COMPLEX PLAN FOR TUBERCULOSIS CONTROL IN KAZAKHSTAN, 2014-2020

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CHAPTER 1: EXECUTIVE SUMMARY AND INTRODUCTION

1. ACRONYMS & ABBREVIATIONS

ADR	Adverse Drug Reaction
ACSM	Advocacy, Communication and Social Mobilization
AIDS	Aquired Immunodeficiency Syndrome
AFEW	AIDS Foundation East-West
AAO	Almaty & Almaty oblast
AGIUV or AIPDME	Almaty Institute for Postgraduate Medical Education
ART	Antiretroviral therapy
ALOS	Average length of stay
BCG	Bacille Calmette-Guerin
BOR	Bed occupancy rates
CAR FETP	Central Asia Regional Field Epidemiology Training Program
CDC	Centre for Diseases Control
CBO	Community-based organizations
CP	Complex Plan
CI	Contact investigation
CPT	Co-trimoxazole preventive therapy
CCM	Country Coordinating Mechanism
DST	Drug-susceptibility testing
DRA	Drug Regulatory Authority
XDR-TB	Extensively Drug-resistant tuberculosis
EPTB	Extrapulmonary tuberculosis
FEFO	First Expiry First Out
FLD	First Line Drugs
FDC	Fixed Dose Combinations
GLC	Green Light Committee
GDP	Gross Domestic Product
HCF	Health Care Facility
HCW	Health care worker
HIV	Human Immunodeficiency Virus
HR	Human resources
IDU	Injecting Drug User
ICH	International Conference on Harmonisation of Technical Requirements for Registration
IC	Infection control
IEC	Information Education & Communication
IRB	Institutional Review Boards
ISTC	International standards of TB health care and control
LIMS	Laboratory Information Management System
LTBI	Latent TB infection
LPA	Line Probe Assay
LJ	Löwenstein-Jensen
MRT	Magnetic Resonance Tomography
MMR	Mass Miniature Radiography

MSM	Men who have sex with men
MOH	Ministry of Health
MIA	Ministry of Internal Affairs
MOJ	Ministry of Justice
MDR-TB	Multidrug-resistant TB
MGIT	Mycobacterial Growth Indicator Tube
NAC	National AIDS Center
NCTP	National Centre for Tuberculosis Problems
NTLR	National Tuberculosis Laboratory Register
NTP	National Tuberculosis Programme
NRL	National TB Reference Laboratory
KNCV	Nederland Tuberculosis Foundation
NGO	Non-Governmental Organisation
OTBD	Oblast TB Dispensary
OST	Opioid Substitution Therapy
PIH	Partners in Health
PLHIV	People living with HIV
PHCS	Primary health care services
PTB	Pulmonary tuberculosis
QMS	Quality Management System
R&R	Recording and Reporting
RCHD	Republican Center for Health care Development
SES	Sanitary-Epidemiological Service
SLD	Second Line Drugs
SOP	Standard Operating Procedures
GFATM/TGF	The Global Fund to Fight AIDS, Tuberculosis and Malaria/The Global Fund
TST	Tuberculin Skin Test
TB	Tuberculosis
UNHS	Unified National Health System
UVC	Ultraviolet C
UVGI	Ultra Violet Germicidal Irradiation
WHO	World Health Organisation

2. EXECUTIVE SUMMARY

The Complex Plan for Tuberculosis Control in Kazakhstan for the period of 2014-2020 **(CP)** defines overarching goal, targets, strategic interventions and activities, with the purpose to inform and guide the TB prevention, care and control during the times pan it covers. It is based on the actual epidemiological data[1] for 2011, with case notification rate of 142/100.000 (estimate 168/100.000)[1], mortality rate of 8/100.000 population (estimation 14/100.000) and the growing problem of M/XDR-TB with 3.500 cases diagnosed in 2011(out of 5,400 MDR-TB cases estimated among notified TB cases)." These epidemiological data suggest that Kazakhstan has the highest TB burden among 18 high burden countries of the WHO European Region.

However, over the last decades, Kazakhstan's National TB programme (NTP) has proven its capacity to improve the TB epidemiological situation by reducing the TB prevalence by 42.3%, between 2002 and 2012. Of particular importance is the Government commitment to fight TB, with continuous increase in the allocated budget every year (from 15 mil tenge in 2009 to 23 mil in 2012, increase for 39.1%), in addition to dedication of MoH for more efficient TB services, involvement

of PHC in TB control, intensified ambulatory treatment, reduction of unnecessary hospitalization of TB patients, and rationalization of TB services.

At present, the health system of Kazakhstan is subject to numerous reforms and transformation, including the financing of healthcare. Actual situation impose inevitable amendments in legislation and financing system, expected to prepare the ground and conditions for creation of a new rational TB control system for the coming 7 years within health system reform with rational reduction of TB hospital beds and expansion of out-patient treatment of TB patients, including in the PHC facilities. Strategic interventions of the proposed CP are linked to and harmonized with the recommendations defined in the TB Master Plans for 14 oblasts and 2 cities up to 2015.[2]

Based on the comprehensive review of the current TB programme conducted in 2012 by NCPT, WHO and partners, research carried out by "Sanigest international" (2013) as well as other independent assessments of the laboratory network and infection control, many achievements and weaknesses of the programme were identified.

The basic challenges of NTP in Kazakhstan can be defined in several aspects: The need for: (i) revision of existing TB care delivery models, as well as revision of protocols for prevention, diagnosis and treatment (especially M/XDR-TB), TB in children, infection control, TB in prisons, collaboration with civil society and penitentiary system, TB in migrants, TB/HIV, and other vulnerable groups; (ii) improvements of TB surveillance, bacteriological diagnostics (through introduction of molecular testing), and treatment success rate (now is 75%); increased coverage with DST, and increased involvement of social sector in patient support.

This CP is a result of close collaboration between the NCPT experts and local and international stakeholders. The document has been developed in accordance with the National Health Strategy, and national normative documents (i.e. "On the Improvement of TB Medical Services for the Population of Kazakhstan", 1998; State Programme on Health Development for 2011-2015 "Salamatty Kazakstan," February 28, 2011; Decree of Kazakhstan government No. 1263 "On measures to protect people from TB in the Republic of Kazakhstan", 2007) and is harmonized with the WB project and the newest WHO TB control strategy beyond the year 2015[1], which emphasized the importance of the CP, not only to provide the country with a clear strategic direction for TB control, but also to provide the funding agencies with a clear notion of what their investment might achieve.

This CP is logical continuation of TB control projects implemented in Kazakhstan. The country is determined to continue its progress with the ultimate goal to halve the TB prevalence in the next seven years by 2020:

- **The long-term strategic vision of this CP is Kazakhstan free of TB**
- **The overall goal is reduction of TB incidence and mortality**
- **To reach the targets by year 2020:**
    - **Incidence of 55/100.000 population (81.7/100.000 in 2012)**
    - **Reduce mortality to 5.8/100.000 citizens (8.0/100.000 in 2012)**
    - **Treatment coverage of 95% for M/XDR-TB patients.**

The CP is a comprehensive document covering the anti-TB activities of almost all stakeholders and partners in TB control in Kazakhstan for the period 2014-2020. The CP is structured in 7 chapters: 1) Executive summary and introduction, 2) TB control situation analysis, 3) Master plan, 4) Operational plan, 5) Technical assistance plan, 6) Monitoring and evaluation plan, and 7) Budget

1 Global TB report 2012

plan. The chapter follows the logical framework to present key problems in TB control, strategic interventions in the operational plan addressing those key problems, corresponding budget for financing activities, monitoring of CP implementation, as well as the technical assistance (TA) plan.

TB control situation analysis consists of two parts: (i) achievements of TB control in Kazakhstan so far, and (ii) challenges of NTP and TB control in general

The **Master Plan** (the core chapter of the CP) illustrates basic statistical data for Kazakhstan, TB epidemiological data, NTP organizational structure and the network of laboratories, as well as the results of a recent SWOT analysis. It encapsulates numerous achievements of the NTP in the past, but also identifies serious weaknesses that are addressed by the formulated strategic objectives and corresponding activities, defined through 4 general objectives and 13 strategic interventions.

Objective # 1 deals with reform of TB framework in Kazakhstan in civil and penitentiary health sectors and expansion of outpatient and hospital-substitution care to TB and M/XDR-TB patients. It includes activities regarding the establishment of a regulative and legislative basis necessary for planned changes in the organizational and financing system, aimed at transformation of TB services in the next 7 years. Activities are also defined for higher involvement of PHC services and extension of ambulatory treatment for TB patients (during the whole period of treatment) that is planned to increase from 0.5% in 2012, trough 5% in 2015 and finally to 50% % in year 2020. It is planned to reduce the hospital beds by 35%, and average hospital stay for TB patient from 75 in 2012 to 30 days in 2020. The problem of multi-drug resistance (MDR) will be addressed by decentralizing care for patients with MDR-TB and their treatment to PHC level with support from NGOs.

Objective # 2 is focused on improved access to advanced efficient technologies of TB and M/XDR-TB diagnostics and treatment, as well as improvement of prevention, including in penitentiary sector and migrants. It describes interventions aimed at improvement in diagnosis and treatment of TB, by introduction of rapid molecular tests and increased DST coverage to 95% in 7 years. It is expected that proper implementation of these activities will contribute to treatment success rate of 85% for TB and 75% for MDR-TB patients.

Objective # 3 focuses on activities for improvement of infection control in TB facilities, including in penitentiary sector, upgrade of electronic R&R system that will provide valid data and its use by policy makers and managers at all levels of TB control.

Objective # 4 defines activities on strengthening of interdepartmental and inter-sector cooperation in the field of TB control. This strategic intervention includes definition of standards of social support to high risk groups. It is expected to improve healthcare for migrants, support for TB/HIV collaborative activities and 100% coverage of TB patients with HIV testing, IPT and ART.

Operational Plan outlines what will be done in the coming seven years in order to continue the same steep reduction in prevalence of TB. The experience gained by the successful pilot approaches of the last few years (e.g. contact-tracing, community DOTS) will be expanded to the whole country. It is expected that implementation of the rapid molecular diagnostic tests will contribute towards improvement in case detection, increased DST coverage for more than 95% bacteriological confirmed cases, and timely treatment of M/XDRTB. Close cooperation between NCPT and HIV/AIDS centres that has successfully addressed the TB/HIV problem in Kazakhstan to date, will continue and will be expanded, with emphasis on provision of IPT, and ART for TB/HIV co-infected individuals. It is planned to embark on numerous activities for improving management of TB among migrants and trainings for human resource development, such as special trainings for TB managers, general practitioners and laboratory staff, as well as trainings on IC.

The Technical assistance plan defines projected needs for TA from both inside and outside the country, listed so that partners can match their commitments to these needs. Local experts' assistance will be sought frequently and will continuously provide support at oblast and regional level. The most important need for international TA is for development of documents, protocols, trainings, improvement of TB management, problems with migrants, IC, as well as mid-term and long-term evaluation of the CP achievements.

The Monitoring & Evaluation Plan includes significant strengthening of the monitoring and evaluation system, especially the introduction of electronic data management. It includes a methodology for both monitoring the progress of the CP and the epidemiological impact the CP is having on the TB epidemic. It includes 29 indicators related to the strategic interventions, defined through impact (3 indicators), output (8 indicators), outcome (6 indicators) and 12 indicators at process level. Indicators for routine monitoring of implementation of activities are defined in the Operational Plan.

The Budget Plan defines funds needed for achievement of the national goal, and an assessment of the resources likely to be available from the agencies already engaged. It provides unprecedented transparency in linking goals to objectives, the strategic interventions to activities, and to the budget for these activities, as well as the means by which they will be assessed and operationalized in the 7 years. The seven year cost to achieve the overall goal of TB control in Kazakhstan is calculated at $ 520 million. This involves the treatment of 185,000 cases of all forms of TB, including 35,000 MDR-TB, as well investigating as many as around 2.000.000 TB suspects. During the first three years 2013-2016 of the CP implementation a significant contribution of external partners especially GFATM is planned to contribute.

3. INTRODUCTION

The CP is logical continuation of TB control projects implemented in Kazakhstan and extension of the Comprehensive Plan of Action for prevention and control of multidrug-resistant and extensively drug resistant tuberculosis in the WHO European Region, 2011-2015, and strategies included in this document are consistent with the guidelines established by the State Programme of the Development of Health of Kazakhstan "Kazakhstan Salamatty" in 2011-2015. This document is developed in accordance with the updates outlined in the "Roadmap to prevent and combat drug-resistant TB in the Region" developed and published by WHO European Region in 2012.

The CP was developed on the basis of many consultations with specialists of the TB control service of Kazakhstan at the National, oblast and regional level, as well as with donor and partner organizations (USAID, CDC, TB CARE, KNCV, project «Quality Health Care", PSI un others), involved in TB control in Kazakhstan.

The President of Kazakhstan Nursultan Nazarbayev in his address to the National Strategy "Kazakhstan - 2050"[1] stressed that the health of the nation is the basis of the successful future of the country and the need for a long-term modernization of the national health system and implementation of common standards for the quality of medical services, as well as improvement of alignment and material equipment of medical institutions. One of the priorities of public health in the State programme of development of Health of Kazakhstan "Kazakhstan Salamatty"[2] for 2011 - 2015 years marked improvement in TB epidemiology

The National TB Program (NTP) has launched the DOTS implementation in 1998, followed by the

implementation of the DOTS Plus Strategy as of 2001. The current TB programme was based on the modern Stop TB Strategy, dated in 2006. Based on the finding of the recent NTP Review in 2012[3], Kazakhstan has made significant improvement in its TB control programme building on WHO recommendations.

Many **key achievements** have been made in the recent past, several of which are listed below:

- Diagnosis and treatment of TB, and MDR-TB are according to WHO recommendations.
- Generally TB control activities have been integrated in the primary health care services.
- The national budget for TB control has been increased several folds with rapid scales up of treatment for MDR-TB patients.
- Infection control measures have been significantly improved in the recent years.
- Human resources for TB are well trained and organized within the national system of human resources for health. The country has a robust recording and reporting system with potential for sound monitoring and evaluation. Human resources for TB are well trained and organized within the national system of human resources for health
- There are excellent examples of involvement of NGOs and other partners in TB prevention and control even in the penitentiary services.
- There is a high coverage of TB patients with HIV testing.

Despite significant achievements in TB control, Kazakhstan has, however, the highest TB burden among 18 high burden countries of the WHO European Region and there are numerous challenges that need proper attention.

Key Challenges:

1. Revision of existing TB care delivery models (restructuring the hospital network, reducing unnecessary hospitalizations; reducing average length of stay; adapting the supply of services ; reducing the emphasis on mono-profile hospitals; establishing minimum population standards for different levels of hospital care).

2. Ambulatory treatment in primary health care services is not functioning to its full potential and does not include all sputum smear negative patients and MDR-TB patients (for example patients needing injections are not treated in some policlinics).

3. Rapid Molecular diagnosis of MDR-TB and DST are not yet available (although the country is planning to embark on it soon) for all patients.

4. High levels of drug resistant TB and with expansion of MDR-TB treatment, there will be more patients who will fail MDR-TB treatment.

5. Existence of: Waiting list, lack of rapid diagnosis and reliable 2nd-line anti-TB drug supply for MDR-TB patients in the penitentiary sector

6. Social support to patients is not standardized and largely depends on the availability of funds from each Oblast.

7. Significant gap in human resources for TB control should be expected in the next 5-10

years, taking into account current deficit of young physicians specializing in TB, aging of current TB staff and new procedures for TB specialization after 2014.

8. TB among external migrant is not addressed adequately. There is no cross border TB control and care mechanism in place.

9. Infection control at all levels of care is not according the international standards. The existing SES regulations on IC are outdated, not evidence based, costly and ineffective for TB prevention.

10. Lack of integrated TB and HIV/AIDS services (early diagnosis of TB at HIV services, late ART initiation in People Living with HIV (PLHIV) with active TB, lack of opioid substitution therapy (OST) in TB hospitals) challenge health outcomes in TB patients with co-conditions (HIV, injecting drug users (IDU)).

11. There are few NGO working on TB and hardly any TB patient association.

More comprehensive characteristic of the abovementioned review is presented in the Master plan.

In line with the above mentioned, and based on the recent NTP Review in 2012, the strategic objectives, interventions, strategic priorities and mechanisms for the implementation of the CP on TB control activities in Kazakhstan for 2014-2020 were defined. The CP for TB control proposes measures to overcome above mentioned challenges. The last WHO review mission together with the national partners delineates the most important recommendations to be addressed with the new CP.

The CP defines legislative, structural and economic measures, as well as staff needed for the implementation of the planned measures, taking into account inter-ministerial and inter-sectorial collaboration. Implementation of this CP will help to increase the accessibility and quality of TB care to the population through introduction of the rapid diagnostic tests for TB, including sustainable forms of effective treatment, compliance with infection control measures in high-risk TB areas, provision of social services for vulnerable population , creation of conditions to improve the TB patients' motivation to treatment, professional and personal growth of medical staff, adaptation of the system of financing of TB control activities to the current requirements and market conditions.

The CP is a document that defines the vision, goal and all strategic interventions for TB control.

The CP aims to provide guidance for actions not only for the Ministry of Health, but also all decision-makers and implementers within the government and the non-governmental sector at both national and international level, to serve as main guide for funding agencies considering investments for TB control in Kazakhstan during the period of 2014-2020.The document is a structured plan which lays out the needs for optimizing TB control in Kazakhstan until , based on an analysis of the achievements to date, the gaps that exist in TB control, and the new directions the country intends to take. The CP clearly delineates strategic priorities in TB control and the value for money achievable with further investment by any agencies, current or potential.

The CP has been created during a consultative process of its authors and members of the country's TB services at national, and regional levels, employees, donors and partner organizations (USAID, WHO, CDC, TB CARE I, KNCV, the project "Quality Health Care», PSI and others), which

operate TB Control in Kazakhstan.

Key principles of the CP for TB control in Kazakhstan 2014-2020

CP for TB control is based on the following principles:

1. Long term principles and vision: all strategic interventions are clearly linked to the CP's vision and the expectations is that the will be able to demonstrate how they contribute to the achievement of that vision

2. Evidence based – Initiatives are based upon evidence and implementation is focused on achievement of well-formulated objectives and targets.

3. **Rational use** of the funds for TB control activities based on protocols for ambulatory treatment, reduction of TB beds, patients orientated approaches, as well as improvement of adherence to treatment and promotion of health personnel.

4. Access to the innovative rapid diagnostics and effective treatment of all TB and M/XDR-TB patients, including those in the high risk groups.

5. Objectivity, transparency and measurability of the monitoring and evaluation system.

6. Coordination and harmonization among different sectors of health agencies (Ministry of Internal Affairs, Ministry of Defence, MLSP, MES), international stakeholders and donors.

7. Flexibility – the idea was that this CP is flexible to ensure that changes can be made quickly when evidence or contexts demand flexibility.

8. **Rights based** approaches – The CP is designed to protect and promote human and legal rights, including prioritisation of gender equality and gender rights.

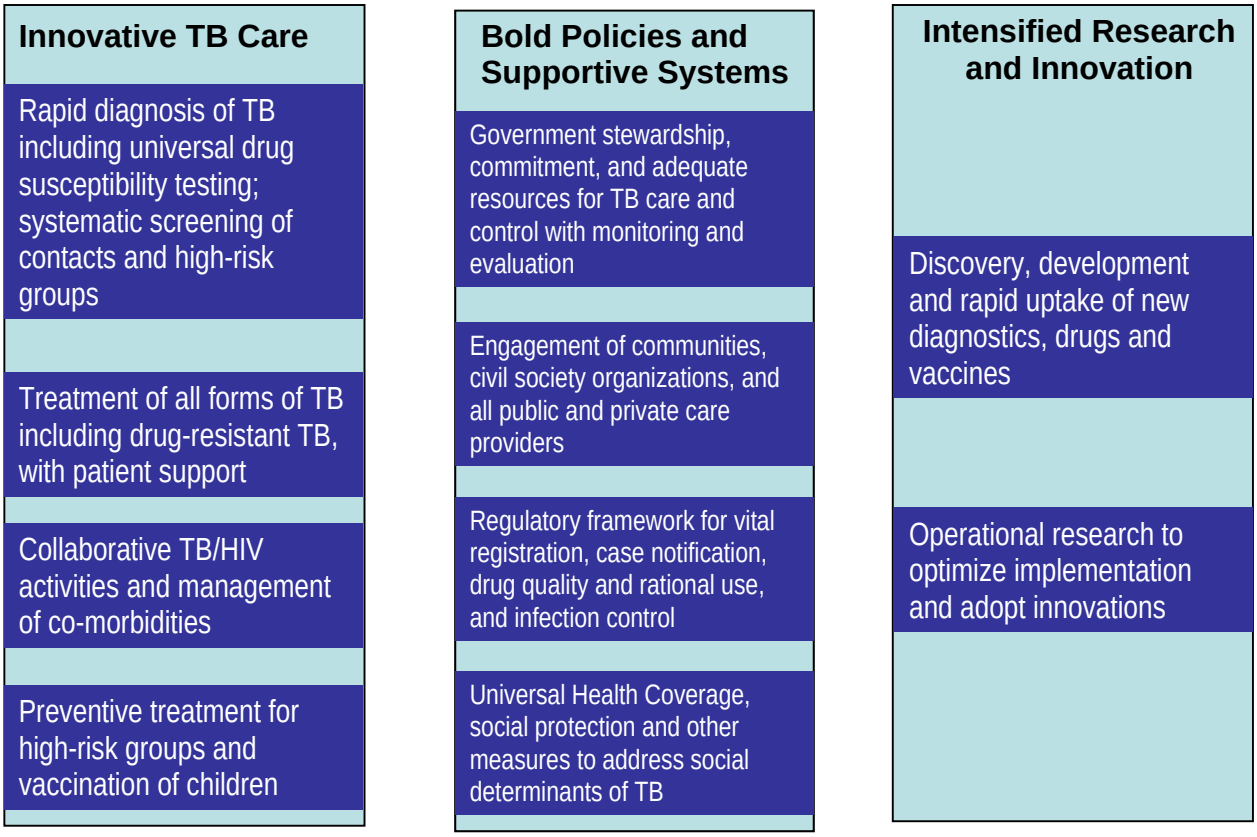
The CP TB control in the following 7-years period will be based on newest recommendations of Global TB Control Strategy beyond Year 2015, what is provisionally called the "End TB" [1] Strategy, 2016-2035, endorsed at the WHO's Strategic Technical Advisory Group in June, 2013. This new "End TB" Strategy, still has to be endorsed by the WHA and will be further refined.
This latest global strategy to fight TB is based on three pillars (Figure 1).

Each pillar includes a package of strategic interventions that should be adapted and implemented by national TB control programmes, depending on the country context.

The first pillar includes care and prevention for TB under the responsibilities of the NTP in collaboration with technical and financial partners and NGOs. This CP undertakes to intensify these activities, many of which Kazakhstan is already implementing.

Figure 1. Components of the End-TB Strategy

Pillars and Components



[1]*Source: WHO, 2013.*

The second pillar – governmental policies to ensure universal health coverage, efficient general health services, support from all relevant components of the health system to TB control, and social protection - is addressed in the new directions taken by this CP, for patients and TB suspects in order to improve TB care and prevention for all citizens. The work already begun to involve communities and all care providers will continue but be made more efficient through better use of existing health services.

The third pillar is represented by the goal of this CP which aims to greatly expand use of the new diagnostic technologies to make them the first-line diagnosis for 100% of suspects by 2020. Mechanisms will be set up to include other innovations that may arise in the period of the plan.

Objectives defined in this CP include all packages of strategic interventions of the newest global TB strategy, adapted to Kazakhstan context.

The CP is closely aligned with the National Health Strategic Plan, 2008-2015, and in particular with its objective, "to achieve a high case detection rate and to maintain a high cure rate for pulmonary TB smear positive cases." Reforms to health governance and health financing that are currently under discussion in the Ministry of Health will likely pose some challenges to current TB control efforts, as and when they are implemented.

Also, this CP is supporting the gradual changes in the structure of TB facilities network in KAZ up to 2025. It is based on the observational research carried out by "Sanigest International" as part of the Health Sector Technology Transfer and Institutional Reform project undertaken by the Government of Kazakhstan, with support from the World Bank.

Process of assembling the Complex Plan for TB control

Preparation of this new CP for TB control is continuation and follow-up of the recommendations received by WHO mission in 2012:

- The need to move towards financial sustainability
- Health reform which will create appropriate milieu for rationalization of TB facilities, reduction of beds, ambulatory care.
- To maximize access to high quality, rapid diagnosis needs to be started and expanded as soon as possible.
- To develop a systematic approach to evaluating and implementing new approaches to TB control.
- Existing examples of involving the civil society organizations and provision of integrated continuum of care (transfer of released patients from prison to civilian sector) need to be expanded across the country.
- TB/HIV collaborative activities need to be strengthened.
- Patient associations and support groups should be developed and integrated in the national TB response.
- Develop standard criteria and guidelines for the provision of palliative care centres need to be considered for MDR-TB and XDR-TB patients not getting cured.
- Dynamics of human resources for TB control for the next 5-10 years should be assessed with estimation of the potential gap against the needs, and measures to be taken to ensure adequate resources available.

The CP is also aimed at satisfying requirements of the new Global Fund funding model, as the country is in process of preparation of Concept Note to be submitted to GFATM.

Since the end of 2012, numerous activities have been launched to prepare this CP for TB control, with involvement of various stakeholders, such as National Center for TB Control that has the leading role in the process, experts for various public institutions, civil and penitentiary sector, as well as international partners. 8 working groups have been working on the development of this document, responsible for defining strategic interventions, activities and budgets for all aspects of TB control (see the list of the working groups' members at the end of this chapter). The initial ideas for objectives and strategic interventions in this CP have been drafted in March 2013 and presented to the Minister of Health, followed by number of consultative meetings and consultations with CCM, which has provided valuable comments and conclusions that are included in this document.

Key components of the CP

The TB CP includes the following chapters:

- **Executive summary and Introduction -** this chapter provides the purpose of the CP and the principles that underlie it and outlines its structure and the collaborative process through

which it was drafted.

- **TB control situation analysis** consists of two parts: (i) achievements of TB control in Kazakhstan so far, and (ii) challenges of NTP and TB control in general.
- **Core plan -** This element is the most important part of the CP, providing the national background in which TB control operates, assessing the strengths, weaknesses, opportunities and threats. It sets out the goal, objectives and strategic interventions for the new planning period, down to the main activities.
- **Operational plan and Technical assistance Plan -** These two chapters cover the activities that will be implemented over time, until 2020, including the essential technical assistance that is needed in order to support the CP implementation.
- **Monitoring and evaluation plan** - This chapter provides detail on how the CP for TB control will be monitored and evaluated.
- **Budget plan** - This part describes the costs of each activity, with the known and likely future resource contribution picture until 2020.

All strategic interventions in the CP are assigned specific numbering system and can be followed in all aforementioned documents.

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2. Strategic Development Plan of the Republic of Kazakhstan till 2020 approved by Ordinance of the President of the Republic of Kazakhstan № 922 of 1 February 2010;
3. Report of WHO Mission of 16 May 2012 Comprehensive Review of TB Care, Prevention and Control in Kazakhstan;
4. Roadmap to Prevent and Combat Drug Resistant Tuberculosis in WHO European Region, 2011-2015.

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CHAPTER 2: ANALYSIS OF THE CURRENT SITUATION IN TB CONTROL IN KAZAKHSTAN

Key achievements and progress of the NTP

TB Epidemiology

- TB control in Kazakhstan is one of the priorities of the Ministry of Health of Kazakhstan and is exercised in line with the National Health Care Development Program *Salamatty Kazakhstan,* 2011-2015.
- Owing to TB response activities the major TB control targets were achieved in the framework of the National Health Care Development Program *Salamatty Kazakhstan,* 2011-2015 (by 2015, morbidity – 94.7/100,000 and mortality – 11.7/100,000).
- TB epidemiological improvement in the country was fostered by systemic measures taken by the Government, Ministry of Health and local governments.
- The updated Administrative Order of the MoH on TB and M/XDR-TB management based on the recent WHO recommendations is going through the approval process.
- Roadmap to Improve TB Service in Kazakhstan in 2012-2015 is developed and approved by the Ministry of Health.
- Morbidity, prevalence, mortality and TB-caused disability rates are steadily lowering due to TB response activities with financial support of the Government of Kazakhstan.
- In 2010, TB morbidity rate was 95.3, in 2011 – 86.6, and in 2012 – 81.7 per 100,000. In 2010, TB mortality rate was 10.6, in 2011 – 8.4, and in 2012 – 7.4 per 100,000. Overall, TB morbidity dropped by 49.1%, and mortality by 67% in the last ten years in Kazakhstan.

TB and M/XDR-TB Diagnostics

- The standards for TB detection, diagnosis, treatment and monitoring were developed and implemented with reference to WHO recommendations and evidence-based principles.
- On the basis of outcome of the joint pilot MDR-TB response project of the NCTP, Almaty city TB dispensary and Alabama University (USA) in 2003-2008, up-to-date protocols for MDR-TB detection, diagnosis, treatment and monitoring in the civilian and penitentiary sectors with reference to WHO recommendations and evidence-based principles were developed. These protocols are implemented all over the country.
- Bacteriological diagnostics is the main evidence for TB and MDR-TB diagnostics.
- To coordinate activities, a certified National Reference Laboratory (NRL) compliant with international standards was created.
- Microscopy of sputum smear is performed in 315 PHC laboratories in the civilian sector and 41 laboratories in the penitentiary sector across the country. PHC facilities do not have base laboratories, instead, there are sputum collection rooms there and experts responsible for sputum collection; the transportation of sputum to bacteriological laboratories of TB facilities is arranged.
- In 2012, the availability of binocular microscopes in the country was only 85% of total needs versus 80% in 2011. 1 bacterioscopy laboratory dealing with TB diagnostics needs 1 microscope. However, if the load is above 4000 smears per year, the number of microscopes should grow too.
- Drug Susceptibility Testing (DST) to first- and second-line drugs is introduced in all oblast, city and regional bacteriological laboratories and the NRL under the NCTP, as well as external quality assurance and internal quality control. DST to second-line drugs facilitates improved XDR-TB diagnostics.
- In the framework of Rounds 6 and 8 of the Global Fund, the critical laboratory equipment,

consumables and reagents are supplied to bacteriological laboratories of oblast, city and regional TB dispensaries and NCTP to implement rapid highly specific molecular genetic diagnostics of TB and MDR-TB.

- Advanced rapid molecular diagnostics of TB and MDR-TB (BACTEC-MGIT-960, HAIN-test and G-Xpert) are implemented in all bacteriological laboratories of the regions, including NRL and Karaganda prison laboratory; it enabled DST in 98.0% of TB cases while the WHO target is 90%. G-Xpert methodology is implemented in 13 pilot regions.
- In 2012, WHO mission experts noted a significant contribution of radiography to TB diagnostics. In early 2013, TB facilities are equipped with 195 radiographic diagnostic devices all over the country.

TB and M/XDR-TB Treatment

- The Government of Kazakhstan and MoH allocate funding from the central budget to supply TB patients with first- and second-line drugs. Every year, financing of TB drugs is growing with the account of registered patients, M/XDR-TB patients in the first instance. Second-line drugs for MDR-TB patients are procured by regional Green Light Committee through the financial support of the Global Fund.
- This has resulted in annually growing coverage of MDR-TB patients with 2-line drugs. At the end of 2012, the coverage was 86.9% (WHO target is 85%).
- Treatment of XDR-TB patients is initiated. A new technology of surgical treatment of M/XDR-TB patients by bronchial blockage and selective lung collapse with silicone implant was introduced at the NCTP.

