



# Healthcare Delivery Optimization Plan for the Kyrgyz Republic

A Reform Programme Towards  
Integrated, Patient Centered Care

Final Report

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## Towards Integrated, Patient Centered Care

### Final Report

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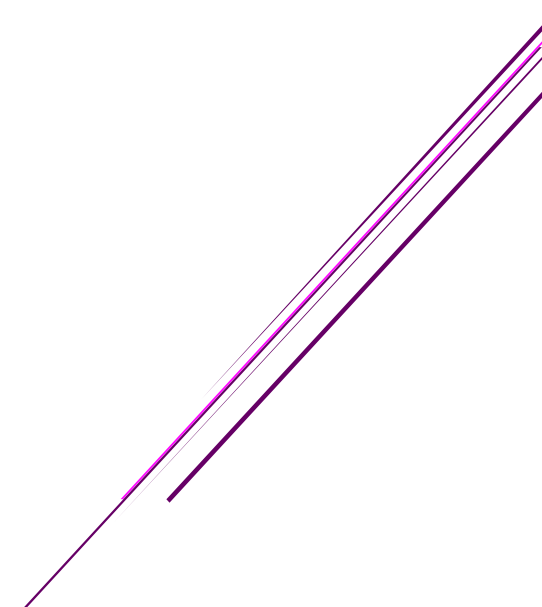


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# TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1-1</b>
<b>1.1</b>	<b>Background .....</b>	<b>1-1</b>
<b>1.2</b>	<b>Context and Key Issues .....</b>	<b>1-1</b>
<b>2</b>	<b>OBJECTIVE, TASKS, AND METHODOLOGICAL APPROACH .....</b>	<b>2-1</b>
<b>2.1</b>	<b>Main Objective of the Master Planning Process.....</b>	<b>2-1</b>
<b>2.2</b>	<b>Main Tasks Accomplished.....</b>	<b>2-1</b>
<b>2.3</b>	<b>Data Collection and Analysis.....</b>	<b>2-1</b>
<b>2.4</b>	<b>Key References and Assumptions .....</b>	<b>2-3</b>
<b>3</b>	<b>CONCEPT FOR THE OPTIMIZATION OF HEALTH CARE DELIVERY.....</b>	<b>3-1</b>
<b>3.1</b>	<b>The Challenge .....</b>	<b>3-1</b>
<b>3.2</b>	<b>Prioritization.....</b>	<b>3-1</b>
<b>3.3</b>	<b>Optimizing Performance.....</b>	<b>3-1</b>
<b>3.4</b>	<b>Integrated Care Model.....</b>	<b>3-1</b>
<b>3.5</b>	<b>Governance / Strategic Management .....</b>	<b>3-5</b>
<b>3.6</b>	<b>Financing .....</b>	<b>3-5</b>
<b>3.7</b>	<b>Model Variations and Complementary Elements.....</b>	<b>3-5</b>
<b>4</b>	<b>REGIONAL OPTIMIZATION PLANS.....</b>	<b>4-1</b>
<b>4.1</b>	<b>Optimization Strategy and Measures at Regional Level .....</b>	<b>4-1</b>
4.1.1	Short-term measures: Adjusting Inpatient Capacity .....	4-1
4.1.2	Mid-term Measures: Focusing on Quality Improvement .....	4-2
4.1.3	Long-term Measures: Sustaining Strategic Development .....	4-3
<b>4.2</b>	<b>Rehabilitation / Renovation of Existing Buildings .....</b>	<b>4-3</b>
<b>4.3</b>	<b>Proposed Optimization Measures by Region .....</b>	<b>4-4</b>
4.3.1	Batken.....	4-4
4.3.2	Chui.....	4-4
4.3.3	Issyk-Kul .....	4-5
4.3.4	Jalal-Abad .....	4-5
4.3.5	Naryn .....	4-6
4.3.6	Talas.....	4-7
4.3.7	Osh.....	4-7
<b>4.4</b>	<b>Medical Equipment.....</b>	<b>4-8</b>
<b>4.5</b>	<b>Total Investment required at Regional Level .....</b>	<b>4-8</b>
<b>5</b>	<b>OPTIMIZATION PLANS FOR THE CITIES OF BISHKEK AND OSH .....</b>	<b>5-1</b>
<b>5.1</b>	<b>Optimization Plan for the City of Bishkek .....</b>	<b>5-1</b>
5.1.1	Planning for Complex Health Care Systems.....	5-1
5.1.2	Situation Analysis.....	5-1
5.1.3	Findings and Recommendations .....	5-4
5.1.4	Specific Recommendations for Republican-level Organizations .....	5-5

5.1.5	Specific Recommendations for City-level Institutions .....	5-6
<b>5.2</b>	<b>Optimization Plan Osh City .....</b>	<b>5-13</b>
5.2.1	Situational Analysis.....	5-13
5.2.2	Interregional Healthcare Organizations .....	5-13
5.2.3	City-level Healthcare Organizations .....	5-14
<b>6</b>	<b>OPTIMIZATION PLANS FOR VERTICAL HEALTH PROGRAMS.....</b>	<b>6-1</b>
<b>6.1</b>	<b>Tuberculosis Care .....</b>	<b>6-1</b>
6.1.1	Situation Analysis.....	6-1
6.1.2	Recommendations.....	6-2
<b>6.2</b>	<b>Mental Health Care.....</b>	<b>6-2</b>
6.2.1	Situation Analysis.....	6-2
6.2.2	Recommendations.....	6-3
<b>6.3</b>	<b>Rehabilitation Services .....</b>	<b>6-3</b>
6.3.1	Situation Analysis.....	6-3
6.3.2	Conclusions.....	6-4
6.3.3	Recommendations.....	6-4
<b>6.4</b>	<b>Emergency Medical Services .....</b>	<b>6-5</b>
6.4.1	Situation Analysis.....	6-5
6.4.2	Recommendations.....	6-7
<b>7</b>	<b>HEALTH CARE FINANCING .....</b>	<b>7-1</b>
<b>7.1</b>	<b>The current Situation .....</b>	<b>7-1</b>
<b>7.2</b>	<b>Health Care Financing Reform – A Strategic Approach.....</b>	<b>7-3</b>
7.2.1	Analyze and Expand Existing Funding Sources .....	7-3
7.2.2	Improve cost-recovery mechanisms for care providers .....	7-4
7.2.3	Promoting an integrated health care delivery model .....	7-4
7.2.4	Establish a Health Policy Council .....	7-5
<b>7.3</b>	<b>Implementation of the Health Care Financing Reform.....</b>	<b>7-5</b>
7.3.1	Introduce Performance-based Financing of Inpatient Services.....	7-5
7.3.2	Manage the Convergence Phase .....	7-5
7.3.3	Promote Widespread Use of Performance Based Funding .....	7-5
7.3.4	Shift to Disease Focus.....	7-6
7.3.5	Shift to Population Perspective .....	7-6
7.3.6	Conclusion .....	7-6
<b>8</b>	<b>OPTIMIZATION SCENARIOS .....</b>	<b>8-1</b>
<b>8.1</b>	<b>Optimization of Health Care Delivery .....</b>	<b>8-1</b>
8.1.1	Rationalize the Organizational Structure of Health Care Services.....	8-1
8.1.2	Improve Access to Quality Care.....	8-1
8.1.3	Ensure Responsiveness of the Health Care System .....	8-2
8.1.4	Integrate Vertical Programs in the Health Care Delivery System .....	8-2
<b>8.2</b>	<b>Measures to Optimize Health Care Delivery .....</b>	<b>8-2</b>
8.2.1	Short-term measures (2020-23) .....	8-2
8.2.2	Medium-term measures (2024-27) .....	8-3
8.2.3	Long-term measures (2028 - 35) .....	8-3

<b>8.3</b>	<b>Economic Effects.....</b>	<b>8-4</b>
<b>8.4</b>	<b>Discussion of Regional and National Master Plans.....</b>	<b>8-4</b>
8.4.1	Health Care Financing.....	8-4
8.4.2	Batken Oblast .....	8-5
8.4.3	Chui Oblast .....	8-5
8.4.4	Osh (City and Region) .....	8-5
8.4.5	Issyk-Kul .....	8-6
8.4.6	Jalal-Abad .....	8-6
8.4.7	Naryn .....	8-7
8.4.8	Bishkek.....	8-7
8.4.9	Talas.....	8-7

## LIST OF TABLES

Table 1:	Projected Population Growth and Disease Prevalence, Kyrgyzstan, 2020 - 2035.....	1-3
Table 2:	Adjustments of Inpatient Bed Capacity.....	4-1
Table 3:	Projected Population Growth and Disease Prevalence, Kyrgyzstan, 2020 - 2035.....	4-2
Table 4:	Investments for Infrastructure Development – Projections for 2027 .....	4-2
Table 5:	Investments for Building Repair and Renovation by Region and Project Phase .....	4-3
Table 6:	Proposed Configuration for ISDNs of Batken Region .....	4-4
Table 7:	Proposed Configuration for ISDNs of Chuy Region.....	4-4
Table 8:	Proposed Configuration for ISDNs of Issyk-Kul Region.....	4-5
Table 9:	Proposed Configuration for ISDNs of Jalal-Abad Region .....	4-6
Table 10:	Proposed Configuration for ISDNs of Naryn Region.....	4-6
Table 11:	Proposed Configuration for ISDNs of Talas Region .....	4-7
Table 12:	Proposed Configuration for ISDNs of Osh Region .....	4-7
Table 13:	Investments for Equipment Procurement by Region and Project Phase .....	4-8
Table 14:	Investments for Health Care Delivery Optimization - Projections for 2035.....	4-8
Table 15:	Summary of Key Indicators – Republican Level Facilities.....	5-3
Table 16:	Summary of Key Indicators – City level facilities.....	5-8
Table 17:	Summary of Outpatient Activities – City Level Facilities .....	5-10
Table 18:	Investments in Infrastructure and Equipment – Republican Level Facilities .....	5-11
Table 19:	Investments in Infrastructure and Equipment - City-Level Facilities.....	5-12
Table 20:	Performance Indicators of Inter-regional Organizations .....	5-13
Table 21:	Investments for Infrastructure Repair and Medical Equipment Upgrade – Osh City .....	5-15
Table 22:	Investments in Infrastructure and Equipment for Osh City-level Organizations .....	5-15
Table 23:	Referral Levels and Referral Structure of Public (General) Hospitals.....	8-1

## LIST OF FIGURES

Figure 1:	Main Causes of Mortality and Trends in Kyrgyzstan 2007 – 2017 (IHME 2019) .....	1-2
Figure 2:	Fragmented Structure of the Healthcare System in the Kyrgyz Republic .....	1-3
Figure 3:	Data Collection and Analysis .....	2-2
Figure 4:	Steps to Optimization of Health Care Delivery.....	3-3
Figure 5:	Investment Needs by Level of Care.....	7
Figure 6:	Estimated (adjusted) Number of Inpatient Beds 2023, 2027 and 2035.....	4-3
Figure 7:	Investment Needs by Level of Care.....	10
Figure 8:	Recommendations for Republican Hospitals .....	5-5
Figure 9:	Recommendations for Bishkek City level facilities.....	5-8
Figure 10:	Health Care Facilities in Osh City – Bed Capacity and Location .....	5-14
Figure 11:	Investment Needs by Level of Care.....	17

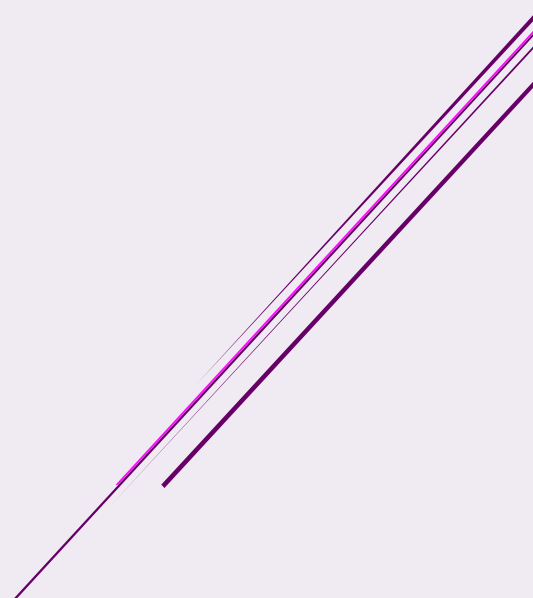
# ABBREVIATIONS

ALOS	Average Length of Stay
BOR	Bed Occupancy Rate
CME	Continuous Medical Education
COPD	Chronic Obstructive Pulmonary Disease
COVID	Corona Virus Disease
CPD	Continuous Professional Development
CPG	Clinical Practice Guideline(s)
CT	Computed Tomography
DMP	Disease Management Program
DRG	Diagnosis Related Group
FMC	Family Medical Center
FTE	Full-Time Equivalent (for HR assessment and planning)
GDP	Gross Domestic Product
GFA	Gross Floor Area
GIS	Geographical Information System
GPC	Group Practice Center
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
IFC	International Finance Corporation (WB)
IHME	Institute for Health Metrics and Evaluation
IMR	Infant Mortality Rate
ISDN	Integrated Service Delivery Network
KPI	Key Performance Indicator(s)
KSMIR&CE	Kyrgyz State Medical Institute of Retraining and Continuous Education
KfW	German (Governmental) Development Bank
m4h	management4health
MCH	Maternal and Child Health
MDC	Mobile Data Collection
MHIF	Mandatory Health Insurance Fund
MNCH	Maternal, Neonatal and Child Health
MoH	Ministry of Health
MRI	Magnetic Resonance Imaging
NCD	Non-Communicable Disease(s)
NICE	National Institute for Health and Care Excellence (UK)
NSC	National Statistics Committee
ODA	Official Development Aid
PHC	Primary Health Care

PPP	Public-Private Partnership
RBF	Results Based Financing
SGBP	State Guaranteed Benefit Package
SWAp	Sector Wide Approach
TA	Technical Assistance
THE	Total Health Expenditure
UN	United Nations
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VAT	Value Added Tax
WB	The World Bank
WHO	World Health Organization



# 1 INTRODUCTION



# 1 INTRODUCTION

## 1.1 Background

Public health is one of the priority directions of the state policy of the Kyrgyz Republic included in the *National Strategy for Sustainable Development 2040* which is part of the Government's Program called "*Trust, Unity, Creation*", approved by the Parliament (*Jogorku Kenesh*) in Resolution No 2377-VI of April 20, 2018, and by Decree No 221 of the President of the Kyrgyz Republic dated October 31, 2018 (hereinafter called "Strategy 2040").

According to the provisions of the implementation plan of the Strategy 2040, in October 2018, management4health (m4h) became the Consultant of the Ministry of Health (MoH) of the Kyrgyz Republic to provide technical assistance (TA) for the development of the National Healthcare Delivery Optimization Plan (henceforth called the *Master Plan*).

The **purpose** of the **Master Plan** was to analyze and evaluate the existing health infrastructure and performance of the health care system, and to develop scenarios for optimization measures to be implemented in three different time periods: short term (1-3 years), medium term (4-7 years), and long term (8-15 years). All scenarios had to be realistic, feasible and sustainable in terms of funding and human resources required for implementation.

The **Master Plan** was developed through a transparent and participatory process to ensure acceptability and accountability, involving MOH, the Mandatory Health Insurance Fund (MHIF), and International Development Partners, as well as local authorities and heads of health care organizations at national, regional, and district level.

The **Master Plan** was also aligned with the state policy direction (Decree of the Government of the Kyrgyz Republic dated December

20, 2018 No. 600) and the main directions of the Health Sector-Wide Approach (SWAp), aiming at harmonization of efforts of various partners undertaken to strengthen the health care system.

A *Roadmap for Implementation* is part of the Master Plan, providing guidance for the development of specific plans and the implementation of specific steps at district, regional, and national levels.

Data and information for the analysis and evaluation exercise, providing evidence for findings and recommendations issued in the Master Plan document were collected through personal interviews with heads of health care organizations and their teams at all levels of care, and through direct observation (primary data). A special *Mobile Data Collection* (MDC) tool was developed to register and upload data to a secure server, after which the data was organized, tables created, and various analytical tools used to produce statistics. Secondary data were obtained from the E-Health Center of the Kyrgyz Republic, the MHIF and other public organizations of the Kyrgyz Republic. International benchmarks were used to evaluate the data and develop recommendations.

## 1.2 Context and Key Issues

The population of the country shows a trend of significant growth and it is expected that by the end of the life cycle of this Master Plan, the population will have reached a number of 7.9 million people, with 66% of the population living in rural and mountainous areas.

A review of data from previous years shows that the Compound Annual Growth Rate (CAGR) of the overall disease incidence was 0.86%, however, considering the expected demographic changes (gradually ageing popu-

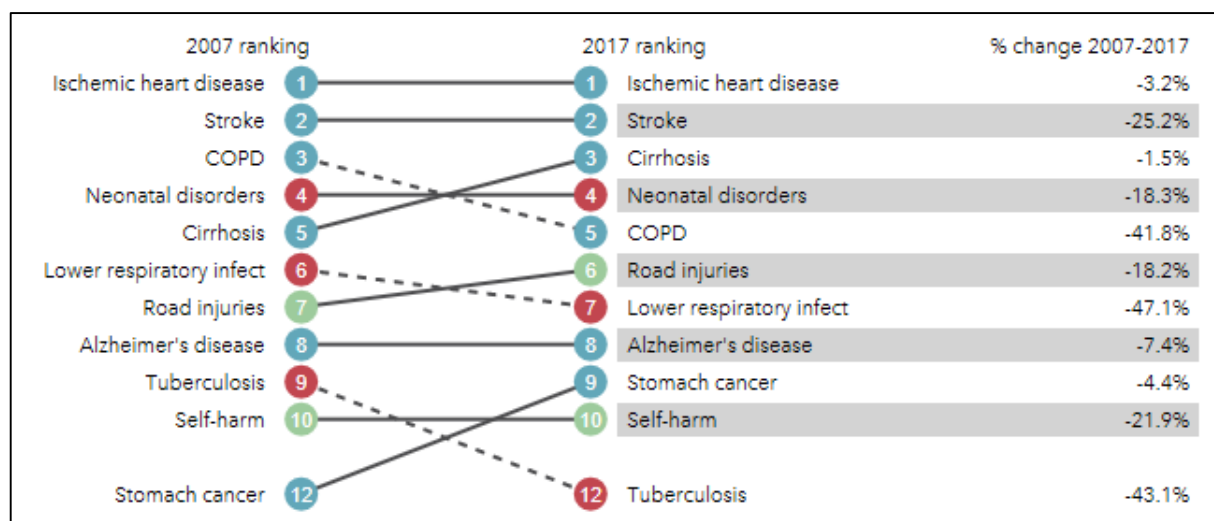


Figure 1: Main Causes of Mortality and Trends in Kyrgyzstan 2007 – 2017 (IHME 2019)

lation with the population segment above 65 growing to more than twice its size over the next 15 years), needs and demands for health care will probably grow faster than the population, specifically for certain conditions such as diseases of the gastrointestinal tract, the vascular and musculoskeletal systems, etc. As part of the demographic transition, the projected number of births (2035 by 2019) is expected to decline by 7.43%.

The two major health reform programs implemented after independence of the country included Manas (1996 to 2006) and Manas Taalimi (2006 to 2010). These programs aimed

to bring structural changes to the healthcare system through the development of family medicine in the field of primary care, and through reorganization of the hospital sector for secondary and tertiary care levels.

Other accomplishments include the introduction of clinical practice guidelines, improvements in the provision and use of pharmaceuticals, quality improvements in the priority programs for mother and child health, cardiovascular diseases, tuberculosis and HIV/AIDS, strengthening of public health and improvements in medical education.

	2023	2027	2035
Time Period in Years	4	4	8
Population increase	6.37%	12.03%	22.71%
Annual growth (between time periods)	1.56%	1.31%	1.14%
Disease prevalence	3.52%	7.21%	15.12%
Annual growth (between time periods)	0.87%	0.88%	0.89%
Combined factor	10.12%	20.11%	41.26%

Table 1: Projected Population Growth and Disease Prevalence, Kyrgyzstan, 2020 - 2035

Overall, despite a high level of political and technical commitment to pursue reform efforts, the health system remains fragmented, with limited quality of care and poor service delivery.

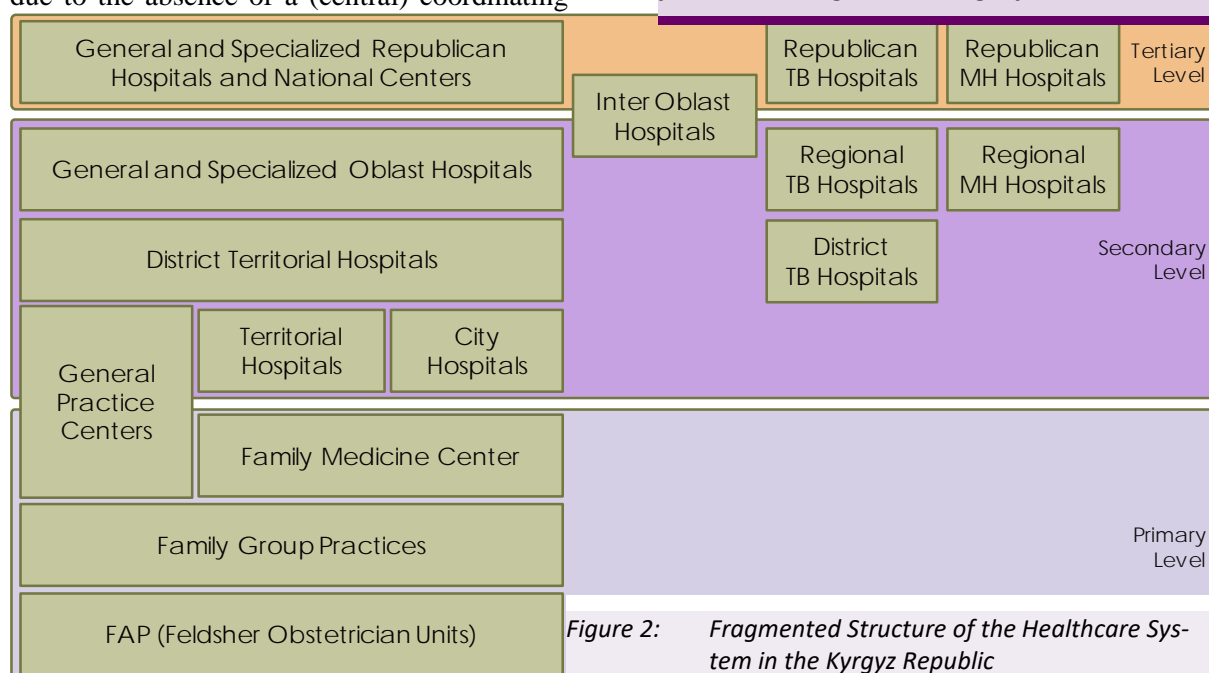
Outpatient services are provided by 81 health organizations: Family Medicine Centers (FMCs), General Practice Centers (GPCs) and two emergency medical care centers in Bishkek and Osh. The total number of visits was 18.6 million, an average of 2.91 visits per person per year, with the majority of outpatient visits to family doctors (40.3%), then to narrow-profile specialists and paramedics (25% of visits for each category). Emergency visits accounted for 9.7% of the total outpatient visits.

