

EVALUATION REPORT

NORWEGIAN-RUSSIAN COOPERATION PROGRAMME

«STOP TB IN NORTHWEST RUSSIA IN OUR LIFETIME» (B1402)

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And thank you all for the warm and hospitable welcome!

Evaluation team

ACRONYMS

AIDS	acquired immunodeficiency syndrome
DOTS	Directly Observed Treatment, Short-course
HIS	health information system
HIV	human immunodeficiency virus
JWGHS	Joint Working Group on Health and Related Social Issues in the Barents Euro-Arctic Region
LHL	Norwegian Heart and Lung Association (Landsforeningen for hjerte- og lungesyke)
LHL International	LHL International Tuberculosis Foundation
MDR	multidrug-resistant
NCM	Nordic Council of Ministers
NSMU	Northern State Medical University
NW Russia	Northwest Russia
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
XDR	extensively drug-resistant

EXECUTIVE SUMMARY

Norway and Arkhangelsk Region have been cooperating in TB control for over 20 years now. This cooperation slid through several phases, each having distinct goals, objectives, format and orientation of activities, and such a dynamics in cooperation stands out as a factor of success and longevity of the bilateral cooperation. Regular monitoring of the ongoing situation in TB control and epidemiology enabled shifts in the cooperation's priorities, and the external evaluation is one of the instruments to obtain an unbiased picture of the progress in achieving goals and objectives, to assess the role of the cooperation in wide-scale TB response activity, to analyse effectiveness of conducted measures, and to define the biggest challenges for the following period of cooperation.

In the given period (2014 – 2018), Norwegian-Russian Cooperation Programme “Stop TB in Northwest Russia in Our Lifetime” (hereinafter referred to as the cooperation programme) aimed at the scale-up of early diagnosis, reduction in the loss to follow-up and increase in successful outcomes of TB treatment; and at implementation of the patients' rights and dignity.

The main purpose of this evaluation is to obtain a systematic assessment of programme "Stop TB in North West Russia in Our Lifetime", covering the five year plan 2014-2018. The evaluation consultants were tasked to assess the progress and achievements in all components of the cooperation programme. The evaluation also provides recommendations for future direction of TB control in Arkhangelsk and the North West Russia in the framework of possible future collaboration between Norwegian and Russian stakeholders.

The epidemiological analysis demonstrated achievement of practically all target indicators set for 2018 as early as in late 2017.

There is solid evidence that the TB situation in Arkhangelsk Region improved in the period from 2013 to 2018. The improvements became possible due to implementation of new organisational, diagnostic, therapeutic and preventive solutions and measures.

In addition to the analysis of the progress in achieving the cooperation's target indicators, the evaluation was done in such conventional criteria as relevance, effectiveness, impact, sustainability, and participation.

The cooperation programme is being implemented in the sector of TB control, which remains relevant both from the public health perspective and agenda of international cooperation; the cooperation programme has completed next to all planned activities, accumulated an extensive package of concrete products worth of further replication in Arkhangelsk Region and beyond; the cooperation programme produced huge positive impact on the TB situation in Arkhangelsk Region both thanks to the implemented actions and to the consolidation of the efforts of relevant stakeholders; the programme-driven methods, approaches and products are being actively built in the practice of the Arkhangelsk TB service and adjacent organisations; the extent of participation and ownership of the local partners in planning and implementation of actions has been increasingly rising.

There are problems and challenges for the future, which both are connected with stronger TB control in general and accents of the Norwegian-Russian cooperation in the next period. Particularly, challenges are found in successful treatment of drug-sensitive and drug-resistant forms of TB, expansion of cross-sectoral collaboration and cooperation with other non-governmental organisations, higher effectiveness of preventive and educational work via zooming in on key populations, reduction of stigma among health workers.

Keeping in mind that Arkhangelsk Region is one of the advanced Russian regions in reducing TB rates and in implementation of state-of-the-art methods and practices, it seems important to shift attention to the dissemination of Arkhangelsk experiences to other territories of the Northwest Russia in the next phase of the cooperation, i.e. to closer pursue the goal named in the title of the cooperation programme.

INTRODUCTION

The Norwegian-Russian cooperation in TB control was established over 20 years ago: in 1997 a group of Norwegian experts was invited by Arkhangelsk Region to help cope with the escalating TB situation. In 1998, the first memorandum of cooperation was signed between the Arkhangelsk Regional Healthcare Department and Norwegian organization LHL. The memorandum of cooperation laid down a formal framework for the implementation of the first international project on TB control in Arkhangelsk Region.

From 1997 to 2018 the cooperation programme moved through several milestones, each characterised by certain goals and objectives. While the first phase of the cooperation (1997-2001) aimed at restructuring the TB services and monitoring system in compliance with international guidelines, the following phase (2002-2006) targeted rather exchange of experiences and implementation of up-to-date approaches in diagnosis and treatment of MDR-TB. The next period (2007-2013) set new tasks – capacity building and qualification upgrade of medical staff and design and rollout of a new health information system for TB monitoring. In the current phase of the cooperation (2014-2018) attention was placed patient's questions, namely patient's right for quality services, reduction of stigma including self-stigmatisation, better accessibility of services, further development of the health information system, which also enabled orientation of services of the problems and needs of the patient.

The overall goal of cooperation programme “Stop TB in Norwest Russia in Our Lifetime” in 2014 – 2018 was to contribute to the reduced TB burden in the Northwest Russia based on the example of Arkhangelsk Region.

The objectives of the cooperation programme were to ensure early detection, reduction of defaults and increase in successful treatment outcomes; to ensure implementation of patients' rights and dignity.

Expected outcomes

- Civil society contributes actively in prevention of and the fight against TB and HIV in the region;
- People have access to patient friendly TB services in the region;
- The rights and needs of vulnerable groups are addressed

The formal **partners** of the cooperation bound by memoranda of cooperation were LHL International (Norway), charity foundation “Easy Breathing” (local coordinator and implementing party), Ministry of Health of Arkhangelsk Region, Arkhangelsk Regional TB Clinic, Arkhangelsk Regional Office of the Federal Prison Authority, and Northern State Medical University. The associated partners (not bound by memorandum of cooperation) were Arkhangelsk Regional AIDS Centre, Arkhangelsk city children’s TB sanatorium No 1, TB department of Severodvinsk city hospital No 1.

The actions in the cooperation programme were split by components:

- Thematic/technical Conferences/sharing of experiences on best practices and challenges in TB control
- TB and HIV in prison
- Health communication – patient friendly approaches
- Information campaigns and outreach activities
- Children's sanatorium
- Health system development and patient friendly activities
- Operational Research (added in 2017)

Target indicators to measure the progress of the cooperation programme were agreed at the onset of the implementation process. Baseline rates were defined (2013) and targets for achieving in 2018 were formulated.

Table 1. List of target indicators of the cooperation programme

Indicators in Arkhangelsk - both civil and prison sector unless stated otherwise		
Indicators	Baseline	Target by end 2018
	2013	
(Decrease in) TB case notification rate (number per 100 000). New cases	40,1	30 % reduction
Proportion of new TB cases that are multi drug resistant (MDR TB including XDR)		
Proportion of new TB cases that are extensively drug resistant (XDR TB)		
TB treatment success rate (sensitive TB)(cohort registered one year before)	86,6% (cohort 2012)	85 %
MDR TB treatment success rate (not including XDR TB)(cohort registered two years before)	60,7% (cohort 2011)	70 %
(Decrease in) TB mortality rate Per 100 000)	5,7%	30% reduction
HIV prevalence rate, total cases pr year (pr 100 000) - only civil sector		

HIV notification rate, new cases pr year - only civil sector		
Proportion of TB patients with result of HIV test	97,9 %	100,00 %
Proportion of new TB/HIV notified cases on ART	87,5 %	100,00 %
Co-infection TB/HIV, proportion with HIV of new TB cases (civil and prison)	5,2%	
Coinfection TB/HIV, proportion with HIV of total TB cases	4,5%	7,00 %
Tb notification rate for children aged 0-14 (new cases pr 100000)	4,8%	33% reduction

Means of verification: Arkhangelsk TB Dispensary, TB data for the Arkabngelsk Oblast

To better comprehend the overall situation it would be best to provide a concise description of the system and structure of the TB Service in Arkhangelsk Region.

Arkhangelsk Region is located in the northwest of the European part of Russia. The area is 410,700 square km. By size, Arkhangelsk Region is the 12th region out of all 85 Russian regions. In the socio-economic development ranking it had 45th place in 2015. There are 20 administrative districts, 15 cities and towns, over 4,000 rural settlements. The penitentiary system includes 20 correctional facilities, 4 pre-trial detention centres, 10,000 inmates and remand detainees.

Fig. 1 Map of Arkhangelsk Region



Table 2. Demographic trends in Arkhangelsk Region in 2013 versus 2017 (absolute figures)

	Adults	Adolescents	Children	Total
2013	937 588	32 414	189 504	1 159 506
2017	892 699	31 087	198 027	1 121 813

As compared with the 2013 demographic data, the adult population dropped in 2017 but the children population grew up. The general situation tends towards population loss.

Structure of the Arkhangelsk TB Service (as of 1 January 2018):

The Arkhangelsk Regional TB Clinic, 100 beds: in the inpatient care department: ward for new and relapse drug-sensitive TB cases 35 beds, of which 8 are nursing care beds; ward for MDR-TB cases, totally 65 beds (5 palliative, 17 nursing care¹, and 43 therapeutic): of them 30 beds for sputum smear-negative TB, and 35 beds for sputum smear-positive, pre-XDR and XDR TB; children's ward of 20 beds. The outpatient care department: adult ward and a counseling and diagnostic centre for children; a day-care centre for 20 beds; a home-based hospital for 30 beds in Arkhangelsk City, 20 daycare beds and 10 home-based beds in Kotlas, 19 district-level TB offices and 10 city district offices; Favorskaya children's TB sanatorium for 60 beds (school grades 1 to 9). Due to improving TB situation (reduction in TB incidence and reduction in absolute number of TB patients over 2014 – 2018), the number of hospital beds has decreased in the TB Service of Arkhangelsk Region.

Staffing situation in the TB Service as of late 2016: in the civil TB Service there were 64,5 TB doctor posts, of which filled 50,75 by 39 physical bodies; managerial staff: 2 posts, both occupied by 2 physical bodies. And again, due to improving TB situation it has become possible to restructure the TB Service and save resources with no harm to effectiveness and quality of services.

In 2016, 9 TB doctors received continued medical education in phthisiology at the Northern State Medical University. In 2016, 25 nurses received continued medical education in the phthisiology in nursing care. Besides, the TB staff continuously take part as trainers or trainees in training courses, seminars, workshops and conferences on TB and other related healthcare questions in Russia and abroad.

INTRODUCTION

LHL International, the administrator and lead partner of the examined cooperation programme is the commissioner of the evaluation. The coordinator of the cooperation programme from the Russian side is charity fund "Easy Breathing".

Goal and objectives of the evaluation

The main purpose of this evaluation is to obtain a systematic assessment of programme "Stop TB in North West Russia in Our Lifetime", covering the five year plan 2014-2018. The evaluation consultants were tasked to assess the progress and achievements in all components of the cooperation programme. The evaluation also provides recommendations for future direction of TB control in Arkhangelsk and the North-West Russia in the framework of possible future collaboration between Norwegian and Russian stakeholders.

The main objectives of the evaluation are to

- Assess **progress according to plans** – document the results of the intervention/program
- Assess the **impact** of the program on the TB situation **in Arkhangelsk Region** as well as **beyond** (in particular in the North-West Russia)

¹ A nursing care bed presumes long-term care and is intended for supportive therapy, medical rehabilitation, qualified care and nutrition, health checkups and socio-rehabilitative measures.

- Assess **strengths and weaknesses** - Document and describe lessons learnt
- Propose **recommendations for future** collaboration in the region.

Limitations

From the perspective of limitations to the evaluation two points should be stressed:

- Such evaluation criterion as efficiency will not be in the scope of this evaluation due to limits in time and human resources. Besides, previously, efficiency has never been on the evaluation radar. Client's accounts and book-keeping are normally subjected to auditing once a year.
- The evaluation is being made in mid-2018 while the cooperation programme is still continuing until the end of 2018. Therefore, the evaluation will likely not encompass all interventions of the programme and will be limited to accomplishments from 2014 to 2017.

Evaluation tools

To do the evaluation, a matrix with key and auxiliary questions, indicators, sources of information and methods of evaluation was employed. The evaluation matrix was divided by evaluation criteria typical of the programme and project evaluation, and also considered the tasks defined in the Terms of Reference.

