Tuberculosis
in the Russian Federation
2007

An analytical review of the main tuberculosis statistical indicators used in the Russian Federation

Editied by M.I. Perelman and Y.V. Mikhailova

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Analytical review is prepared in collaboration among Ministry of Health and Social Development Russian Federation, World Health Organization (WHO) TB Control Program in the Russian Federation, Central Research Institute for Management and Information Services in Health Care (Federal Public Health Institute, FPHI), Central Tuberculosis Research Institute, Russian Academy of Medical Sciences, and Russian Federal Penitentiary Service.

This analytical review is revised edition of publication released in 2007 (Tuberculosis in the Russian Federation 2006. An analytical review of the main tuberculosis statistical indicators used in the Russian Federation, Moscow. 2007. 126 p.p.)

The review contains analysis of indicators calculated based on state and specialized statistical reports; meaning of indicators for assessment of epidemiological situation and quality of TB services in the Russian Federation in 2006-2007 is discussed; changes in indicators during last 10-15 years are assessed.

Particular attention is given to the methods issues of use and interpretation of different indicators of effectiveness for TB control used in the Russian Federation and internationally.

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List of abbreviations

AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
CC	Correctional colonies
CF	Correctional Facility
CI	Confidence Interval
CDL	Clinical diagnostic laboratory
CFR	Central Federal Region
CNS	Central Nervous System
CTRI	Central TB Research Institute, Russian Academy of Medical Sciences
ChT	*Chemotherapy*
DFG	Dispensary Follow Up Group (follow up groups of TB patients, see Annex)
DRG	Dispensary Registered Group (groups of individuals with residual effects of tuberculosis and TB risk groups, see Annex)
DST	Drug susceptibility test
EQC	External Quality Control
EPTB	Extra-pulmonary TB
ERTB	Extra-respiratory TB
FCTB	Fibro-Cavernous Tuberculosis
FCTB-HIV	Federal Center of TB Care for HIV-infected Patients
FEFR	Far-Eastern Federal Region
FPHI	Federal Public Health Institute (Central Research Institute for Management and Information Services in Health Care)
FSIN	Federal Penitentiary Service
FSSS	Federal Service of State Statistics of the Russian Federation
FSEQC	Federal Service of External Quality Control in Clinical Laboratory Examinations
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GHC	General Health Care
GLC	Green Light Committee
HIV	Human Immunodeficiency Virus
IBRD	International Bank of Reconstruction and Development
ICD-10	| International Classification of Diseases

IUATLD	International Union against Tuberculosis and Lung Diseases (The Union)
MbT	*Mycobacteria tuberculosis*
MbT+	Bacteriological positive TB
MDR TB	Multidrug-resistant tuberculosis
MoH	Ministry of Health
MoH&SD	Ministry of Health and Social Development of Russian Federation
MoJ	Ministry of Justice of Russian Federation
NTRI	Novosibirsk TB Research Institute
NWFR	Northwestern Federal Region
OMD	Organizational and methodological division
PFR	Povolzhsky Federal Region
PHC	Primary health care facilities
PTB	Pulmonary TB
RAMS	Russian Academy of Medical Sciences
RTB	Respiratory TB
RF	*Russian Federation*
RI	*Research Institute*
RIPP	Research Institute of Phthisiopulmonology Sechenov Moscow Medical Academy
SbFR	Siberian Federal Region
SFR	Southern Federal Region
SIZO	Pre-trial detention center
SSTM	State System of TB Monitoring
ss+ TB	sputum smear positive TB
St-PRIPP	St. Petersburg Research Institute of Phthisiopulmonology
TB	Tuberculosis
UIS	Penal executive System
URIPP	Ural Research Institute of Phthisiopulmonology
UFR	Ural Federal Region
WHO	World Health Organization
WHO RF	WHO TB Control Program in the Russian Federation

CONTENTS

Introduction

This analytical review is the collective work product of the Ministry of Heath and Social Development of the Russian Federation (MoH&SD), the WHO TB Control Program in the Russian Federation (WHO RF), the Central Research Institute for Management and Information Services in Health Care (a.k.a. Federal Public Health Institute, FPHI), the Research Institute of Phthisiopulmonology of the Sechenov Moscow Medical Academy (RIPP), Central Tuberculosis Research Institute, Russian Academy of Medical Sciences, the Federal Penitentiary Service (FSIN), and Federal Service of External Quality Control of Clinical Laboratory Research (FSEQC).

This review contains updated materials of analytical review published in 2007 ("Tuberculosis in the Russian Federation 2007. An analytical review of the main tuberculosis statistical indicators used in the Russian Federation", Moscow, 2007, 126 pages).

Compared to previous edition, this review has significantly updated chapter about TB-HIV co-infection, the separate chapter with more detailed information about MDR TB problem in Russia, and the new chapter about the implementation of external quality control of laboratories involved in case detection and TB treatment control. Besides, issues on TB incidence and treatment control were significantly updated.

This review presents an analysis of TB indicators based on state and TB branch statistical reporting data and their use in the evaluation of the epidemiological situation and the quality of TB control activities in the Russian Federation (RF) in 2006-2007. The review also examines trends in the indicators over the past 10-15 years.

Special attention has been paid in this review to methodological issues in the use and interpretation of varying TB indicators used in the Russian Federation and abroad for the assessment of TB control effectiveness.

There were significant changes in last three - four years in tuberculosis control in Russia: Orders ##109 and 50 [15, 16] were approved; these orders gave the base for improvement of the national strategy, and IBRD and Global Fund projects were started. Owing to these projects, almost all bacteriological tuberculosis laboratories and one third of CDLs participating on TB diagnosis and treatment were upgraded. Training courses improved staff qualification were organized in all regions for tuberculosis control services as well as for primary healthcare; system of supervision of regions by federal TB research institutes was resumed; activities against MDR TB and other activities took place (drugs procurement, infection control improvement, hospitals renovation, stuff education).

During last years major efforts applied for TB service modernization process were finished at the end of 2008; so the main outcomes from these activities could be expected at years 2009-2010.

At the same time, the analysis of the data cited in the review demonstrates that during past two years certain positive results are observed because of applied efforts. For example, incidence of tuberculosis among civilians stopped to increase because of some improvement of TB notification process (involving new fluorography technique in practice, and improvement of notification of MBT+ TB patients in many regions), rates of relapses and proportion of chronic TB forms started to decrease, TB mortality decreased during past two years.

It should be noted that these positive results were observed in stable, but still challenging epidemiological TB situation. In general, basic indicators in Russia still demonstrate high TB burden. The presence of some troubling indicators, for example changes in demographic and social characteristics of TB patients, may be due to the unfavorable socio-economic situation in the regions.

The review demonstrates that stabilization of the epidemiological situation to a certain extent is due to increased efficiency of TB service in penitentiary system.

The quality and completeness of statistical data on tuberculosis significantly improved over the past two years, which significantly increased the capacity of analysis of data on TB notification, management and effectiveness of TB treatment. This review more widely used information from the reporting forms approved by Order #50 [16]. This became possible as a result of intensive work of TB Research Institutes and WHO RF on supervision of creating the reporting forms and verification of data received from these forms.

Overall, the analysis performed in this review has confirmed the following:

- The information available from statistical reporting forms on TB in the Russian Federation is sufficient for the general analysis of TB situation in the country.
- The indicators used to assess TB epidemiology trends were adequate to meet the analysis's objectives and, for the most part, are compatible with internationally-accepted indicators.
- Significant variation in indicator rates exists across the territories of the Russian Federation, requiring a differentiated analysis of data to be performed by territory, by groups of territories and by region.
- For conducting data analysis using evidence-based principles, it is necessary to use data from the State System of TB Monitoring (SSTM)based on t territorial case-based computerized TB surveillance registries.

This publication is intended for use by public health leaders in the territories of the Russian Federation, heads of general health care and TB facilities, TB specialists and epidemiologists, and public health managers.

In preparing the publication the information was used from state and sectoral statistical report forms, demographical and socio-economic data from Federal Service of State Statistics

of the Russia (FSSS), Global Tuberculosis Control reports of WHO/IUATLD[1], SSTM data, and data from scientific publications.

The annex contains tables of the main epidemiological indicators of TB control activities in Russia in 2003-2007.

[1] The UNION

1. TB surveillance and the statistical reporting system in the Russian Federation

Son I.M., Skachkova E.I.

TB epidemiological processes are quite complex. A number of factors, reflected to varying degrees in the commonly used indicators, have an impact on the process of the spread of TB (1, 2). Factors influencing the spread of TB include:

- regional variety (demographic, social and economical characteristics, standards of living, education, intensity of migration, etc.)
- political and economic processes (crises, conflicts)
- high level of TB prevalence in the penitentiary system on the civilian population

And finally:

- the effectiveness of TB control activities (management of prophylactic activities, timely TB case detection and high-quality TB detection activities performed by laboratory and radiology services, effective treatment, etc., performed by both specialized and PHC facilities).

The registered rates, which reflect the TB situation, to a large degree are also affected by factors not related to the direct results of TB prophylactic, detection and treatment activities. Such influencing factors include:

- The statistical system in use (recording and reporting forms, data flow, agencies responsible for the collection and processing of statistical information)
- The qualifications of the staff responsible for collecting and processing the information, as well as technical support for this process (communications infrastructure, computerization, software)
- Motivation of leaders and staff of federal and regional institutions in receiving valid information.

Unfortunately, the limited space of the current edition and the structure of available statistical data do not allow for a complete assessment of the impacts of before mentioned factors on the results received. Nevertheless, several of these factors will be examined during data analysis and interpretation.

The monitoring and evaluation of changes in epidemiological rates and indicators, reflecting the effectiveness of TB activities, should be based not only upon data both from officially approved forms, but also from results of specific research. It is important for the statistical reporting system to permit the collection of reliable data from regional and federal levels, using evidence-based principles, and in the end, for appropriate directive decisions to be made using this information.

Therefore, along with reviewing the traditional TB rates and indicators, the current edition considers ways to improve and extent use of the existing reporting forms, and to calculate additional indicators.

Currently the basic information used to assess the TB situation is contained in 15 reporting forms.

The main TB related reporting forms are the following:

1. State statistic reporting forms:

- Form #33 “TB patients’ information”, filled in for cases registered and followed up at MoH&SD facilities for “permanent residents” (or civil population) of the territory.

- Form #8 “Information on active TB case notifications” filled in for all new and relapse TB cases registered in a given administrative unit of Russian Federation. The form includes information about cases registered at MoH&SD facilities and other institutions with jurisdiction over provision of TB services (including the Federal Penitentiary Service, FSIN), as well as about cases diagnosed postmortem and among foreigners, persons from other territories, and homeless.

- Form # 61 “HIV patients’ information” contains information about HIV and TB-HIV co-infection.

These forms are collected by statistic department of FPHI.

2. Forms of sectoral statistic reports, introduced by Order #50 [16] of Ministry of Health of Russian Federation for cohort analysis.

- Form #07-TB “Information on new and relapse cases of tuberculosis” contains data on detection and registration of patients for treatment including data about initial drug resistance.

- Form #08-TB “Information on chemotherapy outcomes of pulmonary TB patients” reflects the results of TB treatment monitoring.

Information for these forms is collected by specialized research institutes through their organizational-methodological (TB management) divisions with supportof coordination offices of WHO located in these institutes. Monitoring Center of RIPP was responsible for the data collection and analysis, since 2008 this role was taken by FPHI’s “Federal Center of TB Control in Russian Federation”. Aggregated data of cohort TB forms from 2007 were reviewed and approved by specialists of joint Thematic working group on epidemiological TB surveillance (Russian Federation, WHO TB RF)

3. Sectoral TB report of FSIN of Russian Federation

- Form #4-TB is filled in for patients registered and followed up at FSIN correctional facilities (inmates or individuals accused or suspected of crimes).

4. Demographic and socio-economic data, obtained from FSSS reports:

- Form #1 (Population of subjects of Federation and total Russian Federation, for intensive indicators calculation for years before 2006),

- Form #4 (Population of subjects of Federation and total Russian Federation, for intensive indicators calculation for 2006-2007)

- Official WEB publications of FSSS [38],

Before 2007 intensive indicators such as notification and mortality were calculated based on the average population of the year[2], and prevalence - based on population at 1st January of the next year. Values of intensive indicators for 2007, used in the review are preliminary; these were calculated based population in Form #4 for 01.01.2007. These indicators will be updated after receiving final data on population of subjects of Federation and Russian Federation on 01.01.2008.

