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WHO assessment of tuberculosis prevention, control and care in Kazakhstan

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ABSTRACT

The mission's purpose was to assess implementation of recommendations made during WHO's national tuberculosis (TB) programme review mission to Kazakhstan in 2012 and provide strategic and technical advice on the way forward. The assessment team noted strong political support to the TB control programme from the Ministry of Health and Social Development. Continuous improvement in TB interventions and implementation of the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020* was evident, with advances in use of new molecular diagnostic tests, updated treatment protocols to international standards, increased availability of multidrug and extensively drug-resistant TB chemotherapy and reduction in hospital beds. Despite good progress, some challenges and deficiencies remain. Areas for improvement include: ensuring management of childhood TB meets international standards; improving active case-finding and contact-tracing protocols; strengthening infection control; further rationalizing the TB network and institutions; ensuring more sustainable financing; and promoting greater advocacy by nongovernmental organizations and social mobilization. This report presents key findings, challenges and recommendations for the national TB programme in Kazakhstan.

Keywords

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The evaluation team would like to congratulate the WHO country office in Kazakhstan for its excellent organization of the mission before and during field work.

Acronyms and abbreviations

ACF	active case-finding
ACSM	advocacy, communication and social mobilization
Amx	amoxicillin
BCG	bacilli Calmette-Guérin (vaccination)
CCM	country coordination mechanism
CI	contact investigation
Cir	clarithromycin
CM	capreomycin
Cs	cycloserine
CSO	civil society organization
CVKK	Central Medical Consultative Committee
DOT	directly observed treatment
DOTS	directly observed short-course treatment strategy
DST	drug-sensitivity test(ing)
Eto	ethionamide
HCW	health care worker
HEPA	high-efficiency particulate air
HR	human resources
GFATM	Global Fund to Fight AIDS, TB and Malaria
GLC	Green Light Committee
IPT	isoniazid preventive therapy
KNCV	Netherlands Tuberculosis Foundation
Lfx	levofloxacin
LTBI	latent TB infection
M&E	monitoring and evaluation
MDR-TB	multidrug-resistant tuberculosis
Mfx	moxifloxacin
MGIT	<i>Mycobacteria</i> growth indicator tube
MHSD	Ministry of Health and Social Development
MIA	Ministry of Internal Affairs
NCTP	National Centre for Tuberculosis Problems
NGO	nongovernmental organization
NRL	National Reference Laboratory
NTP	national TB programme
PAS	para-aminosalicylic acid
PDR	polydrug resistance
PHC	primary health care
PiH	Partners in Health
PLHIV	people living with HIV
PMDT	programmatic management of drug-resistant TB
PV	pharmacovigilance
S	streptomycin
SES	Sanitary Epidemiological Service
SIZO	pre-trial detention centre
TB	tuberculosis
TBEC	TB Europe Coalition
TST	tuberculin test
USAID	United States Agency for International Development

UVGI	ultraviolet germicidal irradiation
XDR-TB	extensively drug-resistant TB
Z	pyrazinamide

Executive summary

The national tuberculosis (TB) programme (NTP) in Kazakhstan has made significant steps in the past five years in improving quality of service and epidemiology of the disease. Kazakhstan is one of the first countries to prepare a national programme based on the new WHO post-2015 Global TB Strategy. The government of Kazakhstan has increased public funding several-fold, such that almost 99% of costs in the last two years have been covered by the national budget. Rapid advances have been made across the whole programme, as evidenced by the acceptance and adaptation of new laws, efforts to apply international recommendations for TB control, implementation of rapid diagnostic molecular testing, development of guidelines based on international standards (such as multidrug-resistant TB (MDR-TB) treatment and infection control), slow but steady reduction in the number of TB hospital beds for inpatient care, availability of all TB drugs, increased implementation of ambulatory treatment, and a frank and fruitful collaboration with international partners.

Important and serious challenges remain, however, and much work still needs to be done. Kazakhstan is one of the 27 countries globally that still reports a high burden of MDR-TB. The estimated incidence rate remains high at 99 per 100 000 population. Treatment outcomes need to improve even further if the proposed target set for 2020 is to be reached on time.

Process

The overall purpose of the mission was to assess the level of implementation of recommendations made by the WHO-led evaluation team during the comprehensive NTP review mission to Kazakhstan conducted in 2012 (1) and provide strategic and technical advice on the way forward. The mission was planned for July–November 2015. The WHO country office in Kazakhstan, in collaboration with the WHO Regional Office for Europe, led the preparation and coordination of the assessment mission and field visits. On the suggestion of the Ministry of Health and Social Development (MHSD), the assessment was carried out in Astana city and the Kyzylorda oblast.

The assessment team included six international experts led by a Regional Office TB expert. Mission members were involved in several Skype and WebEx phone conference calls prior to the assessment. Relevant documents, including the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020* (2), policy documents [prikazes] (3–5), clinical protocols and guidelines (6,7), and surveillance and epidemiological data were reviewed. Two assessment questionnaires were developed: the first assessed the level of implementation of the 2012 mission recommendations and contained questions asked during the mission by international experts; and the second included questions to facilitate national representatives to self-assess results achieved.

Different levels of TB services, including inpatient and outpatient treatment facilities, laboratories, and children's hospitals and sanatoria, were visited. The team had opportunities to meet MHSD and National Centre for Tuberculosis Problems (NCTP) representatives, staff from Kyzylorda oblast health authority and doctors and other medical staff from TB hospitals and polyclinics. Members also met representatives of civil society organizations and Project HOPE. Representatives from NCTP accompanied the international experts throughout the mission and provided all necessary information and valuable logistical support.

The team member responsible for assessing MDR-TB and TB in prisons visited the NCTP and the National Tuberculosis Reference Laboratory in Almaty and also held frank discussions with

prison representatives. The member leading the TB financing section of the mission met with representatives from the MHSD committees of payment for medical services representatives and medical and pharmaceutical activity regulation.

The review team spent five days on field visits and two discussing the findings and recommendations with NCTP representatives before debriefing the MHSD. Technical areas covered during the mission were:

- MDR-TB;
- TB in prison;
- TB in children;
- TB contact-tracing;
- infection control;
- advocacy, communication and social mobilization (ACSM) and civil society organizations' involvement in TB prevention and care;
- human resource development and capacity-building; and
- TB financing and governance.

Key findings

1. Kazakhstan is one of the WHO European Region countries with a high TB burden. The estimated incidence rate is 99 per 100 000 population and the mortality rate 8.6 per 100 000. A total of 15 718 TB cases were notified in 2014, of which 11 480 were new cases: this represents a decrease from 2012, when 22 000 were notified, including 13 620 new cases. The estimated proportion of cases with MDR-TB is 26% among new cases and 58% among retreatment cases (8).
2. The latest treatment success rate for pulmonary TB patients with susceptible strains is 89% (2013 cohort); the success rate for patients with MDR-TB is 73% (2012 cohort) (8).
3. Kazakhstan has made significant progress since the 2012 programme review in following and addressing the main recommendations. Achievements were observed in diagnosis and treatment of TB/MDR-TB, childhood TB, shifting from chiefly inpatient-based TB care to more ambulatory care (the annual reduction in bed capacity is approximately 7%), strengthened infection control measures, and adequate human resources development and planning.
4. The NTP has significant and strong political support, as evidenced by several policy documents that have been developed and implemented. These include the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020* (May 2014) (2), prikazes 19 (9) and 362 (10) (which enabled the expansion of outpatient ambulatory care and provided additional social and psychological support in five pilot regions (Akmola, Zhambyl, Kyzylorda and Aktobe oblasts, and Astana city)), approval of TB prevention guidelines, and acceptance of a multidrug and extensively drug-resistant TB (M/XDR-TB) case-management strategy.
5. In 2014, 99% of the cost of the NTP (including procurement of first- and second-line drugs) was financed by the national budget. The dedicated budget for TB services at national level presents a great opportunity for political decision-makers to ensure actions to combat TB remain securely embedded in the overall health care system.

6. Coverage of MDR-TB patients with adequate treatment has increased consistently, reaching 99% (7321 patients) in 2014 compared to 85.7% in 2012.
7. Rapid implementation of new molecular methods of diagnosis has been made possible through national and external financial support. There are 23 GeneXpert machines and 12 items of Hain equipment at oblast level.
8. TB control in the prison sector has made considerable progress since 2012. Collaboration with the civil sector is stable and is improving continuously.
9. The prison sector is implementing new treatment guidelines extensively. In 2013, 920 patients were treated with second-line drugs (versus 657 in 2012); treatment coverage was 85.8% in 2014. The main problems are related to staff shortages and an increasing number of new MDR-TB cases.
10. A patient-centred approach and social support services for people with TB and MDR-TB have been implemented widely, but not uniformly, across all oblasts (the Kyzylorda oblast is a good example).
11. Overall, TB incidence in children and adolescents is improving. Most cases are diagnosed through active case-finding (ACF). In 2014, 64% of all cases among children (286 of 445) were diagnosed through tuberculin skin-test screening and 74% (403 of 547) of adolescents by fluorography. The bacteriological confirmation rate of the disease in this age group is quite low. In 2014, only 8.5% (17 of 200) of pulmonary TB cases in children and 17.7% (85 of 480) in adolescents were documented as smear-positive.
12. Human resources and capacity-building for TB is on MHSD and NCTP agendas. Medical staff are well trained and organized within the national medical education system. In 2014, the TB physician staffing rate was 91.1%, phthisiologists 92.8% and bacteriologists 92.4% of the projected need of 100%.
13. TB contact investigation is one of the NTP's important preventive activities, but some protocols need to be updated to international standards. The recently introduced Diaskintest®, which is being used to diagnose latent TB infection (LTBI), lacks sufficient scientific evidence (local and international) on its reliability.
14. The policy of ACF for TB contacts and risk groups does not follow current international recommendations. Standards defining an index case lack international conformity and no distinction is made between close and casual contacts. All cases are considered to be equally infectious, even if smear-negative, so no distinction or priority is given to contacts of smear-positive index cases. A more rational definition of risk groups is required.
15. Evidence is scarce on the contribution and yield of routine contact investigations leading to early secondary case-detection.
16. Significant improvement in the implementation of infection control measures, particularly administrative measures, has been noted, but environmental and personal protective measures have not yet fully or equally been implemented.
17. The national infection plan and budget are part of the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020* (2). The documents currently governing infection control need to be harmonized to avoid inconsistency and misunderstandings during implementation of planned activities. The documents can be found in the complex plan for TB control (2), prikazes 19 (9) and 124 (3), and NCTP guidelines on infection control.
18. There is a desire at national and oblast levels to involve nongovernmental (NGOs) and civil society organizations (CSOs) to supplement the efforts of the NTP. International NGOs and local CSOs can be found at both levels and have the capacity to build community engagement in support of the NTP.
19. A national plan for ACSM activity was adopted in 2012.

20. As recommended by the 2012 review, regular interdepartmental policy meetings are held at national and oblast levels to strengthen advocacy and political commitment.
21. A disability welfare allowance is paid to the parents of children with TB and patients with MDR-TB during the period of treatment. The size of the allowance is determined at oblast level and varies across the country.
22. The determination of the national government to ensure good TB care is indicated by the existence of a process through which any death due to TB of a pregnant woman or mother of young children is automatically subjected to a detailed investigation led by a legal officer reporting to a presidential commission. The process had recently been enacted in the oblast visited by the mission.
23. A significant reduction in TB bed numbers has been achieved. The average length of stay, however, has not changed in the last 3–4 years and reportedly ranges from 100 to 102 days for adults and 180 days for children.
24. Improvements in the development of ambulatory care have also been made, but the new case-based tariff system for the reimbursement of TB special services has not been launched. This was one of the key recommendations of the 2012 review mission and is intended to motivate service providers to enrol patients for ambulatory care. The deadline for implementation is the end of 2016.
25. The nationally contracted and controlled drug procurement and supply system is well established. The nationally centralized public procurement process for TB drugs and the contractual practice, including the bargaining process, can ensure relatively low prices. This is leading to a stable supply of, and equal access to, drugs at oblast and rayon levels.
26. Important steps have been taken to develop quality monitoring and assurance of TB care and apply TB indicators in primary care.
27. Kazakhstan is committed to introducing new drugs to address the problem of XDR-TB. A memorandum on implementation of the End TB pilot project for 500 patients has been signed by the NCTP and the Partners in Health NGO.

Key challenges

1. The epidemiological situation is still a matter of concern, particularly in view of the high prevalence of drug-resistant cases in the civil population (more than 7000 MDR-TB cases are registered annually). Despite an overall decrease in TB cases in the penitentiary sector, the number of new MDR-TB cases increased from 81 (9.9%) in 2012 to 139 (16.1%) in 2013 and 152 (25%) in 2014.
2. Ambulatory treatment in primary health care (PHC) services is not yet functioning to full potential. There is scope for better planning and the identification of acceptable motivational packages for providers and patients to increase cooperation with TB services.
3. The average length of hospitalization for patients with susceptible and drug-resistant TB is too long. Children are hospitalized for at least six months, with some staying an additional three months in sanatoria. This brings several implications, including disruption to family life and schooling and a risk of continuing exposure to nosocomial infections.
4. Current practices in relation to involuntary isolation and palliative care require more flexible rules and standard criteria and need to better differentiate between categories of patients.
5. There is no sustainable mechanism for procurement of good-quality paediatric TB drugs.
6. Procurement of TB medications from the national budget does not fully follow international standards, good manufacturing practices and requirements for WHO

prequalified medicines. The process of registration of new drugs remains a challenging problem.

7. Kazakhstan has been selected as one of 16 End TB project countries and Partners in Health will be the implementing partner. As of 2015, the NCTP had yet to fulfil the main organizational and patient-related criteria to implement the project.
8. There is a lack of qualified medical personnel willing to work in this field, despite the provision of incentives (salaries are 190–220% above the basic level, with 42 annual leave days per year). Reasons given for resistance among young doctors include fear of infection, insufficient remuneration, logistical problems and the limited prestige of the specialty.
9. The national policy on active TB contact-screening and screening of other high-risk groups without prioritizing close contacts such as family, prisoners and those with HIV/AIDS is outdated. Protocols are not based on international standards.
10. Implementation of the ambitious and comprehensive infection control plan (part of the complex plan for TB control (2)) will require significant financial resources and investment (particularly for environmental control) and updated policy documents to meet international standards.
11. Documents now in force in relation to sanitary instructions (SANPIN) have inconsistencies and differences (4,5,11). There is a lack of a single policy document with specific updated and recommended controls.
12. Ongoing perceptions of stigma are reinforced by policies that stop children from attending mainstream schools (even if not infectious) and routine fumigation of the homes of TB patients.
13. NGOs are not extensively involved in supporting patients in ambulatory care. Funding for local NGOs is patchy and not sustained.
14. There is a general lack of community awareness of TB and patient support is scarce, leading to suboptimal community support during ambulatory treatment.
15. Yearly expenditures on TB services are not aligned with strategic directions and do not provide for the recommended shift from traditional hospital care to ambulatory care with the support of mobile teams and NGOs.
16. Cost-effectiveness studies on special (very expensive) third-line drugs have not been conducted, so there is no compelling evidence base to support their distribution nationwide.
17. The database for the whole range of TB services is not unified, reducing the potential of the case-based tariff system. Further refinement in reimbursement methods and continuous quality monitoring and improvements are necessary.
18. There is no mechanism of depreciation for the 23 GeneXpert laboratory machines procured in 2015, raising concerns for the long-term sustainability of this specialized assay on pathological samples.

Key recommendations

1. M/XDR-TB should be considered a public health emergency in Kazakhstan. Preventing and combating it should be a top priority for the country and the entire region.
2. Reorganization of TB services by oblast should be continued, expanding outpatient treatment and optimizing TB inpatient capacity while remaining responsive to the changing dynamics of the TB epidemic in the country. Hospital optimization plans should take into account efficiency, cost–effectiveness and the risks of nosocomial transmission of TB.

3. The NTP should update the reporting system for TB and MDR-TB cases to accord with international standards. The same data should be used for local programmes and international reports.
4. The current policy for involuntary isolation and treatment should be revised, as such measures are not cost-effective and are generally problematic in terms of human and patient rights. Instead, efforts to strengthen compliance and treatment outcomes using patient-centred approaches should be intensified, with special emphasis on vulnerable population categories and groups at high risk of default.
5. The country should prepare a comprehensive plan for using new drugs (including bedaquiline) and other third-line drugs to further improve treatment of M/XDR-TB patients.
6. The NCTP should establish a system for active pharmacovigilance in the country.
7. Criteria used to warrant hospitalization should be critically reviewed to reduce hospital stays in accordance with WHO recommendations and discontinue practices of routine admission to sanatoria for children with LTBI and non-infectious TB.
8. Potential gaps in human resources (due to retirement of experienced professionals) should be further assessed and addressed to motivate new recruits by, for example, promoting TB control among interns and combining TB and respiratory medicine specialties.
9. Professional development through training programmes for TB staff on issues such as working in mobile teams and measuring and evaluating indicators should continue.
10. Guidelines should be developed to support the work of new facilities and mobile teams.
11. Support should be supplied for change management at oblast and rayon levels to reduce inpatient care, develop ambulatory care and utilize mobile outreach (mobile teams).
12. A revision of existing policy documents should be planned, using risk-based approaches for contact investigation that follow international standards.
13. The results of contact investigations comparing close (household) and casual contacts should be reviewed and analysed periodically.
14. Environmental infection control measures in TB health facilities should be improved, giving priority to zones at highest risk of nosocomial transmission (such as microbiology laboratories, wards with infectious (especially resistant) cases, bronchoscopy units and sputum induction rooms), while ascertaining rational use of funds.
15. Sanitary instructions (SANPIN and prikazes 194 (4) and 19 (9)) should be adapted in accordance with international standards, addressing existing differences and avoiding inconsistencies to produce a single policy document.
16. Systematic policies and plans should be developed at national and oblast levels to engage community and patient groups in undertaking work that supports the NTP. WHO and the TB Europe Coalition of civil society activists (TBEC) could provide advice and training.
17. Social contracting mechanisms should be developed by the MHSD and appointed chemizators (directly observed treatment (DOT) nurses). WHO and TBEC could provide advice and training.
18. Chemizators (DOT nurses) should be trained to enable them to see their role as being central to effective ambulatory TB care and help them understand that they can not only deliver drugs to patients, but also provide social and informational support.
19. The restructuring programme for further reducing hospital TB bed capacity while diversifying methods of ambulatory care should continue.
20. The introduction of the new merit-based reimbursement scheme (case-based tariffs) should be enforced as an incentive to the delivery of more efficient and higher-quality TB services.

21. Ambulatory outpatient care should be encouraged with the support of mobile teams (including psychological support for patients), social care workers and NGOs/CSOs interested in this field of work.
22. A more efficient allocation mechanism should be developed by the government to reduce unacceptable regional differences in spending, while taking into account demographic and epidemiological differences between oblasts. This should guarantee the timely shift from inpatient to ambulatory care. Regular revision of TB expenditure should be systematized and methods to analyse performance, including efficiency, opportunity-cost and cost-effectiveness measures, applied.
23. Further efforts should be made to develop quality measures and key performance indicators (such as readmission of cases, patient adherence to drug use and activities of mobile teams) and create mechanisms that allow comparisons between oblasts and provide feedback for quality improvement. Reporting data forms should be standardized at national and oblast levels.
24. A mechanism for analysing patient pathway management and exploring bottlenecks and other delays in care should be created. The IT system for complete patient registries should cover the whole range of TB services while allowing the NCTP to follow patient pathways through the system using nationwide unique identification numbers for each patient.

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Overview of recommendations

Recommendations are summarized in Table ES1.