Emergency Medical Services (EMS) in Kyrgyzstan lack a systematic approach, which is due to the absence of a (central) coordinating

mechanism or agency managing the organization and provision of assistance. The lack of financial and specifically qualified human resources, and the lack of modern equipment, seriously reduces the efficiency of EMS services. The lack of emergency departments at GPCs, territorial and regional hospitals further reduces the quality of response to emergencies.

Apart from Bishkek city, the existing ambulance system is dysfunctional, especially for the population living in rural areas. Herewith, timely access to emergency care is vital to patient outcomes.

*Despite successes in earlier health care reforms, Kyrgyzstan is still affected by significant challenges, especially at the hospital level, due to the lack of “modern” hospitals at district, oblast, and republican level and the high cost for maintaining the existing infrastructure.*



A total of 87 general hospitals offer services at district and oblast level. Bed occupancy rates are high in Bishkek and Osh, but low in Batken, Naryn, and Osh oblasts. During 2018, 895,562 patients (approximately 15% of the population) have been admitted for inpatient care, but only 5.3% of them got admitted to specialized services (tuberculosis, mental illness, and rehabilitation) services representing 20% of the bed capacity. During 2018, the average number of admissions for inpatient care in general hospitals was 13.3 per 100 population.

Service levels are not clearly defined in terms of service volume, resources, and geographic accessibility. Tertiary level care organizations are concentrated in Bishkek city, which leads to problems with access to care, and the lack of a clear referral system leads to a mismatch between patient needs and available resources.

Elective (planned) inpatient care is mixed with emergency care, thus compromising the quality of both emergency and routine, including social care, rendering the system ineffective and inefficient. Performance indicators such as BOR and ALOS are suboptimal, and the concept of day care has hardly been implemented.

The distribution of technical and clinical units in 10 - 20 separate buildings, scattered over an area of several hectares, and the obsolete infra-

structure of many facilities, is not supporting modern ways of health care delivery. For half of the sites assessed, access and utilization is limited, leading to inefficient use of equipment, human, and financial resources, but also to problems related to the quality of care provided in such a fragmented system. Many branch facilities are too small to provide quality care and operate in a cost-effective manner. Lack of personnel and equipment in small facilities at district level, especially in remote areas, on the one hand, and the concentration of better staffed and equipped centers at regional level and in the capital on the other hand, jeopardize accessibility to quality care, especially for the rural poor.

Just over 16% of the healthcare infrastructure are in optimal condition. Almost 80% require small to significant amounts of money to be invested, and about 5% of the country's public health infrastructure is beyond repair and demolition is the most reasonable option.

Access to medical services for citizens varies greatly depending on their place of residence. The qualification of doctors and nurses is insufficient, and available data indicate that nurses are underemployed. In addition, salaries of doctors and nurses are inadequate and skilled personnel is emigrating to Russia, Kazakhstan, and other countries in search of decent wages.

## **2 STUDY PURPOSE AND OBJECTIVES**



## 2 OBJECTIVE, TASKS, AND METHODOLOGICAL APPROACH

### 2.1 Main Objective of the Master Planning Process

Key objective of the Master Plan exercise was to develop a long-term vision for continuous and sustainable improvement of the quality of medical care offered in the health care system of the Republic of Kyrgyzstan, compliant with internationally recognized norms and standards, through both investments in infrastructure and equipment and through organizational reforms.

### 2.2 Main Tasks Accomplished

The following tasks led to the development of the Health Care Delivery Optimization Plan (Master Plan) for the Kyrgyz health sector and specifically for the improvement of hospital and emergency care services:

- Analysis and evaluation of the needs for outpatient and inpatient medical care in all regions of the country, today and for the next 15 years.
- Analysis of the existing infrastructure, equipment, and human resources to evaluate current availability and performance of health care services and to determine requirements for the future to improve the delivery of medical care.
- Development of standards for the classification of health care facilities (types and sizes of departments), staffing requirements and investment requirements for medical equipment and infrastructure improvements.
- Development of specific proposals (concept and roadmap / implementation plan) for the reorganization / modernization of healthcare organizations at district, regional, and national levels.
- Assessment of the existing Emergency Medical Services (EMS) system and the

resources involved and development of a strategic approach to improve quality and efficiency of the EMS ambulance networks and services.

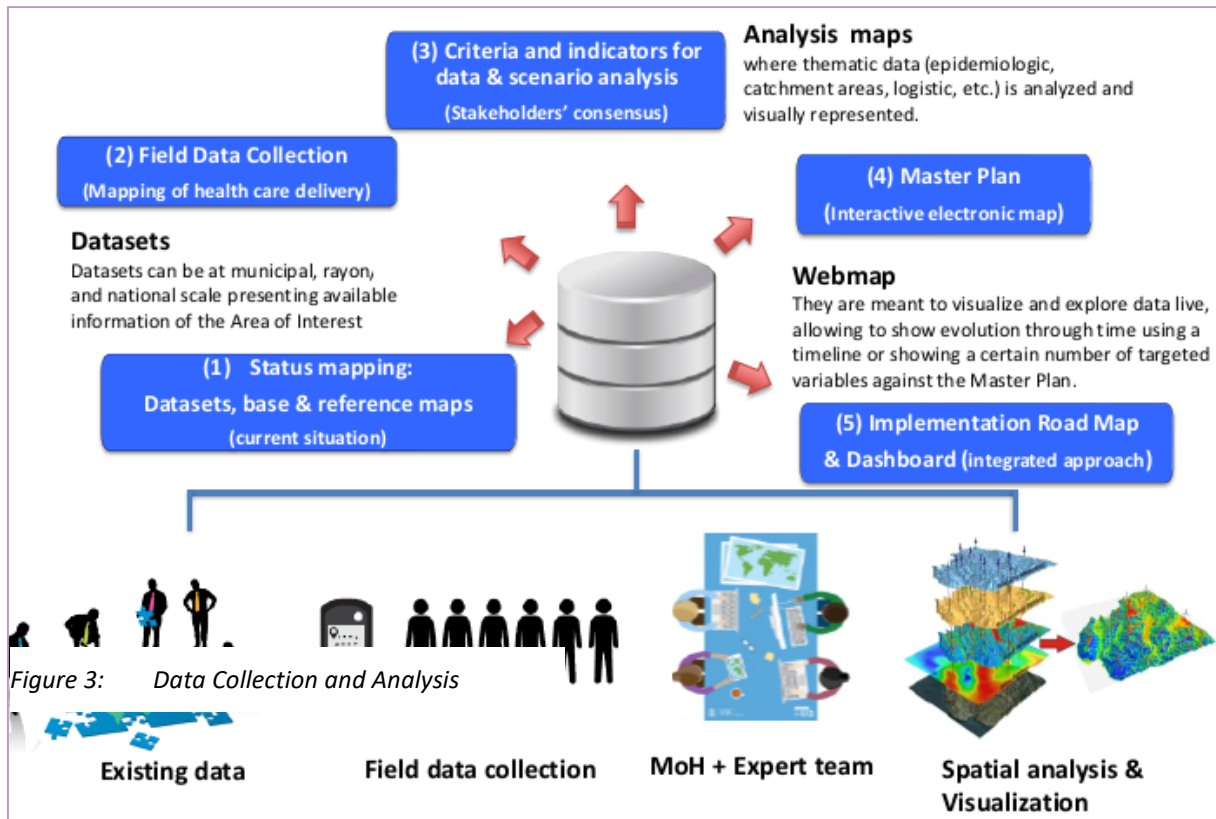
The development of master plans for districts and regions and for the national level was based on the following methodological approach:

- Analysis of existing and collection of new data and information through visits to each health care facility and organization.
- Mapping and visualization of the results of assessments in a Geographic Information System (GIS).
- Definition and approval of an exhaustive list of key performance indicators (KPI) that will be used to monitor the development of the health care system at regional and national level.
- Development of appropriate national standards for human resources, medical equipment, and infrastructure based on international benchmarks.
- Identification of priorities for short-, medium, and long-term measures for the development of health services in the country and in each region.
- Development of the concept of Integrated Service Delivery Networks (ISDN).

### 2.3 Data Collection and Analysis

Data were collected on the current status of the health infrastructure (type, number of beds, wards, physical and functional conditions of buildings and equipment); on human resources and on activity levels (number of outpatient visits, number of inpatients treated, bed occupancy rate, and average length of stay) as part of a nationwide data collection conducted in 2018.





520 healthcare facilities of 193 different healthcare organizations and were visited. Most of the facilities visited are in the Jalal-Abad Region (116), while the Talas Region has the lowest number of facilities (30).

Mobile data collection (MDC) was based on coded data tables, optimized for use on a computer, tablet or smartphone. Once the device got connected to the internet, data was uploaded to a server for storage and backup. Data were analyzed in MS Excel and disseminated in the form of electronic maps showing the location of all healthcare organizations as well as relevant data on infrastructure, human resources, and clinical activities. The MOH got direct access to the database and indicator dashboard to allow for continuous analysis and follow-up.

Based on international best practice, a list of **key performance indicators** (KPI) has been developed to establish a baseline and allow national stakeholders to continuously monitor the development of these KPIs.

Existing service capacities have been documented and future needs for medical services

have been assessed at all levels. Gaps identified served as basis for recommendations regarding measures to be implemented in the context of this Master Plan focusing on the reorganization of the current health care delivery system and bringing in new (human, infrastructural and financial) resources.

The proposed list of KPIs covers all aspects of a functioning health care system, including:

- Population based assessment of health care needs, broken down to the level of the populations served by a specific health care facility (primary, secondary, or tertiary care).
- Human resources, infrastructure, equipment, and financial resources required for the provision of medical care (by organization / division).
- Health outcomes / population health status to be monitored and linked to the respective status and resources needed for the provision of quality health services.

The compiled list of key performance indicators (KPI) was discussed with local stakehold-



ers and finalized before developing the regional plans.

The next step was to analyze the resources needed to provide quality health care services today and in the future. Health service delivery is the result of the coordinated use of four types of resources: human resources, infrastructure, technology, and financial resources, based on a regulatory framework. The analysis of the data provided an inventory of the resources currently used in the Kyrgyz health care system.

For human resources, national and international benchmarks for the availability of qualified medical doctors (generalists and specialists) and paramedical staff (nurses, midwives, specialized medico-technical personnel) were used to develop recommendations for the prospective development (recruitment, training, provision of incentives to retain qualified staff especially in remote locations) of human resources for health.

While human and financial resources are relatively easy to analyze (since they are a categorical type of information), the analysis of infrastructure and medical equipment faced major challenges. The entire set of data, including photographs, video, and audio files, was used to classify infrastructure and medical equipment in four functional categories, ranking from “good” to “to be replaced”.

International and national norms and standards were used to determine infrastructure investment needs.

Decisions on repair or replacement of medical equipment, and the assessment of related investment needs were equally carried out in accordance with national and international norms and standards. For example, it is a generally accepted norm that the average life span of medical equipment is seven (7) years. For low- and middle-income countries with appropriate service and support, the average life span can be extended to up to (10) years.

The proposed scenarios for the future development of the health care system in Kyrgyzstan are based on projections of health care needs and the use of health services.

In the analysis we used population data published by the *National Statistical Committee of the Kyrgyz Republic*, which indicated a population of 6,389,500 as of January 1, 2019.

Data on the prevalence of diseases for the period from 2008 to 2015 (source: E-Health Center KR) and expected population growth (source: [www.populationpyramid.net](http://www.populationpyramid.net)) were used to analyze trends and forecast the demand for health care services for the following time periods: short term (2019 -2023), medium-term (2023-2027) and long-term (2027-2035).

Further, data were collected on the number of staff planned, employed, and the number of staff working in each health facility. To calculate the various rates and workloads for all categories of personnel, occupied (full-time) positions (FTEs) were taken as a basis.

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## 2.4 Key References and Assumptions

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For a medical facility providing inpatient services, a bed occupancy rate of 80 to 90% (average 85%) was considered as optimal in terms of efficiency, based on the exploitation of human and financial resources, as well as the infrastructure and technical equipment available. However, depending on the level of care (primary / secondary or tertiary / specialized care) and the location of the facility (country-side / city / population density), goals may differ, and in remote areas with difficult geographic access, the optimal occupancy rate was set at 75%.

Following the proposed concept, measures to improve care processes through service integration, will allow for many cases currently managed as inpatients to be treated in an outpatient or daycare setting. As a result of a combination of many factors: modern technology, evidence-based Clinical Practice Guidelines, daycare arrangements, and the introduc-

tion of Diagnosis Related Groups (DRGs) as output based financing scheme, the Average Length of Stay (ALOS) can be reduced by approximately 10%.

To determine space requirements for health care infrastructure, based on international good practice, we have used the following Gross Floor Area (GFA) per inpatient bed ratios for the various types of hospitals:

- 70 m<sup>2</sup> GFA /bed for national and regional (referral) hospitals
- 60 m<sup>2</sup> GFA /bed for local / territorial (district) hospitals
- 65 m<sup>2</sup> GFA /bed when assumptions apply to entire regions having a mix of national / regional and district / local facilities.

Regarding investment needs for the development of the healthcare infrastructure, based on the experience we have with previous and ongoing projects for the development of health

care facility projects in Kyrgyzstan, we used the following ratios:

- Minor repairs on a hospital building: USD 195 / m<sup>2</sup>
- Major repairs on a hospital building: USD 300 / m<sup>2</sup>
- New construction of a hospital building (district level): USD 1,250 / m<sup>2</sup>
- New construction of a hospital building (regional / national level): USD 1,500 / m<sup>2</sup>
- When assumptions apply to entire regions having a mix of national / regional and district / local facilities: USD/1.375 / m<sup>2</sup>

New construction has been proposed in all cases where the cost for repair (and extension / modernization, if and as required) would exceed 60% of the price of a new construction (a guideline being used and applied in public health care infrastructure projects in Germany).

### **3 CONCEPT FOR THE OPTIMIZATION OF HEALTH CARE DELIVERY**



## 3 CONCEPT FOR THE OPTIMIZATION OF HEALTH CARE DELIVERY

### 3.1 The Challenge

With the current level of organization and the absence of a rationalization or optimization scenario, a total investment of more than US \$ 501 million will be required to modernize the infrastructure and medical equipment of healthcare organizations in the Kyrgyz Republic (US \$ 244 million for infrastructure upgrades and US \$ 257.2 million for medical equipment upgrades).

Most of the investments (more than 60%) are needed for the repair of hospitals stationary general-purpose organizations (TH, RH), followed by inpatient healthcare facilities of vertical programs (15.2%), and for FMCs (12.3%) and GPC (11.6%) US \$ 1.3 Million Needed to Repair Emergency Medical Service Providers.

During the assessment, 24,808 pieces of medical equipment were examined and it was found that 18,290 pieces of equipment (73.7%) are in working order and are in use, 9.9% of the equipment is in working order, but needs to be repaired, 5.2% working, but not used (by different reasons), 7.3% need in repair and are not used, and 3.9% do not work and cannot be repaired. A total investment of US \$ 181.5 million is required to modernize medical equipment of all healthcare organizations and bring it to an optimal standard. Of these, 70.1% of the total investment requirement or US \$ 127 million is needed for the modernization of general-purpose organizations, 12.2% for the modernization of the GPC, 10.5% for the modernization of the FMC and 7.2% for the modernization of organizations where assistance to patients with tuberculosis, mental illness and rehabilitation.

### 3.2 Prioritization

Due to their strategic location, relevance for the provision of medical care and relatively

low investment requirements, regional organizations can be a priority in short-term investment plans for the acquisition of medical equipment.

### 3.3 Optimizing Performance

To optimize hospital care, two main factors are considered: current use and assessment of future needs.

An internationally recognized benchmark for optimal use of hospital resources is an 80% to 90% bed occupancy rate (BOR). For all hospitals with less or more than 80%, the number of required beds has been adjusted according to the following formulas:

- Number of beds required = Current number of beds x BOR / 80%.
- Number of beds required = Current number of beds x BOR / 90%
- For hospitals with BOR 80% to 90%, the current number of beds was maintained.

The second level of optimization is related to the promotion of day care services. A 15% shift of inpatient cases towards daycare is the target to be achieved (2020-2023).

The third optimization approach relates to the average length of stay (ALOS) and the target is to reduce the ALOS by 10% during the period 2020-2023.

### 3.4 Integrated Care Model

Other goals for the short-term period will be focusing on the implementation of the reform framework required for the development of Integrated Service Delivery Networks (ISDN).

ISDNs are health networks organized at the district or regional / inter-district level, in which preventive primary, emergency, general and specialized inpatient and outpatient care will be integrated, including the referral system

that will be built accordingly. The closest to the ISDN concept in the current organization of the health care delivery system of Kyrgyzstan are large General Practice Centers (GPC).

When evaluating and analyzing the results of the Master Planning exercise, it was revealed that almost all territorial hospitals and family medicine centers are located next to each other and there are the following problems:

- Operation of both types of healthcare facilities is suboptimal, with most hospitals having a BOR of less than 85%, and the average number of daily visits per provider at FMCs is less than 20 per day.
- The ratio of the number of doctors and beds in hospitals is below the recommended level of 0.3-0.5 doctors per bed, while there are many underutilized highly specialized doctors in FMCs.
- The ratio of nurses per bed in hospitals is lower than recommended, and in FMCs / FGPs, overstaffing is noted.
- The need for investments in medical equipment is especially great both in hospitals and in outpatient organizations, and if the same equipment packages are provided to both facilities, duplication and inefficient use of both diagnostic and expensive laboratory equipment will occur.
- Hospitals are understaffed with non-medical personnel.

Ensuring the right mix of preventive and clinical services is a complex task that requires good coordination between different levels and different parties. Ideally, all patients should have access to the full range of services through a “single window”. This does not mean that all services are provided “in one place” or “by one service provider”.

As one of the first measures to ensure more rational (effective and efficient) health care delivery, it is recommended to implement (ISDN).

The main characteristics of ISDN will be: Coordinating the delivery of diagnostic and clinical services responding to the real needs of

patients and providing financial incentives to promote a coordinated and results-based approach, rather than fragmentation of service delivery.

The integration concept underlying ISDNs will enhance the provision of PHC services as the main characteristic of integrated care is its interdisciplinarity. By ensuring adequate levels of staffing (GPs, specialists, nurses, and other medical staff), patients will experience a continuum of care within the same organization. The “outpatient first” and “daycare first” principles will significantly improve resource allocation by reducing expenditures related to inpatient care and promoting outpatient and home care arrangements. The health care model will promote a personal, family and community approach to health care that is centered on the health needs of the population.

Based on the analysis and assessment of the health care delivery system in each region, pilot facilities have been proposed that will be flagships in the implementation of ISDN. In total, 50 ISDN (44 district and 6 regional) should be created in seven regions of the country.

This can be done in a sequential manner, starting with the selected pilot sites, and then moving on to national rollout, building on the lessons learned from the pilot sites. ISDN pilot projects can be carried out in parallel with other activities aimed at preparing the health system for the proposed structural reform:

- Repair / rehabilitation / modernization of those health care organizations that were selected using priorities and criteria.
- Replacement and modernization of medical equipment, following the standard equipment lists offered for all categories of institutions.
- Review and updating the Clinical Practice Guidelines (CPGs) and Treatment Protocols to promote standardization, quality improvement and rational use of resources.
- Strengthening outpatient and inpatient daycare and transferring mental health and

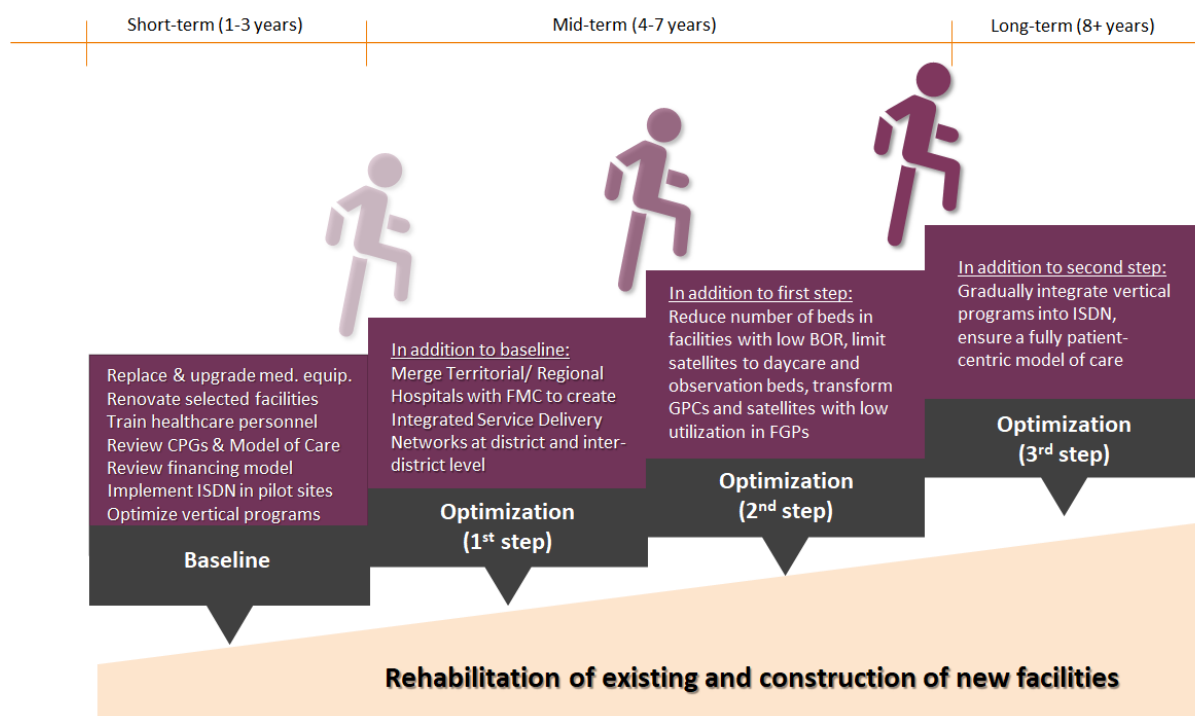


Figure 4: Steps to Optimization of Health Care Delivery

TB care to outpatient and home care treatment (deinstitutionalization).