Also in review there were used the results of processed and analyzed data from SSTM databases, which receive information on the basis of approved MoH&SD TB reporting forms.

[2] The annual average population is calculated based on half of the sum of population as of January 1st of reporting year and as of January 1st of following year.

2. TB case notification rate in the Russia

Belilovsky E.M., Borisov S.E., Skachkova E.I., Son I.M., Danilova I.D., Jakubowiak W.

Along with mortality and prevalence, the TB case notification rate (hereinafter, "notification rate") is one of the most important epidemiological rates characterizing the TB situation in the country.

However, the TB notification rate has both an epidemiological and an "organizational" component (2). The latter reflects the capacity of TB services and primary healthcare facilities to detect TB patients. Therefore, the real value of incidence is always different from the values registered by statistical institutions.

Later in the review we will use the term "notification rate"[3], and a separate section of this review is devoted to the current methods for estimation of TB incidence.

The current chapter contains the following:

- epidemiological data on the spread of TB in the Russian Federation overall, as well as TB notification rates in the territories of the Russian Federation, in the federal (geographics) regions ("okrugs") and other strata and population groups;
- evaluation of the structure (disease forms and sites) of detected tuberculosis;
- review of the indicators reflecting case-finding management (ways, channels and methods of TB detection and confirmation of diagnosis);
- comparison of TB notification rates in the Russian Federation with data from other former Soviet Union countries and selected countries of the world;
- description of methods of TB incidence estimation

2.1 Trends and socio-demographic structure of the TB notification rate in the Russian Federation

Over the last 20-25 years in the Russia, significant changes have been observed in the TB notification rate (2), as seen in figure 2.1. A gradual decrease in the rate in the 1970-80's, reaching a low of 34.0[4], was replaced by a significant increase in 1991 - 2000, rising to 90.7 (an increase of 2.7 times) with stabilization of the rate between 82 and 84 per 100,000 population.

The decrease in the TB notification rate during the final per-crisis years of the Soviet Union could arguably be considered a reflection of the relative stability in society and the

[3] «Registered tuberculosis incidence» corresponds to the international English language terms "TB notification rate" or "Case notification rate", as opposed to the English terms "TB incidence rate" or "TB morbidity", which reflect the real level of incidence, estimated only by special methods. (*There is no distinction between 'TB incidence" and "TB notification" in Russian publications. "TB incidence" and "estimated TB incidence" terms are used. That is why that footnote was necessary in Russian issue – comments of interpreter)*

[4] Hereinafter, notification and mortality rates are calculated per 100,000 of the annual average population of the country, region or reviewed population group

systematic TB control activities in place, including the administrative methods in use. Those years were characterized by close attention of the state to TB control and by the effective registration and follow up of cases by TB services. The quality of TB case-finding among the civilian population ensured a relatively low level of hidden incidence (about 12-15%), basing such a calculation on the number of postmortem diagnosed TB cases , cases with spontaneous recovered TB and level of cases with severe late-detected TB forms (3, 4).

The accelerated pace of the decrease in the notification rate in 1988-1990 may be related to the socio-economic crisis at the end of the 80's and beginning of the 90's. This entailed problems with completeness of registrations and referrals of new TB case notifications for data entry into the reporting documents in the territories.

The rapid increase in the notification rate after 1991 reflects changes in the socio-economic environment in the Russian Federation. Significant increases in the notification rate were recorded after the economic crises in 1991, 1994 and 1998 (with respective increases of 19.8%, 20.4% and 12.1% accordingly) (4). During these years, the SSTM patient data show a significant growth in the percentage of new TB cases that were unemployed (5). Today this percentage is more than 50%, while the official unemployment rate in the country does not exceed 5-7%[5] (see Figure 2.2). This proves the well-known thesis that TB is a socially significant disease (1, 5, 6).

According to SSTM data [37], while the nationwide TB notification rate was 82.6 in 2006, the notification rate among the unemployed has reached value between 500 and 1,000 per 100,000 unemployed individuals, depending on calculation method; and this value up on almost 20% in three years (2004-2006) . At the same time, the notification rate among employee was approximately only 45 per 100,000 employed individuals[6] and among disabled persons up to 50 per 100,000 disabled.

[5] Based on information from sampling occupation surveys in regions. Persons are considered unemployed if they are of able-bodied age and do not have a job (gainful employment), are searching for a job, and are ready to start working at the moment of evaluation (7).

[6] The results are obtained according to the Federal Center for Monitoring of Tuberculosis Spread Control in the Russian Federation on the basis of data from 31 territories, where among 46,612 new cases notified in 2006, there were 24,009 unemployed, 12,717 employed and 2,556 disabled individuals. According to FSSS data, there were registered 2,254,000 unemployed or 2,481,000 not employed in economics among economically active population, and 28,440,000 employed individuals.

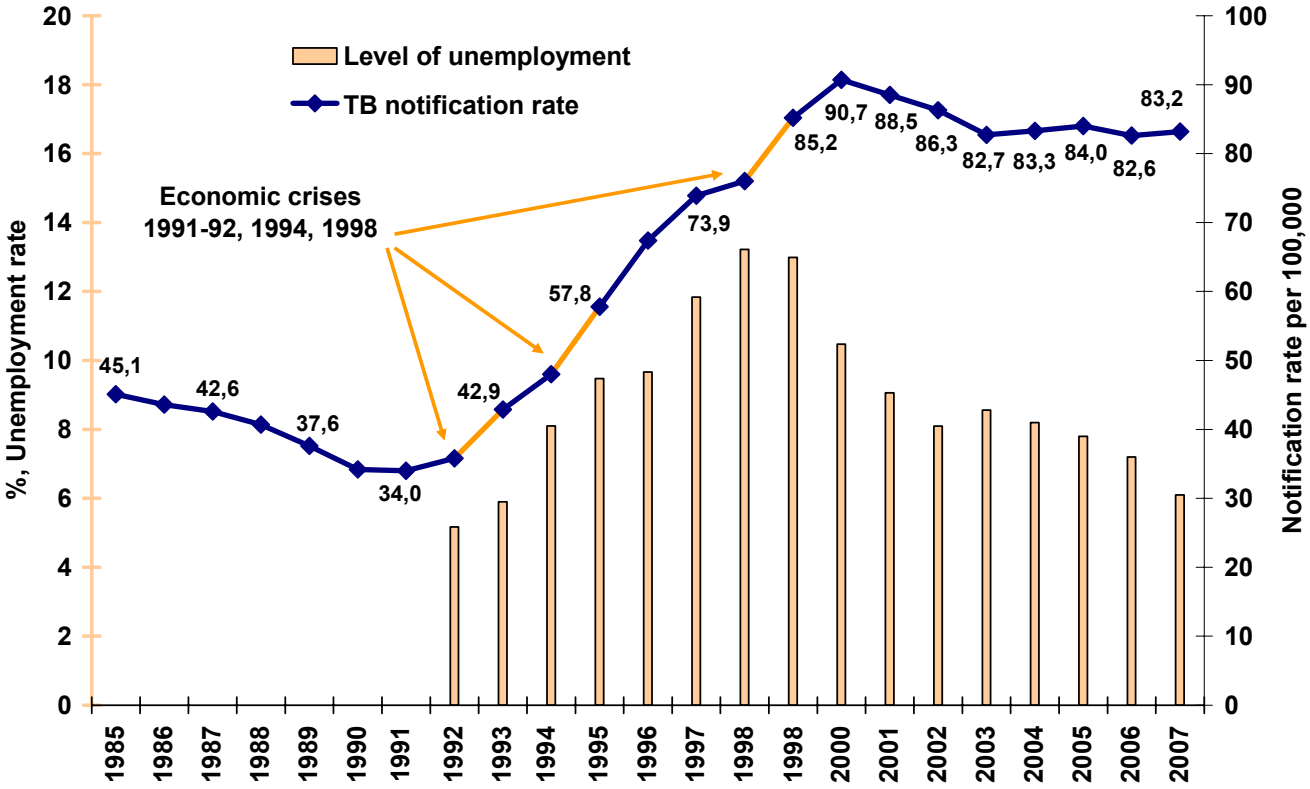


Figure 2.1. TB notification rate and the unemployment rate in the Russian Federation, 1985–2007, (source: form # 8 and [7], population: forms ## 1 and 4)

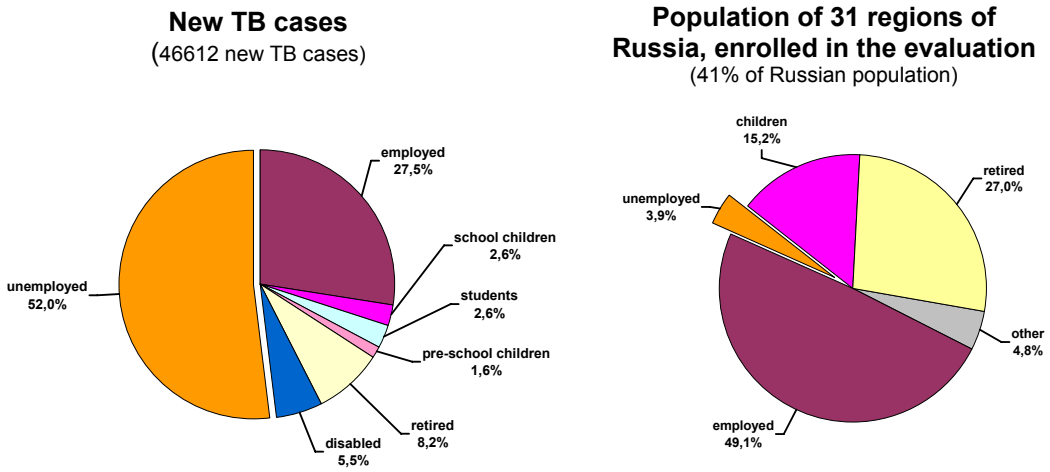


Figure 2.2. Socio-economic status of new TB cases and of the general population, 2006, 31 regions of Russian Federation (source: [37] and [7])

The available data on the social status of TB patients make evident the need of further development of social support programs for TB patients in Russia [8]. The active participants of the programs implementation are the MoH&SD, WHO, and Russian and International Red Cross Societies.

The last five years the major epidemiological tuberculosis indicators are relatively stable. This applies, first of all, the tuberculosis notification rate [4]. This indicator varies

between 82 and 84 per 100,000 populations (82.6 in 2006 and 83.2 in 2007[7]). The annual changes statistically non-significant and are compatible with the value of 95% confidence interval, which is about 0.5 per 100,000 population (see Figure 2.3).