This report will draw on the review of the literature provided by the Client: Memoranda of Understanding, cooperation programme plan for 2014-2018, annual plans (2015, 2016, 2017, 2018), annual progress reports (2014, 2015, 2016, 2017) and their attachments, cooperation programme's evaluation report from 2009, review "Results of 15-year Russian-Norwegian collaboration in TB control and ways of future cooperation" from 2014 and compiled by the programme's partners, and annual financial statements.

The Evaluation Team have also made use of the official statistics and reports to compile necessary quantitative information to depict the TB situation in Archangelsk Region, NW Russia and Russia in 2014 – 2018. The Arkhangelsk Regional TB Clinic has kindly provided information about the structure of the regional TB Service.

To collect qualitative data, a field mission was made from 8 to 15 June, and interviews held with the key partners and associated partners of the cooperation programme, with stakeholders, direct beneficiaries (TB patients in the civil and prison sector, TB/HIV patients in the civil and prison sector, health personnel working in the civil and penitentiary health system.

The Evaluation Team validated and triangulated the collected data. A feedback session with the focus group was organised on 15 June to present preliminary results of the evaluation.

Preliminary hypothesis

In the inception phase of the evaluation, having studied the documentation of the cooperation programme, the following preliminary hypothesis with relation to the cooperation programme in question, which later was examined by the Evaluation Team:

The cooperation programme has successfully implemented all originally planned activities, reached the expected outcomes, demonstrated sound progress on the key indicators, and contributed to the overall goal

FINDINGS

This chapter will be divided into two sub-chapters. The former will relate to the overall findings received from the evaluation of cooperation programme “Stop TB in Northwest Russia in Our Lifetime”. The latter will deal with the achievement of the key target indicators of the cooperation programme.

Overall findings of the evaluation

Above all, it should be noted that in the last two decades Arkhangelsk Region has become one of the most advanced Russian regions in terms of reduction of TB-related mortality and morbidity both in the civil and the prison sector, and in terms of implementation of up-to-date treatment regimes, including treatment of MDR TB, and new technology and approaches in TB prevention. A good evidence of the high recognition of the achievements and role of Arkhangelsk Region in TB control is that Professor Andrei Marjandyshev, head of the lung health department at the Northern State Medical University, member of the Russian Academy of Medical Sciences, acts as the chief external TB doctor of the Russian Federal Northwestern Region.

As for the epidemiological situation in the last four years, it will be discussed in detail below in chapter “Achievement of indicators”. All in all, the epidemiological situation tends to improve in practically all major rates.

It is important to note that the cooperation between Arkhangelsk Region and Norway (LHL International) has continued uninterruptedly for over 20 years.

As regard the **relevance** of the cooperation programme’s topic, TB control remains as one of the prioritised areas of the healthcare development and public health in the Russian Federation and Arkhangelsk Region. Despite the positive changes in the TB epidemiology, the situation is still alarming due to the increased incidence and prevalence rates of the HIV infection, which is a powerful risk factor for TB spread. Arkhangelsk Region has no regional TB control programme, this is a block of a wider programme on control of socially related infections. At the national level there is no TB programme but a comprehensive programme on socially related diseases where TB control is one of the components of the programme.

The theme of the infectious disease control still responds to Norway’s interests in the development cooperation. Pursuant to the recommendations of the external evaluation performed at request of the Norwegian Ministry of Health and Care of the Grant Scheme for Norwegian-Russian

collaboration projects in health and related social issues (2014)², infectious disease control deserves expansion in the future.

Tuberculosis is characterised by social triggers, and most TB patients represent socially deprived and marginalised populations, which require special approaches in ensuring adherence to treatment. Aside from this, TB, being an infection, is associated with high stigmatisation from the society and even medical profession. Therefore, the emphasis placed in the current phase of the cooperation on development of patient-friendly services and practices seems very much relevant.

In terms of **effectiveness**, the cooperation programme has realised almost all planned activities. For the reasons not dependent on the programme's partners, the training on communications planned for St. Petersburg in 2015 did not take place since the St. Petersburg Healthcare Committee did not give permission. There are certain difficulties in working with the penitentiary system due to its rigid subordination, a complicated process of endorsements, and closeness of the prison system. This was the reason why the penitentiary system of the Komi Republic was not included into the cooperation programme as planned in 2015.

In 2017, operational research was added into the cooperation programme as a new component. The operational research is one of the major factors for the implementation of the WHO's Stop TB Strategy. The proposal about the new component was supported by the Russian partners, a group of trainees formed, and two training modules out of three completed in 2017. This change in the content of the cooperation programme speaks in favour of its pursue of the maximum effect.

Analysis of the original framework plan made for the cooperation programme 2014 – 2018, annual reports and annual plans allowed the evaluation consultants to follow the logic of general goals, objectives, expected results and interventions of the cooperation programme. In the meantime, as the cooperation programme rolled out, some modifications were made, particularly into the indicators. So, the indicators of the patient satisfaction, treatment default and a few others were excluded. The modifications in the indicator list was connected with a series of causes: the list of indicators had already been quite comprehensive, secondly, it turned out that measuring of some indicators required a lot of resources, and last but not least, adequate quality of data could not always be assured. The shifts in the accents of the cooperation programme point at the continued follow-up and realistic assessment of the changing situation, flexibility and prompt responsiveness in the decision-making process. All this rather underlines the effective management style than refusal from the originally set tasks.

Coming to speak about the **coverage of the target group**, which consists of TB patients in the civil and penitentiary healthcare system, and TB control staff, one can claim that the cooperation programme achieved good results. All diagnosed TB cases, both in the civil and prison health systems, were entered into a single health information system, and a detailed patient record

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https://www.regjeringen.no/contentassets/b753137c753a4a06abc9d316876ce000/evaluation_grant_scheme_norwegian-russian_collaboration_2009-2011.pdf, Evaluation of the Grant Scheme for Norwegian-Russian Collaboration Projects in Health and Related Social Issues 2009-2011

established for each case. In 2017, sub-project “In Touch” covered 26 patients who were taking TB drugs in the directly observed video-aided online mode (video DOTS). The Arkhangelsk Regional TB Clinic regularly arranges communications trainings for the staff dealing with TB patients. When a TB patient is discharged from the prison, information about the dismiss from the prison and diagnosis is forwarded to the place of residence of the patient in question.

When referring to the concrete **products of the cooperation programme**, it is worth noting the following:

1. A **health information system** (HIS) was developed and put into operation. The HIS contains electronic patient records and enables TB patient data flow between the civil and prison health systems and the Arkhangelsk Regional AIDS Centre. The HIS is also compatible with the Federal TB Patient Registry.
2. **Online directly observed treatment** (video DOTS) was successfully brought into practice (sub-project “In Touch”)/ If a patient satisfies criteria of high adherence to therapy, this person can be offered online directly observed drug taking (via Skype, WhatsApp, Viber), and this method confirmed its effectiveness in Arkhangelsk City. The video DOTS has now been in use for three years – first, as a pilot for 1,5 years, and now it is a routine practice of the Arkhangelsk TB Service.
3. For a few years now, the cooperation programme has conducted **trainings on communication**. In 2013, when the incentive system (food packages and reimbursement of travel costs) for TB patients came to the end, the TB staff were only left with verbal means and their attitudes towards TB patients to work on the motivation of their clients, and the communication coaching helped them ensure high adherence of patients to treatment. All interviewed participants of the training highly appreciated its effectiveness.
4. **The module-based training on operational research**, included into the cooperation programme in 2017, is one of the biggest gains. The first 3-module course was attended by 6 trainees, who, in the end of the course, prepared articles on selected topics according to the scientific article design. At the moment, the articles are being finalised to meet the criteria of specific scientific journals and funds for their publication are being searched. The articles are prepared in the English language.
5. **The model of inter-sectoral collaboration** in TB response, which was built in Arkhangelsk Region can be taken as an example worth of replication in other regions. The collaboration team supported by the regional ministry of health consists of charity fund “Easy Breathing”, Arkhangelsk Regional TB Clinic, Arkhangelsk Regional Branch of the Federal Prison Authority, Northern State Medical University, and Arkhangelsk Regional AIDS Centre. This triumvirate combines inter-sectoral collaboration, collaboration between governmental and non-governmental organisations, and a symbiosis of research, educational and clinical work, which enables addressing a wide range of questions.

To **disseminate** information about the cooperation programme and its achievements, such information channels as the internet website of charity fund “Easy Breathing”

(<http://www.tubfund.ru>), inter-regional and region-wide conferences and seminars organised by the cooperation programme and other actors at the regional, Northwest Russian, Russian national (National Association of TB Doctors and Russian Society of TB Doctors) and international levels were used. Other distribution channels were the Barents TB Programme and WHO publications³. Alongside, a package of info materials for TB patients and general population, which were disseminated through medical institutions, correctional facilities, and mass health promotion actions. Also, experiences were disseminated via hosting of specialist delegations from other regions and countries (Tajikistan, Turkmenistan) or via participation of local experts in missions to other regions or countries (Kyrgyzstan – UNAIDS; Pskov Region – Nordic Council of Ministers’ cooperation programme with Northwest Russia).

From the viewpoint of **impact** produced by the cooperation programme, one should refer to the achievement of the key indicators, and this will be discussed below in detail. While talking about better quality or wider range of services, the interviewed specialists underscored high benefit of the communication trainings, which helped them change the quality of communication with patients and achieve solid results in their work. The communication trainings became part of the regional conferences, which are held twice a year for all the TB staff of Arkhangelsk Region. Besides, the interviewed patients remarked positive impact from the social and motivational support they had received and helped them not interrupt the therapy and reach successful treatment outcome. Also, accessibility of services has improved: the online directly observed treatment allows patients live their normal lives at home without unnecessary referral to the hospital bed or abundant visits to the doctor. This also adds to the effect of the treatment process. The component of operational research brings along an enormous impact: firstly, this gives new knowledge to the trainees, secondly, this creates tangible results in the form of articles, thirdly, publication of these articles in international journals leads to dissemination of Arkhangelsk experiences far beyond the Arkhangelsk Region’s borders and enhances international attention. As for the informational activity within bigger actions and mass activities (“tent of health”), the impact of such work is doubtful, particularly with regard to reduction of stigma among general population. The problem is to measure the impact of mass information campaigns on people’s attitudes, behaviors, and mindsets. One popular measurable indicator is the number of print products distributed. But the linkage between such services and behavioral transformation is pretty vague – this is rather an output indicator than an outcome indicator. Neither TB incidence data can be used as an indicator of the information work. People who attend such big mass activities do not normally think of being at risk of TB and therefore hardly interested in information or changing their behavior. A better indicator would be an on-site survey combined with rapid testing and post-test consultation, which is quite resource-demanding, yet. Ideally, one more survey should be done in the same audience over time to see how lasting the impact is.

Yet, information dissemination is still important, and public awareness campaigns and actions should be continued in a more targeted way. It is advisable to create reader-friendly leaflets with basic facts: symptoms, key preventive techniques, what to do if you suspect tuberculosis in yourself or somebody

³ Good practices in prevention and care of tuberculosis and drug-resistant tuberculosis in prisons, WHO, 2018. http://www.euro.who.int/__data/assets/pdf_file/0003/360543/TB-prisons-9789289052917-eng.PDF?ua=1

from your close environment. It is also recommendable to make posters on TB-related basic facts for dissemination in the primary healthcare network.

On the other hand, the information package for TB and HIV patients (“Tuberculosis is curable” and “You will recover from tuberculosis”) where information is very much useful for the target population, and where the readers themselves are interested in getting such information, deserves further distribution. Last but not least, patients themselves took part in making the texts for the booklets, which makes the information readable and adapted to real needs.

The geography of the cooperation programme’s actions is mostly limited by Arkhangelsk Region, and not all municipalities participate actively in the programme – only Kholmogorsky, Krasnoborky, Velsky, Kargopolsky, Lensky and Solovetsky Islands, Arkhangelsk, Severodvinsk and Novodvinsk municipalities are covered. From 2017 a parallel project was commenced in the Komi Republic, and the Komi project assumes dissemination of the expertise from the cooperation programme in Arkhangelsk.

The **sustainability** of received results echoes in many ways with the impact. Having interviewed local experts, the evaluation team became assured that those outcomes, which were developed and implemented in the cooperation programme, will be in demand in the future as well.

The health information system, developed in Arkhangelsk Region, has already been installed in the TB Services of Leningrad and Kaliningrad Regions of Russia, and in the St. Petersburg City AIDS Centre.

The communication training, which was highly appraised by the trainees, will become integral part of the regional conferences organised by the TB Clinic. According to Prof. Andrei Marjandyshv, the basics of communication are already taught to students of the phthisiopulmonology of the Northern State Medical University.

When the articles of the operational research training course have been published, there will be strong evidence that this direction has sustainable foundation and will be of interest in the future, particularly to young specialists who are eager to do research and science.