- Rationalization of the structure and organization of emergency medical care (EMS).
- Revision of the financing model and mechanisms of medical care to promote performance-based payment schemes.

Taking into account the actual distribution of the population in some rural areas, it will not always be possible to achieve the objective of eliminating inefficiently working health care facilities and shift service delivery to the ISDN. Geographical accessibility to essential and emergency care needs to be maintained.

Establishing ISDNs will require significant efforts in addressing weaknesses of the Kyrgyz health care system related to

- The traditional model of care
- The hierarchical organization and management of health care services
- The lack of financial resources and the way they are being distributed
- The lack of a clear health system policy and implementation strategy for ISDNs

On the other hand, by eliminating the fragmentation that exists in the Kyrgyz health care system, the envisaged changes will help

- mobilizing efficiency gains and achieving continuity in medical care,
- avoiding duplication in service provision, as well as in equipment procurement and infrastructure development,
- improving efficiency in the use of human resources, infrastructure, technology, and finances available,
- improving the quality and access to medical care, increasing patient satisfaction

Successful implementation of the ISDN model requires careful planning, preparation, and management of the necessary change processes. Health care providers need to share their demographic and personal information to determine eligibility and the type of service provided. Financial and program data is required to determine payments, monitor performance, and meet reporting requirements.

In addition, a needs-based workforce concept should accompany ISDN implementation and other core elements of systematic HR development including Continuous Medical Educa-



tion (CME) and Continuous Professional Development (CPD) of all medical personnel. Human resources in both FMC and TH are understaffed and underutilized; it is therefore necessary to rethink the role of specialist doctors in FMCs, allowing them to offer both inpatient and outpatient services (in the hospital and in the FMC, as both services will be integrated).

Redeployment of nursing staff is also recommended. For example, nurses working in FMCs can be reassigned to hospitals to improve the nurse-to-bed ratio and feldshers can improve the feldsher-to-doctor ratio. Non-medical personnel need strong support in support functions such as finance and administration, maintenance, and utilities (digitalization, medical equipment maintenance, heating and ventilation, infrastructure, catering, laundry, security, etc.) for modern hospital care.

These measures will help improving the quality of medical care through increased availability of doctors, nurses, and other paramedics for both outpatient and inpatient care. In addition, medical and paramedical staff will be more evenly distributed, and support functions will be properly developed and staffed.

Another measure is related to the need to create optimal treatment conditions. Many hospitals in the country have a Gross Floor Area (GFA), which is too low for the provision of quality medical care. The recommended minimum is 60 m<sup>2</sup> per bed for territorial hospitals and 70 m<sup>2</sup> / bed for regional hospitals).

To achieve the recommended quality targets, many hospitals will need additional (new) premises in existing buildings. Currently, in Kyrgyzstan, hospitals are built over large areas and consist of several buildings. In the context of major restructuring, it is recommended to gradually replace the existing fragmented hospital infrastructure (many buildings located too far apart) and promote new construction of units that are more compatible with state-of-the-art hospital design. What is needed is a hospital infrastructure with a modern design

that accommodates seamlessly all diagnostic and clinical (core) functions in one (separate) building.

The implementation of these measures will initially require additional investment, which will be partly compensated by improved efficiency of the health care delivery system.

Laboratories and other diagnostic units represent important clinical support services. Each healthcare facility needs investments to purchase missing medical equipment or to replace existing but non-functional equipment.

The analysis revealed an inadequacy of medical equipment (with the recommended standard), as well as the presence of medical equipment that either did not work or had already expired its life cycle. It is recommended that investments in the procurement and deployment of key medical equipment shall be seen as a short-term priority to be completed within the first three years of Master Plan implementation (2020-2023).

All hospitals in the oblasts represent organizations that belong to small (less than 250 beds) and medium (from 250 to 500 beds) organizations. In addition, many of them are geographically close to each other and could benefit from the sharing of services. Clinical and non-clinical support services that can be shared by different organizations include:

- Laboratories and advanced imaging
- Central sterilization and supply departments (CSSD)
- Laundry and kitchen services
- Centers for electronic media

Establishing such centralized provider structures will create economies of scale by increasing operational efficiency, especially for smaller hospitals and healthcare organizations. It can also improve the quality of services (e.g. for laboratory and sterilization services).

### 3.5 Governance / Strategic Management

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The Territorial Hospital and FMC, which together will constitute the ISDN, shall be managed by one common Board. Community participation should be encouraged including local governments, patient associations, and business representatives. The administrative structure of the ISDN shall consist of one Director General, assisted by two Deputy Directors for Clinical / Technical Affairs (one for outpatient and one for inpatient care). Two Associate Directors (Nursing and Health Services including Diagnostics, Pharmacy, and CSSD) will complete the clinical management team.

A Deputy Director of Operations will oversee functions such as financial management (head of finance), supply chain and logistics, and facility management (buildings and equipment). All non-medical support functions must be adequately staffed, based on well-defined organizational charts and job descriptions. All management functions shall have adequate IT support since electronic medical records and resource planning are the two main systems to support the medical and managerial functions of the health care facility.

A Medical Council can be initially organized and implemented at the regional level. This regional council can function for 2-3 years and supervise all ISDN organizations in the region. During this period, district councils will be created, and their capacity will be strengthened to manage the district ISDN.

### 3.6 Financing

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An adequate level of funding is required to create, maintain, and develop ISDNs. This should encompass requirements for infrastructure development, equipment procurement, and HR recruitment. Funding should be results oriented and performance-based financing should form part of the overall ISDN funding. Existing practices, such as funding for outpatient TB care, need to be expanded to include

“outpatient first” and “daycare treatment first” approaches.

When encouraging the provision of day care services, as opposed to inpatient services, an incentive scheme should support this approach. For example, a hospital may be awarded a DRG bonus or multiplier if a given diagnosis is treated on an outpatient or day case basis. Abu Dhabi is one example where this scheme has been implemented and has led to a significant shift from traditional inpatient to outpatient and daycare services.

A strategic approach and good governance are important prerequisites for the implementation of ISDNs. In a long-term perspective, ISDN healthcare providers can evolve into Accountable Care Organizations (ACO) offering in one hand a comprehensive package of primary and secondary, preventive, and clinical care for a per capita budget to promote efficient and effective service delivery. Defining and managing such a budget requires robust processes and systems, as well as a comprehensive nationwide patient registry and electronic health records, in order to obtain the necessary data to manage and report on expenditures and results.

### 3.7 Model Variations and Complementary Elements

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The organizational structure of the emergency medical service (Ambulance) will be merged with regional and territorial hospitals (except for the cities of Bishkek and Osh).

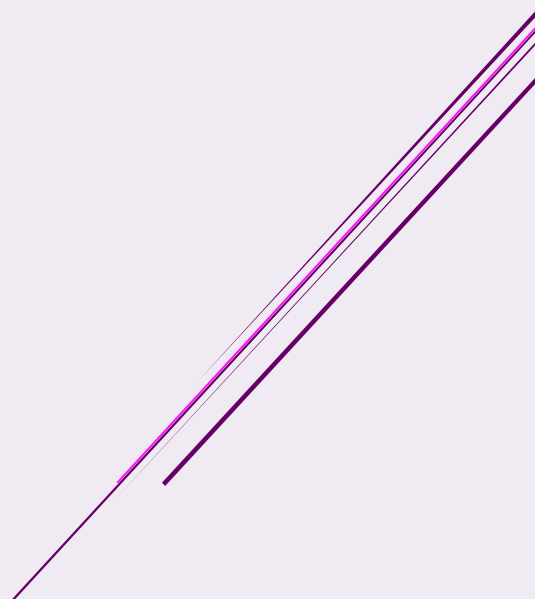
ISDNs which will be created through the merger of the Regional FMC with the regional hospital will retain the regional status and will serve as referral structure (for districts in the region). With full integration, the health care landscape of Kyrgyzstan will be characterized by the presence of health organizations of the republican and interregional levels and the nationwide ISDN system. Fully developed ISDNs will integrate services currently provided separately by hospitals, FMCs, GPCs, EMS organizations and specialized care facilities for mental health, TB care and rehabilitation.



The Ministry of Health will promote multi-sector action to promote health and well-being. Examples of cross-sector activities include collaboration with social services, the education sector, local authorities (for EMS services), etc.

Given the political complexity of the envisaged reform process, it is proposed to establish a National Health Policy Council composed of representatives from the MoH, MHIF, Healthcare Providers and other stakeholders such as the Ministry of Finance. The council could play a critical role in defining the benefit package, accrediting healthcare providers, quality management systems and tools to be implemented, health technology assessments and continuing medical education.

## 4 REGIONAL OPTIMIZATION PLANS



## 4 REGIONAL OPTIMIZATION PLANS

### 4.1 Optimization Strategy and Measures at Regional Level

#### 4.1.1 Short-term measures: Adjusting Inpatient Capacity

Short-term measures shall focus on adjusting the number of beds considering current and future (expected) utilization rates (using BOR as reference) and their determining factors such as

- the demographic transition (towards a more elderly population),
- the epidemiological shift with increasing incidence and prevalence of chronic, non-communicable diseases and multimorbidity, and
- measures that aim at rational use of inpatient care capacity, i.e. the increased use of daycare and ambulatory care arrangements.

During the period 2020-2023, optimization measures shall consist of:

- Adjusting the number of beds at regional and district level facilities to achieve BOR between 80% and 90% (N.B.: Only Bishkek and Osh City facilities have a BORs between 80 and 90%. Accordingly, the number of beds will be reduced in all regions).
- As another short-term goal, ALOS shall be reduced by 10% and day-care cases increased by 15%. This will result in a further reduction of the number of beds.
- Considering compensatory effects such as population growth and increasing disease prevalence, the number of beds will have to increase by 10.12%.

With these considerations, in a short-term perspective, the number of acute care beds in regional and territorial hospitals can be reduced by almost three thousand units. From this number, 1,690 units (57.1%) are deemed non-essential, as they belong to the following categories:

- GPCs in districts that have a territorial hospital AND have an adjusted bed number below 50 units

Table 2: Adjustments of Inpatient Bed Capacity

- Satellites and branches of hospitals or GPCs with an adjusted bed number of less than 50 units

Region	Actual bed number		Adjusted bed number		Number of beds reduced through adjustments	Of which are non-essential beds
	Number	Per 1,000 population	Number	Per 1,000 population		
Batken	1,775	3.38	1,379	2.63	-396	222
Bishkek	1,884	1.83	1,604	1.56	-280	0
Chui	1,914	2.03	1,523	1.62	-391	155
Issyk-Kul	1,307	2.67	1,101	2.25	-206	154
Jalal-Abad	3,162	2.60	2,594	2.14	-568	561
Naryn	873	3.04	656	2.28	-217	54
Osh	2,825	2.11	2,143	1.60	-682	518
Osh City	846	2.82	720	2.40	-126	0

<b>Talas</b>	608	2.31	513	1.95	-95	26
<b>Total</b>	15,194	2.38	12,233	1.91	-2,961	1,690

The organizations hosting non-essential beds are usually not able to offer adequate quality of care because of a combination of factors that include size, location, ability to attract qualified personnel and availability of (functional) medical equipment. Any investment in facilities with “non-essential” beds is unreasonable and is therefore not recommended.

Consequently, short-term measures aiming at service optimization will focus on:

- Facilities with non-essential acute care beds shall be transformed into ambulatory care centers (FAP, FGP, FMC) with or without a 24/7 emergency care service (as part of EMS system)
- Further reducing the number of beds based on individual facility characteristics.

#### 4.1.2 Mid-term Measures: Focusing on Quality Improvement

The purpose of mid-term measures is to improve the quality of care including hospital hygiene by implementing a standard space per bed ratio across the country. At present, the ratio of Gross Floor Area (GFA) per bed is 46.2 m<sup>2</sup> for all inpatient care facilities, far from the recommended (minimum) targets which are 70 m<sup>2</sup> for regional and 60 m<sup>2</sup> per bed for district hospitals. This benchmark has been defined in coordination with the MOH considering international references (including e.g. district and regional hospitals in Germany) and aspects of feasibility / rational use of limited resources). Of course, looking e.g. at the United States of America, much higher ratios would be required but those are neither achievable nor necessary (from a medical point of view).

Table 3: Projected Population Growth and Disease Prevalence, Kyrgyzstan, 2020 - 2035

	2023	2027	2035
Time Period in Years	4	4	8
Population increase	6.37%	12.03%	22.71%
Annual growth (between time periods)	1.56%	1.31%	1.14%
Disease prevalence	3.52%	7.21%	15.12%
Annual growth (between time periods)	0.87%	0.88%	0.89%
<b>Combined factor</b>	<b>10.12%</b>	<b>20.11%</b>	<b>41.26%</b>

With the establishment of ISDNs, the size (GFA) of the facilities and consequently the space / bed

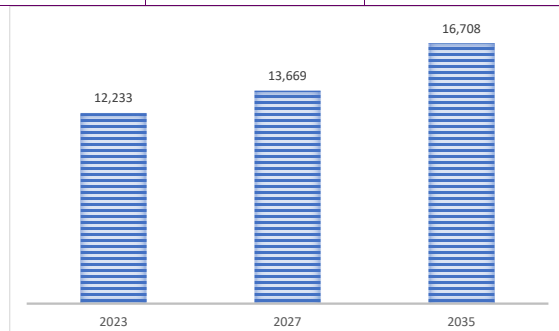
Table 4: Investments for Infrastructure Development – Projections for 2027

\* Osh Region has only district-based facilities

Regions	Total area (sqm) reference: ISDN	Adjusted number of beds	GFA/bed (incl. FMC)	Additional space needed (sqm)	Investment needs (USD)
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ratio will increase (due to the integration of FMCs). Healthcare needs will also increase due to population growth and increasing disease prevalence (see above). For the year 2027, the combined factor will lead to a 20.11% increase compared to the year 2019 (using the BOR adjusted bed number as reference).

Batken	102,435	1,540	66	0	0
Bishkek	132,253	1,792	74	0	0
Chui	109,516	1,702	64	1,119	1,538,293
Issyk-Kul	82,565	1,231	67	0	0
Jalal-Abad	182,807	2,898	63	5,586	7,681,050
Naryn	33,320	733	45	14,309	19,674,469
Osh *	132,713	2,395	55	10,967	13,708,419
Osh City	47,466	805	59	4,835	6,647,587
Talas	46,354	573	81	0	0
<b>Total</b>	<b>869,430</b>	<b>13,669</b>	<b>64</b>	<b>36,815</b>	<b>49,249,817</b>



Considering average construction costs of 1,375 USD / m<sup>2</sup> (except for Osh where there are only district facilities and the costs for infrastructure development were calculated at 1,200 USD / m<sup>2</sup>), in a mid-term perspective (until 2027), an investment of 49.2 million USD is needed to renew, modernize and extend the health care infrastructure in four regions and in Osh City, in order to improve working conditions for better quality of care (increasing the GFA/bed ratio

being one key indicator) to get closer to international norms and standards.

#### 4.1.3 Long-term Measures: Sustaining Strategic Development

Considering both population growth and increasing disease prevalence, until 2035, demand for health care services will increase by more than 40% (cf. Table 3 above). It is obvious that projections for inpatient capacity must account for this development, as well as compensatory effects due to advances in medical technology and increasing use of daycare and outpatient services. Putting all these factors together, the number of acute care beds needed in regions and districts in 2035 will turn around 17,000. To maintain the proposed GFA / bed ratio, a total investment of 273.5 M USD will be required to secure the recommended inpatient care capacity by 2035 (including 50 M USD to be spent until 2027).

## 4.2 Rehabilitation / Renovation of Existing Buildings

About 15% of the existing buildings are in good condition and do not require repair / renovation. Almost 80%, however, require either minor or major repair and renovation measures. About 5% of the existing buildings are beyond repair and demolition is the most reasonable option. By applying the above mentioned 195 USD per m<sup>2</sup> as benchmark cost for minor repairs and 300 USD/m<sup>2</sup> for major repairs / renovation works, a total investment of 244 M USD would be needed to repair and renovate all existing buildings of all public district and regional health facilities. However, when considering the proposed reform and reorganization measures (see below), costs for infrastructure repair and renovation can be significantly reduced (overall by 20%) and minimum working conditions for good quality care can be assured in all facilities to be maintained.

Table 5: Investments for Building Repair and Renovation by Region and Project Phase

Region	Estimated costs in USD (no reform)	Estimated costs (USD) considering reform / reorganization measures				Cost reduction (%)
		2020-23	2024-27	2028-35	Total	
Batken	18,417,125	3,595,754	3,329,730	5,809,760	12,735,245	30.9

Bishkek	68,032,616	10,903,335	15,489,045	31,157,544	57,549,924	15.4
Chui	26,652,765	4,964,098	4,752,561	8,428,042	18,144,701	31.9
Issyk-Kul	19,399,835	4,600,440	3,987,380	7,399,707	15,987,528	17.6
Jalal-Abad	44,748,068	9,940,297	8,590,883	17,176,204	35,707,383	20.2
Naryn	8,503,013	1,729,683	1,618,812	2,899,663	6,248,158	26.5
Osh	20,411,440	4,655,333	4,539,781	8,704,176	17,899,289	12.3
Osh City	25,967,980	3,575,748	6,063,591	11,477,602	21,116,940	18.7
Talas	11,741,159	2,601,132	2,502,126	4,715,475	9,818,733	16.4
<b>Total</b>	<b>243,874,000</b>	<b>46,565,819</b>	<b>50,873,908</b>	<b>97,768,174</b>	<b>195,207,900</b>	<b>20.0</b>

### 4.3 Proposed Optimization Measures by Region

#### 4.3.1 Batken

As a result of the optimization efforts, all public health care facilities in the Batken Region shall be reorganized in three inter-district ISDNs. The Batken ISDN shall serve as a referral (regional) ISDN.

Table 6: Proposed Configuration for ISDNs of Batken Region

Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Batken Region ISDN	Regional Interdistrict	Batken Town Batken District	525,100 (region) 114,300 (town and district)	Merged Batken RH Batken FMC Samarkandek GPC
2	Leylek + Sulyutka ISDN	Interdistrict	Leylek Sulyukta Town	163,900	Leylek TH Leylek FMC Sulyutka GPC Kulunda GPC
3	Kyzyl-Kiya + Kadamjay ISDN	Interdistrict	Kyzyl-Kiya Town Kadamjay	246,900	Kyzyl-Kiya Town TH Kyzyl-Kiya Town FMC Kadamjay TH Kadamjay FMC Uch-Korgon GPC Aidarken GPC Zhany-Zher GPC

#### 4.3.2 Chui

As a result of optimization efforts in the Chuy Region, one regional-level ISDN, two inter-district-level and four district-level Integrated Service Delivery Networks (ISDN) shall be created.

Table 7: Proposed Configuration for ISDNs of Chuy Region

Nr.	Name	Catchment area	Districts served	Population	Organizations
1	Chuy Region ISDN	Regional District	Alamudun	941,100 (region) 181,800 (district)	Merged Chuy RH Merged Chuy FMC Arashan GPC
2	Jayil + Panfilovka ISDN	Interdistrict	Jayil Panfilovka	155,300	Merged Jayil TH Panfilovka GPC Suusamur GPC
3	Tokmok Town + Chuy District ISDN	Interdistrict	Tokmok Town Chuy District	119,800	Tokmok Town TH Tokmok Town FMC Chuy District TH Chuy District FMC
4	Moscow ISDN	District	Moscow	98,900	Moscow TH Moscow FMC
5	Sokuluk ISDN	District	Sokuluk	187,500	Sokuluk TH Sokuluk FMC Jangy-Jer GPC
6	Issyk-Ata ISDN	District	Issyk-Ata	150,500	Issyk-Ata TH Issyk-Ata FMC
7	Kemin ISDN	District	Kemin	47,300	Kemin TH Kemin FMC Orlovka GPC

### 4.3.3 Issyk-Kul

As a result of the optimization plan for the Issyk-Kul Region, one regional-level ISDN, three inter-district-level and one town-level Integrated Service Delivery Networks (ISDN) shall be created. The regional ISDN shall serve as the referral center for the region, but also as a provider of secondary care services for the Karakol Town, as well as the Ak-Suu and Tyup districts.

Table 8: Proposed Configuration for ISDNs of Issyk-Kul Region

Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Issyk-Kul Region ISDN	Regional Interdistrict	Karakol Town Ak-Suu Tyup	489,800 (region) 212,900 (districts)	Merged Issyk-Kul RH Merged Issyk-Kul FMC Ak-Suu TH Ak-Suu FMC Tyup TH Ak-Suu FMC
2	Jeti-Oguz ISDN	District	Jeti-Oguz	91,700	Jeti-Oguz GPC
3	Ton ISDN	District	Ton	52,900	Ton TH Ton FMC
4	Balykchy Town ISDN	Town	Balykchy Town	49,100	Balykchy Town TH Balykchy Town FMC
5	Issyk Kul District ISDN	District	Issyk-Kul District	83,200	Issyk-Kul District TH Issyk-Kul District FMC Ananyevo GPC

### 4.3.4 Jalal-Abad

Jalal-Abad is the district with the most particular configuration. We propose to create one regional, three inter-district and five district-based ISDNs.

Table 9: Proposed Configuration for ISDNs of Jalal-Abad Region

Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Jalal-Abad Region ISDN	Regional District	Jalal-Abad Town	1,214,400 (region) 119,100 (district)	Jalal-Abad Merged TH Jalal-Abad Region FMC
2	Nookan + Mailuu-Suu + Tash-Kumyr ISDN	Interdistrict (multicentric)	Nookan Mailuu-Suu Town Tash-Kumyr Town	207,700	Nookan TH Nookan FMC Kochkor-Ata TH Kochkor-Ata FMC Tash-Kumyr GPC Samaldy-Shai GPC Mailuu-Suu GPC
3	Toktogul + Karakol ISDN	Interdistrict (multicentric)	Toktogul Karakol Town	126,400	Toktogul TH Toktogul FMC Karakol Town GPC Uch-Terek GPC Ozgorush GPC
4	Ala-Buka + Sumsar ISDN	Interdistrict	Ala-Buka Sumsar (Aymak)	110,600	Ala-Buka TH Ala-Buka FMC Sumsar GPC
5	Chatkal ISDN	District	Chatkal	21,500	Chatkal GPC
6	Toguz-Toro ISDN	District	Toguz-Toro	24,800	Toguz-Toro GPC
7	Aksy ISDN	District	Aksy	133,500	Aksy TH Aksy FMC
8	Bazar-Korgon ISDN	District	Bazar-Korgon	175,800	Bazar-Korgon TH Bazar-Korgon FMC
9	Suzak ISDN	District	Suzak	295,000	Suzak TH Suzak FMC Oktyabrskoe TH Oktyabrskoe FMC Kok Zhanak GPC

Due to the population distribution and present configuration, two of the inter-district ISDNs will be configured like multicentric facilities. Whereas a facility will still retain the status of the “center”, there will be other facilities that will also have a complex configuration of departments and clinical services to distinguish them from satellites that have a much smaller size, a less complex configuration of services, and a limited number of beds (5 to 10).