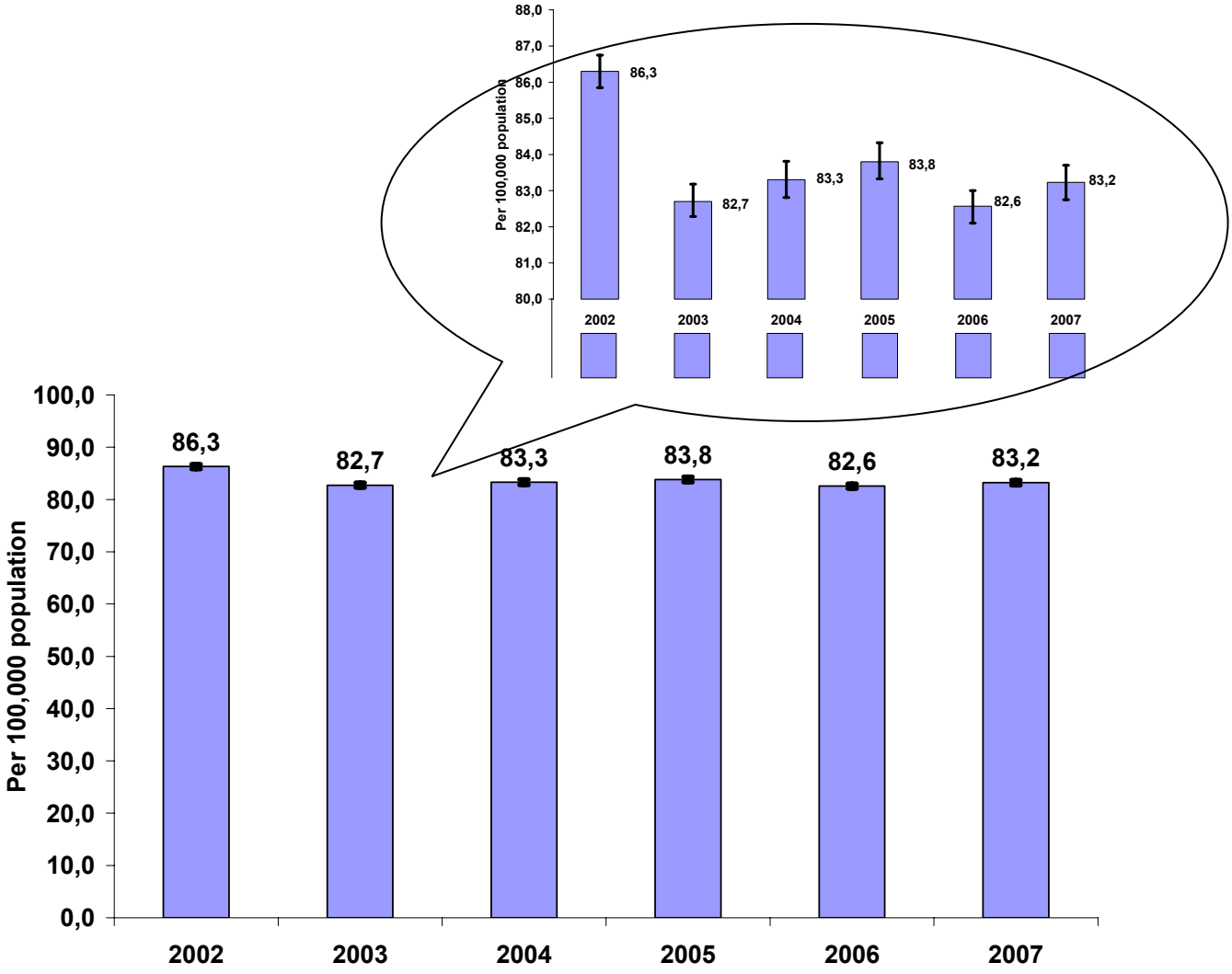


Figure 2.3 Changes in notification rates of tuberculosis in 2002-2007 in the Russian Federation. Lines mark variations in values of 95% CI (Source: Form #8; population – Forms ##1 and 4).

The slight increase of the number of newly diagnosed TB patient in 2007 compared to 2006 (from 117,646 to118,367, see Figure 2.4) occurred primarily due to growth of number of foreign patients registration – from 554 to 2,123 cases. Note, that the contribution of patients with foreign nationals in the overall notification rate of TB is minimal (less than 2%). In addition, a significant increase in the number of reported cases of tuberculosis among foreign nationals linked, first of all, not only with increasing spread of the disease in this category, but also with the improvement of the registration of the disease among them (realization of the Federal Law

[7] According to the form #8.

from 25.07.2002 #115-FZ “On the legal status of foreign nationals in the Russian Federation”, governmental regulation from 02.04.2003 #188 and Federal Law #189-FZ 05.11.2006 “On amending the Russian Federation Code of Administrative Violations of the Law”). I.e. this increase in the number of this category of citizens in the structure of TB notification rate is not due to no increase in TB notification rate among people who have been living in the territory of the Russian Federation for some time, but among those first time arriving to Russia and first tested for TB when they receive a temporary registration.

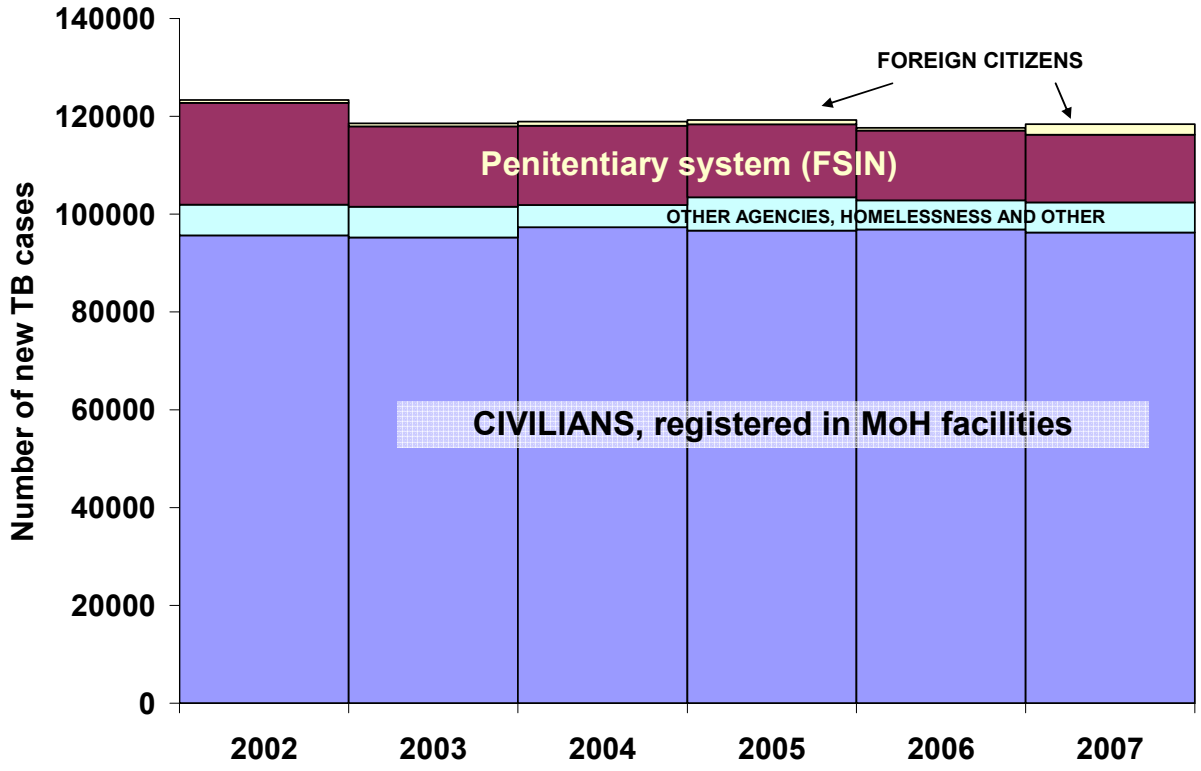


Figure 2.4. Newly diagnosed TB patients (new TB cases) registered in the Russian Federation in 2003-2007 among the civilian population, FSIN, and other agencies and foreign nationals. (Source: Form # 8).

It is important to note that in assessing the dynamics of the overall TB notification rate in Russia it is important to take into account changes as its territorial components, as well as contribution to its value of notification rates in certain groups of population. Besides, as illustrated by foreign nationals contribution, dynamics of the indicator depend on changes in statistical reporting or legal documents, based on which it operates. Of course, this is true with respect to any other analyzed indicator.

The national Russian indicator of TB notification rate is calculated based on Form #8 report. It reflects the number of new TB cases registered from various jurisdictional entities among different categories of population: civilian population, inmates in penitentiary system, military personnel, etc. (in total, 118,367 new TB cases in 2007). The main contributor to the

TB notification rate (86.5% in 2007) are TB cases detected among the civilian population, including homeless peaople, and deceased cases previously not registered as TB cases. According to Form #33, 81.3% of all detected TB cases were registered in the MoH&SD facilities (96,251 new cases, 2007). Cases detected in medical facilities under other jurisdictions (Ministry of Internal Affairs, Ministry of Defense, Ministry of Justice, etc.) account for 13.1% (15,453 patients, 2007).

Table 2.1. New TB cases registered in 2005-2007 in the Russian Federation, according to forms ##8 and 33

	Source (statistical form)	2005		2006		2007	
		#	%	#	%	#	%
New TB cases, total	form 8	119,226	100.0	117,646	100.0	118,367	100.0
New TB cases, among permanent residents (civil population)[8]	form 8	101,732	85.3	100,912	85.8	102,379	86.5
- including registered by MoHSD*	form 33	96,646	81.1	96,867	82.3	96,251	81.3
New TB cases, among foreigners	form 8	896	0.8	554	0.5	2,123	1.8
New TB cases registered by “other institutions”	form 8	16,598	13.9	16,180	13.8	15,453	13.1
- registered by MoJ** (FSIN)	form 8	14,898	12.5	14,283	12.1	13,865	11.7

*MoHSD – Ministry of Health and Social Development

**MoJ - Ministry of Justice

Cases detected among the FSIN population (accused and convicts) accounted for a significant percentage of cases registered under the category “other institutions”. They still have an impact on the overall notification rate in the country. In 2007, the percentage of all TB cases detected in FSIN facilities was 11.7% (13,865 cases, Form # 8). Over the last nine years (1999-2007), due to major efforts to improve the effectiveness of TB activities in the penitentiary system, the TB notification rate has decreased from 4,347 to 1,372 per 100,000 FSIN population (see chapter 6 “TB in the penitentiary system”). Meanwhile, the notification rate registered among permanent residents by MoH&SD facilities (see Figure 2.5) significantly increased up until 2004, and has since essentially stabilized (2007: 67.7 per 100,000 population, 96,251 cases).

[8] Total number of new TB cases according form #8, excluding prison (FSIN) data and data about new TB cases among foreign

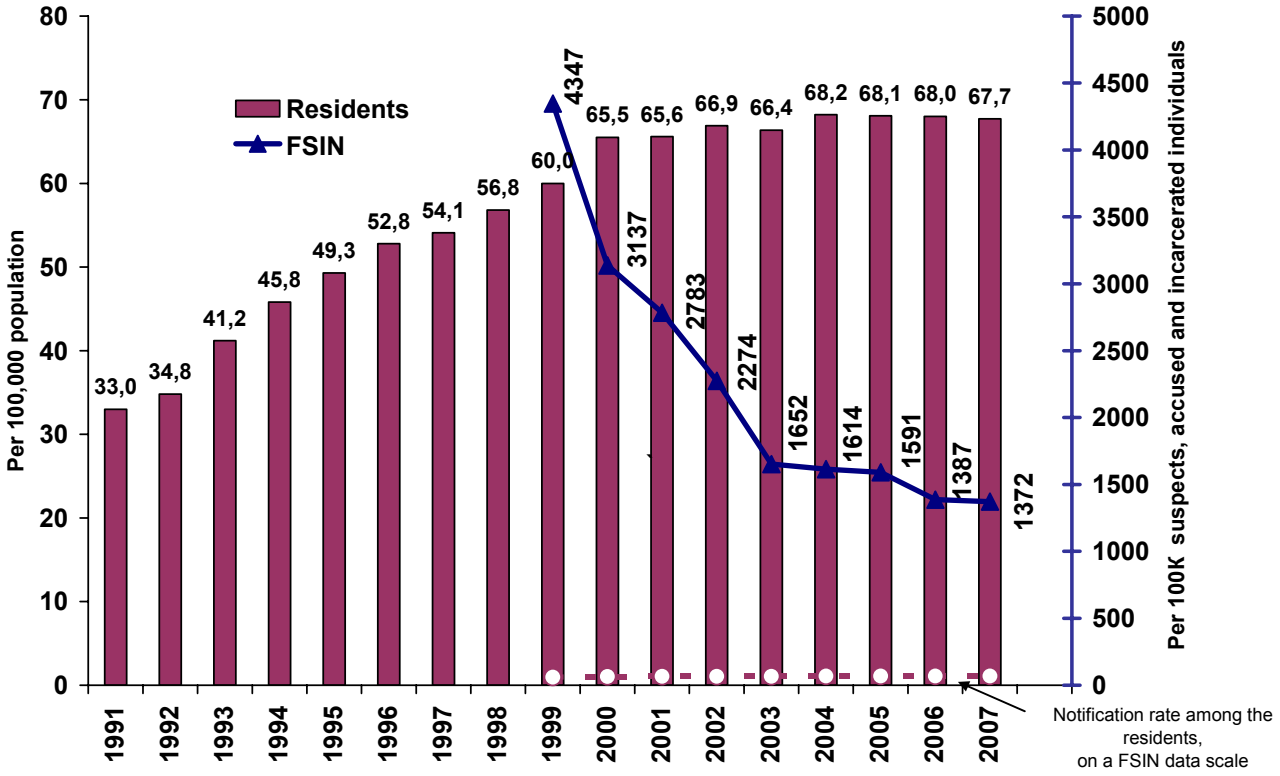


Figure 2.5. TB notification rates among residents and the FSIN population, 1991-2007. The dotted line and circles at the bottom right denote notification rates among residents reproduced in FSIN data right scale (Sources: Forms 8 and 4-TUB, population – Forms ##1 and 4)

Therefore, over the last few years, the trend of the TB notification rate has been affected by two separate processes: an increase in the number of cases registered among the civilian population (from 87,258 in 1999 to 96,251 cases in 2007, according to Form # 33) and a decrease in the percentage of registered cases from the penitentiary system – from more than a quarter (29%) in 1999 to 11.7% in 2007 (see Figure 2.6). It should be noted however that the notification rate among the FSIN population remains high (1,372 per 100,000).