Table ES1. Overview of recommendations

Area of expertise	Action	Timeline	Responsibility
Drug susceptibility test	Use experience of ambulatory treatment from pilot sites to inform successive introduction in all oblasts. Careful preplanning and situation analyses are needed for every oblast.	2016 and ongoing	NCTP, chemizators
	Consider optimization of TB hospital-bed reduction coupled with increasing the capacity and expansion of outpatient treatment of TB patients.	2016 and ongoing	MHSD/NCTP, chemizators
MDR-TB prevention and control	Increase motivation of PHC staff to deal with TB patients (by creating a suitable performance-based system).	2016 and ongoing	MHSD/NCTP
	Further improve treatment of M/XDR-TB patients by preparing a comprehensive plan for using new drugs, including bedaquiline, and other third-line drugs.	As of 2016	MHSD/NCTP
	Ensure that the planned partner project for implementing new drugs in 2016 will be in line with current NTP policies.	As of 2016	MHSD/NCTP
	Harmonize data used for programmatic management and international reporting to ensure consistency.	2015 and ongoing	MHSD/NCTP
	Current experience for using involuntary isolation and palliative care will need more precise rules for selection criteria and better differentiation between categories of patients. Involuntary isolation should be considered only as an extreme measure (last option) provided all other support activities are in place and made available for every individual case.	2015 and ongoing	NCTP, oblast TB institutions
Penitentiary system	Analyse the reasons and underlying causes for the increased numbers of new MDR-TB cases during recent years.	By mid-2016	Health Department of the Committee of Corrections of Ministry of Internal Affairs (MIA)
	Further strengthen the system of pre- and post-release of TB and MDR-TB patients from prison to civilian and TB services to ensure treatment continuation and follow-up.	As of 2016, ongoing	Health Department of the Committee of Corrections of MIA, NCTP, TB treatment institutions

Area of expertise	Action	Timeline	Responsibility
Drug and supply-chain management	Procure TB medicines from the public budget in line with international quality assurance standards (good manufacturing practices, WHO prequalified medicines).	As of 2016	MHSD/NCTP
	Create a system of sustainable supply of paediatric TB formulations.	As of 2016	MHSD/NCTP
Childhood TB	Critically review criteria for hospitalization to reduce hospital stay in accordance with WHO recommendations and discontinue practices of admission to sanatoria for children with LTBI and non-infectious TB.	By June 2016	MHSD/NCTP
Human resources development	Assess the potential gap in human resources for TB control in coming years (caused by educational reforms and ageing of existing TB professionals) and further develop measures to meet needs (for example, promote TB control among interns, combine TB and respiratory medicine specialties).	Continuing	NCTP/MHSD, medical faculties, WHO, international partners
Contact investigation	Prepare guidelines on active screening of contacts (including appropriate risk groups definition) based on international standards. The guidelines can unify all existing documents. Monitoring and evaluation (M&E) on contact-tracing should be a routine part of regular M&E. Detailed analysis of contact investigations is needed (in terms of characteristics of index case, differences between close (family, prison, hospital etc.) and casual (work, schools, neighbours, relatives) contacts). Consider the need for new indicators as part of standardized M&E checklists, such as the number of close contacts planned for screening, people examined, diagnosed TB patients and/or with LTBI out of all examined.	Preparation activities 2016 and final completion at the end of 2017	NCTP/consumer rights protection/ international partners
	Consider operational research in contact investigation (such as determining the yield of ACF in different risk groups, especially in TB contacts) to improve programmatic management in those areas through increased understanding.	Within six months to define the methodology of operational research/ finance, completion at the end of 2017	NCTP/MHSD/ international partners
Infection control	Prepare an investment plan to improve mechanical systems of ventilation in TB health facilities. Assess existing systems of mechanical ventilation in TB institutions at oblast and regional levels based on the data to prepare a mid/long-term plan (3–5 years) and budget for activities; investment	Continuing process: 12 months for assessment; investment plan approved	MHSR/NCTP, oblast health authority

Area of expertise	Action	Timeline	Responsibility
	priority to zones of highest risk for TB transmission (laboratories, MDR-TB, sputum collection rooms).	end of 2016	
	<p>Revise and adopt SANPIN instructions (prikazes 127 and 194 from 2015) in terms of:</p> <ul style="list-style-type: none"> - discontinuing ineffective contact investigation practices such as comprehensive disinfection of index cases' homes and veterinary control; - using UV lamps with protection instead of open ultraviolet germicidal irradiation (UVGI) lamps and follow instructions for proper installation and maintenance; - revising the policy of using recycled irradiators – medical lamps in plastic housing (облучатель-рециркулятор медицинский) – with circulation of air (no evidence on its efficacy); - stopping the practice of building high 2.5 m walls around TB facilities; - installing mechanical ventilation in the gateways of health facilities providing air backup to prevent airflow between the insulated rooms. 	<p>Documents could be revised and agreed among national representatives within 12 months; changes implemented into practice from July 2017</p>	<p>MHSR/NCTP, oblast health authority</p>
<p>ACSM A. Community action in TB care</p>	<p>Develop systematic plans for involvement of community and patient groups to undertake work the NTP wants to be provided and that can best be delivered by CSOs. Develop social contracting mechanisms for use by MHSD and chemizators. Consider advice and training on the nature of NGOs and development of their use by NTPs.</p>	<p>Within six months: training on use of NGOs; discuss social contracting funding mechanisms at national and oblast levels. Within 12 months: plans for NGO use developed at both levels. Within 18 months: plans put into operation</p>	<p>WHO, NCTP, oblast TB authorities</p>

Area of expertise	Action	Timeline	Responsibility
B. Enhancing the role of chemizators (DOT nurses)	Train chemizators to see their role as central to effective ambulatory TB care and to understand that they can be more than deliverers of drugs to patients, but also providers of social and informational support.	Within six months: develop training module. Within six months: train all existing chemizators. Continuing from then on: build the module into the overall training of new chemizators.	NCTP/PHC facilities
C. Policy-level decision-making on TB	At national level: continue existing policy links on TB through the Republican Coordinating Council, country coordinating mechanism and the MHSD consilium. At oblast level: ensure interdepartmental TB meetings continue.	Continuing; oblast meetings to take place at least six-monthly	NTP; oblast health authorities and chemizators
D. Counter stigma	Identify and actively use celebrity TB champions. Explain TB infectiousness to school leaders.	Continuing	NCTP/MHSD/ Ministry of Education
E. Patient information	Review distribution of existing materials to ensure they are available at all points of contact with TB patients, not just where diagnosis occurs.	Initial review within 12 months; thereafter, continuing	NTP for initial review; local TB authorities to ensure materials are always in the relevant places
Financing and governance	Prepare mid- and long-term plans for reduction of TB hospital capacities and develop different forms of ambulatory care. Prepare and introduce a new merit-based reimbursement scheme (case-based tariffs) as a new incentive method for more efficient and higher-quality TB services. Develop quality measures, key performance indicators (such as readmission of cases, patient adherence in drug use, activities of mobile teams). Develop the IT system to complete the patient registries and enable coverage of the whole range of TB services.	End of 2017	MHSD/Ministry of Finance/NCTP/WHO

1. Country visit objectives and terms of reference

Following discussions with national authorities, the WHO country office in Kazakhstan and the WHO Regional Office for Europe carried out a country visit on 17–24 November 2015. The purpose of the mission was to assess the level of implementation of recommendations made by the WHO evaluation team during the comprehensive national tuberculosis (TB) programme review mission to Kazakhstan conducted in 2012 and provide strategic and technical advice on the way forward.

Objectives

The objectives were to:

- carry out an analysis of the current TB control situation; and
- identify, in cooperation with national counterparts, achievements, challenges and possible actions for progress towards stronger TB control in Kazakhstan.

Technical areas covered during the visit

The areas covered were:

- TB strategy and financing, including human resources (HR) and training;
- multidrug-resistant TB (MDR-TB);
- TB prevention and control, with special reference to infection control measures;
- TB in vulnerable populations such as children, prisoners and TB contacts; and
- involvement of nongovernmental organizations (NGOs) in TB programme implementation and social mobilization.

The mission programme is shown at Annex 1, site visits at Annex 2, and people met during the mission at Annex 3.

2. Epidemiology of TB

TB notifications and trends

Kazakhstan is among the countries of the WHO European Region with a high TB burden and is also one of the 27 high MDR-TB burden countries in the world. The estimated incidence rate for all forms of TB in 2014 was 99 (64–141) per 100 000 population and the mortality rate was 8.6 (7–10) per 100 000 population (1). The estimated TB case-detection rate (all forms) for the same year was 89% (64–140) and the total number of TB registered cases was 15 718 (15 244 new and relapses and 474 previously treated), with 70% of new cases having bacteriologically confirmed pulmonary TB. TB is more common in males, with a male to female ratio of 1 : 5.

The numbers of notified TB cases in Kazakhstan for 2014 are presented in Table 1, and further information about Kazakhstan in Annex 4.

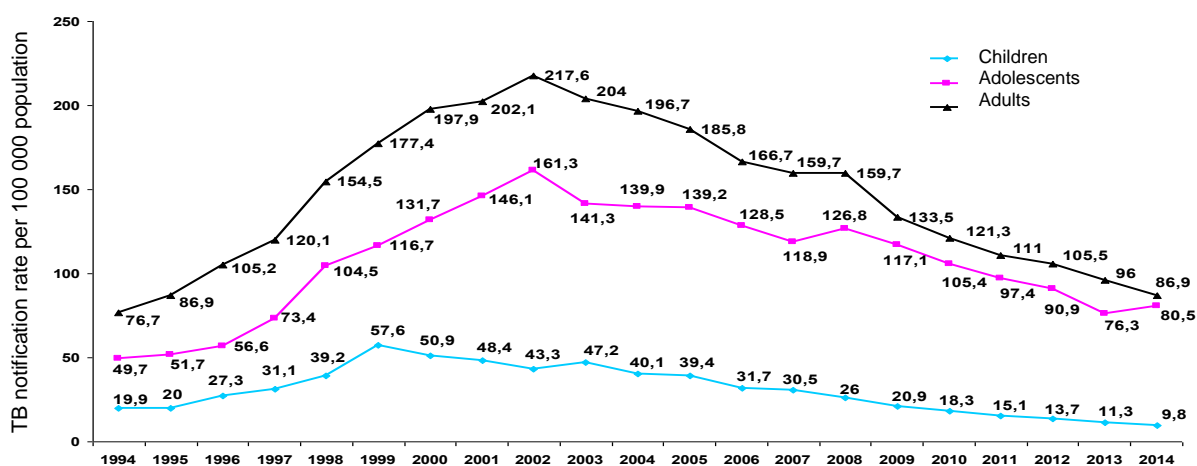
Table 1. Notified TB cases, 2014

Type of TB	New	Relapses
Pulmonary, bacteriologically confirmed	8 026	2 414
Pulmonary, clinically diagnosed	1 883	1 050
Extrapulmonary	1 571	300
TOTALS	11 480	3 764

Source: WHO (1).

Significant improvements in TB notification rates have been achieved over the past 14 years across all age groups, with a total reduction in incidence of 55% and mortality of 77%. The proportion of cases with drug-resistant TB is of concern, however, and has remained high. Trends in new TB cases (children, adolescents and adults) notified from 1994 to 2014 are presented in Fig. 1.

Fig. 1. TB notification rates per 100 000 population (new TB cases among children, adolescents and adults), 1994–2014



Source: data provided by the national TB programme (NTP), 2015.

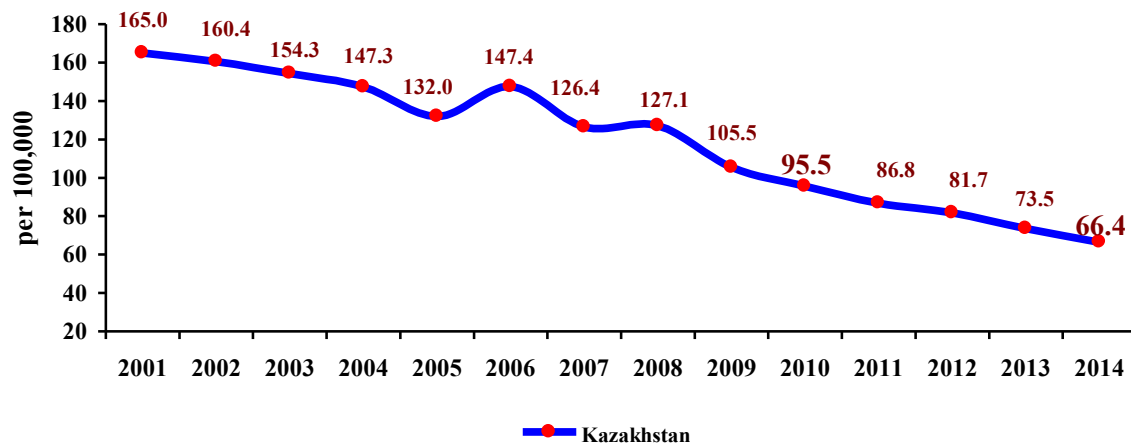
Prevalence

Prevalence of TB in Kazakhstan remains stable and has not decreased significantly in the past few years (24 265 cases in 2012 and 23 267 in 2013).

Incidence

TB incidence (new cases in the civil sector) and mortality rates have decreased during the last five years from 95.3 to 66.4 per 100 000 and 10.8 to 4.9 per 100 000, respectively. TB incidence has decreased by 55% and mortality by 77% over the past 10 years (Fig. 2).

Fig. 2. TB incidence rate (new cases), 2001–2014



Source: data provided by the NTP, 2015.

TB in children and adolescents

The population of Kazakhstan was estimated at 16 909 800 in 2014, with 25.4% children aged 0–14 (4 302 400) and 4% adolescents aged 15–17 (678 660). Of the total number of all forms of TB cases registered in 2014, 2.8% (445) were among children and 3.5% (547) adolescents (Table 2).

Table 2. Registered new childhood TB cases, 2014

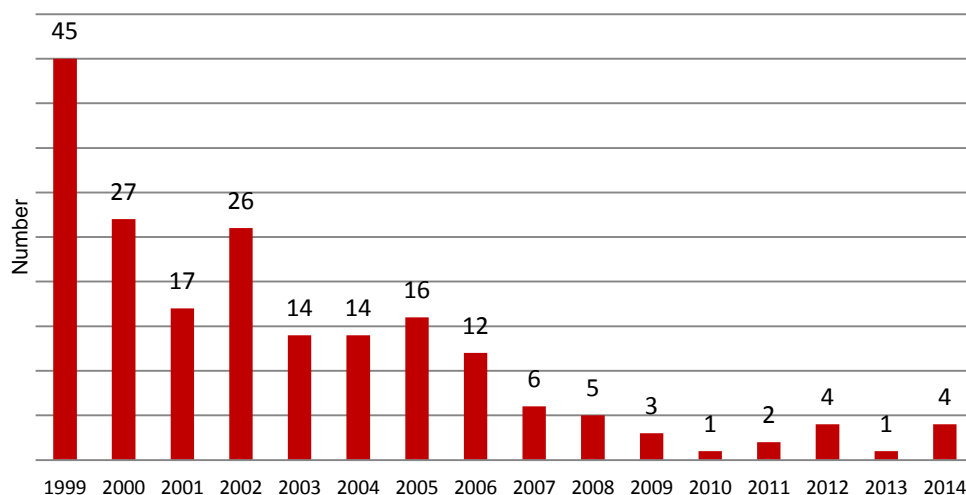
Age group	New TB cases			Total
	Pulmonary smear+	Pulmonary smear–/sputum smear not done	Extrapulmonary	
0–4	3 (2.4%)	32 (25.6%)	90 (72.0%)	125
5–14	14 (4.4%)	151 (47.2%)	155 (48.4%)	320
Total 0–14	17 (3.9%)	183 (41.1%)	245 (55.0%)	445
15–17	85 (15.5%)	395 (72.2%)	67 (12.2%)	547

Note: percentage is that of total cases in each age category.

The TB notification rate among children has been decreasing rapidly since 1999 (when the highest rate was registered), from 57.6 per 100 000 population to 9.8 in 2014. A more modest decrease in notification rates was observed among adolescents, from the highest registered rate of 161.3 per 100 000 in 2002 to 80.5 in 2014 (Fig. 1).

A positive trend is also observed among registered numbers of children with TB meningitis, which has been decreasing rapidly and has remained low for the past few years. Three cases in adolescents and one in a child were registered in 2014 out of a total of 14 cases. The decline in TB meningitis cases in children and adolescents since 1999 is shown in Fig. 3.

Fig. 3. Absolute number of TB meningitis cases among children and adolescents, 1999–2014



Source: data provided by the NTP, 2015.

TB in prisons

Although the total number of patients with TB in prisons has decreased steadily since 2003, prisons remain a priority area as incidence, mortality and reports of MDR-TB are significantly higher than in the general population. Data from 2014 show a high mortality rate (91.2 per 100 000) and a growing problem of MDR-TB among new (25%) and previously treated (80.6%) TB cases. Some basic epidemiological data from prisons in Kazakhstan for the period 2003–2014 are presented in Table 3.

Table 3. Epidemiological TB data (absolute numbers and rates) in prisons, 2003–2014

Indicator	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total prison population	51 788	49 522	44 234	42 428	44 556	49 272	53 802	52 580	46 629	42 362	No data	No data
New TB cases	2 137	1 388	1 042	1 230	1 100	1 361	1 287	986	731	629	828	473
All TB cases	6 340	6 042	5 150	4 920	3 665	3 925	3 748	2 634	2 451	1 779	1 872	1 581
TB mortality	103	82	45	103	122	160	179	138	86	77	57	54
New TB cases per 100 000	4 126	2 802	2 355	2 899	2 468	2 762	2 392	1 875	1 567	1 484	966	799
All TB cases, per 100 000	12 242	12 200	11 642	11 596	8 225	7 966	6 966	5 009	5 256	4 199	No data	No data
TB mortality, per 100 000	198.9	165.6	101.7	242.8	273.8	324.7	332.7	262.5	184.4	181.8	88.6	91.2

Source: data provided by the NTP, 2015.

Drug-resistant TB, especially extensively drug-resistant (XDR) strains, presents a real threat to health in prisons. Registered MDR-TB cases for the period 2007–2014 are presented in Table 4.

Table 4. MDR-TB cases in prisons, 2007–2014

		2007	2008	2009	2010	2011	2012	2013	2014
MDR-TB	%	17.8	24.9	18.8	21.1	12.0	9.9	16.1	25.0
new cases	Total	60	109	103	54	88	81	139	152
MDR-TB	%	52.2	59.4	72.5	33.9	69.1	50.7	63.7	80.6
retreatment cases	Total	423	520	447	427	561	396	422	374

Source: data provided by the NTP, 2015.

Drug-resistant strains

Although positive trends in TB control have been observed, levels of drug resistance remain a concern. The estimated proportion of cases with MDR-TB in 2014 was 26% among new cases and 58% among retreatment cases, with a total of 5877 notified M/XDR-TB cases (1).

Some inconsistency was observed between the main epidemiological data provided for the international database and those in the local NTP. The issue was addressed during discussions between the National Centre for Tuberculosis Problems (NCTP) and the WHO country office.

The numbers of all MDR and XDR-TB cases reported in the local NTP database for the period 2008–2014 are shown in Table 5.

Table 5. Number of notified (new and relapses) MDR-TB and XDR-TB cases, 2008–2014

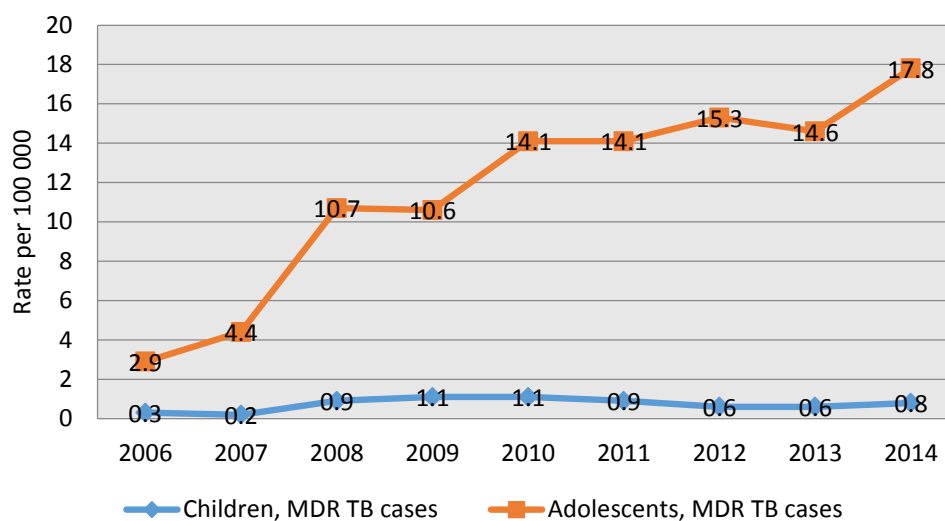
Year	2008	2009	2010	2011	2012	2013	2014
MDR	3 676	3 644	7 387	7 408	7 608	7 011	6 905
XDR	N/A	N/A	N/A	N/A	440	322	301

Source: data provided by the NTP, 2015.