Inputs and Equipment Supply of TB Facilities

- In Kazakhstan from 2004 to 2011, 46 new standard-design TB hospitals were commissioned in the framework of the republican budget program 005 *Dedicated Development Transfers to Oblast Budgets and Budgets of Astana and Almaty for Construction and Reconstruction of Health Facilities*.
- In the framework of MoH's *Equipment Supply of TB Facilities Program*, advanced medical and laboratory equipment was supplied to TB dispensaries in the last five years. It enables wide implementation of laboratory testing and TB and MDR-TB management.
- The building of the NCTP was properly rehabilitated and positive-pressure ventilation was installed in line with international standards for infection control.
- In the framework of Intergovernmental Agreement between Germany and Kazakhstan in respect to NTP strengthening, KfW has granted laboratory equipment to civilian and penitentiary TB facilities in Akmola, North-Kazakhstan and Kyzylorda Oblasts and NCTP. Another supply of laboratory equipment is expected to civilian and penitentiary TB facilities in Aktobe and South-Kazakhstan Oblasts.
- In the framework of EXPAND-TB Project, another agreement provides for grant supply of laboratory equipment for HAIN-test to Aktobe Oblast TB dispensary, city TB dispensary of Almaty and NCTP.
- A Department of 60 MDR-TB beds was established under financial assistance of Round 6 of the Global Fund in city TB dispensary of Almaty. The specific feature about this department is that this is the first experience in the country when the design of rehabilitation and installation of ventilation was performed by *Alternativa Klimat* company (Russia) with engineers certified by CDC. IC needs recommended by WHO and Sanitary Regulations of Kazakhstan were taken into account in the design.

Infection Control

- Input and equipment supply of TB facilities is strengthened in line with international standards for infection control (IC).
- Proper environment is created in many TB hospitals to separate patients according to bacteriological status. MDR-TB patients are treated as a priority for treatment in tertiary care Oblast, City and Regional TB dispensaries. In each oblast there are special departments for such patients. At present, there are 53 departments (3,147 beds) for adequate treatment of MDR-TB patients in line with international standards in the country.
- An emphasis is made on restructuring of TB facilities. Pursuant to Oder of the Ministry of Health of 10.03.2009 №129 *On Strengthening Measures to Prevent Development of Resistant Forms of Tuberculosis in the Republic of Kazakhstan*, TB bed restructuring initiated in the country is an important step towards streamlining of excessive infrastructure of TB hospitals; it provided proper environment for adequate patients' triage and separation according to epidemiological status at hospital phase. Large-scale restructuring led to establishment of inter-rayon TB hospitals for compulsory treatment in all regions of the country capable of adequate triage and separation of TB patients according to sputum smear (SS (+) separately from SS (-) and drug susceptibility (separately for TB susceptible patients from MDR-TB).
- At present, there are 17 departments (685 beds) for compulsory treatment. In 2011, 1051 (4.1%) TB patients of 25,611 active TB patients were treated in these departments, in 2012 – 846 (3.5%) of 24,265 active TB patients. Among patient treated in compulsory hospitals the majority is MDR-TB patients – 627 (59.7%) in 2011 and 466 (55.1%) in 2012. During 9 months of 2013, 573 (2.3%) people of 24,971 active TB patients were treated in such departments.
- Compulsory treatment is regulated by Code of the Republic of Kazakhstan of 18.09.2009 № 193-IV ZRK *On Health of the Nation and Health System*. According to Article 107 clause 3, decision on compulsory treatment of patients with contagious tuberculosis and those who evade treatment is taken by court at the request of health authorities (organizations) if a patient's refusal is available in medical records. For compulsory treatment, medical records are submitted to court following decision of the Central Medical Commission in respect to those patients who continually defaulted the prescribed treatment regimen and when other methods to engage them to observed treatment proved to be ineffective. The purpose is to protect rights of the entire society and, in the first instance, family of the patient who evades treatment to keep other family members away from contagious resistant TB. Compulsory treatment is funded from the budget of the country only.
- Bed restructuring in TB facilities pursues prevention of nosocomial spread of TB. It enabled reduction of low-capacity and inefficient hospitals and develop IC system. At present, IC is strengthening in hospitals at all levels, including in penitentiary system.
- In the course of implementation of the National Health Care Development Program *Salamatty Kazakhstan*, 2011-2015, positive pressure ventilation is installed in high risk zones of TB facilities in order to strengthen IC. TB facilities in the country are adequately equipped with personal protective devices of high-level security. IC measures are taken in TB facilities at all levels.
- In the framework of the National Health Care Development Program *Salamatty Kazakhstan*, 2011-2015, positive pressure ventilation is installed in 5 bacteriological laboratories of Oblast TB dispensaries, including bacteriological laboratory in Karaganda penitentiary system with appropriate IC. This will improve efficiency of laboratories and reduce TB incidence in personnel.
- Clinical base of the NCTP was properly rehabilitated and positive pressure ventilation was installed.

Ambulatory and Hospital Substituting Treatment of TB and MDR-TB Patients. Integration with PHC System.

- In 2012, in line with recommendations of WHO mission and NCTP and under support from USAID TB CARE I Project on expansion of ambulatory treatment and psychosocial support to TB and MDR-TB patients, a pilot project on hospital-substitution technology is implemented in Akmola Oblast: day-care hospital and home care.
- National Health Care Development Program *Salamatty Kazakhstan*, 2011-2015, approved by Ordinance of the President of Kazakhstan on 29 November 2010 №1113 is implemented. It provides for stronger integration of TB framework with PHC network.
- Early TB detection and diagnostics, as well as observed treatment of TB patients are strengthened in PHC settings.

Psychosocial Support to TB Patients

- Social support and incentive rewards are provided to patients in all regions. Every year, Oblast Akimats make a positive decision on social support to TB patients at the ambulatory phase. In 2012, such support amounted to US$ 2,224,000 versus US$ 1,707,500 in 2011.
- Patients' Schools are created and operating in Almaty, South-Kazakhstan, Kostanai and Karaganda Oblasts and in Almaty city.

Support to TB Patients in Penitentiary Institutions

- Penitentiary system of Kazakhstan is under the jurisdiction of the Ministry of Interior.
- Health Service is represented by Health Supply Department on the national level, Health Supply Group (15) on Oblast level and Health Units, hospitals and Health Posts (94) on local level.
- Secondary TB aid is provided by 7 regional TB facilities of the penitentiary system (1,840 beds). Staffing of health service with phthisiologists in the civilian sector and physicians in penitentiary system is 94.2% and 75.8% respectively.

Monitoring and Evaluation of TB Control

- With respect to TB and M/XDR-TB, the country is successful in epidemiological monitoring according to principles of Stop-TB strategy.
- Monitoring and Evaluation Teams are set up on national and oblast levels and performance-based M&E of TB response activities is introduced. Every year, according to MoH Order performance-based M&E of TB response activities is implemented in the country with the participation of experts of the MoH, MIA and republican lower-level organizations.
- The Information System was modernized and the National TB Register is maintained on-line now.

Training of Health Professionals

- In the framework of the Program, regular training is organized for health professionals of TB facilities, PHC, SES, Correctional System Committee of the MIA, RC AIDS on MDR-TB, IC, TB/HIV management, monitoring and evaluation, improvement of record and registration of TB patients. Over 18,000 experts attended training in the last two years. Training with developed modules is used at the NCTP, as well as phthisiology-related field visits.

- To improve TB control, international donors (Global Fund, KfW, USAID, KNCV, EXPAND-TB Project) provide grant assistance. The grant assistance is used for training of health professionals at TB facilities, PHC and penitentiary institutions, supply of laboratory equipment to Oblast TB dispensaries, as well as social support to TB patients and health professionals.
- Efficiency of detection and observed treatment of TB patients by health professionals at the supporting phase is directly linked to training of Stop TB strategy (including DOTS and IC) to health professionals in PHC settings, SES and lower-level organizations. For this purpose in 2012 only, over 15,000 experts from PHC, SES, Correctional System Committee and TB facilities attended training on detection, diagnostics and management of MDR-TB, TB/HIV and IC owing to financial support of Rounds 6 and 8 of the Global Fund.
- Integrated Training Center is established to deliver phthisiology skills development cycles, as well as cascade training to experts from PHC, TB facilities, SES and Correctional System Committee.

The following documents on TB control were developed and approved:

- The Guidelines on TB Control in the Republic of Kazakhstan;
- The Guidelines on MDR-TB Management in the Republic of Kazakhstan;
- The Guidelines on Role of PHC in TB Control;
- The Guidelines on M&E of TB Response in the Republic of Kazakhstan;
- TB Drug Needs Estimation Instructions (estimation of TB patients, needs in TB drugs and formulation of the final request for TB drugs to treat M/XDR-TB patients).

These documents were developed and pending for approval:

- IC Guidelines;
- Advocacy, Communication and Social Mobilization National Strategy developed in 2012.

In the process of implementation:

- Joint Action Plan of MoH and MIA on admission to dispensary control, treatment and care of active TB patients with incomplete therapy course released from correctional institutions;
- Comprehensive Action Plan of MoH and MIA on prevention, diagnostics and treatment of TB and HIV-infection in correctional institutions in 2012- 2015.

During 10-18 May 2012, the WHO mission made an external evaluation of TB response in Kazakhstan. In general, the progress of the National TB Program in Kazakhstan was assessed as positive. Significant progress is noted in all aspects of TB prevention and control (TB and MDR-TB diagnostics and treatment, IC, dispensary care, M&E).

Key Challenges of the NTP and Way Forward

Early TB and M/XDR-TB Detection and Diagnostics

At present, TB is largely detected through radiography; however, it does not exclude diagnosis errors and hyper-diagnostics. From year to year, bacteriological TB diagnostics remains low. In 2012, only 42.7% new cases and 67.3% repeated cases were confirmed by bacteriological testing (any methodology). Lengthy MDR-TB diagnostic process on rayon and inter-rayon level results from a number of factors, such as lack of rapid diagnostic methods, challenged transportation of sputum to the bacteriological laboratory of Oblast TB dispensary (due to deficit of vehicles and

large distances); reagent and consumables supply for BACTEC-MGIT-960 and HAIN-test is not regular either. Early TB diagnostics is challenged by limited access of TB suspects to rapid diagnostic methods (G-Xpert), especially on rayon level and in PHC settings.

In-patient and Out-patient Treatment of TB and M/XDR-TB

Despite relatively limited number of TB patients with bacterial excretion among registered cases (11,203 new and repeated cases in 2012), there are 12,063 hospital beds in the country, i.e. more than 1 bed per every patient with bacterial excretion. As a result, TB patients get lengthy care in hospitals regardless of bacterial excretion. Though it should be noted that in the last three years the bed stock in TB facilities of the country decreased by 17.8% (2,607 beds). However, since there is no mechanism to transfer the saved resources (from bed reduction) to strengthening of ambulatory treatment the financing automatically dropped too. Lengthy stay at hospital is somewhat linked to poor quality of ambulatory treatment where free diagnostics of adverse TB drug reactions and ADR reduction, or psychosocial support to improve adherence of patients to treatment is provided. In return, PHC physicians, due to large load and inadequate TB and MDR TB training, are not able to provide proper care to TB patients at ambulatory phase. At present, in PHC settings, only nursing staff responsible for observed therapy is dealing with TB patients. Students with TB stay long in hospitals too because they are not able to attend school in the outpatient settings.

The problems of ambulatory phase of treatment are primarily related to inadequate financing. The existing TB financing is based on hospital bed occupancy rather than therapy course of a TB patient. As a result, 50.4% (up to 66.9% in Mangistau Oblast and up to 59.3% in Karaganda Oblast) of funding allocated per 1 MDR TB patient are used at hospital phase of treatment. In addition, ambulatory treatment financing covers only maintenance and utility bills of DOT rooms and salary of health employees.

MDR/XDR-TB

In 2012, primary MDR-TB was 20.8%, secondary MDR-TB was 53.6% in Kazakhstan. 10,575 MDR-TB patients are on dispensary files. One of the key reasons of MDR-TB prevalence in the country is inadequate infection control in TB hospitals of regional and rayon levels where newly detected and relapse patients with susceptibility to TB drugs and persons with potential drug resistance to TB stay together until DST results. For each patient at rayon and inter-rayon TB hospitals it takes 2-3 months (on average) to get DST results. Only after laboratory confirmation the Central Medical Commission decides to refer the MDR-TB patient to secondary care hospital. It goes without saying that nosocomial transmission of MDR-TB occurs during this period.

TB epidemiology in Kazakhstan remains severe due to chronic TB patients with permanent bacterial excretion which make 3.3% of overall cohort in dispensary files. At present, 563 patients with chronic incurable TB who do not take TB drugs are recorded in dispensary files and 598 patients diagnosed MDR-TB confirmed by laboratory. Following re-orientation of TB beds, 20 departments are opened, generally on inter-rayon level, 690 beds, for isolation and symptomatic treatment of such patients. But they are absolutely inadequate in terms of IC. In the context of unsatisfactory environment in these hospitals, patients subject to palliative care strongly object to hospitalization until they develop severe complications and continue spread of M/XDR-TB. Personnel of these hospitals are not protected from TB infection either and do not get compensation for high risk of TB and MDR-TB infection and psychological and emotional burden.

Health professionals are not trained to provide palliative care to this category of patients. In Kazakhstan, there are no manuals or guidelines on palliative care to TB patients and therefore there are no training courses on this theme either.

In parallel to increased coverage of MDR TB patients with second-line TB drugs some problems occur related to adherence to DOT. In Kazakhstan, there are no unified programs of social motivation of TB patients and health professionals to ambulatory treatment. Social support is usually one-time, while frequency and volume of support vary across oblasts (weekly in Almaty Oblast and Astana, monthly in Kostanai and Pavlodar Oblasts and in Almaty, quarterly in Akmola, Aktobe, West-Kazakhstan, Karaganda and North-Kazakhstan Oblasts and only once a year in Jambyl and South-Kazakhstan Oblasts). The unified mechanism of social support to TB patients is not available, while volume of budget allocations to social support varies across oblasts. In 2012, 59 million KZT was allocated in Astana, while nothing was allocated from local budgets in Atyrau and Kyzylorda Oblasts.

Drug Management

The range of TB drugs needs to be expanded. However, there are more problems in drug management, such as non-observance to Resolution of the Government of 5 December 2011 №1460 *On Approval of Drug Attribution to Prescribed and Non-prescribed Sale* and easy access to TB drugs in pharmacies and non-prescribed sale of anti-bacteria medicines. No regulations are available on distribution and redistribution of TB drugs among various organizations and regions. There are no released Drug Coordinators in all regions and experts to enter data to Pharmacy Component of the National TB Register. The access to Internet for pharmacy TB drug depositaries on rayon level is limited. It should be noted that second-line drugs funded from the republican budget are not in the list of drugs prequalified by WHO.

TB in Penitentiary System

Penitentiary system includes such problems as poor introduction of IC in facilities for TB treatment, and total absence of IC during transfer for investigation action and to service and treatment facilities. Therefore, detention and treatment facilities for TB patients in penitentiary system need to be immediately reconstructed and be appropriate for advanced IC measures. Besides, due to the absence of secondary-care hospitals or wards, the patients with incurable chronic TB who do not take TB drugs stay in TB colonies together with other patients.

Human Resources

Despite regular M&E activities there are no approved M&E groups on national and oblast levels in the country yet. The existing staff of Methodology Units in TB facilities is not sufficient to do epidemiological surveillance and statistical analysis of quality of TB care. All M&E activities in Kazakhstan are funded mainly by the Global Fund. Introduction of innovative rapid TB and M/XDR-TB diagnostic methods calls for staff increase in bacteriological laboratories too.

Social Determinants

Migration processes in the country, as well as steadily growing high-risk population which includes TB/HIV patients, IDUs, alcohol addicts, internal and external migrants, released prisoners have a negative impact on TB epidemiology.

Access of external migrants to quality TB care is limited. Health providers constrain internal migrants to timely registration and prescription of efficient therapy if they do not have permanent place of residence and identification documents. TB patients from high risk groups (TB/HIV, alcohol and drug abusers, disadvantaged, homeless persons, prisoners and the released) hardly get any psychosocial support.

Despite high coverage of TB patients with HIV testing, there are some problems of TB detection in PLHIV. PHC and AIDS Centers are not efficient enough to follow principles of active tuberculosis detection. Coverage of PLHIV with isoniazid prophylaxis and TB/HIV patients with ART remains low as well. Moreover, isoniazid prophylaxis and ART are non-observed. Due to the absence of training courses for physicians from TB facilities, PHC and AIDS Centers on TB/HIV management and treatment, there are no skilled experts in this area in Kazakhstan.

Proposed Way Forward:

1. Improve regulations for primary care and TB service in Kazakhstan in connection with revision of the existing model for services rendered to TB patients: a) amend MoH Order of 07.04.2010 № 238 *On Approval Of Standard Staff Schedule and Staff Standards of Health Care Providers* in respect to released M&E teams, staff positions responsible for TB case management on national, oblast and rayon levels and responsible for drug management, staff increase in bacteriological service and revise staff schedule of departments on M/XDR-TB treatment and palliative care; b) include limited drug list for prevention and reduction of adverse drug reactions to MoH Order of 4 November 2011 №786 *On Approval Of List of Drugs and Medical Devices for Free Supply to Population in the framework of Guaranteed Benefit Package at the Out-patient Level with Certain Diseases (Conditions) and Special Medical Products*, c) provide psychosocial support to TB patients on all phases of treatment, including high risk groups, d) jointly with the Ministry of Education and Science, develop education mechanism for children with TB during the treatment course; e) amend regulations on drug management.

2. Reform TB service in Kazakhstan including in penitentiary sector by reducing low-efficiency and low-capacity hospitals and strengthening large-scale, efficient, multi-disciplinary hospitals for TB and M/XDR-TB care.

3. Develop palliative care hospital regulations and clinical guidelines on palliative care. Develop skills of health professionals from such hospitals.

4. Expand ambulatory treatment of TB patients in PHC settings by training PHC physicians on TB treatment and management, monitoring of quality of ambulatory treatment, introducing differentiated remuneration of PHC health professionals according to volume and quality of works.

5. Expand access to G-Xpert for TB and MDR-TB suspects, including prisoners and migrants. Supply G-Xpert to rayon and inter-rayon TB dispensaries to improve timely MDR-TB diagnosis, regular supply of regents and consumables for all bacteriological and molecular TB and M/XDR-TB diagnostic methods through local budgets, including needs of the penitentiary system.

6. Jointly with the Ministry of Labor and Social Security, develop and approve criteria and tools for social support to TB patients.

7. Develop guidelines on drug supply to TB patients, strengthen government monitoring over sales of TB drugs and other antibacterial medicines via retail pharmacy network, and ensure unlimited Internet access at all pharmacy depositaries of TB facilities.

8. Train M&E Coordinators, infection disease physicians of AIDS Centers, narcologists, PHC specialists on TB/HIV management and treatment. Develop guidelines on co-infection case

management: TB/HIV, M/XDR-TB/HIV.

See detailed analysis of the existing problems of the NTP and way forward in Chapter 3.

CHAPTER 3: MASTER PLAN

TB BURDEN AND CONTROL STRENGTHENING IN THE REPUBLIC OF KAZAKHSTAN

1. Background

The Republic of Kazakhstan is an independent state in the Central Asia with 2.7 million sq.m. of area. It is the second largest country in the former Soviet Union straight after the Russian Federation and the ninth largest country in the world. Kazakhstan borders with the Russian Federation in the north, China in the east and Kyrgyzstan, Uzbekistan and Turkmenistan in the south. Kazakhstan is almost a landlocked country with two enclosed inland seas: the Aral Sea and the Caspian Sea. The country spreads across steppes and deserts up to highlands in the north-east, including Tien Shan and Altai[2].

Similar to geographic variety the country is also diverse in ethnic terms. In 2012, approximately 16.8 million people divide into 130 ethnic groups, where 57.2% are the Kazakhs, 27.2% are the Russians and 15.6% are other ethnicities[i]. The major religions are Islam and Russian Orthodoxy. The official national languages are Kazakh and Russian. Since 1997, Astana is the capital of Kazakhstan with population 709,000 people; followed by the second largest city Almaty which used to be a capital with population 1,438,000 people and then Shymkent (630,000) and Karaganda (472,000). The country is divided into 14 Oblasts; all Oblasts and two cities with an individual status – Astana and Almaty – are divided into Rayons.

Kazakhstan is classified by the World Bank as an upper middle income country, with GDP per capita US$ 11,950 in 2012[3]. After gaining independence the economy of the country faced a heavy fall in the early 1990-ies with its peak in 1994 when GDP fell by 17.8%. In 1999, GDP of Kazakhstan resumed its growth due to rapid development of the energy sector. Afterwards, GDP growth remained high - almost 10% each year, these indicators enabled the country to become economy with the highest growth in the world[4].
Agriculture offers the majority of jobs in the country; approximately one third of the entire population works in this sector. Poverty rate has essentially dropped in the last years from 12.7% in 2007 to 5.3% in 2011. There is a divergence in poverty rate between urban and rural areas. Education remains universal and compulsory in the country. In 2009, literacy rate among adults was 99.7%[2].

1.1. TB Prevalence, Incidence and Mortality

Kazakhstan is classified by WHO as a TB high priority country and with heavy burden of MDR-TB. After significant increase in the late 1990-ies and early 2000-ies, the estimated TB incidence reached the peak in 2003; but afterwards the trend was permanently dropping. In 2010, approximately 3,600 (2,200-5,800) HIV-infected people died of TB, 23 (14-36) per 100,000.

The statistics in 2011 shows 2,200 TB-related deaths or 14/100,000 as a mortality rate; the morbidity during this year accounted to 129/100,000 (Table 1).

[2]Kazakhstan health system review. Vol 9, No 7, 2007. Available from
[3]http://data.worldbank.org/country/kazakhstan
[4]http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113406.pdf

Table 1: TB epidemiology in Kazakhstan in 2011.

TB burden	Quantity (thousands)	Rate (per 100,000)
Mortality	2.2 (2.0-2.5)	14 (12-15)
Prevalence	27 (11-51)	168 (66-316)
Incidence	21 (18-24)	129 (109-151)
Case detection	87 (75-100) %	

Source: WHO http://www.who.int/tb/country/data/profiles/en/index.html

The outcomes of treatment vary depending on a category of the TB patient; it is lower among previously treated TB patients (47%), slightly higher among new cases with positive sputum smear test (61%), 73% - for patients with MDR-TB and the highest (85%) among new cases with negative sputum smear test and extra pulmonary TB (Table 2).

Table 2: Outcomes of treatment of TB patients (cohort of 2010), Kazakhstan

Outcomes in 2010	Successfully cured (%)	Deceased (%)	Failed (%)	Lost * (%)
New cases with positive sputum smear	61	3.2	6.7	2.4
New cases with negative sputum smear /extra pulmonary	85	1.4	2.5	1.7
Previously treated cases	47	8.7	4.5	4.8
MDR-TB cohort of 2009	73	6.5	7.2	5.3

Source: WHO http://www.who.int/tb/country/data/profiles/en/index.html

In 2011, detection rate amounted to 87%; however, case registration rate varied by oblasts between 96.1 and 223.6 per 100,000 (Figure 1).

Figure 1. Registered TB cases (new and re-treated) per 100,000 in Oblasts of Kazakhstan, 2011

1.2. M/XDR-TB

According to WHO, Kazakhstan finds itself among 15 countries with the highest burden of MDR-

TB in WHO European Region. In 2010, it amounted to 5,500 – 6,800 MDR-TB all cases. It is estimated that 14% of all registered new cases and 45% repeatedly treated cases are MDR-TB (Table 3).

Table 3. MDR-TB Burden in Kazakhstan, 2011

MDR-TB burden	Quantity ('000)	%
Estimations of registered TB cases:		
MDR-TB among new cases	3.8 (3.6-3.9)	30 (29-32)
MDR-TB among previously treated cases	4.5 (4.3-4.6)	51 (50-53)
Registered MDR-TB cases being treated	4.7	63

Source: WHO http://www.who.int/tb/country/data/profiles/en/index.html

According to the existing country policy, Drug Susceptibility Testing (DST) to 1st line TB drugs is mandatory for all new and repeatedly treated cases in the country. In 2011, DST coverage was 93.8% for culture-confirmed new cases and 93.6% for culture-confirmed repeated cases (Table 4). Recent reports show that DST coverage is low relative to total pulmonary TB cases with the account that only 42.7% of new pulmonary TB cases and 58.6% of repeated cases have positive culture. This is because there is a regular x-ray screening (fluorography) in the country and TB diagnosis is based on radiological lung changes in the M. tuberculosis smear and culture negative cases. The annual x-ray screening is conducted for all pupils of secondary schools and high schools students, staff of the health care facilities, kindergartens and schools, persons on military service, workers of public feeding facilities, MiA staff, pensioners, and risk groups (persons with diabetes, pulmonary diseases, stomach ulcer, hormone-depending, HIV infected, former TB patients, alcohol and drug abusers, as well as persons presented themselves to PHC facilities). In addition, the low bacteriologic yield is probably could be explained also by inappropriate sputum collection and transportation from raions to bacteriological laboratories of oblast TB dispensaries.

New diagnostics methods, such as **GenoType MTBDR*plus*(Hain)** and Xpert MTB/RIF approved by WHO are currently on the initial stage of introduction or piloted. So far, the results gained in the country are not reviewed yet. However, it is expected that the use of new diagnostic methods will contribute to increased rate of detected MDR-TB patients.

Table 4. Culture survey and DST coverage, MDR-TB among detected and estimated cases in Kazakhstan, 2011

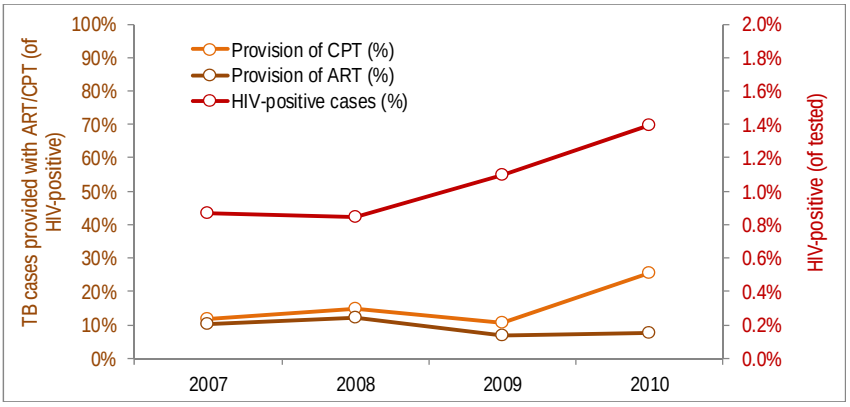
	New cases		Re-treatment cases		Total cases	
	N	%	N	%	N	%
PTB cases notified	12399	-	8304	-	20703	-
- with a culture result	11717	94.5%	7748	93.3%	19465	94.0%
- culture-positive	5293	42.7%	4862	58.6%	10155	49.1%
Culture-positive PTB cases with DST result available	4963	93.8%	4551	93.6%	9514	93.7%
MDR-TB cases detected among notified PTB cases	1453	11.7%	2286	27.5%	3739	18.1%
MDR-TB cases estimated among notified PTB cases	1700	14.0%	3700	45.0%	5400	26.1%

1.3. TB/HIV co-infection

In Kazakhstan, response to TB/HIV is in line with WHO's TB/HIV policy[5]; HIV testing coverage among TB registered cases is high (according to data of 2010, HIV status is clear for 96% TB cases). TB/HIV rate demonstrates a growing trend but remains low. In 2010, HIV prevalence among TB was 333 (1.4%) cases. In 2007-2010, co-trimoxozole preventive therapy (CPT) and Antiretroviral therapy (ART) were not regular for HIV-positive patients (Figure 2). In 2010, 85 (25.5%) HIV-positive TB cases received CPT and only 25 (7.5%) received ART.

Cumulatively as of 01.01.2013, 3,452 TB/HIV co-infected persons were detected in Kazakhstan, 627 (18%) of them were detected for the first time in 2012. In 2012, 559 persons living with HIV died of various diseases, 45.0% deaths were caused by TB (251 PLHIV), 5.0% were diagnosed TB postmortal, 6.0% interrupted TB treatment due to interruption of regime, 39.0% took TB drugs from several days up to 3 months, and 30.0% over 3 months. 37.0% (94 out of 251) of the diseased were under ART, 50 of 94 (53%) of them discontinued the therapy due to low commitment and rejection of ART.

Figure 2: The share of HIV-positive TB cases, provision of CPT and ART, 2007-2010



When TB is detected in any TB institution they counsel and perform HIV-test. The test coverage in the country reaches 98% of all notified cases. Thereafter, if a patient continues to be cared in the active group, HIV-testing is performed every six months. Analysis of co-infection detection in the course of HIV-testing among TB patients shows the growing number of co-infected people. In 2010 in the course of HIV-testing among all TB cases 333 (1.4%) TB/HIV cases were detected, 145 (1.0%) of them among new cases; while in 2012, this indicator was 441 (2.1%) and 256 (1.9%) among new TB cases (Table 5).

Table 5. TB/HIV detected cases in the course of HIV-testing

Years	Cases	Number of HIV tested TB patients	Positive outcomes
2010	All TB cases New cases	23,852 15,301	333 145
2011	All TB cases New cases	22,480 14,248	352 179
2012	All TB cases New cases	21,184 13,653	441 256

[5]Report of the 16th Core Group meeting Almaty, Kazakhstan, available fromhttp://www.stoptb.org/wg/tb_hiv/assets/documents/Final%20Report16CG%20meeting.pdf

Analysis of TB/HIV patients by Oblasts shows high proportion of cases in the regions with high prevalence of HIV-infection. In 2012 in Karaganda Oblast, the proportion of TB/HIV patients was 22%, in Almaty - 18%, in Kostanai Oblast - 9%, Almaty Oblast – 9.5%, South Kazakhstan Oblast – 9%, Pavlodar Oblast - 8%. These are the regions with developed urbanizations and where penal institutions are located.

In 2012, 159 TB/HIV patients (205 in 2011) were detected in penal institutions. Of them, the ART coverage in 2012 was 55% (58.7% in 2011). According to Oblast AIDS Centers, the coverage in the country with isoniazid preventive therapy is 90.3% (89.6% in 2011). In order to improve general coordination between TB and HIV/AIDS programs a new Order *On Strengthening Tuberculosis and HIV-Infection Control in the Republic of Kazakhstan* was drafted and sent for approval to the Ministry of Health of Kazakhstan on 27.02.2013.

Experts responsible for interaction on TB/HIV on all levels of tuberculosis institutions were appointed in the regions. The Republican AIDS Center and Republican Scientific-Practical Center for Medical and Social Problems of Drug Abuse developed monitoring and evaluation indicators on TB/HIV (*Annexes 2, 3, 4 in the new Order*). To improve TB/HIV management, all TB patients go through counseling and HIV-testing. From January 2013, HIV-infected persons are involved to TB screening group using rapid diagnostics tool (G-Xpert). At PHC, HIV-infected people referred by AIDS Centers every year take TB photoroentgenography, and if coughing is available and/or any other complaints suspected of TB, experts from AIDS Center refer PLHIV to local PHC institutions for TB diagnostics. PLHIV with negative results of the TB screening are referred to TB specialist for IPT commencement. At the PHC facilities PLHIV are not in contact with contagious TB patients because TB patients are smear and culture negative. In addition, DOT cabinets have separate entrances and exits.

From 2011, 2 departments to treat new TB/HIV cases were organized based on Temirtau TB Dispensary: the first department (80 beds) is for smear positive patients while the other one (60 beds) for smear negative patients. In 2011 and 2012, 546 and 550 patients were treated in these departments respectively with hospital mortality 10.8% and 6.7% respectively.

In 2012, of all detected TB/HIV cases, 53.7% (359) received ART and 67.3% (422) CPT**.** Such treatment is prescribed by infection disease doctor of the AIDS Center (between 2 and 4 weeks from inception of TB treatment). TB/HIV patients receive CPT and ART unobserved irrespective where a patient is treated. Izoniazid chemical prophylaxis is not observed either. Due to wide spread of MDR-TB in the country doctors do not always believe in efficiency of izoniazid chemical prophylaxis (IPT). IPT for PLHIV is prescribed by TB specialists of the territorial TB facilities just after the exclusion of active TB based on the clinical, bacteriological and radiological examinations. After that IPT for PLHIV is done one time at the AIDS centres during 6 months. The development of invoice for isoniazid for IPT and its purchase is AIDS centres responsibility. IPT is unsupervised and isoniazid is delivered to patients for several months.

It should be noted that there are certain challenges in TB differential diagnostics of PLHIV at PHC level due to inadequate access to rapid TB diagnostics. TB/HIV patients are inadequately covered with ART due to low adherence to ART and adverse reactions because of poor patients' information about ART effectiveness and possible adverse reactions. Because of lack of qualified experts to treat TB/HIV co-infection among phthisiologists, ART adverse reactions are not cut short adequately and timely. At present, there are no standards for psychosocial aid to TB/HIV co-infected patients from vulnerable population (injecting drug users, of no fixed address, etc.).