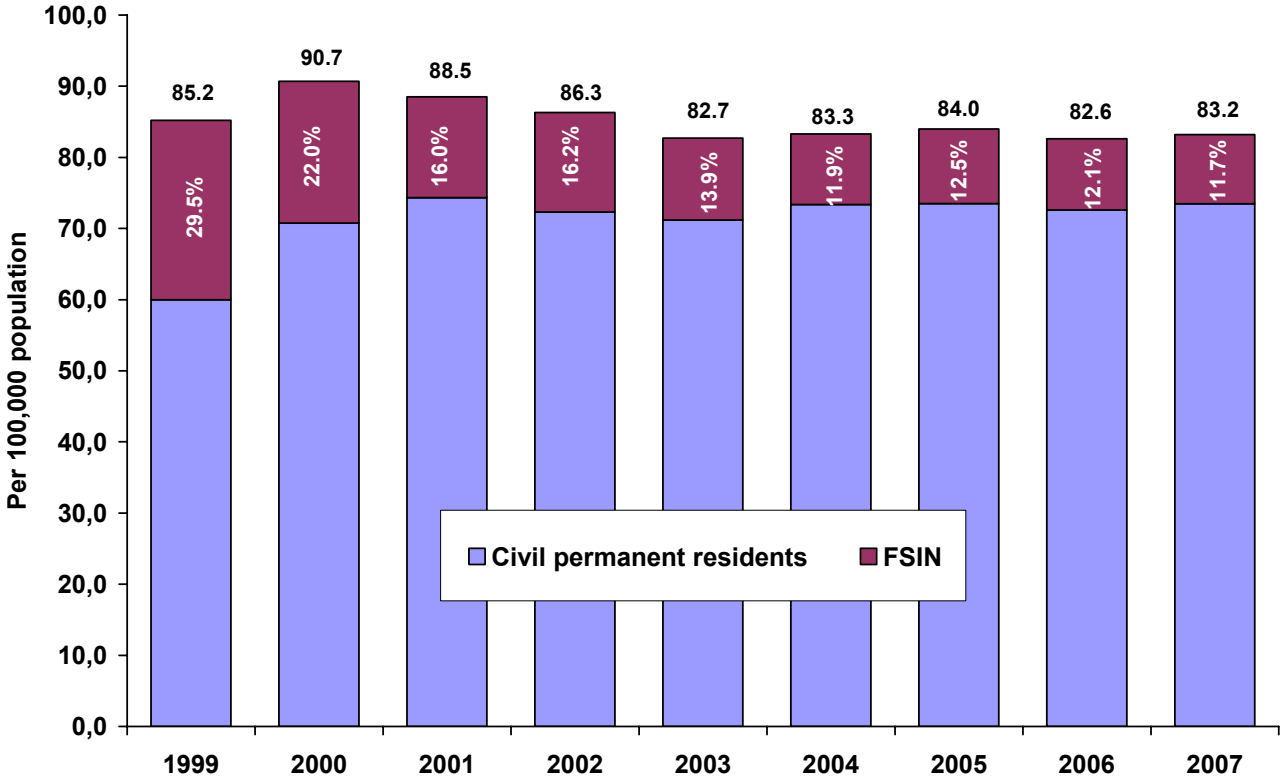


Figure 2.6. Percentage of the overall TB notification rate contributed by the FSIN population, 1999-2007. Black labels above the bars indicate the overall TB notification rate in the Russian Federation, including data from all jurisdictional entities (Sources: Form #8 and 4-TUB, population: Forms #1 and #4).

The notification rate in each group of the population is of a relative nature. It reflects, first of all, the risk of disease in this group and not the percentage of the absolute number of cases in the country. For example, the high level of TB notification rate in FSIN population (1,400 per 100,000 in opposite to only 67.9 for civilians) combine with a limited portion of absolute number of new TB cases from FSIN among all TB cases (less than 12%,while the civilian population accounts for 85.8%). It is therefore very important to know the absolute number of patients for planning the resources needed for targeted TB control activities.

2.2. TB notification rate in the Federal Regions and subjects of the Russian Federation

Total (integral) value of any indicator, is derived for the whole country, does not sufficiently reflect the situation in separate territories. This is particularly true for Russia, the country with the largest area in the world, which includes the regions that significantly differ both in its geographic and demographic conditions, and socio-economic level and the population structure.

Countywide indicators are not sufficient for management decisions in the organization of Tuberculosis Control in each particular subject of the Federation.

Therefore, along with uniform rates for Russia it is important to take into account changes in the notification rate on the level of regions or subjects of the Russian Federation.

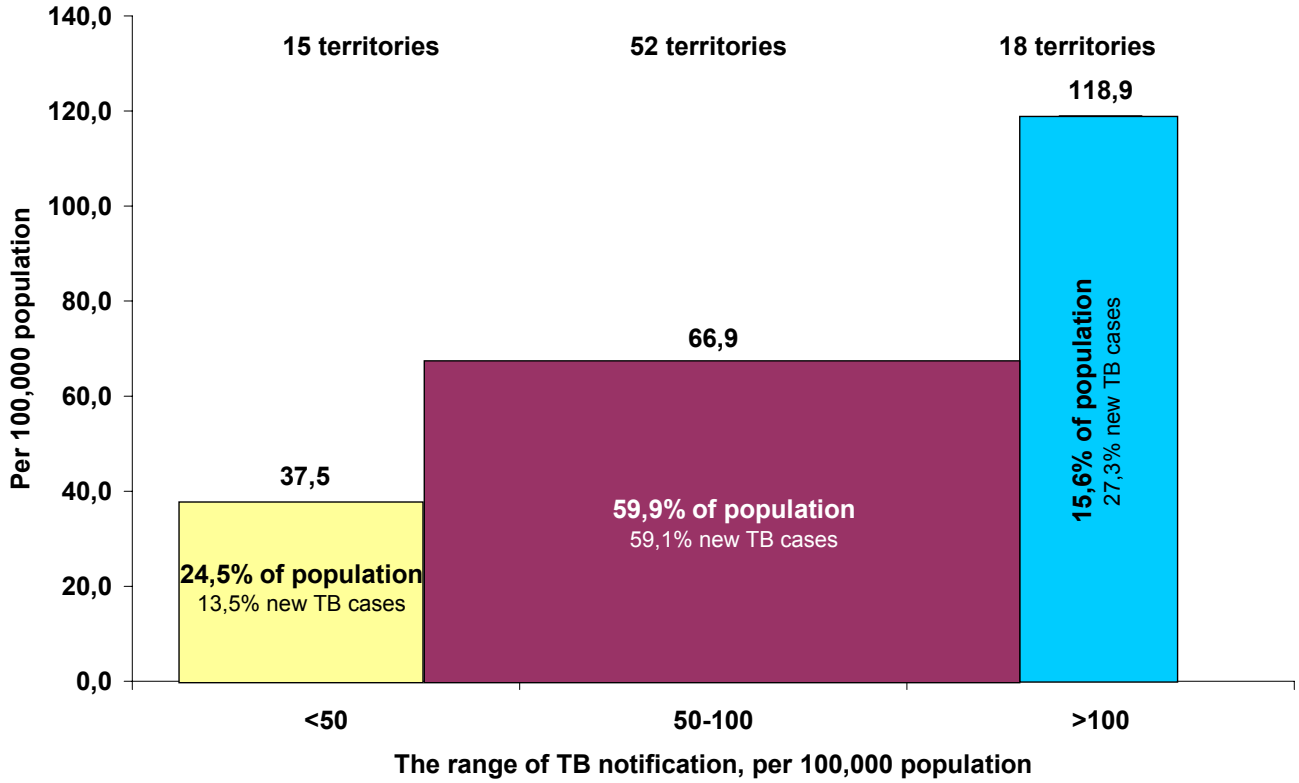


Figure 2.7. Distribution of the population and the Russian Federation territories by the level of TB notification rate, 2007. Territories are divided into 3 range groups: with a notification rate higher than 100, from 50 to 100, and lower than 50 per 100,000 population. The width of the rectangle represents the relative population covered by those territories (source: Form #33, population, Forms 1 and 4)

The TB notification rate differs significantly from territory to territory in the Russian Federation. The highest territorial rates in the Russian Federation are steadily reported in a number of territories in the SbFR and FEFR (data from Form #33, 2007)[9]: in the Republic of Tyva (183.2 per 100,000 population), Primorskiy krai (145.3), Republic of Buryatia (142.2), Kemerovo oblast[10] (124.4), Irkutsk oblast (119.6), and also in Republic of Kalmykia (117.0) and Kurgan oblast (116.2). The lowest rates are registered mainly in the central and northern territories: in the Moscow city (26.4 per 100,000 population) and St. Petersburg city (32.2), Kostroma oblast (34.5), Vologda oblast (36.7), Ivanovo oblast (41.8), Arkhangelsk oblast (43.9), Yaroslavl oblast (45.3), Murmansk oblast (43.5) and Moscow oblast (44.1) and also in republics of Ingushetia (43.0) and Bashkortostan (43.2).

[9] Hereinafter, comparisons of notification rates take into consideration only territories with populations over 300,000.

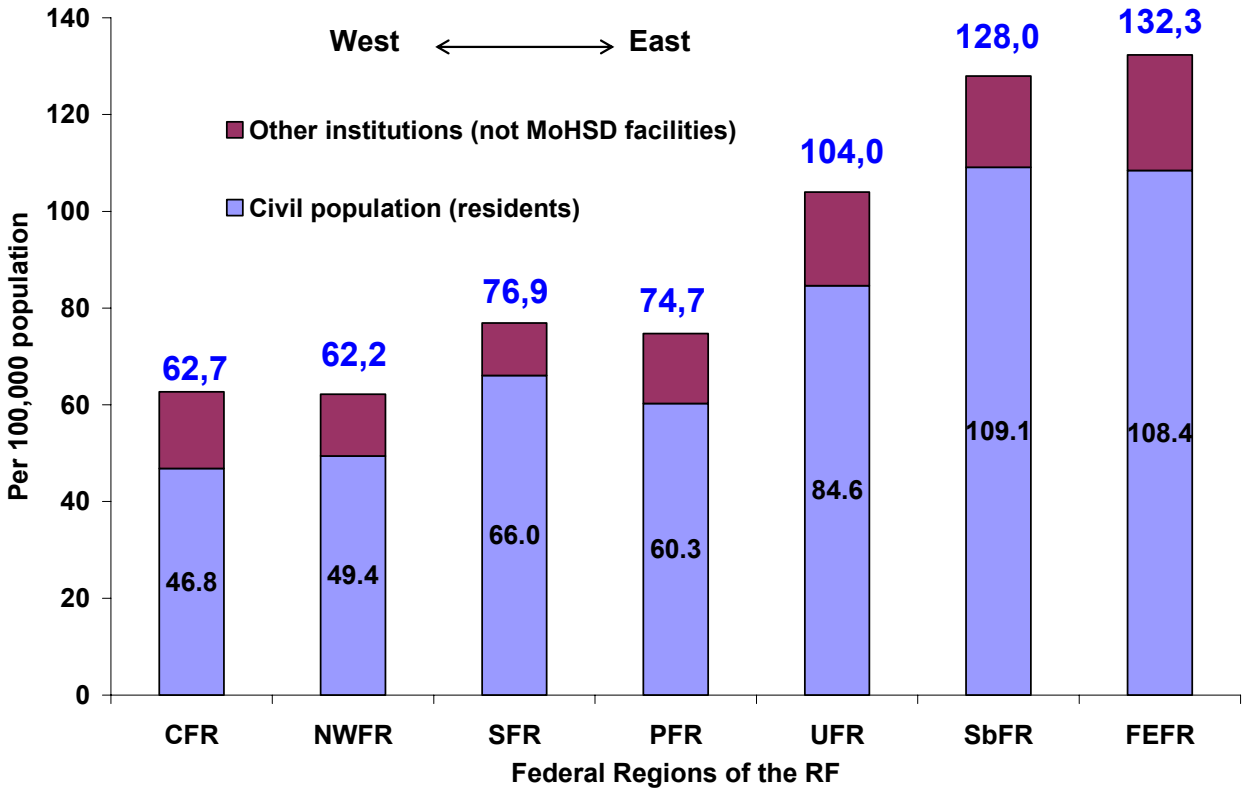
10 “Oblast” is the administrative unit of Russia or “region”

In 18 territories, accounting for 15.6% of the nationwide population (see Figure. 2.7), in 2007 the TB notification rate was over 100 per 100,000 population (the aggregated notification rate in such territories was 118.9). Over a quarter of new cases detected in Russia were registered in these territories (27.3%). Relatively high notification rates - from 50 to 100 per 100,000 population - were also registered in 52 additional territories (the aggregated notification rate in such territories was 66.9). Almost 60% of new TB cases registered in Russia were notified in these regions, which have 60% of the country's population. Only a quarter of the Russian Federation population lives in the regions (15 territories) with relatively low notification rates - less than 50 per 100,000 population (the aggregated notification rate for such territories was 37.5 per 100,000 population, 13.5% new TB cases in 2007).