For the ISDN Toktogul - Karakol, both Toktogul and Karakol shall maintain a significant number of beds (ca 70-100 each) including diagnostic and surgical services. The GPCs of Uch-Terek and Ozgorush shall be transformed into satellites with 10 beds each.

For the ISDN Nookan + Mailuu-Suu + Tash-Kumyr, the existing Territorial Hospitals of Nookan and Kochkor Ata shall also maintain a significant number of beds (120-130 each). Considering the small distance between the two facilities, one could specialize in surgical and the other in non-surgical disciplines. GPCs Mailuu-Suu, GPC Shamaldy-Sai and TH Tash-Kumyr shall be transformed into branch facilities with 30-50 beds. Nevertheless, for none of the satellite facilities it is recommended to maintain the full scope of (general) hospital services except for the provision of basic inpatient care for priority diseases close to the place of residence of the population.

#### 4.3.5 Naryn

As a result of optimization efforts in the Naryn Region, one regional-level ISDN and three inter-district- ISDNs shall be created. The regional-level ISDN shall serve as regional referral center, but also serve the populations of Naryn Town, Naryn District and At-Bashy District as secondary level hospital.

Table 10: Proposed Configuration for ISDNs of Naryn Region



Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Naryn Region ISDN	Regional Interdistrict	Naryn Town Naryn District At-Bashy	287,000 (region) 144,000 (town and districts)	Merged Naryn RH Merged Naryn FMC Naryn District FMC At-Bashy TH At-Bashy FMC
2	Kochkor ISDN	District	Kochkor	66,200	Kochkor TH Kochkor FMC
3	Jumgal ISDN	District	Jumgal	44,300	Jumgal TH Jumgal FMC Min-Kush GPC
4	Ak-Tala ISDN	District	Ak-Tala	32,500	Ak-Tala TH Al-Tala FMC

#### 4.3.6 Talas

The optimization plan for the Talas Region foresees that all public health care facilities of the region will be reorganized to form two inter-district ISDNs. The Talas/Bakai-Ata ISDN shall also serve as a regional referral network.

Table 11: Proposed Configuration for ISDNs of Talas Region

Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Talas Region ISDN	Regional Interdistrict	Talas Town Talas District Bakai-Ata	263,500 (region) 159,600 (town and districts)	Merged Talas RH Veterans Hospital Talas District TH Talas Region FMC Talas District FMC Bakai-Ata GPC
2	Manas + Kara-Buura ISDN	Interdistrict	Manas Kara-Buura	103,900	Kara-Buura TH Kara-Buura FMC Manas GPC

#### 4.3.7 Osh

Due to population size of each district and accessibility considerations, only district-based IS-DNs shall be established in Osh Region with each district being served by its own ISDN.

Table 12: Proposed Configuration for ISDNs of Osh Region

Nr.	Name	Catchments area	Districts served	Population	Organizations
1	Chon-Alay ISDN	District	Chon-Alay	31,100	GPC Chon-Alay
2	Alay ISDN	District	Alay	86,000	Alay TH Alay FMC
3	Kara-Kulja ISDN	District	Kara-Kulja	99,000	Kara-Kulja TH Kara-Kulja FMC
4	Uzgen ISDN	District	Uzgen	273,100	Uzgen TH Uzgen FMC Kurshab GPC Myrza-Aki GPC
5	Kara-Suu ISDN	District	Kara-Suu	430,800	Kara-Suu TH Nariman TH Kara-Suu FMC GPC Papan
6	Aravan ISDN	District	Aravan	131,900	Aravan TH Aravan FMC
7	Nookat ISDN	District	Nookat	290,000	Nookat TH Nookat "Medigos" FMC Nookat "Baryn" FMC

## 4.4 Medical Equipment

Based on the MOH standard list as well as international benchmarks and experience, the need for the procurement of medical equipment (replacement of outdated machinery, introduction of new technologies) was determined and related costs estimated. A total amount of 257,2 m USD would be required to fulfil standard requirements for quality care (including recent adjustments for the treatment of patients suffering from severe COVID-19 infection). However, considering the above-mentioned reform and reorganization measures, economies of around 20 M USD (11% of the total volume) can be realized.

Approximately 70% of the projected total investment would go into the upgrading of inpatient care facilities, 12% to GPCs, 10% to FMCs and 7% to facilities focusing on special programs (tuberculosis care, mental health care, and rehabilitation).

Table 13: Investments for Equipment Procurement by Region and Project Phase

Region	Estimated costs (no reform) USD	Estimated costs (USD) considering reform / reorganization measures				Cost reduction (%)
		2020-23	2024-27	2028-35	Total	
Batken	15,798,300	6,093,800	2,931,840	2,931,840	11,957,480	24.3%
Bishkek	84,559,450	21,973,005	22,146,525	37,269,345	81,388,875	3.7%
Chui	24,302,350	9,947,415	4,616,795	4,616,795	19,181,005	19.1%
Issyk-Kul	17,187,150	8,252,505	3,663,960	3,663,960	15,580,425	9.3%
Jalal-Abad	39,032,950	15,042,325	8,176,780	9,538,570	32,757,675	16.1%
Naryn	11,903,250	5,848,665	2,540,205	2,540,205	10,929,075	8.2%
Osh	19,820,700	8,750,170	3,946,530	3,946,530	16,643,230	16.0%
Osh City	33,819,150	8,277,105	8,660,025	15,020,145	31,957,275	5.5%
Talas	10,737,350	5,374,635	2,467,250	2,467,250	10,309,135	4.0%
<b>Total</b>	<b>257,160,650</b>	<b>89,559,625</b>	<b>59,149,910</b>	<b>81,994,640</b>	<b>230,704,175</b>	<b>10.1%</b>

To prioritize investments in equipment we suggest focusing on regional hospitals first (to strengthen referral level care) and on territorial hospitals merging with FMCs to develop ISDNs in order to guarantee access to and functioning of all essential diagnostic and therapeutic services that are part of the State Guaranteed Basic Package (SGBP) of healthcare services. In a medium to long-term perspective Republican and Inter-Regional facilities shall be upgraded.

## 4.5 Total Investment required at Regional Level

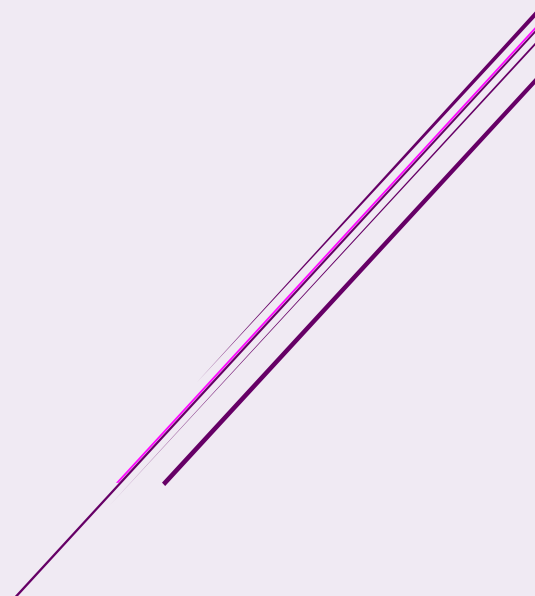
Summarizing the above, the following investments will be required to develop and optimize health care delivery (improved accessibility to quality care, better efficiency in service delivery) at public health care facilities in Kyrgyzstan (all regions).

Table 14: Investments for Health Care Delivery Optimization - Projections for 2035

Regions	Adjusted bed	Investments (USD) for
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	number (2035)	New construction	Repair / Renovation	Equipment Procurement	All together (2035)
Batken	1,883	27,449,874	12,735,245	11,957,480	52,142,599
Bishkek	2,190	13,913,207	57,549,924	81,388,875	152,852,006
Chui	2,081	35,366,577	18,144,701	19,181,005	72,692,283
Issyk-Kul	1,504	20,922,256	15,987,528	15,580,425	52,490,209
Jalal-Abad	3,543	65,285,055	35,707,383	32,757,675	133,750,113
Naryn	896	34,237,621	6,248,158	10,929,075	51,414,854
Osh *	2,927	53,646,724	17,899,289	16,643,230	88,189,243
Osh City	984	22,639,367	21,116,940	31,957,275	75,713,582
Talas	701	0	9,818,733	10,309,135	20,127,868
<b>Total</b>	<b>16,708</b>	<b>273,460,680</b>	<b>195,207,900</b>	<b>230,704,175</b>	<b>699,372,755</b>

## **5 OPTIMIZATION PLANS FOR THE CITIES OF BISHKEK AND OSH**



## 5 OPTIMIZATION PLANS FOR THE CITIES OF BISHKEK AND OSH

### 5.1 Optimization Plan for the City of Bishkek

#### 5.1.1 Planning for Complex Health Care Systems

In the previous chapter, we analyzed the health care system at district and regional level and presented a strategic approach to strengthen effectiveness and efficiency of health care delivery and to improve access to quality care for the population. Doing the same for the central level is much more difficult and there is no standard approach or strategy that would tell us what exactly to do in order to improve the situation in national and city level facilities, especially for those that already have high utilization rates and offer specialized services for which there is no alternative in the country. The system that has evolved over the past decades is rather complex and there is no easy answer or recommendation.

The following articles present and discuss different options. It is the role and responsibility of the key stakeholders, the MOH, MHIF and the clinical and administrative managers of both the republican and the city health care facilities to consider these options and develop specific master plans for their individual facility or group of facilities in order to mobilize efficiency gains and improve access to quality care with manageable costs and without any negative impact on the provision of tertiary level referral diagnostic and therapeutic services.

Incremental improvement can lead to significant gains in terms of effectiveness and efficiency. Sharing of general services may be one of these options. Unifying what belongs together from a clinical perspective (Cardiology / Cardio-surgery) does make sense. But we also should pay attention to avoid the creation of mega-facilities, difficult to be managed effectively and efficiently.

1,000 beds should be considered a maximum not to be exceeded.

We therefore suggest organizing a series of multi-stakeholder workshops to discuss the below mentioned issues and suggestions on a case-by-case basis. Unfortunately, limited time and resources, as well as travel restrictions due to the COVID-19 pandemic did not allow the Master Planning Team to conduct this exercise in the framework of this study.

#### 5.1.2 Situation Analysis

Bishkek is the capital and largest city of the Kyrgyz Republic. As of January 1, 2019, the population of Bishkek was reported to be 1,027,200 inhabitants. Over the past 10 years, the population in Bishkek has grown by not less than 2% annually (2.05% to 2.14%). Because of internal migration, population growth for the City of Bishkek will be higher than in other regions of the country (1.14 to 1.56%). UN estimates that the population of Bishkek in 2035 will reach 1,429,000.

PHC services in the capital are provided by a network of four Family Medicine Centers (FMCs) and one Students' Polyclinic. During 2018, over 3.9 million FMC visits were performed in Bishkek City (two thirds by GPs and one third by specialized physicians). This translates into 3.8 visits per person per year, one of the highest ratios in the country.

641 General Practitioners and 407 Specialized Physicians provide care in the four (4) merged FMCs and the Students' Polyclinic. The average number of consultations per GP per day is 18.7, for specialist doctors it is 14.3. Considering an average duration of 20 minutes of a specialist consultation, the expected number of specialist consultations / day would be 24 (GP consultation >36). Emergency Medical Services (EMS) are being provided by a separate

organization that has a central head quarter facility and ambulance points spread throughout the city.

Table 15: Summary of Key Indicators – Republican Level Facilities

Republican Facility	Beds	ALOS (days)	BOR (%)	Inpatients (IP)	IP (Bishkek)		IP (country)		Out-patients
					N°	%	N°	%	
National Hospital	1,070	8.8	84.3	37,244	8,738	23.5	28,504	76.5	118,658
National Center for Maternal and Child Welfare	580	7.0	85.0	25,585	5,759	22.5	19,826	77.5	95,780
National Center for Oncology and Hematology	456	15.7	80.0	8,464	6,086	71.9	2,378	28.1	68,777
Republican Infectious Disease Hospital	400	3.3	69.0	31,264	23,175	74.1	8,089	25.9	83,592
National Center for Cardiology and Therapy	349	9.7	88.0	11,480	3,301	28.8	8,179	71.2	98,651
National Surgical Center	255	8.7	79.0	8,489	5,246	61.8	3,243	38.2	21,647
Republican Narcology Center	180	10.9	86.0	5,173	2,734	52.9	2,439	47.1	0
Railway Hospital	100	7.8	78.0	3,653	1585	43.4	2068	56.6	98 037
Kyrgyz Scientific Center for Human Reproduction	70	3.5	63.0	4,608					21,647
Republican Center for Dermato-venereology	70	8.8	35.0	1,015	277	27.3	738	72.7	55,224
<b>Subtotal (acute care)</b>	<b>3,530</b>	<b>7.6</b>	<b>80.6</b>	<b>136,975</b>	<b>56901</b>	<b>41.5</b>	<b>75 464</b>	<b>58.5</b>	<b>662 013</b>
Research Institute of Heart Surgery and Transplant	64	60.0	79.0	308	63	20.5	245	79.5	4,881
Republican Mental Health Center	460	39.7	96.0	4,074	3,004	73.7	1,070	26.3	86 464
National Center for Phthisiatry	390	54.5	74.0	1,943	465	23.9	1,478	76.1	11,505
<b>Subtotal (long- and in-intermediate care)</b>	<b>914</b>	<b>NA</b>	<b>NA</b>	<b>6,325</b>	<b>3,532</b>	<b>55.8</b>	<b>2,793</b>	<b>44.2</b>	<b>102 850</b>

Facilities providing inpatient services have been categorized as republican or city level facilities and analyzed separately. There are 14 republican institutions, two of which provide general acute care, two mental health care, one MNCH Care, another one TB care and eight hospitals provide various kinds of specialized care. Republican hospitals have good utilization rates with average BOR of 80.6%. However, some of them show sub-optimal performance, such as the Hospital for Infectious Diseases, the Dermato-Venereological Center, and the Center for Human Reproduction.

In 2018, all republican hospitals together had about 137,000 patients admitted, and 662,000 patients were consulted in their outpatient departments. Considering the origin of the patients we found that almost every republican-level hospital has more than 20% of their patients being Bishkek residents (share of the Bishkek population: 16.1%) and in some hospitals the share was as high as 72-74%.

Out of a total number of 6,331 staff working in republican acute care hospitals, 60% are medical staff. This ratio is slightly lower in long-term and intermediate care facilities where

56.3% of the personnel is medical personnel. The ratio of physicians per bed is lower than expected for tertiary care facilities, with numbers as low as 0.2 physicians per bed in the Infectious Diseases Hospital and 0.27 physicians per bed in the National Center for Cardiology and Therapy.

Even lower is the ratio of nurses per bed, with the average being 0.69 (as compared to a standard of 1 nurse per bed that we used as a national benchmark and acceptable standard).

From the 12 city-level hospitals, two (2) provide general acute care, four (4) provide Mother and Child Healthcare, one (1) provides pediatric care, and five (5) provide tuberculosis and other specialized care. With 1.9 acute care beds per capita (calculated as the sum of city hospitals, the trauma center, the pediatric hospital and the maternal and child health facilities), Bishkek has the lowest acute care beds per capita ratio among all regions of the country (1.8 beds per 1,000 inhabitants).

To a certain extent, this is reflected in the high BOR (>93% for acute care and >82% for MCH facilities). Nevertheless, it must be emphasized that the high BOR can partially be attributed to the high ALOS, observed in both general care and MNCH facilities. 4,029 staff (2,422 of them are medical and paramedical staff) provide services in Bishkek City Hospitals. 750 doctors (for a high physician to bed ratio of 0.4) and 1,567 nursing positions (0.83 nurses per bed) are employed in acute care hospitals. Most of the hospitals have an adequate physician per bed ratio, while the nurse per bed ratio is less optimal.

The evaluation of the financial situation of the national centers demonstrated rather low levels of staff expenditures, due to a) the relatively low number of staff, particularly of (qualified) nursing staff, and b) the comparatively low salaries paid to medical and paramedical staff. It also demonstrates the rather low overall budgets and expenditures, except for the specialized centers for Oncology and Hematology and the Republican Research Institute for Heart Surgery and Organ Transplant, both benefitting from external subsidies. Without

this additional amount of funding, the average expenditure per bed would turn around 500,000 KGS per annum corresponding to 1,370 KGS (16.6 EUR) / day. It is obvious that with a budget of this (low) amount tertiary / referral care services cannot be assured without compromising on quality and availability / accessibility. Not as a benchmark or target figure – but just for broad level orientation: In Germany, the average expenditure per day / hospital bed turns around 600 EUR of which 62% (372 EUR) are related to staff expenditures, and 2/3 of this 62% are being spent on salaries for medical doctors and nurses.

### 5.1.3 Findings and Recommendations

From the above analysis it becomes obvious that major investments are required to upgrade the existing infrastructure and equipment and to increase the operational expenditure budget to allow the tertiary / referral level hospitals to provide services at appropriate levels of quality.

The investment required for appropriate development of all hospitals located in the city of Bishkek would turn around 89.9 million USD – without taking into consideration synergies and cost savings due to proposed rationalization measures. Globally those measures will allow to reduce investment needs by up to 25%. From the total amount noted above, 36.8 M USD are required for infrastructure upgrade (8.292 USD per bed) and 53.1 M for medical equipment upgrade (11.936 USD per bed).

More than one quarter of the total investment is required for the National Hospital (22,72 million USD) or 25,3% of the total amount. In the field of medical equipment, the top three institutions with the highest investment needs are the National Center for Oncology and Hematology with 29,1% (more than one third of the total investment needs), the National Hospital with 21,3% and the National Center for Maternal and Child Welfare with 11,3%.

The annual budget of the city-level organizations is above 1,8 billion KGS. Unlike the republican-level facilities, the proportion of ex-



penditure dedicated to staffing represents 67.9% of the total amount. The percentage, of course, is higher in those facilities that offer outpatient in addition to inpatient services. In turn, expenditures per staff and specifically per medical doctor are higher in facilities offering inpatient care only. However, both average and individual expenditures per staff and per doctor are significantly lower among city-level organizations as compared to republican-level organizations (723,000 compared to 2,250,000 KGS per annum in 2018).

As noted above, without taking into consideration possible synergies and cost savings through optimization measures, 62.8 million USD of investments would be needed to upgrade the existing infrastructure and equipment for all city-level facilities in the capita of Bishkek. From this amount, 31.3 million USD would be allocated to infrastructure upgrading (8,556 USD per hospital bed). For medical equipment, 31.5 million USD would be needed, corresponding to 10,317 USD per bed (for inpatient facilities). The Bishkek Research Center for Traumatology, the Children's Clinical Hospital, the City Clinical Hospital No. 1, the FMC Sverdlov and the City Perinatal Cen-

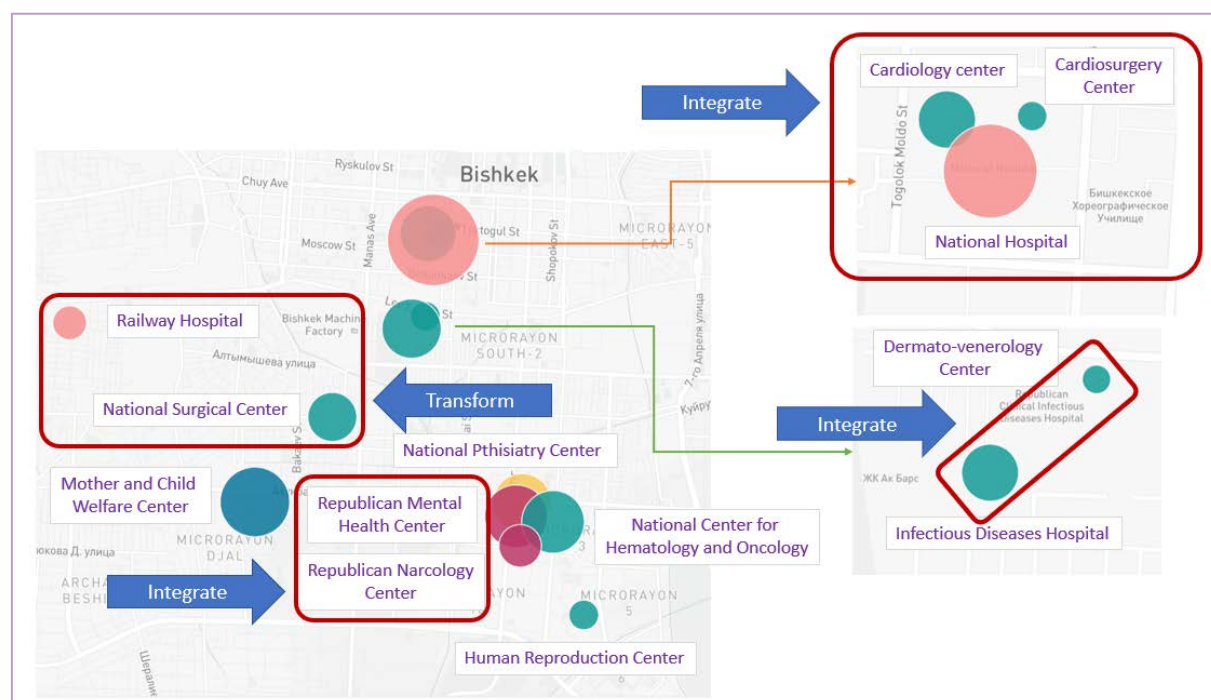
ter require investments above average. In the field of medical equipment, three institutions only would consume more than 50% of the proposed budget. Although the investment needs are more balanced among the city-level organizations as compared to republican level organizations, still, six out of 12 organizations would consume more than 70% of the total investment needs.

#### 5.1.4 Specific Recommendations for Republican-level Organizations

Republican-level facilities have evolved over time to become highly specialized due to different factors such as population needs, evolving priorities in health service delivery, knowledge, skills and capabilities of staff, and the development of the Kyrgyz Healthcare System. Therefore, recommendations for the development of republican-level organizations are as follows:

1. Integrate / coordinate services provided at the National Hospital, the National Center for Cardiology and Therapy, and the Research Institute of Heart Surgery and Organ Transplant.
2. Integrate in one single facility the Republi-

Figure 8: Recommendations for Republican Hospitals



can Center for Dermatology and Venereology and the the Republican Infectious Disease Hospital, considering that Dermato-Venerology services can mostly be provided at an outpatient basis.

