult and does not take place sufficiently. This confirms the above conclusion that late hospitalization is related to late visits of patients to a doctor for healthcare services.

5.2.5 Hospital stage

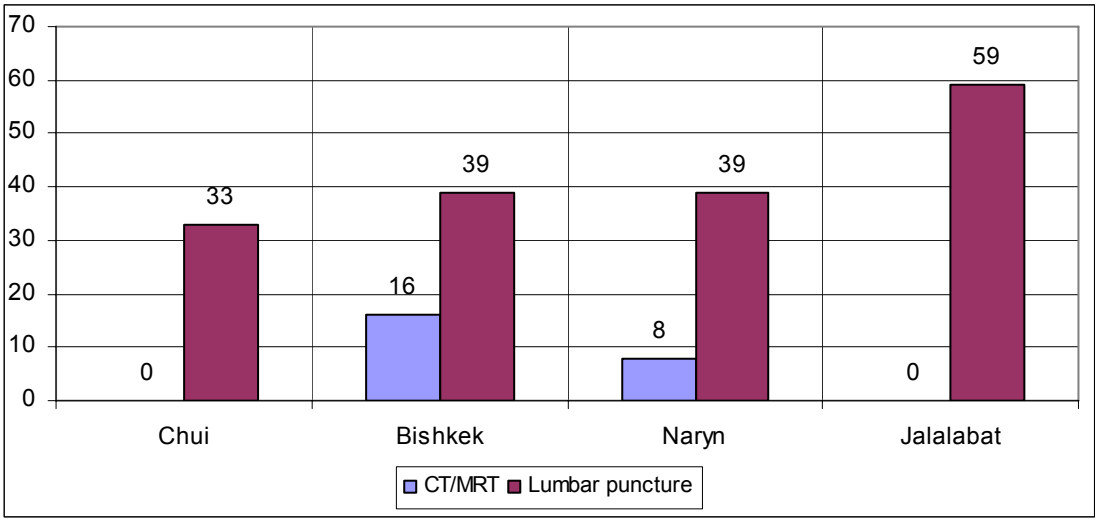
Main diagnostic and treatment interventions take place at the hospital stage.

Stroke diagnosis

Correct diagnosis of strokes especially in the early period is of decisive importance for the selection of the treatment tactics (thrombolytic therapy, surgical intervention etc.), which later has an impact on the disease prognosis. According to the evidence-based medicine principles the main diagnostic procedures for stroke are computer and magneto-resonant tomography (CT/MRT) and lumbar puncture. CT/MRT are the "golden standard" for stroke

diagnosis, with sensitivity of up to 98%. This method is widely practiced in many countries around the world and is applied as the main method of differential diagnosis of all types of strokes. At present there is only one MRT and two CT machines in Kyrgyzstan. Furthermore, the high cost of this screening for the population is yet another barrier in ensuring its accessibility. Based on the above, access to this type of diagnostics is limited despite its high sensitivity. Alongside with this there is another method to diagnose strokes – lumbar puncture. Based on the research studies sensitivity of this method for the diagnostics of subarachnoidal hemorrhage (SAH), one of the subtypes of hemorrhagic strokes, approaches 100% given the manipulation is conducted within the first 12 hours from when the symptoms occur. However SAH accounts only for a part of all hemorrhagic strokes, consequently CT/MRT remain the main methods of differential diagnostics of all types of strokes. Figure 25 shows the results of using CT/MRT/lumbar puncture by the regions.