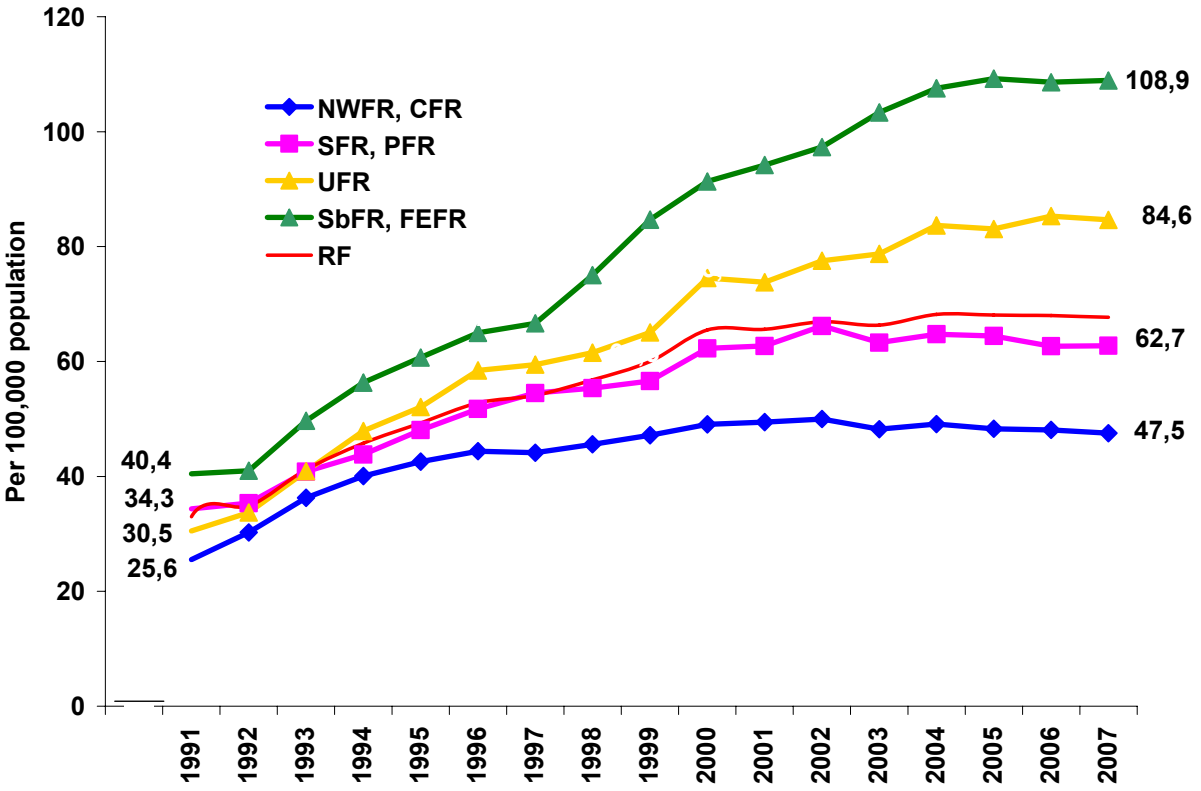
There has been a reliable correlation between TB notification rate and geographic location of Russia's regions. With the exception of the Kaliningrad region (oblast), which is situated for a considerable distance to the west from the main territory of Russia, the rate is gradually increasing from west to east (see Fig. 2.8a, 2007) - from 62.7 and 62.2 in the CFR and NWFR to 128.0 and 132.3 in FEFR and the SbFR).

The eastern regions of the country reported higher growth of notification rates. In the regions located in the east (SbFR and FEFR) and in the Urals (UFO), the notification rate increased by 2.7 times from 1991 to 2005, while in the west, it increased by 1.8-1.9 times (see Figure 2.8). In the past three years (2005-2007) TB notification rate stabilized in all federal districts. As can be seen in Figure 2.8, the notification rates from the three eastern regions (UFR, SbFR and FEFR) in the late 90's - early 2000's have had an increasing effect on the overall TB notification rate among the civil (resident) population of Russia. However, lack of increase in the notification rates in 2000's in the more populated European part of Russia (CFR, NWFR, SFR and PFR) in part restrained the increase in the overall TB notification rate in the country and, finally, determined the process of rate stabilization.

A strong relationship between territorial notification rates and socio-economic factors (first of all, the level of quality of life of territories) can be observed. The level of quality of life is characterized by such indicators as the percentage of the population with income below the cost of living (Figure 2.9) and unemployment level (Figure 2.10).



A) TB notification rate distribution by Federal regions, form #8



B) Trends of the TB notification rate in four groups of federal regions and the Russian Federation, 1991-2007, Form 33, MoH&SD facilities

Figure 2.8. Geographic distribution of TB notification rates by Federal region and trends by groups of regions, 1991-2007. (Sources: Form #33 MoH&SD facilities and #8, population from forms ##1 and 4).

Differences in the proportion of the population with income below the cost of living in the federal regions correlate with the TB notification rates in these regions, except UFR (Figure 2.9).

Changes in the unemployment rate from region to region also correlate in general with the TB notification rates, except UFR[11] (Figure 2.10).

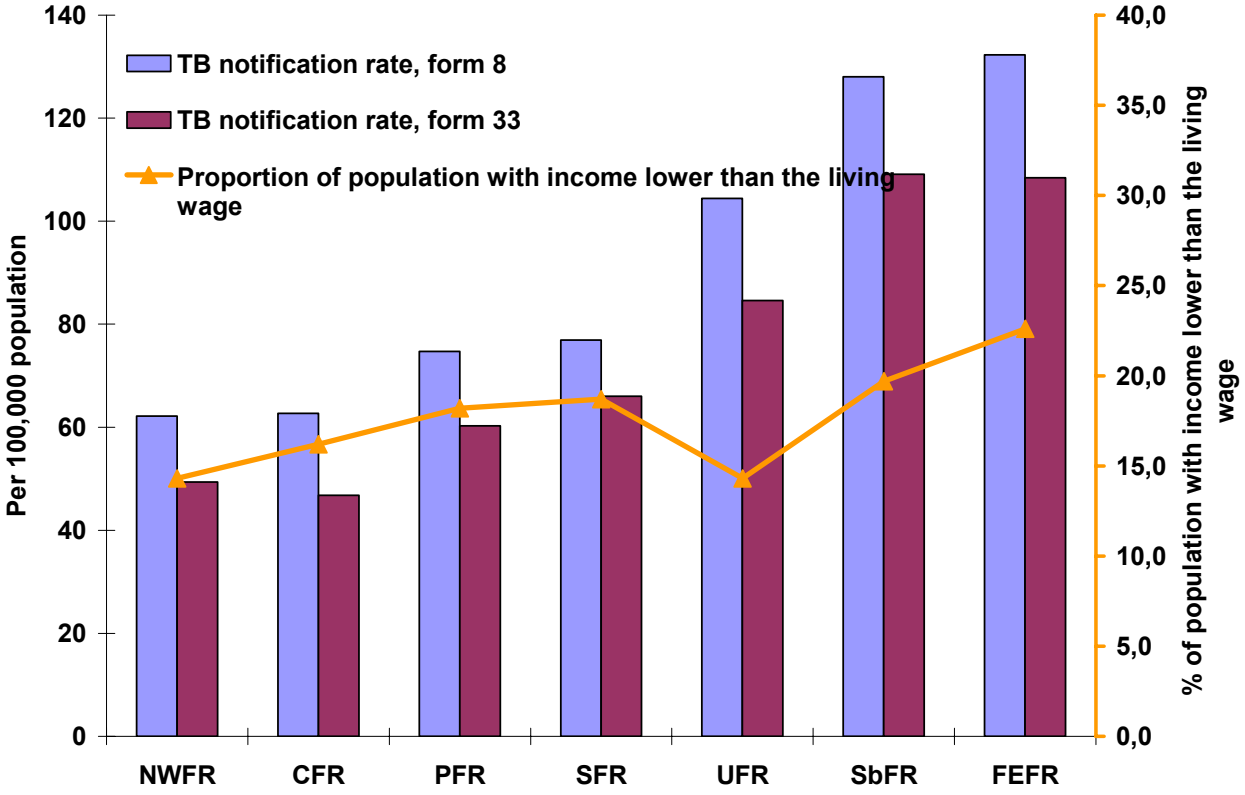


Figure 2.9. Percentage of population with income below the living cost and the tuberculosis notification rate in the Federal Regions of the Russian Federation, 2007. The regions are displayed on the figure on a geographical basis: from the North-West to the Far East. (Sources: Forms ## 8 and 33, [7]).

[11] UFR data was excluded from figure 2.10 because the total unemployment level for UFO is mainly defined by unemployment level in Republic of Ingushetia (58.5%) and Chechnya (66,9%) which connected with the last Chechen crisis. At the same time, the crisis could be a reason of probable underestimation of TB incidence there.

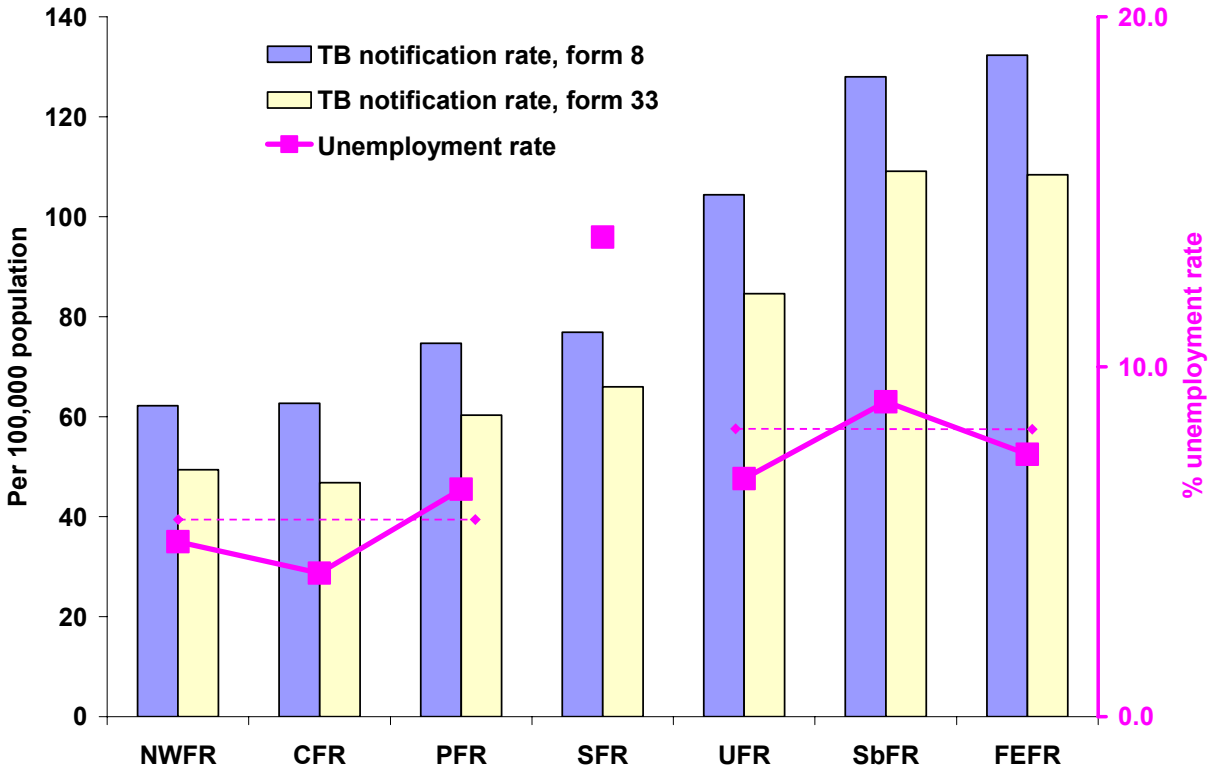


Figure 2.10. The unemployment rate and the tuberculosis notification rates in the Federal regions, 2007. Pink dotted line shows the total rate of unemployment in general and in the three regions to the west of the Urals (NWFR, CFR and PFR) and in the three districts in the east (UFR, SbFR и FEFR). The regions are displayed on the figure on a geographical basis: from the North-West to the Far East. (Sources: Forms ##8 and 33, [7]).