1.4. TB in Prisons

Medical aid management and provision to prisoners and persons on trial is organized in line with Article 88 clause 4 of the Code of the Republic of Kazakhstan *On Health of the Nation and Health System* ("Health Code") and regulated in accordance with *Rules for Delivery of Health Services to Persons with Restraint of Liberty and Serving Sentence in Special Detention Institutions* approved by Resolution of the Government of Kazakhstan dated 7 April 2012 № 430. All Orders related to medical aid provision to prisoners and persons in detention have to be agreed with the Ministry of Health of Kazakhstan and based on WHO recommendations. The correctional system of Kazakhstan includes 76 penitentiary institutions, 18 detention facilities, 3 educational institutions, 3 republican public enterprises (Enbek, Enbek-Karaganda, Enbek-Oskemen), 240 correctional inspections. Cooperation between MoH and MoI is based on the joint MoH prikaz No 117 and MoI prikaz No 155 (issued in February 2012) "On the approval of the anti-TB care organizational rules for persons at the correctional facilities of the MoI".

Total beds in penitentiary system are 4,298 where 1,840 beds are for TB patients. According to Health Service Support Department of the Correctional System Committee of the Ministry of Interior of Kazakhstan, there are 100 TB hospital beds in TB institutions of the Correctional System of the Ministry of Interior of Akmola Oblast, 180 beds in East-Kazakhstan Oblast, 960 beds in Karaganda Oblast, 150 beds in Pavlodar Oblast, 150 beds in North-Kazakhstan Oblast and 300 beds in South Kazakhstan Oblast. Health institutions in penitentiary system include 13 general hospitals, 1 mental health facility, 7 TB hospitals; they are treated as specialized institutions. Besides, the correctional system includes 74 medical units based at the correctional institutions and 17 medical units with phthisiologist or GP doctor responsible for prevention and first aid measures to relevant prisoners. Medical units are available at each correctional institution, detention center and penal colony settlements. According to Order of the Ministry of Justice № 347 dated 31.12.2010 agreed with the Ministry of Health, all medical units are equipped with minimum needed medical equipment. 88.9% buildings in medical units of penitentiary institutions were commissioned last century. Therefore, the majority of medical units including those for TB are located in adapted facilities (60 or 63.8%) and only 34 medical units (36.2%) have standard design. None of the TB hospitals meet international standards and are equipped with engineering tools of infection control.

In early 2000, the Government of Kazakhstan initiated reform of correctional system by changing jurisdiction from the Ministry of Interior to the Ministry of Justice. In 2011, the penitentiary system returned to the jurisdiction of the Ministry of Interior by the Decree of the President and the same year approximately 11,000 prisoners were amnestied due to 20th anniversary of independence of Kazakhstan. Among amnestied persons, there were 200 (1.8%) TB patients, who continued treatment at the civilian sector's TB facilities.

In the last years, reform of the criminal law and introduction of alternative punitive measures in legislation led to reduced number of prisoners in correctional institutions. This enabled Kazakhstan to descend from the 3rd position to 30th in terms of prison population in 2012.

Table 6. Prison population in Kazakhstan, 2003-2012

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
51,788	49,522	44,234	42,428	44,556	49,272	53,802	52,580	46,629	42,362

According to International Center for Prison Studies in 2012, the number of prisoners made 392. 8 per 100,000; 321 per 100,000 in 2010; 318 per 100,000 in 2011. As of 1 January 2013, the number of isolated prisoners in Kazakhstan is 45,335 and 14,424 are not isolated.

In the last ten years, the TB incidence in penitentiary system was lowering; however, in 2012, the incidence grew from 522.5 to 941.1 per 100,000 prisoners. TB incidence growing is possibly

connected with the decreasing of the prison population (see table 6) and improvement of access to TB and MDR-TB diagnosis, including the rapid tests.

Table 7. TB incidence per 100,000 prisoners in Kazakhstan, 2003-2012

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1,936.7	1,573.0	1,391.0	771.3	750.5	767.6	643.9	672.8	522.5	942.1

Mortality has similar trends. Essential growth of absolute number of deaths caused by TB in penitentiary system during 2005 - 2010 is attributed to increased number of patients with DR-TB treated with 1st line drugs only. Treatment with 2nd line drugs was initiated as late as in 2010 and this enabled considerable drop of prisoners' mortality from TB in 2010 versus previous year when the mortality rate reached its peak. It should be noted that notwithstanding absolute decrease of deaths caused by TB in 2012 the mortality from TB per 100,000 prisoners substantially grew due to decrease of prison population in the country (Table 8.)

Table 8. TB Mortality per 100,000 prisoners in Kazakhstan, 2003-2012

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
94.7	69.2	46.1	64.9	83.2	115.9	107.7	94.0	61.4	115.2

As a result, regular supply of TB drugs and introduction of observed therapy enabled drop of TB incidence and mortality.

However, extensive use of 1st line TB drugs to treat patients with unknown status of mycobacterial resistance and inadequate use of 2nd and 3rd line TB drugs led to wide spread of MDR-TB among prisoners.

Another cause of DR-TB growth is limited access of prisoners to laboratory methods of rapid DR diagnostics. Besides, the situation is worsened by:

- late inception of therapy for patients with laboratory confirmed DR-TB;
- lengthy stay of DR-TB patients with patients excreting susceptible mycobacteria and patients without bacterial excretion in the same facilities; absence of infection control in penal colonies to keep and treat TB patients;
- no infection control measures during transportation of prisoners.

Besides, TB epidemiology is damaged by poor motivation of prisoners to health maintenance and disrupted therapy, drug and alcohol abuse, HIV-infection and other concomitant diseases, as well as non-compliance with the regime and unobserved use of TB drugs.

See Table 9 for comparison of MDR-TB rates between 2003 and 2012.

Table 9. MDR-TB rates in penitentiary system (%), 2003-2012

MDR-TB	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Primary	0	0	12.6	21.4	17.8	24.9	38.7	40.6	33.8	29.7
Secondary	0	0	55.1	55.4	52.2	59.4	64.6	72	60.7	63.4

Photoroentgenography performed twice a year remains a priority in detecting TB cases in penitentiary sector of health care.

Laboratory network of penitentiary system includes 41 microscopic laboratories and 1 bacteriological laboratory in correctional institutions of Karaganda oblast.

From 2008-2010, microscopic laboratories in correctional institutions of Pavlodar, Aktobe and Jambyl Oblasts are integrated into updated External Quality Assessment (EQA) Scheme by using random smear sample collection and panel testing. In the framework of EQA, sputum bacteroscopy in penitentiary system proved 90-95% coincidences.

In 2012, laboratory tests in penitentiary system include sputum bacterioscopy in all Oblasts and culture test and susceptibility to 1st and 2nd line TB drug testing in solid and liquid media and the Hain test in Karaganda Oblast. Thus, culture and susceptibility to 1st and 2nd line TB drug testing in other Oblasts are performed by laboratories from civil health sector and regulated by Joint Order of Ministers of Health and Interior dated 27.02. 2012 № 115/117 *Rules for TB Treatment of Persons in Correctional Institutions of the Ministry of Interior of the Republic of Kazakhstan*.

Analysis of data from the national reference-laboratory showed only partial execution of the above Order in practice. Combination of limited stay in detention centers and the existing practice of assigning certain Oblasts in the country to 7 institutions for stay and treatment on convicted TB patients lead to inability to divide patients according to bacteriological status during transportation and after arrival to TB control penal colony. Besides, there are no formal regulations on cooperation of penitentiary and civil services in the field of laboratory diagnostics. Currently, notwithstanding vacancies for health professionals in correctional institutions (savings on payroll), no contracts are executed between health facilities of both sectors and experts from civil laboratories are not compensated for extra testing. Besides, laboratories of the correctional system are not integrated into the single EQA for culture and susceptibility testing. Inmates have limited access to rapid laboratory diagnostics as well (Hain test and GeneXpert MTB/RIF). GeneXpert MTB/RIF should be introduced at detention centers in oblasts because: (1) a detention center is on a border line between civil and penitentiary society; (2) short stay of prisoners at detention centers; (3) detention center is an institution which distributes TB patients to other penitentiary institutions of Oblast and the country; (4) detention center is located in a city; (5) maximum capacity of a detention center may exceed 1,000 inmates; (6) the number of penitentiary institutions may exceed three; (7) there is a TB hospital in a city for treatment of TB patients.

Proper TB treatment is arranged in all detention centers. If TB has to be treated in penal colony settlements the administration of the local TB hospital of the civil health sector bears responsibility for registration, treatment and TB drug supply.

Procurement of 1st line TB drugs for patients in correctional institutions was for 100% funded from the republican budget, in 2010, 2nd line TB drugs was for 100% funded from the grant of the Global Fund, and in 2011-2013 – 70% from the GF and 30% from republican budget, from 2014 – 100% from republican budget.

Analysis of outcomes of treatment of new TB cases with bacterial excretion showed low efficiency of treatment - 53% (Table 10).

Table 10. Outcomes of treatment of new TB cases with bacterial excretion in penitentiary system of Kazakhstan in 2003-2012 (%)

Outcome	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cured	54.6	50	54.8	45.7	58.6	53.3	58	54.1	55.9	53
Treatment completed	0	2	0	0	0.4	0.5	0	0	0	0
Disrupted	0.6	0	0.4	1.5	0.9	0.5	3.2	2.1	4.4	3.7
Died	0.8	1	0.6	0.9	1.4	4.9	3.2	2.1	4.6	3.3
Failed treatment	18.5	25	26.5	26.4	22.3	22.5	19	22.3	24.1	25.1
Transferred	25.5	22	17	24.5	15.3	7.7	8	12.5	7.5	14.6

Considering regular supply of 1st line TB drugs such outcomes indicate late diagnosis of TB and undetected MDR-TB and unobserved therapy. The share of failures remains high and disrupted treatment is growing too. High failure rate (25.1% in 2012) may indicate MDR-TB among prisoners. This calls for a review in the framework of operational study, the findings of the study may have impact on changes in procedure and management of TB patient treatment in penitentiary system under direct care.

As it was mentioned above, absence of infection control measures is a significant disadvantage for treatment of TB patients in penitentiary system. Spread of communicable diseases in correctional institutions poses a serious threat for prisoners and general public as well. An urgent reconstruction of penitentiary facilities is needed to enable stay and treatment of prisoners with the account of advanced infection control measures; timely inception of treatment with 2nd line TB drugs and selection of penitentiary institutions for treatment of MDR-TB patients.

Regarding staffing of correctional institutions it should be noted that they have been understaffed with health professionals for some years. According to official statistics of the Correctional System Committee of the Ministry of Interior, the penitentiary sector is understaffed with health professionals, mainly therapists and radiologists. Besides, the staff of penitentiary system does not envisage medical psychologists. On average, correctional institutions are staffed with doctors jointly with second job employees by 73.3%, with nursing staff by 96.6%; and without second job employees by 53.6% and 96.1% respectively. Personnel interview has indicated the following reasons of understaffing with health professional in penitentiary system: distance of these institutions from Oblast Centers, no extra pay for phthisiologists for harmful working conditions and challenges in treatment of prisoners. Besides, curriculum for specialists in penitentiary sector should include timely TB detection, diagnostics, treatment and management.

In the last years, budget financing of the correctional system grew several fold. According to Resolution of the Government of 7 November 2009 № 1781 *On Designated Single Distributor for Procurement and Supply of Drugs, Medical Tools*, limited liability company *SK-Farmacia* was designated as such single distributor in the framework of guaranteed benefit package. Therefore, correctional institutions dealing with TB treatment entered into contracts with *SK-Farmacia* for procurement of 1st line TB drugs. Following WHO recommendations, the treatment of MDR-TB with 2nd line TB drugs has been practiced in civil health sector from 2001 while in penitentiary sector from 2010. 2nd line TB drugs were procured through the republican budget to treat MDR-TB in penitentiary system for 30 patients in 2010 and 150 patients in 2012. In 2013, it is planned to procure 2nd line TB drugs for 150 patients.

National TB Program is the principal recipient of Round 6 (2007-2012.) and Round 8 (2010-2014) of the Global Fund to Fight AIDS, Tuberculosis and Malaria. In the framework of these grants the

country procured 2nd and 3rd line TB drugs of a guaranteed quality for 510 MDR-TB patients in Almaty (Round 6) and 6,310 M/XDR-TB patients all over the country (Round 8). Following GF's Round 8 2nd line TB drugs are supplied for MDR-TB patients in 7 TB institutions of penitentiary system of Kazakhstan (in 2010 for 355 patients, in 2011 for 200 patients, in 2012 for 470 patients, and in 2013 for 300 patients). Drugs to treat XDR-TB in penitentiary system are not funded by Global Fund or the republican budget. It was because of absence of XDR-TB diagnosing and notification in the penitentiary system. From 2015 the introducing of the third-line anti-TB drugs for XDR-TB treatment in the penitentiary system has been planned, since anti-TB drugs procurement for 2014 has been performed in the 3rd quarter of 2013. According to the joint MoH prikaz No 117 and MoI prikaz No 155 (issued in February 2012) "On the approval of the anti-TB care organizational rules for persons at the correctional facilities of the MoI" treatment of XDR-TB patients at the correctional facilities can be covered by civilian sector according to the needs.

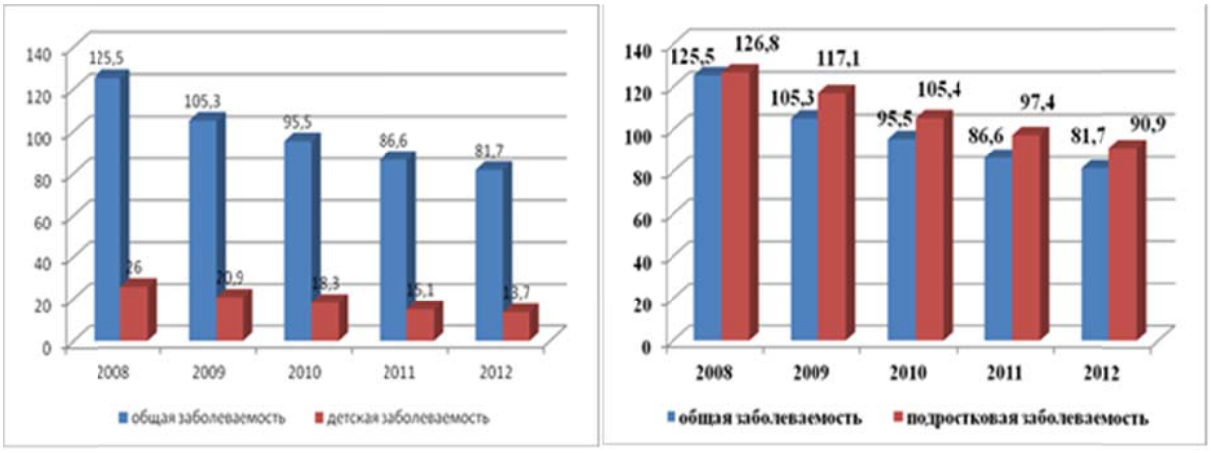
1.5. TB in Children

In 1999 during the period when a TB epidemic was announced and a new TB strategy recommended by WHO was introduced, the registered TB rate in children was the highest (57.6 per 100,000 children). Due to appropriate TB control the registered TB incidence in children dropped by 47.3% in the last five years and in 2012 it was 13.7 per 100,000 children versus 26.0 in 2008 (Figure 3). However, the incidence rate varies across Oblasts between 6.5 and 24.7 per 100,000 children. In 2012, TB incidence in children grew in North-Kazakhstan and Kyzylorda Oblasts beyond the average in the country 1.8 and 1.5 times respectively.

Among annually registered TB cases the share of childhood TB dropped from 5.0% to 4.2% in the last five years, and it is falling every year by 0.16% on an average. The share of children with destructive pulmonary tuberculosis dropped as well from 18.6% in 2008 to 10.1% in 2012. During 2008-2012, 3,710 new childhood TB cases were registered including 12 with TB meningitis. Every year, the number of registered TB meningitis was falling from 5 in 2008 to 2 in 2012.

In 2012, 578 cases of TB in children were registered where 218 (21.8%) children aged 0-4, this is twice as much as TB in children aged 5-7: 109 (18.6%). Among all registered childhood TB cases the share of pulmonary TB is 45.8%, 8.7% of it confirmed by bacterioscopy and 32.8% by culture (2012). Extra pulmonary TB detected in 54.2%. In 2012, TB incidence in adolescents dropped by 27.7% versus 2008 and made 90.0 per 100,000 (Figure 3).

Figure. 3. TB morbidity (per 100,000) in children and adolescents in 2008-2012

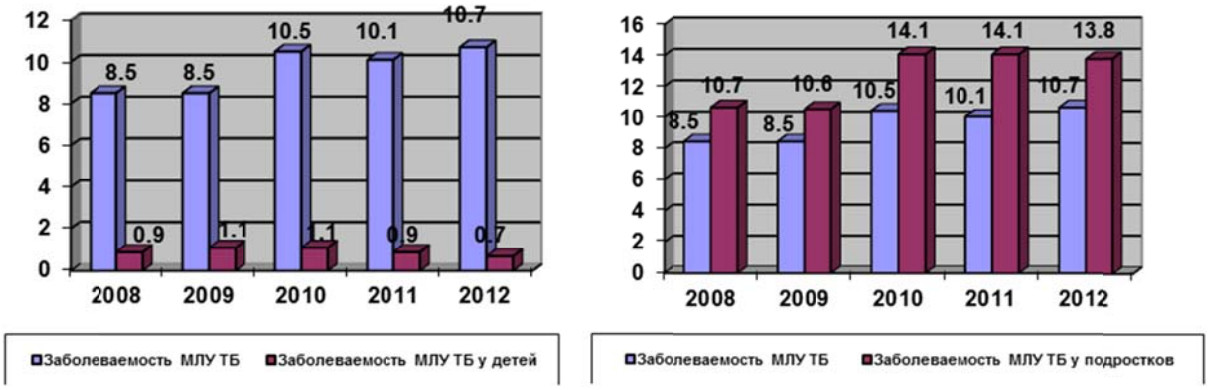


The major reasons of high TB incidence in this age group are overall TB incidence, untimely detection and treatment of TB patients with bacilli excretion and poor epidemic control and

prevention in centers of TB infection. But notwithstanding some decrease of TB incidence in children, the MDR-TB incidence grew from 2008 (0.2/100,000) to 2012 (0.7/100,000) 3.5 times (Figure 4).

In 2012, 29 new MDR-TB in children were registered. In the last 5 years, the share of children in all registered MDR-TB cases varied from 0.8% to 3.1%; and in 2012 it amounted to 1.6%. During the same period MDR-TB incidence in adolescents grew by 29.0%; and in 2012 it amounted to 13.8 versus 10.7 per 100,000 in 2008 though during this period their share dropped from 6.5% to 5.8% to overall registered MDR-TB cases in the country.

Figure 4. MDR-TB morbidity in children and adolescents in 2008-2012



TB in children is prevented through specific immunization with BCG vaccine, as well as chemical prophylaxis of contact and HIV-infected persons and persons with latent TB infection. BCG vaccination is undertaken twice: in the first days after birth and then at the age of 6-7 (1-st year schoolchildren) following mass TB diagnostics with negative Mantoux test 2 TE. From 2005, BCG vaccine made in Japan is used. Annual coverage of newborns with BCG vaccination is over 97%, and with BCG re-vaccination approximately 50% of 1st year schoolchildren. However, according to WHO recommendations, only newborns are subject to vaccination while re-vaccination and mass TB diagnostics at any age are not required. The incidence of complications following BCG vaccination varies between 0.01% and 0.02%, mostly as regional lymphadenitis (94.3%), where, on average, 36.1% children were subject to operative therapy. Also in the event of BCG lymphadenitis in order to speed up regenerative process of specific inflammation the 1st line TB drugs may be used excluding pyrazinamide. Quantity of drugs depends on manifestation of inflammation in lymphonodus which is inconsistent with WHO recommendations.

The key measure of TB prophylaxis in children is TB early detection and efficient treatment of adults. In the course of examination of contact children when an adult TB patient with bacterial excretion is detected, the incidence among children was 198.5 and without bacterial excretion 10.8 per 100,000 contacts. Every year for TB detection in children, PHC undertakes screening with tuberculin test (Mantoux) 2TE in risk group. In 2012, through such screening covering almost 50% children, including TB contacts, TB is detected in 381 (65.9%) out of 578 detected childhood TB cases. In risk groups, the majority (66.6%) covered with PPD test is children from disadvantaged families. They represent the highest morbidity 135.9 per 100,000 covered with Mantoux test 2 TE.

For the purpose of early TB detection, the adolescent population of Kazakhstan is annually subject to mass photoroentgenography. The share of adolescents with detected TB in the course of prophylaxis photoroentgenography is 76.4%.
Contact children are examined and observed every 6 months irrespective of adult's bacterial

excretion. In 2012, 22 TB cases were registered in contact children; this is 3.8% of all registered childhood TB cases. The share of cases detected through clinical manifestations and X-ray is 30.3% (175 cases).

Diagnostics of TB and MDR-TB in children and adolescents is performed through standard diagnostic minimum which includes bacterioscopy and culture testing in solid and liquid media. Susceptibility of mycobacteria is tested to 1st and 2nd line TB drugs, as well as molecular genetic methods including G-Xpert MTB/Rif. Out of 110 children suspected for TB it was detected in 33 (30%), where with susceptible mycobacteria in 23 (20,9%), and resistant to rifampicin in 9 (8.1%) by G-Xpert MTB/Rif. TB meningitis was diagnosed in 2 children through spinal fluid testing. Taking into account the high MDR-TB rates in the country, the expansion of indications for G-Xpert MTB/Rif in children, including those from MDR-TB sources.

From 2008, the Global Drug Facility allocates child doses 1st line TB drugs to Kazakhstan. 2nd line TB drugs are available for MDR-TB children as well; they are funded either by the republican budget or Global Fund. There are 1,020 hospital beds to treat TB in children and adolescents in the country. The majority of children are treated in hospitals. A decision on out-patient case management is taken by consultation of experts from the National Center for Tuberculosis Problems and Oblast Centers according to location of TB detection.

The indications to out-patient TB treatment of children and adolescents are:

- new-onset limited drug susceptible TB without complications – supportive treatment untill sputum conversion through bacterioscopy and culture if treated in a hospital;
- absence of pulmonary destructions during chemotherapy;
- good social and housing conditions of a family.

In a cohort of TB children treated with 1st line TB drugs in 2011, 87.4% are successfully cured, 1.8% failed, 0.9% died, 0.9% transferred, 0.2% disrupted regime, and 57 MDR-TB patients (8.7%) transferred to category IV to start treatment with 2nd line TB drugs. Treatment of children with 2st-line anti-TB drugs was started during their treatment with 1st-line drugs after MDR-TB diagnosing, except children from MDR-TB contacts. Children from MDR-TB sources have been treated with 2nd-line anti-TB drugs based on DST of contacts.

In 2010 in a cohort of patients category IV, 89% were successful, 5.5% died and 4.4% transferred. It means that timely detection and correct treatment of TB in children may yield high success rate. Efficiency of tuberculosis control in children and adolescents is assessed in the course of monitoring visits at Oblast and Rayon levels.

<u>Key achievements of TB control in children and adolescents:</u>

- up-to-date international recommendations on TB detection, diagnostics, treatment and prophylaxis are gradually introduced in the country;
- 1st line TB drugs child doses are used, that were delivered through Global Drug Facility (GDF) because there is no procurement mechanism of anti-TB drugs in child doses from republican budget.
- 2nd and 3rd-line anti-TB drugs to treat M\XDR-TB are available as well;
- efficiency of Diaskintest for TB detection is reviewed;
- TB surveillance system is well organized;
- out-patient model for treatment of TB in children is under development; the model is based on the findings of a pilot project in Akmola Oblast;

- monitoring mechanism for TB detection, diagnostics, treatment and prophylaxis in children and adolescents is developed.

Key challenges in TB control in children:

- incomplete coverage of newborns with BCG vaccination due to refusal from parents;
- computer tomography for TB diagnostics is not available in each oblast;
- low rate of bacteriologically confirmed TB in children;
- 1st line anti-TB drugs child doses registered in Kazakhstan and purchased from republican budget are not available;
- mechanism for training of children and adolescents at the outpatient phase of treatment is not available;
- pediatric phthisiologists and PHC pediatricians are not trained on MDR-TB management;
- special national guidelines on TB and MDR-TB in children and adolescents are not available.

1.6. TB in migrants: development and introduction of highly efficient TB, M/XDR-TB and TB/HIV control in internal and external migrants

Recently, migration processes in Central Asian Republics (CAR) have been very active due to rapidly growing economy of Kazakhstan. This growth influenced both internal and external migration. TB control over internal and external migrants has an essential impact on TB and M/XDR-TB epidemiology. At a rough estimate, internal and external migrants amount to 5 - 10% of all new TB cases in different countries.

According to WHO mission in 2012 for National TB Program evaluation, TB treatment system in Kazakhstan has to be improved to enable proper TB, M/XDR-TB and TB/HIV control over internal and external migrants. At present, migrants have limited access to TB diagnostics and treatment, including in TB facilities. The existing regulations restrict provision of services to migrants and make it unable for them to exercise one of the principal human rights – right to health.

Internal migrants formally have right to TB diagnostics and treatment services; however, in reality they may not exercise it due to absence of registration at a health facility at temporary residence. According to the existing legislation, external migrants, undocumented ones in particular, may have access to health services only when they need emergency care.

The study in the framework of HOPE Project[ii] on access of migrants to health services has identified the following problems:

- legal barriers (complicated procedure with local registration, fear to be deported);
- adverse labor conditions (raised load, non-observance of occupational health, hard living conditions);
- in the health system (limited access, attitude of health professionals, language barrier, etc.).

These problems contribute to growth of inveterate forms of M/XDR-TB in the country. Besides, the situation is worsened by growing incidence of HIV infection and TB/HIV in the absence of infection control. Migrant TB patients continue work and stay in a community, rather than seek medical advice, or return to permanent place of residence without any infection control during the transit. In both cases they pose hazard for a migrant community and general public as well. The relevant measures were developed in line with Minimum package of cross-border TB control and care in WHO European Region: Wolfheze Consensus Statement (2012) aimed at enhanced access

and quality of TB treatment among migrants, including TB, M/XDR-TB and TB/HIV diagnostics and treatment.

The planned interventions will strengthen key provisions of the National TB Plan integrated in the TB Control Comprehensive Plan 2014-2020 and will include the following:

- assessment of TB, TB/HIV and M/XDR-TB burden among internal and external migrants;
- development of guidelines on TB and M/XDR-TB among migrants;
- development of legal and procedural agreements to enable M/XDR-TB treatment of migrants;
- use of innovative approaches to timely detection and treatment of TB, TB/HIV and M/XDR-TB in migrants in parallel with introduction of hospital substitution technologies;
- strengthening of monitoring and evaluation;
- advocacy, communication and social mobilization with active engagement of civil society;
- development of financing mechanisms to enable TB diagnostics and treatment of migrants.

Operational research in order to get reliable evidence for national and regional policy-making and planning of the National TB Plan by regional authorities, migration authorities, penitentiary system and other stakeholders is an important mechanism to measure the size of internal and external labor migration in Kazakhstan and key factors affecting access to services (legal, economic, social, health, etc.). At present, only estimated data are available; they are based on estimation of minimum and maximum number of migrants from various sources, as well as assumptions that TB and MDR-TB rate in migrants will, at least, demonstrate similar rates in the same age group in the migrant's country of origin.

Initial activities include establishment of a cross-sector working group on TB and migration supported by national and international technical experts. The working group will develop guidelines on TB and M/XDR-TB control in migrants by reference to minimum service package recommended by WHO (Wolfheze Consensus Statement). The working group and consultants should focus on four key components: governance, service delivery, monitoring and surveillance, supporting environment.

The governance component included legal framework, financing and development of mechanisms to share information with the country of origin of external migrants, as well as improvement of data management system for internal migrants with TB. It is planned to develop the concept of health and social insurance fund for TB and M/XDR-TB diagnostics and treatment of illegal migrants to be submitted to the Ministry of Health and assessment of additional needs for TB drugs supply to this category of patients. At the initial stage, the diagnostics and treatment costs will be covered by health and social fund financed from grant of the Global Fund and in future these costs will be covered through special insurance policy acquired by migrants. Migrant survey showed interest of migrants to buy such insurance.

TB diagnostics and treatment will be provided by TB facilities and PHC with use, where possible, of hospital substitution technologies to reduce financial burden on hospitals and in line with a general approach to reform of health sector.

HIV testing will be a part of countrywide approach to mandatory testing of TB patients (see previous objective). If HIV is detected, counseling will be provided by health facilities and supported by NGOs with extensive experience in this area.

For the surveillance purpose specific indicators will be developed and migration data will be integrated to the standard TB M&E system.

Special efforts should be turned to advocacy, communication and social mobilization focused on migrants and relevant structures of public sector involved. They include integration of migrant component to national communication strategy, development of special awareness /training materials, raising awareness for employers, mass media and training for NGO (e.g., for implementation of regional NGO projects, see below), for representatives of law enforcement authorities , such as policy and migration service.

To promote regional (inter-country) cooperation on TB in migrants the project is expected to organize three high-level meetings. The meetings will be chaired by Kazakhstan and it is expected that official representatives of all CAR governments will participate. These meetings will launch joint efforts for development of legal and procedural agreements and will improve interaction among countries to secure access to essential services and promote rights and responsibilities of migrants. Supported by WHO, International Organization for Migration and other international partners, these meetings will facilitate development of Regional TB Control Action Plan in the Central Asia which will include mechanisms to share information by countries, develop bilateral and multilateral agreements, encourage in-country dialogue on TB and migration in neighboring countries, strengthen contacts among National TB Programs and other important activities. The Project will support involvement of NGO to activities related to TB, MDR-TB and TB/HIV control among internal and external labor migrants. Grant assistance will be provided to NGOs and the projects will be implemented in the regions with high concentration of labor migrants (Astana, Almaty, Almaty Oblast, South Kazakhstan Oblast, Atyrau Oblast and Mangistau Oblast). Grant assistance will be used for innovative approaches enabling timely detection of TB, TB/HIV and M/XDR-TB in migrants and efficient treatment to reduce morbidity and mortality, prevent development of drug resistance in this high risk group and, finally, in general public. In particular, it is expected that projects will contribute to improved cooperation between health services and NGO; improved efficiency of TB treatment, especially in PHC; comprehensive support to patients to secure their commitment to therapy; advocacy, communication and social mobilization among labor migrants, their employers and local authorities to reduce stigma, improve access and ensure observance of patient and human rights.

All activities related to migrant TB control will be undertaken in close cooperation with the National Center for Tuberculosis Problems. HOPE Project developed a conceptual approach in partnership with WHO, International Organization for Migration and International Federation of Red Cross and Red Crescent Societies (IFRC) and implemented TB control programs across CAR. Time and again, migrant issues were discussed in each country with managers of national programs from a perspective of potential activities among migrants in the framework of current programs, if the program in Kazakhstan includes migrant component. All countries expressed interest and a provisional agreement achieved on joint efforts in this area confirmed by letters from managers of the national programs.

Funding from the Global Fund received through new financing facility will be used only in Kazakhstan to render health services to internal and external migrants, develop regulations, advocacy and raising awareness. Continuity of treatment after migrant's return to the country of permanent residence will be secured through CAR current programs and budget. Besides, the IFRC has been implementing a migration program in CAR from 2009. Under this program, 23 migration centers (8 in Kazakhstan, 4 in Kyrgyzstan, 7 in Tajikistan and 4 in Uzbekistan) are operating; they provide legal and social aid to migrants. HOPE Project plans to work with migrants in the countries of permanent residence together with IFRC with financial resources available there.