Sub-project “In Touch” (online directly observed therapy), as said above, has become part of the routine work of the Arkhangelsk TB Clinic. A similar pilot has now been launched in the Republic of Komi.

And, most importantly, the model of collaboration in TB control, which was built in Arkhangelsk Region and has demonstrated its effectiveness for over 20 years, will continue functioning in the future, regardless of external funding.

As for the delivery of social and material support to TB patients and children’s TB sanatoria, programme’s funding has been cut down on this activity in the recent years. Such a reduction of the project funding should encourage the local budget and private sector to take on the responsibility for the social and material support. Besides, keeping in mind that the incidence is declining, it is assumed that the needs in such support will decline too. Yet, people, from socially marginalised groups,

continue to die from TB, and this should be used as an argument in negotiations with the authorities about consistent social and material support to TB patients and people at risk of TB.

In the last years, the responsibility for the organization, conduct of actions and reporting has increasingly shifted to local partners, i.e. **participation and ownership** by the local side in the view of the local interests has been assured. The cooperation programme has an informal local coordinating body of charity fund “Easy Breathing”, Arkhangelsk Regional TB Clinic and Northern State Medical University. When needed, representatives of the Arkhangelsk Prison Authority are invited. Active cooperation is exercised with the Arkhangelsk AIDS Centre, general healthcare network, and medical prevention offices of the Central Regional Hospital. The social care service and other NGOs (Red Cross, NGO “Rassvest”) do not take part in the implementation of the cooperation programme as they do not deal with TB patients. In Arkhangelsk Region, there are no TB patient organisations. Having completed the therapy successfully, the patients leave this environment as quickly as possible.

The cooperation programme did not have close or systematic contacts with other projects and programmes running in the similar field in the Northwest Russia. The cooperation programme is part of the Barents TB Programme, and information about the progress is delivered at request to the coordinator of the Barents Programme. Yet, there is no information about other projects or programmes under the umbrella of the Barents TB Programme, nor information about the implementation of the Barents TB Programme in general. The Steering Committee of the Barents TB Programme seems a relevant audience to communicate information about the cooperation programme and collect first-hand feedback.

Only in the last year of the cooperation programme’s implementation, contacts were established with Nordic Council of Ministers’ health cooperation programme in Northwest Russia “Mobilising efforts for better response: HIV and Co, 2017-2018”. Ms. Nina Nizotseva and Ms. Aleksandra Avdeeva took part at inter-regional seminar “Effective technologies and key principles of active TB screening – Russian regions’ experiences. Management of patients identified in screening” in Murmansk on 23 March 2018, which was held within the NCM health cooperation programme. Also, the Russian partners and programme manager Berthe Stenberg (Norway) took part at NCM health programme’s inter-regional conference in Arkhangelsk on 7-8 June, where they presented their experiences (inter-sectoral collaboration in electronic information management and cooperation of governmental and non-governmental organisations in HIV and TB control. Prof. Andrei Marjandyshev and Dr. Elena Nikishova held a TB control training for Pskov Region’s TB staff in the City of Pskov on 19-20 April 2018.

It is crucial to note that those 8 recommendations that were laid down in 2013 (Results of the 15-year Norwegian-Russian collaboration in TB control ...) have been accomplished or are under implementation in the current phase of the cooperation).

Achievement of the key indicators

Table 3. Achievement of the key indicators of the cooperation programme

Indicators for the cooperation programme B1402 – civil and prison sector unless stated otherwise

Indicators	Baseline indicators	Target indicators	Achieved rates
	2013	2018	end 2017
Decrease in TB notification rate (number per 100,000 population). New cases	40,1	Reduction by 30%	Reduction by 44,1%
Proportion of new multidrug-resistant cases (MDR TB + XDR TB)	26,4%		33,1%
Proportion of new extensively drug-resistant cases (XDR TB)	3,1%		4,2%
TB treatment success rate (drug sensitive TB) (cohort registered one year before)	86,6% (birth cohort 2012)	85%	81,1%
MDR TB treatment success rate (excluding XDR TB) (cohort registered two years before)	60,7% (когорта 2011)	70%	51,9%, but in cohort from year 2016 – 66,0%
Decrease in TB mortality rate, per 100,000 population	5,7%	Reduction by 30%	Reduction by 57,9%
HIV prevalence rate, total cases per year per 100,000 population (only civil sector)	54,5		89,8
HIV notification rate, new cases per year per 100,000 population (only civil sector)	9,4		26,6
Proportion of TB patients tested for HIV	97,9%	100%	98,3%
Proportion of new TB/HIV cases on ARV therapy	87,5%		100%
Co-infection TB/HIV, proportion of HIV among new TB cases (civil and prison sector)	5,2%		6,8%
Co-infection TB/HIV, proportion of HIV among all TB cases	4,5%	7%	5,6%
TB notification rate among children (0 – 14 years old) per 100,000 children population	4,8	2,0 Reduction by 33%	Reduction by 58,3%
<i>Means of verification: Arkhangelsk Regional TB Clinic, statistics for Arkhangelsk Region</i>			

Analysis of the data in Table 3 showed that the majority of the cooperation programme's key indicators planned for achievement in 2018, have in fact been achieved by the end of 2017.

The following key indicators have been over-achieved:

- decrease in TB notification rate per 100,000 population: planned reduction by 30% while the factual reduction was 44,1% as compared to the 2013 baseline rate;
- decrease in TB mortality rate per 100,000 population: planned decrease by 30% while the real decrease was 57,9%;
- Reduction of TB notification among children (0 – 14 years old): planned reduction by 33% while the real reduction amounted 58,3% when compared to the 2013 baseline;

These results serve good evidence about the intense work by the Arkhangelsk Regional TB Service to improve the epidemiological situation and implement new organisational and methodical, diagnostic, therapeutic and preventive techniques and measures.

The following key indicators have not been fully achieved by the end of 2017:

- TB treatment success rate (drug-sensitive TB) (cohort from a year before): planned rate at 85% but in fact the rate was 81,1%;
- MDR TB treatment success rate (excluding XDR TB) (cohort registered two years before): the planned rate was 70% but in reality, the achieved rate was 51,9%, but in cohort from the year 2016 (in the context of the newly introduced short therapy) – 66,0%;
- Proportion of TB patients tested for HIV: it was planned to test all 100% TB patients for HIV but only 98,3% were tested in reality.

These rates show where the gaps in TB control exist and therefore require more effort in the future.

The TB situation in Arkhangelsk Region was analysed in comparison with the situations in Russia and Northwest Russia, and the findings clearly demonstrate solid advance in the period from 2013 to 2018. Total TB incidence rate in Arkhangelsk Region dropped from 40,5 per 100,000 down to 22,4 per 100,000 in 2017 (the Russian average rates declined from 59,5 down to 48,3 per 100,000 population). Notifications about new cases and relapses in Arkhangelsk Region fell from 47,6 in 2013 down to 26,9 in 2017 (together with the prison sector), and from 39,9 down to 21,6 per 100,000 population in the civil sector. In absolute figures the incidence changed from 407 new cases down to 214 in the civil sector, and from 58 new cases down to 37 in the prison sector, and relapses went down from 56 to 28 in the civil sector, and from 32 to 22 in the prison sector. The incidence among children (between 0 and 14 years old) reduced from 4,8 to 2,0 per 100,000 children, and incidence among adolescents (15 – 17 years old) slightly inclined from 5,9 up to 6,4 per 100,000 adolescents. The absolute number of newly diagnosed children declined from 10 to 4, and the absolute number of newly diagnosed adolescents remained the same (2 persons).

In terms of the TB incidence among all Russian regions, Arkhangelsk Region was ranked among the regions with the least incidence rates in 2017 (Fig. 1, 2, 3, 4, 5, 6, 7 in Annex 1).

In the period from 2013 to 2017, the TB-induced mortality in Arkhangelsk Region (including the prison sector) reduced from 5,7 to 2,4 per 100,000 population (in Russia, the average rates changed from 11,3 to 5,9 per 100,000 population; data from death certificates). In absolute terms, TB-caused deaths diminished from 74 to 65 in the civil sector, and from 1 to zero in the prison sector. With regard to TB mortality among all Russian regions, Arkhangelsk Region belonged to the regions with the lowest death rates in 2017 (Fig.8, 9 and 10 in Annex 1).

The comparative analysis shows that both in the mortality and morbidity rates among all northwestern Russian regions in 2017, Arkhangelsk Region scores as one of the best regions (Fig. 11 in Annex 1).

The absolute number of the co-infection (TB and HIV) in the civil sector reduced from 12 to 7 cases, and remained the same in the prison sector (12 persons). In 2013, one relapse of TB in

combination with HIV was recorded, while in 2017, no relapse of TB was registered among the co-infected (Fig 12 and 13 in Annex 1).

As of 31.12.2017, all in all, 250 people with active TB were on the records, of whom 214 were new cases and 36 were relapse cases; with multidrug-resistant TB – 133 people, of whom 18 had per-XDR TB, and 15 people had XDR TB (Fig. 14 and 15 in Annex 1).

Therefore, one can conclude that the TB epidemiological situation in Arkhangelsk Region improved in the period from 2013 to 2018. The improvement became possible due to further development of available and introduction of new organisational, methodical, diagnostic, therapeutic and preventive techniques and measures.

A big achievement of the Arkhangelsk Regional TB Service has been an established and continuously improved TB monitoring system, which helped track the TB situation in the civil and prison sectors in a series of parameters:

I. Monitoring by disease category (age, gender) and mortality:

- New cases (co-infection with HIV)
- Relapses (co-infection with HIV)
- Advance of the disease after interrupted therapy (co-infection with HIV)
- Ineffective therapy (co-infection with HIV)
- Morbidity by age group and gender
- TB mortality.

Monitoring combined with drug sensitivity testing and disease category, including:

- drug sensitivity among new cases of pulmonary TB (percentage);
- drug sensitivity among relapse cases of pulmonary TB (percentage).

Analysis of the drug sensitivity in these groups of patients showed that in the period from 2013 to 2017 the proportion of patients with pulmonary TB reduced but also reduced the proportion of drug-sensitive pulmonary TB patients, both among new cases – from 64% to 58,1%, and among relapse cases – from 48,1% to 45,8%. The share of drug-resistant pulmonary TB patients grew from 26,4% to 33,1% among new cases, and from 51,9% to 54,2% among relapse cases.

The improved monitoring system enabled obtaining detailed data about the prevalence of drug resistance in different patient groups (Fig. 16 and 17, Tables 1, 2, 3 in Annex 1)

II. Sputum smear monitoring:

- sputum smear microscopy;

- culture confirmation test (MGIT);
- molecular test (GeneXpert);

The thorough sputum smear monitoring became possible due to the implementation of rapid drug sensitivity testing methods, including BacTAlert – in 2004 – 2009, LPA (Hain Test) - from 2009, Bactec MGIT (drug sensitivity to the first-line drugs from 2010, drug sensitivity to the second-line drugs from 2011, GeneXpert – from 2011). At the moment, microscopy in Arkhangelsk Region is being done in accordance with the algorithm of microscopic diagnostics and drug sensitivity testing. This enabled bacteriological confirmation of TB diagnosis in 2017 by sputum smear microscopy in 50,7% of the cases, by Gxpert method – in 69,8%, by MGIT method – in 67,1% of the cases (Fig. 18 and 19 in Annex 1).

III. Monitoring by treatment success

- by disease category
- by drug sensitivity test
- by sputum smear

TB patients are treated in Arkhangelsk Region in compliance with the standard treatment regimes based on drug sensitivity data (Table 13 in Annex 1).

Treatment of TB patients is exercised in stationary and ambulatory settings (including online video-observed therapy). The major criterion for referral to the hospital is suspicion of sputum smear-positive TB in combination with clinical, laboratory and radiology symptoms. The stay in hospital can be prolonged in case of persistent active TB, progression of the disease, poor tolerance of drugs and serious side-effects, which require hospital care. In this case a patient may be transferred to the nursing care bed. The criterion for the discharge of a patient from the hospital and continuation of treatment in outpatient facilities is absence of epidemic danger for the public health (when the patient is not contagious) combined with positive clinical, radiological and laboratory changes.

The results of the treatment of all categories of TB patients (by sputum smear and drug sensitivity data) are presented in Tables 4 - 12 of Annex 1.

The comparative analysis of the treatment success among all categories of TB patients demonstrated large differences in these groups in certain parameters in the period under examination – 2013 to 2017.