It is important to note that in Russia, unlike many other countries, TB notification rate is higher among the rural population than among urban ones- 92.5 and 79.8 per 100,000 population, respectively ($p < 0.001$, form # 8).

2.3 TB notification rates in different age and gender groups

In the Russian Federation, TB is more common in males: in 2007, the notification rate among males was 2.7 times higher than that among females (125.4 and 46.9 per 100,000 population, respectively; see Figure 2.11). During last six years (from 2002 to 2007), this ratio decreased from 3.2 to 2.7. A decrease in the notification rate was observed among males (from 136.2 to 125.4), and an increase was observed among females (from 41.9 to 46.9). The decline in the notification rate among males is due to the decrease in the number of new cases among individuals in penitentiary system (FSIN). The rate for males from the civilian population practically did not change over these years (in the range of 105-107 per 100K).

Among the permanent resident population, the percentage of new cases that were male was 69.8%. This percentage increases from 49.1% among children of 0-14 years old to 76.7% among those 45-54 years old, and declines back down to 58.9% among the oldest age group (Figure 2.12). It should be noted that the percentage of the overall Russian population that is

male has smooth decrease from 51% among children to 32% among individuals over 65 years old. New TB cases registered in the prison system do not have a significant impact on these trends. Excluding new TB cases in FSIN, proportion of males among the new TB cases would be 66.8% and would be slightly smaller than the proportion of male patients from ages 15-24, 25-34 and 35-44 years groups - 56.2%; 64.0% and 74.2% respectively.

Different age groups have different susceptibilities to TB infection, and therefore notification rates by age group differ considerably. The relationship is further complicated by the fact that rates differ substantially in males and females (see fig 2.13A), making it necessary to examine notification rates by age group for each gender.

Among the male population of the Russian Federation, the highest risk of TB is among 25-34 year olds age group (203.5 per 100K in 2007). However, the notification rate among the FSIN population makes a considerable contribution to the overall rate for this gender and age group (almost 30%). When considering notification rate data for permanent resident malesonly (without FSIN), the highest rate in Russia falls at an older age group - 45-54 year olds (157.4 per 100K, 2007). The notification rate among 25-34 year old males from the resident population only is considerably lower than the rate among all males from this age group, and equals 148.7 per 100K compared to 203.5 per 100K, respectively.

Using personal based registers of SSTM [37] data, the analysis of smaller 5-year age intervals for the resident population (excluding FSIN population) in 2004-2006 allows to identify peaks in TB notification rates among males of the age groups of 26-30 and 41-45 years old. The peak in the 26-30 years old age group is more specific for the territories of the SbFR and FEFR.

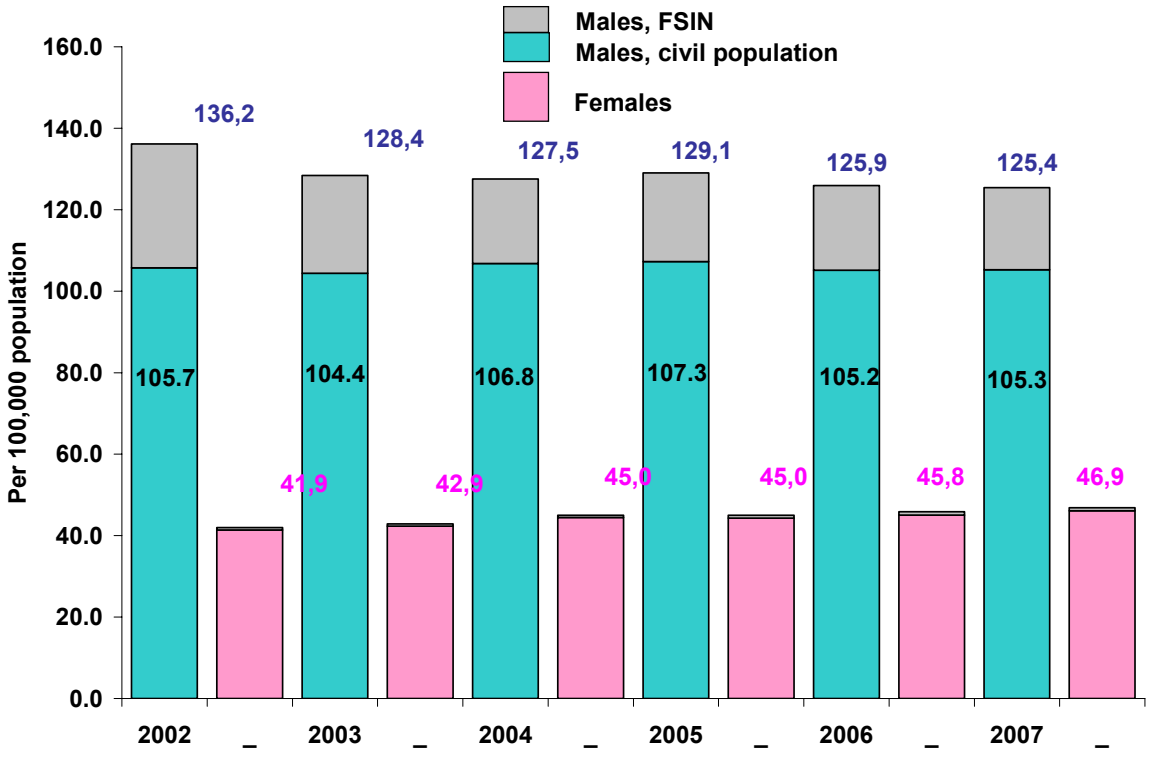


Figure 2.11. TB notification rates among males and females, 2002-2007. Civil and prison population. Notification rates for men and women from Form #8 are indicated above the bars; TB notification rates for men in the civil population are indicated inside the bars (Sources: Form #8, population: Form #4)

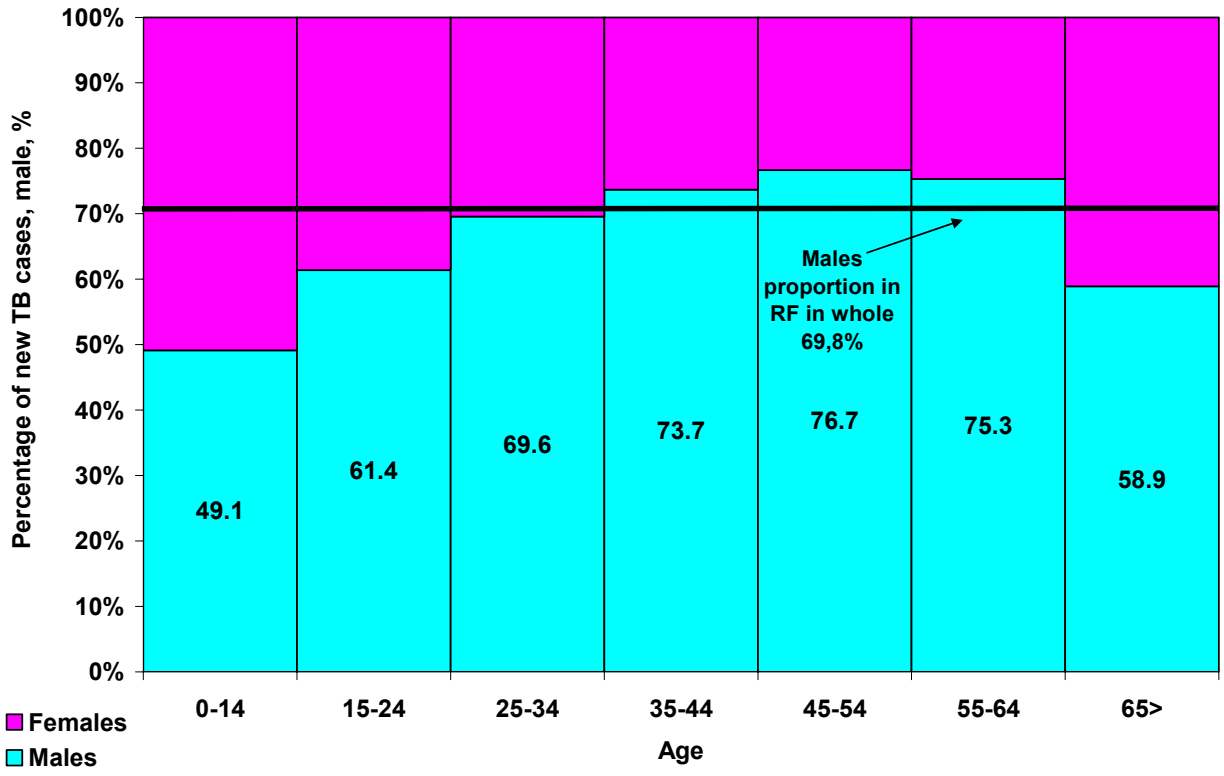
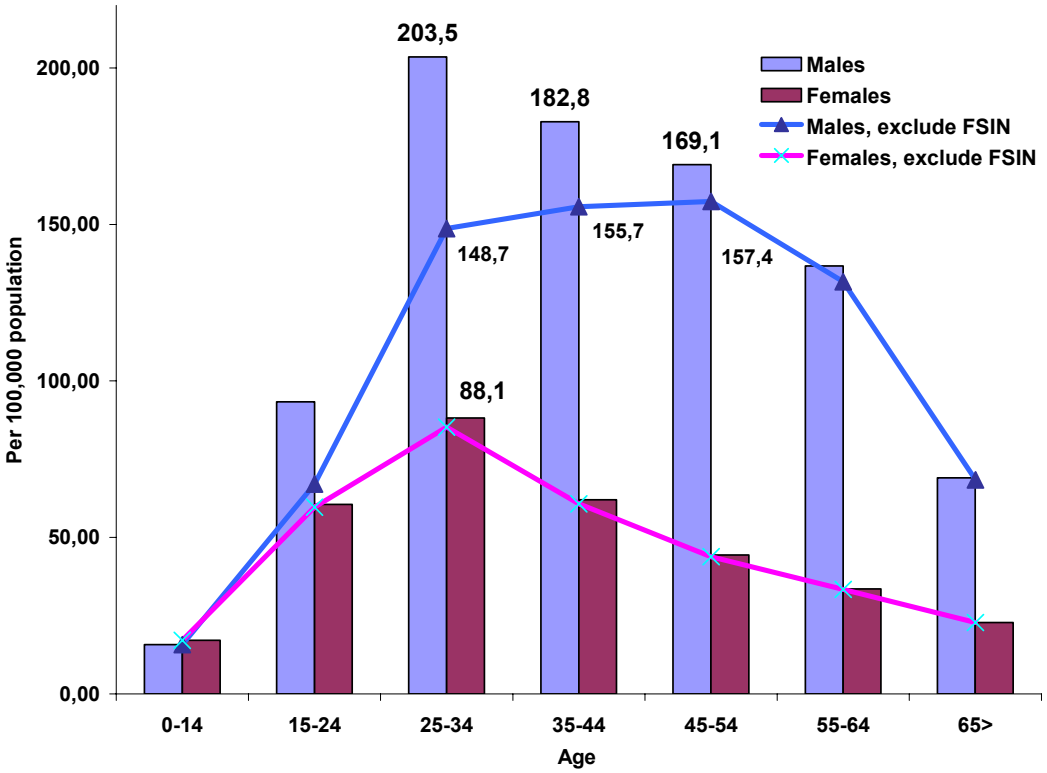
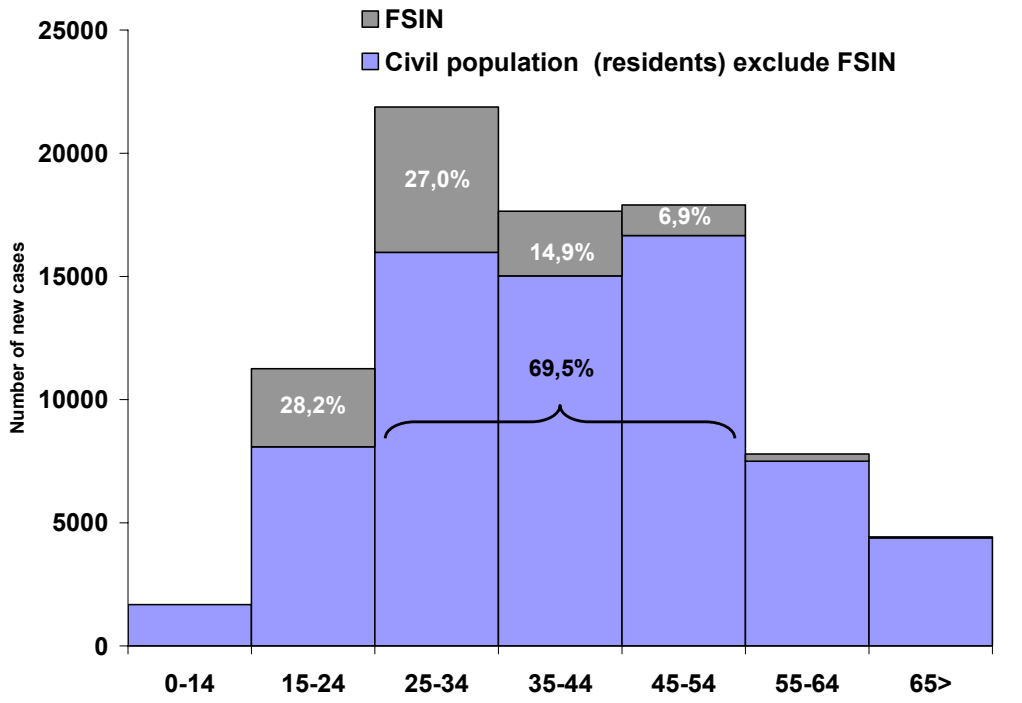