2. Management/Governance National TB Program

2.1. Strategy and Policy-Making

The Government of Kazakhstan is aware of size and challenge of TB problem from worrying epidemiology and from 1990 it developed many documents to improve the situation. The following documents are especially important:

1. Decree of the President of the Republic of Kazakhstan of 4 December 2001 № 735 *On Further Measures for Implementation of Kazakhstan Strategy -2030;*
2. Labor Code of the Republic of Kazakhstan of 15 May 2007 № 251-IIIZRK;
3. Resolution of the Government of the Republic of Kazakhstan of 21 December 2007 №1263 On *Measures to Protect Population from Tuberculosis in the Republic of Kazakhstan;*
4. Resolution of the Government of the Republic of Kazakhstan of 29 December 2007 № 1400 On *Wage System for Civil Employees, Employees of Organizations Funded from the Republican Budget, Employees of Public Enterprises*;
5. Code of the Republic of Kazakhstan of 18 September 2009 *On Health of the Nation and Health System*;
6. Order of the Minister of Health of 16 November 2009 № 722 *On Integration of Tuberculosis and HIV-Infection Programs*.
7. Resolution of the Government of the Republic of Kazakhstan of 15 December 2009 №2135 On *Approval of Drug Supply to Citizens;*
8. Decree of the President of the Republic of Kazakhstan of 1 February 2010 № 922 On *Strategic Plan for Development of the Republic of Kazakhstan till 2020;*
9. Order of 07.04.2010 № 238 *On Approval of Standard Staffing and Staff Quota in Health Providers*;
10. Decree of the President of the Republic of Kazakhstan of 29 November 2010 № 1113 On Approval of the National Program of Health Sector Development in the Republic of Kazakhstan *Salamatty Kazakhstan* in 2011 – 2015;
11. Resolution of the Government of the Republic of Kazakhstan of 25 February 2011 №183 On *Strategic Plan of the Ministry of Health of the Republic of Kazakhstan* in 2011-2015;
12. Order of the Minister of Health of 25.04.2011 №218 *On Certain Issues of Tuberculosis Control*;
13. Order of the Minister of Health № 786 of 4 November 2011 On *Approval of List of Drugs and Medical Tools for Free Supply to Population in the Framework of Guaranteed Benefit Package at the Outpatient Level with Certain Diseases (Conditions) and Special Therapeutic Food*;
14. Order of the Minister of Health of 02.12. 2011 № 867 On *Approval of the Procedure for Inventory and Dispensing of Drugs Funded from the Republican Budget at the Outpatient Level in the Framework of Guaranteed Benefit Package;*
15. Order of the Minister of Health of 13 April 2012 № 246 *On Approval of List of Drugs, Medical Tools in the Framework of Guaranteed Benefit Package Subject to Procurement from the Single Distributor in 2013*;

The Ministry of Health is aware of the need to prepare new documents in line with current changes in health system, on TB as well, aimed to streamline the system and raise efficiency by reduction of number of TB institutions and beds, and shift of TB treatment to PHC like in other countries.

2.2. Execution of the National TB Program

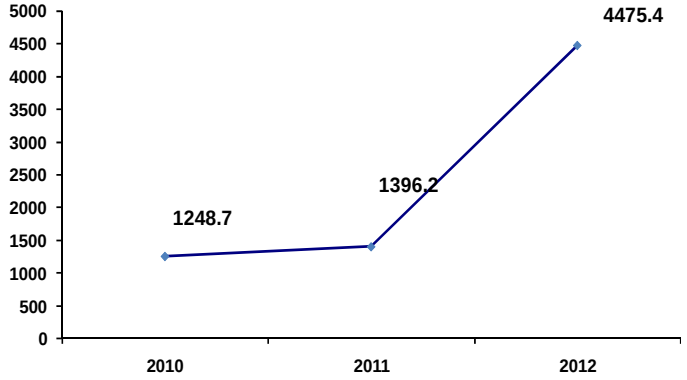
2.2.1. National Level

The Government of Kazakhstan is responsible for TB prevention and control, and the high level is

strongly committed to do so. According to the World Bank, the Government of Kazakhstan is keen to be among 50 most developed countries in the world by 2020 and understands that TB burden is one of the priorities to achieve this goal. These efforts are supported by steadily growing financing every year.

NTP budget in 2009 was 22.1 bil. KZT, in 2010 - 26.4, in 2011 - 31.3, and in 2012 – 34.6 bil. KZT.

Financing for anti-TB drugs from republican budget (mil.KZT) is shown in the figure below:



As presented in the figure, the financing for anti-TB drugs procurement is growing annually. If in 2010 for the 1st and 2nd-line anti-TB drugs was spent 1.2 bil. KZT, but in 2012 – 4.5 bil. KZT There is a strong commitment to increase such financing in addition to obligations currently financed by the Global Fund to Fight AIDS, Tuberculosis and Malaria, such as training of specialists, social support to patients and home treatment (Sputnik Program). Kazakhstan is a recipient of Round 10 of the Global Fund with well-functioning Country Steering Committee to oversee and monitor the program and budget. Nevertheless, the Steering Committee lacks full vision of the national budget and sources of financing in the budget of the Ministry of Health, and there is a need to strengthen coordination among stakeholders and authorities on local/regional level.

2.2.2. Oblast Level

Each oblast level in Kazakhstan developed strategic plans for the development of health sector during 2011-2015 and till 2020 where one of the priorities is TB control. High burden of M/XDR-TB is recognized and local governments of most oblasts (Akimats) have special programs to improve M/XDR-TB management. A focus is made on creation of human opportunities, motivation of personnel working with XDR TB patients and securing commitment to TB therapy especially an outpatient one. Medical staff in M/XDR-TB hospitals receive 220% of the basic salary, i.e. 38 933 KZT and medical staff in other TB facilities – 190% of basic salary, i.e. 33 624 KZT. In order to attract young specialists to the raion TB facilities each specialist receives relocation financial grant and apartment.

The majority of oblasts allocated resources for TB patient incentives to encourage them to comply with the regime and complete therapy. In 2011, the prison sector in South Kazakhstan Oblast received additional funding from the Government to reconstruct a specialized TB colony and medical equipment in the amount US$ 2.9 Million in the framework of the National Health Program *Salamatty Kazakhstan*. In 2013, TB colony expects additional financing from the Government in the amount 218 Million KZT (approximately US$ 1.5 Million) to strengthen administrative measures of infection control. In addition, in 2012 treatment with 2nd line drugs will be available from government funding.

2.2.3. The Structure of Specialized TB Services

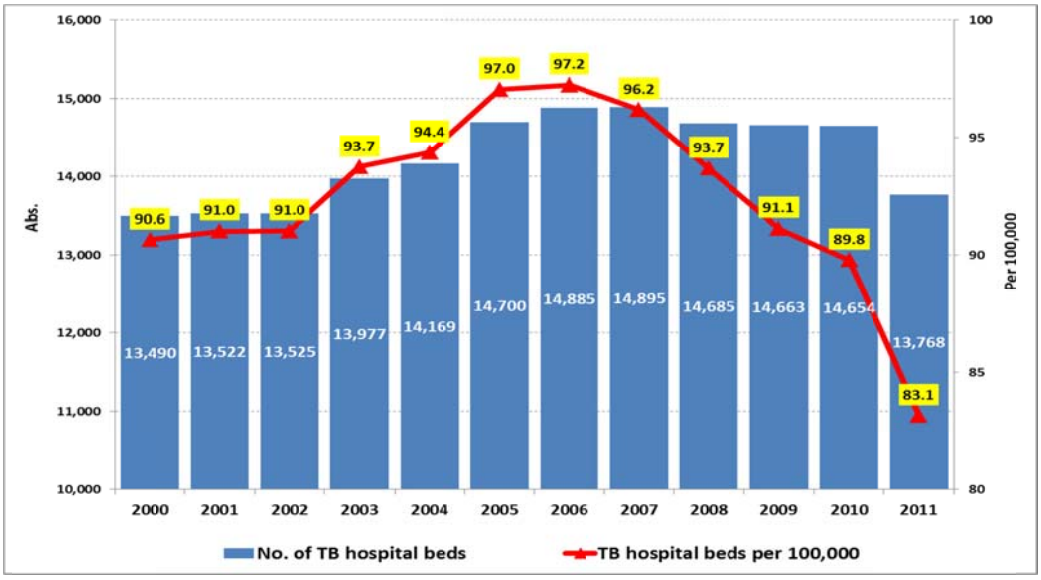
There is a wide network of TB institutions in Kazakhstan. In early 2012, there were 309 specialized TB institutions in the country. Types and quantity of such institutions in the country in the last 4 years, as well as regional distribution are shown in Table 11.

Table 11. Quantity and type of specialized TB institutions in Kazakhstan in 2009-2012

Type	2009	2010	2011	2012
TB dispensary	65	62	65	64
TB hospital	67	64	61	57
TB departments in general health facilities	13	20	6	4
Total 1: TB inpatient institutions	**145**	**146**	**132**	**125**
TB consulting office	122	122	147	146
TB sanatorium	31	30	30	30
GRAND TOTAL: all TB institutions	**298**	**298**	**309**	**301**

Due to TB epidemic, the Ministry of Health expanded the infrastructure of TB services. From 1990-ies, the number of TB in-patient institutions (dispensaries, hospitals and departments in general hospitals on the rayon level) grew from 106 in 1999 to 136 in 2008. During the next 4 years, the number of in-patient institutions dropped to 125 in 2012. TB services in Kazakhstan possess a large number of beds for TB treatment. According to official statistics, in Kazakhstan there is the highest TB bed rate among former Soviet Union countries and in the world too. At present, there are 12,063 specialized TB hospital beds, including National Center for Tuberculosis Problems (NCPT), or 71.3 TB beds per 100,000. TB bed capacity achieved the capclimax in 2007: 96.2 per 100 000 (Figure 5); in 2011, the number of beds dropped by 1,127 in the country.

Figure 5. Total TB hospital beds and rate per 100,000 in 2000-2011



Institutions responsible for TB control at the national level are well aware of a large number of TB beds, inefficient use and the need to lower this number. The number and occupancy of TB beds

vary across regions. Occupancy in three regions with the highest rates 2.1 times exceeds the one in the regions with the lowest rates (except Almaty and Astana). Significant difference reflects historic factors in service development rather than real needs and/or differences in the disease burden. In 2011, the number of beds essentially dropped in South Kazakhstan Oblast (by 200) and Kyzylorda Oblast (by 160).

Due to the increased incidence of M/XDR-TB, the number of beds for resistant TB grew too (830 beds were converted for this purpose in 2009-2011, while total beds for adults dropped by 740 during the same period). The number of beds for MDR-TB patients grew from 800 in 2006 to 2,645 in 2012. Because of absence of mechanism for funds relocation within anti-TB service remained from bed reduction, up to now anti-TB service loses these funds. It is necessary, therefore, in the pilot projects to develop and approve a mechanism and legal framework to maintain financial resources remained from anti-TB facilities and beds reduction for the support and implementation of anti-TB activities.

A meticulous analysis of normative-legal basis is planned at the initial phase of the anti-TB service's reform. The main directions of its changes will be related to those reforms which are being implemented in the health system of the country, i.e.: 1) rational use of hospital capacity implementing new technologies and as a result a reduction of the hospitalization time; 2) Expansion of ambulatory treatment by strengthening of the PHC network.

The important step in the anti-TB service reforms will be also the legally guaranteed possibility to maintain the existing government financing of the anti-TB activities and use of the remaining funds after the reducing of the in-patient treatment phase. This will be done by separating of anti-TB activities' financing into an independent programme and consolidation of the whole oblast budget similarly to the "Global budget" (GB). This will be done by separating of anti-TB activities' financing into an independent programme and consolidation of the whole oblast budget similarly to the "Global budget" (GB). There is already such experience in the country. Since 2012, according to the Kazakhstani government's decree the financing of the whole oncological service is done based on the GB principles. Such approach will lead to the flexible and rational use of remaining funds, to improve administration and monitoring of anti-TB service's adequate financing and to maintain the existing volume of financial resources. Implementation of above mentioned financial mechanism will enhance the responsibilities of the oblast anti-TB dispensaries as main coordinators for TB control in the region because the received resources will be oriented on the final result – cure of a patient.

In order to ensure a sustainable financing of anti-TB activities in the frame of a separate programme it is planned to lead all anti-TB organizations into the united property's form – "the governmental formal enterprise with the rights of the ownership's management". With the implementation of this approach it will be possible to prepare legal and financial background for the mobile and flexible anti-TB care in regions, including NGO care's acquisition, provision of a phsycho-social support to TB patients, large-scale trainings of specialists, as well as procurement of symptomatic and pathogenetic drugs for out-patient treatment.

A distinguished feature of the GB is that it is planned the development and approval of the united universal tariff scale for different clinical TB forms. This will help to calculate the cost of TB detection, diagnosis, treatment, prevention and, finally, cure of each patient. The tariff scale will include also all other expenses, i.e. for in time TB detection, quick cure and TB prevention. Using data of the National TB register and tariff scale the real needs for each region will be calculated and a budget of the oblast and republican anti-TB programme will be developed. Later on, the anti-TB service's budget will be adjusted depending on the number of TB cases and changes in anti-TB service.

The reform of in-patient care for TB patients will be one of the important interventions. The following activities are planned: revision and determining of the strict criteria for patients' hospitalization (i.e. bacteriological status, patients requiring day and night hospital care); reducing of hospitalization's time (i.e. for the contagious period, until the improvement of patient's condition); implementation of the new technologies for TB and M/XDR-TB diagnosing and treatment, including genetic and molecular tests. As logical results of above mentioned activities will be the improved access to the quality anti-TB care on one hand and a release of additional resources by reduction of irrational expenses. The revision of the financial mechanism for hospitals and transition from financing for bed to treated case will be conducted also. This will stimulate all levels managers to use a bed more effectively (to increase turnover) during a year and to economize significant resources (human, financial, and material-technical). During 2014-1016, 4632 beds are planned to be reduced, that is 34.2% of the total anti-TB facilities' beds in the country. The minimal reduction of beds is planned in 2014 – 890 beds, and maximal – in 2016 – 2150 beds.

Among activities on the financial improvement of the anti-TB service the reduction of anti-TB facilities has been planned. In 2014, it is expected to close 4 low power TB hospitals: in Atyrau, West-Kazakhstan, Kostanai, and Pavlodar oblasts. Among those 2 hospitals will be transformed into dispensary departments for ambulatory treatment. In turn, the hospital buildings in Kostanai oblast will be given to Lisakovsk city general hospital, and in Pavlodar oblast – to oblast Akimat.

In 2015, 3 TB hospitals is planned to be closed, in West-Kazakhstan, Kostanai, and Pavlodar oblasts. In the first two oblasts dispensary departments will be established, and the building in Pavlodar oblast is planned to be transferred to oblast Akimat. In the same year, it is planned to open anti-TB dispensary in Astana city. In 2016, 5 TB hospitals will be closed: 4 in Almaty oblast, and one – in Kostanai oblast. All abovementioned hospitals will be transformed into TB dispensaries for the ambulatory treatment of TB patients. As a result of TB hospitals' closing and reduction of beds, changes in staffing will occur also. In total, during 3 years countrywide 416 persons of anti-TB facilities will be retired, among them 88 doctors and 265 middle and junior level staff, and 63 others. Taking into consideration that the lack of doctors currently is 15.1% (352 units), but forecasting additional annual need will be 11.7-16.7%, unemployment problems for remaining staff of reduced TB hospitals is not expected. In addition, the staff list expansion is being planned for departments of palliative TB care, organizational-methodological, monitoring & evaluation and dispensary, as well as bacteriological laboratories. The additional cost can be covered from the GB without additional funds from the local and republican budget. It is expected that including of phsycologists and social workers into the staff list of the TB organizations with following their training will move phsyco-social support to the new quality level and improve patient adherence to the treatment.

It should be mentioned also that development and approval of the legal act is being planned for the improvement of TB patients' access to the social support. It is expected that the majority of nurses will be transferred to the dispensary departments for the organization and implementation of ambulatory treatment. Financial resources will be moved first of all for the hospital replacing technologies' implementation, infection control strengthening in TB facilities, patients' motivation for uninterrupted treatment, and incentives for staff of TB facilities. In order to do this, changes and additions in the normative and legal acts is being planned (MoH prikazes, government decrees, etc.)

The next important step of anti-TB service's reform will be expansion of the out-patient treatment for TB patients through the implementation of hospital replacing technologies and involvement of the PHC network. For this purpose during the second phase of the implementation of the united health care system in Kazakhstan, since 2014 a significant enhancement and strengthening of PHC in the health care system in general is being planned through increasing of funds and improvement

of financial mechanisms. As a result, increasing of financing per capita up to two-three times is expected. It is planned also to improve involvement of PHC network's specialists in TB detection and prevention through per capita financing. A motivation of the PHC specialists for directly supervised ambulatory treatment of TB patients could be improved by including per capita norms into the incentive component, which expects double increase since 2014. The introduction of several indicators to measure activities of the PHC specialists are planned (absence of treatment interruptions, advanced TB forms, etc.)

Implementation of the hospital replacing technologies will help to increase the annual number of patients at the out-patient treatment and consequently will facilitate their rehabilitation and decreasing of stigma in the community.

The reforms in the anti-TB service's financing are planned in 2014-2016. For this purpose pilot projects in 3-4 regions of the country have been proposed (Jambyl, Kyzylorda, and Aktiubins oblasts, and Astana city). During the piloting, the experience of the ongoing pilot project "Expanded ambulatory treatment of TB patients" in Akmola oblast since 2012 under USAID financial support will be used. Based on the pilot projects' results the plan of their gradual expansion to other regions with country-wide coverage till 2016 will be developed and approved.
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It is important to emphasize that reform of the TB service in Kazakhstan towards the improvement of quality care through expansion of ambulatory TB treatment, rationalization of in-patient care (reduction of small ineffective and strengthening of big effective multiprofile hospitals), implementation of the new technologies for TB diagnosis and treatment, including M/XDR-TB, is being coordinated with the WB project's results and general health care reforms in Kazakhstan.

2.2.4. Outpatient TB and MDR-TB Treatment in the Framework of Healthcare reform and Psychosocial Aid to TB and MDR-TB Patients in the Republic of Kazakhstan

Outpatient treatment

Quality of outpatient treatment in the country is directly related to PHC network management.
It is regulated by Orders of the Minister of Health of 26 November 2009 № 794 *On Approval of Rules for Providing Primary Health Care and Allocation of Individuals to Primary Health Care Providers* and of 5 January 2011 № 7 *Regulations for Healthcare Providers Rendering Outpatient Aid*. Both documents emphasize the need for countrywide transition to outpatient diagnostics and treatment of various diseases at PHC. PHC's health professionals take over 3 important TB tasks: prevention, timely detection and observed therapy at the outpatient phase. To ensure quality of TB control, the standard staffing of polyclinics includes a position of chemical nurse responsible for observed therapy of TB patients at the outpatient phase. A standard organizational structure of a polyclinic, PHC center, health ambulatory and medical aid post includes Directly Observed Therapy (DOT) room to take TB drugs; base laboratory and sputum collection room. At present, 1,611 DOT rooms and 2,064 sputum collection rooms function within PHC.

The key reason for directly observed therapy of TB patients during the continuation phase at PHC is delivery of therapy closest to the place of residence of patients. DOT of TB and MDR-TB patients during the supporting phase is delivered at structural subdivisions of PHC in the home area of patients: in polyclinics, health ambulatories and rural health posts. Administration of TB drugs is observed by a health professional, all patients use disposable cups. DOT is recorded in forms TB-01 and TB-01 Category IV. In the event of a patient's noncompliance with DOT or poor acceptability of TB drugs the nurse informs a phthisiologist. A General Practitioner (GP) at a PHC facility examines a TB or MDR-TB patient at least every 10 days to check general state and adverse effect of TB drugs. Apart from TB drugs, such medications as vitamins, hepatoprotectors etc. are

prescribed. In case of serious adverse effect of TB drugs or progression of the disease a patient is referred to a TB hospital. Examination records by doctor are entered into patient medical record.

In the country there are 7 day TB and MDR-TB hospitals with in total 151 beds (2 in Akmola Oblast, 1 in Jambyl Oblast, 1 in West Kazakhstan Oblast, 1 in Karaganda Oblast, 1 in Almaty and 1 in Astana).

Day TB and MDR-TB hospitals are regulated by *Regulations on Day Inpatient Clinics in TB Hospitals and Institutions* and Orders of Oblast and Municipal Health authorities. Day patient facilities work from 8.30 till 16.45 in one or two shifts and working schedule is made with regard to infection control needs. Therefore, a patient may attend day patient facilities at any convenient time. A health professional observes TB drugs intake by the patient, makes necessary injections and a notes on DOT in forms TB-01 or TB-01 Category IV. At the same time a patient receives food in the amount equal to lunch cost in day-and-night hospital (approximately 300 KZT from local budget). In some regions cash is provided to cover fare, food coupons, etc. However, not all day patient facilities provide financial incentives to patients. If a patient fails to appear at day patient facility, refuses therapy or has a poor acceptability of TB drugs, a health professional notifies the doctor verbally or in writing.

Doctor at day patient facility examines a patient at least 3 times a week to check general state, adverse effects of TB drugs and observes intake. Apart from TB drugs, such medications as vitamins, hepatoprotectors etc. are prescribed. In case of serious adverse effect of TB drugs or progression of the disease a patient is referred to a TB hospital. Apart from therapy at day patient facility, patients are trained to recognize adverse effect of TB drugs or any other serious symptoms worsening general state to enable the patient seek doctor's or any other health professional's advice in due time. If a patient is not committed to DOT he/she may be referred for compulsory treatment in specialized hospitals.

Outcomes of examination and DOT are recorded in National TB Patient Tracking Register. The source is form TB 01 and TB-01 Category IV.

In 2011, 752 TB patients were treated at day patient facilities and 867 in 2012. Average stay grew from 62 days (day stays with returns home at night) in 2011 to 75 days 2012. Bed occupancy in day patient facilities improved as well. In 2011, the occupancy was 221 bed/days, in 2012 – 260 bed/days; this is 67% and 79% respectively with average 11.5 in 2011 and 8.4 in 2012.

According to oblasts, the share of patients in outpatient intensive and supportive therapy was 16.4% (2,262 patients) in 2011, 16% (2,194 patients) in 2012 of total TB patients without bacterial excretion under therapy. The majority of patients were under therapy in TB institutions. In 2011, this group of patients amounted to 82.7%, in 2012 – 81.0%, while at PHC 17.3% and 19.0% respectively. In 2011, 2% patients dropped therapy during continuation phase and 1.7% in 2012. From June 2012 up to now in Akmola Oblast, a pilot project of USAID TB CARE 1 is under implementation. The objective is to expand outpatient therapy and psychosocial support to TB and MDR-TB patients, including former prisoners to complete therapy in civil health sector. The project will finish in September 2014.

Akmola Oblast was selected as a pilot region due to the following:

- strong political support from Akimat in terms of social support to TB patients;
- availability of adequate TB control programs both in civil and penitentiary health sectors;
- inclusion of Akmola Oblast as a pilot to Perspective Master Plan of the Ministry of Health

for restructuration and optimization of TB hospital bed stock (developed by the World Bank on request of the Ministry of Health in 2011).

Outpatient therapy of TB patients in Akmola pilot Oblast consists of:

- complete course of outpatient treatment of TB and MDR-TB patients (at PHC, in dispensaries of TB institutions, day patient facilities, at home, at pre-schools and schools of oblast). Short-term hospitalization followed by outpatient treatment is considered as well;
- psychological, social and economic support to patients according to individual needs to retain patients until full completion;
- reduction of beds in TB institutions and redistribution of free financial resources to new staff at day patient facilities, home car, social support, additional positions for social workers and psychologists.

At present, there is a day patient facility (35 beds) and home care (25 beds) in the pilot oblast. A patient may be transferred to home care owing to: concomitant diseases preventing daily attendance of TB institution or PHC for therapy, elderly age, pregnancy, a female patient has an infant or she is a lone parent, disability. The working schedule for home care specialists is approved. Appropriate medical documentation is developed for each patient. Every day, a health professional from TB dispensary delivers TB drugs to home care, observes intake and makes necessary injections with an appropriate record of DOT in forms TB-01 or TB-01 Category IV. If a patient is non-compliant with therapy regime or has a poor acceptability of TB drugs, a health professional notifies the doctor.

Home care phthisiologist visits and examines a patient at least twice a week to check general state or adverse effects of TB drugs and oversee intake of drugs. Apart from TB drugs, phthisiologist prescribes pathogenetic and symptomatic therapy. In the event of TB aggravation or serious adverse effect of TB drugs, phthisiologist, following consultations with head of dispensary, decides on hospitalization to conventional hospital.

Implementation plan of USAID TB CARE project is coordinated with the National Center for Tuberculosis Problems and donor every year.

In 2013, the following activities were undertaken in Akmola pilot oblast:

- development of protocol on outpatient therapy and TB patient support (during the meetings of multi-disciplinary group of Akmola Oblast);
- establishment of a training center under Akmola Oblast TB Dispensary properly equipped and curriculum developed;
- training of specialists of TB services and PHC on outpatient TB therapy and commitment;
- training of specialists of correctional institutions on commitment to therapy of TB patients in correctional institutions after release as well;
- tutor and monitoring visits with the participation of specialists from National Center for Tuberculosis Problems (NCTP);
- interim evaluation of expansion of outpatient therapy in Akmola Oblast (data collection, meetings with specialists of TB services and PHC, visits to patients, meetings with oblast government, analysis of data and preparation of report with recommendations for improvement of outpatient therapy);
- workshop to discuss interim outputs of the pilot project.

Health Department of Akmola Oblast issued Order dated 29 September 2012 №550 on support to

project and establishment of multi-disciplinary group to implement enhanced outpatient therapy of TB and MDR-TB patients. NCTP developed eligibility criteria for outpatient therapy, partially these criteria formed basis of Order of the Ministry of Health of 12.07.2013 № 402 On Pilot Project for Enhanced Hospital Substitution Therapy of TB patients. The peculiar feature about the pilot project was that following collection of patient information during the first two weeks from inception of therapy by psychosocial support group an action plan to retain patient in therapy was developed, which may be adjusted during therapy if needed. If outpatient therapy accepts a TB patient released from correctional institutions, the doctor from TB colony submits patient-related documentation to central health authorities commission 10 days prior to release.

A group of psychological, social and economic support to TB and MDR-TB patients consisting of representatives of Employment and Social Program Department of Akmola Akimat, head of oblast dispensary, social worker, lawyer, 2 nurses from TB service and psychologist is established in the pilot oblast.

Training center is established in the pilot oblast, training programs on extensive outpatient therapy to TB patients for social workers, psychologists, NGO, chemists and specialists from PHC, TB institutions responsible for sputum collection are developed and approved. It is planned to organize training on development of quality management system in TB laboratory diagnostics for laboratory doctors and assistants at PHC and TB institutions. Phthisiologist, primary care therapists, pediatricians and epidemiologists will attend training on extensive outpatient therapy of TB patients and role of PHC in TB control.

In the pilot project, psychosocial aid to TB and MDR-TB patients is provided by psychologists who talk to patients, their family members or authorized representatives from early days to identify individual needs and risks of therapy disruption. The outcomes are reported to doctor in charge.

The following patient categories are distinguished: committed to therapy and persons inclined to interruptions in therapy and non-compliant with therapy regime. Besides, a group of patients may need social adaptation and help from social worker, psychologist and lawyer. Head of psychosocial support group is closely interacting with doctor in charge, head of department and members of central health authorities' commission. Social support facilitates better commitment of TB patients to therapy. It dramatically reduces probability of early termination of chemotherapy in risk groups.

Psychosocial Support

In Kazakhstan since independence, a number of national documents related to social support were developed, such as *National Poverty Reduction Program 2003-2005*. Poverty criteria included not learning and unemployed youths, children and large families, unemployed for a long time, lonely and elderly people, disabled people and marginalized groups (homeless, released from prisons, refugees).

To protect population from poverty the Republic of Kazakhstan adopted Law on *National Social Support* dated 17 July 2001 № 246-11. According to the Law, citizens of Kazakhstan, repatriates, persons destitute of nationality, persons with residence permit and permanently living in Kazakhstan with average income below poverty line (Artcile 2) have right to targeted social support.

According to the Law on the Republican Budget 2013 – 2015, the minimum subsistence level in Kazakhstan grew by 7% in 2013 versus 2012. From 1 January 2013, the minimum subsistence level is 18,660 KZT versus 17,439 KZT in 2012. Minimum wage in 2013 is the same as subsistence level. In 2013, Monthly Calculation Index grew by 7% and is 1,731 KZT versus 1,618 KZT in

2012.

Minimum subsistence level is a money equivalent to minimum set of food products, services and living essentials. The size is on a countrywide basis and determined each year adjusted for inflation and according to Law on the Republican Budget for the relevant year.

Minimum subsistence level is designed to assess living standards and define poverty line and focus of social policy and social support, rationale for minimum wages, pensions, benefits and other welfare payments. Minimum wages is approved every year based on minimum subsistence level.

Monthly Calculation Index is used in Kazakhstan to calculate pensions, benefits and other welfare payments, as well as penalties, taxes and other payments. It is established each year according to Law on the Republican Budget. Targeted social support does not address unemployed and those who are not registered in employment authorities.

The system of social support to TB and MDR-TB patients in Kazakhstan consists of government (oblast) and non-government sectors of social aid. Government (oblast) sector of social aid includes independent social welfare agencies as well as social institutions under the Ministry of Labor and Social Welfare of the Republic of Kazakhstan.

Government targeted social aid is funded from local budgets as appropriate to legislation of Kazakhstan. Non-government sector of social aid includes various public associations, charity and religious organizations, other social enterprises, organizations and institutions with a legal status not related to government, as well as private persons engaged in social services. Social aid provided by non-government social services is contract-based. Persons dealing with social aid to TB patients are mostly employees of social services of the Ministry of Labor and Social Welfare of Kazakhstan.

Types and forms of social aid to TB and MDR-TB patients:

- **Financial aid -** money or in kind (manufactured essential commodities, medications, personal hygiene products, clothes, footwear, fare to therapy venue by issuing monthly passage tickets, payment for utility services, etc.);
- **Free hot meals –** in some regions (Akmola, Mangistau and Pavlodar Oblasts and in Almaty) special canteens for TB patients under outpatient therapy are organized;
- **Social and counseling aid.** The competence of local governments includes social aid as appropriate to the existing legislation, record and reporting in social welfare system, preparation of annual report on social aid, interaction and coordination of activities of various agencies, enterprises and public organizations engaged in social aid to population.

Social aid to TB and MDR-TB patients is provided in oblasts and regions by Akimats from local budget and Global Fund, Kazakhstan Society of Red Crescent, large universities of the country. For example, Rectors of Universities in Almaty pay allowance, provide meal coupons and free accommodation in hostels to students with TB and MDR-TB. Social package to TB and MDR-TB patients are provided by appointed persons of TB institutions (usually chief nurses and doctors in charge). In some regions special employees from social welfare, employment and social programs are involved for these purposes.

By regions, social aid is provided:

- Once a week in Almaty Oblast;
- Once a month in Atyrau, Kostanai, Mangistau, Pavlodar, South Kazakhstan Oblasts and in

Almaty;

- Once a quarter in Akmola, Aktobe, West Kazakhstan, Karaganda, North Kazakhstan Oblasts;
- Once a year in Jambyl Oblast.

See Table 12 for volume of social aid to TB and MDR-TB patients by regions.

Table 12. Volume of social aid to TB and MDR-TB patients by regions

Oblast	2011		2012	
	patients	$ '000	patients	$ '000
Republic of Kazakhstan	15,467	1,707.3	15,852	2,223.8
Akmola	1,523	243.2	1,379	354.3
Aktobe	512	25.9	652	81.6
Almaty	485	33.0	722	37.3
Atyrau	384	2.8	54	0
East Kazakhstan	2,099	142.4	3,544	231.8
Jambyl	158	27.1	512	80.8
West Kazakhstan	1,248	147.3	1,320	183.7
Karaganda	2,071	121.3	1,413	99.0
Kyzylorda	568	32.0	0	0
Kostanai	654	66.1	790	79.3
Mangistau	54	6.6	102	12.4
Pavlodar	2,000	331.1	1,444	367.5
North Kazakhstan	1,228	44.6	1,395	48.1
South Kazakhstan	487	44.9	464	55.4
Almaty (city)	426	108.5	312	201.1
Astana	1,570	330.5	1,749	391.5

It is evident from the table that financing to social aid to TB patients varies across Oblasts. For example, financing allocated in 2012 varies from $391,500 in Astana to $12,400 in Mangistau Oblast. In Atyrau and Kyzylorda Oblasts, no social allocations to TB patients were made from the local budget.