Despite the decline in overall TB notification rates among children and adolescents, MDR-TB increased almost threefold among children between 2006 and 2014 (from 0.3 per 100 000 to 0.8) and sixfold among adolescents (from 2.9 per 100 000 to 17.8) (Fig. 4). The percentage of children among all notified MDR-TB cases has been stable over the last three years (0.4%, 0.4% and 0.5%), but the proportion of adolescents increased from 1.3% in 2012 to 1.7% in 2014 (Table 6).

Although the number of new and relapsed MDR-TB cases in the civilian population has been stable in the past four years, the number of similar cases in prisons increased from 54 in 2010 to 152 in 2014. This trend needs further study. The numbers and proportions of MDR-TB cases among new and previously-treated TB cases (in civilian and prison populations) are presented in Table 7.

Fig. 4. MDR-TB notification rates per 100 000 among children and adolescents, 2006–2014



Source: provided by NCTP, 2015.

Table 6. Notified MDR-TB patients, all cases, adolescents and children, 2012–2014

	2012	2013	2014
MDR-TB, all ages	7 608	7 011	6 905
XDR-TB, all ages	440	322	301
MDR-TB, adolescents:			
- number	104	99	121
- % of all M/XDR-TB	1.3	1.35	1.7
- rate per 100 000	15.3	14.6	17.8
MDR-TB, children:			
- number	29	28	36
- % of all M/XDR-TB	0.4	0.4	0.5
- rate per 100 000	0.6	0.6	0.8

Source: provided by NCTP, 2015.

Table 7. Numbers and proportions of MDR-TB among new and previously treated TB patients, 2009–2014

Year	2009	2010	2011	2012	2013	2014
New TB cases	5 111	5 022	5 293	5 819	5 937	4 664
%	24.5	30.5	29.3	30.7	25.2	23.8
Retreatment TB cases	4 460	4 614	4 862	4 288	5 547	4 298
%	44.3	49.2	50.2	52.2	48.6	40.0

Source: provided by NCTP, 2015.

Drug-sensitivity testing

Drug-sensitivity testing (DST) of bacteriologically confirmed cases has been increasing consistently, reaching 100% of new and previously treated cases in 2013 and 2014. The

proportion of mono- and polydrug resistance (PDR) was almost identical between new and retreatment cases, but MDR-TB was significantly higher in retreatment. The results of DST coverage are shown in Table 8.

Table 8. Summary of DST coverage for new and retreatment cases, 2009–2014

	Total cases	DST coverage (%)	Cases with DST results	Drug-resistance pattern (%)			
				Sensitive to all FLDs ^a	Mono	PDR-TB	MDR-TB
New cases							
2009	5 111	89.2	4 559	47.3	9.4	18.8	24.5
2010	5 022	92.0	4 619	42.6	8.6	18.3	30.5
2011	5 293	93.8	4 963	42.2	9.9	18.6	29.3
2012	5 819	94.9	5 520	41.6	9.6	18.1	30.7
2013	5 937	100.0	5 937	45.6	11.9	17.3	25.2
2014	4 664	100.0	4 664	49.5	10.8	15.9	23.8
Retreatment cases							
2009	4 460	88.1	3 928	29.4	7.3	18.9	44.3
2010	4 614	91.4	4 218	24.9	7.1	18.8	49.2
2011	4 862	93.6	4 551	24.3	8.4	17.0	50.2
2012	4 288	94.6	4 056	21.9	8.7	17.4	52.0
2013	5 547	100.0	5 547	29.0	5.4	17.0	48.6
2014	4 298	100.0	4 298	33.0	10.5	16.5	40.0
All cases							
2009	9 571	88.7	8 487	39.0	8.4	18.9	33.7
2010	9 636	91.7	8 837	34.2	7.9	18.5	39.5
2011	10 155	93.7	9 514	33.7	9.2	17.9	39.3
2012	10 107	94.7	9 576	33.3	9.2	17.8	39.7
2013	11 484	100.0	11 484	37.4	8.9	17.2	36.5
2014	8 962	100.0	8 962	41.6	10.6	16.2	31.6

^a FLDs = first-line drugs.

Source: provided by NCTP, 2015.

According to information obtained from the National Reference Laboratory (NRL), MDR-TB strains show high resistance to second-line drugs. In 2013, approximately 40% of strains were resistant to ethionamide and injectable drugs, and 30% were resistant to fluoroquinolones. Accurate data on XDR-TB patients became available from 2012 and are included in Table 6.

TB/HIV coinfection

According to national data, Kazakhstan has a low HIV/AIDS disease burden. There are 16 AIDS centres in Kazakhstan. All HIV-positive cases are registered in the electronic database for people living with HIV (PLHIV). The cumulative number of registered PLHIV in 2014 was 16 318, up from 14 742 in 2013.

HIV test results were available for 97.2% of TB patients. The TB/HIV coinfection rate has increased slightly from 3.2% in 2010 to 4.3 % in 2014. The trends of selected TB/HIV data registered from 2010–2014 are presented in Table 9.

Table 9. Trend of selected TB/HIV information (civilian sector),
2010–2014

	2010	2011	2012	2013	2014
Total number of PLHIV registered at AIDS centres	10 057	11 369	12 279	14 742	16 318
Total number of TB/HIV cases	807	983	1 316	803	875
Number of new TB cases among PLHIV detected during the year	503	573	667	281	267
Total number of TB cases (civilian sector)	24 847	23 076	21 676	21 396	20 308
TB/HIV prevalence (%)	3.2	4.3	6.1	3.8	4.3

Source: Republican AIDS Centre, 2015.

Treatment outcome-monitoring

Treatment outcomes do not reach expected international goals. Successful treatment of sputum-positive pulmonary TB was reported in 61.4% of new and 53.4% of previously treated cases in 2013. The proportion reported as “treatment failure” and “transferred out” was very low for both new and previously treated cases. The percentage transferred for treatment into Category IV (as M/XDR-TB), however, was very high (29.1% of new cases and 32.2% of previously treated). This observation requires further study. Treatment outcomes of bacteriologically confirmed cases of pulmonary TB are shown in Table 10 and of the MDR-TB cohort registered in 2012 in Table 11.

Table 10. Treatment outcome-monitoring of new and previously treated bacteriologically confirmed pulmonary TB cases in 2013

Treatment category	Success	Died	Failure	Default	Transfer out	Transfer to Category IV	Total
New SS ⁺ ^a cases	2 201	124	133	54	28	1 043	3 586
%	61.4	3.5	3.7	1.5	0.8	29.1	100.0
Previously treated TB cases	3 594	522	148	217	711	2 181	6 764
%	53.4	7.7	2.2	3.3	1.1	32.2	100.0

^a SS⁺ = sputum-smear positive.

Source: provided by NCTP, 2015.

Table 11. Treatment outcomes of MDR-TB cohort registered in 2012

Category of patients	No.	Success		Defaulted		Failed		Died		Transfer out		Still on treatment	
		Total	%	Total	%	Total	%	Total	%	Total	%	Total	%
New pulmonary TB	1 699	1 404	82.6	109	6.4	58	3.4	84	4.9	36	2.1	8	0.5
Other	4 314	2 985	69.2	332	7.7	377	8.7	448	10.4	100	2.3	72	1.7

Source: provided by NTP, 2015.

3. Structure of specialized TB services

The Ministry of Health and Social Development (MHSD) has overall responsibility for TB control in the country. The implementation of TB activities is coordinated by the NTP Central Unit, represented by the NCTP. The NCTP is also responsible for the coordination and collaboration of responsible government entities, NGOs and international partners. The regions have a certain degree of autonomy, so many TB control aspects depend on local government (akimats).

TB control in the country is organized through a vertical system, with the NCTP at national level and a network of TB facilities at oblast and rayon levels. TB dispensaries at rayon level form the basic management units of TB care and control. They are closely interlinked with primary health care (PHC) services, or polyclinics. At regional level, TB managers actively involve PHC services, which are part of the TB control programme.

TB dispensaries are responsible for diagnosing TB patients and organizing patient referral to TB hospitals for treatment, ensuring follow-up and ambulatory care. TB dispensaries at rayon level are also the basic recording and reporting units and regularly report cases and treatment outcomes to dispensaries at oblast level, which act as supervising units. The numbers and types of specialized TB institutions in Kazakhstan are presented in Table 12. A decrease in TB institutions (especially in the number of TB hospitals) has been noticed during the last three years, from 309 in 2011 to 276 in 2015.

Table 12. Number and type of specialized TB institutions, 2011–2014

Type	2011	2012	2013	2014
TB dispensary	65	64	63	60
TB hospital	61	57	47	40
TB departments in general health facilities	6	4	9	14
Total: TB inpatient institutions	132	125	119	114
TB consulting offices	147	146	145	135
TB sanatoria	30	30	26	27
Total: all TB institutions	309	301	290	276

Source: information provided by NTP, 2015.

The institutions responsible for TB control at national level are well aware of the high capacity of TB beds in the country and the need for them to be reduced and used more efficiently. According to NTP data, the number of TB beds reduced by 2708 between 2011 and 2014, by a further 788 in 2014 and again by 795 in the first nine months of 2015. At present, there are 11 060 specialized TB hospital beds. Overall bed capacity in TB facilities has decreased by 6–7% annually since 2011. A detailed profile of TB beds is shown in Table 13.

Due to the increased incidence of M/XDR-TB, the number of beds for these patients increased from 2725 in 2011 to 3423 in 2014. According to Prikaz No. 19 (issued by the MHSD in August 2014) (2), there is ongoing reorganization of TB hospitals/departments in several oblasts to differentiate between categories of patients, such as sputum-smear-positive and sputum-smear-negative patients, or patients with sensitive strains of TB from MDR-TB cases. Treatment facilities for palliative care and mandatory treatment exist in every oblast. The further optimization of hospital care for TB patients is a priority and will be based on the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020* (3).

Table 13. Number of TB hospital beds by profile, 2011–2014

	2011	2012	2013	2014	Change 2011–2014
Total number of TB hospital beds	13 768	12 751	11 848	11 060	–2 708
- e.g. for adults	12 678	11 716	10 900	10 230	– 2 448
- e.g. for children	1 090	1 035	970	830	– 260
- e.g. for MDR-TB	2 725	2 792	3 292	3 423	+ 698
- e.g. for coercive treatment	610	550	555	537	– 73
- e.g. for symptomatic treatment of chronic patients	800	755	665	458	– 170

Source: data provided by NTP.

In contrast to the declining number of TB hospitals, there are many sanatoria in the country. Sanatoria are present in most regions, except in north Kazakhstan oblasts and Astana city. They serve as medical, preventive and social care institutions for children after exposure to TB, children and adults with latent TB infection (LTBI) and convalescing children and adults after anti-TB treatment. Based on cost-effectiveness merits and in line with international experience, this large network of sanatoria should be reduced. Further negotiations involving MHSD, NCTP and oblast health administrations are needed to achieve this goal.

The duration of hospitalization for TB treatment in Kazakhstan is very long, and the bed occupancy rate has remained unchanged since 2012. The average length of stay for adults with pulmonary TB in 2014 was 103.4 days, an increase over 2013 and 2012 (96.7 and 101.5 days, respectively). Kyzylorda oblast was an exception, with the average length of stay decreasing from 127.5 to 97.6 days. The longest average hospital stay (201.7 days) was in Kostanay oblast. In most of the 14 oblasts, fewer than two TB cases per bed per year were accommodated, but it was fewer than three cases in Astana and Almaty.

MDR-TB

The 2012 WHO mission presented important and well defined recommendations for improving the management of MDR-TB that aimed to:

- prepare and finalize a comprehensive national MDR-TB response plan based on the consolidated action plan to prevent and combat M/XDR-TB in the European Region and in consultation with a range of stakeholders, including civil society organizations (CSOs), communities and patients;
- increase access to second-line treatment for all diagnosed MDR-TB patients in prisons;
- introduce and scale-up rapid molecular diagnostic testing for TB and MDR-TB (all MDR-TB suspects to be tested for MDR-TB by molecular tests by the end of 2013 in accordance with the consolidated action plan);
- develop criteria for hospitalization and discharge of TB and MDR-TB patients; and
- expand ambulatory care of patients (all sputum-smear-negative patients, including those with MDR-TB).

Achievements

Kazakhstan has made rapid improvements in its TB control activities in accordance with WHO recommendations, particularly in the last three years. Significant progress has been made in managing M/XDR-TB, increasing social support, improving infection control and prioritizing outpatient treatment, all achieved despite the high burden of disease and a complicated economic situation.

The following main achievements were identified.

- All main activities related to M/XDR-TB management were incorporated in the *Complex plan for tuberculosis control in Kazakhstan, 2014–2020 (3)*. Guidelines on the management of M/XDR-TB were prepared with assistance from WHO and the international organization Partners in Health (PiH), with technical and financial support provided by the United States Agency for International Development (USAID) TB Care I programme. The prikaz that regulates this plan was prepared and accepted.
- The Ministry of Internal Affairs (MIA) is fully supporting and extensively implementing DOTS-Plus (the directly observed short-course treatment strategy) in all penitentiary institutions. More patients are receiving second-line drugs: 920 cases of MDR-TB were treated with second-line drugs in 2013, versus 657 in 2012. All TB facilities in the penitentiary sector have access to second-line drugs and treatment coverage in prisons reached 85.8% in 2014.
- Four pilot regions started implementing rapid molecular testing in 2012. By 2014, Xpert machines were available in 23 regions and the Hain test in 12, covering most of the country. This facilitated rapid TB diagnosis and sensitivity testing in 99% of patients.
- Hospitalization and discharge criteria for patients with TB and M/XDR-TB were specified in Prikaz No. 19 (2).
- The number of patients receiving ambulatory treatment has increased (9.6% in the first nine months of 2015 versus 7.5% in all of 2013).

Background report

The Green Light Committee (GLC) approved treatment with second-line drugs for 380 MDR-TB patients in Almaty city for the first time in January 2007. Since then, the numbers of patients treated have increased considerably each year: by 2014, more than 7800 MDR-TB patients had started on treatment. Several GLC monitoring missions have been conducted subsequently to assess the epidemiological situation and support TB control activities in the country.

Kazakhstan was listed as one of the six early-applicant countries in the transition phase of the new funding model of the Global Fund to Fight AIDS, TB and Malaria (GFATM) in 2014. The process of developing the concept note to access the funding was finalized by the end of 2014. At the same time, two parallel processes were underway in Kazakhstan: a plan for reforming TB services in the civil and penitentiary sectors, and a plan to develop a new national TB strategy. As a result of complicated administrative and financial issues, the next GFATM grant (based on the concept note for 2015–2017) was suspended.

The Kazakhstan country coordination mechanism (CCM) decided in December 2014 to prolong the financial period for GFATM round 8 grant financial activities until 30 June 2015. This decision gave additional space for the TB programme at a time when the future of the project

was not clear. Representatives of the NCTP asserted that substantial financial support would be made available to cover possible financial gaps when the GFATM funding ended. In fact, CCM, together with representatives of GFATM, decided that the previous year's financial savings could be used to procure second-line drugs for 100 MDR-TB patients in the prison sector. Additionally, laboratory reagents and consumables for *Mycobacteria* growth indicator tubes (MGIT) and Hain test equipment for 22 laboratories were purchased to cover one year's requirements, increasing access to new rapid methods of diagnosis. Molecular methods Xpert MTB/RIF (23) and the Hain line-probe assay (12) for first- and second-line drugs became available in every oblast and in the NRL in Almaty. DST to first-line drugs is currently mandatory for all new and retreatment cases in the country. Coverage with DST in 2013 and 2014 was high and test results were available for all culture-confirmed new and retreatment cases of pulmonary TB.

Prior support from GFATM and increased national finances allowed Kazakhstan to quickly scale-up treatment for M/XDR-TB patients in civilian and prison settings. Government funding has been allocated to all M/XDR-TB patients since 2014. Treatment coverage with second-line drugs increased from 57.6% in 2009 to 99% in 2014 (Table 14). These findings were also included in the WHO global tuberculosis report 2015 (1) and are shown in Fig. 5.

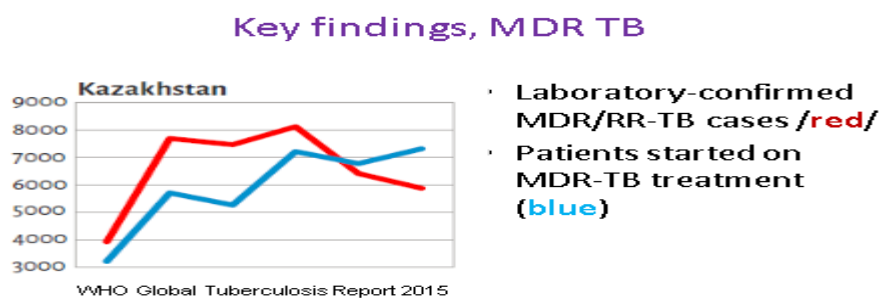
Table 14. Coverage of MDR-TB patients with second-line drug treatment, 2008–2013

	2009	2010	2011	2012	2013	2014	2015 (plan)	2016 (plan)
Total number of registered Category IV patients	7 579	8 634	7 690	8 458	7 737	7 398	6 962	6 719
Total patients on second-line treatment	4 366	5 219	5 565	7 353	7 729	7 321	5 664 ^a	
Coverage with second-line treatment (%)	57.6	60.4	75.3	86.9	99.9	99.0	81.4 ^a	

^a Enrolled for treatment during nine months of 2015.

Source: data provided by NTP, 2015.

Fig. 5. Laboratory-confirmed MDR-/rifampicin-resistant TB cases and patients started on treatment



The coverage of MDR-TB patients with the treatment has consistently increased. In 2014, this indicator reached to 99%- 7321 patients (2012- 85.7%- 7353 patients).

Source: WHO (1).

Reported treatment outcomes for the 2011 and 2012 patient cohorts showed an overall success rate of more than 70% (82% for new pulmonary cases). The proportion of cases lost to follow-up in the same period was 5–7%, with a failure rate of 4–8%.

MDR-TB care services are decentralized throughout the country and patients receive daily directly observed treatment (DOT). Each dispensary has a clinical review team to provide oversight of programmatic management of drug-resistant TB (PMDT) patient care. Rapid initiation of appropriate treatment for MDR-TB has been carried out in the vast majority of cases over the last two years, with each case being discussed in the Central Medical Consultative Committee (CVKK). Treatment of MDR-TB patients is standardized in each region in accordance with local or national guidelines. The main treatment regimen consists of six drugs: streptomycin (S) (or other injectable), levofloxacin (Lfx), ethionamide (Eto), cycloserine (Cs), para-aminosalicylic acid (PAS) and pyrazinamide (Z). For XDR-TB, capreomycin (CM), moxifloxacin (Mfx), Cs, PAS, clarithromycin (Cir) and amoxicillin (Amx) are used. The target is for all MDR-TB patients to be tested for second-line drugs to diagnose XDR-TB prior to the start of Category IV treatment.

Considering the high burden of TB in the country (more than 7000 new MDR-TB cases each year), the current treatment regimens need to be revised. Patients who fail MDR-TB therapy or have highly resistant forms of TB (that is, show additional resistance to fluoroquinolones and/or second-line injectables) currently have very limited therapeutic options. Kazakhstan is committed to introducing new drugs and treatment strategies to address these problems. Just before the country visit, the NCTP and PiH signed a memorandum for implementation of the End TB pilot project for 500 patients. This support will facilitate the establishment of a legal framework for introducing bedaquiline and other group 5 drugs under strict programme conditions.