Figure 2.12. The percentage of males and females among new TB cases from civil population in the Russian Federation, 2007 (source: Form #8)



A) TB notification rates for different age and gender groups of the entire population and of the civil population of the Russian Federation (excluding FSIN)



B) Structure of new TB cases registered among males of different age groups. Cases from FSIN, civil population of the Russian Federation. Braces show percentage of new male cases in age group 25-54 years.

Figure 2.13. TB notification rates and number of TB cases in different gender and age groups, 2007. The entire population, FSIN and civil population of RF (Sources: Form #8, population – Forms ##1 and 4)

The socio-economic burden of TB can be estimated on the basis of the absolute number of cases in defined population age groups, not on the basis of TB notification rate. Analysis of the form #8 shows that almost 70% of new TB cases among males occur during the most productive years, between 25-54 years old, accounting for almost 57,000 new TB cases a year (Figure 2.13B).

The highest notification rates among females fall at the fertile age of 25-34 years old (88.1 per 100K population in 2007, Figure 2.13A). The notification rate in this age group has been increasing every year. From 1999 to 2007, the rate increased from 70.6 to 88.1 per 100,000 population (Figure 2.14), and the percentage of TB cases registered in this age group among all female cases increased from 23% to 27%.

Overall, the presence of peaks in the notification rate among the younger and more productive age groups in both males (25-34 and 45-54 years old) and females (25-34 years old) indicates an unfavorable TB epidemiological situation in the country. Furthermore, it suggests that a high level of TB spread will be retained into the nearest future. Thus, the high notification rate of tuberculosis in these age groups is a prognostic sign of the deteriorating situation in the future.

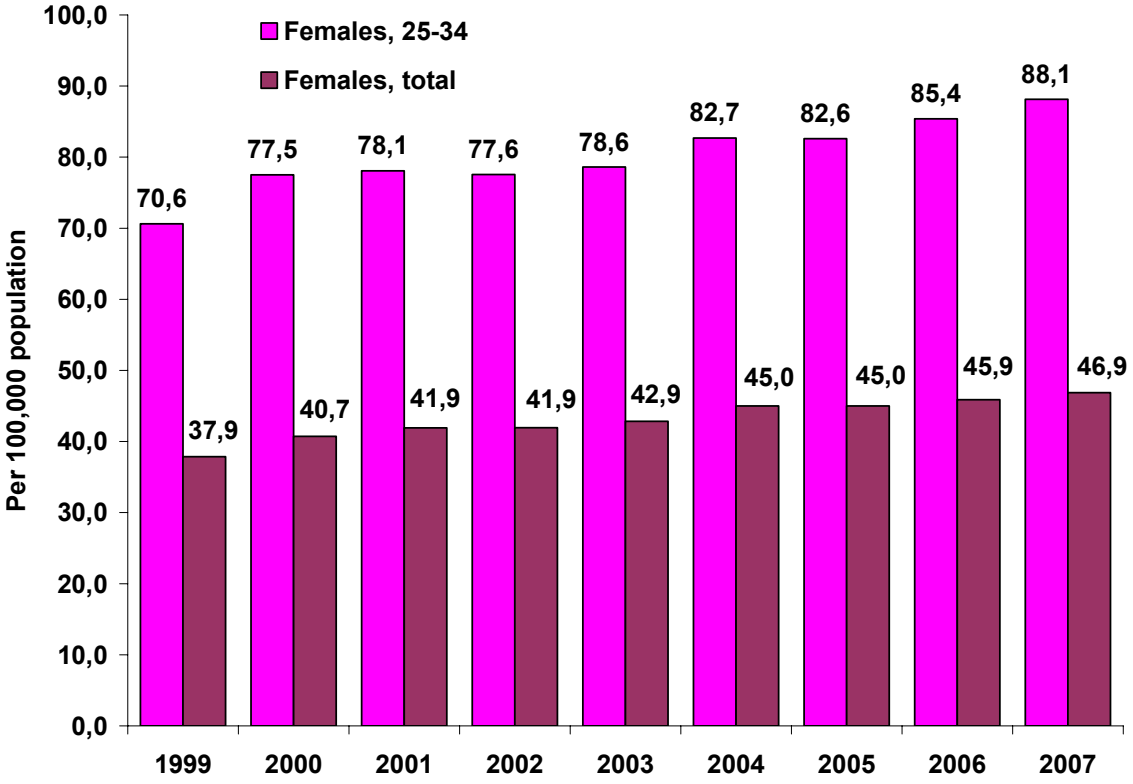


Figure 2.14. The notification rate among females, all ages and the subset of 25-34 years old. (Sources: Form #8, population: Forms #1 and # 4)

Analysis of the gender and age structure trends in tuberculosis notification rates over the past six years (2002-2007) showed on condition that the overall notification rate has stabilized, the age structure of patients are deteriorating during this period - the new TB patients are becaming younger. This is noted in more or less in all federal districts of Russia.

Over the past six years, more than a 20% increase in the number of new male cases registered in the most economically and socially active age - 25-34 years was observed (Figure 2.15). Graphs (figure 2.15, 2.16 and 2.17) show the emergence of a new maximum or a gradual shift towards age of 25-34 years for men, especially in the Urals and Siberian Federal Regions. As noted above, in recent years an increase in peak among women aged 25-34 years was observed, especially in SbFR, FEFR and UFR.

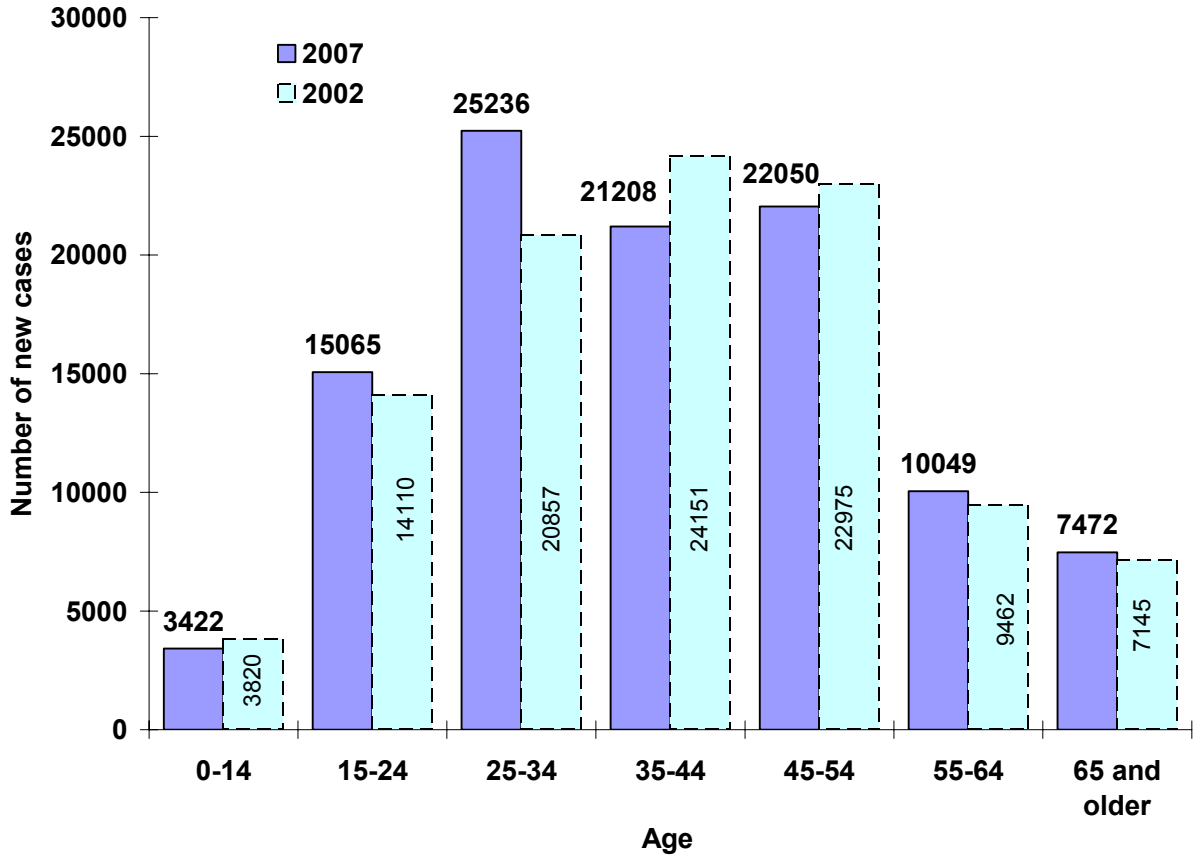
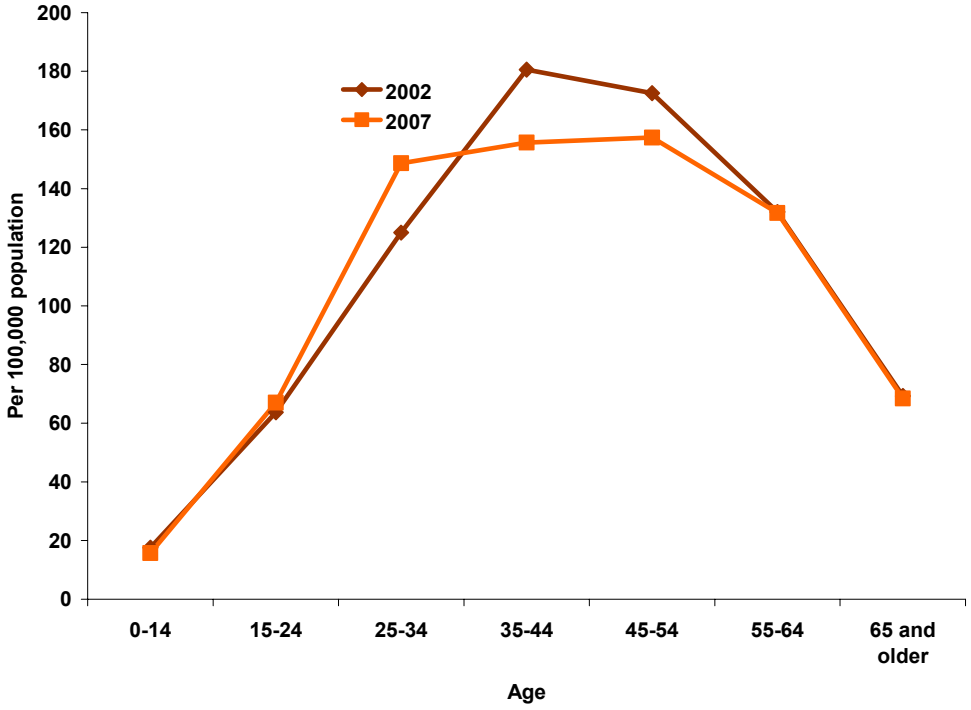