Challenges in Outpatient Therapy and Psychosocial Support to TB and MDR-TB patients in the country:

1. PHC doctors have a big workload and not adequately motivated to provide TB aid to patients;
2. Due to deficit and turnover of PHC doctors there is a need for operating training centers on TB and M/XDR TB management;
3. At the outpatients phase, the legal framework does not regulate diagnostics and treatment of adverse effect of TB drugs;
4. No mechanism to provide psychosocial support to TB and MDR-TB patients;
5. No clear criteria to select patients for social support and types of social support (food, hot meals, fare and others);
6. Lack of qualified health professionals responsible for social support to TB patients;
7. Psychologists and social workers are not in the staff schedule of TB institutions;
8. No legal framework to regulate volume and mechanism of financing from local budget. Development of such framework requires involvement of the Ministry of Labor and Social Welfare, Ministry of Finance, Ministry of Economy and Budget Planning, Ministry of

Interior.

9. Monitoring of social aid quality is not available.

All these challenges are major barriers to reduction of hospital beds and roll-out of outpatient therapy and require urgent solution in the framework of reform of TB aid in the country.

2.2.5. Laboratory Services

Laboratory Service of the National TB Program of Kazakhstan (NTP) has a developed infrastructure and is represented by a laboratory network at all Program levels – national, oblast (regional) and local. In 2008, the Ministry of Health of Kazakhstan approved and specified international standard to accreditation of medical laboratories ST RK ISO 15189 (Specific requirements to Quality and Competence). Registration and reporting of laboratory tests are performed every month, quarter and year. There is a National TB Register.

Oblast laboratories are equipped with baseline equipment to perform bacteriological tests, including culture in solid and liquid media, DST to 1st and 2nd line TB drugs. Genetic molecular technology based on line probe assay (HAIN) is used in the National reference laboratory and 10 out of 22 second level laboratories. There exists a quality control system of bacteriological tests. In the framework of this system, EQA for DST and bacterioscopy is developed and employed. Laboratories use SOP for key procedures. The system of collection, storage and transportation of biological samples is well established in each oblast of the country.

The system of monitoring and supervision over performance of low level laboratories by upper level laboratories is in place. Standardized checklists are used for monitoring and quality assessment of services rendered to TB patients. Disposable inputs are used in many laboratories to improve quality of assays; waste management system is well established in all laboratories. Laboratory personnel are equipped with personal protective devices. To strengthen infection control, the National TB Infection Control Guidelines are under development.

NRL has a potential for operational and other research. The National Guidelines for Laboratory Equipment Maintenance is under development. Skills of laboratory personnel are developed in the framework of the National TB Program and donor-funded projects of international organizations.

In 2009, differentiated compensation package is introduced for TB hospital specialists (220% those in contact with MDR-TB and 190% for other employees of TB hospitals). There is an open access to international publications, documents, standards and guidelines (WHO, Global Laboratory Initiative, USAID TB CARE I Project).

Financial and technical support is provided by some donors and international organizations (Global Fund, USAID, KNCV, etc.).

Kazakhstan's National TB Program (NTP) has a developed laboratory structure represented be network general and TB laboratories divided into three levels according to objectives and functions:

- level 1 – local (Rayon) laboratories;
- level 2 – oblast/regional laboratories;
- central level 3– National Reference Laboratory (NRL) of the NCTP.

Level 1 laboratory network in Kazakhstan consists of 466 laboratories integrated into PHC, TB hospitals and correctional system (41):

- 315 bacterioscopy general laboratories (1 laboratory per 100,000 people);
- 151 bacteriological laboratories and culture stations at Rayon TB hospitals;
- 41 bacterioscopy laboratories in the correctional system.

Level 2 - 22 laboratories (21 in civil health sector and 1 bacteriological laboratory in the correctional system in Karaganda Oblast) are under oblast (regional) dispensaries and dispensaries of Astana and Almaty.

Level 3 (national) – NRL. NRL is a part of the National Center for Tuberculosis Problems.

In 2012-2013, molecular genetic method of TB and MDR-TB diagnostics (G-Xpert) was introduced at the NCTP and in 11 oblasts. Equipment was procured and delivered through funding from USAID (4) Global Fund Round 8 (9) (cities of Astana and Almaty, as well as Akmola, Atyrau, East Kazakhstan, Jambyl, Karaganda, Kostanai, Pavlodar, South Kazakhstan and Mangistau Oblasts). At the end of Q4 2013, 6 G-Xpert devices more are expected through Expand TB project. However, the available number of devices will be insufficient for extensive introduction of rapid diagnostics of TB and MDR-TB (G-Xpert); therefore, 28 more devices have to be procured (to 2 oblast TB dispensaries, 6 detention centers and 20 inter-rayon TB dispensaries for patients with bacilli excretion and PHC of oblast centers for TB, migrants, PLHIV).

Rapid MDR-TB diagnostics (Hain test) is introduced at the NCTP and equipment is procured and delivered to 10 Oblasts through funding from GF Round 8 (Astana, Jambyl, Akmola, Kyzylorda, Aktobe, Almaty, North Kazakhstan, West Kazakhstan, Karaganda Oblasts and Correctional System Committee in Karaganda oblast). Reagents and inputs have to be procured every year to ensure quality and reliability of this technology.

Bacteriological laboratories at oblast and regional TB dispensaries (21) are equipped with BACTEC – Mitgit – 960 (rapid TB and MDR-TB diagnostics).

At present, all dispensaries are able to cover with culture tests and rapid identification of DST to 1st and 2nd line TB drugs, that led to increased number of tests and load on the available devices. 7 BACTEC – Mitgit – 960 devices more have to be additionally procured. Some of the available equipment was procured in 1998 and is now obsolete and often needs repair (NRL, TB dispensaries in Aktobe and South Kazakhstan Oblasts) and at 3 Oblast TB dispensaries where this technology is not available.

The following important ***challenges of laboratory services*** should be emphasized

- International standard for medical laboratories ISO 15189 approved by the Ministry of Health in 2008 is not fully introduced and not all bacteriological tests are standardized.
- The facilities of oblast laboratories dealing with culture tests do not meet standards for class 3-4 biosafety laboratories.
- The majority of the existing equipment is not always used efficiently due to inconsistent approach to supply of health facilities with new devices.
- Due to deficit of financing, it is not possible to procure quality equipment and inputs and pay for maintenance. Therefore, it is necessary to develop National guidelines for equipment maintenance.
- Not all available laboratory equipment meets biosafety requirements, while efficiency of some units is inadequate to the existing workload. Therefore, it is necessary to strengthen coordination from the NRL in supply of laboratories with equipment, reagents and inputs, and develop list of necessary laboratory equipment with technical specifications.

- It is necessary to strengthen infection control, including procurement of adequate personal protective devices with the account of anatomical peculiarities to ensure air-tightness of respirators, tools to check quality of equipment's performance and packaging for transportation of specimens.
- Due to introduction of new diagnostic technologies the existing reporting documentation has to be revised and adjusted.
- There is no strategic plan for human resources development; this leads to irregularity of training of specialists from civil and penitentiary health sectors. High turnover of laboratory staff and deficit of specialists, as well as demotivation of personnel to develop skills call for development of a system to incentivize and retain employees.
- TB in penitentiary system is diagnosed by Ziehl-Neelsen bacterioscopy in 41 laboratories. Bacteriological tests (culture and drug susceptibility) are taken primarily by bacteriological laboratories of oblast TB dispensaries but not in any oblast because there is no mechanism to pay laboratory staff from civil sector for tests made for penitentiary patients. Therefore, it results in significant challenges to ensure quality of laboratory test.
- Due to geographic peculiarities of the country and localization of penitentiary institutions, as well as scarce laboratory staff and plenty of DR-TB patients, it is necessary to introduce rapid diagnostics methods safe for health professionals in the penitentiary system, as well as technologies which do not raise workload on personnel. Besides, know-how and skills development should be systemic in view of new technologies.

Suggested solutions (addressed in the operational plan)

- Develop guidelines on laboratory diagnostics of TB and MDR/XDR-TB;
- Amend staffing schedule of laboratories in TB facilities, including in penitentiary system;
- Develop HR regulations with consideration for base educational background;
- Assess material and technical condition and identify needs in advanced equipment and reagents for rapid TB and MDR-TB diagnostics, including in penitentiary system;
- Procure equipment for rapid TB and MDR/XDR-TB testing to laboratories of TB facilities, PHC and penitentiary laboratories: 28 XpertMTB/RIF to Almaty TB dispensary and Arkalyk Rayon TB dispensary; 20 Inter-rayon dispensaries;
- Procure reagents for rapid TB and MDR/XDR-TB testing (XpertMTB/RIF);
- Procure reagents for rapid TB and MDR/XDR-TB testing (HAIN) to laboratories of TB facilities, PHC and penitentiary laboratories;
- Develop guidelines on external quality assessment (EQA) of laboratory diagnostic methods for TB and MDR/XDR-TB applied in civilian and penitentiary health sectors;
- Supply advanced bacteriological equipment, reagents and consumables to TB laboratories;
- Introduce a position of engineer to the staff schedule of TB facilities to maintain laboratory equipment;
- Regularly improve knowledge and skills of personnel in new TB and MDR/XDR-TB diagnostic methods in civilian and penitentiary health sectors;
- Procure reagents and consumables for BACTEC, HAIN tests to prison bacteriological laboratory in Karaganda Oblast and cartridges for 6 detention centers.

2.2.6. Infection Control in TB High Risk Locations

At present, strengthening of TB infection control is a priority of the NTP and infection control is extensively discussed by the National and Oblast Public Health Steering Committees. TB Infection Control is an extremely important topic in Kazakhstan because of high prevalence of MDR-TB in population and frequent registration of TB cases among health professionals and personnel of correctional institutions versus general population *(Figures 6 and 7)*. During the last few years, the

Kazakh NTP made very important efforts towards improvement of infection control with political and financial support from the Government. It resulted in:

- Resolution of the Government of Kazakhstan dated 21 December 2007 № 1263 *On Protection of Population from Tuberculosis in the Republic of Kazakhstan in TB Hospitals, as well as in Primary Care Settings* which initiated restructuring of TB beds in civil and penitentiary health sectors of the country.
- Reduction of TB beds by 15.3% (2,292 beds) and TB hospitals by 21.4% (34 hospitals) in civil health sector during 2008-2012 (Table 13). Reduction applied to low capacity TB hospitals only where infection control was not in line with the minimal quality demands.
- Vigorous construction of a new TB hospital and reconstruction of many of the existing ones from the country's budget made it possible to improve lay-out of the facilities for efficient separation of patients according to epidemiological status and introduce infection control. This is relevant to PHC institutions in civil health sector and TB colonies of the correctional system.

Figure 6. TB Morbidity among Employees of TB Hospitals and General Public of Kazakhstan per 100,000 population ***(based on statistical data of the NCPT epidemiological, organizational and planning department for anti-TB activities)***

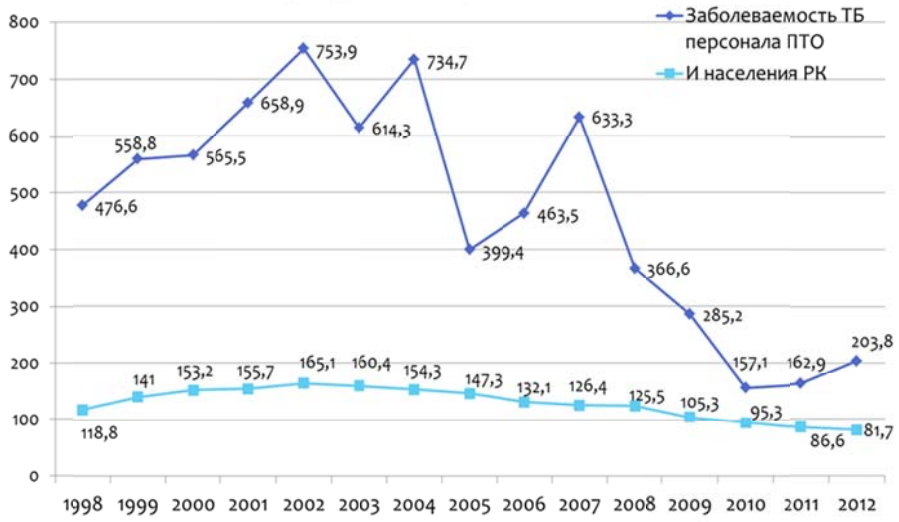
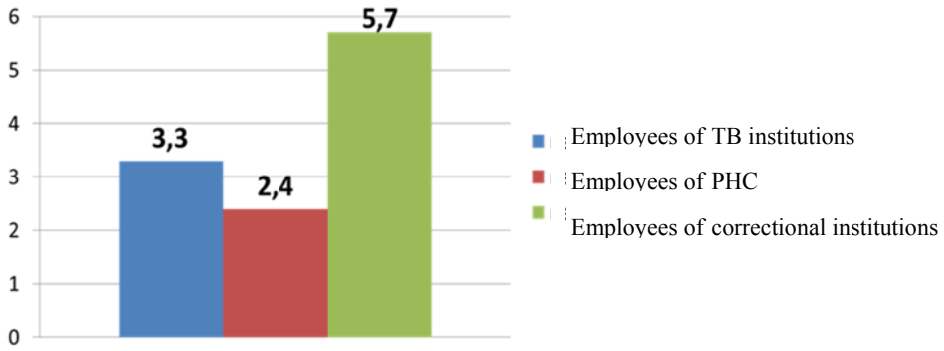


Figure 7. Assessment of relative risk of TB incidence among employees of TB institutions, PHC network and correctional institutions versus general public in 2008-2012 *



Thus, one of the key elements of TB bed restructuring is creation of proper environment in TB hospitals to enable efficient sorting and separation of patients according to epidemiological status.

Table 13. Trends of reduction of TB beds and hospitals in the Republic of Kazakhstan in 2008-2012

Year	Reduction of TB beds	Reduction of TB hospitals
2008	210 (1.4%)	7 (4.4%)
2009	22 (0.1%)	6 (3.9%)
2010	9 (0.06%)	0
2011	1156 (7.8%)	14 (9.5%)
2012	895 (6.6%)	7 (5.3%)
Total during 2008-2012	2 292 (15.3%)	34 21.4%)*

In addition, during 2010-2013, the NTP in close cooperation with international partners and organizations has undertaken a number of infection control evaluation missions to civil and penitentiary institutions of the health sector:

- The mission of infection control consultants to NTP in 2010 undertaken by USAID's TB CAP project through a representative office of NGO KNCV in Central Asia. It was the first evaluation mission on TB risk reduction. Afterwards, the National TB infection control plan was drafted and technical advice was provided.
- Mission on comprehensive assessment of TB aid, prevention and control in Kazakhstan in 2012 by WHO experts upon request of the Ministry of Health. The mission produced comprehensive recommendations on key aspects of the NTP, including infection control.
- Follow-up infection control mission in Kazakhstan in 2013 upon request of the SES Committee of the Ministry of Health. The key mission objective was to streamline infection control policy in the country on the legislative level. In the course of evaluation, the recommendations of the previous missions were reviewed.

Therefore, recommendations of evaluation missions lay the ground for systematic infection control in the framework of this Comprehensive TB Control Plan, 2014-2020, in Kazakhstan.

* *Future projection of TB the beds and hospitals' reduction is described in the first part of this chapter*

Considering importance of skills development for target employees of TB hospitals and development of multi-disciplinary cooperation in the field of infection control, the NCTP organized a number of trainings under financial and technical support from international partners. In such a manner, a full-scale training of specialists from national and sub-national level of health sector and engineering from private sector lay the ground for the development of multi-disciplinary cooperation in the area of infection control and enabled:

- establishment and approval of Infection Control Technical Working Group on the national level consisting of specialists from various organizations, such as NCTP, SES Committee, Correctional System Committee of the Ministry of Interior and NGOs.

- development of guidelines on TB infection control in Kazakhstan based on up-to-date principles of TB control.
- development and discussion of proposed amendments to sanitary regulations and norms on the national level in line with modern infection control concept recommended by WHO.

Administrative measures of infection control

These measures address early detection and isolation of contagious patients followed by TB chemotherapy which is recognized as the most efficient reduction of risk of TB spread in population.

In Kazakhstan, there is a good environment for administrative measures of infection control:

- developed network of bacteriological laboratories with external and internal quality control; such network allows 100% coverage of detected patients with smear microscopy and 98.0% with DST.
- Substantial infrastructure of PHC network fully integrated into the NTP. This advantage allows full-scale TB detection for free in the patient's home area. In the last 6 years, the proportion of
- people suspected for contagious tuberculosis detected by PHC remains relatively stable within 4.0 and 4.7%. Following initial examination in primary care settings, TB suspects are referred to Rayon TB dispensaries where diagnosis is confirmed and TB patients are registered for therapy. Central Health Commission regularly reviews patients' records and verifies TB diagnosis and changes in therapy pattern according to results of laboratory tests.
- In the last years, the Ministry of Health proposed for the PHC to take part in No-Queue-Policlinic contest. In this project various technologies are piloted to reduce 'live queues', including electronic individual appointment to various health services at PHC.
- If contagious TB is confirmed, patients are bound to hospitalization to relevant departments of TB hospital at least till absence of bacilli in sputum smear.
- Protocols of detection, diagnostics, treatment and monitoring of TB patients are standardized on the national level as appropriate to WHO recommendations. In parallel, centralized procurement of TB drugs through the republican budget and GF grant allows free access to therapy resulted in 86.9% coverage of TB and MDR-TB patients with 2nd line TB drugs in 2012.
- There is an evident progress in targeted TB/HIV efforts on the country level resulted in TB/HIV guidelines development, high coverage of TB patients with HIV-testing, high coverage of TB PLHIV with cotrimoxazole prophylaxis. Also, the staff schedule of 5 AIDS Centers includes TB specialists.
- All PLHIV go through TB screening. For this purpose they are referred to policlinic at the home area for clinical examination by GP, X-ray and sputum smear microscopy. If TB is suspected, phthisiologist makes further examination at TB dispensary in the home area. The staff schedule of 5 of the existing 21 AIDS Centers includes phthisiologist to examine TB among PLHIV.

Therefore, the existing infrastructure of PHC network and TB hospitals, as well as increasing access of patients to TB diagnostics and therapy facilitate support to administrative measures of infection

control at locations of potential TB spread.

Challenges in administrative measures of infection control:

- Poor practice of swift sorting of coughing patients and individual protection of personnel at policlinics of PHC network.
- Due to limited access to rapid TB diagnostics, M/XDR-TB patients do not get adequate therapy and stay in the same chamber or cell (in correctional institutions) with DR-TB patients for a long time, critically increasing the risk of nosocomial spread of infection.
- Absence of practice of prompt prescription of ART to TB/HIV patients hospitalized to TB hospital aggravate prognosis for a disease. At the same time, all-round hospitalization of TB/HIV patients increases the risk of nosocomial TB.
- In the course of transfer of prisoners and persons on trial, TB and M/XDR-TB patients are not separated from healthy ones and are transferred in overcrowded wagons during a lengthy period of time increasing the risk of infection spread.
- Unreasonable frequent and lengthy hospitalizations of patients who do not need day-and-night medical care and isolation critically increase the risk of TB spread and take up active space needed to TB patients with absolute indication to hospital care.
- Widely used decontamination of living space of patients after TB is detected worsens the existing stigma and discrimination in society and inefficient use of NTP's resources.

Measures planned to overcome challenges:

- Development and approval of guidelines on sorting, hospitalization and isolation of TB and HIV patients in civil and penitentiary health sectors by inter-sector level will streamline administrative measures of infection control, including epidemic control in TB center.
- Full-scale use of rapid TB diagnostics will facilitate inception of proper treatment of TB patients (immediately after detection) and reduce risk of TB and MDR-TB transmission.
- Amendments to sanitary regulations of Kazakhstan will specify minimum requirements to infection control in transport in the course of transfer of TB patients in penitentiary health sector
- Modernization of the existing funding infrastructure of TB hospitals in parallel with development of outpatient TB treatment patterns will exclude unreasonable hospitalization and streamline expenses. Subsequent redistribution of saved resources to strengthening of outpatient aid infrastructure will lay ground for quality detection and treatment of TB patients at PHC level based on capitation of each detected patient.

Challenges of the technical measures of infection control

These measures are recognized as the weakest component of the NTP due to the following:

- Majority of TB, correctional and general health institutions are located in the adapted buildings with poor ventilation and have to be urgently modernized to meet current infection control requirements.
- Due to the absence of engineering oversight over buildings and ventilation system in health facilities during design, construction and use, the personnel facilities (health professionals

and security) are not isolated from wards and rooms for medical procedures.

- In many facilities with a high risk of exposure of contaminant aerosol (surgeries and wards, sputum collection, bronchoscopy, cubicles in bacteriological laboratories, etc.) there is no ventilation system enabling adequate air exchange and safe airflow direction.
- Civil and penitentiary health facilities do not have shielded UV lamps to enable safe use in the presence of people. The existing practice of decontamination with open-type UV lamps in the absence of people has low efficiency for reduction of TB transmission risk and other air-borne infections.
- Civil and penitentiary health facilities do not have appropriate maintenance of engineering devices (ventilation system, HEPA-filters, biosafety boxes) due to underfinancing of maintenance, limited availability of qualified engineers and lack of testing equipment (anemometers and particle counting sensors).

Planned solutions:

- Training of ventilation engineers from private sector at international courses on engineering measures of infection control. To meet the needs of the country 2 engineers from each oblast will be invited. In future, trained engineers will be contracted by local TB institutions to maintain ventilation systems.
- Training of at least 3 specialists on maintenance of biological safety cabinets at international courses.
- Technical audit of mechanical ventilation in TB hospitals, including in correctional institutions to assess the program's needs for additional investments related to modernization and repair of the existing mechanical ventilation.
- Procurement of measurement devices for each Oblast to test ventilation system, shielded UV lamps and biosafety cabinets.
- Approval of the working group to examine ventilations systems in civil and penitentiary TB hospitals during design, installation and acceptance to prevent use of inefficient mechanical ventilation.
- To equip high-risk facilities in TB hospitals with efficient mechanical ventilation and shielded UV lams and repair the existing systems.

Due to increased financing of TB hospitals the provision with personal protective devices and UV lamps has improved (Table 14).

Table 14. Provision with UV lamps and respirators in TB hospitals in Kazakhstan

Oblast	Number of TB institutions	Provision with shielded UV lamps			Provision with respirators		
		needed	procured	%	needed	procured	%
Akmola	5	210	137	65.2	113,200	113,200	100.0
Aktobe	5	357	347	97.2	167,200	167,200	100.0
Almaty	9	380	0	0	39,340	39,340	83.3
Atyrau	6	0	0	0	5,500	0	0
East Kazakhstan	9	293	169	83.3	90,895	88,120	96.9
Jambyl	9	843	820	97.3	82,246	82,481	100.0
West Kazakhstan	10	453	311	68.7	24,104	25,755	100.0
Karaganda	5	280	133	47.5	9,167	9,167	100.0
Kostanai	8	289	68	23.5	71,864	65,078	90.6
Kyzylorda	9	338	200	59.2	16,298	15,716	96.4
Mangistau	5	441	402	91.	60,400	54,900	90.9
Pavlodar	12	249	77	30.9	24,384	24,384	100
North Kazakhstan	5	420	418	99.5	29,130	28,185	96.8
South Kazakhstan	11	489	269	55.0	91,331	69,404	75.9
Almaty city	3	885	451	51.0	25,339	22,770	89.9
Astana city	1	250	250	100.0	3,000	3,000	100.0
Kazakhstan	**112**	**6177**	**4,052**	**65.6**	**853,348**	**808,700**	**94.8**

However, the following problems with personal protective devices should be noted:

- respirators are not always worn correctly and not always used only in high risk locations;
- employees do not check tight fitting of a respirator, it leads to a risk of use of off-size and ill-fitting models;
- usually, institutions procure one model of respirators, it essentially limit a chance of selecting an appropriate respirator;
- mixed location of personnel stations and patient wards in the clinical department due to inadequate layout is a serious barrier to appropriate personal protection in a facility;
- assessment of respirator needs is difficult due to unclear frequency and performance life of the same respirator;
- no trained employees responsible for personal protection management in a facility;
- no clear instruction to regulate use of respirators (where to wear, storage and frequency of use).

Planned solutions:

- to approve instructions on respirator use and testing on the national level.
- to standardize specifications of procured wares.

Priorities in reduction of nosocomial TB risk in Kazakhstan

1. Strengthening capacity of hospital epidemiologist and members of Infection Control Committee (ICC) in development of TB IC Plan

Institution-level plans will be coordinated with Oblast IC Plan and National TB Program. In turn, the consolidated TB program, depending on level, will be integrated into regional and National Health Program in order to strengthen advocacy of IC and commit authorized persons who make

decisions on financing and staff supply to the program. Therefore, it is very important for the ICC in the institution to include following specialists:

- Epidemiologist from local SES responsible for TB;
- Officer from the NCTP and local TB hospital;
- Expert from local HIV/AIDS Center;
- TB Coordinator from correctional system.

At the same time, the ICC will assist social mobilization of the program and extensive support to it. To that end, leaders from civil society, NGO partners and patients will be involved into planning, execution and evaluation of activities. Such consolidation will facilitate objective evaluation of needs before interventions and timely focus of the program on interests /needs of patients and health professionals.

2. Development of IC budget plan based on TB risk assessment and expected costs.

Key efforts will be turned to implementation of up-to-date strategy FAST (Find cases Actively, Separate safely, and Treat effectively).

3. Raising efficiency of TB bed infrastructure through:

- increased number of beds for safe and comfortable hospitalization of contagious and severe TB cases by means of expansion of ambulatory treatment of patients who do not need separation and permanent medical care;
- swift sorting of patients to relevant departments of a TB hospital according to sputum smear, DST and therapy regime.

4. Expansion of ambulatory treatment of TB patients at PHC network will essentially enhance patient-initiated approaches and reduce costs related to hospital stay; because the available data confirm cost efficiency of outpatient treatment versus hospitalization. Subsequent redistribution of saved resources to strengthening of outpatient infrastructure will lay the ground for quality detection and treatment of TB patients in primary care settings.

5. Strengthening of environmental control and personal protection program in a health facility. Correct use of engineering and personal protective devices in combination with administrative measures will contribute to steady reduction of transmission risk of nosocomial TB and other air-borne infections. As part of engineering measures, a focus will be made on designer and engineering supervision in the course of system installation, as well as accurate design.

2.2.7. Partnership and Engagement of Civil Society

At present, the stakeholders in TB control cooperate through the Country Steering Committee and its subgroups which represent interests of various sectors. There are successful pilot projects in the country implemented by NGOs in cooperation with TB organizations and NTP (IDU/TB, HIV/TB, ex-prisoners, migrants), they may be used on the national level as well. Many TB or TB/HIV-related NGOs financially depend on international resources, such as Global Fund, USAID and others. Such international NGOs as Project Hope, USAID-assisted *Quality Health Care Project*, USAID *Dialogue on HIV and TB Project* implemented by Population Services International (PSI), USAID *TB Care I Project* (implemented by KNCV), Red Crescent Society of Kazakhstan (supported by International Federation of Red Cross and Red Crescent Societies), KNCV, *Partners*

in Health play an active role in TB activities in Kazakhstan. They provide information, financial, technical and methodology support to TB and HIV prevention and treatment.

In 1993, Project HOPE, as an international non-government organization, initiated the first TB program in Kazakhstan. From 1993 on, Project HOPE has implemented numerous projects funded by USAID and a number of activities in the framework of Round 6 of the Global Fund in 2009-2010. In the framework of previous projects, Project HOPE provided technical assistance to organization of TB response, including drug-resistant TB management in pilot Almaty Oblast and pentitentiary system of Karaganda Oblast. Together with the NCTP, a monitoring and supervision system was implemented in the pilot oblast. This experience of system introduction was analyzed and used as a model by the Ministry of Health to be introduced all over the country. Project HOPE has extensive experience in organization and implementation of activities focused on raising awareness of TB among general population and vulnerable groups. Employees of the organization were leading in convening Working Group meetings to prepare National Advocacy, Communication and Social Mobilization Program focused on support to achievement of objectives under the National Program *Salamatty Kazakhstan* 2011 – 2015. A number of activities were organized to develop national HR capacity in Advocacy, Communication and Social Mobilization, including training of trainers on interpersonal communication, development of information and educational materials on TB for various target groups.

Project HOPE is experienced in TB response activities among vulnerable groups, and migrants in particular. Dealing with TB problem in the Central Asia, Project HOPE made a research on migrants and their access to health care. In 2010-2012, in the framework of HIV and TB Dialogue project of USAID, Project HOPE was involved to the development and implementation of activities focused on raising awareness of TB, reduction of stigma and discrimination of vulnerable groups. Together with the NCTP and Ministry of Health, Project HOPE was involved into the system of logistic management of TB drugs in the country. The experience gained from introduction of such system on the pilot level enabled harmonization and introduction of drug management reporting forms all over the country. Over these years, Project HOPE has trained thousands of health professionals and community members in the course of various workshops addressing all aspects of TB program. Currently, Project HOPE is working on TB component under Quality Health Care Project of the U.S. Agency for International Development (USAID).

Currently, the Red Crescent Society in implementing a number of TB Prevention projects:

1. Support Program to TB patients under treatment category 1 and 2 in cities of Semei and Kokshetau. The Program includes patient patronage, Directly Observed Therapy (DOT), raising awareness among population groups. Social support is provided with food and personal hygiene products.
2. Support Program to MDR-TB patients in cities of Almaty, Taldykorgan, Kyzylorda (patronage, DOT, social support with food and personal hygiene products, raising awareness among all population groups)
3. Social Support Program to co-infected patients (HIV/TB) in cities of Almaty, Karaganda, Temirtau (social support, psychological and lawyer counseling).

Quality Health Care (ABT), Dialogue on HIV and TB (PSI), TB CARE I (KNCV) Projects funded by the US Agency for International Development (USAID) deal with advocacy, communication and social mobilization, make active efforts to improve interaction, joint planning and activities related to engagement of the civil society, raising awareness of the general public and vulnerable groups on tuberculosis prevention and treatment.

Population Services International (PSI) is an international non-government non-profit organization,

world leader in social marketing with projects implemented in 70 countries. PSI undertakes advocacy and educational campaigns to encourage correct use of certain products and services in the field of family planning, prevention of HIV/sexually transmitted infections, TB, mother and child health. PSI programs are implemented through mass media and interpersonal communication, in the meantime investing into capacity development of local NGOs to create a sustainable social model of safe behavior among vulnerable groups. The INGO is working in Kazakhstan from 2002. Its efforts are focused on change of risk behavior among vulnerable groups (injecting drug users, sex workers, men having sex with men, prisoners, migrants, people living with HIV and youths). At present, PSI chairs consortium of organizations in the regional Central Asian Dialogue on HIV and TB project of USAID, as well as Orleu Project on Expansion of HIV Prevention Programs among Vulnerable Groups in Kazakhstan through the grant assistance of the Global Fund to Fight AIDS, TB and Malaria. These programs will provide wide access to health services and products related to HIV/AIDS prevention, drug abuse, change of risk behavior, as well as tuberculosis prevention and treatment to vulnerable groups.

USAID Dialogue on HIV and TB Project is in progress from October 2009 and addresses reduction of HIV and TB spread through change of risk forms of behavior related to HIV transmission, as well as strengthening of HIV and TB prevention among vulnerable groups. The project provides technical support to local government and non-government organizations which render services to groups faced with increased risk of HIV and TB infection. From April 2010 till July 2013, the Project's activities on TB prevention and promotion of adherence to TB therapy in Kazakhstan covered people from increased HIV and TB infection risk groups:

- 25,831 people covered with HIV and TB prevention services;
- 2,541 people took TB examination in the framework of voucher referral system;
- 115 new TB cases detected in vulnerable groups;
- 268 injecting drug users, PLHIV, prisoners and migrants received support to adherence to TB therapy and successfully completed it.

Besides, training was provided to health and social workers:

- 283 community leaders were trained to support adherence to TB therapy;
- 328 PHC health professionals and NGO employees were trained on TB prevention and infection control;
- 328 health professionals were trained to reduce stigma and develop communication skills to interact with groups faced with infection risk.