The basic chemotherapy course was successful mostly among patients with drug-sensitive TB (81,1%), least successful it was among patients with pre-XDR TB (25%). Most often, the basic chemotherapy course failed among patients with XDR TB (25%), and least often – among patients with drug-sensitive TB (2,1%). The loss to follow-up was most often recorded in patients with XDR TB (25%), and least often – in patients with drug-sensitive TB (0,7%). In the period under examination, the biggest share of deaths caused by TB was among sputum smear-positive patients with no drug sensitivity data (up to 46,7%).

The opportunity to differentiate treatment results in different patient groups underlines advantages of the TB monitoring system implemented in Arkhangelsk Region. It should be noted that the existing health information system contains data on all TB patients in the civil sector and the prison

sector of Arkhangelsk Region. Over the period under examination, the information system was enlarged with new parameters and sections (chemoprevention, TB skin test, intolerance to TB drugs, laboratory parameters – blood and urine tests, data on identified genetic mutations of mycobacteria, pharmacy stock).

One of the components of the cooperation programme is realisation of patient-friendly approaches. In 2013 to 2017, several measures were put into practice:

- the psychologist works practically with each patient who was placed on the records of the regional TB Clinic. The psychologist work implies individual consultations, usage of original methods (plastilina therapy) aimed at prevention of the loss to follow-up and improving adherence to treatment;
- the social workers help all inpatient and outpatient TB patients who need social support (restoring documents or making new ones, purchase of basic products, etc.);
- the psychologist works with the staff of the TB Clinic and other professionals (individual and group classes) to improve their skills of working with different categories of TB patients;
- the psychologist also takes care of the burnout among the staff of the regional TB Service;
- such methods have been introduced in Arkhangelsk Region as online video-observed therapy (both among adults and children), home-based hospital (TB drugs are delivered directly to patients' homes and drug taking is observed by health workers);

One of the components of the cooperation programme is support to children's TB sanatoria. In 2013 to 2017 the TB situation among children (0 – 14 years old) has improved a lot. The TB incidence in this group reduced by 58,3%: from 4,8 per 100,000 children in 2013 down to 2,0% per 100,000 children in 2017, which exceeds the target indicator (reduction by 33%). The counseling and diagnostic centre in the City of Arkhangelsk and the Favorskaya children's TB sanatorium (school grades 1 to 9) offer services to the children population. The counseling and diagnostic centre does outpatient counseling for patients from all over the region, and also has an inpatient ward with 20 beds. Keeping in mind the present epidemiological situation the existing facilities are enough to cover the needs of the children population. The counseling and diagnostic centre is equipped with needed equipment and tools, and fully staffed.

An important role in the improvement of the epidemiological situation belongs to charity fund "Easy Breathing", the local coordinator and implementing party of the cooperation programme.

LESSONS LEARNT

1. Arkhangelsk Region has accumulated state-of-the-art experiences in prevention, diagnosis and treatment of tuberculosis. These experiences are worth of studying by other Russian regions and demonstration at the international level. Dissemination of these experiences and practices is possible, inter alia, through communication of the outcomes at relevant fora, and piloting through project-based activity in other regions.
2. Well-coordinated work of the regional TB Service, general healthcare network, regional AIDS centre, non-governmental organisations, Arkhangelsk Regional Branch of the Prison Authority, Northern State Medical University, and charity fund "Easy Breathing" contributes

- to the improvement of the TB situation in Arkhangelsk Region. This model suits ideally for project planning and implementation.
3. Restructuring of the TB Service in line with the current demand will help save and rationally use the material and human resources. It will also open opportunities for re-training and use of free human resources in adjacent specialties (e.g. pulmonology).
 4. The single regionally-wide monitoring system based on the health information database allows to unbiasedly assess the current epidemiological situation and plan measures for further improvement of the situation.
 5. Data collection is not a purpose in itself but an instrument for decision-making.
 6. Application of such methods as social support, psychological work, online video-observed therapy, work of the charity fund and volunteers allow enhancing the effectiveness of preventive, diagnostic and therapeutic measures and, consequently, improving the epidemiological situation for tuberculosis.
 7. International cooperation does not just enrich with new knowledge, information and experiences but also facilitates stronger and closer collaboration at the local level.
 8. On the one hand, a cooperation programme should have clear and well-constructed goals, objectives, expected results and actions. On the other hand, it is crucial to have space for maneuvering to be able to operatively respond to the changing situation.
 9. Material incentives have important, but not decisive, role in ensuring adherence. A kind word and human attitude motivate a patient to treatment with the same effect.
 10. The cooperation between Norway and Arkhangelsk Region in the health sector, which has uninterruptedly been going on for over 20 years, is a big asset and should be valued.
 11. According to the interviewed specialists, without the cooperation programme it would hardly be possible to arrive at the current situation and reach such results. The cooperation programme is a powerful motivational factor and a catalyst of own initiatives.

RECOMMENDATIONS

The list of recommendations for future cooperation will be divided into two parts. The former will deal with recommendations concerning the territory of Arkhangelsk Region. The latter will present recommendations for actions at the level of Northwest Russia. In some parts the recommendations for Arkhangelsk Region and Northwest Russia may coincide. It is important to note that the recommendations given below in many ways resonate with the recommendations given four years ago.

Recommendations for Arkhangelsk Region

1. It is crucial to further improve the work with key groups of the TB service and, among other things, exercise differentiative approach based on the social status, psychological features, pathology, and history of therapy interruptions. Arkhangelsk Region has all appropriate conditions to serve as a demonstration site for other regions and pilot best practices from Russia and abroad.
2. To continue early identification of TB in risk groups (social, medical, epidemic) to prevent post-mortem diagnosis of tuberculosis, advanced TB cases, disseminated and progressing cases of TB with positive sputum smear and drug resistance, which pose a threat for the spread of the disease in Arkhangelsk Region.
3. To shift the accent of the preventive, diagnostic and information work from general population to key groups and to enlarge the contact-tracing range (whole house or a block of an apartment building).
4. To look for own resources, including extra-budgetary resources, to deliver social support to TB patients.
5. To find opportunities, including the use of the administrative resource (meetings of the Governor with the heads of districts and municipalities) to involve other municipalities of Arkhangelsk Region, particularly most affected municipalities, in the future phase of cooperation.
6. To consider continuation of the communication training course and expansion of the training beyond the TB service by using trained trainers.
7. To consider continuation of the operational research training course.
8. To strengthen qualifications of the general healthcare network in early identification of TB and HIV infection, which will also have a stigma reduction effect. Such trainings could become part of the continued medical education in the future.
9. To activate reduction of self-stigma and stigma from medical workers and employers.
10. To integrate the topic of patient communication into the curricula of the medical university and medical college.
11. To continue the search of the ways how to attract other stakeholders into the joint work (social support service, drug addiction service, non-governmental organisations, also from outside of Arkhangelsk Region, e.g. Global Coalition of TB Activists, Lilly MDR-TB Partnership, TB PEOPLE – a network of people with experience of TB in the Eastern Europe & Central Asia region) and get involved into bigger networks (e.g. TB Europe Coalition, Stop TB Partnership).

Recommendations for the Northwest Russia

1. To shift the accent of the next cooperation phase on dissemination of experiences to other regions of NW Russia and on working in regions of NW Russia in general, e.g. via delivering the message about the key actions and successes of the cooperation programme at meetings of the Joint Working Group on Health and Related Social Issues of the Barents Euro-Arctic Region (JWGHS) where relevant healthcare authorities from NW Russia are present.
2. To use own trained staff for the translation of experiences, in particular for realisation of the communication training.
3. The model of the triumvirate – partnership of the practice (civil and prison TB control services), science and education (Northern State Medical University), and the third sector (charity fund “Easy Breathing”) – established in Arkhangelsk Region in TB control proved its effectiveness and the right for replication.
4. The component of operation research can be expanded through inclusion of young researchers and specialists from other regions of the NW Russia. It looks possible to set up teams of two specialists from different regions, who would work at one article. It may also be possible to establish teams of different specialties.
5. The online video-observed therapy has potential for the use in other regions of the country. Such form does not require large investments and enables a patient-friendly approach.
6. The health information system introduced in the TB Service of Arkhangelsk Region enables up-to-date and high-quality data and presents a tool for mutually beneficial inter-sectoral - patient-centred collaboration. The health information system is compatible with the federal TB and HIV registers. It is strongly advisable to promote advantages of the HIS and find ways to implement the software product in other regions of NW Russia.
7. It is advisable to employ other international cooperation projects and programmes for synergies and avoidance of overlapping, e.g. to establish closer links with the Steering Committee of the Barents TB Programme
8. Charity fund “Easy Breathing” can be a coordinator in dissemination of experiences and best practices to other regions of the NW Russia.

Suggestions for the next immediate steps

- To produce a leaflet (both electronic and in print) and a presentation (in Russian and English) about the major outcomes (success in combating with TB – a few graphs) and key products of the cooperation programme with a short description and a list of advantages for each, e.g. HIS, online video-controlled therapy, communication training, operational research module-based training, etc. Three principles should be kept in mind: plain language, visualisation, and conciseness. This will help in marketing effort and achievements.

- To ensure delivery of the message about the cooperation programme, its principal areas and key outcomes to the relevant audience, particularly healthcare authorities of the Russian northwestern regions (e.g. Steering Committee of the Barents TB Programme, BEAR JWGHS, conferences and seminars for NW Russian TB authorities and experts)
- In the next phase of the cooperation to combine work inside Arkhangelsk Region (to prioritise under-achievements of the 2018 key indicators and define appropriate interventions, and shift to working with key populations) with work outside Arkhangelsk Region (to negotiate at least one NW Russian region for replication of the best practices)
- To identify ongoing TB-related projects and programmes in the NW Russia, both domestic and international, to establish bonds and launch concerted actions.

ANNEXES

Annex 1. Epidemiological data

Figure 1

TB notifications in Russia and Arkhangelsk Region in 1991 to 2017 (per 100,000 population, civil and prison sector together)

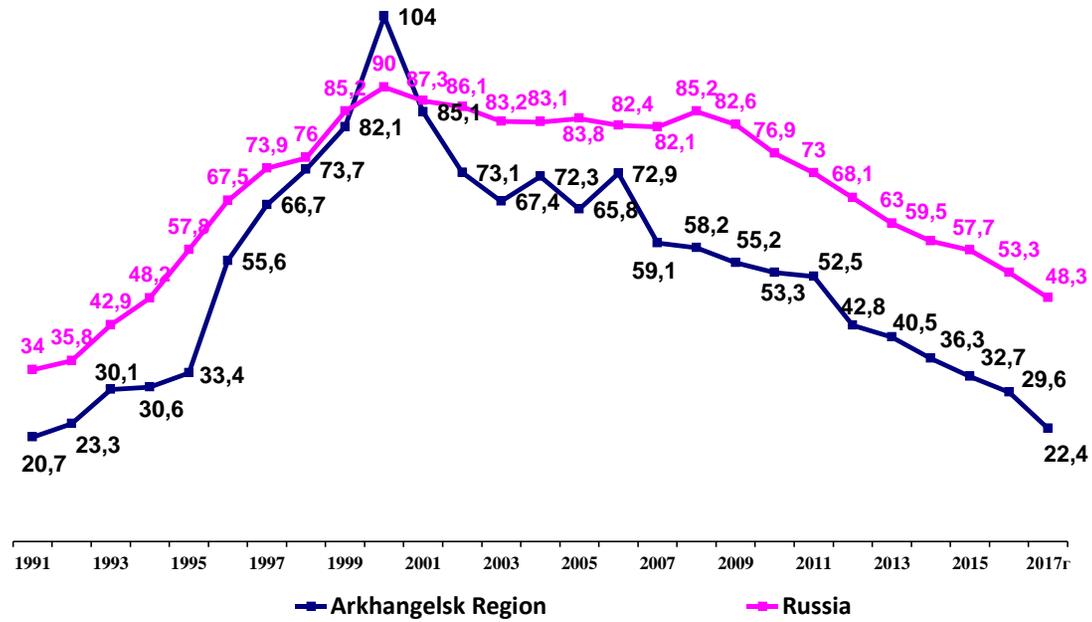


Figure 2

TB notifications (new and relapse cases) in Arkhangelsk Region in 2000 to 2017, per 100,000 population