3. Review the model of care and referral patterns for the Infectious Diseases Hospital considering that ~75% of patients admitted are residents of the City of Bishkek.
4. Transform the National Surgical Center in either a Training Center for Minimally Invasive Surgery (preferred option) or in a city-level facility (more than 60% of admitted patients are Bishkek residents). Strengthening competencies in minimally invasive surgery at regional level, however, would help improving access to care and promote a more rational utilization of existing resources.
5. Ownership and legal status of the Railway Hospital should be carefully examined. The facility could be transferred to the MOH or a contractual agreement between the MOH and the (State owned) Railway Company assures integration of the facility in the public health care system at city or republican level.
6. The National Hospital and the National Center for Oncology and Hematology are the two organizations with the highest investment needs. Together they will absorb 34.8 M USD or 45.7% of the investment required for all republican facilities. Synergies, especially in the areas of diagnostic and other services that could be shared (CSSD, laboratory, imaging, etc.) shall be further analyzed and evaluated in the framework of facility-based master plans.

The National Center for Maternal and Child Welfare should explore synergies with the National Perinatal Center and the four MCH facilities of the City of Bishkek (e.g. for shared use of diagnostic facilities and to reduce bed capacity following reductions in the number of births and the ALOS).

### 5.1.5 Specific Recommendations for City-level Institutions

City level facilities correspond to regional and district level facilities in the other, mostly rural parts of the country, where our approach to optimization is focusing on the establishment of Integrated Service Delivery Networks (ISDNs). Due to the particularities of Bishkek City, especially due to the large size of FMCs, the implementation of an ISDN model (that still needs to be experimented) does not seem to be appropriate. We recommend awaiting the outcome of ISDN implementation in other areas of the country before attempting its implementation in Bishkek City. However, the concept of collaboration and exchange between inpatient and outpatient services shall be promoted.

Consequently, we propose implementing three types of interventions for the optimization of health care services for the City of Bishkek:

1. Integration of inpatient facilities with complementary and/or similar scope of service.
2. Collaboration and resource pooling between inpatient and ambulatory organizations (i.e. hospitals and adjacent FMCs).
3. Implementation of shared services for clinical and non-clinical support functions.

### Integrated City Clinical Hospital

We propose integrating the City Clinical Hospitals No. 1 and 6 with the Bishkek Research Center for Traumatology and Orthopedics. A structure with three campuses and a cumulative number of 934 beds would be created to generate synergies for better quality and higher efficiency. Strategic planning of the new facility would lead to a revised concept for the distribution of services and departments across the three campuses and revised (and more rational) programs for the development / upgrading of the infrastructure and equipment. Instead of a renovation and upgrade program that will require more than 15 M USD, the integrated approach has the potential to significantly reduce costs by avoiding duplications, and by

promoting shared services and other elements contributing to an economy of scale.

*During discussion with MOH and directors of the Bishkek City healthcare facilities, the need for a central emergency hospital was highlighted. The City Clinical Hospitals 1 and 6 could be candidates to serve this purpose.*

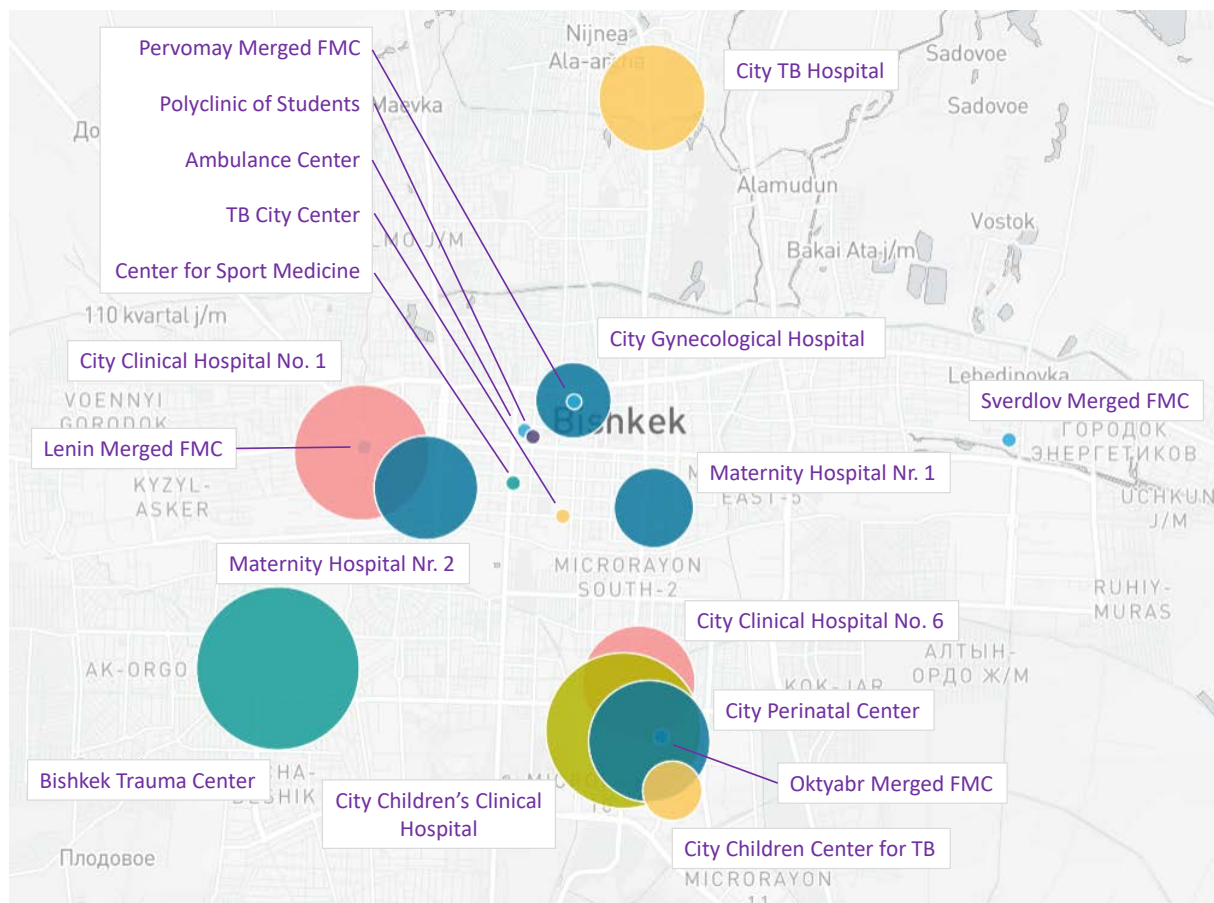


Table 16: Summary of Key Indicators – City level facilities

Name	Beds	ALOS	BOR	IP	OP
City Clinical Hospital No. 1	294	8.6	101.0%	12,634	4,798
City Clinical Hospital No. 6	195	10.4	103.0%	7,076	2,883
Children's Clinical Hospital for Emergency Care	400	4.6	87.0%	27,775	137,711
Bishkek Research Center of Traumatology	445	11.6	89.0%	12,511	13,994
<b>Subtotal (acute care)</b>	<b>1,334</b>	<b>7.6</b>	<b>93.1%</b>	<b>59,996</b>	<b>159,386</b>
Maternity Hospital No. 1	85	4.5	75.0%	6,143	0
Maternity Hospital No. 2	160	4.8	85.0%	10,264	0
City Perinatal Center	230	5.2	83.0%	13,486	3,927
City Gynecological Hospital	75	3.4	83.0%	6,596	0
<b>Subtotal (women and children)</b>	<b>550</b>	<b>4.6</b>	<b>82.3%</b>	<b>36,489</b>	<b>3,927</b>
City Tuberculosis Hospital (Bishkek)	170	50.1	60.0%	748	0
City Children's Center for TB	40	149.0	45.0%	44	0
<b>Subtotal (TB)</b>	<b>210</b>	<b>NA</b>	<b>NA</b>	<b>792</b>	<b>0</b>

Figure 9: Recommendations for Bishkek City level facilities



Table 17: Summary of Outpatient Activities – City Level Facilities

	GP visits	Specialist visits	EMS visits
Merged FMC of Lenin District	1,015,451	320,092	0
Merged FMC of Sverdlov District	884,808	180,684	0
Merged FMC of Oktyabr District	383,781	235,992	0
Merged FMC of Pervomay District	355,357	203,536	0
Polyclinic of Students	0	339,604	0
<b>Subtotal (Primary Health Care)</b>	<b>2,639,397</b>	<b>1,279,908</b>	<b>0</b>
Tuberculosis City Center	0	116,392	0
Center for Sports Medicine	0	216,066	0
Ambulance Center (Bishkek)	0	0	211,733

### City MCH Hospital

At present, there are four adjacent facilities with the largest being the City Perinatal Center (230 beds) and the smallest the City Gynecological Hospital (75 beds). All four facilities could be integrated to form one City MCH Hospital with the following characteristics: The 230 bed City Perinatal Center requires almost two thirds of the infrastructure investments and almost 40% of the medical equipment investment needs.

With the integration approach, this investment can be spread over the short-, mid- and long-term implementation periods of the Master Plan without compromising access and quality of MCH care. Reorganization of services may lead to overall reduction in investment needs. Decreasing birth rates, combined with the expected decrease in ALOS, due to better performance, will allow to reduce the number of obstetric beds. Reorganization of services could also lead to better quality of care especially for complicated and referral cases, thus contributing to reduced maternal mortality.

### Family Medicine Centers

For Bishkek City, we do not recommend implementing the ISDN approach in a short- or mid-term perspective, the two main reasons being:

1. FMC services recently have undergone a reform process and results and impact still have to be analyzed and evaluated

2. All four merged FMCs in Bishkek City represent relatively large organizations. Together they have 5,277 staff.

*A brief analysis of the FMC Merger in Bishkek showed the following effects:*

- More efficient use of human resources – reduced numbers of administrative and technical support staff
- Unified procurement strengthening synergies in logistics and helping to achieve better market prices (and consequently reduced costs)
- Availability of space to improve the offer of clinical services.
- Central lab services with new and well-maintained equipment and sufficient staff have increased the number and improved the quality of lab diagnostic tests.

In addition to the various city hospitals, the four FMCs will continue being part of the health care provider network of the City of Bishkek. The small Student's Polyclinic, however, could be merged with the Pervomay FMC to create an organization with slightly over 1,000 staff, a size like that of the other three merged FMCs of the City of Bishkek.

Three of the four FMCs are in proximity to hospital facilities, respectively:

- Merged FMC of Lenin District is close to City Clinical Hospital No. 1.
- Merged FMC of Pervomay District is close to City Gynecological Hospital.



Table 18: Investments in Infrastructure and Equipment – Republican Level Facilities

Name	Beds	Infrastructure	Investment/bed	Equipment	Working	Equipment	Investment/bed			
National Hospital	1,070	11,408,901	31.0%	10,663	564	470	83.3%	11,304,600	21,3%	10,565
National Center for Maternal and Child Welfare	580	6,037,134	16.4%	10,409	727	596	82.0%	5,984,000	11,3%	10,317
Republican Mental Health Center	460	2,843,888	7.7%	6,182	49	49	100.0%	184,500	0,3%	401
National Center for Oncology and Hematology	456	603,819	1.6%	1,324	144	139	96.5%	15,412,600	29,1%	33,800
Republican Infectious Disease Hospital	400	3,331,445	9.0%	8,329	327	316	96.6%	1,369,100	2,6%	3,423
National Center for Phthisiatry	390	2,134,026	5.8%	5,472	183	156	85.2%	2,165,700	4,1%	5,553
National Center for Cardiology and Therapy	349	1,459,230	4.0%	4,181	604	463	76.7%	5,088,300	9,6%	14,580
National Surgical Center	255	4,405,127	12.0%	17,275	222	183	82.4%	3,892,300	7,3%	15,264
Republican Narcology Center	180	1,177,001	3.2%	6,539	21	20	95.2%	283,800	0,5%	1,577
Railway Hospital	100	963,591	2.6%	9,636	94	90	95.7%	931,600	1,8%	9,316
Kyrgyz Scientific Center for Human Reproduction	70	1,106,645	3.0%	15,809	100	99	99.0%	1,037,100	2,0%	14,816
Republican Center for Dermatology and Venereology	70	419,309	1.1%	5,990	26	25	96.2%	150,300	0,3%	2,147
Research Institute of Heart Surgery and Transplant	64	836,550	2.3%	13,071	175	158	90.3%	5,068,100	9,6%	79,189
Endocrinology Center		123,201	0.3%	NA	30	23	76.7%	171,400	0,3%	
Total	4,444	36,849,865	100.0%	8,292	3,266	2787	85.3%	53,043,400	100.0%	11,897

- Merged FMC of Oktyabr District is close to City Clinical Hospital No. 6.

All these three centers require an investment in medical equipment of almost 3.2 M USD. We propose reducing to the minimum needed the investment in diagnostic equipment (x-ray, laboratory, ultrasound, etc.), as well as the investment in CSSD equipment. All three centers may enter into resource sharing arrangements with adjacent hospitals and utilize their technological capabilities.

Table 19: Investments in Infrastructure and Equipment - City-Level Facilities

Name	Beds	Infrastructure		Investment / bed	Equipment	Working		Equipment		Investment / bed
City Clinical Hospital No. 1	294	3,828,678	12.2%	13,023	223	222	99.6%	4,164,300	13,2%	14,164
City Clinical Hospital No. 6	195	860,321	2.7%	4,412	95	90	94.7%	745,800	2,4%	3,825
Children's Clinical Hospital for Emergency Care	400	2,039,679	6.5%	5,099	343	336	98.0%	5,437,900	17,3%	13,595
Bishkek Research Center of Traumatology	445	2,970,711	9.5%	6,676	379	368	97.1%	5,151,100	16,3%	11,576
Maternity Hospital No. 1	85	661,067	2.1%	7,777	119	113	95.0%	1,010,800	3,2%	11,892
Maternity Hospital No. 2	160	1,190,210	3.8%	7,439	170	161	94.7%	1,368,800	4,3%	8,555
City Perinatal Center	230	4,696,410	15.0%	20,419	279	261	93.5%	2,123,100	6,7%	9,231
City Gynecological Hospital	75	625,775	2.0%	8,344	80	76	95.0%	618,300	2,0%	8,244
City Tuberculosis Hospital (Bishkek)	170	739,290	2.4%	4,349	53	49	92.5%	659,050	2,1%	3,877
City Children's Center for TB	40	304,328	1.0%	7,608	15	6	40.0%	323,900	1,0%	8,098
Merged FMC of Lenin District		3,422,607	10.9%		309	291	94.2%	1,843,900	5,9%	
Merged FMC of Sverdlov District		4,806,903	15.4%		248	232	93.5%	1,558,000	4,9%	
Merged FMC of Oktyabr District		2,025,709	6.5%		413	388	93.9%	1,282,600	4,1%	
Merged FMC of Pervomay District		1,170,254	3.7%		135	131	97.0%	1,284,100	4,1%	
Polyclinic of Students		229,320	0.7%		25	24	96.0%	282,900	0,9%	
Tuberculosis City Center		463,800	1.5%		23	21	91.3%	223,600	0,7%	
Center for Sports Medicine		244,530	0.8%		49	49	100.0%	487,900	1,5%	
Ambulance Center (Bishkek)		1,007,232	3.2%		259	153	59.1%	2,950,000	9,4%	
<b>Total</b>	<b>2,094</b>	<b>31,286,824</b>	<b>100.0%</b>	<b>8,556</b>	<b>3217</b>	<b>2971</b>	<b>92.4%</b>	<b>31,516,050</b>	<b>100.0%</b>	<b>10 317</b>



## 5.2 Optimization Plan Osh City

### 5.2.1 Situational Analysis

Osh is the second largest city of the Kyrgyz Republic. As of January 01, 2019, the population of Osh City was 299,500 inhabitants. Geographically, Osh City is the center of the Osh Region in the Fergana Valley. Due to its geographical position, Osh City is frequently referred to as the “capital of the south”. The city covers an area of 182.5 km<sup>2</sup>, i.e. a population density of 1,641 inhabitants per km<sup>2</sup>. During our survey, we analyzed and evaluated 12 healthcare organizations spread across 33 different locations.

A total number of 1,819 staff (1,081) of whom medical staff) provide services in the three Bishkek City inpatient facilities. The 846-bedded Osh City Clinical Hospital has 276 doctors for an acceptable physician to bed ratio of 0.33 and a somehow lower nurse to bed ratio of 0.73.

PHC services are being provided by one FMC (“Family World”) that delivers services through a central location and 11 branches distributed across the city. During 2018, over 937,053 FMC visits were performed in Osh City (almost half by GPs) and the rest by specialized physicians and feldshers. This translates into 3.1 visits per person per year, one of the highest ratios in the country. The medical staff of the “Family World” FMC consists of 172 general practitioners and 125 specialized

physicians.

The average number of visits per GP per day is 12.1, whereas the average number of specialist doctor visits per day is 14.3. Both numbers represent suboptimal utilization of human resources, especially for the GPs. Like in Bishkek, emergency care is being provided by the separate (EMS) structure.

### 5.2.2 Interregional Healthcare Organizations

There are 7 inter-regional institutions, four (4) of which provide general acute care, two (2) mental health care, and one (1) TB care. As expected, inter-regional services show good utilization rates with an average BOR of 90.5% for acute care facilities. Nevertheless, the relatively high ALOS (8.9) keeps the BOR at an artificially high level. In 2018, the acute care facilities had about 61,599 patients admitted, and 140,873 patients visited their OPD services.

Among the facilities providing long-term and intermediate care, only the Inter-Regional Child and Adolescent Center shows suboptimal utilization, the other facilities have high BORs.

Out of a total number of 2,644 staff working in acute care hospitals, 58.8% are medical doctors; this ratio is lower in long-term and intermediate care facilities MDs = 44.0%.

The annual budget of the inter-regional facilities is around 623 M KGS with almost 50% of

Table 20: Performance Indicators of Inter-regional Organizations

Institution	Beds	ALOS	BOR	IP	OP
Inter-Regional Hospital	952	9.3	98.0%	36,307	3,567
Inter-Regional Children's Hospital	540	7.5	79.0%	20,729	75,850
Inter-Regional Oncology Center	100	10.7	83.0%	2,844	8,908
Inter-Regional Dermato-Venereology Center	80	14.9	88.0%	1,719	52,548
<b>Subtotal (acute care)</b>	<b>1,672</b>	<b>8.9</b>	<b>90.5%</b>	<b>61,599</b>	<b>140,873</b>
Inter-Regional Mental Health Center	170	31.8	92.0%	1,791	0
Inter-Regional Child and Adolescent TB Center	110	197.0	59.0%	120	0
Inter-Regional Narcology Center	50	10.7	86.9%	1,481	30,294
<b>Subtotal (long- and intermediate care)</b>	<b>330</b>	<b>NA</b>	<b>NA</b>	<b>3,392</b>	<b>30,294</b>

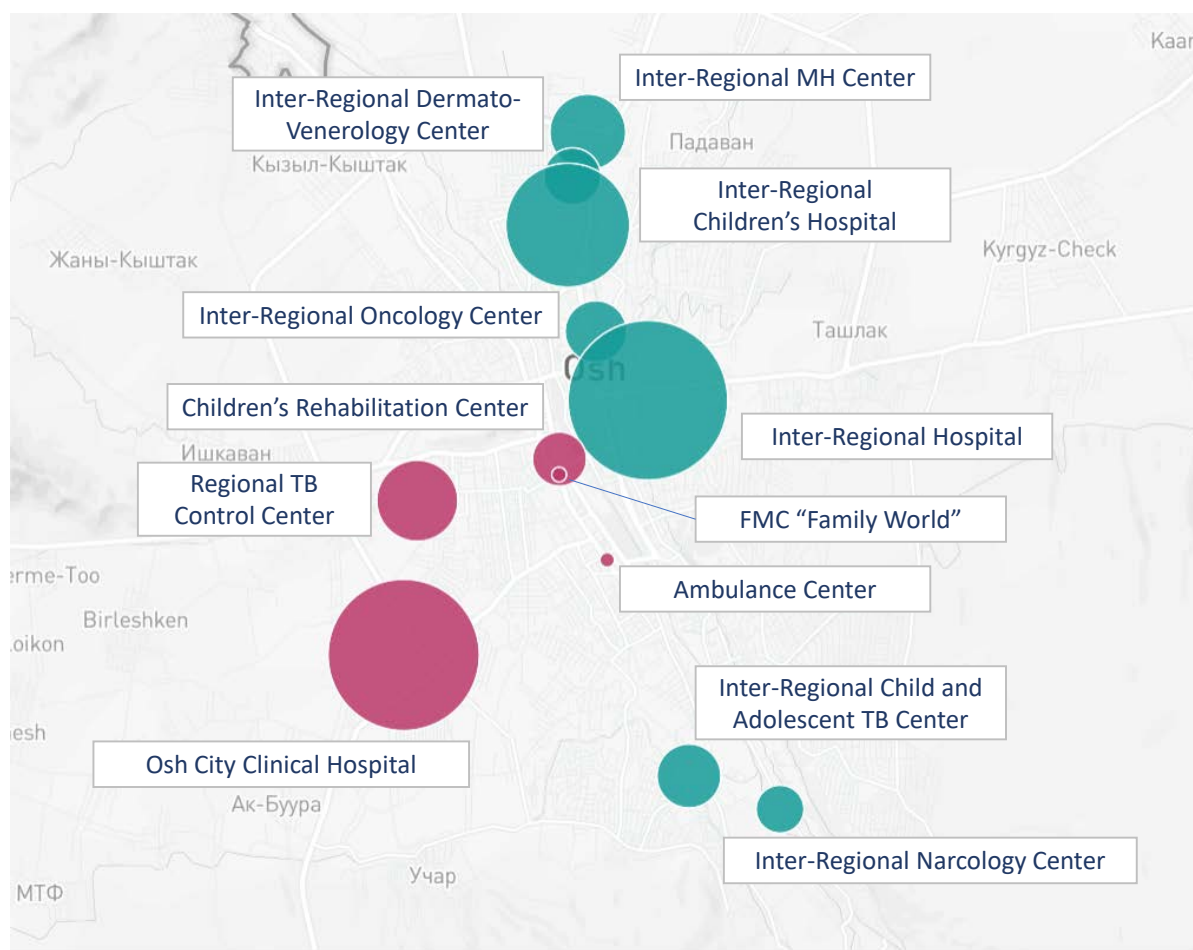


Figure 10: Health Care Facilities in Osh City – Bed Capacity and Location  
Bubble size proportional to number of beds; green: inter-regional facilities, red: city level facilities

this amount being spent on human resources.

The Oncology Center has the lowest proportion of expenditures dedicated to staff, as most of its budget is dedicated to the procurement of expensive drugs and pharmaceutical products.

As expected, expenditures per bed are the highest in the Oncology Center, as are the expenditures per staff and expenditures per physician. In general, the long-term and intermediate care facilities have lower expenditures per bed and per staff.