Figure 25. CTs, MRTs, LPs by regions as % of all stroke cases

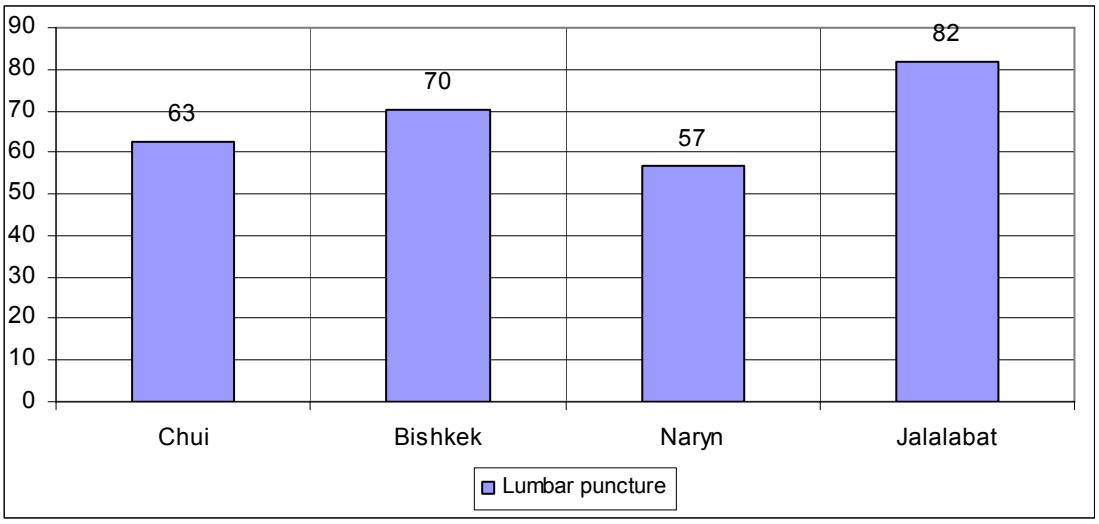


Rates pertaining to the conduct of CT/MRT for the diagnostics of stroke types reflect the situation described above. Practically all patients that have been through the CT/MRT in selected regions received their treatment in Bishkek, whereas their share of the total number of patients is only 16%. The small share (8%) of patients from the Naryn oblast did have their CT/MRT done in Bishkek at later stages after the acute period of the stroke.

The rate pertaining to the performance of lumbar puncture varies from 33% in Chui oblast to 59% for the patients with strokes. This provokes a legitimate question: why isn't this accessible diagnostics method performed in all cases? It turned out that this method of diagnostics is chosen only in cases when there is a vague symptom pattern and it is difficult to either exclude or confirm hemorrhagic stroke. In this relation the researchers analyzed

the number of patients with hemorrhagic stroke subjected to lumbar puncture (Figure 26).

Figure 26. Share of patients subjected to lumbar puncture of the total number of patients with hemorrhagic stroke

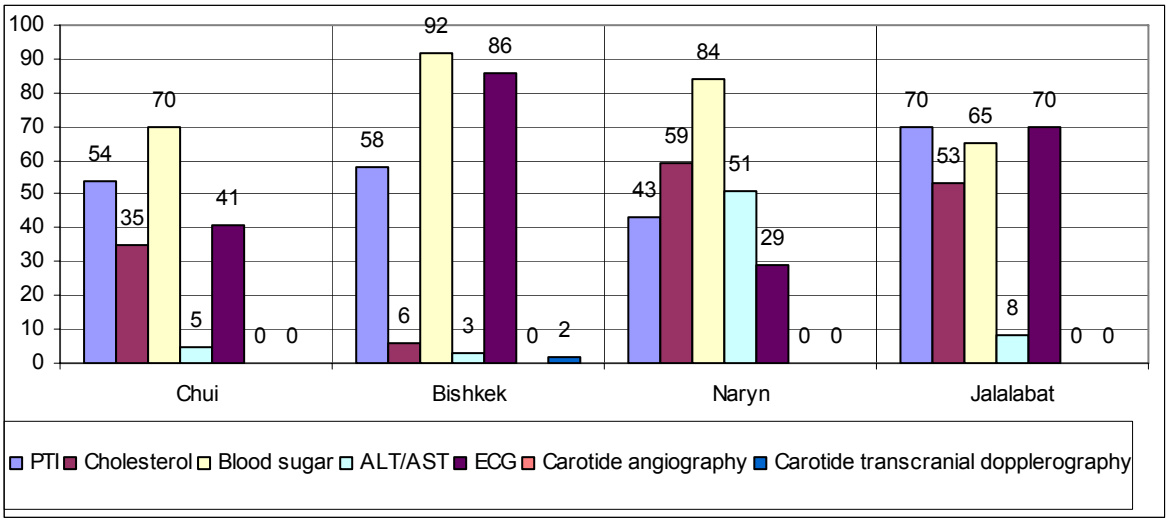


It can be seen that the share of LP for hemorrhagic stroke is much higher than that for the patients with ischemic stroke and hemorrhagic stroke combined. For example, in Jalalabat oblast this share was the highest. It is noteworthy that in some cases as it was mentioned by specialists, the patients refuse to be subjected to this intervention despite the explanations of doctors on the need for puncture.

On the whole one may come to the conclusion that stroke diagnostics is based on physical methods of patient screening and personal experience of the doctors. This is confirmed by the position of specialists, expressed in the interviews on this issue: *"…diagnostics of the type of stroke is done on the basis of symptoms, anamnesis and objective screening. In unclear cases we invite a neuropathologist from the oblast hospital and perform lumbar puncture depending on indications…".*

The other methods of study are used to clarify subtypes of strokes and make decisions on the choice of treatment, including surgical interventions (Figure 27).

Figure 27. Other diagnostics tests in stroke cases, %



Carotid transcranial dopplerography was performed in 1,1% of cases (4 cases), carotid angiography was not performed in a single case, even in Bishkek. Other diagnostic tests were prescribed to identify risk factors: ECG in 67,7% of cases, blood sugar in 81,9% of cases, PTI in 57,7% of cases and cholesterol in 27,5% of cases.