Data systems need to be strengthened to facilitate the monitoring of treatment effectiveness. This requires the establishment of interim outcome criteria to allow more stringent evaluation of treatment outcomes. More robust data systems should also include the creation of an active pharmacovigilance (PV) component to strengthen treatment monitoring.

Important changes have been implemented since the 2012 mission to improve surveillance and monitoring. The use of either paper-based or electronic systems for recording and reporting varies at national level. At district level, only paper systems are used for registration and reporting, while a well-developed electronic database is in use in all oblasts and large municipalities.

The electronic centralized database system is managed at MHSD level (together with other registries) by the Republican Centre of Electronic Health Information (MHSD decree of 28 August 2015). TB surveillance is linked to a general database that allows browsing of records and generates standard reports. As of 2014, this database has had several modules/platforms to allow monitoring of key information throughout the treatment period. Data are entered at oblast and central levels. The electronic system includes information on treatment regimen, drug resistance, follow-up of DOT performance, laboratory monitoring, social support (such as sources of financial incentives, transport compensation and disability status) and a special information section concerning migrants, but none of the TB surveillance staff have administrative rights on the database.

It is expected that electronic systems will contain details on PV in future. The current structure for PV in Kazakhstan is passive and is based on spontaneous reporting. Severe or unresolved adverse events are reported to the PV centre in Almaty: a yellow card (No. 192-1/y, in accordance with MHS D decree No. 647 of 2009) is filled out and a copy sent to the PV centre. Information from these forms is stored electronically at the National Centre for Drug Expertise. Thanks to the pilot project on the use of new second-line TB drugs in 2016, plans are now in place to establish a regular system of monitoring with the support of PiH.

Preliminary preparations and training sessions were conducted in 2015, but regular capacity-building of medical personnel is essential to improving implementation of the new surveillance and registration systems and the proposed treatment strategy.

Observations

- The team noticed some inconsistencies between epidemiological data provided for the international database and data used for NTP analysis. This issue was addressed during discussions with NCTP and the WHO country office.
- The national budget has covered all needs for first- and second-line drugs and drugs for the management of side-effects since 2014. Additional allocations have been made at oblast level for TB services such as social support for patients. There has been no waiting list for MDR-TB treatment in either the civil or penitentiary sector since 2013.
- In 2014, 99% of the financial needs of the NTP were met by the government, including procurement of second-line and other drugs to manage adverse effects.
- MDR-TB departments and hospitals are separated from other treatment facilities and several of them are being reconstructed.
- Implementation of new molecular diagnostic methods has made rapid testing available. There are 23 Xpert machines and 12 pieces of Hain equipment in oblasts.
- Diagnosis and treatment of TB and MDR-TB accord with WHO recommendations and are based on Prikaz No. 19 (2), which also includes measures on restructuring TB services and prioritizing ambulatory treatment and care.
- Treatment coverage of rifampicin-resistant MDR-TB patients has increased consistently, reaching 99% of patients (7321) in 2014 compared to 85.7% in 2012.
- The latest treatment success rate for rifampicin-resistant/MDR-TB cases (2012 cohorts) is over 73% (1).
- Patient-centred approaches and social support services (including for patients with MDR-TB) have been implemented on a wide scale, although practice at oblast level may vary (a good example can be found in Kyzylorda oblast).
- Significant progress has been made in the management of M/XDR-TB, with a special focus on addressing social support and infection control, and prioritizing outpatient treatment.
- Kazakhstan is committed to addressing the XDR-TB issue and is at the forefront in countering the problem by introducing and regulating the use of third-line drugs. A memorandum between the NCTP and PiH on implementation of the End TB pilot project for 500 patients was signed for this purpose.

Challenges

Despite a good management strategy and strong political and financial support, the TB epidemiological situation continues to concern, given the high prevalence of drug-resistant cases (more than 7000 MDR-TB cases are registered annually). The following challenges in preventing and controlling drug-resistant strains remain.

- There is evidence of ongoing transmission of drug-resistant TB in the community.
- Surveillance systems need to be strengthened and should follow WHO criteria.
- Ambulatory treatment in PHC services is not functioning to its full potential. There is room for better planning and identification of acceptable motivation packages to increase cooperation with TB services.
- The average length of hospital stay for patients with susceptible and drug-resistant TB is too long.
- Rules for involuntary isolation and palliative care need to be more flexible.
- Criteria used to differentiate between categories of patients are unclear.
- Kazakhstan has been selected as one of the 16 End TB project countries in collaboration with PiH. The NCTP has had to fulfil all main organizational and patient-related criteria to implement the project since 2015.

Recommendations

- M/XDR-TB should be considered as a public health priority in Kazakhstan and additional prevention and combatting efforts should be made at the highest political level.
- NTP should update the reporting system for MDR-TB cases to accord with international standards. The same data format should be used for local programme and international purposes.
- The IT system needs to be strengthened. Patient registries should be complete and a master database created to cover the entire range of TB services and follow the patient pathway through the system to facilitate NCTP data collection.
- Oblasts should expand outpatient treatment services and review and optimize bed capacity based on regular monitoring of the epidemiology of TB in the country. Optimization plans should take account of efficiency and cost-effectiveness, as well as the risks of nosocomial transmission of TB.
- The current policy for involuntary isolation and treatment needs to be revised, balancing successful treatment outcomes with patients' human rights. Efforts to ensure compliance using patient-centred approaches, with special emphasis on vulnerable population groups at high risk of default, must be strengthened.
- NCTP should establish a system for active PV in the country.
- A comprehensive plan on the introduction and use of new third-line drugs (including bedaquiline) is needed.

TB in prison

The 2012 WHO mission review recommended that steps be taken to:

- improve access to treatment with second-line drugs for all patients diagnosed with MDR-TB in all settings, including XDR-TB patients;
- ensure universal coverage of DST first-line drugs for all patients with positive smear/TB culture; testing for second-line drugs should be given a high priority for all MDR-TB patients to detect XDR-TB strains and strains resistant to fluoroquinolones;
- resolve human-resource shortages and motivate all health care workers (HCWs) and other staff involved in the care of TB patients;
- address TB infection control in penitentiary institutions and take the following actions: ensure administrative separation by cases based on positive direct sputum microscopy and culture results (and Diaskintest® where applicable); install a sufficient number of UV lamps; ensure individual protection for personnel (using respirators); and provide surgical masks for patients with positive sputum smear and culture;
- improve the system of pre- and post-discharge preparation of TB patients (with both sensitive and drug-resistant strains) and transfer out from prison to civilian TB services to ensure continuous therapy and observation; and
- review best practices from other countries and in Kazakh regions.

The following assessment of TB in prisons is based on relevant documents, discussions and information received from the head of the Medical Department of Health Committee of the MIA and NCTP representatives. Meetings were held at the WHO country office in Astana. No prison TB facilities were visited, which imposed limitations on the ability to perform a comprehensive assessment.

Achievements

TB control in prisons has seen some positive changes in recent years. Achievements include the following:

- a new five-year work plan was agreed and signed by the MHSD and MIA in December 2014;
- the total prison population and absolute number of TB cases in prisons have been decreasing steadily over the past five years;
- the civil sector is providing full laboratory services free of charge to prison hospitals, and Karaganda penitentiary hospital has its own bacteriological laboratory;
- the penitentiary committee is implementing PMDT in all penitentiary institutions and an increase in the number of cases treated with second-line drugs in prisons is noted: 920 patients were treated with second-line drugs in 2013 compared to 657 in 2012;
- all TB facilities in the penitentiary sector extensively use second-line drugs for MDR-TB patients, with treatment coverage reaching 85.8%; and
- a greater level of cooperation between civilian and prison health authorities has been observed since the last NTP review, and the management of TB among prisoners continues to improve.

Background report

TB control in the penitentiary system is implemented within the NTP. The Health Department of the Committee of Corrections in the MIA is responsible for the implementation of all health programmes, including TB. After the reorganization of TB services in 2014, prisoners with TB are now managed in five prison TB hospitals spread across four oblasts – Akmolinsk, South-Kazakhstan, North-Kazakhstan and Karaganda oblast, which has two hospitals. Each prison TB hospital covers on average 3–4 oblasts.

According to the most recent official data from 2012, the prison population amounts to 42 362 inmates. Total bed capacity for TB cases has decreased, currently totalling fewer than 1500. New legislation is expected to address the lack of medical personnel willing to work in the prison sector. There is also a plan to increase salaries and introduce other incentives to attract new staff members.

The penitentiary sector applied for financial support in line with Kazakhstan's health development plan for 2016–2020 to renovate its main TB facilities according to internationally accepted infection control measures, including ventilation systems (this was approved in 2015).

After a change in legislation in 2015, all TB patients released from prison who still need treatment should continue treatment in involuntary isolation. It is not clear whether this is obligatory for all released prisoners or only for those who are smear-positive. It has nevertheless been reported that the proportion of cases lost to follow-up has decreased considerably.

Some problems exist when patients are released from the pre-trial detention centre (SIZO). A mechanism has been established at oblast level to transfer patients released from prison to the civilian sector. The oblast TB Dispensary and Penitentiary Committee compares the list of released TB patients monthly. During the first nine months of 2015, 527 TB patients with unfinished therapy were released, 92.4% of whom were registered at the dispensary of their place of residence. Requests are forwarded to local MIA representatives to assist in searching for patients who fail to turn up.

The penitentiary sector is implementing extensively new treatment guidelines. Allocation of budgetary funds to cover all costs for first- and second-line drugs and for other drugs needed to manage side-effects has been sufficient since 2014. There is no waiting list for MDR and XDR - TB treatment. At present, 809 MDR-TB patients are in prison hospitals, 31 of whom have XDR-TB; of these, 709 are on second-line TB drugs and 68 are receiving palliative care.

The number of new MDR-TB cases in prisons seems to be on the increase (81 in 2012, 139 in 2013 and 152 in 2014). The proportion of new MDR-TB compared to sensitive cases has also increased (from 9.9% to 16.1% and 25% in the same years). These trends remain unexplained and more detailed analyses and data collection is required to clarify the situation.

It is estimated that 150 of a total of 1581 TB cases in prison are TB/HIV coinfecting. HIV testing is performed on all TB patients and antiretroviral therapy is available from oblast AIDS centres. No data were provided about treatment outcomes in this population.

Observations

- TB control in the prison sector has reported considerable progress since 2012.

- Although the total prison population and absolute number of TB cases have been decreasing steadily, the number of new MDR-TB cases has increased since 2010.
- TB control in prisons is receiving strong political support, with a new five-year work plan between MHSD and MIA being signed.
- As a result of the reorganization of TB services in 2014, the number of TB facilities has reduced from seven to five and management of TB is concentrated in only four oblasts. Bed capacity has also been reduced and is currently below 1500.
- Collaboration with the civil sector is improving continuously. The main problems are related to staff shortages and the increasing number of new MDR-TB cases.
- The penitentiary sector is actively involved in TB control. It is implementing new treatment guidelines and ensuring good treatment coverage despite increasing numbers of cases with drug-resistant strains. In 2013, 920 patients were treated with second-line drugs, versus 657 in 2012. Treatment coverage was 85.8% in 2014.
- Dedicated funding for drug procurement of first- and second-line drugs is available through the national budget and GFATM and there is no waiting list for XDR-TB treatment.
- TB services in the sector are being strengthened within the frame of Kazakhstan's health development plan for 2016–2020. Buildings are being renovated according to internationally accepted infection control standards and a new platform for online registration and surveillance in line with the civil sector database has been established.
- A lack of medical staff was apparent. Measures are being taken to address this shortcoming and increase service providers' motivation.
- Some areas of data collection and performance indicators may not be easy to access. The lack of information provided to the evaluation team about the most recent baseline total prison population and treatment outcomes for XDR-TB patients was noted.

Challenges

- Although there is an overall decrease in TB cases in prisons, the number of new MDR-TB cases is increasing.
- There is still a shortage of medical personnel working in the prison sector.
- The current management and follow-up system for patients released from SIZO has still not reached expected levels.

Recommendations

- Collaboration with NGOs supporting TB patients released from prison in areas such as providing counselling, psychological support and social support should be scaled-up.
- Current legislation on involuntary isolation for patients released from prison needs to be revised to take human rights issues into consideration.
- Underlying causes for the increasing number of new MDR-TB cases in prisons in recent years need to be identified and addressed.

- The system of pre- and post-release of all patients from prison to civilian TB services should be strengthened to ensure compliance with treatment and adequate follow-up.

TB in children

The 2012 WHO mission review recommended that steps be taken to:

- finalize the revision of treatment and prophylaxis guidelines for TB in children according to WHO standards;
- update and retrain paediatricians working in TB, taking into account new medical developments in the field;
- improve methods used for sample collection for bacteriological confirmation of TB in children and stop using throat swabs as a diagnostic tool; and
- revise criteria for hospitalization and length of stay in sanatoria.

Achievements

No marked changes have been seen in this area since the 2012 mission, but some achievements were noted:

- treatment of TB in children was revised according to WHO recommendations, approved in Prikaz No. 19 by the MHSD (2); and
- paediatricians working in PHC are receiving professional development training based on the amendments and recommendations of Prikaz No. 19.

Background report

This report will focus on bacilli Calmette-Guérin (BCG) vaccination and management and treatment policies in children.

BCG vaccination

There have been no changes in BCG vaccination policy since the 2012 mission. BCG vaccination is given at birth and revaccination occurs in the first year of primary school (age 6–7) if the child is tuberculin-negative by Mantoux testing. Annual coverage of neonates with BCG vaccination is over 97% and revaccination coverage is approximately 50%. WHO currently recommends that only newborn babies are eligible for BCG vaccination and that revaccination at any age is unnecessary.

Diagnosis of TB in children

Diagnosis of childhood TB is often based on clinical evaluation, a positive tuberculin test (TST) and a suggestive chest X-ray, often within the context of having known contact with an infectious TB case. Access to normal bacteriological methods of diagnosis, including smear, culture and DST, is available at all centres. Some facilities also have access to rapid molecular methods such as the Hain test and the GeneXpert MTB/RIF assays.

Most cases are detected through active case-finding (ACF) as part of mandatory TST screening and fluorography examination of risk groups, or following contact with an infectious TB case. The proportion of child TB cases with bacteriological confirmation of the disease is quite low: only 8.5% (17 of 200) of pulmonary TB (including primary complex) cases in children and 17.7% (85 of 480) in adolescents were documented as smear-positive in 2014.

Methods recommended for obtaining clinical specimens in children in Kazakhstan include sputum expectoration, sputum induction, gastric aspiration and bronchoalveolar lavage. Obtaining clinical specimens from children by using throat swabs is no longer recommended and was removed from national guidelines in 2014, but is still being used in practice. Methods for diagnosis of extrapulmonary TB (such as fine-needle aspirates, spinal puncture, plural puncture, computerized tomography scan and magnetic resonance tomography) are routinely available. Children with TB are routinely tested for HIV after receiving consent from their parents.

In 2014, 64% of all child cases (286 of 445) were diagnosed through TST screening and 74% of adolescents (403 of 547) through fluorography screening (Table 15). Contact investigation in households of adult infectious cases is done routinely. Data show that 37 child cases (8.3%) and 20 adolescent (3.7%) were found through contact investigations in 2014.

Table 15. TB case-finding among children and adolescents by method of diagnosis, 2012–2014

	2012		2013		2014	
	Children	Adolescents	Children	Adolescents	Children	Adolescents
TST screening	403	0	401	0	286	0
Fluorography screening	0	523	0	370	0	403
Detected by symptoms (passive case-finding)	175	162	32	120	158	144

Source: data provided by NCTP statistics, 2015.

The following criteria have been set (2) to assist paediatricians and family doctors to identify children and adolescents who are at high risk of TB. These include those who:

- are socially disadvantaged (low-income families with many children or parents who are ex-prisoners, have alcohol or drug addictions, have HIV infection, have no permanent place of residence or are migrants);
- have been receiving treatment for prolonged cough (more than two weeks) and have other constitutional symptoms (low-grade fever, sweating, loss of appetite and weight loss, irritability, lethargy);
- are registered at the paediatrics dispensary for various diseases;
- are students in a closed education institution (boarding schools, special schools for disabled children or those who have been involved in delinquent behaviour);
- are unvaccinated or have no adequate BCG post-vaccine scar; and
- are receiving immunosuppressive therapy (corticosteroid, immunosuppressant, cytostatic or biological agents).

All adolescents aged 15–17 belong to the risk group that is subject to mandatory annual fluorography (2).

Within the framework of the comprehensive plan to improve the diagnosis of TB in children and adolescents in all regional TB dispensaries, a new skin test, Diaskintest®, was introduced in 2014 as a diagnostic means of detecting *Mycobacterium tuberculosis* infection. According to the manufacturer, the test does not crossreact with past BCG vaccination. It is noted that Prikaz No. 19 (2) recommends that the test should be applied to children with newly positive TST reaction to differentiate infection with *M. tuberculosis* from post-BCG reaction and select children for chemoprophylaxis. There are no plans to use Diaskintest® for general screening purposes.

Treatment and care

Sections on childhood TB are included in the most recent national TB and MDR-TB guidelines (2). Childhood TB treatment regimens and preventive treatment regimens follow WHO guidelines. Current daily drug doses used are as follows: isoniazid – 10 mg/kg body weight (10–15 kg); rifampicin – 15 mg/kg (10–20 kg); pyrazinamide – 35 mg/kg (30–40 kg); and ethambutol – 20 mg/kg (15–25 kg). Second-line drug treatment has been available for children and adolescents with drug-resistant TB since 2000.

Paediatric anti-TB drug formulations, including fixed-dose combinations, are available in the country, but as there is no procurement mechanism available for paediatric anti-TB drugs from the national budget, all paediatric formulations are obtained through donations.

Hospital treatment of children with TB requires special attention. Criteria for hospitalization are still unclear, resulting in lengthy stays in departments, sanatoria and specialized kindergartens. Hospital capacity has been decreasing in recent years, but the number of cases per bed per year remains practically unchanged. A total of 445 new paediatric TB cases were identified in 2014: with the number of paediatric TB beds countrywide being 830, this means a ratio of just 0.54 cases per bed per year (down from 0.65 in 2009 and 0.60 in 2010).

The length of hospital stay for children is extremely long and has not changed. Average length of hospitalization for paediatric cases across the country in 2014 was 180.2 days, which is similar to 2013 (172.4) and 2012 (182.2). Children in hospital are separated by sputum status and drug-resistance profile. They are also placed in specific hospitals according to age or availability of day-care worker and educational support on site.

After treatment in hospital, many children are sent to sanatoria (Kazakhstan has 3226 places in 140 children's TB sanatoria-type institutions). Some children do not receive treatment in the sanatorium but are placed there for social reasons. It is common practice to provide full isoniazid preventive therapy (IPT) for children in sanatoria. Those who are contacts may also be sent to special kindergartens (a total of 3300 places), where the length of stay is on average three months. It is noted that the number of sanatoria and special kindergartens has been increasing in recent years (Table 16).

These practices may have a negative psychosocial impact on children, contribute to social stigma and increase the risk of reinfection. The issue was raised by the members of the mission with a number of NCTP representatives: they did not agree with this view, citing special needs of children who are on treatment and resistance to changing current practice. Excessive TB hospital capacity was also mentioned during discussions in Kyzylorda oblast.