According to our assessment, a total investment of 38.1 M USD is required for repairs of buildings and installations, as well as the upgrading and modernization of medical equipment. 42% of the total amount would be spent on infrastructure and 58% on equipment. Per hospital bed, this represents USD 7,967 for infrastructure repair and renovation, and

11,063 USD for equipment upgrade and replacement.

The Inter-Regional Hospital alone will consume more than half the of infrastructure repair budget (51.9%), followed by the Inter-Regional Children Hospital (22.0%) and the Inter-Regional Oncology Center (11.8%). In the field of medical equipment upgrade, the top two institutions are the Inter-Regional Hospital (45.6%) and the Oncology Center (28.4%), followed by the Inter-Regional Children Hospital (21.1%).

### 5.2.3 City-level Healthcare Organizations

From the 5 city-level hospitals, three (3) acute care facilities, one outpatient care facilities and one (1) emergency medical care. One of out of three healthcare facility provides general care, one tuberculosis control care, and last rehabili-

Name	Beds	Infrastructure	Investment / bed	Equipment	Investment / bed
<b>Inter-Regional Hospital</b>	952	8,278,160	51.9%	8,696	10,097,100
<b>Inter-Regional Children's Hospital</b>	540	3,506,265	22.0%	6,493	4,668,500
<b>Inter-Regional Mental Health Center</b>	170	0	0.0%	0	151,000
<b>Inter-Regional Child and Adolescent TB Center</b>	110	1,182,255	7.4%	10,748	515,900
<b>Inter-Regional Oncology Center</b>	100	1,883,595	11.8%	18,836	6,287,500
<b>Inter-Regional Dermato-Venereology Center</b>	80	981,006	6.2%	12,263	147,300
<b>Inter-Regional Narcology Center</b>	50	119,520	0.7%	2,390	280,800
<b>Total</b>	<b>2,002</b>	<b>15,950,801</b>	<b>100.0%</b>	<b>7,967</b>	<b>22,148,100</b>

Table 21: Investments for Infrastructure Repair and Medical Equipment Upgrade – Osh City

tation children care. Osh City has 2.8 acute care beds per 1,000 inhabitants which is adequate. The ALOS of 6.6 days and the BOR of 87.0% indicate a good utilization of resources and efficient care.

The annual budget of the city-level organizations is over 555 million KGS. Expenditure on staff is 59.1%. - lower than in the Clinical City Hospital but higher as in the rest of the city organizations. 22.3 million USD is needed for infrastructure repair and infrastructure upgrade in Osh City (47.7 and 52.3% respectively). Most of the investment is needed for two facilities – the “Family World” FMC (34.5%) and Osh City Clinical Hospital (43.2%).

We propose the following optimization measures for the healthcare organizations of

sources and interdisciplinary care for oncological patients).

3. Consider transfer of the Osh Special Hospital administration from Osh Region to Osh City and transformation of the hospital into a department of the Inter-Regional Clinical Hospital.

As a result of these measures, an integrated, solid 1,192-beds healthcare organization with common budget, staff and management structure could be created.

Table 22: Investments in Infrastructure and Equipment for Osh City-level Organizations

the Osh Region:

1. Transform Inter-Regional Dermatology Center in a Department of the Inter-Regional Hospital (as most of dermatology diagnosis and treatment can be provided on an outpatient basis).
2. Transform Inter-Regional Oncology Center into a Department of the Inter-Regional Hospital (to allow for efficient use of re-

Name	Beds	Infrastructure	Investment/bed	Equipment	Investment / bed		
Osh City Clinical Hospi- tal	846	3,579,917	33.6%	4,232	6,060,200	51,9%	7,163
Regional Center for TB Control (Osh City)	200	908,036	8.5%	4,540	1,042,850	8,9%	5,214
Children’s Rehabilita- tion Center (Osh City)	70	1,582,416	14.9%	22,606	250,000	2,1%	3,571
Ambulance Center (Osh City)		322,818	3.0%		860,000	7,4%	
FMC "Family World"		4,247,367	39.9%		3,458,000	29,6%	
Total	1,116	10,640,554	100.0%	5,439	11 671 050	100.0%	6 589

## **6 OPTIMIZATION PLANS FOR VERTICAL HEALTH PROBLEMS**



## 6 OPTIMIZATION PLANS FOR VERTICAL HEALTH PROGRAMS

### 6.1 Tuberculosis Care

#### 6.1.1 Situation Analysis

Tuberculosis (TB) - is a disease of poverty and inequality, disproportionately impacting low- and middle-income countries and the most marginalized and vulnerable people within communities. TB is largely a result of health and living conditions including the lack of access to appropriate care, diagnostic tools and effective medicines, inadequate nutrition, sanitation, and safe and healthy living and working environments.

Based on the roadmap, in January 2017, the Kyrgyz Government issued *Order 9r Plan of Action on Optimization of the System of TB Care Provision to the Population of the Kyrgyz Republic for 2017–2026*. In February 2017, the MOH issued Order 123 on the implementation of the Plan for the period 2017-2019. TB-REP supports the implementation of the above-mentioned reforms, putting country policy and related technical documents into practice.

Reducing beds is a key strategy of the roadmap: In 2020, 1,040 beds are to be closed and another 320 beds by 2026, leading to an overall reduction from 2,605 to 1245 beds. WHO Europe developed a bed calculation model. Applied to Kyrgyzstan with 5,570 newly diagnosed cases and 2,065 under treatment<sup>1</sup>, assuming a standard share of MDR TB, the model would result in an estimated number of 720 beds needed<sup>2</sup>.

The system of TB control in Kyrgyzstan is organized through a network of inpatient TB facilities with a capacity of 2,095 beds (2019; in 2017, bed capacity was at 2,605). Unfortunately, there is little integration with PHC facilities, and treatment and care coordination executed by specialists working at TB hospitals. It is common practice in Kyrgyzstan to admit suspects to TB hospitals even after a first contact where initial symptoms have been presented.

At present, none of the existing in-patient facilities complies with the required infection control standards (NICE 2016). Patient rooms are overcrowded (3 to 6), and the ALOS is long. There is no appropriate system for infection control and the high risk of hospital-acquired TB is well documented.

Financing of TB services includes medicines, laboratory equipment and testing materials and is supported by international development partners, while the state budget covers staff salaries and expenditures on hospital maintenance. WHO, however, promotes the shift to ambulatory treatment, since it is effective, cheaper, and more patient oriented. Moreover, there is also a movement from a purely medical to a multi-pronged, integrated approach maintained by the *Fund for Social and Psychological Support of Tuberculosis Patients*, which is especially important for patients who are in difficult situations and whose low adherence to treatment endangers their health.

<sup>1</sup> Tuberculosis surveillance Europe 2019, Table 5, p. 50

<sup>2</sup> Own calculation. Cf. Annex 2 of the WHO publication - A people-centered model of Tb care. Blueprint for EECA countries, 1<sup>st</sup> edition. Copenhagen 2017. We used total numbers described in the table in "Step A": 7.240 Tb cases and the number of Tb cases in Kyrgyzstan in table 5 of the report: 5,570 newly diagnosed cases and 2,065 previously treated cases totaling 7.635 cases. The no. of

beds calculated for the model country amounted to 683 (see step P of the calculation tool) and therefore gives 720 beds needed (7.635 cases in the model country / 7.240 cases in Kyrgyzstan \* 683 beds). For sake of simplicity we assumed the same distribution of different Tb cases as in the model.

### 6.1.2 Recommendations

- Primary health care providers (physicians, paramedics, nurses) must play an increasingly important role in TB control for timely detection and referral of cases to reduce transmission and prevent the development of drug-resistant TB, to do this, they should receive a performance-based incentive.
- The number of TB laboratories should be reduced; at the same time, the remaining facilities must be technically modernized. Regularly used direct smear testing with staining is cheap and easy to use, but with low sensitivity, PCR test is an alternative, but its cost-effectiveness should be evaluated before its implementation.
- The link between PHC and specialized TB services at district and regional levels should be strengthened to support the identification and treatment of TB patients. It is projected to reach 70% for TB detection and 85% for PHC treatment, these rates should be monitored at least annually.
- Introduce changes in payment mechanisms: providers of outpatient care should be covered through per capita budgets in combination with performance-based payments; payment for inpatient care should be based on TB-specific DRGs.

It is proposed to concentrate inpatient anti-TB care in 3 or 4 (depending on the decision on an inter-district hospital in Kyzyl-Kiya) organizations of complex care for respiratory diseases, a model that has been introduced in Tajikistan (the former tuberculosis hospital in Macheton, which has become an advanced center for diagnosis and treatment of respiratory diseases). These organizations will treat not only tuberculosis but also other lung diseases such as asthma, Chronic Obstructive Pulmonary Disease (COPD) or lung cancer. In addition, it is proposed to keep a number of small regional organizations of the middle level and two specialized treatment and rehabilitation centers for children and adolescents.

The future role of the National Center for Phthisiology will be to evolve into a National Center for Respiratory Diseases (including noncommunicable diseases such as asthma, COPD and lung cancer) to avoid limited attention to TB given the anticipated epidemiological shift and current treatment guidelines that facilitate outpatient TB care. (more detailed information is provided in the appendix to the report: Reorganization of TB care in the Kyrgyz Republic).

## 6.2 Mental Health Care

### 6.2.1 Situation Analysis

Mental health hospitals and centers almost completely absorb the country's mental health budget but only serve a relatively small proportion of the population's mental health needs. Compared to other countries, the number of psychiatric beds is small: 0.24 per 1000 population, while the EU average is 0.72 / 1000. Cyprus is the only country in Europe where the ratio is lower (0.2 per 1000). Average length of stay (ALOS) data range from 9.4 days in Belgium to 45.7 days in Montenegro, indicating different treatment approaches.

WHO is working to move mental health care away from a hospital-based institutional model to the community level, making mental health care more accessible and less stigmatizing. Many Central Asian countries, including Kazakhstan, Kyrgyzstan, Turkmenistan and Uzbekistan, are already involved in mental health reforms. The Kyrgyz Republic has a mental health policy and plan, as well as relevant legislation, and the country is embarking on a deinstitutionalization path, transferring patients from state "mental hospitals" to community mental health centers.

Mental disorders are one of the largest and fastest growing categories of disease burden worldwide. Mental health care in the Kyrgyz Republic continues to be predominantly based on an inpatient basis. Eight psychiatric hospitals / centers, most of which are in rather poor physical condition as their infrastructure has



not been rehabilitated or modernized for decades, provide almost exclusively all inpatient and outpatient care in the field of mental health.

There are no psychiatric wards in any of the general hospitals in the country, and there are no recognized specialists for outpatient care. Modern settings, such as outpatient departments, day hospitals, and shelters, are under development.

Promoting deinstitutionalization requires meaningful involvement of three types of participants: government officials, health professionals and local experts. Progress towards deinstitutionalization depends on partnerships formed between these actors and with various stakeholders who can provide resources and scale up pilot projects based on local conditions and community needs. Greater emphasis should be placed on the management and implementation strategies used to scale up curative and preventive services.

It is recommended that incentives and resources be provided to restructure primary health care services. Over the course of several years, this will likely involve experimenting with changed workloads, recruiting new staff to primary health care teams, strengthening the knowledge and skills of existing PHC teams, and developing collaborative and consultative relationships with mental health experts. In addition, training should be a core task and an appropriate budget.

The main challenge is to increase funding for mental health because the budgets are extremely low and it is proposed to add substantial funding for community mental health while maintaining funding levels for institution-based treatment. Funding for mental health hospitals should ideally be reviewed when structures, processes and patients are considered in detail.

### 6.2.2 Recommendations

- Strengthen treatment capacity at PHC level and make mental health a PHC component

- Make psychotropic drugs available and ensure the availability of five essential drugs in all health care settings (chlorpromazine, fluphenazine, haloperidol, amitriptyline, and diazepam)
- Include the diagnosis and treatment of common mental disorders in the curricula of all medical personnel and provide training for primary care physicians (at least 50% coverage in 5 years)
- Gradually reduce the number of psychiatric hospitals and develop partial hospitalization programs (not overnight, only during the day) focused on chronic mental illness and / or substance abuse on an outpatient basis
- Initiate pilot projects to integrate mental health care with general health care and close prison psychiatric hospitals.
- Merge the Republican Mental Health Center with the Republican Narcological Center. This recommendation requires careful study of the care models and talent profiles of both organizations but will provide significant potential for synergy in clinical areas that relate to both organizations.

## 6.3 Rehabilitation Services

### 6.3.1 Situation Analysis

Analysis of the organization and provision of rehabilitation medical services in the Kyrgyz Republic was carried out based on an integrated clinical model.

The Kyrgyz Research Institute of Balneology and Rehabilitation in the village of Tash-Dobo, located near Bishkek, supplies most of the beds (561 beds or 51.6%), while other organizations provide services in facilities having a capacity of 30 to 105 beds. 140 beds are intended for the rehabilitation of children in two organizations in Osh and Chui regions.

The total number of personnel in health facilities, with a rehabilitation profile, amounted to 1,074 people, of which the Kyrgyz Scientific Research Institute of Balneology and Rehabilitation has 515 allocate to two facilities in Tash-



Dobo and Bishkek, i.e. it accounts for almost half of the staff providing rehabilitation care. The staff is almost equally divided between medical (52.1%) and non-medical (47.9%). Nurse to Doctor ratio is 2: 1.

According to a study commissioned by the International Finance Corporation (IFC) to assess the feasibility of creating a public-private partnership (PPP) for the provision of rehabilitation services in the Kyrgyz Republic, none of the rehabilitation organizations in the republic provides comprehensive rehabilitation services.

Evidence-based protocols for rehabilitation are largely lacking in Kyrgyzstan and hospitals are limited to providing "health resort" services, focusing on the treatment of pain as part of general treatment interventions. Kyrgyzstan is also experiencing a shortage of qualified rehabilitation personnel (specialists, therapists, etc.) capable of providing modern rehabilitation services for various forms of treatment. This worsens the quality of care and patient outcomes.

The Kyrgyz Research Institute of Balneology and Rehabilitation, the main rehabilitation center in the country, is a relatively outdated structure providing a range of fairly basic rehabilitation services, some medical / surgical and non-medical services. According to the results of the researchers' work, out of 572 groups of diseases that are under the jurisdiction of the Kyrgyz Scientific Research Institute of Balneology and Rehabilitation, only 89 needed inpatient care (15.6% of the total). The remaining 22.7% did not need rehabilitation assistance, and 61.7% could be treated on an outpatient basis. Almost every fourth patient in the Kyrgyz Research Institute of Balneology and Rehabilitation receives services that he does not need, and also based on the diagnosis upon admission, almost two thirds of them could be treated on an outpatient basis.

According to this analysis, in Kyrgyzstan, about 15,000 patients will need inpatient rehabilitation services, and another 345,000 will

need outpatient rehabilitation services. To provide rehabilitation services in hospitals, 792 beds will be required, which is covered by the existing potential. On the other hand, outpatient services are currently only able to serve about 70,000 patients, which requires a significant amount of additional space to meet anticipated service needs.

### 6.3.2 Conclusions

In summary, we can conclude the following:

- There is insufficient capacity to provide rehabilitation outpatient services and unnecessary overload of patients in inpatient rehabilitation treatment.
- In addition, the existing staff is not well trained to provide evidence-based inpatient rehabilitation care, only a few types of treatment are offered, outdated treatment protocols, not always based on evidence.
- Only very basic equipment is available, very few new equipment in comparison with modern types of equipment used in modern rehabilitation centers.
- Dilapidated infrastructure requiring 11.5 million US dollars for repair and reconstruction.

### 6.3.3 Recommendations

The following recommendations have been developed:

- Develop a fully integrated model of rehabilitation services for children. The current model is based on long-term inpatient stays (up to 4 months a year), with alternating periods when little or no services are provided on an outpatient basis or at home. These organizations should be transformed into departments of neighboring territorial or regional hospitals on the model of the rehabilitation department of the Ak-Suu village of the Issyk-Kul merged regional hospital.
- In cooperation with the Kyrgyz State Medical Institute for Retraining and Advanced Training (KSMIR & PK), revise curricula, theoretical and practical training of reha-

bilitation specialists as part of their retraining and continuous professional development. Introduce a retraining and training program for modern rehabilitation programs.

- The future role of the Kyrgyz Research Institute of Balneology and Rehabilitation will be based on a feasibility study for PPP. If PPP mechanisms are selected, they should take into account not only the Kyrgyz Scientific Research Institute of Balneology and Rehabilitation, but also all those supposed 792 beds that are necessary for the provision of inpatient rehabilitation services in the country. The PPP partner should help the MoH to develop an integrated rehabilitation service delivery model that takes into account the continuity of services in hospitals, day and / or outpatient care units associated with inpatient organizations, and community-based, outpatient home rehabilitation services. If a PPP approach is not chosen, it is recommended that an international consultant be hired to advise on the new treatment model, protocols and guidelines, infrastructure transformation, staff development and related measures.

## 6.4 Emergency Medical Services

### 6.4.1 Situation Analysis

#### Overview

Emergency Medical Services (EMS) vary widely from country to country due to differences in the organization of their respective health systems, in funding mechanisms and funds available, and in geographic accessibility of both, homes and hospitals. The analysis of the situation in the Kyrgyz Republic has shown the following:

- EMS services in Kyrgyzstan lack a systemic approach and a central coordinating mechanism and that affects the organization and provision (quality) of care.
- The lack of resources (financial, qualified employees, functional and modern equip-

ment) reduces the effectiveness of EMS and does not allow for complete and comprehensive coverage.

- The lack of emergency departments in GPCs, territorial, and regional hospitals, and the lack of specialized EMS, such as emergency interventions for cardiovascular diseases, represent a significant gap in the response to emergencies.
- The principle of primary care level home visits provided by ambulance teams has not been replaced by a model in which the goal is to select cases that require urgent intervention and transportation to a hospital for emergency care.

The lack of a central organization coordinating EMS delivery at the national level has resulted in the fragmentation of the EMS service leading to a lack of coordination between control room “103”, ambulance teams, general (acute) hospital care and trauma centers. In addition, there is no regulatory framework, insufficient funding, outdated EMS vehicles and equipment, and no CME program for all EMS personnel.

Duplication of data collection and analysis by the MHIF and the E-Health Center leads to differences and discrepancies in the analysis and assessment of EMS effectiveness. There is uncertainty in the concepts and names of emergency services, e.g. prehospital and hospital-based emergency interventions have the same name: emergency medical care.

#### Staffing

Following the current legislation, to ensure 24/7 coverage, each ambulance car must be serviced by four teams; however, 60 (39%) teams do not work around the clock due to insufficient number of staff, specifically in remote areas with low population density.

Currently, a total of 2,760.5 FTEs are involved in emergency medical care at the national level. Almost half of them (>46%) are feldshers. They are used both as dispatchers and caregivers. Currently, there is one medical staff (feldsher) in the feldsher Ambulance teams. The

current situation requires a feldsher ambulance team to include at least two feldshers (or 1 feldsher and 1 nurse), a general medical team must include 1 doctor and 1 paramedical worker, and in specialized teams the number of paramedics is increased to two. Doctors represent less than 10% of the total workforce. Specialized medical teams can be found in Bishkek and Osh only.

### Location

At district level, ambulance teams are deployed at ambulance points accommodated in FMCs or in separate locations as required to ensure geographic coverage.

### Financing

The operating costs of prehospital EMS are covered by various sources: MHIF, local government contributions and others. The MHIF uses a cost-based financing scheme that consists of a fixed annual amount paid for each team. Currently, for 1 ambulance team, regardless of its type and the number of specialists working in this brigade, 569,300 KGS are provided for one 24/7 service point, in total 357,500,000 KGS for 682 (out of 745) teams. This amount, however, is insufficient to cover all the costs related to the EMS.

Theoretically, local governments can supplement this budget, subject to the availability of funds and approval to be provided by the local government councils. Currently, only the municipality of Bishkek allocates funds for EMS purposes. In 2018, subsidies from the Bishkek City Council accounted for 13% of the operational budget of the Bishkek City Center EMS.

### Coverage

The ratio of population per ambulance brigade varies from 12,500 people in Talas to 32,700 in the Osh region. The national average is 21,807 people per vehicle and team. However, some ambulance cars are broken, and some cannot work due to insufficient number of crew members. Consequently, the existing brigades can only operate 186 cars (745/4), which results in one (operational) ambulance car for 34,608

people, close to the officially recommended ratio of 36,000 / vehicle and team.

### Communication, Dispatch, and Referral

Each FMC / GPC is responsible for the operation of a dispatch center managing incoming emergency calls from their respective district through the toll-free phone numbers 103 and 112. Each ambulance point has its own number, and the dispatch center can communicate with them only individually. It happens frequently, that EMS teams arriving at the scene often do not know what to expect in terms of e.g. the number of injured persons and their condition. They also do not know to which hospitals patients shall be referred to. This situation results in delays that jeopardize timely assistance.

In view of the above, people often use their own vehicles to get to the ambulance point or hospital, bypassing the District Command and Control Service. This leads to a high number of outpatient visits (at the ambulance point) and a low level of team visits (at the site). In Batken oblast, 50% of all contacts was with patients visiting the ambulance points for consultation (outpatient visits); in Jalal-Abad it was 35%, and only in Bishkek, the share of outpatient visits was <10%. Furthermore, there is insufficient counseling of patients contacting the EMS by phone; of all 63,176 registered EMS telephone consultations in 2018, 89% (56,038) were conducted in Bishkek.

The low share of hospitalizations (only 12.8% of all cases attended by EMS teams) indicates low quality of the triage of incoming calls. In Bishkek, the share of hospitalizations is 35.8%, in Chui and Osh it ranges from 15 to 16%, in other regions the rate is less than 10%. Further, there is a high rate of people who self-refer to hospitals – not only for emergency care.

In Talas, from all emergencies treated in hospitals, only every fifth patient was brought in by an ambulance car. Across the country, on average, only one third of all emergency cases were brought in by ambulance teams, while international benchmarks suggest a 70% share.

Following the example of the Bishkek, EMS command and control centers (CCC) equipped with modern communication technology and competent staff should be established at least at regional level to improve the management of emergency calls and assure adequate medical response.

### Emergency Departments at Hospitals

One of the most important problems of the EMS system is the lack of emergency departments (ED) in hospitals and GPCs. Only a few hospitals have such units (e.g. Merged Zhayil Regional Hospital, Merged Issyk-Kul Regional Hospital, and territorial hospitals in all districts of the Osh oblast and Osh city). EDs should be available in all general (territorial and regional) hospitals to ensure adequate diagnosis and treatment of emergency cases in all key disciplines, allowing for interdisciplinary assessment of a new patients (who may be admitted in a coma), immediate treatment of life-threatening injuries or diseases, and the preparation of patients for further treatment or transportation.