Conclusions:

- Accessibility of modern methods for the diagnostics of stroke and its subtypes (CT/MRT) remain very low not only in the regions, but also in Bishkek
  - The "golden standard" of stroke diagnostics – CT/MRT is only performed in 9,2% of cases for the whole country, and only in Bishkek
  - Lumbar puncture is performed depending on the indications, for differential diagnostics of stroke types in the range between 57% and 82%
- At present differential diagnostics of individual types of strokes is based only on the physical data on the patients and the doctor's personal experience

Recommendations:

It is necessary to improve access of the patients with cerebral hemorrhages to precise diagnostics of stroke types, meaning CT/MRT.

Treatment of strokes

Treatment of hemorrhagic and ischemic strokes in the acute phase differs.

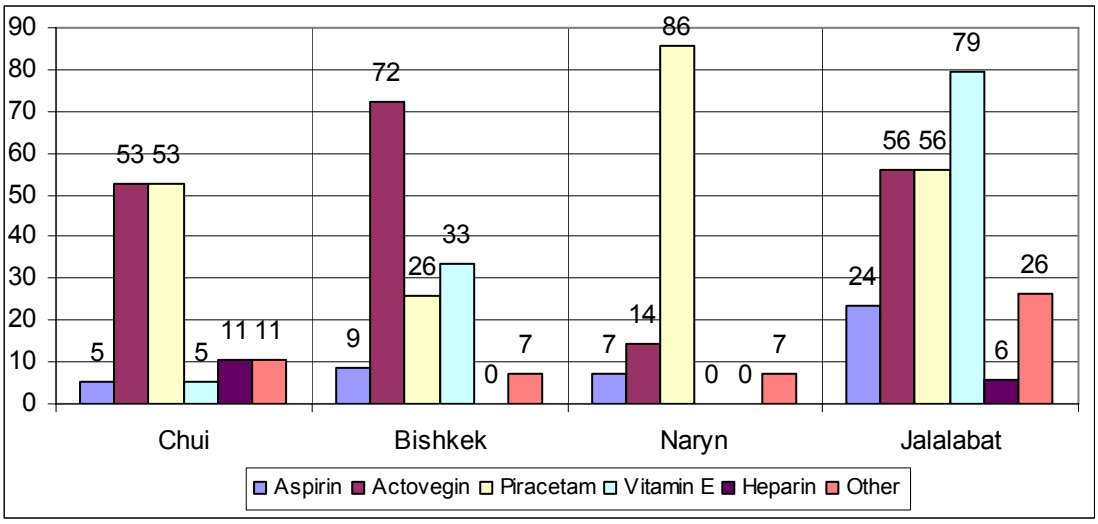
Treatment of hemorrhagic stroke

According to international experience and evidence-based medicine in the treatment of hemorrhagic stroke priority is given to interventions aimed at the prevention of recurrent

bleeding and the reduction of the frequency of secondary complications in the form of cerebral ischemia and cerebral edema. One prescribes blockers of calcium channels (nimodipine) and should not prescribe fibrinolitics and steroids.

The study's findings in Kyrgyzstan (Figure 28) show that in the treatment of hemorrhagic stroke one prescribes neuroprotectors (piracetam, vinpocetin, vitamin E etc.), whereas in the Naryn oblast a drug of this group – piracetam – is the drug of choice (86%). In Jalalabat oblast the drug of choice is vitamin E (79%), whereas in Bishkek the most widely prescribed drug is actovegin (72%), with this indicators being slightly lower in Chui oblast (53%). It can be seen that approaches to the treatment of hemorrhagic strokes are different in different regions.

Figure 28. Treatment of hemorrhagic strokes, %



Such difference is most likely related to the economic accessibility of these drugs. Thus, actovegin is the most expensive drug, and it is economically accessible in the capital, whereas drugs from the group of neuroprotectors and vitamin E are relatively cheap and more accessible in the regions. Special attention should be given to the cases of prescription of aspirin for hemorrhagic stroke, which is an unacceptable prescription that may lead to increased bleeding. This indicator varies by regions from 5% in Chui oblast to 24% in Jalalabat oblast. In the majority of cases these cases involved patients with the initial diagnosis of transitory ischemic attack or ischemic stroke, which were lately diagnosed as hemorrhagic stroke.