In the framework of the project, successful models addressing target groups were developed. One of such models is *Unison* – Multidisciplinary Approach to Develop Adherence to HIV and TB Therapy among PLHIV – this is a patient-centered approach conducted by a a multidisciplinary team consisting of a doctor, nurse, psychologist and social worker, peer consultant, narcologist (if opioid substitution treatment, or OST, is available in a target site) closely working in a range of healthcare sectors including TB organizations. Team activities were focused on medical and social and psychological services. Families of PLHIV are also brought into the team, where possible, for additional support and to build a stable home environment. All members of the team sign an agreement expressing full commitment to participate in the program. Such model was used together with the trained NGOs in Almaty, Temirtau and Ust-Kamenogorsk.

One of the key problems of vulnerable groups is absence of access to health services due to problems with identification documents and local registration. In the framework of the project, Orders of Health Departments on voucher referral system for vulnerable groups were issued in pilot regions. Project clients might use these vouchers to take TB and HIV examination without documents. To roll-out this initiative, joint advocacy is undertaken on the national level by USAID projects in the Ministry of Health with sharing experience gained in Karaganda and East-

Kazakhstan Oblasts and Almaty-city.

In May 2013, PSI/ Central Asia was awarded the *Excellence in Innovation in Health Sector* award by the American Chamber of Commerce for the efficiency of HIV and TB client data records.

NGO Partners In Health established with the assistance of Harvard School of Medicine in the 1980-ies is one of the leaders in clinic and program management of MDR-TB and HIV-AIDS patients in many countries, including the USA, Peru, Haiti, Lesotho, Malawi, Mexico, the Russian Federation and the Republic of Kazakhstan. One of the key priorities of the *Partners in Health* globally and in Kazakhstan in particular is high-quality technical assistance to the National TB Program in the field of program and clinical MDR-TB case management both in civil and penitentiary sectors. The activities of *Partners in Health* in the framework of Round 8 GF Project included technical assistance to program and clinical MDR-TB case management of civil and penitentiary TB hospitals, training of health professionals from TB hospitals and PHC, monitoring of utilization of GF' grant in 6 Oblasts of Kazakhstan and operational research. In six regions where *Partners in Health* worked, there are TB hospitals of the correctional system where MDR-TB patients are treated (Karaganda, Pavlodar, East-Kazakhstan, South-Kazakhstan and Akmola Oblasts). From July 2013, *Partners in Health* terminated its operations in Kazakhstan.

The Royal Netherlands Society Tuberculosis Foundation (KNCV) – is a non-profit non-government organization established in 1903 in the Hague (the Netherlands) dealing with TB prevention and control on the international level in close collaboration with the World Health Organization, International Union against Tuberculosis and Lung Diseases and is a co-founder of Stop TB WHO Partnership. KNCV is one of leaders on TB control on the global level. From 1997, KNCV is operating in Kazakhstan through technical assistance to improvement of TB and MDR-TB control in civil and penitentiary health sectors, infection control, collaborative activities on TB and HIV, development of research capacity in TB program and creation of patient support system.

Key Work Areas of NGOs in Kazakhstan

Technical assistance to the national TB program to improve quality of TB control programs in civil and penitentiary health sectors, such as:

- participation in development of national documents (programs, guidelines, regulations, protocols), including TB and HIV;
- participation in development and introduction of best practice models of DR-TB program management, including creation of a model to retain a patient;
- promotion of integrated approach to TB control, including in penitentiary institutions;
- improvement of quality of TB program in prisons;
- participation in development of training curricula, workshops, conferences, as well as joint research aiming at prevention and treatment of socially significant diseases (TB, HIV/AIDS and others), for penitentiary system as well;
- development and implementation of joint projects in the field of TB prevention and treatment;
- support to mobilization of society in TB control through raising awareness;
- introduction of innovative international models of work with vulnerable groups on how to change risky behavior towards TB and HIV, co-infection TB/HIV, improved access to health and social services;
- advocacy to proposing lots in the government social service contract for NGOs in the field of TB and HIV;
- creation of models of health organizations and TB hospitals in correctional institutions in

particular, which can be replicated in Central Asian countries;
- introduction of international standards to comply with biological safety of bacteriological laboratories.

At present, KNCV, with the assistance of USAID, is implementing technical project TB CARE I (2011- 2014) in Kazakhstan.

Such NGOs as social funds *Luch Nadezhdy* (Ray of Hope) in Akmola Oblast, *Penal Reform* and *Human Rights Monitoring Committee* in Pavlodar Oblast, *Sauiygu* in Almaty and Almaty Oblast, *Regional Center for New Information Technologies* are sub-recipients of the Global Fund projects in Kazakhstan. They monitor TB-related activities in penitentiary institutions and provide psychosocial counseling to prisoners 2 months prior to release.

To improve interaction of the penitentiary system with civil health sector the Ministry of Health has placed a social service order on enhancing adherence of TB patients to treatment following release through NGOs. Relevant tender was launched with the following bidders *Luch Nadezhdy* in Akmola Oblast, *Umit*, Association TC *Taza El* and *Sauiygu*. The winning bidder is *Luch Nadezhdy* in Akmola Oblast. This is a social fund for protection of human rights and TB control. On 19 April 2012, it commenced implementation of a socially significant project on the national scale *Engagement of NGOs to Ensure Succession between Penitentiary and Civil Sectors in Treatment of TB Patients after Release*.

The target groups of the project are:

- convicted persons in correctional institutions;
- the released persons;
- TB patients who served the term with unfinished treatment;
- health professionals from penitentiary and civil health sectors;
- representatives of civil society (NGOs from Akmola, North-Kazakhstan, Pavlodar and Karaganda Oblasts).

From 24 April to 15 May 2012, a permit was obtained from the Correctional System Committee of the Ministry of Interior for unhampered access to secure settings and project activities in North Kazakhstan, Pavlodar, Karaganda and Akmola Oblasts. Information letters were prepared and sent to oblasts departments.

Workshop modules were prepared for the prisoners to develop adherence to continued treatment and healthy life style.

On 28 May 2012, a training was conducted at ES-168/4 SK (health institution for convicted TB patients) attended by 20 persons. Individual advice is provided to prisoners to be released in the next three months. 110 people are covered with advice and 20 people with training.

A list of prisoners to be released soon with probable destination address after release are prepared and sent to local TB dispensaries. All the released are delivered to Oblast or regional TB dispensary by vehicles accompanied with prison officer. The project has identified a number of problems to be resolved on the legislative level.

Notwithstanding the above-said, the NGOs are not adequately engaged in TB-related activities. No sustainable engagement mechanisms are available and social service orders from the government to NGOs are not sufficient.

2.2.8. Advocacy, Communication and Social Mobilization

It is evident from international studies that such factors as, inter alia, poor awareness of population about TB, late resort to medical advice and stigmatization in society have a serious impact on TB incidence. In 2005 and 2009, to review awareness about TB, the HOPE Project studied TB knowledge, attitude and practice in the target groups (doctors, nurses, patients) in Almaty Oblast. In February 2010, HOPE Project undertook qualitative studies among groups at high TB/HIV co-infection risk: injecting drug users (IDU), PLHIV, men having sex with men (MSM) and sex workers (SW) in Almaty and Temirtau. The study showed that usually knowledge about TB in the target group is poor especially in respect to transmission routes and symptoms which are decisive for TB detection, prevention and treatment. Also, all groups demonstrated poor awareness of TB transmission routes due to lack of information.

In 2010, PSI, international organization, studied HIV and TB-related issues and assessed risk behavior related to HIV transmission and use of HIV and HIV/TB prevention services by IDU, SW and MSM in Almaty and Karaganda.

The study produced the following recommendations:

- further efforts should be focused on raising awareness and motivation to take TB examination through peer-to-peer interviews, mini-sessions, counseling and illustrated publications (printed, TB diagnostics maps);
- disseminate information on the need to take regular TB examination (including fight against prejudice and discrimination) and on TB-related issues among IDU, SW and MSM and their family members.

These recommendations have been partially implemented in Almaty, Ust-Kamenogorsk, and Karaganda cities, where NGOs were involved in activities with risk groups' population and with NTP participation.

Since these problems are not purely medical ones, health education plays an important role. At this stage of society development, advocacy, communication and social mobilization are the components of the proposed approach. The proposed advocacy, communication and social mobilization provide for engagement of the entire society and even NGO rather than health professionals from various levels (PHC, phthisiologists) only to meet the objectives of the Comprehensive TB Control Plan 2014-2020.

Raising awareness of the society about TB symptoms and risks is expected to change people's attitude to health. At the same time, the use of communication technologies by health professionals will have effect on medical practice focused on early detection and prevention. Patients strictly follow recommendations of health professionals with good communication skills, because they raise confidence of patients and are able to convince patients to take TB examination, follow coughing hygiene and other procedures for TB detection and prevention. It is assumed as well that patients will seek medical advice in a timely manner, while training of qualified and committed health professionals in civil and penitentiary systems will enable early TB detection and appropriate treatment.

Affordable qualified medical aid to TB patients will facilitate early detection and increased adherence of patients to complete and uninterrupted therapy. NGO and community-based action groups are expected to play an active role in work with patients at the supporting therapy phase.

Creation of patient support groups with NGOs will increase patients' adherence to treatment, reduce disruptions and subsequently have effect on the outcome of therapy.

This area of focus covers wide TB-related training, interpersonal communication and counseling of patients by general practice health professionals. It will improve awareness of general public and patients about the disease and skills for communication and counseling TB patients. It will allow selection of the most efficient behavior strategy towards patients in order to improve their adherence to complete course of treatment.

Advocacy, communication and social mobilization activities will be integrated into strategic plans of oblast TB Programs and supported by adequate budget in the process of implementation. This is expected to raise efficiency of TB control by 5-10%.
Advocacy, communication and social mobilization activities will be coordinated by the thematic working group (TWG) under the technical working group at the Ministry of in charge of strengthening TB control.

All these activities will be conducted by the NCTP and the National Center for Problems of Healthy Life Style Development and supported by all NTP participants. All the participating organizations will share expenses as well in order to achieve efficient use of resources.

TWG will monitor progress towards achievement of objectives, review and approve information materials. Monitoring missions will take place twice a year and use defined performance indicators.

Advocacy, communication and social mobilization activities will be evaluated through interview and detailed analysis of outputs to monitor progress towards achievement of objectives for each target group. Efficiency of certain planned activities will be evaluated through interim reviews in order to assess impact on knowledge, attitude and behavior of target groups.

Key Objectives for Advocacy, Communication and Social Mobilization in 2014-2020

1. During 2014-2020, in order to detect TB early, to raise awareness of general public about early resort to PHC in the event of any physical complaints.
2. To engage NGO to raising awareness of general public about TB, anti-stigma and discrimination, as well as increased adherence to TB treatment.
3. By 2020, to focus support on improved access and quality of TB aid to risk groups (migrants, IDU, TB/HIV patients and others).
4. During 2014-2020, to facilitate creation of groups of support and mutual aid to TB patients in the course of outpatient phase in order to improve adherence to treatment.
5. During 2014-2016, to facilitate expansion and improvement of social aid to TB patients.
6. During 2014-2015, to facilitate expansion of outpatient treatment of TB patients.

2.3. Financing of TB Control

TB control activities in Kazakhstan are funded from central and local government budgets. The central (republican) budget covers procurement of TB drugs (1 and 2 lines), operating expenses of the NCTP. Oblast (local) budget covers TB-specific expenses according to standard budget classification. During 2009-2012, expenses of specialized TB hospitals varied between 24.5 million KZT in 2009 to 23.5 million KZT in 2012 году (Table 15), but these are expenses of specialized TB hospitals only and they do not include other expenses of health system (e.g., PHC and SES expenses and general guidance).

Equally to the trends in health system of Kazakhstan, funding of TB specialized hospitals has

essentially grown from 15.5 million KZT in 2009 to 23.5 million KZT in 2012 (by 39.1%) mainly due to oblast budgets which have increased by 50.9% (Table 15).

Table 15. Budgets expenses on specialized TB treatment, in thousand KZT

	2009	*2010*	*2011*	*2012*
Local (oblast) budget	15,579,527.5	17,885,363.7	21,767,773.0	23,509,194.9
Central (republican) budget	8,959,033.9	8,959,033.9	9,935,228.3	10,630,694.3
Total TB budget	**24,538,561.4**	**26,844,397.6**	**31,703,001.3**	**34,139,889.1**

Source: WHO Extensive Review

During the same years, the republican budget expenses demonstrated lower nevertheless essential growth by 18.7% (Table 16).

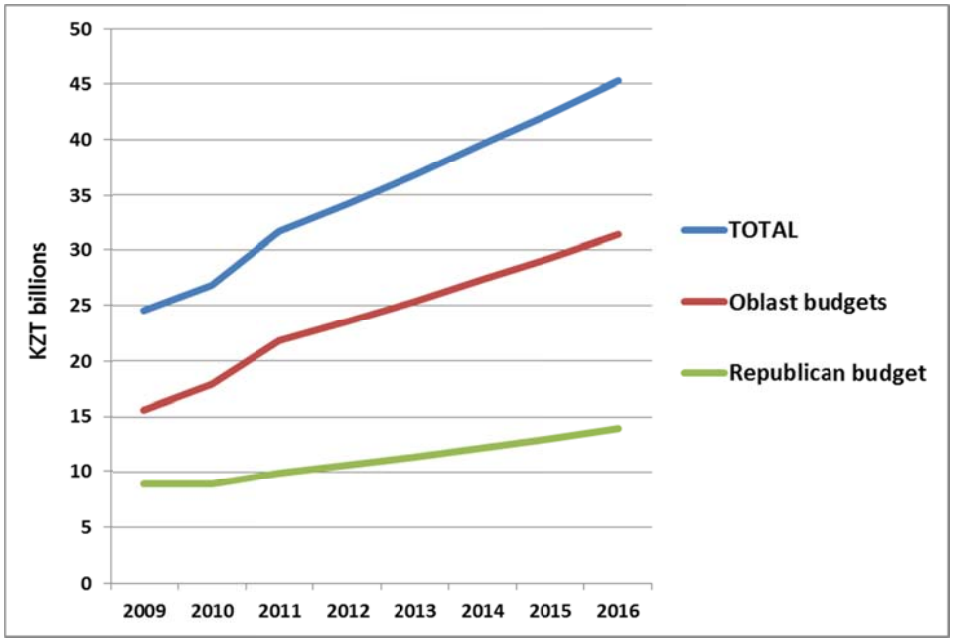
Table 16. Expenses on specialized TB treatment in 2009-2012, in USD

	2009 (expenses)	*2010 (expenses)*	*2011 (expenses)*	*2012 (expenses)*
Local (oblast) budget	105,623,915.3	121,380,140.6	148,463,872.7	158,695,793.6
Central (republican) budget	60,739,212.9	60,801,044.4	67,761,753.5	71,761,133.2
Total TB budget	**166,363,128.1**	**182,181,185.0**	**216,225,626.2**	**230,456,926.8**

Source: WHO Extensive Review

Figure 8 demonstrates increase of TB budget in the recent years:

Figure 8. Increase of TB budget in Kazakhstan in 2009-2016



2.4. Epidemiological Surveillance, Monitoring and Evaluation

In Kazakhstan, TB is subject to mandatory registration at TB hospital and Sanitary and Epidemiological Surveillance (SES) authorities. TB surveillance is a vertical system of standardized TB record and reporting at three administrative levels: rayon, oblast and republican level. Patients are detected and registered at rayon and oblast levels. Information on registered cases from rayon level goes up to the oblast and then from oblast TB dispensaries to the republican level. The NCTP

receives patients' records from all regions and produces standard reports on TB cases and outcomes to the Ministry of Health.

TB surveillance in penitentiary system is conducted through Health Department of the Ministry of Interior. Every year, TB cases detected in the penitentiary system are reported to the civil health sector.

All standard case definitions and indicators for TB registration and reporting in Kazakhstan are in line with WHO standards and recommendations. They include registration of TB cases according to disease localization (pulmonary or extra pulmonary), outcome of sputum smear and culture test, type of patient (new case or relapse, failed treatment, treatment after interruption and transferred case), category of therapy (category I – new cases, category II – re-treated cases, category IV – M/XDR-TB).

In 2001, the US Center for Prevention and Disease Control (CDC) provided general guidance and USAID provided financial assistance to Kazakhstan in creation of the National E-Register of TB Patients (TB Register). From 2003, new forms of data collection were integrated into the TB Register. It is working in Visual Basic developed by limited liability company *Medinform*. In 2007, all records and reporting data in the TB Register were harmonized with international standards. In 2013, the TB Register commenced on-line functioning under financial assistance of the Global Fund and efforts of *Medinform*; all patients' data available in the FoxPro database became fully accessible on-line. Additional components on laboratory and social support directly linked with the National register were developed for the TB Register, as well as Drug Stock and Monitoring and Evaluation modules though not directly linked to the TB Register.

TB Register database is integrated with two national databases: it contains record of all persons in Kazakhstan who had ever been registered for dispensary care for any disease and Register of Attached Population contains records of all persons attached to local PHC facilities in the country. Information on a new detected TB case is entered through sequential search of a patient in three DBs starting from the TB Register, then in Register of Dispensary Patients and, finally, if not found yet, in Register of Attached Population. A patient may be searched by full name or Individual Identification Number (IIN).

When a patient is found the data from standardized records are entered. The source documents are:

- TB 16 – dispensary observation record;
- TB 01 – medical record of a TB patient;
- TB 01 category IV - medical record of a TB patient category IV.

The base document is TB16 form, the TB Register retrieves data on the group of dispensary register from it and then if a patient was prescribed a therapy such information is taken from TB01 or TB01 category IV.

The TB Register includes detailed personal information on each TB patient in the country, including social, demographic, diagnostic, therapy and outcome data. The system is developed in such a way that access is authorized according to the role and level of TB hospital. Separate login and password is provided to enter information to Laboratory and Social Support components. All bacteriological laboratories enter test results themselves. In addition, each bacteriological laboratory is attached to a certain TB hospitals and is unable to edit data of another laboratory. Now, for the first time ever the Laboratory component of the TB Register can incorporate results of culture tests conducted through BACTEC method, as well as results of molecular genetic test: HAIN-test and G-Xpert. Moreover, any oblast may see only its rayons while the national level may see all oblasts and rayons in the system. Data on any type of social aid provided to a patient may be entered into Social

Support component. Responsible persons have been designated to enter data to all new components on rayon and oblast levels.

The system may generate standardized reports according to WHO recommendations and produce lists with names of patients in a certain report (for comparison and check of data quality) ensuring at the same time a maximum degree of patient confidentiality.

In the framework of the NTP, monitoring and evaluation (M&E) system is arranged in a way to ensure sound use of resources to obtain data for decision-making and allow managers to trace trends. M&E is focused on integrating interests of all partners into the single system to avoid overlapping.

The M&E unit is established at health authorities of Kazakhstan and is properly equipped and staffed to process data. The unit coordinates TB M&E efforts irrespective of localization of activities. From 2004, a M&E thematic working group is created to assist selection of indicators and execution of M&E. To enhance practical research line the M&E system at the NTP has links with national research institutions, as well as Ministries of Justice and Interior, NGO and donors (GF, USAID).

Personnel of the M&E system on the national, oblast and rayon levels of the NTP is trained and has experience in epidemiology, data processing and statistical analysis, data dissemination and tracking financial and non-financial resources.

The M&E system relies on strategy which includes aims and performance indicators; guidelines for rayons, regions and oblasts in respect to M&E and interrelation of M&E with other health sectors; indicators to assess progress of the program, plans for data collection, analysis and dissemination, use of outputs for program improvement. National and short-term M&E plans are regularly updated. Statistical overviews with evaluation of progress of the national program and/or projects are disseminated every year. Coordination of national and donor needs in M&E is conducted by Office for Organization and Planning of TB Activities of the NCTP of the Ministry of Health. M&E priorities and additional indicators comparable with a course of time and with data from other countries are developed and described for each level of TB Program. General national plan for collection and analysis of reliable data is supplemented with data dissemination plan on national, oblast and rayon levels of the program.

The single M&E sequential system enables transmission of accurate data to managers at each level of TB program and health system. Various methods of TB control M&E are used by the NTP:

- current monitoring system;
- supporting oversight;
- surveillance and inspection;
- country case study;
- external program overviews.

2.4.1.Current Monitoring System

The NTP is using data collected in the course of aid provided to TB patients: detection, diagnostics, registration, treatment and drug supply utilized by program managers. TB control program is using patient records as a source for patient registration journals TB 03 and TB11 which in turn are used for follow-up of disease progress of each patient and regular monitoring. Journal records are regularly used to produce quarterly reports with information on inclusion of a patient to therapy programs and outcomes. For this purpose, cohort analysis is used. These reports are reviewed on the

local level and sent to oblast and national levels for aggregation, analysis, dissemination and use in program management.

2.4.2. Supporting oversight at NTP consists of check of quality of reporting and registration. Patients' records and registration journals are audited, data transmission is re-checked and certain elements in the quarterly reports are re-calculated. Supporting oversight includes discussion of problems as well and provides training opportunities to eliminate detected problems. Supporting oversight is scheduled at least once every three months. It is also used to submit checked data to the central level. Once a year, a group of supporting oversight experts conducts an in-depth systemic review. It includes check of quality of reporting and analysis by cohort groups; quality of quarterly report; additional double-check of registration journals; systemic sample of patient records to assess quality of TB aid and basic indicators.

One of the tools to review the available TB information, as well as structure, functions, results and impact of TB program on health system is a *case study.* It is used to identify strengths and weakness of the program and gaps. Usually, it is used by the national experts to prepare strategic plans and requests for finance to donor organizations, as well as obtain information for external program overview.

In the course of development of a long-term strategic plan, the NTP *requests external program review* every 5 years. A team of national and international program management experts or technical experts, partners on the local level, program personnel from the Ministry of Health, representatives of civil society and donor organization is mobilized.

A newly established team of experts makes use of the agreed instruments to review documentation, activities, interview key information sources, including medical personnel, clients, other health providers and members of voluntary civil and public organizations. Final report with findings and recommendations for the government and stakeholders is used in follow-up planning.

As one of monitoring methods, the NTP uses a system of dynamic and comprehensive tracking of TB epidemic process all over the country to promote efficiency of TB prevention and epidemic control. On country level, TB-related information, significant from epidemiological perspective, is collected, forwarded and continuously analyzed; as well as on-going assessment of epidemiology and trends is performed and efficient management decisions are made according to the assessment findings.

2.4.3. Existing M&E problems

- System introduction and support require strengthening of staff capacity at Methodology and M&E subdivisions of the NCTP and on oblast level.
- Inadequate knowledge of advanced tools of statistical analysis and data interpretation used in a system by specialists from Methodology and M&E subdivisions.
- Inadequate supply of Methodology and M&E subdivisions with sophisticated computers and high-speed Internet.

2.4.4 *Planned solutions:*

- Amend Administrative Order № 238 of 07.04.2010 On Approval of Standard Staff Schedule and Staff Standards in Health Facilities with respect to detached M&E teams and staff positions responsible for National TB Register on national, oblast and rayon levels.
- Train persons responsible for maintaining National TB Register (including from penitentiary system) to enter, analyze and present data.
- Secure Internet-connection and supply PCs to bacteriological laboratories, pharmacies and Methodology Units in TB facilities and correctional institutions.

2.5. Pharmacological Surveillance: Planning, Procurement, Storage and Distribution of TB Drugs

In the Republic of Kazakhstan, the TB drug demand is planned for three years and every year the items, volume and budget of TB drugs have to be agreed. The most convincing method of TB drug needs estimation for a budget request is registered-case method based on expected incidence. This requires reliable data on registered cases and therapy schemes. The annual TB drug needs are estimated according to the approved methodology. After the needs are assessed a request (TB Drugs Demand under budget program 010-101 Dedicated Current Transfers to Oblast Budgets, Budgets of Astana and Almaty for Drugs Procurement) is prepared before 1 March in each region and sent in MS Excel format by e-mail (the original with a cover letter by mail) to the NCTP for approval. In turn, the NCTP aggregates the needs under Drug Budget Transfers Program collected from Departments of Health of oblasts, Astana and Almaty. The aggregated needs are submitted to the Ministry of Health before 1 April of the year preceding to the planned year for final approval and confirmation of regions' requests. Maximum drug prices procured in the framework of the guaranteed benefit package through the single distributor are annually revised and approved by the Order of the Ministry of Health. All drugs for TB and M/XDR-TB treatment are funded from the republican budget. From 2015, the list of drugs procured through the single distributor will include child doses 1st line TB drugs.

Funding of TB drugs from the republican budget is regulated by Resolution of the Government of Kazakhstan dated 30 October 2009 № 1729 *On Approval of Rules for Preparation and Procurement of Drugs, Preventive (Immunobiological, Diagnostic, Bactericidal) Medication, Medical Devices and Medical Equipment, Pharmaceutical Services to Provide Guaranteed Benefit Package* and is executed by means of a two-phase tender through the single distributor *SK-Farmacia*.

The first phase includes:

- establishment of a commission by the single distributor or organizer of medical equipment procurement;
- announcement of a two-phase tender;
- receipt, opening and review of bids of potential suppliers;
- admission of potential suppliers to the least price bidding.

During phase two, the least price bid is selected. TB drug ordering customers (oblast/municipal health authorities) should enter into contracts with the winning bidder for procurement of medical equipment during ten working days after receipt of notarized copies of two-phase tender protocol.

Following the results of two-phase tender, the single distributor concludes supply contracts. Annual volume of TB drugs may be divided into monthly or quarterly supplies.

The residual shelf life at the time of supply with total shelf life below two years may not exceed thirty per cent of total shelf life at the time of supply. For goods with the shelf life below two years the residual shelf life may be at least eight months at the time of supply.

2nd line TB drugs funded by the Global Fund arrive to the temporary warehouse after customs check and then are distributed to all oblasts and cities of Kazakhstan.

At all distribution levels, the medication and the stock are stored at pharmacy warehouse of oblast \city\regional TB dispensaries. Drug residues at all levels are reviewed each month and adjusted if

necessary. Medication is further distributed to rayon level and health facilities every month or quarter upon request /waybills. Monthly consumption of TB drugs forms the basis of the request. Distribution to PHC facilities for outpatient treatment is conducted every month according to requests /waybills (with reserve stock at least 25% of monthly needs).

Storage of drugs and TB drugs in particular is regulated by Resolution of the Government of Kazakhstan of 23 December 2011 № 1595 *On Approval of Rules for Storage and Transportation of Drugs, Medical Devices and Medical Equipment to Maintain Safety, Efficiency and Quality*.

Use of drugs is regularly monitored with respect to sound use and prevention of shelf life expiry. FEFO (first-ended first-out) principle is used for stock management. There is an established system of stock inventory and reporting to enable the program management to plan distribution, apply medication and avoid expiry of shelf life. At least once a year experts from the NCTP monitor management of all inventory stock during monitoring visits. Data for monitoring purposes is collected from special check-lists and monitoring is based on check of drug consumption documents and physical inspection: records, balance of inventories, drugs' flow and adherence to therapy scheme, consumption level, drug management reports, etc. Apart from this, TB 13 reports on receipt, distribution and use of TB drugs are collected from local level every month for follow-up analysis and adjustment. The received information on monthly drug consumption is compared versus patient plan.

Following introduction of pharmacy component to the TB Register it is planned to get on-line TB drug flow and residues reporting forms from 2014.

Monitoring of drug adverse reactions is introduced in Kazakhstan from 2005 in accordance with the Drug Law and Order of the Ministry of Health №52 of 14.02.2005. From 2008, Kazakhstan is a full member of WHO's International Program for Adverse Reaction Monitoring. From early 2009, a new phase of pharmacovigilance development commenced aiming to improve and harmonize regulations in the field of drug safety control.

Earlier on, according to Order of the Ministry of Health of 14 February 2005 №52 *On Approval of Guidelines for Monitoring of Adverse Drug Reactions*, only health and pharmaceutical professionals might notify of adverse reactions of drugs. From November 2009, according to Order of the Ministry of Health 647 of 03.11.2009 *On Approval of Rules for Monitoring of Adverse Drug Reactions in Medical and Pharmaceutical Organizations*, adverse drug reactions are monitored at:

- medical and pharmaceutical facilities;
- in the course of clinical research;
- owners of registration certificates.

Each health facility, including PHC, collects and registers spontaneous case reports on any adverse drug reactions. The original case reports filled by doctors in charge (district doctors) are submitted by drug coordinators by mail to the authorized entities (local branches of Pharmaceutical Control Committee or Drug Unit of Health Department or Adverse Drug Reaction Unit at the National Center for Drug Expertize).

The final purpose of pharmacovigilance and monitoring of adverse drug reactions is to protect patients by means of ceaseless review of risk/benefit balance in drug therapy, early detection and assessment of frequency of severe and adverse drug reactions. Pharmacovigilance provides for review and assessment of data on absence of therapy effect, incorrect drug use contrary to terms approved during registration and drug abuse, interaction with other drugs or other interactions if such data may have impact on assessment of risk/benefit.

In Kazakhstan, pharmacovigilance and monitoring of adverse drug reactions is conducted by the Committee on Pharmaceutical and Medical Performance Oversight ("Committee") and the National Center for Expertize of Drugs, Medical Devices and Medical Equipment ("Drug Expertize Center»).

The Committee conducts pharmacovigilance through such regulatory measures as:

- restriction in drug application;
- suspension of marketing;
- amendments to medical use specifications;
- withdrawal from market, prohibition of manufacturing, distribution and use in Kazakhstan.

The Committee takes regulatory measures based on recommendations of the Drug Expertize Center – the expert organization in national drug registration in Kazakhstan and authorized for ADR monitoring.

The Drug Expertize Center collects and analyzes reports on suspected ADRs, reviews causal relationship between adverse reaction and drug use.

The NCTP collects routine information on all registered adverse reactions of TB drugs every month.

In 2013, following improvement of Drug Component in the TB Register a computerized personal data management will be introduced for acceptability of each drug. For this purpose, some amendments were made in TB01 and TB01-category IV forms to extend DOT records – records are made per each drug including any case of cancellation of drugs.

Pharmacovigilance and ADR monitoring regulations in Kazakhstan:

The Code of the Republic of Kazakhstan on *Health of the Nation and Health System* (with amendments as of 19.01.2011):

Article 84. Prohibition, Suspension or Withdrawal of Drugs, Medical Devices and Medical Equipment

The Authorized entity may prohibit or suspend use, sale or manufacturing of drugs, medical devices and medical equipment and decide on withdrawal when:

- drugs, medical devices and medical equipment fall short of technical regulations and standardization regulations;
- ADR hazardous to human health but not listed in drug use specifications are detected;
- defects in design, operation principle, manufacturing affecting safety of application of medical devices or medical equipment when in use are detected;
- the approved manufacturing process of drugs, medical devices and medical equipment is troubled and affects quality, safety and efficiency;
- there are data on harm to patient or user health caused by use of drugs, medical devices and medical equipment;
- there are data on inappropriate scientific and technical level of the technology of manufacturing and quality control leading to lower safety of drugs, medical devices and medical equipment.

The procedure for prohibition, suspension or withdrawal is established by the authorized entity.

Article 85. ADR Monitoring

- ADR monitoring is conducted by health and pharmaceutical providers as specified by the authorized entity.
- Health providers are obliged to notify the authorized entity in writing on any manifestation of peculiar interaction of drug with other medications and their adverse reactions, including those not listed in drug use specifications.

Achievements:

- The document for estimation of TB drug needs to treat TB, MDR/XDR-TB patients is approved.
- All regions of the civilian sector are trained on methodology for estimation of TB drug needs.
- All necessary TB drugs are procured in a timely manner and centrally through the single distributor.
- TB drug supply from the republican budget is regular.
- Storage conditions for TB drugs are observed in all TB facilities.
- Adverse drug reactions are monitored.
- On-line e-tracking system for receipt, use and residuals of TB drugs (pharmacy component of the electronic TB Register) is developed.
- Persons responsible for coordination of drug supply to TB patients are appointed in all regions of the civilian sector.