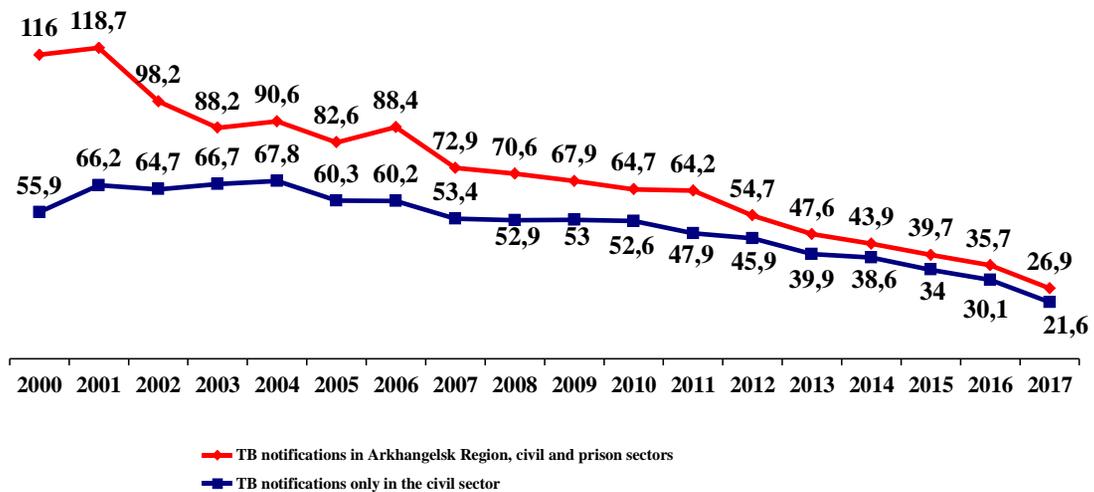


Figure 3

TB notifications (new cases) in Arkhangelsk Region in 2001 to 2017 (absolute numbers)

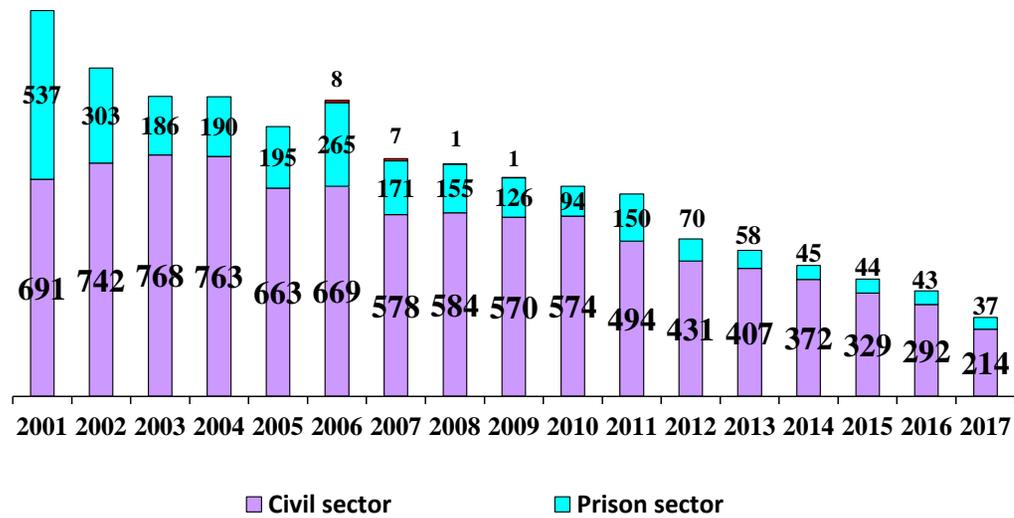


Figure 4

TB relapses in 2001 to 2017 (in absolute figures)

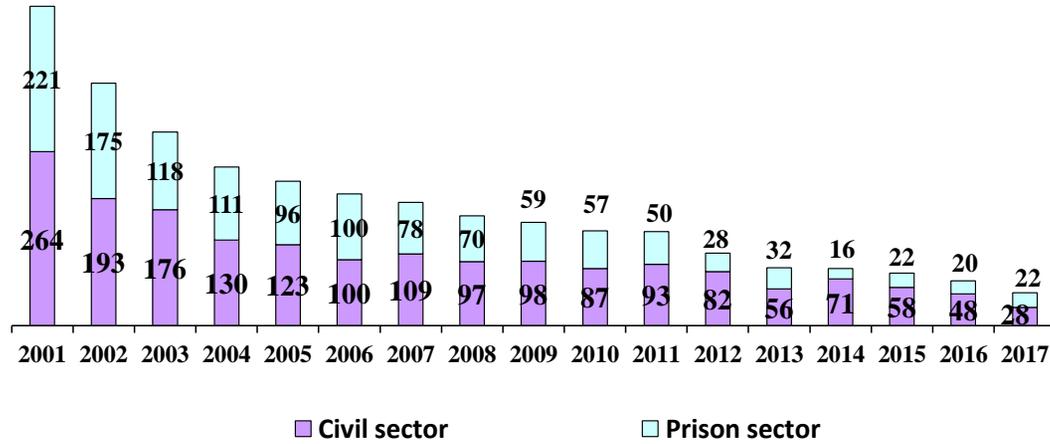


Figure 5

TB incidence (new and relapse cases) among children in Arkhangelsk Region in 1995 to 2017 (per 100,000 population)

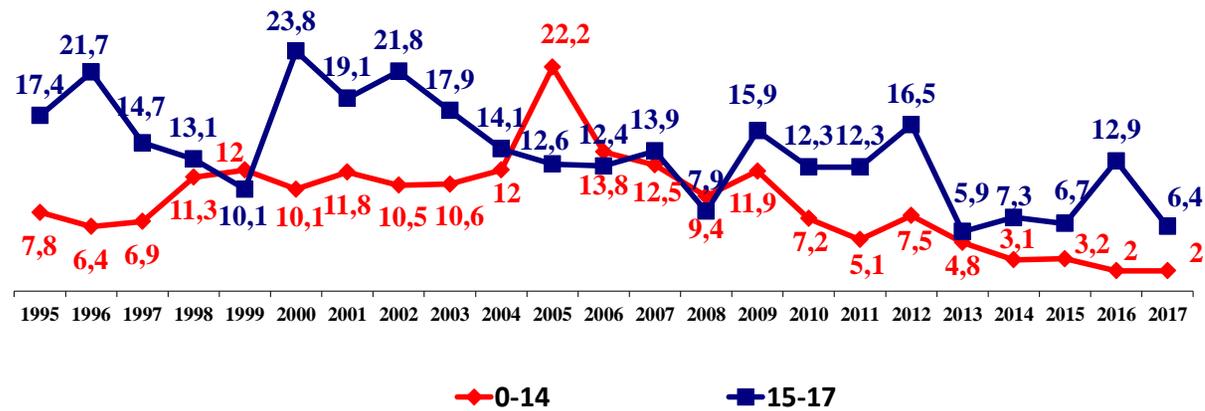


Figure 6

TB incidence (new cases and relapses) among children and adolescents in Arkhangelsk Region in 2001 to 2017 (in absolute numbers)

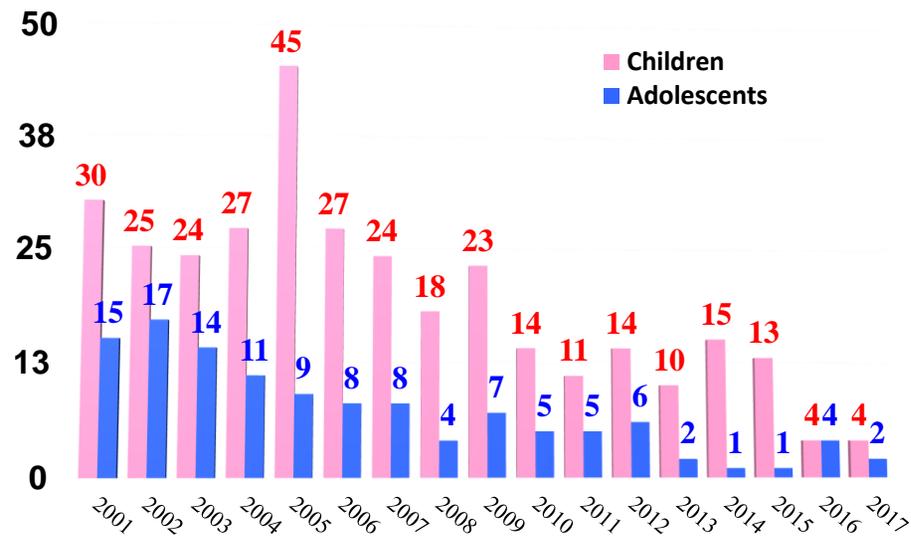


Figure 7

Russian regions with highest and lowest TB incidence in 2017

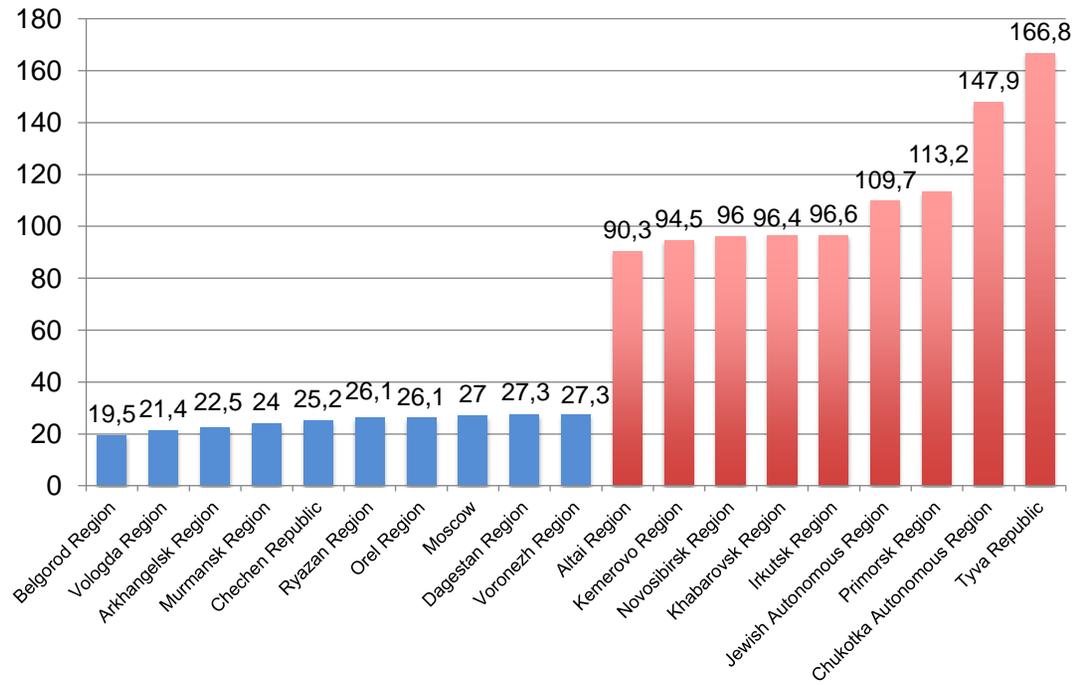


Figure 8

TB mortality in Russia and Arkhangelsk Region, civil and prison sectors (per 100,000 population), data retrieved from death certificates

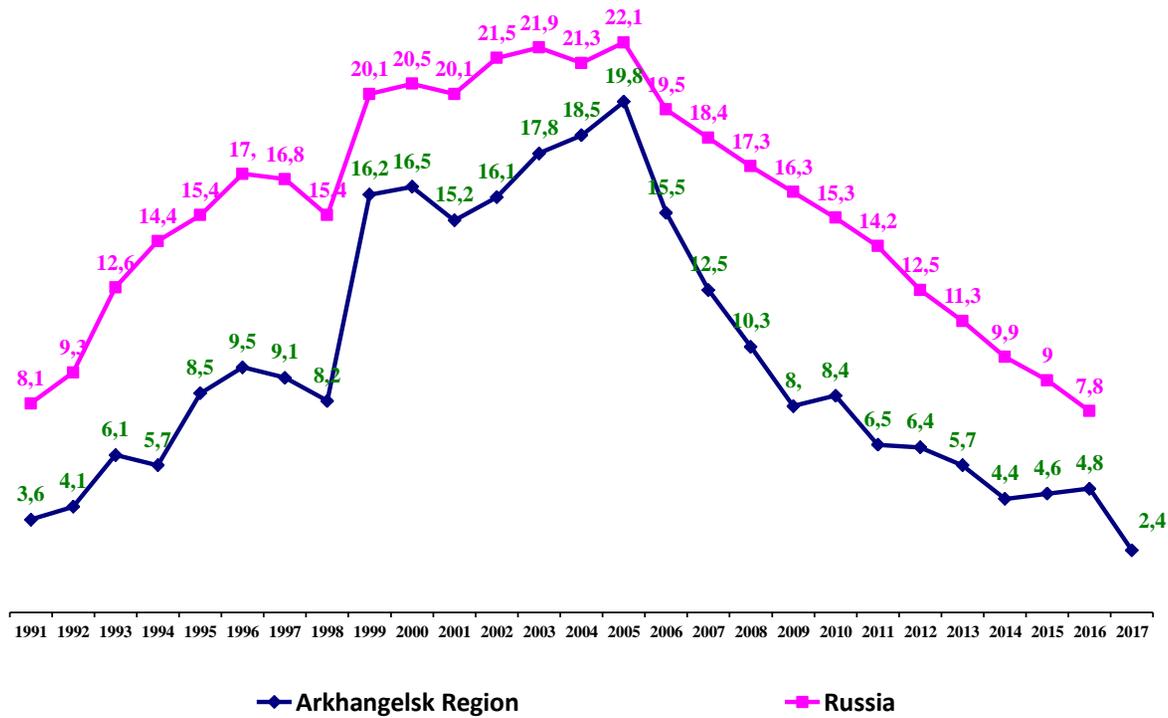


Figure 9

TB mortality in Arkhangelsk Region (in absolute figures)