Table 16. Health institutions by sanatorium type, 2012–2014

Country/oblasts	2014				2013				2012			
	Kindergarten		Sanatorium groups		Kindergarten		Sanatorium groups		Kindergarten		Sanatorium groups	
	No.	Places	No.	Places	No.	Places	No.	Places	No.	Places	No.	Places
Kazakhstan	69	7 380	140	3 226	73	7 300	138	2 946	70	7 115	135	2 837
Akmola	1	35	41	791	1	35	41	786	1	35	41	786
Aktyubinsk	6	315	7	157	5	310	9	152	5	310	9	167
Almaty	2	120	7	190	7	185	2	120	7	185	2	120
Atirau	10	685	3	80	10	685	3	80	10	685	3	80
East-Kazakhstan	4	560	3	60	4	560	2	40	4	560	1	20
Dzhambul	3	370	10	245	3	370	13	300	2	320	13	325
West-Kazakhstan	1	160	3	70	1	160	3	70	1	160	3	70
Karaganda	2	265	4	100	2	265	4	100	2	265	4	100
Kyzylorda	14	1 660	0	0	14	1 660	0	0	14	1 600	0	0
Kostanai	1	100	13	265	1	100	13	265	1	100	14	257
Magistau	8	885	3	70	7	810	3	70	7	810	2	44
Pavlodar	5	840	19	308	5	840	19	313	5	840	19	313
North-Kazakhstan	0	0	13	325	0	0	13	325	0	0	11	280
South-Kazakhstan	3	310	13	390	4	255	13	325	2	180	13	275
Almaty city	7	715	1	175	7	745	0	0	7	745	0	0
Astana city	2	360	0	0	2	320	0	0	2	320	0	0

Source: data provided by NCTP, 2015.

Observations

- Coverage of BCG vaccination at birth is very high and a second vaccination continues to be given to tuberculin-negative primary-school children.
- The new Diaskintest® has been introduced.
- The proportion of bacteriologically confirmed childhood TB cases is very low due to difficulties in obtaining clinical samples in children.
- High-risk groups for TB among children have been identified.
- Children and adolescents are often hospitalized for up to the full duration of treatment. This practice may have social and psychological implications, but there is some hesitancy to adopt less rigorous criteria for hospitalization in this age group.
- The availability of paediatric formulations is still dependent on donations.

Challenges

- Despite the decrease in overall TB notification rates among children and adolescents, rates of MDR-TB increased almost threefold among children (from 0.3 per 100 000 in 2006 to 0.8 in 2014) and sixfold in adolescents (from 2.9 per 100 000 in 2006 to 17.8 in 2014). This implies spread of MDR-TB infection in the community.
- There is strong reluctance among TB professionals to reduce hospital stays of children.
- Paediatric formulations of anti-TB drugs are not registered in Kazakhstan, so are currently available only from donations.

Recommendations

The following are recommended to the MHSD and NCTP.

- The criteria for hospitalization of children need to be reviewed with the aim of reducing hospital stays in accordance with WHO recommendations. Ambulatory treatment services for children also need to be expanded (in compliance with, for example, legislation and school education).
- Routine admission of children with LTBI and non-infectious TB to sanatoria must stop. Alternative methods of social support to the family through community and outreach workers should be explored.
- Specimen collection for increasing bacteriological confirmation of TB and DST in children is difficult, but needs to be improved. The throat-swab method should be abolished.
- Access to rapid molecular diagnostics for TB and drug resistance must be available to all paediatric cases.
- Revised guidelines for treatment and prophylaxis of TB in children from Prikaz No. 19 (2) should be published as a separate booklet and disseminated to service providers.
- A more sustainable model for procuring paediatric anti-TB drug formulations using national resources needs to be adopted.
- BCG revaccination at primary schools should be discontinued.
- The list of procured TB drugs should be enlarged and formulations of TB drugs for children registered and procured.
- Child-friendly health education materials should be developed and awareness campaigns organized in schools to prevent and reduce social stigma.

HR for TB prevention, control and care

HR capacity was thoroughly assessed during the country review mission in 2012. The key recommendations were to:

- appoint a HR coordinator in NCTP;
- assess potential gaps in HR for TB control after 2014 (caused by education reforms and ageing of existing TB professionals) and develop measures to meet needs (by, for example, promoting TB as a specialty among interns, developing incentives for phthisiologists and combining TB and pulmonology specialties);
- assess and review the impact of existing performance-based payment arrangements; and
- integrate TB control training courses supported by the Netherlands Tuberculosis Foundation (KNCV), USAID and Project Hope in the national postgraduate medical education curriculum.

Achievements

The following achievements have been made in the area of HR for TB prevention, control and care:

- a national HR coordinator has been appointed;

- TB staff members demonstrated a good knowledge of TB control, national orders and guidelines, and showed enthusiasm for, and good compliance with, MHS orders and sanitary control recommendations;
- main national information materials and guides on TB control are available at all levels and are being used;
- intersectoral collaboration is good and TB specialists and TB paediatricians work several days per week in PHC polyclinics; and
- local governments in most oblasts have special programmes to improve M/XDR-TB management that include incentives for TB specialists and TB paediatricians.

Background report

The Kazakhstan health system has been subject to numerous reforms and transformations in recent years, including restructuring of financing for health care. Amendments in legislation and financing systems are expected to prepare the ground for the creation of a new TB control system as part of general health system reform. This reform is expected to reduce the number of TB hospital beds and expand outpatient treatment services for TB patients, including in PHC facilities.

TB control activities have been integrated within PHC services responsible for early TB detection and diagnosis, and providing DOT for TB patients. One of the key challenges for the NTP within the complex plan for TB control (3) is the fact that PHC physicians are not able to provide appropriate care to ambulatory TB patients due to a large patient load and inadequate training. Chemizators in PHC settings are solely responsible for supervising therapy and dealing with TB patients in general. Good intersectoral collaboration between PHC and TB dispensaries alleviates pressure on nursing staff, and TB specialists and paediatricians from TB dispensaries work several days per week in PHC polyclinics.

The working group established to deal with the reform of TB financing includes international experts. The following activities are planned within the framework of the complex plan for TB control (3):

- the legal status of TB facilities in the civilian sector will be gradually changed to that of companies holding economic control;
- a differentiated payroll system for TB facility staff will be developed and implemented;
- a mechanism for improving performance-assessment of PHC staff in TB prevention will be developed;
- the financing mechanism for TB facilities to expand outpatient TB care, including for drug-resistant forms, will be improved;
- the improved model of case-based financing of TB and M/XDR-TB diagnostics and treatment in hospital settings will be implemented gradually;
- mechanisms for reallocation of released funds due to optimization of beds in TB facilities will be introduced to support new models of TB treatment and prevention; and
- psychosocial assistance to patients in outpatient care and financial incentives for phthisiologists will be provided.

A key recommendation of the 2012 TB review mission, to apply a case-based tariff system for reimbursement of TB special services by the end of 2015, has not yet been implemented. The system is still under development.

The NCTP is the leading national TB institution providing supervision, education, research, treatment, and diagnostic, consultative and highly specialized TB medical care. The NCTP assigned a human resources focal point for its staff at the end of 2015. Prior to this, there was no focal point or department in the NTP responsible for planning or monitoring HR for TB control. Overall responsibility for HR development for TB control in the NTP lay with the NCTP director, but the post of national HR coordinator was created in the third quarter of 2015. A database of technical HR points in each TB institution and detailed HR information is kept in the central electronic register for HR for health, which includes detailed information on each medical worker's training and qualifications and any training they are due to receive.

The medical education system has been reformed since 2012 in accordance with the Bologna process, and specialization in TB now requires a two-year residency. Retraining of physicians from other specialties is not allowed. In line with the complex plan for TB control (3), regular training opportunities are organized for health professionals working in TB facilities, including PHC settings, consumer rights protection institutions (formerly known as the Sanitary Epidemiological Service (SES)), the Correctional System Committee of the MIA and the National Centre for AIDS. Areas covered include MDR-TB, infection control, TB/HIV management, monitoring and evaluation (M&E), record-keeping and registration of TB patients. Over 18 000 professionals have attended training in the last two years.

Training using developed modules is provided at the NCTP, as well as phthisiology-related field visits. Kazakh Medical University of Continuing Education and postgraduate departments of medical universities deal with postgraduate medical education. A workshop on paediatric TB was held for the first time in Kazakhstan in 2013 with KNCV support, with directors of paediatric departments in oblast TB facilities and doctors from paediatric TB sanatoria invited to attend. WHO regional training on TB drugs estimation and needs was delivered for six Commonwealth of Independent States countries (including Kazakhstan). KNCV has now completed its operations in Kazakhstan and Project Hope does not provide training for HCWs.

Within the framework of the complex plan for TB control (3) and in accordance with the legal mandate, a roundtable meeting was held in 2015 to discuss and clarify TB policy documents issued by the MHSD during 2014 and 2015. Around 100 key people, including health managers from TB services, regional PHC personnel and international representatives involved in the implementation of TB control activities, took part.

Based on information gained from the NCTP, 5148 professionals from PHC centres, the prison sector, the MIA and AIDS centres were trained on topical TB issues in 2015.

Staffing levels are defined in MHSD decree No. 218 of 2011. This determines standard norms for hospitals (according to the number of beds) and outpatient TB facilities (per 10 000 population). Overall, the staffing rate in 2014 was 91.1% for phthisiologists and 92.8% for bacteriologists.

HR analysis was undertaken and HR supply activities were incorporated in the complex plan for TB control (3). Each oblast developed strategic plans for development of the health sector during 2011–2015 and projected needs until 2020, with TB control as one of the top priorities. The high

burden of M/XDR-TB is recognized and local governments of most oblasts (akimats) have special programmes to improve M/XDR-TB management. Special attention was given to incentivize personnel working with XDR-TB patients and ensure adherence to TB therapy, especially in outpatient settings. Medical staff in hospitals treating M/XDR-TB patients receive 220% of the basic salary and those in other TB facilities 190%. All TB doctors get 42 days paid annual leave per year, with health benefits during their vacation. To attract young specialists to rayon TB facilities, each specialist receives a relocation financial grant and rent-free accommodation.

HR levels in most medical institutions appear to be stable and at satisfactory levels. Staff turnover is low and is not considered to be a problem. Incentives from central and oblast levels for rural and remote areas and the decrease in hospital beds mean there is currently no significant HR gap. There is, however, a lack of young doctors willing to specialize in the field. Reasons vary and may include low salary, low prestige of the speciality among peers, fear of nosocomial infection and logistical problems. On the other hand, there is a high turnover of laboratory staff and insufficient numbers of specialist microbiologists. This needs to be addressed by developing other incentive schemes.

Observations

- Ongoing health care reform is laying the ground for a revised TB control system that will gradually shift the care of TB patients to outpatient services whenever possible.
- Professional development and retraining at various levels to cover all new challenges and advances in the area is being prioritized.
- HR in medical institutions is stable, but young doctors and medical laboratory staff are not showing enthusiasm to work in this field.

Challenges

- Insufficient numbers of young doctors are showing interest in specializing in this field. Factors leading to their reluctance are still not fully understood.
- Turnover of laboratory staff is high and numbers of bacteriologists and other laboratory specialists are insufficient.
- The new case-based tariff system for the reimbursement of TB special services has not yet been launched. The reasons for delay should be overcome.

Recommendations

The following are recommended to the MHSD, NCTP and oblast health facilities.

- Potential gaps in HR for TB control services (caused by retirement of TB professionals) should be further assessed in coming years and measures to meet needs, such as promoting TB control among interns and combining TB and respiratory medicine specialties, further developed.
- An incentive scheme for laboratory staff should be developed to decrease turnover and reduce the deficit of specialists. The current downward trend needs to be reversed.

- Development and implementation of the case-based tariff system for reimbursement of TB special services should be completed.

Contact-tracing

The key recommendations from the 2012 review in relation to contact-tracing were to:

- update current contact investigation (CI) procedures and develop screening algorithms based on index-case infectiousness and risk of transmission for contacts;
- identify staff responsible for CI, update job descriptions and provide training in CI;
- include CI fields in surveillance and case-management modules of the TB register data systems and link to index cases;
- regularly review the yield of CIs and identify areas for improvement; and
- discontinue routine comprehensive disinfection of homes of index cases.

Achievements

Based on recommendations for examination of contacts made in 2012, several important positive changes and achievements were observed.

- CI procedures were included in the national complex plan for TB control (3). The key purpose of CI is to diagnose patients at early stages and to identify people, especially children, with LTBI.
- Two new orders, prikazes 19 (2) and 194 (4), regulate investigation of contacts and other risk groups. They cover the organization of sanitary preventive measures in infectious cases, implementation of preventive measures among risk groups and identification of HCWs responsible for carrying out contact-tracing at different levels using set terms of referral.

Background report

The policy of active contact-screening has not changed significantly in the past three years. Some data related to TB contact examinations among adults, adolescents and children are available in M&E reports at national, oblast and regional levels but information on the contribution of routine CIs for early TB case-detection is scarce.

Contact screening is performed among individuals who are close and casual contacts of TB patients. On average, 5–7 contacts are examined per index case, but the number may be much higher in certain cases and can include extended-family, neighbourhood, workplace and school contacts.

A significant number of children and adolescents are discovered by ACF. In 2014, 64% of all TB and LTBI in children was identified by CI, mainly through TST/Diaskintest®, and 74% of adolescents by abnormal fluorography. In the same year, 31 501 child and 3403 adolescent contacts were examined. According to national statistics, active disease was found in 37 children (0.12%) and 20 adolescents (0.59%).

In lieu of national guidelines for TB contact-tracing procedures, prikazes 19 (2) and 194 (4) were followed in the health care facilities visited. The results of contact-tracing for 2012 to 2014 in Kazakhstan and Kyzylorda oblast are presented in Table 17.

Table 17. Number of contacts identified and TB patients

Year	Kazakhstan			Kyzylorda oblast		
	TB contacts identified	TB patients	TB per 1 000 examinations	TB contacts identified	TB patients	TB per 1 000 examinations
2012	65 087	156 (0.23%)	2.40	7 384	13 (0.18%)	1.76
2013	67 125	77 (0.11%)	1.15	6 554	25 (0.38%)	3.81

Source: data provided by NTP, 2015.

The evaluation team was informed that CI commences within five days of a patient being diagnosed and registered as having active TB (including cases with extrapulmonary forms). An epidemiologist from the local SES is joined by a specialist from the TB dispensary and both visit patients' homes to perform an epidemiological assessment (TB form 176/y). All family contacts from the previous four months are listed. The occupation of the index case is noted and the extent of tracing work contacts is determined. This can include co-workers, employees and students in schools or institutions. Any work with cattle is identified. All contacts are examined in PHC centres at a location close to their homes.

After the initial examination, follow-up takes place in nearby TB facilities. A nurse from the nearest TB facility is assigned to work with the family, with special attention given to children, adolescents and pregnant women.

Procedures for screening and assessing TB contacts are clearly defined and algorithms (developed predominantly to detect pulmonary TB) are available. Systematic screening of contacts of infectious index cases consists of a combination of two screening tests (TST and chest X-ray for children, and fluorography for adolescents and adults) and bacteriological diagnostic tests (smear, GeneXpert MTB/RIF, culture followed by DST) when indicated. A clinical assessment is made, taking into account results of chest radiography, microbiological sputum testing and positive TST or Diaskintest®, indicating LTBI (especially in children). The health system has sufficient capacity to ensure that all suspected cases identified by screening can have the necessary microbiological tests.

Information systems exist at national, oblast and regional levels and can be used to monitor and evaluate CI activities. Insufficient information is available for accurate assessment of the total number of active TB cases diagnosed among contacts and to differentiate results from screening of close and causal contacts. Indicators are routinely used to monitor and evaluate CI activities and include the total number of contacts investigated by age group (adults, children and adolescents), the number of contacts found to have positive smears and cultures, and the number of contacts of MDR-TB index patients.

An analysis of the results of active case-screening among risk groups (without stratification) by fluorography was conducted at PHC facilities in the first nine months of 2015. This covered 6 689 004 people in 2015 (6 498 734 were screened in 2014), with 5948 (0.09%) TB patients being identified. There is no information about the number of TB patients belonging to different risk groups (including contacts).

Contact-tracing for TB is not conducted on the so-called stone-in-the-pond principle, which logically serves to identify (temporally and spatially) circles of contacts in decreasing proximity to the index case. According to national representatives, all identified TB contacts should be

examined for TB. Screening procedures vary according to age group (children, adolescent or adults). All contacts diagnosed with active TB or LTBI (children and adolescents) are expected to start treatment, but there are no official indicators to report on this activity.

Diagnosis of LTBI is part of CI screening, especially in children and adolescents. Diaskintest® was recently introduced through Prikaz No. 19 (2) and is widely used. Diaskintest® is used only in children with newly diagnosed positive hypersensitivity reaction to Mantoux 2 TU to differentiate between post-BCG vaccine-induced sensitivity and LTBI. Children with a positive reaction on Diaskintest® are referred for preventive treatment. In a recently conducted study among 49 929 children with positive tuberculin (Mantoux) test, 16 420 (33.7%) were examined by Diaskintest® and a positive reaction was found in 18 (3%). In another (currently unpublished) study of children and adolescents who had TB confirmed by GeneXpert MTB/RIF, BACTEC or positive smear, 20.5% of cases were negative on Diaskintest®.

The Diaskintest® has been routinely used in Astana city since November 2014. For the first nine months of 2015, 8591 tests were administered and 358 children with a positive result were referred for preventive treatment for LTBI. According to instructions set out in Prikaz No. 19 (2), the test is used only in children with positive Mantoux 2 TU to:

- identify TB infection
- differentiate TB from environmental *Mycobacterial* exposure
- differentiate post-infectious from post-vaccination hypersensitivity
- determine the activity of TB.

There seem to be some inconsistencies in the testing of TB contacts of internal and external migrants.

Observations

- Active contact-screening is ongoing and has not changed over the past three years. Prikazes 19 (2) and 194 (4) have further consolidated and harmonized this activity.
- The actual number of contacts screened per case is probably much higher than the reported average of 5–7.
- Reports from 2014 show that active disease was found in 0.12% of child contacts and 0.59% of adolescents.
- The health system has sufficient capacity to perform contact-tracing and include rapid microbiological testing when necessary.
- The Diaskintest® has been adopted as a screening test for LTBI in children.
- Contact examination procedures may not ensure the confidentiality of patients and their families, resulting in social stigma and fear of the disease.

Challenges

- The national policy on active TB contact-screening does not distinguish between or prioritize risk groups. Contacts such as close family, prisoners and people with HIV/AIDS are not differentiated. Some aspects do not meet international practice and standards.

- Definitions of infectious index cases and contacts are not standardized. No difference is made between close and casual contacts, and no difference in priority is given to contacts of sputum-positive and sputum-negative index sources. Risk groups are not clearly defined.
- Insufficient indicators for performance monitoring of CI activities are reported and data and analysis regarding yield from investigations of TB contacts are lacking.
- Routine analysis at national and oblast levels of data from TB contact-screening (close and causal) is insufficient.

Recommendations

The following are recommended to the NCTP and consumer rights protection agencies.

- Policy documents on CI and ACF should be revised. A national policy document should be prepared to guide NTP staff to establish strategies for sound TB CI practices among risk groups.
- Guidelines on ACF based on international standards should be prepared, prioritizing close contacts (such as families, prisoners and people with HIV/AIDS). Preparation activities for this should be made in 2016 with completion at the end of 2017.
- Essential changes in the system of investigation of TB contacts and risk groups are required to achieve a more efficient, effective and rational approach to TB control.
- CI, yield and analysis of the effectiveness of ACF among close (household) and occasional contacts should be reviewed annually.
- The contact list should be stratified, with contacts grouped according to the so-called stone-in-the-pond principle (that is, household contacts and different levels of casual contacts based on the extent of contact forming widening circles around the index case). Stratification should be predetermined to at least three levels before contact screening is commenced.
- The need for new indicators as part of standardized M&E checklists should be considered. The following indicators should be considered for CI and targeted risk groups:
 - the number of people eligible for screening
 - the proportion of those eligible for screening who were screened
 - the number of people with suspected TB who were identified
 - the number of people undergoing diagnostic investigation
 - the number of people diagnosed with TB and classified by type of disease
 - the number needed to screen to detect one case of TB.
- Additional disaggregation of data may be achieved by, for example, close or casual contact and different risk groups. This requires more detailed data collection on each individual screened and an improved user-friendly database.
- M&E of contact-tracing examinations should be a routine part of regular M&E. Detailed analysis of contact investigations is needed in terms of the characteristics of the index case (differences between close (family, prison, hospital) and casual contacts (work, schools, neighbours, relatives)).