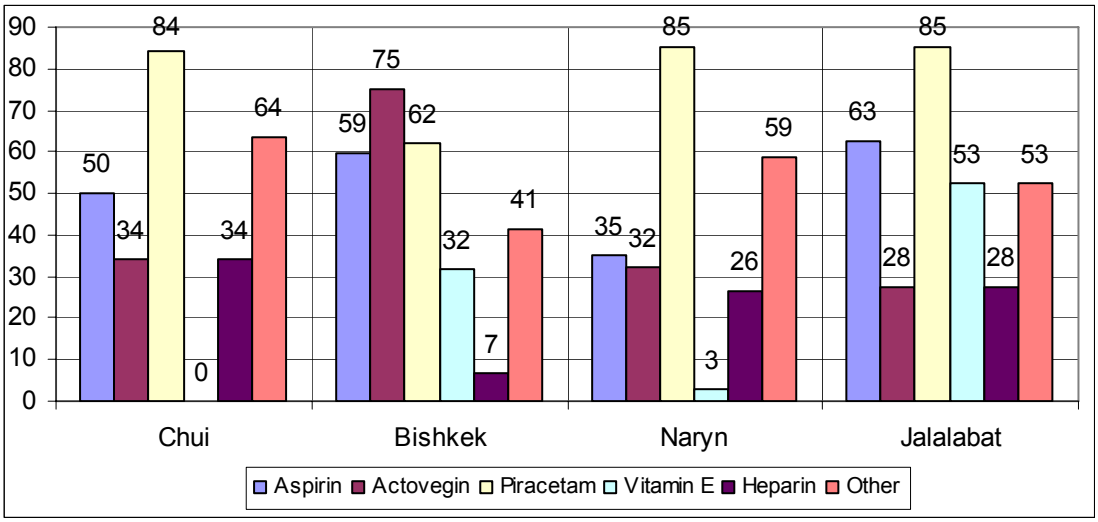
Treatment of ischemic stroke

When treating ischemic stroke in the acute phase of the disease it is necessary to prescribe thrombolytic (streptokinase) and Antiplatelet therapies (aspirin, clopidogrel or dipiridamol).

This tactic is reflected in particular in the British clinical guidelines which were used for comparison purposes in this study.

Treatment pattern of ischemic stroke in Kyrgyzstan is similar to the principles of treatment of hemorrhagic stroke in some of the criteria (Figure 29).

Figure 29. Treatment of ischemic stroke, %



As it can be seen, drugs with unproven effectiveness (neuroprotectors – actovegin, piracetam etc.) are prescribed more frequently that drugs with proven effectiveness, whereas piracetam is prescribed on average in 80% of cases and is the “leader” among other drugs prescribed in all regions. In Bishkek the main drug for the treatment of both ischemic stroke and hemorrhagic stroke is actovegin in 75% of cases.

It is well known that aspirin is an accessible drug with proven effectiveness and is considered an attested method of treatment of ischemic stroke beginning with the early levels of healthcare. However, aspirin was prescribed in the majority of regions in less than half of cases, whereas in the regions with the presence of the tertiary level (Bishkek city) this rate was not the highest – 59%, with the Naryn oblast being the oblast with the lowest rate of aspirin prescriptions – 35%.

Finally, thrombolytic therapy was not performed for a single patient with ischemic stroke. This may be explained by the fact that due to the lack of opportunities for a clear differentiation of the types of strokes one should not prescribe thrombolytic therapy whereas the latter may only be started when the opportunity of bleeding is out of the equation.

Home-based stroke treatment

In contrast to the patients with acute myocardial infarction part of the patients with cerebral strokes are not hospitalized and are treated in a home setting. This is a serious problem, especially in Bishkek, where according to the data of the Stroke register for the city of Bishkek only 39% (!) of all stroke patients are hospitalized. This is confirmed by the interviews with patients. Thus, 10 out of 25 interviewed stroke patients were not hospitalized. One of the reasons stated was the unwillingness of the patients themselves: *"…we already had the experience when our mother stayed in the hospital and we had to care for her fully. This is why when my mother-in-law had a stroke we decided to keep her at home and care for her under the observation of a doctor. We think she will get better faster this way…".* Another stated reason was also the absence of free beds in the hospitals: "…when we brought our father, it turned out they had no beds in the ward, and we were offered a place in the corridor. We refused and brought our father back home…".

Altogether 62 cases of home-based treatment of stroke were studied, broken down into the following categories: 12,9% - hemorrhagic strokes, 75,8% - ischemic strokes and 11,3% - unspecified stroke (Table 7). An analysis by the regions was not conducted taking into account the small sample size. The purpose of this part of the study was to evaluate general trends in the home-based stroke treatment and identification of differences from hospital-based management of stroke patients.

Table 6. Home-based stroke treatment, %

Treatment	Hemorrhagic. 12,9%	Ischemic. 75,8%	Unspecified. 11,3%
Cinnarisin		6,4%	14,3%
Vinpocetin		25,5%	
Piracetam	12,5%	40,4%	28,6%
Actovegin	12,5%	25,5%	
VItamin E		4,3%	
Aspirin	12,5%	40,4%	28,6%

As one can see from the Table, drugs from the group of neuroprotectors (piracetam, vinpocetin, cinnarisin, actovegin) are the main drugs also in the case of home-based stroke treatment. At the same time the share of aspirin prescriptions for ischemic stroke is low (40,4%), i.e. the picture is similar to the hospital-based prescriptions.