Challenges:

- TB drugs funded from the republican budget are not in the prequalified list of WHO.
- Child doses of first-line drugs are not funded by the republican budget.
- Drugs used for prevention and reduction of adverse TB drug reactions at the ambulatory phase are not in the guaranteed benefit package.
- Detached Drug Supply Coordinators are not available.
- Members of drug formular commission in TB facilities are not trained to methods of evaluation and analysis of drug supply to TB patients.
- Systemic control over TB drugs' quality during distribution and use is not available.
- In Kazakhstan, there are no TB Drug Management Guidelines.

Planned solutions:

- Develop mechanism for procurement of TB drugs prequalified by WHO.
- Extend the existing list of procured TB drugs with registration followed by funding from the republican budget.
- Include symptomatic and pathogenetic drugs to Administrative Order of the Ministry of Health № 786 of 4 November 2011. On Approval of List of Drugs and Medical Devices for Free Supply to Population in the framework of Guaranteed Benefit Package at the outpatient level.
- Develop and approve staff norms on M&E, including Drug Coordinators.
- Train members of Formular Commissions on methods of evaluation and analysis of drug supply to TB patients.
- Develop and approve post-registration quality control of first and second line TB drugs procured in the country.

- Develop TB Drug Management Guidelines in Kazakhstan.

2.6. Evaluation of National TB Control Strategic Plan 2007-2012

The last NTP and national TB control, prevention and care evaluation for the period 2007-2012 was conducted in May 2012 in Kazakhstan identified many strengths and opportunities, but at the same time weaknesses and challenges which have to be addressed in future.

2.6.1. Strengths:

- Extensive support from the President and Government of Kazakhstan in the field of TB aid to population.
- National documents to enable regulation and implementation of TB activities.
- Regular discussion of TB problems at national and regional meetings.
- Adequate funding of 1, 2 and 3 line TB drugs from the national budget (82% 2 line TB drugs were funded from the republican budget in 2012, 18% from GF fund in civil health sector; 24% and 76% in penitentiary sector respectively).
- Well-developed infrastructure of TB institutions.
- The Code on *Health of the Nation and Health System* and National Guidelines on TB and MDR-TB treatment in Kazakhstan in line with WHO recommendations. Resolution of the Government of 30 October 2009 № 1729 *On Approval of Rules for Organization and Procurement of Drugs, Prophylaxis (immune biological, diagnostic, disinfectant) Products, Medical Devices and Medical Equipment, Pharmaceutical Services within the Guaranteed Benefit Package*.
- Orders of Ministry of Health related to care of TB, M/XDR-TB and TB/HIV patients.
- Successful experience in TB control in Kazakhstanв and MDR-TB therapy programs.
- Ongoing improvement of national and regional bacteriological laboratories by means of new equipment, advanced rapid TB and MDR-TB diagnostics.
- Good drug management with timely and centralized procurement of all necessary TB drugs through the single distributor.
- Countrywide treatment of MDR-TB patients, including penitentiary sector with 86.9% coverage of MDR-TB patients with 2 line TB drugs.
- 16 surgery departments (705 beds) do surgeries to TB and M/XDR-TB patients. 1,428 surgeries in 2012.
- All TB patients take voluntary HIV-testing.
- TB and MDR-TB children take standard chemotherapy.
- In Kazakhstan, a lot of focus is made on improvement of infection control in TB hospitals. An IC working group is established. The staff schedule of each general hospital and TB hospital includes epidemiologists responsible for infection control. At SES Department level there are TB surveillance epidemiologists.
- Unified TB Register, including M/XDR-TB. It is filled in rayon, oblast TB houspitals and aggregated at the NCTP based on approved TB reporting forms.
- Monitoring and evaluation of TB activities on national, oblast, rayon levels based on indicators. Checklists developed per each aspect.
- In the course of monitoring visits, advice and guidance provided, control over needs in TB drugs, sound use and storage of TB drugs; efficiency of TB activities assessed and specific

recommendations provided.

- Regular Monitoring of TB program and DR TB in regions and oblasts by the NCTP.
- Regular training of specialists involved in monitoring and evaluation.
- Specialized institutions (penal colonies) in correctional system of the Ministry of Interior where TB care is provided to prisoners.
- Strategies on early detection of TB patients, including active screening with X ray and sputum smear. Developed network of microscopic laboratories.

2.6.2. Weaknesses of TB care to Population:

- The existing system of financing is based on hospital bed-day occupancy rather than successful TB cure. Such system favors lengthy stay of TB patients and hospital treatment.
- TB and MDR-TB children are treated in hospitals throughout entire therapy course because they cannot attend school during outpatient phase and there is a plenty of TB hospitals for children.
- Outpatient treatment of TB and MDR-TB patients should be expanded and include psychosocial support to vulnerable groups of patients.
- Funding is needed to improve material and technical base of bacteriological laboratories, procure advanced equipment and secure uninterrupted supply of reagents and inputs to BACTEC, HAIN and GeneXpert for rapid diagnostics of TB and M/XDR-TB.
- 2nd line TB drugs funded by the republican budget are not listed among pre-qualified drugs by WHO.
- Drugs used for prevention and reduction of adverse drug reactions at the outpatient phase of treatment are not listed in the guaranteed benefit package.
- There are no unified social motivation programs for TB patients and health professionals to encourage regular outpatient treatment.
- Insufficient surgery interventions in M/XDR-TB treatment. Quality of surgery interventions does not meet up-to-date requirements due to inadequate knowledge of phthisiology by phthisiological surgeons and acute shortage of advanced equipment for surgery interventions and post-operative case management.
- Poor coverage of co-infected TB/HIV patients with ART.
- Incomplete legislative mechanism and regulations on isolation and compulsory treatment of contagious TB patients avoiding treatment.
- TB hospitals do not meet infection control requirements. The existing sanitary norms and regulations do not reflect modern IC approaches.
- All hospitals in the country designed to provide palliative therapy to patients with incurable contagious TB forms do not meet IC requirements either.
- Poor engagement of NGOs to TB activities.
- Absence of approved M&E groups on national and oblast levels. The existing resources of Methodology Units of TB hospitals are not sufficient for epidemiological surveillance and statistical analysis.
- There are serious challenges in TB aid to internal and external migrants, including a limited access to TB diagnostics and treatment for them.
- There are no permanent training centers to train TB and M/XDR-TB management to specialists from PHC network, SES, and correctional system.
- There are no training courses for doctors of TB hospitals, PHC and AIDS Centers on TB/HIV patient management.
- Staff schedule of bacteriological services has to be radically revised to incorporate advanced innovative laboratory technologies (BACTEC, Hain-test, G-Xpert).
- Staff schedule of departments for M/XDR-TB and palliative treatment needs to be revised.
- There is deficit of qualified doctors in civil and penitentiary systems due to the lack of

sustainable retention programs.
- Employees have no incentives to do research; this leads to deficit of research capacity.

In summary, the above problems are major factors hindering improvement of TB epidemiology.

2.6.3. Good Opportunities for TB Activities:

- Close cooperation with international donors, partners, NGO may favor dissemination of best practices in MDR-TB and TB/HIV diagnostics and treatment.
- Collaboration with National TB Programs of neighboring countries will enable exchange of experience and R&D.
- Greater involvement of civil society may increase awareness of general public about TB, prevention and early diagnostics.
- Use of rapid TB and MDR-TB diagnostics will enable commencement of adequate treatment at early stage, and will contribute to decrease of nosocomial transmission of TB and MDR-TB in hospitals.
- Wide use of patient-oriented approaches will facilitate decrease of failures in TB and M/XDR-TB treatment; in turn, it will reduce TB spread among population.
- Assistance of TB program from civil sector to penitentiary sector in the field of MDR-TB diagnostics and treatment will curb growth of primary and secondary drug resistance among prisoners.
- Adequate ART to TB/HIV patients will reduce mortality and drug resistance.

2.6.4. Threats to TB Activities:

- Increased cost of TB and MDR-TB treatment (cost of drugs and total cost of treatment) will affect coverage of M/XDR-TB patients with treatment.
- Low quality of treatment of TB and M/XDR-TB patients may lead to escalation of M/XDR-TB, and development of incurable forms of TB.
- Increase of HIV-infection may act as catalyst of growing TB morbidity in population.
- Unobserved ART by TB/HIV patients may lead to growing resistance to ART and mortality.

3. Aim and Objectives of the Complex Plan, 2014-2020

Vision: Kazakhstan is a TB-free country

The aim of this Complex Plan is to define mission and vision of TB control in the Republic of Kazakhstan during 2014-2020, and to define strategies, activities and target indicators for progress evaluation.

Aim of the Complex Plan: To reduce TB morbidity and mortality in the Republic of Kazakhstan. To reduce TB mortality to 5.8 per 100,000 by 2020. To reduce TB morbidity by 50% in 2020 versus 2010. To achieve 100% coverage of M/XDR TB patients with treatment in 2020.

3.1. Introduction

In the context of current reforms in health sector of Kazakhstan, the efforts of the Ministry of

Health are focused on reform of TB control in the country in collaboration with many national and international partners. The objectives and strategic measures specified in this document are a logic continuation of the National Health Development Program *Salamatty Kazakhstan* in the Republic of Kazakhstan in 2011-2020 and are in line with WHO recommendations, review of the NTP by WHO in 2012, as well as recommendations of the World Bank.

The Plan provides for broad use of rapid TB and M/XDR-TB diagnostics and outpatient treatment, implementation of patient-oriented approaches to improve therapy outcomes through engagement of communities and meet special needs of high risk groups and vulnerable population (prisoners, PLHIV, migrant workers) and finally strengthen program management, monitoring and evaluation.

Implementation of the Comprehensive Plan will radically improve TB epidemiology in Kazakhstan by reducing morbidity, mortality and disability caused by tuberculosis in civil and penitentiary sectors, steadying drug resistance rate, preventing development and spread of TB/HIV according of Millennium Development Goals of WHO.

Mobilization of all TB diagnostics and treatment resources and capacities in 2014-2020 is expected to lower TB mortality to 6.5 per 100,000 in 2013; 6.4 in 2014; 6.3 in 2015; t 6.2 in 2016; 6.1 in 2017; 6.0 in 2018; 5.9 in 2019; 5.8 in 2020.

Reduction of major TB epidemiological indicators will be achieved through better integration of health services, agencies (Ministries of Interior, Defense, Labor and Social Welfare, Information and Communication, Education and Science), international donors and NGOs leading to early diagnostics of any TB forms, better efficiency of TB and M/XDR-TB treatment, low spread of drug resistant forms, creation of improved system of e-record and reporting, efficient monitoring and evaluation of quality of activities.

Strengthening of infection control will promote prevention of nosocomial transmission of TB and M/XDR-TB.

Use of social motivation towards TB patients from vulnerable groups, as well as health professional in primary care settings and TB hospitals will enhance adherence to permanently observed treatment in these target groups.

In future these activities will improve efficiency of the TB Program:

- 100% coverage of MDR-TB patients with rapid DR-TB diagnostics and 2nd line TB drugs will be achieved; 85% curing among new pulmonary TB cases with positive smear and 75% among MDR-TB patients.
- Failures, ‘breakers’ of therapy regime, relapses of the disease, nosocomial TB transmission in TB hospitals, including penitentiary system will be reduced.
- TB patients will have equal access to health facilities to get necessary diagnostics and adequate treatment irrespective of location.
- 100% voluntary HIV-testing and consultation by TB patients will be achieved.

The republican and local budgets will be allocated to implementation of this Comprehensive Plan in 2014-2020, as well as other sources consistent with legislation of Kazakhstan.

3.2. Objectives

The document consists of 4 general objectives and 13 strategic interventions. The next Section specifies key strategic interventions.

1. To reform of TB framework in Kazakhstan in civil and penitentiary health sectors and expand outpatient and hospital-substitution care to TB and M/XDR-TB patients.
2. Expending access to the modern effective tools for TB and M/XDR-TB diagnostics and treatment, strengthening preventive activities including those in the penitentiary sector and migrants
3. Strengthening the systems of infection control, monitoring and evaluation of TB control activities, including those in the penitentiary sector.
4. Strengthening interagency and intersectoral interaction in TB control

3.3. Description of Objectives, Strategic Interventions and Activities in order to Meet the Goals of the Comprehensive Plan

Objective 1. To reform TB framework in Kazakhstan in civil and penitentiary health sectors and expand outpatient and hospital-substitution care to TB и M/XDR-TB patients.

At the initial stage of TB framework reforms it is planned to undertake an in-depth analysis of legal framework. Key amendments will apply to the reforms in health system of the country and will address: 1) sound use of hospital capacity through introduction of new technologies and, as a result, shorter hospital stay; 2) expansion of ambulatory treatment through strengthening of PHC network. To keep the existing volume of financing to TB control activities of the government embedded in legislation, and use of these resources in priority areas of TB control is pivotal for TB framework reform.

One of the important areas will be reform of TB hospital care. It is planned:

- to revise and define clear hospitalization criteria (severe state of a patient which requires day and night care);
- shorten length of stay at a hospital (during bacterial excretion and/or till improvement of a patient's state);
- introduce advanced TB and M/XDR-TB diagnostics and treatment technologies, including molecular genetic technologies.

The logic output of the above measures will be, on one hand, improved access of patients to quality TB care and, on the other hand, savings of additional resources due to reduction of unreasonable expenses.

Financing of hospitals will go away from bed/day principle to treated case-based principle. It will encourage managers at all levels to efficiently use each bed (improve turnover) within a year and save significant resources (human, financial, material and technical). During 2014-2016, it is expected to gradually reduce 4,632 beds (or 34.2% of total beds) in TB hospitals and 16 buildings. In 2014, 890 beds will be reduced (the minimum) and 2,150 beds (maximum) in 2016.

The saved resources will be used as follows:

1. some buildings will be turned into sanatoriums (2) and palliative care hospitals for TB patients (1), while the majority of buildings will pass to local governments to help the region to meet its other priorities (10). However, managers at all levels will be able to create appropriate health conditions in the remaining TB hospitals for TB patients and personnel and improve infection control;

2. considering that the current deficit of doctors is 15.1% (352 positions) and the expected additional demand will be 11.7 – 16.7% every year, we do not expect any problems with employment of personnel from abandoned hospitals. Additionally, it is planned to enhance staff schedule of palliative care units for TB patients, bacteriological laboratories, Methodology Units, Monitoring and Evaluation and Dispensaries and envisage training and retraining staff, if needed. It is expected that availability of psychologists and social workers in the staff schedule of TB hospitals and their training will significantly improve psychosocial support and enhance adherence of patients to treatment. It should be noted that a legislative act will be developed and approved to improve access of TB patients to social support in the home area. The majority of nursing staff will be redeployed by dispensaries for efficient organization and delivery of outpatient care;

3. financial resources will be primarily allocated to introduction of hospital substitution technologies, enhancement of infection control in TB hospitals, encouragement of patients to continuous treatment and incentives for personnel of TB hospitals.

Another important area of TB framework reform and linked to the TB hospital reform related element is expansion of outpatient treatment of TB patients by means of hospital substitution technologies and active engagement of primary care settings.

In the framework of second phase of the Unified Health System of Kazakhstan, from 2014, it is planned to essentially enhance and strengthen the role of PHC in health system in general by increasing financing and improving financing mechanisms. 2-3-fold increase of per capita financing is expected. It is planned to strongly engage PHC specialists to TB detection and prevention in population by including these items to capitation norms, to encourage PHC specialists to directly observed therapy of TB patients at PHC settings by integrating it into incentive component of PHC financing. It is planned to employ a number of performance indicators for PHC specialists in these areas (% of disrupted treatment, inveterate forms, etc.). Hospital-substitution technologies will foster quick rehabilitation of TB patients and no stigma in society in general.

Reform of inpatient and outpatient TB treatment is expected to start from pilot projects in four regions (Jambyl, Kyzylorda, Aktobe Oblasts and Astana city). Experience of *Expansion of Ambulatory Treatment of Tuberculosis* pilot project implemented in Akmola Oblast from 2012 under financial support of USAID will be used. The outputs of pilot projects will be used to develop and approve gradual expansion in other regions.

The approach to TB framework reform in Kazakhstan is focused on quality of services by means of:

- expansion of ambulatory TB treatment: introduction of hospital-substitution technologies, motivation of patients and personnel;
- efficiency promotion of hospital care: reduction of low-efficiency low-capacity hospitals and enhancement of large-scale, efficient, multi-disciplinary hospitals;
- introduction of new TB diagnostics and treatment technologies, including M/XDR-TB;
- reform of TB framework in cooperation with the World Bank's project and health reforms in the country.

Strategic intervention 1.1. Reform of TB service in Kazakhstan in civil and penitentiary health sectors

1.1.1 Reduce TB beds on rayon level.
1.1.2 Convert hospitals with developed infrastructure into rehabilitation and palliative care facilities (sanatorium, hospice) on oblast and national levels.

1.1.3 Change legal status of TB hospitals into company with the right of economic management 1.1.4 Draft order on introduction of differentiated payroll of TB specialists.

Strategic intervention 1.2. Improvement of TB management during ambulatory phase at TB facilities and PHC network

1.2.1 Improve legal framework for PHC and TB facilities in Kazakhstan due to revision of the existing model of health services to TB patients.
1.2.2 Develop and approve regulations on day care hospitals, home care and ambulatory care of TB and M/XDR-TB patients.
1.2.3 Include social workers and psychologists into staff schedule of TB facilities.

Strategic intervention 1.3. Reform the TB service financing

1.3.1 Analyze financing and budgeting of TB control activities in order to elaborate and implement new approaches in the course of expansion of ambulatory TB and M/XDR-TB treatment.
1.3.2 Develop and approve sound TB financing and budgeting mechanism in the course of transition to ambulatory TB and M/XDR-TB treatment.
1.3.3 Introduce a new financing model for inpatient case-based phase of TB and M/XDR-TB diagnostics and treatment.
1.3.4 Introduce a new financing model in other regions according to the outputs of pilot projects.
1.3.5 Develop TB financing mechanism based on global budget principle.
1.3.6 Redistribute saved financial resources (from reduction of beds) into new TB diagnostics and treatment technologies, psychosocial support to ambulatory patients and incentives for phthisiologists.
1.3.7 Develop and approve reimbursement rates and DRG for TB and M/XDR-TB diagnostics and treatment. Amendments to Hospitalization Bureau portal.

Objective 2. Expending access to the modern effective tools for TB and M/XDR-TB diagnostics and treatment, strengthening preventive activities including those in the penitentiary sector and migrants

Strategic intervention 2.1. Ensuring access to the modern technologies of TB and M/XDR-TB diagnostics and treatment

This strategic intervention includes development of legal framework for specialists from TB hospitals and PHC, as well as definition of new indicators to measure progress in TB and MDR-TB. It includes trainings, workshops and other similar activities as well capacity development of specialists on different levels of health system involved in TB control.

It is focused on development of protocols, standards and guidelines for introduction of new rapid diagnostics methods. Besides, this strategic intervention includes analysis of the current situation and needs in technologies and inputs in civil and penitentiary health sectors and centralized procurement of equipment and inputs for all bacteriological laboratories (Gene Xpert and HAIN) in civil and penitentiary health sectors. A special focus is made on external quality assurance in all bacteriological laboratories. Laboratory staff capacity development will be regular. In addition, knowledge and skills of laboratory personnel will be assessed, as well as work load considering services to penitentiary health sector.

The strategic intervention includes ensuring high-quality treatment of TB and M/XDR-TB patients in line with international recommendations and individual treatment regime in pilot projects based on DST data. The existing TB drug list will be broadened with new drugs, for M/XDR-TB treatment in particular. According to the outputs of pilot projects, Order № 218 of 25.04.2011 will be revised.

This strategic intervention provides for improvement of quality of surgical TB treatment by means of capacity development of phthysiological surgeons in new technologies. Advanced surgery equipment will be procured at the expense of bed stock reform. Legal regulations will be amended to secure free access to diagnostics and treatment of adverse reactions of TB drugs. Equipment and inputs for diagnostics and treatment of adverse reactions of TB drugs at the ambulatory phase will be procured. Provision is made for reliable supply of 1 and 2 line TB drugs and creation of post-registration quality control system. Child dose drugs will be funded from the national budget.

2.1.1 Develop TB and M/XDR-TB diagnostics guidelines.
2.1.2 Amend staff schedule of laboratories of TB hospitals, including in the correctional system.
2.1.3 Develop HR policy considering for discipline of base education.
2.1.4 Assess material and technical state and demand in advanced equipment and reagents for rapid TB and M/XDR-TB diagnostics, including in the correctional system.
2.1.5 Procure equipment for rapid TB and M/XDR-TB tests in laboratories of TB hospitals, PHC and correctional system:
- XpertMTB/RIF instruments Oblast and regional TB dispensaries, rayon and inter-rayon TB units and pre-trial detention centers;
- Additional BACTEC instruments for the NRL and regional laboratories

2.1.6 Procure reagents for rapid TB and M/XDR-TB tests (XpertMTB/RIF) in laboratories of TB hospitals, PHC and correctional system.
2.1.7 Procure reagents for rapid TB and M/XDR-TB tests (HAIN) in laboratories of TB hospitals, PHC and correctional system.
2.1.8 Develop guidelines on external quality assurance (EQA) of methods used for laboratory diagnostics of TB and M/XDR-TB in civil and penitentiary health sectors.
2.1.9 Supply advanced bacteriological equipment, reagents and inputs.
2.1.10 Develop criteria and include engineer to maintain laboratory equipment to the staff schedule of TB hospitals.
2.1.11 Train laboratory staff in civil and penitentiary health sectors on TB diagnostics methods.
2.1.12 Assess laboratories in penitentiary system.
2.1.13 Procure reagents and inputs for BACTEC, HAIN test in bacteriological laboratory of the correctional system in Karaganda Oblast and cartridges for GeneXpert in pre-trial detention centers.

Strategic intervention 2.2. Ensuring effective treatment combined with the psychosocial support of TB and M/XDR-TB patients

2.2.1 Enlarge the existing list of procured TB drugs and register and procure Linezolid, Clofazimine and other TB drugs in future.
2.2.2 Introduce individual schemes for M/XDR-TB treatment in pilot projects and NCTP.
2.2.3 Amend Order of the Ministry of Health №218 of 25.04.2011 *On Some Issues of TB Control* to incorporate individual schemes for M/XDR-TB treatment according to DST results.
2.2.4 Introduce model of ambulatory treatment of TB and M/XDR-TB patients.
2.2.5 Disseminate model of ambulatory treatment of TB and M/XDR-TB patients (outputs

of pilot projects) in other regions.

2.2.6 Alignment of the system of surgical treatment of TB and M/XDR-TB patients in accordance with the contemporary international requirements and recommendations and priorities of the TB service reform (including restructuring of surgical beds, updating the surgical component in the guidelines and normative documents, training of surgeons, ensuring surgical care in the penitentiary system)

2.2.7 Provide advanced diagnostics methods for adverse reactions of TB drugs and concomitant diseases at all treatment phases, including in penitentiary system.

2.2.8 Amend Resolution of the Government of Kazakhstan of 2009 №2135 *On Approval of Rules for Drug Supply to Population* to incorporate free supply of TB and M/XDR-TB patients with nosotropic drugs.

2.2.9 Include nosotropic drugs to Order of the Ministry of Health № 786 of 4 November 2011 *On Approval of List of Drugs and Medical Devices for Free Supply to Population in the framework of Guaranteed Benefit Package at Ambulatory Level with Certain Diseases (Conditions) and Special Curative Products*.

2.2.10 Develop guidelines on palliative care to TB patients in civil and penitentiary health sectors.

2.2.11 Provide TB patients with medical advice of single-function doctors at all phases of treatment.

2.2.12 Amend Order of the Ministry of Health of 14 March 2011 № 131 *On Approval of TB Organizations Regulations* to define demand for TB drugs for TB and M/XDR-TB treatment and prevention.

2.2.13 Develop guidelines on TB drug management in Kazakhstan.

2.2.14 Train Drug Coordinators in civil and penitentiary health sectors, M&E specialists, drug management supervisors in the regions.

2.2.15 Procure child dose TB drugs under the budget program 010-101.

2.2.16 Develop and approve post-registration system of quality control over 1 and 2 line TB drugs procured in the country.

2.2.17 Provide M/XDR-TB patients with 2 and 3 line TB drugs of guaranteed quality (at least 85%), including correctional system.

2.2.18 Train members of Formulary Commissions on methods of evaluation and analysis of drug supply to TB patients.

2.2.19 Quality control of TB drugs in independent laboratories.

Strategic intervention 2.3. Prevention of Tuberculosis

2.3.1 Improve evaluation of performance of PHC specialists.

2.3.2 Develop and approve curriculum for pediatric phthisiologists on TB and M/XDR-TB management.

2.3.3 Re-publish Guidelines on M/XDR-TB treatment.

2.3.4 Study of the reasons of the poor effectiveness of the standardized anti-TB treatment of patients with susceptible *M. Tuberculosis* in the penitentiary health sector

2.3.5 Undertake research on efficiency of early TB diagnostics in children and adolescents (Diaskintest, quantiferon test).

2.3.6 Expand BCG vaccination coverage to at least 95% (in newborns/infants)

2.3.7 Systematize chemoprophylaxis to contact children.

Objective 3. Strengthening the systems of infection control, monitoring and evaluation of TB control activities, including those in the penitentiary sector

Strategic intervention 3.1. Infection Control in TB facilities and PHC

This strategic intervention includes operative researches on risk assessment of nosocomial spread of tuberculosis in TB facilities and in PHC settings. Under this strategic intervention it is planned for national IC focal points to attend international trainings and conferences, train engineers responsible for maintenance of ventilation systems and other environmental measures, such as biosafety. Ventilation systems at various levels of TB hospitals will be regularly maintained, UV lamps, thermometers procured and replaced, calibrated and maintained. Personnel of TB facilities will be regularly supplied with personal protective devices.

3.1.1 Undertake operative research on risk of nosocomial TB in TB facilities and PHC settings with recommendations on further tactics.
3.1.2 Undertake technical audit of mechanic ventilation in TB facilities, including in correctional system.
3.1.3 Develop instructions on sorting, hospitalization and isolation of TB patients in civil and penitentiary health sectors.
3.1.4 Develop standard format of IC TB reporting.
3.1.5 Install efficient mechanic ventilation in high risk facilities of TB facilities.
3.1.6 To ensure fencing walking areas for TB patients in 51 TB facilities.
3.1.7 To ensure 24-hour security for TB patients and medical staff in 12 TB facilities.
3.1.8 Provide high risk facilities in TB hospitals with shielded UV lamps and replace outdated lamps during 4 years.
3.1.9 Procure UVC-meters, thermoanemometers and particle counting sensors for oblast TB dispensaries.
3.1.10 Procure fit-test kits for personnel of TB facilities.
3.1.11 Procure respirators with efficient filters for personnel of TB facilities.
3.1.12 Control compliance with separate hospitalization of patients according to epidemiological status, periodicity of ward occupancy and mask regime in TB facilities.

Strategic intervention 3.2. Monitoring and evaluation of TB control activities

This strategic intervention deals with improvement of monitoring and evaluation on oblast and regional levels, implementation of internationally recognized TB diagnostics standards, improvement of national record and reporting, update of TB Register and creation of unified e-system incorporating laboratories and pharmacies, including in penitentiary sector. Training workshops will be delivered for specialists of civil (national, oblast and regional levels) and penitentiary sectors involved in monitoring and evaluation. This strategic intervention includes development of protocols for hospitalization and isolation of TB patients in civil and penitentiary sectors, as well as standard record and reporting forms related to such activities.

The existing TB reporting forms will be revised, and TB program personnel will be trained to use these forms. Specialists involved in surveillance will be trained to analyze collected data for the decision-making purposes.

3.2.1 Elaborate software on all components of the TB Register to create consolidated computerized TB patient DB for civil and penitentiary health sectors.
3.2.2 Improve reporting documentation and software for on-line TB and M/XDR-TB case management.
3.2.3 Provide TB and correctional institutions with internet access and computers.
3.2.4 Improve indicators of M/XDR-TB activities assessment in e-register.
3.2.5 Improve monitoring and evaluation of TB control activities.

Strategic intervention 3.3. Strengthening the capacity of human resources

3.3.1 Train IC TB specialists of the national level at the relevant courses.
3.3.2 Train IC TB trainers of the oblast level.
3.3.3 Train engineers at IC TB relevant courses on ventilation in health facilities.
3.3.4 Train specialists on biosafety box management at international courses.
3.3.5 Train specialists of monitoring and evaluation group.
3.3.6 Train persons responsible for the TB register (including from penitentiary system) on data entry, analysis and submission.
3.3.7 Amend Order of the Ministry of Health of 07.04.2010 № 238 *On Approval of Standard Staffing and Staff Norms in Health Facilities* and add M&E groups and positions responsible for the TB register on national, oblast and rayon levels.
3.3.8 Develop criteria and introduce incentives to health professionals responsible for directly observed therapy of TB and M/XDR-TB patients in all sectors (i.e. civil, penitentiary), staff categories (i.e. physicians, nurses, feldshers) and involved disciplines (i.e. pthisiology, primary health care, pediatrics)

Objective 4. Strengthening interagency and intersectoral interaction in TB control

This strategic intervention includes definition of standards of social support to high risk groups. In the framework of multi-disciplinary approach (MDA) regulations will be developed to specify work with high risk groups based on experience of international projects (model Unison with MDA). It is planned to implement *Sputnik* program focused on increased adherence to treatment in pilot regions. *Sputnik* Program is developed by international non-government organization *Partners in Health* and is implemented in Tomsk (Russian Federation). The program is implemented by one or several teams which consist of a health professional responsible for DOT, driver and physician. Social workers and psychologists are engaged as well. The team is provided with a vehicle to deliver and observe intake of medicines at a venue specified by a patient, The program admits non-adhering patients from risk groups. The program is based on creation of most convenient conditions to help patients to finalize therapy course. Personnel involved to *Sputnik* will arrange fully observed TB treatment at a venue and time convenient for patients. Patients of *Sputnik* will get social support (food), support in formalization of documents, advice at home. Eventually, this program may be not needed any more for compulsory treatment. Information materials will be developed for high risk groups. Protocols for TB/HIV case management will be developed.

Strategic intervention 4.1 Strengthening interagency and intersectoral interaction in TB control

4.1.1 Ensure adequate TB control activities in correctional institutions.
4.1.2 Develop and approve criteria and mechanism of social support to TB patients.
4.1.3 Arrange education of TB patients – students of secondary, vocational and high schools.
4.1.4 Secure early TB examination of students and personnel of secondary, vocational and high schools.
4.1.5 Strengthen prevention and raising awareness among population and in PHC settings through involvement of mass media.
4.1.6 Provide TB-related information to all interested organizations.
4.1.7 Clarify TB prevention among people living with HIV/AIDS jointly with TB facilities and PHC.
4.1.8 Ensure full coverage of target groups with X-ray test in PHC settings.
4.1.9 Ensure full epidemiological measures in TB nidus (source of infection).
4.1.10 Strengthen the roles and responsibilities of PHC institutions in tracking defaulters

and referring them to TB institutions, and also persons evading TB examination and treatment

4.1.11 Optimize the system for compulsory isolation and treatment of TB patients, with observation of provisions for human rights and international charter on patients' rights

Strategic intervention 4.2. Ensuring TB/HIV control in the country

4.2.1 Develop Training Plan for M&E focal points, infection disease doctors of AIDS Centers, narcologists, PHC specialists on TB/HIV co-infection case management.
4.2.2 Develop guidelines on co-infection TB/HIV and M/XDR-TB/HIV case management.
4.2.3 Develop Order on diagnostics and symptomatic treatment of adverse effect of ART and TB drugs in TB/HIV patients.
4.2.4 Active social and health education amongst population on co-infection TB/HIV.
4.2.5 Izoniazid chemoprophylaxis of TB/HIV patients, including children.

Strategic intervention 4.3. Involvement of NGO in the implementation of TB control activities in the country

4.3.1 Involve NGO to provide psychosocial support to TB, and M/XDR-TB patients from high risk group
4.3.2 Train NGO on administrative and financial management, monitoring of program activities and analysis of data from behavior factor studies.
4.3.3 Develop TB, TB/HIV, and M/XDR-TB control regulations for NGO.
4.3.4 Provide technical assistance to NGO in obtaining social service contract in the field of psychosocial support to TB patients and strengthen succession between civil and penitentiary sectors.
4.3.5 Engage NGO to national and regional public health steering committees.