- Possible topics for further study on CIs at national level of TB care could include:
 - investigating contacts of smear-positive index patients (TB/MDR or XDR-TB) and the prevalence of TB cases and LTBI;
 - investigating contacts of index patients with known TB/HIV to study the prevalence of TB and prevalence of LTBI;
 - avoiding the use of Diaskintest® to diagnose active TB (see Prikaz No. 19, point 100 (2) – this statement should be revised by the NCTP);
 - contact-tracing in congregate settings (such as prisons) or among only casual contacts; and
 - preparing instructions on contact-tracing among migrants, particularly labour migrants (this should be done by the NCTP, working with Project HOPE and KNCV, and should be completed by the end of 2016).
- Detailed analysis of CI examinations (to determine, for instance, the ACF yield of TB and LTBI among close and causal contacts) should be conducted over six months to define the operational methodology and financial arrangement, with the aim of completion by the end of 2017.
- Attention should be paid to data confidentiality and the need to avoid discrimination against patients and their families, especially in the preparation of contact lists (home, workplace, schools and neighbourhoods) or during disinfections of patients' homes and veterinary control procedures (where cattle or pets are kept at home). Guidelines for maintaining confidentiality and sharing personal health information are available from other programmes. This should be achieved by the end of 2016.

Infection control

Recommendations in this area from the 2012 WHO mission were to:

- update the SES national regulations to provide greater emphasis on airborne transmission of TB and include special regulations for high-risk procedures;
- approve a national TB infection control working group, working plan and infection control guideline; and
- develop and update a monitoring mechanism of infection control measures at facility level, involving all responsible organizations within the working group.

Achievements

The NCTP has undertaken numerous activities over the last three years to implement the recommendations from the previous mission. The following are the key achievements.

- Significant improvements in, and implementation of, infection control measures, especially those relating to administration, have been seen. The national infection control plan and budget is part of the complex plan for TB control (3). Two policy documents targeting infection control (prikazes 19 (2) and 194 (4)) and national guidelines on infection control (5) have been approved by the MHSD.

- Infection control committees and focal points have been nominated at national, regional, oblast and health facility levels. TB infection control plans have been implemented at all levels of health care.
- The introduction of molecular rapid diagnostic tests has contributed to early diagnosis and effective management of TB patients. The number of cases with severe forms of TB shows a decreasing trend.
- Significant improvements have been achieved in implementation of measures for personal protection of TB infection among HCWs.

Background report

General information on infection control

An assigned team member visited TB dispensaries and polyclinics (see Annex 2) in Astana and Kyzylorda and found that all had infection control plans. In most cases, epidemiologists were appointed as the responsible officers in charge of infection control. Risk assessment methodologies and checklists for TB and other medical facilities on infection control were not apparent, even though the information is available in guidelines issued in 2014 through prikazes 19 (2) and 194 (4).

HCWs appear to be well trained in infection control procedures. The NCTP organizes annual five-day education and training opportunities for TB specialists, epidemiologists, paediatricians and other HCWs. The last training was held in Atirau in 2015. Shorter education sessions of a few hours are organized in all TB facilities and hospitals for nurses, technicians and other personnel. Topics include personal protective measures, patient education, triage of patients with cough and cough hygiene. Medical staff in TB institutions and polyclinics are well informed about the importance of procedures for infection control. Environmental TB infection control procedures (ventilation, ultraviolet germicidal irradiation (UVGI) lamps) and personal protection are followed by medical personnel.

Cooperation on patient flows and information-sharing exists between the two vertical programmes of TB and HIV/AIDS, but not enough is linked to infection control. This requires further investigation and discussion.

Environmental control measures

The visited polyclinics in Astana and Kyzylorda are part of a government project involving 100 schools and 100 polyclinics in trying to implement a triage system to identify and separate patients with cough and suspected cases of TB at reception. A new system for scheduling appointments with general or family physicians in the polyclinics with the aim of reducing waiting times commenced recently, but a similar system does not exist in TB dispensaries.

TB educational materials were available for patients in all visited institutions, but practical educational materials on cough hygiene were lacking.

Government allocations for capital investments in TB facilities in the first nine months of 2015 were approximately 253 659 800 tenge, with 78 344 000 tenge for maintenance.

Environmental infection control measures were not fully implemented in some of the TB facilities visited and insufficient information was available about the accuracy of ventilation and airflow dynamics (including frequency of exchanges of air). This is in contrast to the new

polyclinics, in which technical data about quality of mechanical ventilation exist and technical staff are nominated to maintain the system. Natural ventilation is regularly created in TB patients' rooms under nursing supervision, and patients on treatment are aware of the importance of daily natural ventilation where they live.

Based on information from the last national M&E by the NCTP in 2014, 46% (62/136) of TB inpatient units with high infection risk and 58% (15/26) of bacteriological laboratories were equipped with an effective mechanical ventilation system, as were 49% (167/339) of TB treatment rooms and 29% (9/31) of surgical departments. Deficiencies were observed in some of the TB facilities visited in that mechanical ventilation in gateways that should prevent air exchange between insulated rooms had not been installed.

High-efficiency particulate air (HEPA) filters were found only in TB laboratories, with a variety of systems in use. The air-purifier system Tion O2 was observed in the waiting area and treatment room in one TB hospital and other facilities also had irradiator recirculators [облучатель-рециркулятор медицинский] installed. These were operated by health staff during working hours only.

Open (unprotected) UVGI lamps were generally in use in all TB facilities, especially in areas with higher risk of transmission. UV lamps with protection were rarely available. Instructions on the safe use of UV lamps were in place and a nurse was responsible for checking the apparatus. Medical staff were fully aware on the dangers of UV and instructions stated that lamps must be replaced after 8000 hours of use. It was observed, however, that instructions on the maintenance and cleaning of UV lamps were not present in some facilities.

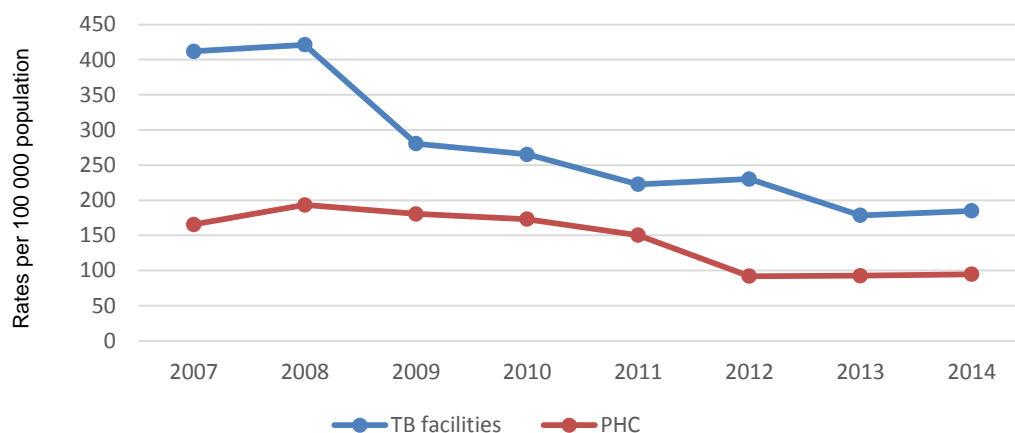
Certain practices ordered in the prikazes have no scientific evidence of their efficacy. Examples include the routine disinfection of patients' homes and ordinance for constructing a wall that is higher than 2.5 m around TB facilities.

Personal protective infection control measures for patients and staff

Personal protective infection control measures for patients and staff were implemented in all the health facilities visited. Different respirators (most of which correspond to FFP2 and FFP3 standards) were used by staff. The respiratory protection programme was based on written standards and procedures set in national guidelines for infection control, but some instructions on maintenance of respirators were lacking. In one TB facility, staff use of respirators was erratic, with respirators employed on only a few days in the week. Standardized procedures state when, how and on whom the fit test on respirator units should be performed. Fit testing was available in some institutions (such as the TB dispensary in Astana), but others still have to procure the test. Surgical masks were used by patients.

Data from the 2012 review mission show that TB was more commonly found among HCWs in prisons than in civilian health care institutions. The number of TB cases among HCWs has been stable in the last three years. Rates from general health facilities are similar to those of the general population at 92.0 per 100 000 population in 2012 and 94.7 per 100.000 in 2014 (Fig. 6 and Table 18).

Fig. 6. Rates of TB among HCWs providing services in TB and PHC facilities, 2007–2014



Source: data provided by NTP, 2015.

Table 18. Number of TB cases among employees in PHC and TB facilities, 2012–2014

Year	PHC settings			TB facilities		
	Number of employees	TB (new and previously treated)	Incidence per 100 000	Number of employees	TB (new and previously treated)	Incidence per 100 000
2012	202 229	186	92.0	17 804	41	230.3
2013	204 807	190	92.8	17 918	32	178.6
2014	204 857	194	94.7	18 388	34	184.9

Source: data provided by NTP, 2015.

TB rates among HCWs from TB facilities show variation across oblasts. The average number of TB cases is twice as high than in the general population (184.9 per 100 000 in 2014), showing that the risk of infection is highest among HCWs working in TB institutions (highest in East-Kazakhstan). This demands particular attention through a study investigating possible reasons for such high risk.

Observations

- Significant improvements have been seen in infection control measures against TB in Kazakhstan, supported by recent prikazes.
- Different infection control strategies have been adopted, including a range of modern personal protection interventions (especially for HCWs working with infectious patients and in laboratories) and environmental decontamination. Clinics serving the general population are introducing triage measures.
- HCWs receive workplace instruction on infection control systems, but usage and maintenance practices in some situations were erratic and incomplete.
- Some so-called traditional infection control measures, especially those related to patients' homes, need to be reconsidered as they are not based on scientific evidence.
- There is strong evidence that staff working in TB facilities have a higher rate of active disease than the general population. This implies transmission of infection is occurring in

health care settings. There is no information on the risk to other staff and HCWs working in prisons.

Challenges

- The ambitious and comprehensive infection control plan (part of the complex plan for TB control (3)) remains only partially implemented. Significant financial resources and investment (particularly for environmental infection control) is necessary to attain international standards.
- Existing differences and inconsistencies in documents now in force for sanitary instructions (SANPIN) need to be overcome. A single policy document with specific sanitary instructions should be prepared.

Recommendations

- Implementation of all measures of infection control related to the complex plan for TB control (3) should be routinely monitored at different levels of health care (an ongoing process).
- The methodology and checklist on risk assessment should be updated to comply with international standards (by the end of 2016).
- Existing systems of mechanical ventilation in TB institutions should be assessed at oblast and regional levels (by the end of 2016).
- A mid- to long-term (3–5 years) evidence-based investment plan should be prepared to improve the mechanical system of ventilation in TB health facilities. This should prioritize zones with the highest risk for TB transmission (such as laboratories, MDR-TB wards, sputum collection rooms and bronchoscopy departments) and mandate rational use of funds (from the beginning of 2017).
- Appropriate engineering controls and maintenance of mechanical ventilation and UVGI systems need to be put in place. In situations in which it is impossible to ensure proper maintenance, emphasis should be placed on use of natural ventilation (an ongoing process).
- Detailed specifications of the upper structures of UV lamps, UV radiation-measuring devices, respirators and test equipment should be developed and distributed to all specialized TB facilities (by the middle of 2016).
- The national commission on infection control should review and develop expert recommendations on the effectiveness and use of Tion O2 and recycling irradiators [облучатель-рециркулятор медицинский] in institutions with high risk of TB transmission (by the middle of 2016).
- Ineffective practices such as comprehensive disinfection of index cases' homes and veterinary control should be discontinued (by the end of 2016).
- SANPIN instructions (2,6) should be revised and adopted in accordance with international standards in terms of:
 - using UV lamps with protection instead of open UVGI lamps, following instructions for proper installation and maintenance;
 - stopping the practice of building high walls of 2.5 m around TB facilities;

- installing mechanical ventilation in the gateways of health facilities and providing air backup to prevent airflow between the insulated rooms; and
- providing written instructions on personal measures of protection (for HCWs and patients) and on routine maintenance of respirators in all TB facilities and PHC settings (by the middle of 2016).
- HCWs should be continuously aware of infection control measures when dealing with infectious patients or suspected cases. Continuing education and training should cover patient triage, rational patient flows, environmental control (directional air-flow, natural or mechanical) and appropriate use of personal protection devices.
- TB infection control in prisons should be strengthened using environmental and personal measures for protection, such as:
 - providing training for medical and non-medical personnel on infection control measures;
 - completing annual procurement plans for upper-level UVGI lamps for MDR-TB patient wards and areas at high risk of contamination;
 - ensuring a regular supply of personal protection measures for HCWs and other staff working in prisons; and
 - training prison administration staff and TB specialists in contemporary practices in TB infection control.

Community and advocacy, communication and social mobilization¹

This section reflects conversations with two international NGOs active in Kazakhstan (Project Hope and KNCV), one republican NGO (Youth for Healthy Lifestyle), and three CSOs active at oblast level (Nazim Shimkent, the Kyzylorda branch of Red Crescent and Belaya Romashka [White Daisy] Kyzylorda). Observations made during visits to health care facilities undertaken by the mission team are also taken into account.

As TB is often viewed as a disease of poverty and is surrounded by stigma, successful care and treatment requires more than medical attention. With a shift to ambulatory care and treatment lasting many months, patients need to be supported in the community. Community engagement and advocacy, communication and social mobilization (ACSM) were reviewed during the previous mission in 2012. Key recommendations were to:

- designate an ACSM post in the NTP team responsible for coordination of the new ACSM strategy in accordance with the national TB and drug-resistant TB plan and interact with various partners;
- adopt, allocate resources to and implement an ACSM strategy and relevant action plan;
- create peer-to-peer support groups and organize activities for inpatients and outpatients with the engagement of trained advisers and social workers; and

¹ The terms civil society organization (CSO) and nongovernmental organisation (NGO) are largely interchangeable, as both describe organizations that are neither governmental nor commercial. Here, international usage is followed, whereby NGO tends to be used for larger and international agencies and CSO for smaller, localized bodies. Following local practice, republican is used to denote national bodies or nationwide activity.

- support the creation of partnerships within the Kazakhstan national association Stop TB to improve collaboration in TB control, including with the private sector.

Achievements

Significant developments have been seen since the WHO mission in 2012. There is a desire to increase the involvement and contributions of NGOs and CSOs to supplement efforts to achieve the NTP at all levels. A number of international NGOs and local CSOs had some capacity to build community engagement in support of the NTP at the time of writing. The team saw good examples of a republican NGO and a local oblast CSO building TB awareness among the general public.

A national plan for ACSM activity was adopted in 2012. While the mission did not allow sufficient time to discuss it in detail with relevant NTP staff, the evaluation team saw good progress, such as oblast TB authorities offering training for Imams to enable them to speak about TB and a CSO providing a service in four oblasts linking prisons and relevant local health services to ensure continuation of treatment when prisoners with TB are released.

Advocacy and political commitment is strong at republican level. Policy discussions and links relating to TB continue through the consilium and various councils of the MHSD. Regular interdepartmental policy meetings on TB take place at oblast level, as recommended by the 2012 review.

Background report

Staff known as chemizators (DOT nurses) are based in polyclinics to provide and supervise patient medications. They have daily contact with patients and consequently are a powerful resource at primary care level for overall patient support. Chemizators and PHC nurses also have responsibility for following-up patients who are unable (or fail) to attend appointments.

A disability welfare allowance is paid to the parents of children with TB and patients with MDR-TB who are on treatment. The size of the allowance is determined at oblast level and appears to vary across the country. Political determination to ensure good TB care is further strengthened by a process through which any death due to TB in a pregnant woman or mother of young children is automatically subjected to a detailed investigation led by a legal officer reporting to a presidential commission. Such a process had recently been enacted in the oblast visited by the evaluation team.

The 2012 report recommended that household fumigation is unnecessary and should be stopped, as it increases the stigma of affected individuals and their families. This has not happened yet, although it is recognized that it may require legislative change as the practice is referred to in formal regulations (Prikaz No. 19 (2)). The 2012 report also encouraged the identification of so-called TB champions, well known public figures with personal experience of the disease, who would be willing to speak of their experience openly.

There appear to be no TB-specific CSOs. All those that work in the field do so as part of broader interests, such as youth or HIV work. There seems to be no specific organization for TB patients such as those that have begun to appear in a number of other countries of the former Soviet Union. Current or recent TB patients are often the most effective people in helping new patients understand what to expect and HCWs to gain insight into patients' perspectives. Patient advocacy can support decision-makers to recognize the importance and practicalities of TB care.

It was encouraging to see six patient volunteers in Kyzylorda participating in staff training and that the Kyzylorda branch of Red Crescent had developed a cadre of patient volunteers whom they had involved in TB work, at least until funding ceased. CSOs can assist in various ways in making ambulatory care a reality, reaching out beyond central institutions such as hospitals and polyclinics. Their role can include: building community awareness of TB; educating and providing reassurance on treatment outcomes; countering stigma; identifying individuals with suspect symptoms and encouraging them to seek medical attention; stressing that TB is curable and that treatment is free; supporting patients through the long months of treatment; and helping patients to understand their condition and how to navigate the system.

Observations

- There is strong commitment to increasing TB awareness among the general public through the various activities of national NGOs and local oblast CSOs.
- Chemizators and PHC nurses can play a key role in supporting patients and their families in the community.
- Understanding of the role of community organizations and ways in which to involve them remains low.
- Local CSOs are not well funded and there are no self-help groups for TB patients in the country.

Challenges

While commitment to provision of good TB services and moving to ambulatory care is high, many challenges remain.

- Perception of stigma is high and is reinforced by policies such as reluctance to retain children in ordinary schools even when not infectious and the fumigation of TB patients' homes. Community action and general public education can assist in countering stigma.
- The community organization sector in the country remains limited. All four local CSOs met by the mission were relatively small and poorly funded: while they were enthusiastic and competent, they are nevertheless fragile.
- Patients can make a unique contribution to raising awareness and supporting TB control in the community. This hidden resource needs to be better understood and utilized. Ways may be found to encourage patient engagement and maximize their support to the NTP and local services.
- Availability of funding for national and local CSOs is very patchy. Funding is sporadic and not sustained from year to year. This makes it difficult for national and oblast TB services to develop long-term working relationships with CSOs.
- A systematic approach to engagement of CSOs is hampered by limited understanding of the roles CSOs could play in TB care.
- There is no systematic action to engage either CSOs or health care outreach cadres, such as the so-called patronage nurses found in other countries, in activities to which they are best suited, and to do so consistently across the country.

- Although the NTP has developed a range of materials to explain TB to the general public and patients, the materials may not be easily available in community settings.
- Privatization of health services and its effect on ambulatory services and community engagement will require careful reflection in the future.

Recommendations

- Programmes to counteract stigma should be developed. These could include the following actions:
 - explaining TB infectiousness to school leaders so they gain a more accurate understanding of the actual limited risk of acquiring the disease and can further educate parents and staff;
 - amending the relevant prikaz and ending unnecessary fumigation of the homes of individuals with TB; and
 - identifying and actively using celebrity TB champions in media campaigns.
- Understanding of the potential uses of CSOs should be increased, with CSOs being built systematically into the implementation of the NTP. This could include the following actions:
 - developing systematic plans at republican and oblast levels that involve community and patient groups and identifying areas of work that can best be delivered by CSOs; and
 - assisting with funding of appropriate CSOs and developing social contracting mechanisms for use by akimats and the MHSD (if desired, WHO and the TB Europe Coalition (TBEC) of civil society activists could provide advice and training on the nature of CSOs and NGOs and development of their use by NTPs).
- Patient support and information could be enhanced by:
 - training chemizators to see their role as central to effective ambulatory TB care and understand that they can be more than just deliverers of drugs to patients – their role as providers of social and informational support should also be acknowledged; and
 - reviewing the distribution of existing health information materials to ensure they are available at all points of health care delivery, not just where diagnosis occurs.
- Policy-level decision-making on TB should be maintained by:
 - continuing existing policy links on TB at republican level through the MHSD consilium, National Coordinating Council and CCM;
 - ensuring interdepartmental TB meetings continue in all oblasts; and
 - reviewing provisions for community action as privatization of health services develops: it will be necessary to find ways to continue developing community action and increasing CSO involvement in TB care, and social marketing concepts may be helpful in this context.