In this connection it was interesting to find out the opinions of doctors regarding the acceptability of home-based treatment of patients with stroke in the acute period. Some opinions were in favor of hospital-based treatment: *"…of course it is better when stroke*

patients are in the ward with round-the-clock attention and timely performance of all prescriptions…". Others spoke of acceptability of home-based treatment: *"…I believe home-based treatment is better since they get the same drugs as in the hospital… At home even the walls are of help…".*

Conclusions:

- Treatment of strokes varies across the regions;
- Treatment of strokes still involves the use of drugs with unproven effectiveness (piracetam, vinpocetin, actovegin etc.);
- Drugs with proven effectiveness are not used widely enough:
  - low commitment of doctors to the prescription of aspirin for ischemic stroke patients;
  - thrombolytic therapy for ischemic stroke is not widespread in Kyrgyzstan;
- At present few stroke patients are hospitalized. In Bishkek only 39% of stroke patients are hospitalized.

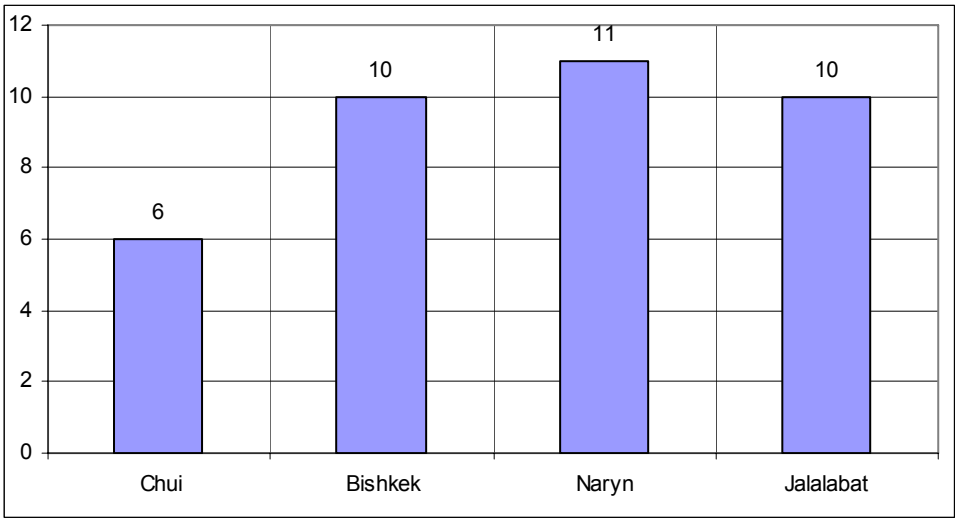
Recommendations:

It is necessary to smoothen over the variations of treatment in different regions and improve the commitment of doctors to following clinical guidelines. It is necessary to expand the coverage of specialist treatment and conduct regular monitoring of treatment quality and doctors' commitment to clinical guidelines.

Average length of stay in a hospital

In the course of the review of patients' records it was discovered that on average patients spend 9,3 days in the hospital with the maximum length – 11 days – discovered in Naryn oblast and the minimum length – 6 days – in Chui oblast (Figure 30). Situation with the average length of the hospital stay is similar to that in cases of AMI, and doctors also discharge stroke patients for further outpatient observation after a 10-day course at the hospital. In this regard many doctors expressed their opinions on the insufficiency of such a period of hospitalization, which may lead to recurrent strokes.