In Bishkek and Osh, the situation is different, as in both cities there are networks of specialized institutions that can provide specialized emergency care. The decision to send a patient to a hospital is made by the ambulance team and in Bishkek there are more than 20 hospitals where patients can be admitted depending on the disease / pathology of a particular case.

### Education and Training

EMS training is critical to delivering high quality care. EMS physicians are trained in the Emergency Medicine Residency and Continuing Professional Development (CPD) program. Similar programs are also offered for paramedics, nurses, and EMS drivers.

The Kyrgyz State Medical Institute for Retraining and Advanced Studies (KSMIRAS) conducts training and CPD programs for all categories of emergency medical personnel. The two-week courses also include simulation and hands-on training. KSMIRAS has a sepa-

rate emergency medical training center that is well equipped with mannequins, consumables, defibrillators, monitors, ECG, laryngoscopes, etc.

In addition to the KSMIRAS, the Bishkek EMS Center also conducts its own training programs. It mainly serves the needs of the Center as an educational institution for medical students, as well as the CPD program of its staff. The center offers a multi-tiered Emergency Medicine program for physicians, medical students, nurses, and non-medical personnel.

### Emergency Medical Information Systems

Emergency Medical Information Systems (EMIS) are essential to the efficient and effective organization of EMS. The Bishkek EMS Center, in cooperation with a local software developer, is piloting an integrated EMIS with financial support from the Bishkek Mayor's Office. The EMIS can be further improved by integrating an interface, that will allow data to be transmitted to information systems of the receiving hospitals, and of various communication tools used by the center, such as walkie-talkies, tablet PCs and mobile phones. The Bishkek EMIS is a modern solution that should be extended to other regions of the Kyrgyz Republic to improve coordination and documentation of EMS calls and responses.

## 6.4.2 Recommendations

### Organizational structure

The EMS system shall be based on an integrated model that broadly includes:

- management and organization (management and administration, and institutions involved in the provision of assistance)
- communication, prehospital care, and transport (call receiving system, triage and first response, referral)
- assistance in medical institutions (hospital care in ED, trauma, and other specialized centers - OMNK, AMI, etc.)

- personnel required to provide EMS (doctors, nurses, paramedics and other medical personnel, drivers, and administrators)
- information and support systems (data and information management, monitoring and evaluation of quality and efficiency of EMS delivery)
- financing (financial requirements, budget approach or fees for services)
- an informed and trained population (public campaigns on emergency medical care and first aid measures, identification, and training of “first responders”)

All the above should be considered when reforming the EMS system to improve its clinical performance (timely and appropriate response) and economic efficiency.

There are 52 general hospitals in the Kyrgyz Republic (including republican, regional, and territorial hospitals). To ensure satisfactory EMS coverage, it is recommended to establish and equip interdisciplinary EDs in each of these hospitals (if they do not already exist).

Of course, regional differences in access to emergency medical care at the referral level cannot be completely avoided, but the existing gap between the level of EMS care provided in urban centers of Bishkek and Osh, and in the rest of the country, can be reduced.

### Ambulance cars

At the time of the assessment (December 2019), there were 315 ambulance cars in service, but only 119 of them were less than 10 years old. Considering the recommended number of 24/7 posts (229), a fleet of 228 vehicles is required, which implies the replacement of 120 vehicles, of which 14 are intended for specialized teams.

Considering a price of US \$ 50,000 for an ambulance for general service teams and US \$ 90,000 for ambulance vehicles for specialized teams, the total investment required to create a suitable fleet would be US \$ 6.31 million.

- [110 cars] \* [\$ 50,000] = \$ 5,500,000
- [9 cars] \* [\$ 90,000] = \$ 810,000

In addition, it is necessary to provide backup vehicles (one per district = 38 for the entire country), as well as vehicles for remote settlements (47). About 2 ambulance cars per annum will have to be procured to maintain coverage and keep the fleet operational.

### Staffing

Redeployment of staff can help achieving the coverage goal without increasing costs: two paramedics (paramedics and / or skilled nurses) can operate one ambulance. Drivers can be trained to provide emergency medical care and become orderlies. EMS should focus on real emergencies and avoid primary level care provided at home. Medical doctors would join the team on a needs basis only (rendezvous system) where the Ambulance team, once on site, would call the doctor in case they cannot handle the situation on their own.

### Coordination and Control Center

The creation of the EMS Management and Control Center (MCC) in Bishkek was part of a larger project; similar projects are being developed for Osh and Karakol. The costs of the MCC component should be used as a guideline for calculating investment requirements in other regions. Establishing a national focal point with regional offices can be a long-term goal.

### Financing

The problem with cost-based funding is that it does not provide any incentive to improve efficiency and effectiveness of the EMS. We therefore propose to discuss and evaluate the feasibility of alternative models. Approximate calculations showed that for the operation of mobile teams the following is necessary:

- For feldsher 24/7 post: 4,308,320 KGS p.a.
- For GP 24/7 post: 4 386 080 KGS p.a.
- For specialized 24/7 post: 5,206,420 KGS p.a.
- For the call center for a population of 150,000 people - 528 640 KGS p.a.



Alternative models could be based on the following principles:

To guarantee countrywide availability of and access to EMS, a basic (annual) fee shall be paid by MHIF considering the number of people served ( $\approx 1$  USD per capita) plus a bonus of 10-20% based on the achievement of KPIs such as low response time, reduced number of unnecessary home visits, mortality during the first two hours after an emergency call, etc.

To guarantee availability of resources for quality emergency care, a fee shall be paid for the actual service provided to the patient according to the following scheme:

- 50 KGS for a simple telephone consultation (trained feldsher / nurse)
- 150 KGS for extended telephone consultation (with a doctor) - this can also be a fee for an outpatient consultation at the Ambulance point
- 500 KGS for home visit (no emergency)
- 1500 KGW for transportation of the patient to the hospital (emergency)

Funding will become results-based, that is, EMS will issue invoices to the MHIF based on the above service categories, which will gradually guide service delivery through pricing, cost recovery policies, and resource allocation. It should be noted that private ambulance cars offer their services in the latter category at a reasonable price, so it can be assumed that cost recovery can be achieved with this system.

Service based fees can be supplemented by performance-based bonuses to steer service delivery and prevent e.g. unnecessary hospitalization. Another mitigating factor could be related to distance: lower fees will be paid for transportation in Bishkek and higher fees for transportation in rural areas, where (longer distances, bumpy roads, etc.). EMS monitoring and electronic maps can help determine distances in a standard way and avoid manipulation.

The idea is to create a funding scheme that would make the EMS system more effective and efficient (faster response times, reduced mortality, low rates of unnecessary home visits and hospitalization). However, both proposed approaches require the reorganization of EMS as an independent (public / para-governmental or private) organization that will manage its budget and provide services based on a contractual (tripartite) agreement with the MoH and the respective municipality.

It should be noted that the organizational independence of the facility providing EMS does not contradict their integration into ISDN at the district and regional levels to ensure smooth coordination and effective cooperation in emergency management.

## 7 HEALTH CARE FINANCING



## 7 HEALTH CARE FINANCING

### 7.1 The current Situation

The health care system in Kyrgyzstan is funded from public, private, and external sources. State funding comes from the republican and local budgets, and from payroll deductions for the Mandatory Health Insurance Fund (MHIF). External financing is provided through the Sector-Wide Approach (SWAp) by bilateral and multilateral development partners (WB, KfW, Swiss Development Cooperation, etc.) or through individual projects based on bilateral agreements.

The State Guaranteed Benefit Package (SGBP) defines services free of charge and identifies the beneficiaries of such services. It therefore contains a list of 72 categories of people eligible for various forms of benefits, including pregnant women and children under five years of age, but government obligations are not always covered by adequate financial resources.

Emergency medical services (EMS) are provided to all citizens free of charge, including the provision of medicines and medical devices, but cash payments are required for expensive services such as computed tomography (CT) scans and Magnetic Resonance Imaging (MRI), surgery, etc. The second largest share of out-of-pocket payments is for diagnostic services. Significant differences (200-500%) are observed between the prices approved by the MHIF and the prices billed by private providers. Involving private providers in the procurement of diagnostic services requires governments to exercise regulatory responsibility and control both standards and prices. Once appropriate contracting mechanisms are in place, price lists need to be revised to ensure fair pricing for the public.

The unequal distribution of the financial burden of health care can be demonstrated using a

socioeconomic gradient showing that 31% of the per capita household budget is spent on out-of-pocket (OOP) payments for health related goods and services, and approximately 40% of OOP spending is on medicines. Despite the fact, that the VAT on medicines was reduced, there was no reduction in the price of medicines.

The amount of funds the Government allocates to the health sector depends largely on the economic situation. In 2017, government spending on health in Kyrgyzstan was 3.1% of GDP or US \$ 25 per capita (should be at least 5% according to WHO requirements).

Co-payments were introduced for patients covered by the MHIF to reduce unofficial payments to medical personnel, especially for surgical interventions and to limit patient requests for unnecessary services to be covered by the insurance fund, and to promote the provision of rational, evidence-based medicine.

However, all formal and official sources of funding, even if taken together, will not be sufficient to fully cover the costs of medical care; therefore, OOP payments, including informal payments remain significant.

The formal introduction of Results Based Financing (RBF) for inpatient care and the transition from line-item budgets to one global budget allocated to health care organizations, as well as some autonomy provided for the management of financial resources, may allow health care organizations to gradually improve the conditions for health care service delivery (in terms of human resources, infrastructure, and equipment).

Most hospitals, however, continue receiving a budget based on actual costs and case-based lump-sums paid for DRG related services only. More than 60% of the money allocated to health care is being spent on hospitals, and of



this amount more than 70% goes to salaries. Given that inpatient services represent the most expensive form of medical care, this allocation of funds is inefficient. And, as before, expenditures on capital investments account for a low share in the structure of general government expenditures on health care.

The list and coefficients for the available types of DRGs have been developed but are used only to monitor the performance of healthcare providers. Currently, the MHIF manages the state budget, but does not play a role as strategic purchaser of health care services trying to improve efficiency in service delivery. Mechanisms for strengthening strategic procurement of health care services from both public and private providers are at an early stage of development and require further improvement.

Financial planning and allocation mechanisms are not needs / results oriented and are based on previous budgets, which used to finance the existing network of health care facilities. Revenues from co-payments and other cash money are included in the hospital's budget. Accordingly, generating additional income becomes complicated, since any deviation from the amounts established in the budget plan require documentation, reapproval of the budget, etc.

Although the salaries of health workers increased significantly in 2010/11, the current pay system does not provide financial incentives attractive enough to retain health workers, especially in rural areas.

Salaries account for more than 70% of the health care budget, but remain low, because salary increases are absorbed by rising inflation. Salaries for health care staff are only at the level of 78% of the national average, and for young doctors and nurses this is much lower. At PHC level, salaries do not take into account the workload: serving a population of 1,000 or 1,500 people does not have any impact on salary. This is one of the root causes for informal payments.

WHO defines health financing as one of six “building blocks” of any health system, to-

gether with governance, health workforce, medical technology, data and information management, and service delivery. There are goals to improve resource allocation efficiency (“make the right decisions”) and technical efficiency (“take the right steps”).

Thus, the proposed changes to the financing system should be included in a broader reform concept that encompasses all aspects of health service delivery: accessibility, adoptability, and quality. Infrastructure and technology can and should play an important role in improving health care, but they must be firmly integrated into sound health financing and governance.

Some of the following problems are common to almost all countries, while others are specific only to Kyrgyzstan:

- A stable budget structure and tight budget lines and rules limit the ability to reallocate resources. The essence of resource allocation efficiency is the ability to quickly move resources to where they will have the greatest impact.
- There is still a culture of “submission and control” rather than “management for results”, although the situation is slowly changing in Kyrgyzstan. Centralized management of the health care system limits the autonomy and flexibility to respond to problems that arise at the level of the oblast, district, facility, or service. Providing more autonomy while ensuring accountability for results is an important reform strategy. This will require training and continuous capacity building.
- Unreasonable payments, i.e. doctors receive additional payments for patients. UNICEF and the MHIF have experimented with a different payment system in five hospitals and have been able to significantly reduce the ALOS, especially for children (short-stay units).
- Despite an acceptable ratio of doctors / 1,000 population, the geographical distribution of health workers is not well-balanced. A significant number of gradu-

ates do not complete their two-year commitments to work in rural areas, and medical students receiving government scholarships go to work abroad, representing a significant drain on government resources.

- Abuse of office, nosocomial infections and a lack of specific patient management approaches undermine effectiveness and efficiency of health services. Many patients are being admitted to the hospital unnecessarily, while others who have been seriously affected by cases such as acute myocardial infarction or stroke do not receive the care they need.
- IT spent little effort for collecting and tracking resource use across different interventions. Therefore, it is difficult to link cost-benefit in a causal chain in relation to annual budgets or medium-term expenditure frameworks.
- The healthcare facility administration spends a lot of time on procurement: one reason for inefficiency for both suppliers of goods and the MOH.
- The cost-effectiveness of the global budget approach is controversial because it has not always been used for the most cost-effective interventions in primary health care; this is not optimal for those who most needed financial support.

## 7.2 Health Care Financing Reform – A Strategic Approach

### 7.2.1 Analyze and Expand Existing Funding Sources

The health financing system must ensure the availability of funds using cost recovery schemes for providers that will improve both access and quality of health services. An independent body such as the MHIF should manage and manage all available health care finances to cover the operating costs of public health services independently of the government / Ministry of Health, which also needs to be further strengthened.

Contributions from formally insured employees do not support the provision of services to the rest of the population, which is the largest informal sector in the country. Contributions must be received from ALL adult workers not covered by the MHI to be eligible for benefits later. Waivers can only be introduced for the poor. In 2018, the population of Kyrgyzstan was about 6.3 million people, 62% of whom are of working age. At the same time, only about 500,000 people make deductions for MHI and the amount is 2.4 billion soms, and the potential number of people to pay for MHI is 2.4 million people. With an average contribution rate of 50%, additional income can reach up to KGS 6 billion.

### Percentage of VAT

It is proposed to use two percentage points of VAT for health insurance purposes. This will be a targeted tax intended to finance the health care system.

### Tax on luxury goods

Currently, about 1.5 million cars are registered in Kyrgyzstan, with an annual tax on these cars in the amount of 1000 soms, this will result in 1.5 billion soms per year. Given the significant number of injuries and injuries due to road traffic accidents and air pollution, such a health tax is justified. In addition, Kyrgyzstan has 7.2 million mobile subscribers (many people have two numbers); taxation on the use of a SIM card worth 50 soms per year will add 360 million soms per year.

### Tabaco tax

As there is widespread public agreement on the need for urgent and decisive action on tobacco control, the excise tax should be raised to at least 7.5% of the retail price, as recommended by WHO. Since the average cost of a pack of cigarettes is currently about 75 soms, 5 soms can be added. With an average consumption of about 25 packages per person per year, this will lead to additional excise revenue of 780 million soms per year.

## Alcohol Tax

Current income from excise taxes on alcohol is about KGS 1.1 billion per year; if an additional 10% is charged on health care, this will lead to additional revenues of about KGS 100 million (including the desired reduction in consumption).

## Sugar Tax

In the UK the sugar tax has resulted in revenues of around £ 240 million a year. Given the national GDP and population of Kyrgyzstan, such a tax could amount to 170 million soms per year for health care.

## Taxes on Flight Tickets

It is proposed to charge 500 soms for each international take-off / landing. Approximately 1 million passengers per year will result in total revenue of KGS 500 million per year.

### 7.2.2 Improve cost-recovery mechanisms for care providers

An adequate system of reimbursement of costs to Service Providers is a key factor for the financing system to improve efficiency in service delivery. The proposed reimbursement scheme distinguishes between primary care, which will be covered by capitation (per person living in the PHC service area and assigned by the institution) and secondary care, which offers a simplified DRG system.

For an autonomous and quality / performance-oriented budgeting of service providers, it is proposed to replace line-item payments with payments by the DRG system for inpatient care, with the inclusion of day care services.

A healthcare financing scheme based on a simplified DRG system (operating costs only) will help control hospital costs and make hospitals themselves accountable for the quality of their services. This combined “DRG + per capita” funding model should be analyzed and further developed, as necessary. To effectively implement such a model, a comprehensive cost analysis should be carried out as a basis for establishing adequate prices and types of med-

ical services, they should be defined and standardized using guidelines and clinical protocols. Epidemiological data in Kyrgyzstan indicate a shift towards cardiovascular disease and other chronic diseases. It is well known that out of 80 percent of health care costs, only 20% falls on all patients, and most of them suffer from chronic diseases.

Quality management (QM) and hospital certification should be made mandatory. QM is based on a patient-centered approach and is a new area for most healthcare workers in Kyrgyzstan; therefore, a phased approach is needed - internal comparative analysis of patient admission, case management and interdisciplinary departments (emergency, intensive care, diagnostics, etc.). A standard self-assessment using ISO 9001: 2000 guidelines can provide hospitals with a cost-effective way to determine their need for improvement.

The cost of services should be calculated from the “bottom – up” and based on clinical protocols, actual prices of goods and drugs, actual capital costs and depreciation charges. This also requires a clear definition of the package of services covered by the SGBP.

### 7.2.3 Promoting an integrated health care delivery model

There are several international examples where the structure was established by the body responsible for the development of the health infrastructure. There are examples of the establishment of a Health Infrastructure Development Fund (HIDF) to effectively manage investment needs.

The *Punjab Health Infrastructure Development Authority* is an autonomous body, created to plan, design, build, and maintain public infrastructure in the province. It is a specialized organization that is exempt from the taxation established for public sector entities. Its goal is to develop and implement large infrastructure projects for the healthcare system and monitor them so that they are carried out efficiently and transparently, without compromising on quality, delay, etc.

The Government of the Bihar State of India established the *Bihar Healthcare and Infrastructure Corporation* under the auspices of the MOH to improve the availability of quality medicines procured at competitive prices, the provision of health services, and the construction and maintenance of health facilities.

The Province of Victoria Australia has established the Regional Health Infrastructure Development Fund, which has been providing grants since 2016 to expand infrastructure capacity and improve the safety, quality, and efficiency of care.

These international examples show that there is experience in creating a specialized, state-owned, but independent body to effectively manage the procurement of works, goods and services for larger projects and programs for the development of healthcare organizations. In Kyrgyzstan, such a fund could help pool funds from different sources, including various bilateral and multilateral development partnerships, and align these contributions in a coherent manner and in line with national priorities.

At a later stage, it may be interesting and appropriate to explore the possibility of public-private partnerships (PPPs) as a financing mechanism for projects that require significant initial investment, such as: diagnostic centers, laboratories, sterilization units, centers for hemodialysis, rehabilitation, etc.

### **7.2.4 Establish a Health Policy Council**

Given the political complexity of the envisaged reform process, it is proposed to establish a Health Policy Council composed of representatives from the MoH, the MHIF, Healthcare Providers and other stakeholders such as the Ministry of Finance. The council may be chaired by the MOH but must remain independent to create a healthy platform and dialogue forum to discuss key health care delivery and health system reforms. The council could play a critical role in defining the benefit package, accrediting healthcare providers, quality management systems and tools to be

implemented, health technology assessments and continuing medical education.

## **7.3 Implementation of the Health Care Financing Reform**

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The healthcare financing reform can be implemented in three stages:

### **7.3.1 Introduce Performance-based Financing of Inpatient Services**

The effectively move to DRGs as basis for financing of inpatient care will create a significant organizational challenge for both hospitals and the MHIF. Considering the specific situation in some hospitals, the transition period should be facilitated by providing a guarantee to the hospital that they will be receiving the same amount as before. For this purpose, DRG rates will not be calculated based on standard costs for predefined service packages (following guidelines and clinical pathways) but based on the actual costs of participating hospitals. As a result, hospitals will receive different rates for the same DRG. This phase should then be used to collect sufficient data to further develop a standard DRG system in preparation for its use in all hospitals for results-based care including quality parameters.

### **7.3.2 Manage the Convergence Phase**

Over the course of three to five years of policy reforms, hospital base rates will be adjusted in stages to establish uniform averages and ratios for all hospitals. As a result of the gradual adjustment of DRG rates, hospitals with higher average spending could face significant economic hardship and the pressure of rationalization to reduce their costs.

### **7.3.3 Promote Widespread Use of Performance Based Funding**

All hospitals must henceforth receive mixed DRGs (with appropriate ratios), reimbursement for emergency expenses (e.g. burns, sepsis, coma patients) and for special services such as organ transplant, etc. Ideally, a specialized (independent) institute should provide regular

(annual) updates of the cost analysis and adjustments of the applied rates.

#### **7.3.4 Shift to Disease Focus**

The above described bundling of services into DRGs and the introduction of performance parameters are measures focusing on the service provider perspective with the aim to mobilize efficiency gains through rationalization.

The next step towards a more results oriented system not only at output level (number and quality of services provided) but also at impact level (improved health status of the population) is to shift to a patient perspective – and to start with disease specific patient management programs (DMPs). I.e. the service provider is no longer being paid for a specific service (package) but receives an annual lumpsum to take care of e.g. all patients suffering from Diabetes mellitus, or from hypertension and chronic heart disease, or from asthma and chronic obstructive pulmonary disease. The idea is to keep the patient out of the hospital by avoiding any aggravation / exacerbation of the disease. The economic incentive of the DMP promotes the preventive approach – and helps the MOH / MHIF to control expenditures for this group of patients – mutual benefit.

#### **7.3.5 Shift to Population Perspective**

The final step – being a strategic perspective – is to provide a budget to health care service providers covering all (primary, secondary, and tertiary) care levels to maintain the health

of the population living in the catchment area of the provider organization and/or registered with the same. Several models of such an Accountable Care Organization (ACO) are currently being experimented in Europe and the United States. Kyrgyzstan should try to follow these developments and analyze and evaluate opportunities to gradually move towards such a patient centered and value-based model of health care financing.