Financing and governance

The key recommendations from the 2012 review were:

- provider-payment mechanisms for TB case management across all levels of care should be revised to reinforce outpatient case management, with appropriate patient support and follow-up by general health service providers through, for example, a performance motivation system;
- improvements in financing of TB control interventions in Kazakhstan will be possible not merely by further increasing expenditure; and
- the MHSD should consider the introduction of a case-based provider-payment system (tariffs) for TB care, with a relevant performance motivation scheme.

Achievements

The government is continuously increasing funding for TB control and a positive trend of funding from domestic sources is evident.

The following achievements can be highlighted for the years 2012–2015.

- A dedicated national-level budget for TB services remains in place.
- There is a well-established, nationally contracted and controlled drug procurement and supply system.
- Appropriate and significant reductions in bed numbers and better comfort for patients are evident.
- The shift to ambulatory care is ongoing.
- Regulation of mobile teams has been developed.
- There is a good system for professional guideline developments.
- Improvement in background facilities and equipment have taken place. A nationwide procurement programme was carried out in 2015 and 23 GeneXpert laboratory machines were commissioned. This has resulted in greater equality and timely access to laboratory testing at national level.
- Quality indicators for TB in primary care have been applied.

Observations

Following the recommendations from the 2012 report:

- an approved process to reduce the number of hospital beds and rate of hospitalizations is in place, with hospital beds being reduced from 13 800 in 2011 to 11 000 in 2014;
- the length of hospital stays is still too long, ranging from 102 to 104 days for adults and 178 to 182 for children;
- while improvements in the use and role of outpatient care have been seen, targets have not been set: the targeted number and ratio of outpatient to inpatient care, as well as milestones and deadlines, are not clear;
- significant investment has been made in establishing an accredited modern laboratory network with new equipment purchased, but the missing mechanism for depreciation of the 23 GeneXpert laboratory machines procured by 2015 raises concerns about long-term sustainability;

- a quality indicator system in primary care that enhances timely diagnostics and treatment of new TB patients is not in place;
- the new case-based tariff system and its proposal are under development but have not yet been approved;
- a potential efficiency gain may be realized if nationwide yearly mandatory screening is modified to ensure a better focus on high-risk population groups, potentially resulting in better use of financial resources;
- Kazakhstan is at the forefront of use of new chemotherapeutic TB drugs, with a pilot project involving between 300 and 400 patients to study the effects of new specific drugs underway;
- some parts of the range of TB services lack detailed information on patient movement, with only cumulative data available;
- cost-effectiveness studies on special (very expensive) third-line drugs have not been conducted, so there is no evidence to support their nationwide implementation; and
- the database for the range of TB services is not unified, reducing opportunities for developing the case-based tariff system; further refinement in reimbursement methods and continuous quality monitoring and improvements are necessary.

Challenges

- The TB budget needs to be realigned with strategic changes to encourage the development of ambulatory care and broaden the role of mobile teams and NGOs.
- Management and supervision of ongoing TB bed reductions needs to be realized through mid- and long-term plans.
- The capacities of different forms of ambulatory care (including psychological support for patients), mobile teams and social care workers need to be developed and up-scaled.
- Critically reviewed criteria for hospitalization to reduce hospital stay (in accordance with WHO recommendations) and discontinue admissions of children with LTBI and non-infectious TB to sanatoria are lacking.
- Evidence-based information on the role and effectiveness of sanatoria in TB treatment is lacking, with allocation efficiency being questioned.
- There is no systematic plan and strategy to promote TB medicine as a specialty among medical interns (by, for example, combining TB and respiratory medicine specialties).
- Change management principles need to be introduced at oblast and rayon levels to reduce inpatient care, develop ambulatory care and further consider the use of mobile teams.
- The new merit-based reimbursement scheme (case-based tariffs) for providers needs to be finalized and introduced as an incentive method for more efficient and higher-quality TB services.
- Quality is difficult to measure, as some key performance indicators (such as readmission of cases, patient adherence to drug use and activities of mobile teams) are missing or have not been reported. Mechanisms allowing comparisons between oblast and national data are not in place, reporting is not standardized and feedback for quality improvement is lacking.

- Mechanisms and tools to analyse patient management pathways to discover and explore bottlenecks and other possible delays in care delivery are lacking.

Recommendations

The following are recommended to the MHSD and NCTP.

- The bed-reduction programme should continue and a criteria-based system to assess and monitor appropriate utilization of hospital and ambulatory care developed. Medium- and long-term planning (setting target data and timelines) for further reductions in TB hospital capacity and the development of different forms of ambulatory care should be undertaken (an ongoing process).
- The new incentive (reimbursement) scheme (as case-based tariffs) should be prepared and introduced to achieve more efficient and higher-quality TB services and encourage delivery of high-quality outpatient care. Mobile teams, social care workers and more systematic involvement of NGOs should be used as a means of reducing high hospitalization rates. Case-based tariffs need to be piloted prior to full implementation to reveal any unexpected adverse effects. The impact on overall funding of TB care will need to be monitored to ensure that the money follows the patient into PHC/ambulatory care. Furthermore, the issue of including paid psychologists also needs to be carefully examined and included in the case-based tariff (by June 2016).
- A government budget-allocation mechanism should be developed to reduce unacceptable regional differences in spending and available funds, taking into consideration regional demographic and epidemiological variations. A timely shift of funds from inpatient to ambulatory care should be guaranteed. Allocation efficiency needs to be generally improved within the whole TB programme, with regular revision of the allocation mechanism for TB expenditure systematized by applying:
 - efficiency measures to compare traditional methods of care in hospital settings with ambulatory care (including mobile teams);
 - opportunity costs in comparison of treatment options and different protocols of drug therapies; and
 - cost-effectiveness analyses, mainly of new screening, laboratory and drug-treatment options.
- More effort should be made to further develop quality and key performance indicators (such as readmission of cases, patient adherence and activities of mobile teams) and create mechanisms for comparison of oblast data to provide feedback for quality improvement. Quality-reporting forms should be standardized at national level.
- A mechanism for analysis of patient pathways should be created to enable exploration of bottlenecks and other delays in care (by the end of 2018).
- The IT system for complete patient registries covering the whole range of TB services should be further developed while allowing the NCTP to follow the patient pathway throughout the system using nationwide unique identification numbering for each patient (by the end of 2018).
- A mechanism to account for yearly depreciation of GeneXpert laboratory machines needs to be developed over the long term (by the end of 2020).

- External accreditation of laboratories (including GeneXpert) should be ensured, while rigorously applying internal quality assurance and quality control (by the end of 2020).
- A nationwide long-term HR policy in the field of TB services should be developed, including:
 - analysis of the current epidemiological situation;
 - a plan for long-term HCW demand;
 - support for universities and medical schools to enrol appropriate numbers of students; and
 - a concrete programme to motivate university and college students to engage with, and specialize in, TB services.
- Health professional curricula should be updated with new and up-to-date diagnostic, treatment and specialist care methods. The pre- and post-diploma training curriculum for doctors and nurses should reflect new methodologies, diagnostic technologies, models of care and therapeutic regimens. HR management methods for TB service providers should be strengthened.
- A training programme should be developed for TB staff, focusing on issues such as how to work in mobile teams and measure and evaluate performance indicators, and including guidelines to support service provision at ambulatory level for new hospital-care replacement models. It is highly recommended that an HR career policy is developed and change management is encouraged in organizations to support these structural changes. Continuing professional development of people with valuable experience in the field should aim to improve skills and motivation. Forecasting of HR needs and capacity for hospital, ambulatory and outreach services should be one of the first tasks of the HR Observatory. This should all be linked to an appropriate remuneration policy.

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Annex 1

MISSION PROGRAMME

**Biannual collaborative agreement for 2014/2015
Assessment of progress on implementation of mission recommendations
Review of 2012 TB programme in Kazakhstan
17–25 November 2015 (Astana, Almaty, Kyzylorda)**

Monday 16 November, Almaty: Manfred Danilovits (accompanying person: Dr Panagul Djazybekova, head of methodological unit, NCTP)		
Time	Event	Venue
06:15	Arrival at Almaty international airport and accommodation at the hotel	
10:00–15:00	Meeting with the national TB programme team – issues related to drugs/medications	National Centre for Tuberculosis Problems (NCTP)
18:45	Departure from Almaty	
20:30	Arrival at Astana	
Tuesday 17 November, Astana: Stephan Talevski, Radmila Curcic, Manfred Danilovits		
Time	Event	Venue
11:00–13:00	Joint meeting of WHO with the Ministry of Health and Social Development (MHSD) at the level of vice-minister, Dr Tsoy AV, with representatives of Astana Health Department and NCTP	MHSD
	<p><u>Participants</u> Dr Baurzhan Baiserkin and representatives of the Department of Medical Care Organization, MHSD Dr Malik Adenov, deputy on clinical issues, chief doctor, NCTP Dr Yana Besstrashnova, reporting coordinator, NCTP Dr Anna Tsepke, city TB dispensary, Astana</p> <p><u>Discussions</u> Content and objectives of the mission and role of team members. Briefing on the TB programme: 2012 recommendations, comprehensive plan for TB, current situation: problems and achievements.</p>	
14:30	Visit to PHC facilities providing TB treatment services in Astana	Polyclinic No. 4, Astana

Wednesday 18 November, Astana: Paul Sommerfeld, Dózsa Csaba, Stephan Talevski, Radmila Curcic, Manfred Danilovits (accompanying person: Dr. Yana Besstrashnova, reporting coordinator, NCTP)

Time	Event	Venue
09:30–10:30	Visit to the city TB dispensary	City TB dispensary
11:00–12:30	Visit to children's TB institutions	Various
13:00–14:30	Working lunch with Project Hope and KCVN	
14:30–18:00	Meeting with NGOs providing assistance to TB patients	NGO Nazym, South Kazakhstan

Thursday 19 November, Kyzylorda oblast: main group – Manfred Danilovits, Stephan Talevski, Radmila Curcic, Paul Sommerfeld

Time	Event	Venue
15:05	Arrival at Kyzylorda (main group)	Kyzylorda
16:15–17:15	Meeting with health department in Kyzylorda oblast; briefing on the mission	

Friday 20 November, Kyzylorda oblast: main group

Time	Event	Venue
08:00–17:00	Visit to the city TB dispensary for adults in Kyzylorda city Visit to Kyzylorda oblast TB clinic for adults and children Visit to Kyzylorda TB sanatorium for children Visit to the PHC facility Polyclinic No. 3, Kyzylorda city	Various venues, Kyzylorda
11:30–13:00	Meeting with Kyzylorda health department on the results of the mission	

Saturday 21 November, Kyzylorda oblast: main group

Time	Event	Venue
09:00–11:00	Visit to the PHC facility Polyclinic No. 4, Kyzylorda city	Various venues, Kyzylorda
11:30–13:00	Meeting with Kyzylorda health department on the results of the mission	

Sunday 22 November, Astana: main group

Time	Event	Venue
11:00–20:00	Dr Martin van den Boom meeting with main group	WHO country office

Monday 23 November

Time	Event	Venue
09:00–13:00	Preparation of the preliminary report	
14:40	Meeting with NCTP: Dr Tleukhan Abildyaev, director general Dr Elmira Berikova, deputy director general Dr Yana Besstrashnova, reporting coordinator	WHO country office

Monday 23 November (cont.)		
Time	Event	Venue
16:00	Meeting with representative of the Committee of Criminal-Executive System (CCES) (TB control service)	
Tuesday 24 November		
Time	Event	Venue
17:00	Final meeting with MHSD	WHO country office
Wednesday 25 November		
Event		
Departure of experts		

Programme for expert Dózsa Csaba

Thursday 19 November, Astana		
Time	Event	Venue
09:00–13:00	Meeting with NCTP employees on national-level funding issues and with the employees of the city health department on funding issues at local budget level	City TB dispensary
15:00–18:00	Working in the WHO country office	WHO country office
Friday 20 November, Astana		
Time	Event	Venue
11:00–13:00	Meeting with the Committee of Medical and Pharmaceutical Activity Regulation, MHSD	MHSD
14:30–16:30	Meeting with the Committee of Payment for Medical Services, MHSD: funding issues in the field of TB treatment	MHSD
17:00	Meeting with Dr Abildayev	Radisson Hotel

Annex 2

MISSION SITE VISITS

16–17 November 2015

Almaty – National Centre for Tuberculosis Problems (NCTP)

The following units were visited during the visit to the NCTP: the multidrug-resistant TB (MDR-TB) department, National Reference Laboratory, drug dispensaries and drug depots, and the National TB Register.

The director of NCTP gave an overview on the main strategic developments since the last Green Light Committee visit and introduced the national TB programme (NTP) plans for the coming years. He thanked the Global Fund to Fight AIDS, TB and Malaria (GFATM) for its support over the last decade and acknowledged the progress made in Kazakhstan in TB control. At the same time, he offered assurance that despite concerns, there would not be major sustainability problems after GFATM support ends. Financial sustainability will be guaranteed by additional budget allocations from government and oblasts.

The NCTP has two departments that can accommodate extensively and multidrug-resistant TB (X/MDR-TB) patients with 120 beds (80 in one and 40 in the other). On the day of the visit, the 80-bed department was completely full and had 20 cases of XDR-TB.

Departments have good infection control conditions: rooms are for 2–3 patients with separate zones for smear-positive and smear-negative patients.

Patients admitted to the Almaty centre may also be referred to other oblasts. The NCTP in Almaty is the main diagnostic and treatment centre for Kazakhstan and receives the most complicated patients for treatment. It is the main referral centre for some categories of patients, such as pregnant women, children with MDR-TB and complicated extrapulmonary cases. All clinical experts working in the NCTP have responsibilities as oblast coordinators and provide consultancy to several treatment sites countrywide.

Regimens and dosages in the inpatient and outpatient facilities visited were adequately determined by the consilium in accordance with national guidelines on programmatic management of drug-resistant TB and WHO recommendations.

Clinical monitoring of patients is performed adequately, with specialists available at the NCTP. Notably, all serious side-effects are managed adequately (one department still needs an audiometer).

The current structure for pharmacovigilance (PV) in Kazakhstan is passive and is based on spontaneous reporting. Severe or unresolved adverse reactions (side-effects of drugs) are reported to the PV centre in Almaty. To report these events, a yellow card (No. 192-1/y, in accordance with Ministry of Health and Social Development (MHSD) decree No. 647 of 2009) is filled out and a copy is sent to the PV centre (121 cases of side-effects were recorded in 2014 and 87 in 2015 in the department visited). The reporter was informed, however, that each report could have multiple side-effects associated with the same exposure. These reports are often

associated with either para-aminosalicylic acid, pyrazinamide, prothionamide or cycloserine. Information held on the forms is stored electronically at the National Centre for Drug Expertise.

In relation to the pilot project for use of new drugs in 2016, the reporter was told that there are clear plans for establishing a regular system of PV monitoring with support from Partners in Health within the framework of the End TB project. Preliminary preparations and training were conducted in 2015, but regular capacity-building of medical personnel, especially in other regions, is essential to improve implementation of the proposed new treatment strategy.

The possibility for a brief visit to the department of surveillance arose, where the reporter received a short introduction to the new TB registration system.

Important changes have been implemented since the last mission. Use of either paper-based or electronic systems for recording and reporting varies across the country. At district level, only paper systems are used for registration and reporting, while a well-developed electronic database is in use in all oblasts and large municipalities. The electronic centralized database system is managed at MHSD level (together with other registries) by the Republican Centre of Electronic Health Information (under MSDH decree of 28 August 2015). TB surveillance is linked to a general database that allows browsing of records and generation of standard reports. As of last year, this database has several modules or platforms to allow monitoring of key information during the whole treatment period. Data are entered at oblast and central levels. The e-system includes information on treatment regimens, drug resistance, follow-up of directly observed treatment (DOT) performance, laboratory monitoring, social support (such as source of financial incentives, transport compensation and disability status) and a special information section concerning migrants.

It was noted, however, that none of the TB surveillance staff have administrative rights on the database. In future, electronic systems may also contain details on PV.

18 November 2015

Astana city TB dispensary

The city TB dispensary serves the entire population of Astana as well as people from surrounding settlements and all regions of Kazakhstan seeking medical care in the city's hospitals (including foreign nationals). It has 320 beds and 465 staff (including 88 physicians and 181 nurses).

The TB dispensary is located in two buildings (built in 1971 and 1981) and organized in several departments:

- pulmonary department for new sensitive TB patients who are sputum-positive (30 beds);
- pulmonary department for previously treated sputum-positive TB-sensitive patients (40 beds);
- pulmonary department for treatment of patients with smear-negative resistant TB (MDR-TB) (50 beds);
- pulmonary department for the treatment of TB patients with smear-positive resistant TB (M/XDR-TB) (60 beds);

- pulmonary department for the treatment of patients who are smear-negative with preserved sensitivity (50 beds);
- pulmonary surgical department (30 beds);
- osteosurgical department (20 beds); and
- children's TB departments (40 beds).

The TB dispensary undertakes activities to rationalize bed occupancy. A day hospital with six beds was opened in July 2013. The TB dispensary began outpatient treatment for 137 patients in 2013 and 119 were treated in 2014. To date, 526 patients have received TB treatment in an outpatient setting. The TB dispensary launched 15 mobile teams in January 2015 to work in patients' homes.

Comparative analysis of preliminary data from nine months in both 2014 and 2015 indicates a TB incidence in Astana slowly decreasing by 5.1% (from 62.4 to 59.2 per 100 000) and a reduced mortality of 6.1%.

For nine months in 2015, 5.1% of TB patients were smear-positive, while the respective figure in 2014 was 2.9%. Based on policy documents, mass X-ray screening was an important TB preventive measure. The number of examinations by fluorography is growing (from 374 473 in 2014 to 426 899 in 2015). The annual plan for fluorography for 2015 amounted to screening of 60.8% of the adult and adolescent population in Astana (up from 47.7% in 2014). The X-ray examination detection rate for nine months in 2015 was 0.4 per 1000 surveyed, compared to 1.1 for the same period in 2014.

The TB dispensary in Astana introduced rapid diagnostic tests (BACTEC MGIT-960, Hain-test and Xpert MTB/RIF) in 2013, when it also introduced an innovative laboratory rapid test for TB, the Xpert MTB/RIF. Diagnostic studies conducted on 1415 cases in 2014 confirmed TB in 533 patients (37.7%), including MDR-TB in 199 (37.3%). The most recent review of this method from 1227 cases shows that TB was confirmed in 278 patients (22.7%), of whom 103 (37.1%) had resistant strains. Coverage of registered people with suspected TB in the primary health care (PHC) network by Xpert increased from 16.5% in 2013 to 33.3% in 2014.

On average, MDR-TB patients are admitted for up to four months in hospital; the continuation phase of treatment is delivered in dispensary outpatient facilities, or patients are sent to special institutions for long-term hospitalization.

According to information from the head doctor, Dr Anna Tsepke (appointed 25 June 2015), some departments need further improvement (infection control and planning of patients' rooms, for example). She expects that a new hospital with 500 beds will open in 2017.

The dispensary has a day treatment unit with six beds and a mobile unit providing domiciliary treatment for around 15–20 patients every day. The TB outpatient department includes 16 service areas for adults and 13 for children (paediatricians have admission hours in respective polyclinics).

At the time of the visit, approximately 506 patients were on ambulatory treatment, 80% of whom were supervised by different PHC institutions. DOT is organized six days per week. All patients with good adherence to treatment have the right to social support packages (750 tenge per month

plus reimbursement of transport costs). The city municipality is responsible for financing social support activities (around 4% of the TB budget).

In 2014, 506 new TB cases were registered, of which 104 were patients with MDR-TB. Respective numbers for 2013 were 594 and 101. Treatment coverage for Category IV patients in 2014 was 96.5% (91.8% in 2013 and 85% in 2012). The treatment success rate for the 2011 cohort of MDR-TB patients was 88.5% (the highest recorded success rate in Kazakhstan to date).

WHO experts met with TB doctors responsible for treating MDR-TB patients during the hospital visit. General principles of MDR-TB treatment were discussed and patients' documents reviewed. Treatment regimens for M/XDR patients were standardized to WHO recommendations.