Figure 30. Average length of stay, bed-days



Share of recurrent strokes

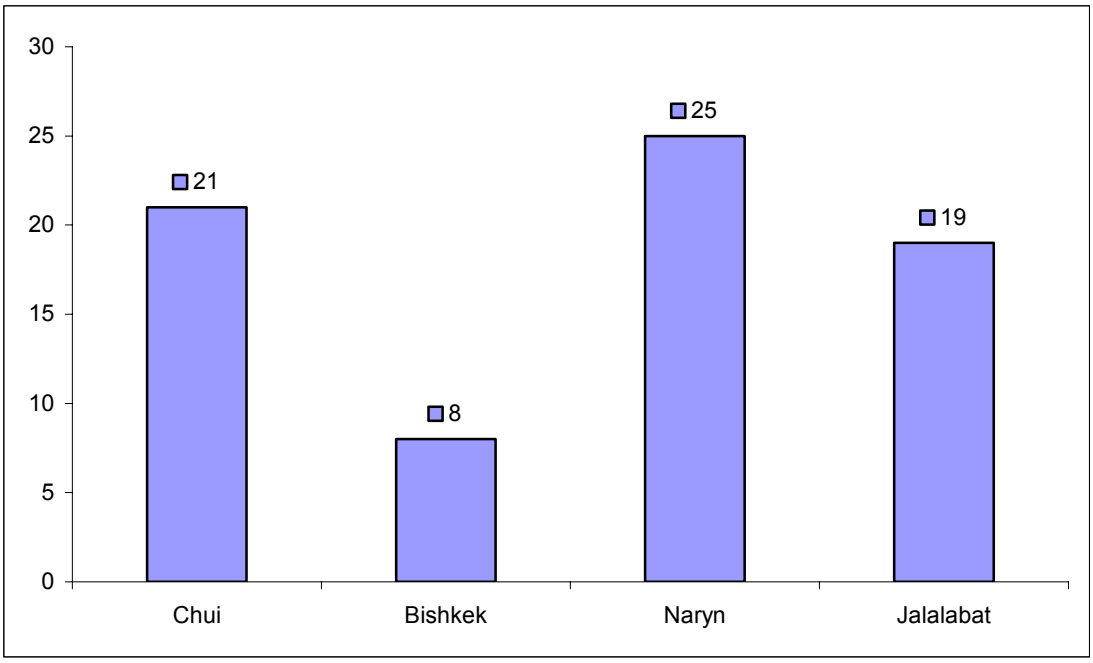
As in the case of AMIs cases of recurrent strokes are associated first and foremost with the insufficient secondary prevention as a result of:

(1) Low commitment of the patients to the intake of drugs to treat main diseases – risk factors (pancreatic diabetes, hypertension);
(2) Insufficient correction of manageable risk factors

This is predefined by economic inaccessibility of drugs, low commitment of doctors in prescribing recommendations upon discharge and at the outpatient treatment level, as well as psychological peculiarities of patients that do not realize the importance of following doctors' recommendations.

Figure 31 shows the share of recurrent strokes by regions. The high share of recurrent strokes may be explained by the insufficient secondary prevention, especially in the regions. It is noteworthy that the lowest percentage of recurrent cases is observed in Bishkek (11%), the highest – in Naryn oblast (34%). In contrast to the situation with the AMI, when patients with recurrent cases from the neighboring regions (Chui, Naryn) are sent to Bishkek, in cases of recurrent strokes long-distance transportation is considered undesirable, since the majority of such patients stay in their localities to receive treatment.

Figure 31. Share of recurrent strokes, %



5.2.6 Provision of drugs:

Drugs used to treat cerebral strokes identified by the CVD working group, are in 80%-compliance with the list of vital drugs (LVD) endorsed by a decree of the government of the KR in 2006.

The study of drug provision revealed that the hospitals wards were supplied with the main drugs for stroke treatment at the level of 75%. Drug availability at pharmacies, closest to hospitals and FMCs was also at the level of 75%.

Thus one may conclude that main drugs for the treatment of cerebral strokes in Kyrgyzstan are physically accessible, which is a positive fact.

5.2.7 Primary and secondary prevention

This section will deal with primary and secondary prevention of cerebral strokes which is pursued both at the primary and at the hospital level.

Primary prevention

Primary prevention of strokes is aimed at the identification of risk factors and their control.

Risk factors

At the hospital level risk factors were diagnosed in 86,3% of cases, of which hypertension was discovered in 87,8% of cases. At the primary level risk factors were diagnosed in 50,3% of cases prior to strokes, of which hypertension was noted in 96% of cases. After the

stroke these indicators came up to 61,3% and 98% respectively. Thus, as with the management of AMI patients, for cerebral stroke patients the leading risk factor mentioned by the doctors was hypertension, whereas the significance of other factors is underestimated.

Interviews revealed that both patients after a stroke and patients after an AMI mentioned stress as the main risk factor. In particular, one of the respondents noted: *"…constant worries over the future of my family, unstable earnings and the need to pay for the education of my children have accompanied me over the recent years…This led to a prolonged stress and I got a stroke as a result…".*

Patients also noted other risk factors, such as high blood pressure, smoking, alcohol, heredity etc., but these were mentioned occasionally. Furthermore, 12 out of 25 stroke patients pointed at insufficient primary prevention: *"…if the doctor made an emphasis on the importance of drug intake for high blood pressure, I would constantly take the drugs and I could have avoided the stroke…".*

Secondary prevention

As mentioned above, secondary prevention is aimed at the prevention of recurrent strokes. This is why it was important to find out the level of adequacy of doctors' recommendations upon the patients' discharge from the hospital.

Recommendations upon discharge

In the course of the analysis of the patients' records the authors evaluated both non-drug-related recommendations and drug-based therapy.