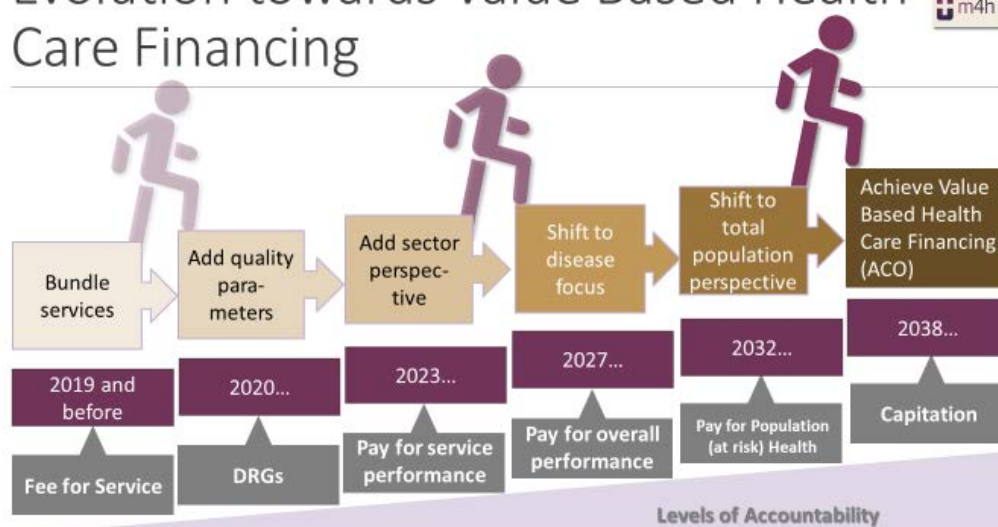
#### **7.3.6 Conclusion**

Key to the reform of the health care financing system are dedicated working groups with clear responsibilities. Outcome monitoring should be based on broader and more comprehensive assessments, including patient and population surveys both in households and hospitals.

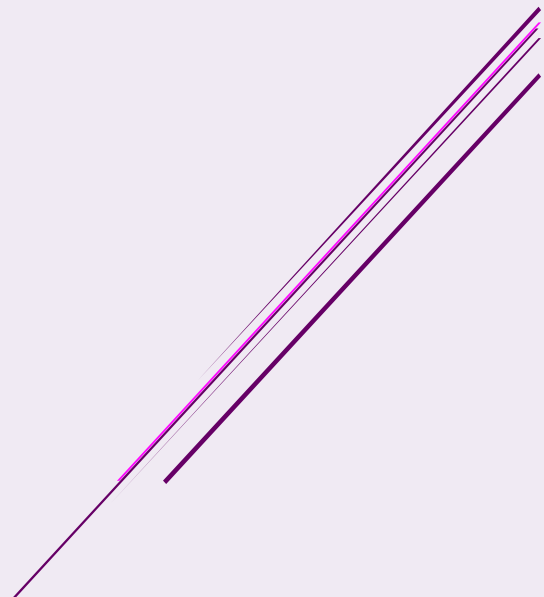
The above suggestions and recommendations are intended to serve as a basis for further discussion between the MOH/MHIF and other stakeholders (MOF, DPs). It is important that these government bodies develop consensus on the reform strategy to be followed. The proposed strategy and implementation plan for the reform of the financing system is a “live document” in the sense that it requires continuous review, refinement, and adaptation to an ever-changing environment. The Master Plan only provides a guideline to the people who lead and manage the organizations involved, and at one point they must take responsibility and must have the courage to move ahead.



## Evolution towards Value Based Health Care Financing



## **8 OPTIMIZATION SCENARIOS AND ROAD MAP FOR IMPLEMENTATION**



## 8 OPTIMIZATION SCENARIOS

### 8.1 Optimization of Health Care Delivery

Starting points for a strategic approach to optimized health care delivery in the Kyrgyz Republic are the following:

#### 8.1.1 Rationalize the Organizational Structure of Health Care Services

Currently, many health care organizations duplicate tasks and responsibilities in service provision: FAP, FMC, GPC, territorial, city, regional, republican hospitals, as well as specialized hospitals at the district, inter-district, and national levels. This leads to unnecessary fragmentation of the health care system and inefficiency in service delivery.

Furthermore, many of the existing facilities are in poor condition (infrastructure, equipment, and human resources) and often they are not used by the population and have extremely low

performance indicators. For the rational use of the limited financial, human and material resources available for the health care system of the republic, an organizational restructuring of the provision of services is required (flexible use of existing premises, albeit small, but well equipped) and an increase in the efficiency of medical care, without wasting resources on non-functional services. Table 23 below shows the basic structure of a rational organization of referral levels and services offered at those levels. This approach should be supported by financial incentives promoting integrated models of care, coordination, and cooperation rather than isolation and competition.

#### 8.1.2 Improve Access to Quality Care

Systematic application of internationally recognized guidelines for diagnostic and therapeutic procedures adapted to the local context,

Table 23: Referral Levels and Referral Structure of Public (General) Hospitals

Level	Beds	Departments	Procedures	OTs	Support
GPC	10-30	<ul style="list-style-type: none"> <li>- ED</li> <li>- Therapy</li> <li>- Pediatric</li> <li>- Delivery</li> </ul>	<ul style="list-style-type: none"> <li>- Basic Lab (hematology, biochemistry)</li> <li>- X-ray, Ultrasound, ECG</li> <li>- Ambulance car</li> </ul>	нет	<ul style="list-style-type: none"> <li>- Laundry, Kitchen</li> <li>- Pharmacy, Sterilization</li> <li>- Morgue, Garage</li> <li>- CSSD, Waste management</li> </ul>
Territorial (TH/GPC)	50 - 150	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Surgery</li> <li>- Gynecology</li> <li>- Obstetrics</li> <li>- Infectious</li> <li>- ICU / NICU</li> </ul>	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Extended Lab (Bacteriology)</li> <li>- Gastroduodenoscopy</li> <li>- Kolposcopy</li> <li>- Monitoring / Resuscitation</li> </ul>	2	
Inter-district	150 - 250	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Cardiology</li> <li>- Neurology</li> <li>- Gynecology</li> <li>- Traumatology</li> <li>- Ophthalmology</li> <li>- ENT</li> <li>- Hemodialysis</li> </ul>	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Colonoscopy, cystoscopy</li> <li>- Bronchoscopy, Spirometry</li> <li>- CT Scan</li> <li>- Ultrasound (Doppler Function)</li> <li>- Extended Lab (Immunology, ELISA)</li> <li>- EEG</li> </ul>	3 - 4	
Regional	250 - 500	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Nephrology / Urology</li> <li>- Oncology</li> </ul>	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- MRI</li> <li>- Extended Lab (PCR)</li> <li>- Histology</li> </ul>	5 - 6	<ul style="list-style-type: none"> <li>- Sanitary aviation</li> </ul>
Inter-regional	500-1500	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Cardiac surgery</li> <li>- Angio-, microsurgery</li> <li>- Neurosurgery</li> <li>- Transplantation</li> <li>- Maxillofacial Surgery</li> </ul>	<b>*Above plus</b> <ul style="list-style-type: none"> <li>- Angiography</li> <li>- Genetic research</li> </ul>	Individual approach	



will help improving availability of and access to quality health care. Continuing medical education and continuing professional development of all human resources working in the health sector, supported by a needs and skills-based recruitment. Improving infrastructure and equipment to meet minimum requirements for quality clinical care. Allocation of the necessary financial resources to maintain an adequate level of care achieved through the above measures.

### **8.1.3 Ensure Responsiveness of the Health Care System**

It will be important to strengthen the ability of the health care system to satisfactorily address the challenges of the ongoing demographic transition (an increase in the elderly population) and the epidemiological shift towards chronic, noncommunicable diseases, while being vigilant and prepared to cope with an acute epidemic such as COVID-19 which will occur from time to time, threatening the health of the population of Kyrgyzstan.

Strengthening the health system requires a clear vision, policy and implementation strategy, and political leadership to engage all stakeholders. Consensus-building mechanisms (such as the proposed Health Policy Council) will help creating a body with responsibility for taking the necessary reform measures (now and in the future) and will encourage active participation of individuals and organizations in the implementation and maintenance of modern, patient-centered care delivered to a high level of efficiency and effectiveness and will be fit for the future.

### **8.1.4 Integrate Vertical Programs in the Health Care Delivery System**

In accordance with the Integration Concept, psychiatric and rehabilitation centers of national importance will be classified as republican or interregional health organizations. Tuberculosis hospitals of national and interregional importance will also receive this status, while other TB facilities will be included in the future ISDN. The organizational structure of

the ambulance service (EMS) will be merged with regional and territorial hospitals (except for the cities of Bishkek and Osh). FMCs will be merged with regional and territorial hospitals to create district and inter-district ISDN.

ISDN, which will be created through the merger of FMCs with regional hospitals, will retain the regional status and serve as a structure for referrals (from district to region).

## **8.2 Measures to Optimize Health Care Delivery**

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Considering the results of the Master Planning Exercise, a total amount of up to US \$ 700 million USD will be required for the period 2020-2035 (700 million / 15 years / average 6.5 Million population  $\approx$  7 USD per capita per year) to provide for adequate and appropriate development of Kyrgyzstan's healthcare infrastructure, the procurement of modern, state of the art medical equipment, and the development of qualified human resources in order to guarantee access to quality care to all citizens of the country. Obviously, prioritization is necessary and based on the proposed priorities, the following approach is recommended:

### **8.2.1 Short-term measures (2020-23)**

The development of the infrastructure of regional and city health facilities should become a priority, along with the integration of EMS, as well as anti-tuberculosis and psychiatric institutions. As a top priority, procurement of medical equipment for regional hospitals (to enhance referral level care) and for territorial hospitals teaming up with FMCs to develop ISDN should be procured to ensure access and operation of all essential diagnostic and therapeutic services that are part of the SGBP.

During the period 2020-2023, optimization measures should consist of:

**Regulation of the number of beds** in regional and district level facilities to achieve a BOR of 80 o 90%. Adjustments to the number of beds should be based on current and expected utilization rates, using a benchmark for bed per-

formance, taking into account factors such as demographic transition (to an older population) and epidemiological shift with increasing prevalence of chronic NCDs, rational use of hospital capacity (increased use of daycare and outpatient activities).

The **ALOS** should be reduced by 10% and the number of daycare cases increased by 15%.

This will result in a 25% reduction in the number of beds. In the short term, the number of acute care beds in regional and territorial hospitals can be reduced by almost three thousand. Of this number, 1,690 units (57.1%) are considered insignificant, as they are related to GPCs in areas that already have a territorial hospital and the number of adjusted beds is below 50, as for branches and departments of hospitals or GPCs with an assigned number of beds less than 50 units. Organizations placing unnecessary beds are generally unable to offer an adequate quality of service due to the low number of cases, the inability to attract qualified personnel and the lack of medical equipment. Any investment in facilities that house unused beds would be unwarranted and is therefore not recommended.

Thus, short-term optimization measures aiming at reorganization of services will focus on the gradual transformation of inpatient organizations offering emergency care to outpatient centers (FAP, FGP, FMC) with or without a basic package of 24-hour emergency services (in cooperation with EMS). The recommendation to transform the branches of territorial hospitals into emergency medical centers, with the organization of emergency departments that provide round-the-clock service with a limited number of maternity and children's beds, seems to be the most appropriate.

It is also necessary to convert a GPC with fewer than 50 beds into an FMC / FGP with an ambulance station and non-complex beds. This general level recommendation should be carefully considered on a case-by-case basis. GPCs with fewer than 50 beds provide services at unreasonably high costs, low resource utilization,

and generally low efficiency. Therefore, it is recommended to analyze on a case-by-case basis which route is the best for each GPC (FMCs, FGPs or ambulances with emergency beds). This measure will lead to the elimination of facilities and services with extremely inefficient use of infrastructure, equipment, and human resources.

### 8.2.2 Medium-term measures (2024-27)

The aim of the medium-term measures will be to improve the quality of care, for example, to improve the sanitary conditions in the hospital, simply by having a standard (minimum) space per bed throughout the country.

Currently, the total area per bed is 46.2 m<sup>2</sup>, which is far from the recommended standards of 70 m<sup>2</sup> per bed in regional healthcare facilities, and 60 m<sup>2</sup> per bed in district healthcare facilities. The current low ratio of total area per bed is partly due to the fact that today hospitals offer only inpatient services and have limited outpatient activities. With the creation of ISDN, new organizations will have a more balanced activity of both outpatient and inpatient care, which will lead to an increase in the size of healthcare facilities after the creation of ISDNs.

Priority should be given to the development of fixed ISDN branches to be created, i.e. mostly from territorial hospitals and some GPCs plus EMS integration. Continuous priority should be given to district level ISDN (to strengthen the foundation of the health pyramid) followed by regional and national institutions.

### 8.2.3 Long-term measures (2028 - 35)

Focus for long-term measures will be on the joint development of both inpatient and outpatient ISDN departments, as well as central and peripheral services for tuberculosis, rehabilitation, and mental health care. The modernization of facilities at the republican and inter-regional levels should be the focus of long-term measures. Given the amount of investment required, national health organizations serving as referral structures can be established (both

infrastructural and equipped) through individual projects with the support of various international development partners.

The long-term strategic vision for the development of the health care delivery system in Kyrgyzstan should be aligned with the expected increase in needs and demand for health services due to factors such as demographic transition and epidemiological shift.

Considering both population growth and the increase in the prevalence of diseases, the demand for medical services will increase by more than 40% by 2035. Clearly, projections for hospital capacity need to take this development into account, as well as offsetting effects from advances in medical technology and increased use of day care and outpatient services. Putting all these factors together, the number of emergency beds needed in regions and districts in 2035 will be about 17,000.

### **8.3 Economic Effects**

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The implementation of the main recommendations of the "Master Plan" will support a more rational use of the limited resources that are available to the health sector. By improving infrastructure and equipment money will no longer be wasted on repair and maintenance of outdated and non-functional buildings, technical installations, and medical as well as non-medical equipment.

Better clinical and organizational performance will contribute to higher levels of efficiency in health care delivery.

In a short-term perspective, the following economic effects can be expected:

1) The integration of 35 FMCs and Territorial Hospitals (TH) and their satellites will reduce expenditures in the range of 3 to 5% of their global budgets. At national level, for one year, these savings can amount to about 300 million KGS (3.9 M USD). This money will be available for other measures to improve the quality of care and staff satisfaction (staff training and staff incentives, equipment maintenance, etc.).

2) The integration of healthcare organizations will reduce the need for investments in medical equipment by 150,000-170,000 USD for each of the 35 locations. At national level this represents a saving ranging from 5 to 6 M USD.

3) The integration of FMCs and THs (i.e. of outpatient and inpatient services) will not only improve the quality of medical care, it will also allow to reduce by 300 to 500 m<sup>2</sup> the surface of both buildings and consequently costs for construction / rehabilitation and maintenance.

## **8.4 Discussion of Regional and National Master Plans**

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Remote workshops (using videoconferencing platforms) have been organized at national level with the MOH / MHIF and at regional level during the months of October and November 2020.

The following paragraphs summarize the most relevant feed-back and comments / suggestions received. Most of them demonstrate the active role that stakeholders at national and regional level are playing or intend to play in the implementation of the master plan. They may serve as a basis for the ongoing discussion following the Road Map that has been developed and is being distributed in a separate document.

### **8.4.1 Health Care Financing**

Participants at the workshop (MHIF) highlighted the following points:

- Good functioning of the DRG system requires clear standards for medical services and correct coding according to ICD-10 by specially trained staff which currently is not available in Kyrgyzstan. Capacity Building is needed.
- Mechanisms and reference schemes need to be developed for the payment (salaries) of employees of the to be created ISDNs.
- DRG rates need to be calculated for day care services (surgery, interventional gastroenterology / cardiology, etc.).

- MHIF cards shall be introduced in the Kyrgyz health insurance system, defining entitlements of the card holder depending on the level of contributions.
- The still restrictive pricing system for medical services needs to be revised to support the development of healthcare organizations.
- Coordination between MOH / MHIF needs to be institutionalized. Roles and responsibilities of both organizations (e.g. for quality of care) need to be defined.
- The legal status of ISDNs needs to be clarified (in accordance with the requirements of the Kyrgyz legislation).
- Who to be included in the management of the proposed Health Infrastructure Development Fund (HIDF) needs to be discussed and agreed upon.

#### 8.4.2 Batken Oblast

In their discussion of the Master Plan presentation, participants focused on the understanding of and commitment to the integration of services, especially in terms of optimizing emergency medical care and recommendations for institutionalizing coordination of the health care system at regional level.

#### 8.4.3 Chui Oblast

In the debate with key stakeholders of the Chui Oblast, the following aspects were noted:

- ISDNs provide obvious opportunities for cost savings and more rational use of human resources (increased efficiency in service delivery).
- The feasibility of establishing the HIDF needs to be analyzed.
- Funding schemes for the EMS ambulance teams need to be discussed and human resources need to be mobilized to increase the number of ambulance teams.
- Healthcare organizations to manage their own resources need to have real autonomy.

#### 8.4.4 Osh (City and Region)

For participants representing both the Osh City and Osh regional health care facilities, the following issues were relevant:

- When developing standards for personnel and medical equipment, effective work organization needs to be taken into account. There are provider organizations that work inefficiently despite good equipment.
- Principles, mechanisms, and opportunities for the outsourcing of partnerships and the development of Public-Private-Partnerships need to be further examined and explored.
- The proposed closure or transformation to FMCs / ambulance points of TH satellites needs to be revisited on a case by case basis considering the current situation with the COVID 19 pandemic or other public health crises, as well as the rapid population growth observed in the southern regions of Kyrgyzstan. *[NB: TH satellite facilities are usually not sufficiently competent (lack of qualified staff and of equipment) - to take care of COVID-19 patients requiring inpatient care].*
- Local peculiarities of the functioning of certain TH satellites must be taken into consideration, especially when there is support provided by local business communities and authorities.
- The need and relevance of the construction of a new building for the Osh Center for TB control needs to be analyzed.
- Per capita payment and performance indicators have to take into account internal migration into the city of Osh (affecting the denominator of the indicator without leading to increased budgets). There should be a registration procedure for PHC services, as well as revised standards for the financing of EMS.
- The regional organization of health services is only possible with additional financial and human resources.
- The Master Plan should indicate situations where the reduction of beds, staff and



buildings would be prohibited, e.g. in an ongoing pandemic. *(NB: routine medical services should not be confounded with the management of Emergencies and Natural Disasters. Maintaining underused hospital bed capacity is not an appropriate solution as this would lead to a waste of resources without providing a guarantee for effective functioning in case of a crisis).*

- For the EMS some thoughts need to be undertaken to justify the costs related to EMS (ambulance) services including diagnostics, treatment and transport.
- For successful implementation, the Master Plan needs political support.

#### 8.4.5 Issyk-Kul

Participants in the workshop raised the following points and issues

- There are doubts about the feasibility of mobilizing the proposed large-scale investments for the modernization of health care facilities and services.
- Guidelines and procedures need to be developed and defined for the application of DRGs and per capita financing in the to be created ISDNs.
- ISDNs, however, provide opportunities for rational and efficient use of equipment and personnel, especially in EMS departments.
- The role and place of existing FGPs in the ISDN creation process needs to be clarified. They should be integrated in GPCs and FMCs as soon as possible.
- Experience made with the centralization of laboratories experimented in 2016 and 17 needs to be evaluated to draw lessons learned and avoid issues related to the costs for sample transport (who pays?) and to delays with the communication of results that came in only 2-3 days after sample taking.
- The regional Center for Human Reproduction and the Jeti - Oguz Tuberculosis Hospital needs to be included in the optimization plan for the Issyk Kul region.

#### 8.4.6 Jalal-Abad

Here, workshop participants addressed the following issues:

- The creation of inter-district ISDNs was seen rather critical; the need to consider the planned administrative-territorial reform in Kyrgyzstan, especially for the Jalal-Abad oblast, was mentioned.
- Rehabilitation centers in Jalal-Abad oblast have the status of interregional facilities and therefore cannot be merged with ordinary district hospitals.
- It was proposed to transfer the HIDF to the MHIF. It was further noted that the proposal for the creation of the HIDF, its funding sources, management structure, processes and implementation tools need to be further developed in discussion and cooperation with other government entities.
- Aspects of HR management (motivation, capacity building), especially in the context of the ongoing COVID-19 pandemic, should be further discussed and elaborated. Participants expressed concern about the possible reduction of medical personnel due to the creation of ISDNs. They insisted on strict adherence to labor laws in the appointment of administrative and management staff.
- Some participants suggested to return to the Semashko model of the national health system, within which medical services are provided by a hierarchy of state institutions, united in the MOH, financed from the national budget.
- Managers should be appointed by Order of the MOH following proposals of regional coordinators (not the local administration).
- To avoid unnecessary hospitalization, funding should be only per capita, and not on a case-by-case basis. Diagnostic services (laboratories, X-rays, etc.) should be decentralized.

#### 8.4.7 Naryn

Representatives of regional health care provider organizations discussed the following aspects:

- The legal status of ISDNs and its branches need to be clarified, especially when combining the Naryn RH and At-Bashin TH.
- Annual plans for the number of cases to be treated limit the activities of the healthcare facility!
- Better coordination of health care is needed at district and regional levels.
- Outdated healthcare infrastructure throughout the region requires modernization.
- Local investors are constructing fully equipped health facilities (Mantysh village) – this should be taken into account in the Master Plan.

#### 8.4.8 Bishkek

Participants at the workshop represented both city and republican (referral) facilities. Their comments and suggestions were as follows:

- The further development of the Master Plan for the Capital City (Bishkek) will consider experience with the implementation of ISDNs at regional level. The main goal is to have a balanced referral system and to strengthen the tertiary level of the health care system, which must be modernized and able to work according to international norms and standards.
- It is necessary to discuss in detail the recommendations of the Master Plan at the level of each healthcare provider organization to allow them (and the MOH) to make informed decisions.
- Merging / integrating health facilities (e.g. the National Hospital and the National Center for Cardiology and Therapy) does not necessarily mean physical merger; participants supported (preferred) integration at service level.
- The rational of creating ISDNs in the capital city still needs to be evaluated, consid-

ering the experience made with the recent merger creating four Mega-FMCs with together more than 5,000 employees.

- Quality improvement of services, especially at tertiary care level will unavoidably lead to rising expenditures. There will be no quality improvement without the necessary financial resources being made available to the health sector.
- Financing schemes and standards as well as main activities of EMS must be revised. There is an urgent need to create an emergency hospital in Bishkek.
- Roles and functions of the City Clinical Hospitals 1 and 6 should be defined and hospitals should be renamed accordingly (e.g. as emergency hospital).
- Daycare and short-term inpatient stay services and departments shall be developed and implemented in all relevant healthcare organizations.

#### 8.4.9 Talas

Hospital managers and representatives of the regional health authority, after having listened to the presentation provided by the Consultant, discussed the following aspects:

- Standards shall be developed for the payment of ISDN staff and a mechanism for the establishment of a staff payment fund (for premiums / financial incentives).
- Doubts have been voiced regarding the feasibility of the recommended investments and related funding sources. Financing mechanisms and related tools for ISDNs and the EMS sector still need to be developed to secure effective and sustainable operation of the networks.
- When calculating investment needs for medical equipment, items received since 2018 (date of the assessment) including COVID-19 related supply, shall be taken into consideration as well as the possibility to redistribute equipment ineffectively used to other regions.
- It was suggested to include in the Roadmap activities to create awareness

among the population, among health workers and other stakeholders for the need to implement reforms, and to promote

commitment to the proposed strategy of the Master Plan.