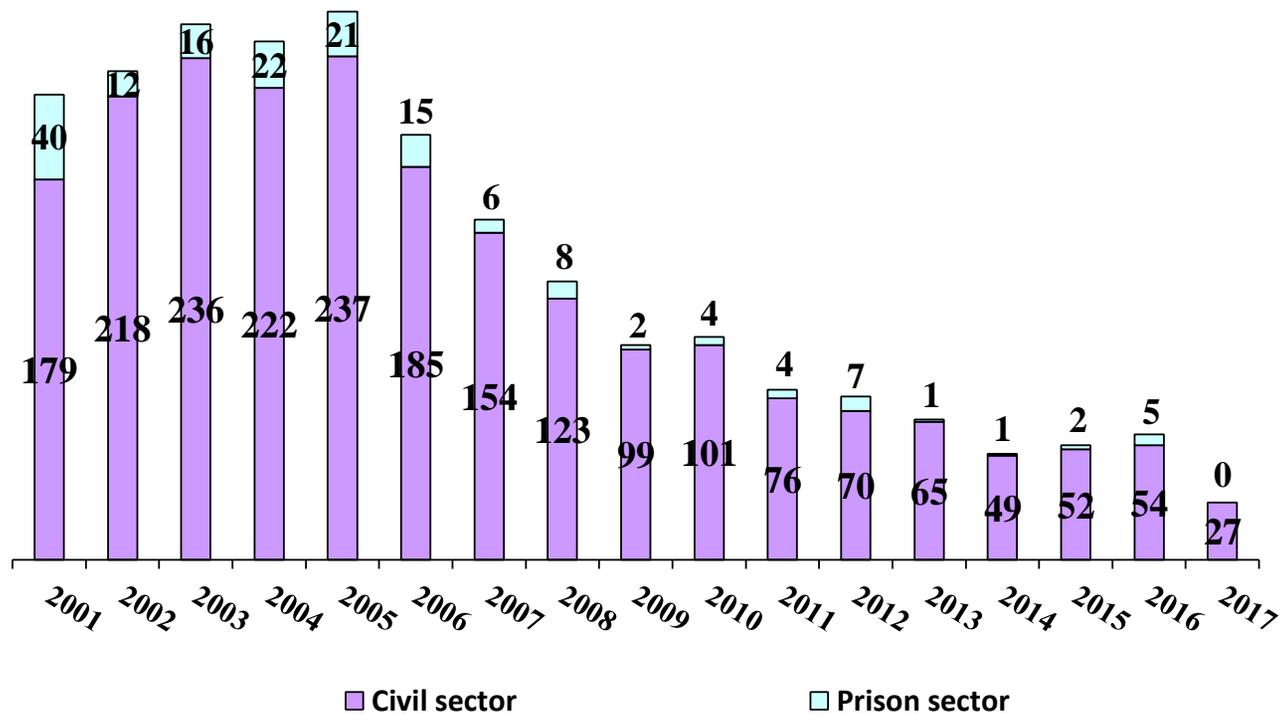


Figure 10

Russian regions with the highest and lowest TB mortality in 2017, civil and prison sectors (data from Rosstat)

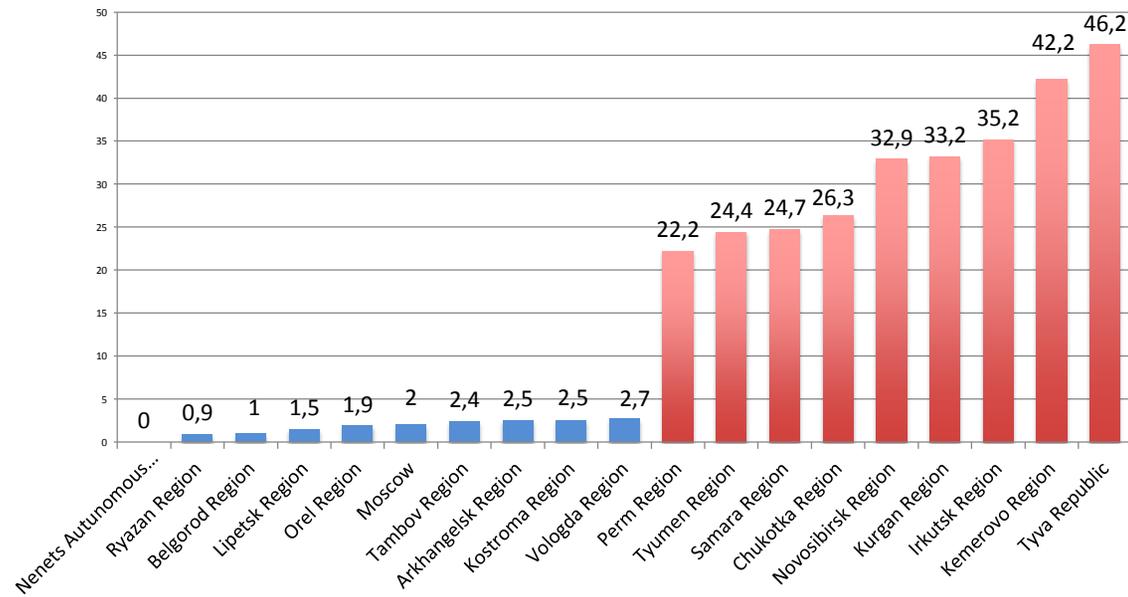


Figure 11

TB incidence and mortality in Northwest Russia, 2017, incl. civil and prison sectors