In the majority of cases doctors point at the recommendations pertaining to the diet and the treatment of accompanying diseases. Doctors note the following **non-drug-related recommendations** in the patients' records**:**

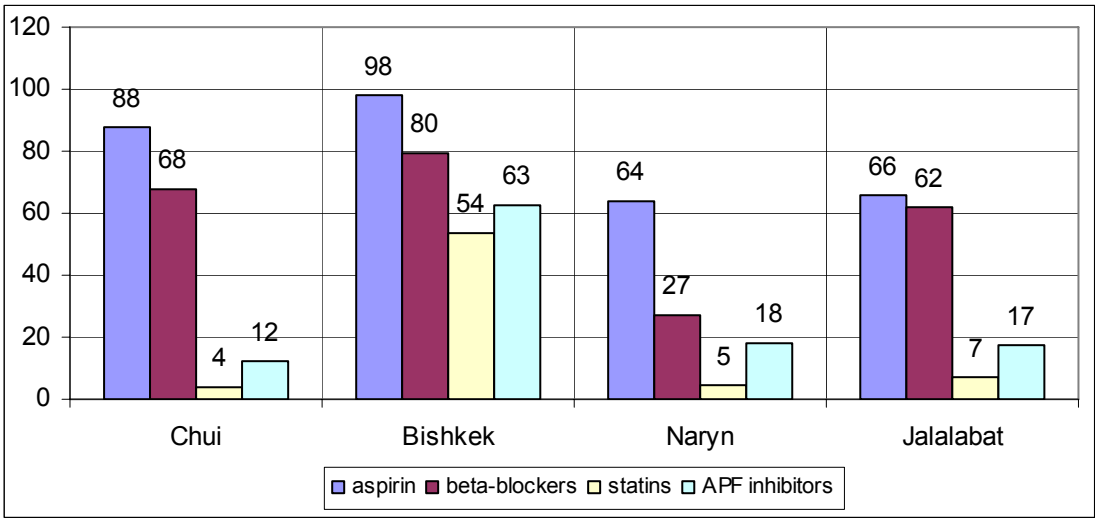
- Quitting smoking – 0%
- Adequate physical exercises – 10%
- Diet – 39%

Recommendations pertaining to the drug-based treatment upon the discharge from the hospital reflect principles similar to hospital-based treatment. For example, in Naryn oblast as mentioned above some drug groups (beta-blockers, APF inhibitors) were prescribed in a small share of cases (Figure 32). In other regions the situation is better, especially for such drugs as aspirin and beta-blockers, which were recommended to the majority of patients in

Bishkek and Chui oblast.

A relatively new group of drugs to control hyperholesterinemia – statins – are present in the recommendations of doctors in all surveyed regions, but the commitment of doctors to their prescription in Bishkek was higher than in the regions.

Figure 32. Recommendations upon discharge, %



Patients after a stroke noted that upon discharge from the hospital they were all prescribed drugs. However due to financial reasons, negligence, fear of addiction etc. the patients did not follow these recommendations: *"…despite the fact that the doctor gave me recommendations to follow at home, I do not take the drugs regularly. The reason is my own negligence. The disease is behind me now, and I hope it doesn't happen again…".*

Life after a stroke

A stroke history significantly reduces the quality of life of patients leading to disability. During the conversations with the patients questions were asked about their life after a stroke. Signs of a depression to different degrees were noticed in all patients:

"…I don't want to communicate with anyone…" Woman, 50 years, Chui oblast

"…I became a burden for my family…" Man, 40 years, Chui oblast

"..Even my grandchildren don't make me happy…" Woman, 70 years, Naryn oblast

"Why have such a life, if I cannot even go to the toilet on my own…" Man, 62 years, Jalalabat oblast

Rehabilitation

The importance of rehabilitation after a cerebral stroke is difficult to underestimate. Rehabilitation activities started within the first 7 days after the stroke have an impact on the outcome of the stroke. It is noteworthy however that whereas rehabilitation of patients after

an AMI can bring them back to full-fledged life, in the case of a stroke even the successful comprehensive rehabilitation can only restore to a certain degree lost functions, leaving the patients disabled for the rest of their lives.

Main principles of rehabilitation boil down to its early start and step-by-step rehabilitation system. The experience of the most advanced countries when a team consisting of a kinesiologist, speech therapist and psychologist join the main treatment from the first few days of hospitalization, proves to be highly effective. Rehabilitation of patients with motor disorders includes kinesiotherapy, medical massage, physiotherapy, biomanagement with feedback, artificial limbs and orthopedic devices, work therapy, restorative training for patients with speech, reading and writing disorders and psychotherapy.