Satisfactory infection control measures are in place and there is high general awareness of infection control measures among staff. Specific administrative, environmental and personal protection elements and activities are covered, as are provisions for the purchase of equipment and supplies (such as UV lights and respirators). TB wards are located on the first, second and third floors. Patients are separated by sputum status and floors are designated by red, yellow and green colour-coding to reflect possible infectious categories (sputum-smear (SS)+, SS-/culture+, etc.). Each department is staffed by three doctors.

Education of medical staff at different levels of care is important and is the responsibility of experts employed in the Astana TB dispensary. In 2015, 562 primary health physicians were trained on different TB issues.

The profiles of medical and non-medical staff are presented in Table A2.1.

Table A2.1. Number of employees in Astana TB dispensary

Employees	Numbers as of 1 November 2015	Percentage of full staffing complement
Medical doctors	88	79.3
Nursing staff	180	89.3
Pharmacists	2	100.0
Pharmacy technician	1	100.0
Non-medical staff	133	100.0
Other personnel	60	74.5
Totals	464	89.8

Source: data provided by the oblast TB dispensary in Astana city, 2015.

19–21 November 2015

Kyzylorda oblast

Sites visited at Kyzylorda oblast included the city TB dispensary, oblast TB dispensary, oblast children's TB sanatoria and kindergartens, and city Polyclinic No. 3.

Kyzylorda oblast (population around 753 200 (January 2012)) is situated in southern Kazakhstan, to the east of the Aral Sea on the low Syrdarya river. The capital city is Kyzylorda. The oblast has seven districts (the Aral, Kazaly, Karmakshi, Zhalagash, Zhanakorgan, Syrdariya and Shieli rayons) and covers an area of 226 000 km².

The oblast has a higher TB incidence rate in all age groups than the rest of the country and one of the highest rates of drug-resistant TB, but a steady decrease in overall incidence and mortality has been seen in recent years. The main TB epidemiological data for 2014 and nine months of 2015 are shown in Table A2.2.

Table A2.2. Main TB epidemiological data, Kyzylorda oblast, 2014 and nine months of 2015

	2014	2015 (nine months)
New cases	573	431
Pulmonary TB	475	357
Sputum-smear +	166	157
Relapses	354	265
Sputum-smear +	217	140
Pulmonary relapses sputum/culture –	86	99
Extrapulmonary relapses	51	26
All MDR-TB cases	465	313
New MDR-TB cases	132	105
XDR-TB cases	34	24
Notification rate per 100 000 population	927–125.3	696–93.3

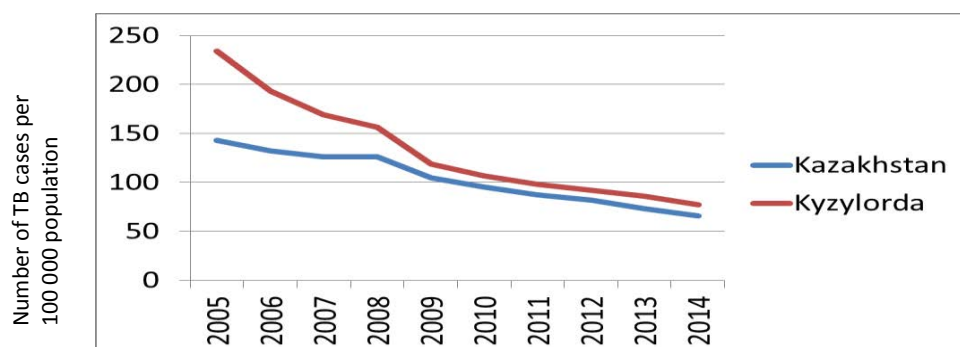
Source: provided by Kyzylorda oblast TB dispensary.

Out of 573 new cases in 2014, 132 had MDR-TB and 34 XDR-TB. The number of registered X/MDR-TB cases in 2015 was around 500; at the time of the mission, 683 patients with MDR-TB were on treatment.

According to the latest NTP data, treatment coverage for Category IV patients was 97.4% in 2013 and 100% in 2014. The number of MDR-TB patients enrolled for treatment in 2014 was 495. The treatment success rate for the latest MDR-TB cohort (305 patients registered between December 2012 and September 2013) was 71.7%. The default rate for the same cohort was 11%, the failure rate 6.8%, and 7.5% of patients had died.

TB incidence rates in Kyzylorda oblast in comparison to those throughout Kazakhstan between 2005 and 2014 are shown in Fig. A2.1.

Fig. A2.1. TB incidence rates in Kyzylorda oblast and in Kazakhstan, 2005–2014



Source: NCTP statistics, 2015.

Nine institutions provide inpatient and outpatient care for adults and children in the oblast. More than 200 beds in specialized departments and sanatoria are available for the relatively small number of children (50) and adolescents (31) with active TB diagnosed last year. Six specialized kindergartens and two schools also provide prophylactic treatment and social support, meaning that altogether, approximately 1600 places are dedicated to children and adolescents across seven districts. In parallel with increased outpatient treatment coverage, comprehensive and unified social motivation programmes have been initiated for all TB patients.

The Kyzylorda city TB dispensary has 70 beds and had been newly renovated at the time of the mission. It has received only MDR-TB patients from all seven districts and surrounding regions since 2014. Patients are separated by smear and culture results and wards are spread across four floors.

The renovated building has excellent infection control and sanitary conditions, with mechanical ventilation in all rooms. Staff members have separate clean zones on each floor and respirators are available. On the day of the visit, 140 patients were on treatment. Patients stay in hospital for an average of 3.5 months.

All patients received treatment under supervision and all treatment cards reviewed were correctly completed. Treatment regimens were confirmed by the Central Medical Consultative Committee (CVVK). The standard treatment regimen was followed, according to local guidelines. All departments had a very strict system for storage and calculation of used and available drugs.

The head of department informed the reporter that sufficient drugs to deal with side-effects were also available. Patients with two consecutive negative cultures can be discharged to special departments or other hospitals for culture-negative patients or for ambulatory treatment (usually not before discontinuation of injectable medication).

The Kyzylorda city dispensary outpatient clinic has 10 ambulatory service areas for adults and six for children, a day treatment unit with six beds (serving 20 patients) and a home care department for 30 patients. Home-based treatment is available in the city for patients with disabilities, older people and young mothers with children. On the day of the visit, 360 patients were on treatment: 15 in the day unit, 32 through home care, 17 in the DOT cabinet and 311 in city polyclinics or other institutions. Approximately 10% of patients had started treatment on an ambulatory-only basis.

The oblast TB dispensary has 370 beds. Of these, 70 are for treatment of patients who are smear-positive with sensitive strains of TB. Only 38 patients were in the department during the visit. Two more departments for patients with susceptible TB (100 beds) are located in other districts.

Connections between the local TB register, laboratory and oblast TB dispensary departments are well established. The bacteriological laboratory has the capacity to perform Ziehl-Nielsen microscopy, solid (Lowenstein-Jensen) and liquid (Bactec MGIT-2010) cultures, drug-sensitivity testing on solid and liquid media, Hain test (2011) and Xpert MTB/RIF (2014). Renovation of the new laboratory building started in 2010 but is still not finished. It will be a well-structured and organized facility with modern equipment and safety conditions.

There is good cooperation with PHC services in the city, but several challenges exist in districts that are far from the oblast centre.

It became apparent during discussions with the head of department, Dr Akmaral Alnazarva, and key staff of city and oblast dispensaries that the oblast health department was paying increasing attention to the problem of TB. An intersectoral committee in Akimat coordinates TB control activities as part of general health service delivery. Several indicators have been set up to control and estimate the effectiveness of different services, including for TB. After approval of the comprehensive TB control plan, greater effort and additional financial resources have been allocated to social support from the local budget.

All staff met during the visit were knowledgeable and motivated, with feedback and follow-up provided on a regular basis.

Despite good progress in TB control in Kyzylorda oblast, key challenges for the coming years are to:

- strengthen outpatient treatment and follow up in districts;
- reduce or reorganize hospital/sanatoria capacity for adults and children;
- facilitate more cost-effective patient management;
- improve infection control conditions in the oblast TB dispensary; and
- analyse possible reasons for the high rate of MDR-TB (such as treatment adherence problems, nosocomial spread of infection and community outbreaks).

Kyzylorda Polyclinic No. 3 is located in a new building constructed according to international standards as part of the national project “100 schools, 100 health centres”. It served 55 315 people in 2015: 36 466 adults, 1800 teenagers and 17 049 children (including 1483 under 1 year). In 2014, the population covered was 53 657. The polyclinic saw 171 324 patients in 2014 and 84 836 were admitted for examinations and treatment in the first nine months of 2015. The numbers admitted to the polyclinic in 2014 and 2015 are shown in Table A2.3 and those with respiratory diseases in Table A2.4.

The number and profile of employees for the nine months of 2015 was: doctors 88, mid-level 209, junior level 50 and administrative level 65.

Table A2.3. Numbers of patients admitted to the polyclinic, 2014/2015

Number of patients	2014	2015
Total patients visiting polyclinic	160 188	171 324
Children (0–14 years)	52 184	56 534
Patients with complaints	87 606	97 194
Preventive examinations	72 582	74 130
Home visits	24 648	24 556
Invitations for home visits	22 737	22 554
Patronage visits	1 911	2 002

Source: data provided by Kyzylorda Polyclinic No 3.

Table A2.4. Number of patients with respiratory diseases, 2014/2015

	2015		2014	
	Numbers/ overall incidence rate per 1 000 population	Numbers/ overall incidence for patients per 1 000 population, registered for first time	Numbers/ overall incidence rate per 1 000 population	Numbers/ overall incidence for patients per 1 000 population, registered for first time
Respiratory diseases	5 862 105.9	5 174 93.5	4 610 85.9	3 880 72.3
Pneumonia	121 2.2	114 2.06	89 1.7	75 1.4
Chronic bronchitis	481 8.7	163 2.9	473 8.8	212 3.9
Bronchial asthma	217 3.9	24 0.4	232 4.3	23 0.4
Chronic obstructive pulmonary disease	137 2.5	24 0.4	149 2.8	27 0.5

Source: data provided by Kyzylorda Polyclinic No 3.

All infection control measures, including administrative, environmental and personal, are met adequately. The waiting time at doctors' offices is not long and severe cases have priority. A system of scheduling medical visits by patients to their doctors has been set up in the last year, reducing patients' stay in waiting rooms and potentially lessening the chance of transmission of infections, including TB.

A nominated person in charge of infection control is responsible for implementing all preventive measures. A local engineer has responsibility for checking the ventilation system on a regular basis.

The polyclinic has resources for sputum collection and smear examinations for all suspect cases. Patients living nearby are treated (mostly during the continuation phase) in the local DOT cabinet. Good coordination for diagnosis and treatment of TB patients exists between the polyclinic and local TB facilities.

During the nine months of 2015, 351 people were examined for TB at the local first-level laboratory by smear testing, with 15 positive tests (4.3%) (Table A2.5)

Table A2.5. People suspected for TB and sputum smear results in Polyclinic No. 3

Year	People checked	Smear examinations	Examinations per patient	Sputum smear +	% TB diagnosed at PHC level
2015	351	1 041	3.0	15	4.3
2014	384	1 121	2.9	20	5.2
2013	285	841	2.9	11	3.8

Source: data provided by Kyzylorda Polyclinic No 3.

Annex 3

PEOPLE MET DURING MISSION

Ministry of Health and Social Development (MHSD) and National Centre for Tuberculosis Problems (NCTP)

1	Bauyrzhan BAISERKIN	Director of the Department for Health Services Provision
2	Aigul TASTANOVA	Director of the Department for Health Services Provision
3	Gulnara SARSENBAYEVA	Chief expert, Department for Health Services Provision
4	Tleukhan ABILDAYEV	Director of the NCTP
5	Melita VUJNOVIC	Head of the WHO country office in Astana-Kazakhstan
6	Malik ADENOV	Deputy director of the NCTP
7	Yana BESTRASHNOVA	NCTP representative – recording and reporting coordinator
8	Serik SADYKOV	Infection control coordinator, NCTP
9	Ainur KANIYEVA	Head of Medical Department of the Health Committee of Ministry of Internal Affairs

WHO Country Office, Astana

10	Zarina PASKOVICH	Nongovernmental organization (NGO) Nazim Shimkent (focusing on prisons)
11	Yersin KUDIYAROV	NGO Youth for Healthy Lifestyle (working on general awareness of TB, especially among businesses; Mr Kudiyarov is also a past TB patient)
12	Aleksandar TRUSOV	TB director for Central Asia Region, Project HOPE
13	Jamila ISMAILOVA	Advocacy, communication and social mobilization (ACSM) coordinator for Central Asia Region, Project HOPE
14	Svetlana Pak	Director for Central Asia Region, Netherlands Tuberculosis Foundation (KNCV)

City Polyclinic No. 4, Astana

15	Saule SMAGULOVA	Deputy chief doctor for treatment of patients
16	Tatygul ZHAKUPOVA	Deputy chief doctor, Committee for Quality Control of Medical Services (CQCMS)
17	Anna SHEVCHENKO	Head of the treatment department
18	Zeinep KULDOZHINOVA	Medical doctor – therapist
19	Nurila KHASENOVA	Medical nurse – directly observed treatment (DOT)

TB dispensary, Astana city

20	Anna TSEPKE	Chief doctor
21	Roza ZHUSSUPOVA	Chief TB doctor, Astana health department; deputy chief doctor, TB dispensary
22	Zhanna DAKENOVA	Deputy chief physician on medical work
23	Natalia PROTCHENKO	Deputy chief doctor of CQCMS
24	Saniya BALTABAYEVA	Deputy chief physician of the economy
25	Saltanat SEITENOVA	Deputy head physician on epidemiological issues

26	Yelena KHEGAI	Head of the dispensary department
27	Sofia KHAMITOVA	Chief accountant
28	Zarina PASHKEVICH	Representative of NGO Nazim Shimkent
29	Garsym KUNDIYARNOV	Representative of NGO Youth for Healthy Lifestyle

Kyzylorda oblast

30	Akmaral ALNAZAROVA	Head of oblast health department, Kyzylorda
31	Abdigabit ABLYAZIM	Chief doctor, oblast TB hospital
32	Zhaksybai BAIMYRZAEV	Chief doctor, city TB dispensary
33	Gulnaz MUSABEKOVA	Monitoring and control, NCTP
34	Gulshat RAKHMANBERDIEVA	Head of dispensary department, city TB dispensary
35	Zhanar SHAZHANBAEVA	Doctor-phthisiologist, city TB dispensary,
36	Aigul ALTEKESHOVA	Perinatal coordinator, oblast TB dispensary
37	Kunbibi TOBAGABYLOVA	Clinical deputy, city TB dispensary
38	Peruza NALIBAEVA	Head of kindergarten Karlygash (children – TB contacts)
39	Aiman UNALBEKOVA	Chief doctor, children’s sanatorium
40	Zoya ABZHALELOVA	Head of department, children’s sanatorium
41	Aisara ERSULTANOVA	Head of paediatrics, children’s sanatorium
42	Saule BISEMBAEVA	Phthisio-paediatrician
43	Nurgul ALDABERGENOVA	Medical doctor
44	Roza TULEUTAeva	Representative of NGO Belaya Romashka [White Daisy]
45	Abzal BAIMANOVA	Oblast subsidiary for Red Cross/Red Crescent
46	Beisen ABSADYK	Head of children’s department, oblast TB hospital
47	Meyagul TASTABEKOVA	Oblast coordinator for childhood TB
48	Aliya AKHANTAeva	Resident doctor, children’s department, oblast TB hospital
49	Nurgul MAKUTOVA	Head of bacteriological laboratory, oblast TB hospital
50	Gulzhanat TOBAEVA	Epidemiologist, oblast TB hospital
51	Alia ABDUKAIMOVA	Head of department, oblast committee for consumers’ rights protection
52	Sholpan UTEGENOVA	Oblast AIDS centre
53	Azamat AKHMETOV	Pulmonary department, oblast TB hospital
54	Kamshat MAKHANOVA	Resident doctor, oblast TB hospital,
55	Naztai KARIMBAEVA	Deputy chief doctor, city primary health care (PHC) No. 3
56	Saule DOSOVA	Deputy chief doctor for children, city PHC No. 3
57	Ainur ALMAKHANOVA	Medical nurse – chemizator

Annex 4

COUNTRY INFORMATION

Kazakhstan is a country in central Asia and the world's biggest landlocked country in terms of land area. It is bordered by Turkmenistan, Uzbekistan, Kyrgyzstan, China, the Russian Federation and the Caspian Sea.

Kazakhstan is the ninth-largest country in the world, covering an area of 2 727 300 km². The country territory is divided into 14 oblasts and the two independent cities of Astana and Almaty. All oblasts are divided into districts (rayons). The capital is Astana, which has a population of 835 000. Astana is the second-largest city; the largest, Almaty, with a population of 1.55 million, was the former capital and is also the cultural and commercial centre. Selected country information is presented in Box A4.1.

Box A4.1.
Country
information

Currency	Kazakh tenge
Official language	Kazakh and Russian
Capital city	Astana
Total area	2 727 300 km ²
Population	17 675 226 (United Nations estimate, July 2015)
Population growth	1.45% (2013)
Urban population	53.36% (2013)
Population density	6.31 people per km ² (2013)
Adult literacy rate	99.69% (2013)
Crude birth rates	19.946 births per 1 000 inhabitants
Crude death rate	7.98 deaths per 1 000 inhabitants (2013)
Life expectancy	69.69 years both sexes; 64.89 females; 74.53 males (2015)
Total fertility rate	Live births: 2.531 children per woman
Infant mortality rate	12.494 deaths per 1 000 live births
HIV/AIDS	Affects 14 000 people (estimate, 2014)

Source: World Bank, World Population Review 2015.

The ethnic majority of the country is the ethnic Kazakhs (63.1%), although there is a large number of other ethnicities, such as ethnic Russians (23.7%), Uzbeks (2.9%), Ukrainians (2.1%), Uyghurs (1.4%), Tatars (1.3%) and Germans (1.1%).

According to the World Bank (1), Kazakhstan is an upper-middle-income country with a gross domestic product (GDP) per capita of US\$ 5575.56 in 2014. Real GDP growth, however, slowed from 4.4% in 2014 to an estimated 1.7% (year on year) in the first half of 2015 due to internal capacity constraints in the oil industry, less favourable terms of trade and an economic slowdown in neighbouring countries. Real GDP growth is presented in Table A4.1.

The World Bank database (1) poverty headcount ratio at national poverty lines (percentage of population) for 2014 was 2.9%.

Table A4.1. Real GDP growth, Kazakhstan, 2003–2015

2003	2004	2005	2006	2007	2008	2009	2010
9.3%	9.6%	9.7%	10.7%	8.9%	3.3%	1.2%	7.3%
2011	2012	2013	2014 ^a	2015 ^a			
7.5%	5.0%	6.0%	4.6%	4.7%			

^a Estimate.

Source: International Monetary Fund (2).

Kazakhstan is facing challenges in restructuring its health care system. The country's health outcomes are lagging behind its rapidly increasing income. At 71.6 years in 2014, life expectancy is low when compared to other countries with similar incomes. Noncommunicable diseases, including cardiovascular diseases, cancers, tobacco- and alcohol-related diseases and injuries, are major causes of adult mortality.

The state health care development programme for 2011–2015 recognizes health as one of the country's major priorities and a prerequisite to sustainable socioeconomic development. Key aspects of health sector reforms are:

- health financing, budgeting, planning and management
- health care quality improvement
- reform of medical education and medical sciences
- development of the health information system
- pharmaceutical policy reform.

All these activities will have a positive impact on overall tuberculosis (TB) control in the country. One of the main objectives related TB to is to improve the efficiency and effectiveness of the national health information system to provide relevant, timely and reliable data in line with internationally accepted methodologies and best practices. A chief aim of health reforms is to get more patients into outpatient care and reduce long periods in hospital. The basic principle of the health system is that services should be easily accessible and free of charge for the entire population.

There are some concerns about the future of continued progress, mainly related to economic downturns and possible financial constraints that may have a negative impact on the current national TB programme strategic plans.

References

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