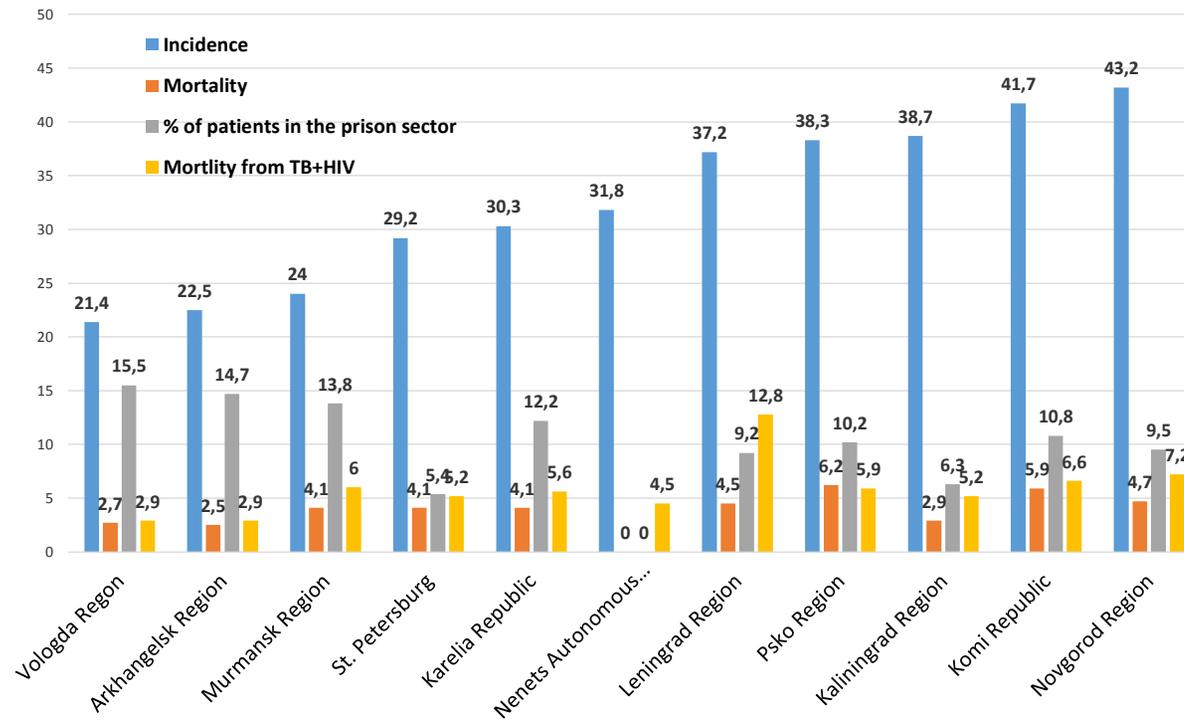


Figure 12

New cases – co-infection of TB and HIV

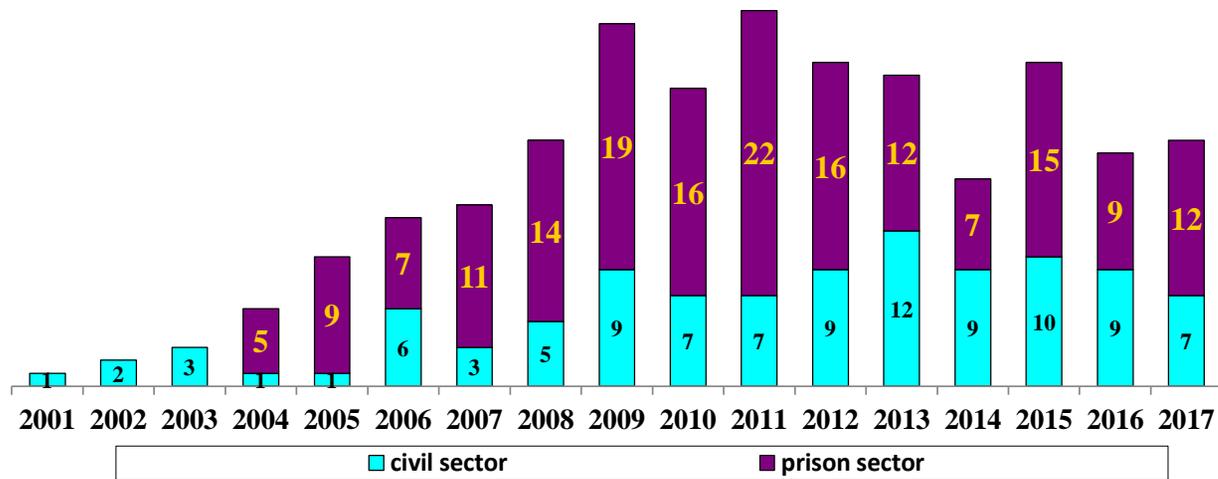


Figure 13

Relapses – co-infection TB and HIV

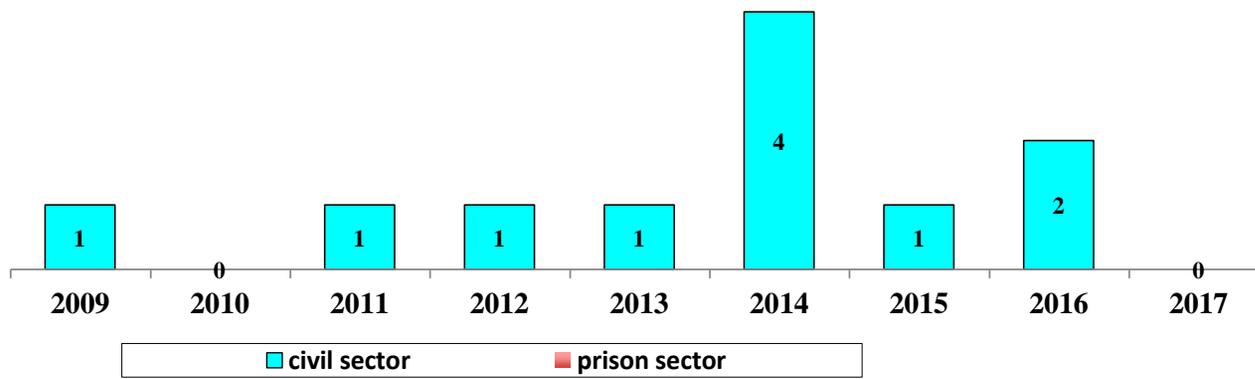


Figure 14

Registration of TB cases in the civil and prison community of Arkhangelsk Region

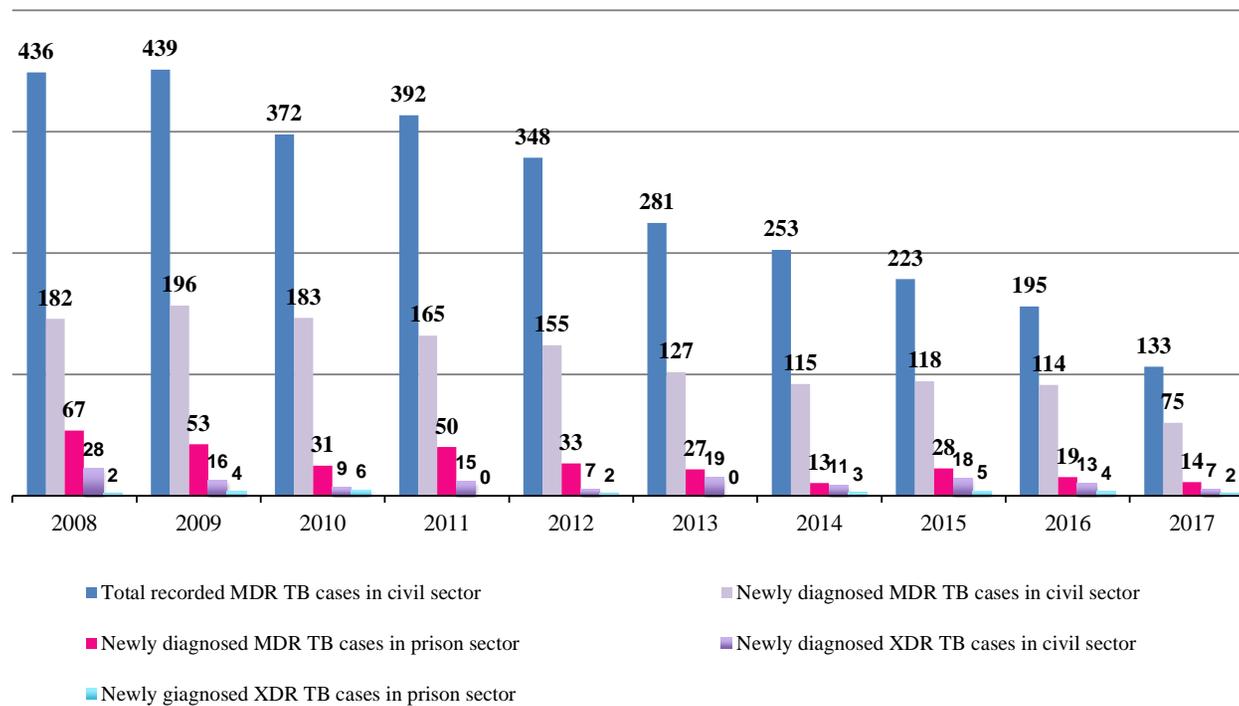


Figure 15

Registration of all TB cases in the civil and prison community of Arkhangelsk Region

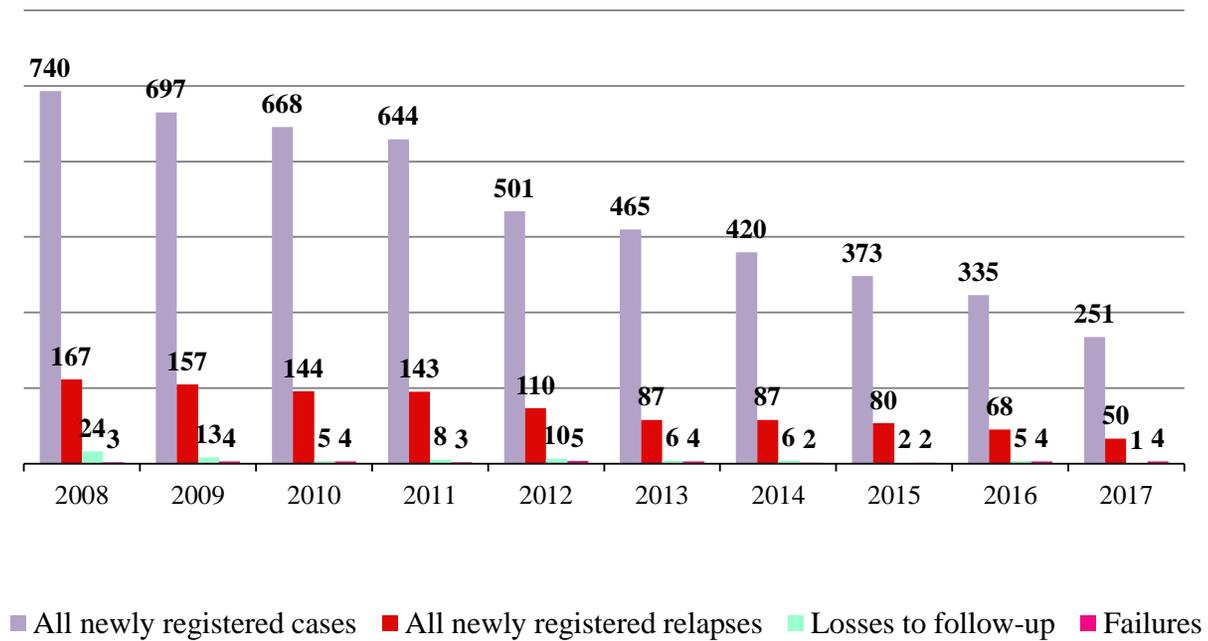


Figure 16

Drug sensitivity among newly diagnosed pulmonary TB cases in 2008 to 2017 (percentage), civil sector

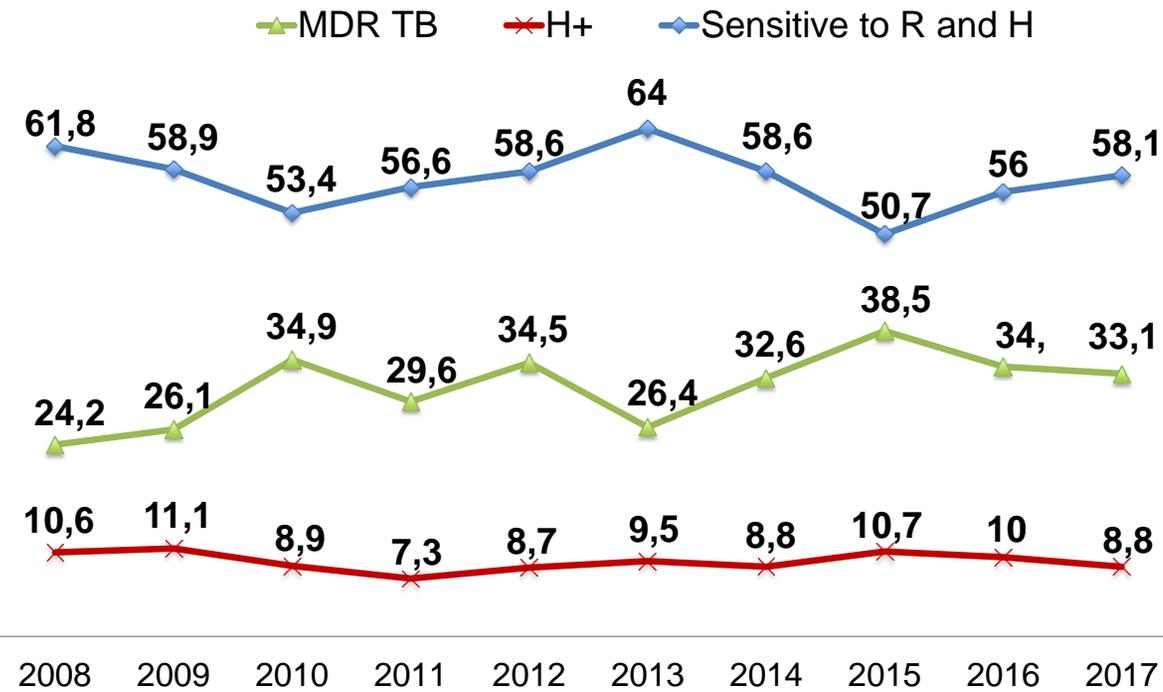


Figure 17

Drug sensitivity among relapses of pulmonary TB in 2008 to 2017 (percentage), civil sector

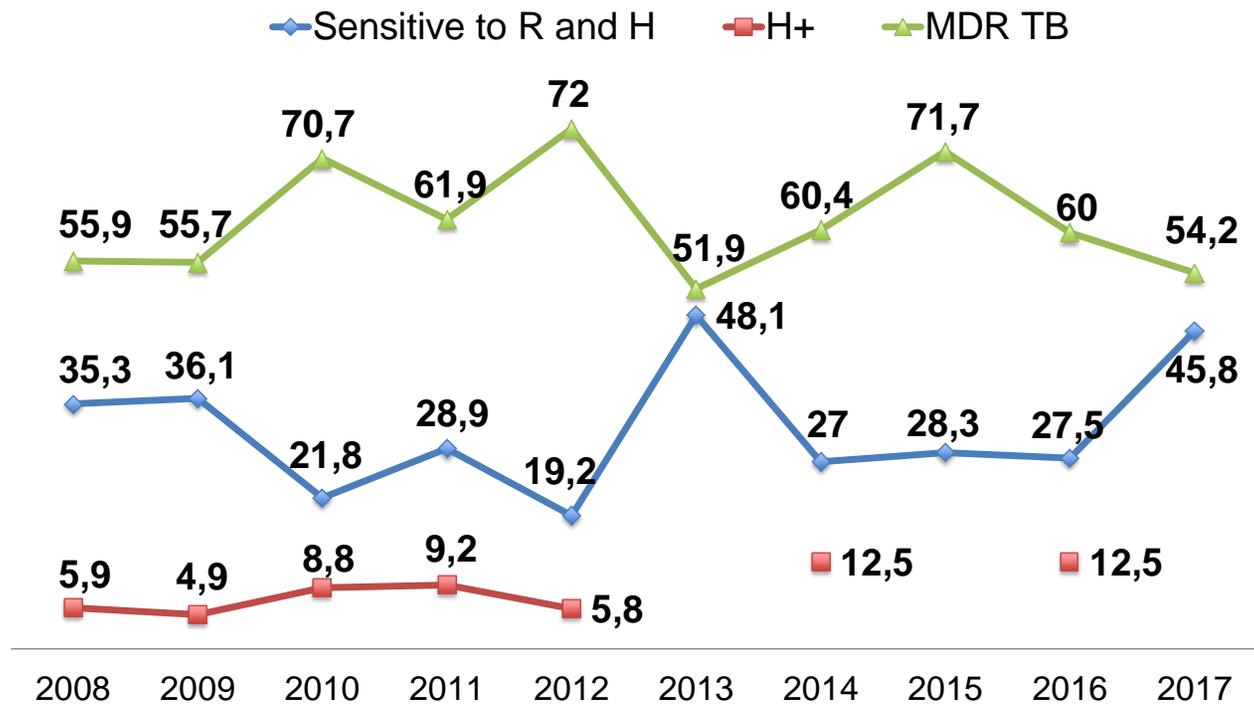


Table 1

Data of drug sensitivity monitoring in the civil sector, 2017
 (% of drug sensitivity tests done)

Ranges of TB drug sensitivity	New case	Relapse	Treatment after loss to follow-up	Treatment after failure
Totally on records	214	28	3	5
Patients with confirmed positive sputum smear	160	24	2	5
Patients who had drug sensitivity tested	160	24	2	5
Sensitivity confirmed	93 (58,1%)	11 (45,8%)		3 (60%)
Resistance to H+	14 (8,8%)	-		1 (20%)
Resistance to R/H R	48 (30%)	10 (41,7%)		
Resistance to H R Fq	-	2 (8,3%)		
Resistance to H R Km/Am/Cm	3 (1,9%)	1 (4,2%)		
Resistance to H R Fq Km/Am/Cm	2 (1,3%)		2 (100%)	1 (20%)

Table 2

Registration of MDR TB in the civil sector in 2007 to 2017

Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
New case	124	113	131	132	111	112	96	91	91	92	66
MDR TB from relapse	70	51	54	45	50	38	28	22	27	19	9
MDR TB from loss to follow-up	13	13	5	3	5		1	-	-	2	0
MDR TB from treatment failure	1	5	6	3	1	5	2	2	-	1	0
First episode of MDR TB	208	182	196	183	167	155	127	115	118	114	75
Relapse of MDR TB	0	5	3	8	5	9	4	13	10	10	4
Loss to follow-up of MDR TB	28	19	21	16	5	4	11	11	10	7	3
Treatment failure of MDR TB	9	3	4	6	5	6	8	8	3	12	1
Other cases of MDR TB					2		1	2	-	1	3
XDR	26	28	16	9	15	7	18	11	18	13	7