In Kyrgyzstan rehabilitation after a stroke begins after the discharge from the hospital. At the time of discharge alongside with drug-based therapy patients are also recommended physical rehabilitation at home as secondary preventions. This includes in most cases massage and physical exercises, aimed at the restoration of the lost functions. Psychological rehabilitation is practically nonexistent. Categorization of a disability after a stroke is part of social rehabilitation, but social rehabilitation is not pursued in the broader sense.

Conclusions:

- Stroke prevention is insufficiently effective due to:
  - Low commitment of doctors and patients;
  - Low level of awareness of specialists in the regions;
- Lack of a holistic approach to prevention, i.e. risk factors are not considered in their totality;
- Rehabilitation after a stroke is not pursued at the due level and is only represented by fragmentary services;
- Patients pursue rehabilitation on their own, using the experience of their relatives, acquaintances and other people

Recommendations:

- To strengthen primary prevention of CVD including the development of strategies for the control of stroke risk factors;
- To develop a system of rehabilitation for patients after cerebral strokes including physical, psychological and social rehabilitation to bring the patients back to full-fledged life as soon as possible.

6. MAIN CONCLUSIONS AND RECOMMENDATIONS

This section of the report presents main conclusions, recommendations and next steps.

6.1 Conclusions

Quality of prevention and treatment of CVD varies significantly across the regions and is characterized by both weaknesses and strengths.

Strengths of prevention and treatment include:

- Prevention in primary level institutions is focused on hypertension, and this is justified by the high prevalence of high arterial blood pressure in the Kyrgyz Republic.

- Clinical guidelines on the diagnostics and treatment of AMI do comply with the international standards. Clinical content of the Kyrgyz protocols for the treatment of strokes does on the whole comply with international clinical guidelines with the exceptions of certain recommendations.

- ECG is the main method of diagnostics of AMI and it is performed in all cases of hospitalizations across the country.

Weaknesses of prevention and treatment include:

- Description of the epidemiological situation in the country from the point of view of cardio-vascular diseases is only possible for mortality rate with the reason being drawbacks of the statistical data on morbidity.

- The existing form of the outpatient record is not informative enough.

- Late hospitalization of patients with AMI and strokes from the time symptoms first occur in half of the studied oblasts;

- With the exception of Bishkek, ambulance services ensure low coverage and provide insufficient services to patients with AMI and strokes;

- A bit less than a half of patients with strokes are not hospitalized but stay at home.

- Accessibility of modern methods of diagnostics of stroke and its subtypes (CT/MRT) remains low in Kyrgyzstan. Lumbar puncture is performed based on indications, for differential diagnostics of stroke types. In the majority of cases differential diagnostics of individual stroke types in Kyrgyzstan is based on physical data on the patients and the doctors' personal experience.

- Significant variations in the approaches to the treatment of AMI and recommendations upon discharge have been noticed between the regions;

- In treating strokes one uses drugs with unproven effectiveness (piracetam, vinpocetin, actovegin etc.). whereas drugs with proven effectiveness are underused.

- Rehabilitation after AMI and strokes does not receive due attention

6.2 Recommendations

- Improving the system of collection of statistical data in the field
- Revision and development of a new format of outpatient records, extracts from the patients' records
- Strengthening primary prevention of CVD including the development of strategies to fight risk factors, in particular a population strategy and a "high risk" strategy (WHO). The population strategy includes impact at the population level on the lifestyles and environmental factors, their social and economic preconditions, which are the reasons for the development of AMI. Due to the high level of prevalence of hypertension and low control, the population strategy should focus on the provision of information about hypertension and its treatment The "high risk" strategy implies identification of persons with high risk of AMI development and organization of activities to reduce the level of risk factors. In this connection one of the main activities should be measurements of arterial blood pressure for the majority of the population.

- Further strengthening of the ambulance service to improve coverage and volume in the area of diagnostics and pre-hospital level treatment.

- Widespread use of the existing clinical guidelines on AMI with their regular revisions and amendments. Development of clinical guidelines for the management of patients with strokes at all levels in accordance with the international methodology.

- An important objective is to smoothen over the variations in treatment and improve the commitment of doctors to following clinical guidelines. It is necessary to expand the coverage of specialist training and conduct regular monitoring to check the commitment of doctors to the clinical guidelines.

- Develop a system of rehabilitation of patients after AMI and strokes including physical, psychological and social rehabilitation to bring the patients back to full-fledged life as soon as possible.

6.3 Next steps

- Create a working group to develop the strategy, to include the entire range of stakeholders including specialists and political decision-makers
- Develop a strategy for the reduction of morbidity and mortality of cardio-vascular diseases in the Kyrgyz Republic including a list of activities.
- Analyze economic efficiency of the proposed activities using the WHO CHOICE instrument.

APPENDIXES

Appendix 1. Instruments of the study

Appendix 2. Mapping

Appendix 3. Comparative analysis of clinical guidelines

Appendix 4. Review of the literature