Strategic intervention 4.4. Anti-TB medical care delivery to the internal and external migrants

This strategic intervention defines activities focused on broader access of migrants (internal and external) to TB aid. At first, TB burden amongst migrants will be assessed. The developed regulations will specify access of migrants to TB aid. NGO will be involved to directly observed therapy of this risk group. The situation will be managed through specific indicators in National Monitoring and Evaluation Plan. Financial mechanism will be established to provide diagnostics and care services to external migrants. Kazakhstan will initiate an international high-level meeting to address problems of TB aid to migrants.

4.4.1 Provide assistance in development of legal and procedural framework agreements and develop migrant guidelines.
4.4.2 Create a working group to develop legal and procedural framework agreements.
4.4.3 Create a working group to develop Guidelines on TB aid to migrants.
4.4.4 Country visits of experts from WHO/Europe.
4.4.5 Arrange country visits of experts from IOM HQ.
4.4.6 Hold regular meetings of steering committee.
4.4.7 Organize training for NGO, partners and employees of migration centers on development of testing of information materials.
4.4.8 Organize training for team of trainers on TB fundamentals and prevention, involvement of migrant communities, communication skills and mobilization to TB prevention and advocacy.

4.4.9 Organize cascade training for employees/volunteers of migration centers and outreach /social workers from NGO on TB fundamentals, communication skills and social support to TB migrants and their family members adhered to TB treatment.
4.4.10 Organize cascade training for health professionals on communication skills and social support to TB migrants and their family members adhered to TB treatment.
4.4.11 Organize training workshops for migration and border authorities and police on TB fundamentals, minimum service package to TB migrants and new rules on TB migrants.
4.4.12 Hold high-level meetings with representatives of neighboring countries (CAR), WHO and partners.
4.4.13 Provide technical assistance to development of TB indicators in migrants and integrate them into standard M&E system.
4.4.14 Provide technical assistance to creation of health and social fund for TB treatment and diagnostics of undocumented migrants.
4.4.15 Appoint national coordinator for creation of health and social fund for TB treatment and diagnostics of undocumented migrants.
4.4.16 Provide technical assistance for analysis of rationale for special insurance fund.
4.4.17 Appoint national coordinator for analysis of rationale for special insurance fund.
4.4.18 Create health and social fund for migrants to get TB aid.
4.4.19 Procure and distribute food baskets for migrants.
4.4.20 Implement NGO projects on TB and migrants.
4.4.21 Develop information materials addressing specific needs of migrants.
4.4.22 Prepare and air awareness-raising audio and video clips.
4.4.23 Organize press event dedicated to Migrant Day with participation of trained reporters.
4.4.24 Organize awareness-raising campaign dedicated to World No Tobacco Day.

CHAPTER 4: OPERATIONAL PLAN

Introduction

The operational plan (OP) of the Complex Plan for TB control in Kazakhstan is presented as separate Excel file. The plan includes all strategic interventions grouped under 4 general objectives that are in details described in the Core plan. Interventions in the OP are appropriately budgeted. Each strategic intervention and activity is accompanied by a specific indicator, to avoid duplication in the M&E plan.

In order to avoid description of technical assistance (TA) needed for certain activities, the respective TA is described in the last column of the Excel file of this OP. However, details on TA for the respective activities are indicated in TA Plan in the chapter 5.

For convenience and proper follow-up of the strategic interventions defined in the Complex plan for TB control, each activity is associated with appropriate numeration.

This plan can undergo revision and alteration over the course of implementation, findings and recommendations of annual evaluation and M&E activities, achieved targets as well as ongoing developments in the health sector that are inevitable in all countries' in transition.

Responsible entity for any changes in the OP is MoH of Kazakhstan, as per recommendations received by NCPT and/or suggestions by international partners.

Updates and eventual alteration and changes in the OP are to be expected beyond Year 2015, when global and national achievements in Kazakhstan are expected to be evaluated and the new post-2015 end-TB Strategy will have commenced.

The period of implementation

The implementation of the Complex plan is planned for the period from 2014 to 2020.

At the first stage (Year 2014-2016) of implementation most of activities from the OP will be undertaken, such as:

1. Analysis of the financing and budgeting of TB control in the civilian and penitentiary health sectors based on WHO recommendations, economical and technical situation in SIZO (responsibility of Ministry of Internal Affairs of Kazakhstan), living and all other conditions needed for appropriate treatment of TB patients, risk assessment of nosocomial transmission of TB infection in health care settings, including penitentiary system, the risk of infection among persons in contact with TB patients and assessment of the transmission of TB infection among external and domestic migrants.
2. Establishment of an effective regulatory-legal framework for the reform of TB services in Kazakhstan in civil and penitentiary sectors with development of medical and health-economic tariffs and clinical-related groups for diagnosis and treatment of TB and M/XDR-TB. Strengthening of infection control measures in areas of high risk of TB, human resources policy, and drug management, including symptomatic and pathogenetic agents.
3. Development of different models for outpatient treatment of TB including the individual schemes of treatment for M/XDR-TB in the pilot projects.
4. Development and endorsement of laws and regulations (prikaz or law) on outpatient

treatment, daily ambulatory treatment and care, home care, the NGO care for TB and M/XDR-TB patients, as well as guidance on laboratory services, management of M/XDR-TB, palliative care, drug management, and guidelines for management of patients with TB/HIV;
5. Development of prikaz or documents to regulate the role of the NGOs providing psycho-social support to TB patients and establishment of link between the civil and penitentiary systems, supporting TB patients after their release from prisons.
6. Development of plans and programmes for training and continuous education for all aspects of the control of TB and M/XDR-TB and TB/HIV.
7. Preparation of guidance for TB control among migrants and development of appropriate regulations.

In the second phase (Year 2017-2020) of the Complex plan's implementation the activities could continue as planned. Also, after the first phase of implementation and further guiding and optimizing implementation, a comprehensive review on TB prevention and control in the entire country with participation of all partners could take place.

The main activities to be implemented in the second phase are:

1. Modernization of laboratory services
2. Secure uninterrupted supply of reagents and consumables for bacteriological and molecular genetic methods, anti-TB drugs, as well as symptomatic and pathogenetic drugs for treatment of TB and M/XDR-TB patients in both civilian and penitentiary health care institutions.
3. Improve the quality of treatment of TB and M/XDR-TB patients with expansion of ambulatory TB care, the introduction of patient-oriented approaches to high-risk groups with involvement of NGOs and individual treatment regimens based on DST, as well as surgical treatment.
4. Strengthen measures for infection control of the transmission of TB and M/XDR-TB in the civilian and penitentiary sectors health care facilities, first off all assessing existing equipment for infection control (effective engineering, technical and personal means for protection).
5. Improve the system of monitoring and evaluation of TB control in the civilian and penitentiary health care sectors.
6. Human capacity building of the TB services' staff, including MIS, establishment of ways of staff motivation and better salary depending on the workload and hazard of infection at the TB facilities.
7. Training sessions on all aspects of TB, M/XDR-TB and TB/HIV control.

CHAPTER 5: TECHNICAL ASSISTANCE PLAN

This chapter outlines technical assistance (TA) plan as one of the components of the Comprehensive Plan for TB Control in Kazakhstan during 2014-2020 and includes planned TA activities and implementation.

TA Plan relies on the Operational Plan and is closely linked to it. It is harmonized with all other components of the Comprehensive Plan and provides details of TA by objectives, strategic interventions and activities specified in the Operational Plan.

TA activities are described in detail for the first two years (2014 and 2015). In 2015, the TA needs will be adjusted, and a new TA Plan will be developed.

The technical assistance will rest on two levels: international (external) and local (domestic). External consultants will be mobilized to review existing documents, make objective evaluation and comparison. Assistance from external consultants will facilitate successful development and implementation of the Comprehensive Plan for TB Control in Kazakhstan. In the course of selection of external consultants, the NTP managers will identify appropriate consultants in terms of skills and experience per specific objective and will make a final decision to enter intro contract with a certain consultant.

For many years, many international partners and donors have beed providing significant assistance to NTP of Kazakhstan: WHO, Global Fund, USAID, KNCV, KfW, HOPE Project, etc. Therefore, employees of these partner organizations who are aware of NTP challenges in Kazakhstan (however, not necessarily from these organizations only) could be the external consultants to provide technical assistance in the field of TB control in the next seven years.

Local consultants appointed by NTP managers will be engaged for the objectives where assistance from external consultants is not needed while only evaluation of rationale of the activities will be needed.

Two directions will be defined for technical assistance to the NTP to achieve objectives of internationally recognized Stop TB strategy.

The first direction is a long-term technical assistance (at least 2 years) to achieve such objectives as improved TB detection rate, success rate, HR development, compliance with international guidelines and global strategies, as well as field visits. The results of TA should be sustainable and efficient to the extent possible.

Another direction of technical assistance is planned as short-term and is limited to specific interventions: field and other site visits, short-term assistance to the NTP, curricula, evaluation of laboratory systems, input and drug supply, as well as logistics.

It is expected that international assistance will be provided primarily in cooperation with local and international partners and supported by TB TEAM.

Local assistance will be provided mainly by NCTP experts to oblasts, rayons and country in general. Acitivies in the framework of technical assistance during the first two years will be funded by Global Fund.

To coordinate cooperation with TBTEAM, the NCTP will appoint a country (local) focal point. He/she will regularly review web-page of TBTEAM and will facilitate expert advice to various directions of activities according to the needs of the Complex Plan.

TA Plan contains information per each strategic intervention and activities which require technical assistance: description of particular technical assistance, specific expertise, NTP partners, timeline, estimated costs, and sources of financing and financial grants.

See Table 1 for detailed description of TA Plan. TA Plan is a dynamic document subject to adjustment according to the current needs which may frequently occur in the process of implemention.

Table 1. National Technical Assistance Plan

Objective #	Activities	Tasks	Cost ($)	Source of financing	Experts	Responsible	2014				2015	2016	2017	2018
							Q 1	Q 2	Q 3	Q 4				
Objective 1. PReform of TB Services in Kazakhstan in the civilian and penitentiary health sectors and roll-out of ambulatory and hospital-substitution care to TB and M/XDR TB patients.														
Strategic Intervention 1.2 Improvement of TB case management at the outpatient treatment phase at TB facilities and in PHC settings														
1.2.1	Improve regulatory framework in the field of PHC and TB services of Kazakhstan due to adjustment of the existing model for services rendered to TB patients.	Adjust the existing documents. Develop new documents with amendments integrated. Present documents to NTP and partners.	11280	TGF, NCTP	International and national experts	NCTP, WHO								
1.2.2	Develop and approve regulations on day-care hospitals, home care and ambulatory care of TB and M/XDR-TB patients.	Review existing data, documents, administrative orders, regulations and standards. Work with local experts. Prepare final report.	40000	TGF, NCTP	International and national experts	NCTP, WHO								
Strategic Intervention 1.3 Reform of Financing of TB Services														
1.3.1	Review financing and budgeting of TB activities for the development and implementation of new approaches to	Review existing local and international documents, administrative orders, laws and	22560	TGF, NCTP	National experts	NCTP, WHO								

	roll-out of ambulatory care of TB and M/XDR-TB patients.	standards. Work with the Working Group on revision and development of new documents. Support development of new documents. Prepare final report.													
1.3.3	Introduce a new model of financing of case-based hospital phase of TB and M/XDR-TB diagnostics and treatment (pilot projects in Astana, Jambyl, Kyzylorda and Aktobe Oblasts).	Evaluate the existing model of TB Program financing. Develop and approve Action Plan on implementation of a new financing model in pilot projects.	11000	NCTP	National experts	NCTP									
Objective 2. Improve access to advanced and efficient TB and and M/XDR-TB diagnostic and treatment technologies, enhance prevention activities, including in penitentiary sector															
Strategic Intervention 2.1 Ensure access to advanced TB and M/XDR-TB diagnostic technologies															
2.1.1	Develop TB and M/XDR-TB diagnostic guidelines.	Assess current situation and review documents. Work in the Center and visit oblasts together with local experts in order to develop guidelines. Present documents to the NCTP and partners. Prepare final report.	13000	TGF, NCTP	National experts	NCTP, WHO									

2.1.3	Develop HR policy regulations considering for relevant base education.	Amend the existing documents. Prepare new documents with suggestions and amendments integrated. Present documents to the NCTP and partners.	15000	TGF, NCTP	National experts	NCTP									
Strategic Intervention 2.2 Ensure efficient care and psychosocial support to TB and M/XDR-TB patients.															
2.2.8	Amend Resolution of the Government of 2009 №2135 On Approval of Drug Supply Regulations to enable free supply to TB and M/XDR-TB patients with symptomatic and pathogenetic drugs.	Amend the existing documents. Prepare new documents with amendments integrated. Present documents to the NCTP and partners.	15000	NCTP	National experts	NCTP									
2.2.10	Develop guidelines on palliative care to TB patients in civilian and penitentiary health sectors.	Review the existing practice of palliative care to TB and M/XDR-TB patients. Develop recommendations to the National Guidelines on palliative care to TB patients.	12380	NCTP	National experts	NCTP									
Objective 3. Strengthening of infection control, monitoring and evaluation of TB response activities, including in penitentiary sector															
Strategic Intervention 3.1 Infection control in TB facilities and PHC settings.															

3.1.1	Undertake operational research to assess risk of nosocomial TB in TB facilities and PHC and recommend subsequent strategy.	Assess current situation. Visit 14 Oblasts of the country. Prepare recommendations and present them to NCTP and partners. Prepare final report.	52197	NCTP	National experts	NCTP								
3.1.3	Develop instructions on triage, hospitalization and isolation of TB patients in civilian and penitentiary health sectors.	Review existing international and country documents. Collaborate with local experts. Meet representatives of NCTP, MIA. Prepare and present instructions. Prepare final report.	18300	TGF, NCTP	International and national experts	NCTP								
Strategic Intervention 3.2 Monitoring and Evaluation of TB Response Activities														
3.2.4	Improve evaluation of MDR/XDR TB response activities in electronic register.	Work with country and international documents and guidelines. Meet Working Groups. Develop national indicators on M/XDR-TB M&E and integrate them into e-register. Prepare final report.	36000	TGF, NCTP	National experts	NCTP								
Objective 4. Strengthening of Inter-Department and inter-Sector Interaction in the field of TB control														
Strategic Intervention 4.3 Engagement of NGO to TB response activities in the country														

4.3.1	Provide technical assistance to NGOs to get social service contract on psychosocial support to TB patients and strengthen continuity between civilian and penitentiary systems	Review existing documents. Meet partners. Develop by-laws to regulate engagement of NGOs in TB response activities.	300000	TGF	International and national experts	NCTP, NGOs									
Strategic Intervention 4.4 Provide TB medical care to internal and external migrants															
4.4.1	Provide assistance to development of legal and procedural framework agreements and develop guidelines on migrants.	Review existing documents. Site visits in the regions. Meet partners. Work with NCTP experts. Active participation in document development. Report.	18540	TGF	International and national experts	NCTP, WHO, HOPE									
4.4.4	Country visits by experts from WHO/Europe.	Site visits in the regions and meet partners. Review existing documents. Present mission's work. Prepare recommendations and final report.	61620	TGF	International experts	NCTP, WHO, HOPE									
4.4.5	Country visits be experts from HQ IOM.	Site visits in the regions and meet partners. Review existing documents. Present mission's work. Prepare recommendations and final report.	61620	TGF	International experts	NCTP, IOM, HOPE									
4.4.13	Technical assistance to development of TB indicators for migrants and integrate indicators to	Assess current situation, review epidemiological documents and select indicators. Assist in	18000	TGF	International and national experts	NCTP, HOPE									

	the standard M&E system.	defining indicators. Review local and international guidelines together with local experts. Prepare final report of the visit with recommendations.												
4.4.16	Technical assistance to evaluation of viability of special insurance fund.	Assess current situation and review existing documents. Meet stakeholders. Prepare presentations. Prepare final report with recommendations.	21156	TGF	International and national experts	NCTP, HOPE								
4.4.17	Appoint National Coordinator to evaluate viability of special insurance fund.	Prepare presentations. Prepare final report with recommendations.	60000	TGF	National experts	NCTP, HOPE								

4.4.18	Set up health and social fund for migrants to get TB care.	Work with local partners. Meet representatives of NCTP, IOM. Site visits to the regions to assess needs. Prepare final report of the visit with recommendations.	75648	TGF	International and national experts	NCTP, HOPE, IOM									

CHAPTER 6: MONITORING AND EVALUATION

Introduction

According the findings of the most recent WHO extensive country TB review, performed in May, 20126, Kazakhstan has a robust recording and reporting (R&R) system with potential for sound monitoring and evaluation (M&E). However, certain weaknesses have been identified, such as utilisation of the new WHO definitions7, absence of network for electronic recording and reporting, and unified system of laboratory registry, pharmacies and penitentiary health sector, as well as the use of outdated indicators not reflecting the real situation and needs. Additionally, indicators for management of drug-resistant TB, TB/HIV co-infection, TB control in specific populations and laboratory strengthening are not included.

There is currently no standard set of simple indicators that allow for rapid assessment of the performance of TB control and the progress towards the international and country-specific targets.

Currently, M&E is responsibility of NCPT at national level and the respective M&E groups at regional and oblast levels. M&E groups, however, has not sufficient number of staff. TB control is monitored at national level via a set of 38 core indicators, but most of those are outdated and/or of uncertain value. TB treatment outcomes are monitored and evaluated on a regular basis. Monitoring visits and annual reports to the Ministry of Health cover the TB epidemiological situation and trends, advances in laboratory-diagnostic services and TB control financing.

Purpose of the chapter

This chapter seeks to describe in detail how monitoring and evaluation of the Complex plan (CP) will be organized. The M&E plan is consistent with the strategic interventions described in the Core plan, operational plan, technical assistance plan and the respective budget.

M&E activities and defined indicators in this chapter do not address routine M&E of the NTP, but are focused on measurement of impact, outcome and process indicators of the CP. Indicators that will measure implementation of strategic intervention defined in the Core plan are described in the Operational plan and will be defined during consultative process planned as one of the strategic interventions.

The purpose of the M&E plan is to:

- measure programme effectiveness
- monitor the progress made in the implementation of strategic interventions and intended targets
- timely identification of problem areas throughout plan implementation
- collection of data, lessons learned and dissemination of technically sound information for high level decision makers at national and oblast level for resource mobilisation and rational allocation of funds

[6] Extensive Review to the Tuberculosis prevention, control and care in Kazakhstan. WHO Regional Butro for Europe.10-16 May 2012.
[7] WHO definitions, 2012

This M&E plan will serve as a base to develop National TB M&E plan of TB control that will be endorsed by the Ministry of Health of Kazakhstan.
For the M&E purpose, the national team will use the internationaly accepted "Monitoring and Evaluation Toolkit" issued in 2011[8].

M&E Plan's implementation and coordination

NCTP is the main agency responsible for collecting data from all sources around the country, including from oblast and regional levels and SES services (epidemiology department).

In the proces of national M&E implementation of the CP, four categories of indicators will be used:

- ***Impact*** indicators focuses on the goals (mortality, prevalence and incidence);
- ***Outcome*** indicators related to the operational objectives (e.g., number of TB cases identified or the treatment success rate);
- ***Output*** indicators assess the strategic interventions (e.g., the number of MDR-TB cases managed);
- ***Process*** indicators evaluate the development or implementation of activities and sub-activities; (e.g., the number of training modules printed or the number of health workers trained).

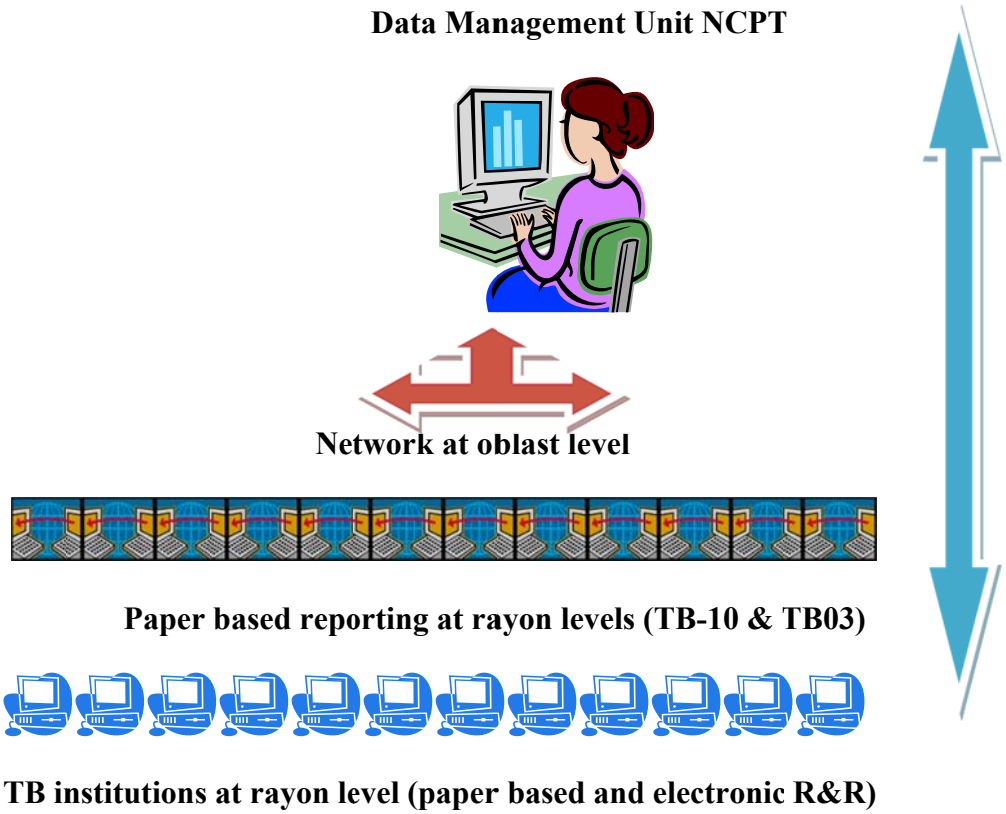
Data analysis, Dissemination and Use

Data for all indicators (impact, outcome, output, and process) will be collected through the electronic system for individualized data. Data collection, aggregation and reporting are the main responsibility of data managers at NCPT and all 16 oblast level TB institutions and Astana and Almaty cities. The country report to the central level will be prepared on quarterly basis. The NCPT will produce and disseminate an annual report on TB in the country.

All TB facilities at rayon level will use, store and aggregate both electronic and paper based reporting system (TB-11 and TB 03) and send regular reports to the Data manager at NCPT; aggregation of data is done at two levels – oblast and NCPT. The flow of information is presented in Figure 1.

[8] Monitoring and Evaluation Toolkit.HIV, Tuberculosis, Malaria and Health System Strengthening. Part 3: Tuberculosis. Fourth edition.2011.

Figure 1: Data flow for impact and outcome indicators



Implementation's evaluation of the Complex Plan for TB control in Kazakhstan 2014-2020

CP for TB control 2014-2020 will be measured by indicators of the strategic interventions. Three impact indicators are linked with the goal of the CP (table 1).

Table 1: Impact indicators to measure progress of CP for TB control in Kazakhstan 2014-2020

No	Indicator	Baseline		Intended targets		Data source	Frequency of reporting
		Year	Value	2015	2020		
1	Mortality rate	2012	8/100000	7.6	6	National TB registry	Annually
2	TB incidence	2012	81.7/100000	75.5	55	National TB registry	Annually
3	M/XDR TB treatment coverage	2012	85%	90%	100%	National TB registry	Quarterly

The detailed description of defined objectives and strategic interventions is provided in the Core plan. The description of indicators that will measure progress of implementation of strategic interventions is presented in Table 2.

Table 2: Indicators to measure strategic interventions (baseline and intended targets, data source and frequency of collection)

№	Indicator	Baseline		Target		Source	Result (indicator's category)
		Year	Indicator	2015	2020		
Objective 1. To reform TB framework in Kazakhstan in civil and penitentiary health sectors and expand outpatient and hospital-substitution care to TB и M/XDR-TB patients							
Strategy 1.1. Reform of TB service in Kazakhstan in civil and penitentiary health sectors							
1.1.1	% of reduced inpatient beds	2012	10%	30%	40%	NTP	Process
1.1.2	% of reduced TB facilities	2012	2,5%	10%	20%	NTP	Process
1.1.3	% reduced days of hospitalization	2012	20%	40%	60%	NTP	Process
Strategy 1.2: Improvement of TB management at the outpatient phase of treatment in the TB service and PHC							
1.2.1	% of TB and M/XDR-TB patients who started on treatment and continued it at the outpatient facilities	2012	0.5%	15%	50%	NTP	Output
Strategy 1.3: Reforming the TB service financing							
1.3.1	% of the annual state budget for TB control	2012	68. 9%	90%	95%	NTP	Process
Objective 2. Improving access to the modern effective technologies for TB and M/XDR-TB diagnostics and treatment, strengthening preventive activities including those in the penitentiary sector and migrants.							
Strategy 2.1. Ensuring access to the modern technologies of TB and M/XDR-TB diagnostics and treatment							
2.1.1	% of coverage by the rapid molecular-genetic tests	2012	15%	95%	100%	NTP	Process
2.1.2	% of patients coverage by DSTs to the FLD	2012	95%	100%	100%	TB-07	Output
2.1.3	% of MDR-TB patients coverage by DSTs to the SLD	2012	85%	100%	100%	TB-07	Output
Strategy 2.2. Ensuring effective treatment combined with the psychosocial support of TB and M/XDR-TB patients							
2.2.1	% of successful treatment among new smear positive	2012	75%	80%	85%	TB-08	Outcome

	pulmonary TB patients						
2.2.2	% successful treatment of MDR-TB	2012	72%	73%	75%	TB-08	Outcome
2.2.3	% of M/XDR-TB treatment coverage	2012	86.9	90%	100%	TB-07	Outcome
2.2.4	% of FLD treatment coverage	2012	100%	100%	100%	TB-07	Output
2.2.5	% of SLD treatment coverage for M/XDR-TB patients	2012	86%	90%	100%	TB-07	Output
2.2.6	% of TB patients regularly receiving social support (at least once a month) at the outpatient phase of treatment	2012	25%	60%	90%	National TB registry	Process
Strategy 2.3. TB prevention							
2.3.5	% of the contact children' coverage with preventive treatment	2012	98	100	100	Report	Output
2.3.6	% of BCG vaccination coverage among newborns	2012	97.7	98	98.5	Report	Output
2.3.2	% of PLHIV coverage with Isoniozid preventive treatment	2012	90,3	93	95	Report	Output
Objective 3. Strengthening the systems of infection control, monitoring and evaluation of TB control activities, including those in the penitentiary sector							
Strategy 3.1 Infection control at the TB facilities and in PHC							
3.1.1	TB incidence among healthcare workers	2012	203.8/ 100.000	150/ 100.000	100/ 100.000	NTP	Impact
3.1.2	% TB staff coverage by the respirator program	2012	98	100	100	NTP	Process
Strategy 3.2. Monitoring and evaluation of TB control activities							
3.2.1	% of staff trained in M&E	2012	50%	95%	98%	NTP	Process
Strategy 3.3. Strengthening the capacity of human resources							
3.3.1	% staffing with TB specialists	2012	94.2%	98%	100%	NTP	Process
3.3.2	% of PHC physicians trained in MDR-TB management	2012	15%	50%	70%	NTP	Process
Objective 4. Strengthening interagency and intersectoral interaction in TB control							
Strategy 4.1. *Strengthening interagency and intersectoral interaction in TB control*							

4.1.1	% of TB patients, released from the penitentiary facilities, who completed treatment in the civilian sector	2012	72.4%	80%	90%	NTP	Process
4.1.2	% of requests from the TB facilities to search for TB patients refusing treatment met by the Ministry of Internal Affaires	2012	75%	90%	95%	NTP	Process
Strategy 4.2. Ensuring TB/HIV control in the country							
4.2.1	% of TB patients covered by HIV testing	2012	98%	99%	99%	TB-07	Process
4.2.2	% of TB/HIV patients covered by CPT	2012	75%	85%	100%	List by code 113	Process
4.2.3	% of TB/HIV patients covered by ART	2012	53%	80%	100%	List by code 113	Process
Strategy 4.3. Involvement of NGOs in the implementation of TB control activities in the country							
4.3.1	Number of NGO's involved in NTP	2012	2	10	15		Process
Strategy 4.4. Anti-TB medical care delivery to the internal and external migrants							
4.4.1	Number of migrants evaluated for TB*	2012	No exact data availabl e	40.000	140.00 0	NGO's report	Process
4.4.2	Number of healthcare workers and NGO's volunteers trained in the framework of the program**	2012	No data	171	311	NGO's report	Process
4.4.3	Number of healthcare workers trained in the framework of the program ***	2012	No data	147	427	NGO's report	Process
4.4.4	% of migrants with TB who received psychosocial support	2012	No data	75%	90%	NGO's report	Process
4.4.5	% of population in the pilot regions covered by the information/	2012	No data	30%	50%	NGO's report	Process

	education campaigns ****						

Operational research

Operational research is planned on 3 strategic interventions: 2.3.4, 3.1.1 and 4.1.2. The first research is aimed at the study of effectiveness of early TB detection's methods in children using tests based on gamma-interferon detection T SPOT TB *(Oxford Immunotec limited Abingdon, UK),* released by sensibilized T-lymphocites, in comparison with Diaskinttest® and TST Mantu 2TE.

The second research - to evaluate the risk of nosocomial TB in TB facilities and PHC with development of recommendations for further actions.

The third study is planned to study the reasons of the high rates of unfavorable treatment outcomes among new TB cases in the penitentiary system.

The mentioned operational research was planned by the working group for the development of this Complex Plan taking into account unstudied problems in the country.

Research methodology will be defined by expert group of local and international professionals for each study separately.

Supportive supervision for M&E and data quality

Implementation of this M&E plan is responsibility of NCPT. Data manager at NCPT is responsible for overall organization of R&R system and collection of data from all levels. There are also expert group at NCPT who in collaboration with epidemiologists and HIV experts will be responsible for regular check of quality of reported data and inclusion of HIV data.

The mandate of the National M&E expert group (as an integral part of the NCPT) is to function as a link between the national M&E system and the M&E system at oblast and rayon levels. In that manner the national M&E system and the M&E system at oblast and rayon level will achieve harmonization, data standardization and unification of reporting systems. Additionally, having the quality data available, the M&E expert group will provide recommendations and further outline for activities at the National level in order to provide high quality broad range activities in the field of TB control. Functioning of the M&E expert group will contribute in providing relevant, timely and accurate data that will be reported to national leaders and will serve as a reliable source for national and international reporting requirements.

CHAPTER 7: BUDGET PLAN

This chapter outlines the estimated budget needed for implementation of the Complex TB Control Plan in Kazakhstan in 2014-2020 and includes proposed activities, expected financing of such activities during the period between 2014 and 2016, as well as sources of financing.

The budget was estimated with the help of budgeting tool for TB Control Plan (WHO). The estimation took into account epidemiological evidence and predicted data, number of TB and M/XDR-TB patients, number and types of laboratory testing, name and required amount of drugs, specialists engaged into activities, necessary trainings, etc. The estimation was made separately per each unit of each activity and summed up to total planned activities. Expenses were summed up by objectives, years and sources of financing as well.

The Budget Plan relies on the plan of operations and is closely linked to it. Also, it is streamlined with other components of the Complex Plan and provides financial details of objectives, strategic interventions and activities specified in the plan of operations.

The Budget Plan is elaborated in detail for the first three years (2014-2016). In 2016, further financing of the Complex Plan will be adjusted following determination of the new budget plan. In broad terms, during 2014-2016, the expected financing of activities under the Complex Plan will amount 51.9 billion KZT; in 2014 it will be 13.5 billion KZT and in the next two years by 19.3 billion KZT and 19.1 billion KZT. The proportion of funding from the Global Fund to some activities in the framework of the Comprehensive Plan will be about 14%.

The Budget Plan includes information on each strategic intervention and activities to be financed; organizations in charge of implementation; timelines and sources of financing.

See detailed description of the budget plan in Excel in a separate annex.

[ii] Structural Influences on Migrant Vulnerability. Huffman, S.A, et al, Exploitation, vulnerability to tuberculosis and access to treatment among Uzbek labor migrants in Kazakhstan. Social Science & Medicine (2011) doi:10:1016/j.soccimed.2011.07.019 – in press