Table 3

XDR TB

	2009	2010	2011	2012	2013	2014	2015	2016	2017
	16	9	15	7	18	11	18	13	7
<i>New case of MDR</i>	4	1	9	4	6	5	7	5	2
<i>MDR from relapse</i>	3	2	1		1	1	3		1
<i>MDR from loss to follow-up</i>	1							2	
<i>Relapse of MDR</i>			1				3	2	1
<i>Loss to follow-up of MDR</i>	5	4		1	3	1	1	1	1
<i>Treatment failure of MDR</i>	3	2	4	1	5	3	2	3	1
<i>Arrivals from outside</i>				1	3	1	2		1

Table 4

Outcomes of treatment of patients with confirmed drug sensitivity

	Recorded	Therapy success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out	TB diagnose removed	MDR/XDR diagnosed in treatment
2012	168	81,5	1,8	7,1	3,6	4,8	0,5		0,6
2013	196	78,1	0,5	9,6	5,1	2,6	3,6	0,5	0,5
2014	161	75,2	3,1	7,5	4,3	5,6	1,2		3,1
2015	148	82,4		9,5	4,7	1,4	2,0		
2016	143	81,1	2,1	11,2	4,9	0,7			

Table 5

Treatment outcomes for patients with resistance to H

	Recorded	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out	TB diagnose removed
2012	30	83,3	3,3	6,7		3,3	3,3	
2013	25	84,0		4,0		4,0		8,0
2014	28	67,9	3,6	3,6	3,6	14,3	3,6	3,6
2015	22	77,3		13,6			4,5	4,5
2016	26	73,1	7,7	11,5	3,8	3,8		

Table 6

Treatment outcomes for sputum smear-neg patients with no drug sensitivity data

	Recorded	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out	TB diagnose removed	MDR/XDR diagnosed in treatment
2012	135	85,6	2,2	1,5	2,2	6,5	1,5	1,5	
2013	97	87,6	2,0	3,0	6,1			1,0	
2014	112	82,1	0,9	1,8	5,3	5,4	2,7	1,8	
2015	121	86,0		0,8	5,0	3,3	2,5	2,5	
2016	46	76,1			15,2	4,3	4,3		

Table 7

Treatment outcomes for sputum smear-pos patients with no drug sensitivity data

	Recorded	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out	TB diagnose removed	MDR/XDR diagnosed in treatment
2012	20	45,0		35,0	10,0		5,0		5,0
2013	16	37,5		18,8		6,3	12,5	12,5	12,5
2014	14	64,3	7,1	14,3	7,1	7,1			
2015	25	32,0		40,0	16,0	4,0		8,0	
2016	15	33,3		46,7	13,3			6,7	

Table 8

Treatment outcomes for MDR TB patients, the whole cohort

	Recorded	Continue therapy	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out	TB diagnose removed	MDR/XDR diagnosed in treatment
2012	157		63,1	6,4	4,5	8,3	10,8	2,5	2,5	1,9
2013	146		51,4	6,8	7,5	2,0	24,7	1,4	0,7	5,5
2014	136		56,6	8,0	3,2	6,7	13,3	3,7	1,5	6,7
2015	156		51,9	4,5	11,5	6,4	19,9	2,6		
2016	144	5,6	60,4	3,5	13,2	5,6	9,7	0,7	0,7	0,7

Table 9

Treatment outcomes for patients with resistance only to R / H R

	Recorded	Continue therapy	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Rejected therapy	Transfer out	TB diagnose removed	XDR diagnosed in treatment
2012	97		53,6	7,2	6,2	12,4	11,3	2,1	7,2		
2013	96		54,1	3,1	9,4	1,0	29,1				3,1
2014	99		56,6	6,0	2,0	12,1	16,2		4,0		2,0
2015	123		57,7	4,9	10,6	6,5	18,7		0,8		
2016	112	1,8	67	2,7	13,4	6,3	8,0			0,9	

Table 10

Treatment outcomes for patients with resistance to H R Km/ Am/ Cm

	Recorded	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Dismissed	TB diagnose removed	XDR diagnosed in treatment
2012	22	77,3	4,5	9,1	9,1				
2013	9	55,5	11,1			33,3			
2014	8	62,5	12,5			12,5			12,5
2015	9	33,3	22,2	11,1		33,3			
2016	10	50	20	10		10			10

Table 11

Treatment outcomes for patients with resistance to H R Fq

	Recorded	Continue therapy	Success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Rejected therapy	Transfer out	TB diagnose removed	XDR diagnosed in treatment
2012	8		37,5	12,5		12,5	25,0				12,5
2013	9		33,3	33,3	11,1		11,1				11,1
2014	7		57,1	28,6					14,3		
2015	6		16,7				50		33,3		
2016	6	33,3	50		16,7						

Table 12

Outcomes for treatment of XDR TB

	Recorded	Continue therapy	Therapy success	Therapy failure	Died from TB	Died from other causes	Loss to follow-up	Transfer out
2011	2			100				
2012	3		66,7			33,3		
2013	11		45,5	18,2	9,1		18,2	9,1
2014	4		50,0	50,0				
2015	18		33,3	11,1	27,8	11,1	11,1	5,6
2016	16	18,8	25		18,8	6,3	25	6,3

Figure 18

Bacteriological confirmation of the diagnosis of pulmonary TB
in Arkhangelsk oblast, 2001 – 2017 (civil sector; percentage)

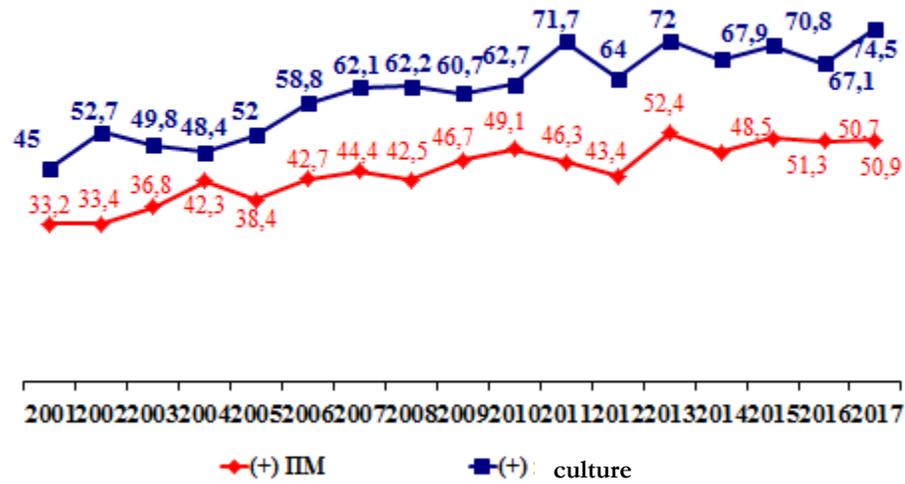
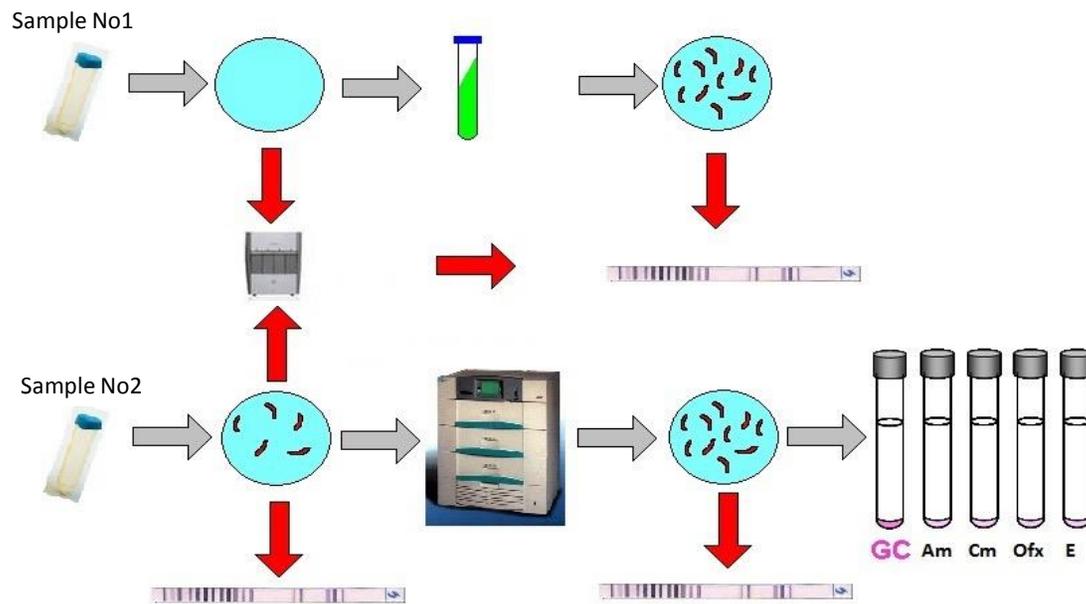


Figure 19

Algorithm of bacteriological diagnostics and drug-sensitivity testing in Arkhangelsk Region



Two sputum assays are tested:
1. In case of a negative result of the sputum microscopy, a line probe assay is taken (HainTest), culture cultivated in solid media followed by microscopy of culture suspension. The both assays are examined by the GeneXpert method.
2. In case of a positive result of the sputum smear, the assay is examined through HainTest, GeneXpert and Bactec MGIT. Microscopy of the culture suspension is done and sensitivity to drugs of the 1st and 2nd line is tested.

Table 13

Standard regimes of all TB patients based on drug sensitivity data

New cases, relapses, treatment after interrupted therapy, treatment after unsuccessful short therapy course	Intensive phase	Continuation phase
Preserved drug sensitivity, negative sputum smear	2 HREZ	4 HR
Resistance to H, incl resistance in combination with other drugs, excluding R	2 R Z E Km Lfx	4 R Z E Lfx
MDR TB	4 (8) Z Km Lfx Pto Cs PAS	8 (12) Z Lfx Pto Cs PAS

Annex 2. List of interviewees during the field mission on 8 – 14 June 2018

Charity Fund “Easy Breathing”

1. Dr. Nina Nozovtseva, chair
2. Ms Aleksandra Avdeeva, manager and interpreter

Arkhangelsk Regional TB Clinic

3. Dr. Dmitry Perkhin, chief doctor
4. Dr. Oksana Sveshnikova, vice chief doctor
5. Dr. Elena Belousova, psychologist
6. Dr. Anastasia Kulizhskaya, head of institutional and methodical department
7. Dr. Aleksander Kropivny, feldsher of the home-based hospital
8. Dr. Palton Eliseev, doctor of clinical laboratory

Northern State Medical University

9. Prof. Andrei Marjandyshev, head of phthisiology department

Norway

10. Ms. Berthe Stenberg, manager of the Norwegian-Russian Cooperation Programme “Stop TB in the Northwest Russia in our Lifetime”, senior advisor at LHL International
11. Dr. Einar Heldal, consultant (by Skype)

Severodvinsk City Hospital No 1

12. Dr. Natalia Vlasova, head of outpatient TB department
13. Ms Svetlana Martynenko, chief nurse
14. Ms Marina Ilatovskaya, nurse
15. Tamara Kolomiets, medical statistician

Arkhangelsk Regional Authority of the Federal Prison Service, healthcare unit No 29

16. Dr. Vladimir Luchinsky, chief doctor of healthcare unit No29
17. Dr. Aleksander Smolensky, vice head of methodical and clinical work

Arkhangelsk Regional Skin and Venereal Disease Clinic, AIDS Centre

18. Dr. Konstantin Baryshkov, chief doctor
19. Dr. Tatiana Sorokina, vice chief doctor
20. Dr. Elena Kizilova, medical psychologist
21. Dr. Olga Romanova, infectionist
22. Dr. Liudmila Verbitskaya, infectionist

Participants of the feedback seminar, 14 June, Arkhangelsk City

1. Olga Shabalina, senior expert from the Ministry of Health of Arkhangelsk Region
2. Nina Nisovtseva, chair of charity fund “Easy Breathing”
3. Aleksandra Avdeeva, manager and interpreter of charity fund “Easy Breathing”
4. Aleksander Smolensky, vice head of methodical and clinical operations at healthcare unit No29 of the Federal Prison Service
5. Vladimir Luchinsky, healthcare unit No29 of the Federal Prison Service
6. Dmitry Perkhin, chief doctor of Arkhangelsk Regional TB Clinic
7. Prof. Andrei Marjandyshev, head of phthisiology department at Northern State Medical University

8. Ms. Berthe Stenberg, manager of the Norwegian-Russian Cooperation Programme “Stop TB in the Northwest Russia in our Lifetime” (LHL International), by Skype
9. Einar Heldal, consultant, by Skype