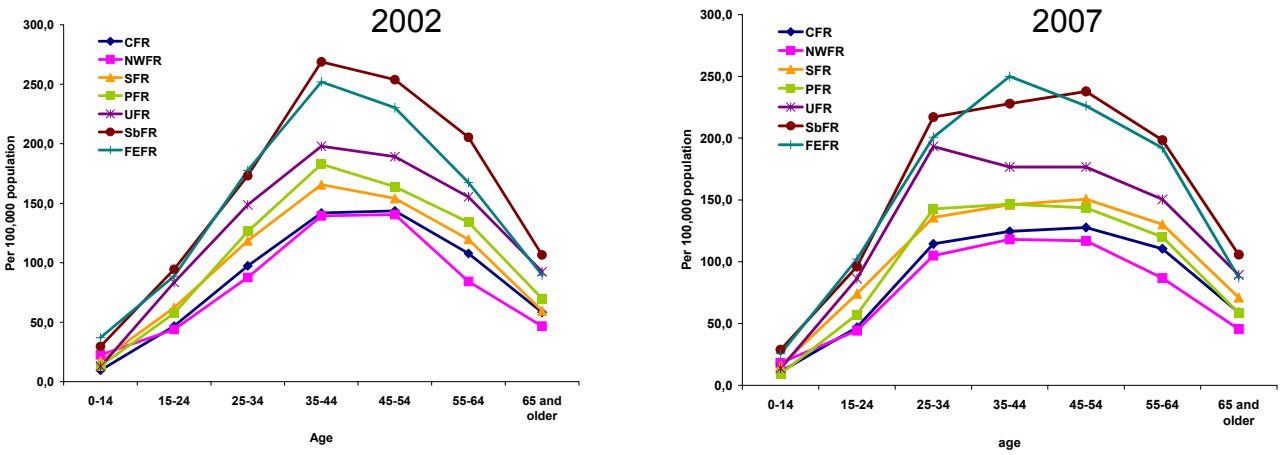
Figure 2.15. The number of new cases of tuberculosis among men of different age groups, the civilian population, the Russian Federation, 2002 and 2007. Information from form #8 excludes data from FSIN. (Sources: Form #8, population: Forms #1 and # 4)

In 2002 marked maximum notification rate among men aged 25-34 was only in the two territories - the Republic of Tuva, and the Yamalo-Nenets AO (1.5-2 times higher than the overall notification rate among males from civilian population), while in 2007 there were 12 territories with the peak in TB notification among 25-34 years old group, exceeding the overall notification rate among men more than 1.6 times (Orenburg, Ulyanovsk region, Khanty-

Mansiysk, Tver, Ivanovo, Samara, Tyumen, Ryazan, Chelyabinsk and the Moscow region, the Republic of Mari El and Tuva).



A) The Russian Federation



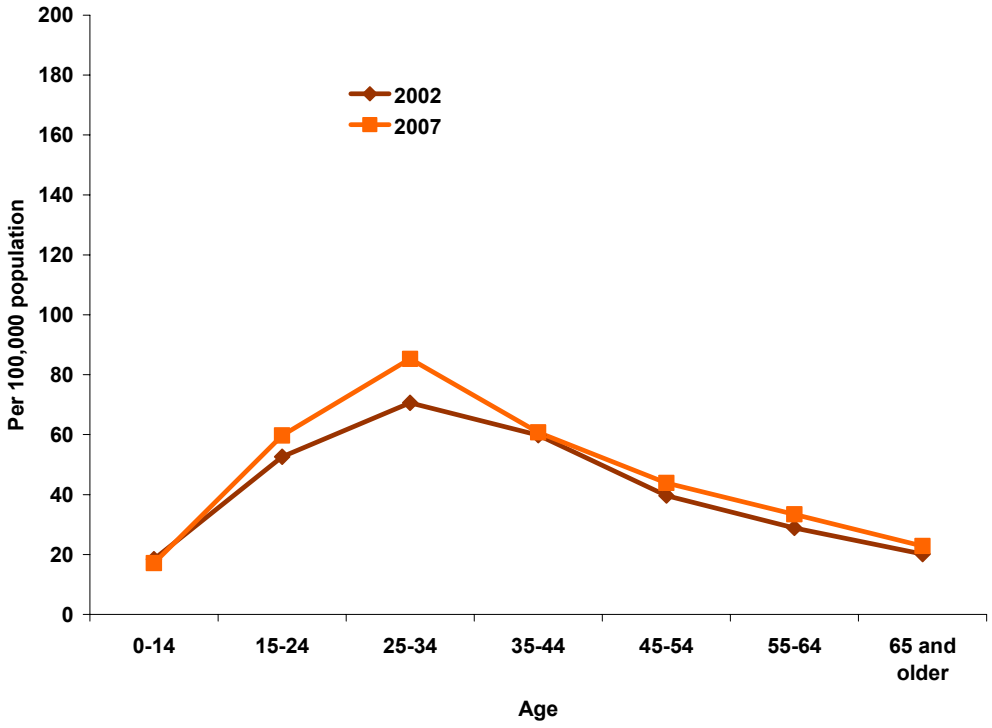
B) Federal Regions

Figure 2.16. TB notification rates among men of different age groups of the civilian population, the Russian Federation, 2002 and 2007. Data from form #8 excepting data from FSIN. (Sources: Form #8, population: Forms #1 and # 4).

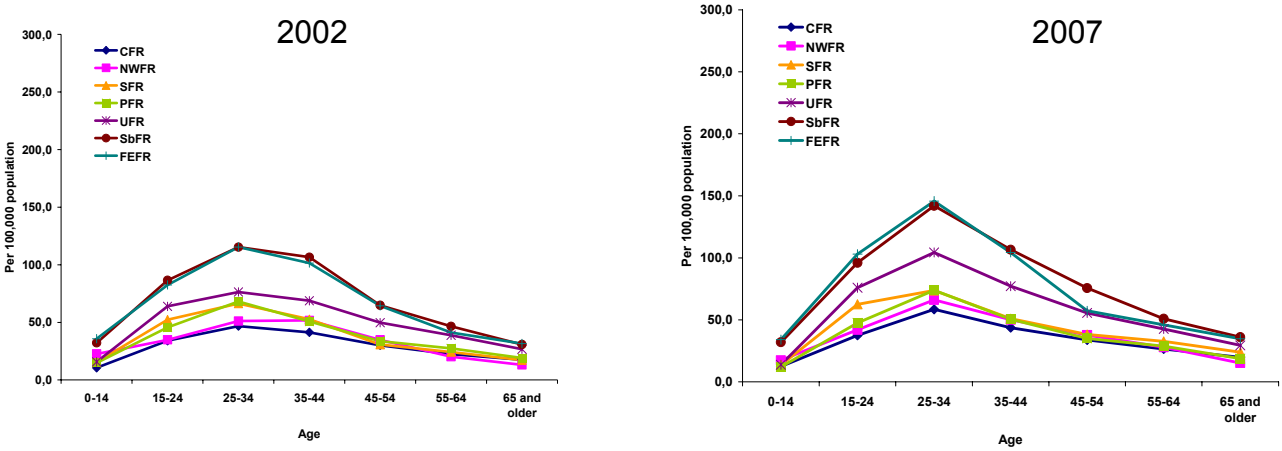
Several territories (Leningrad, Volgograd and Irkutsk region, the Republic of Bashkortostan, etc.) have a strong two-humped TB notification among males of two age groups - 25-34 and 45-54 years, and some (the Republic of Altai, Orel and Chita regions, etc.) - in 35-44 and 55-64 years old groups. Significant notification rate peak for men over the age of 55 years, exceeding the average notification among civilian men almost 2 times was registered in several North Caucasus republics (Chechnya, Dagestan, Kabardino-Balkaria), as

well as in Jewish AO. This can relate to the problems with registration of TB among young people or to a high level of migration of young men outside the region and, as a consequence, using overrated value of population of this age group in denominator for calculation of the notification rate.

The peak of tuberculosis notification among the female civilian population exceeds the nationwide notification among women more than twice in 14 administrative units of the Russian Federation (Vologda, Ivanovo, Ulyanovsk, Penza, Lipetsk, Tver, Amur, Kurgan, Penza, Perm, Tula, Kaluga and Pskov oblasts or areas, the Republic of Bashkortostan and the Primorsky Krai). In 2002 there were only seven such regions.



A) Russian Federation



B) Federal Regions

Figure 2.17. Registered TB notification rate among women of different age groups of the civilian population, the Russian Federation, 2002 and 2007. Data from form #8 excluding FSIN (Sources: Form #8, population: Forms #1 and # 4).

2.4 TB case notification among the child population[12]

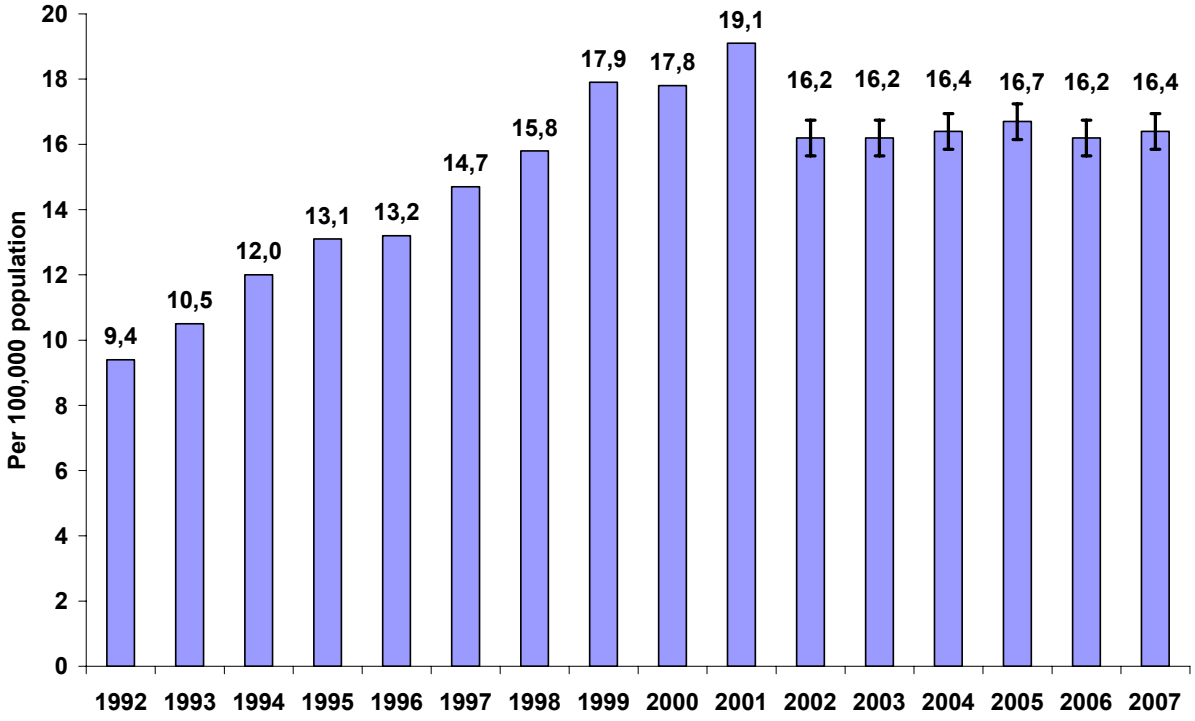
In international practice definition “child” include individuals aged from new born to 17 years 11 months 29 days. However, it is clear that from the epidemiological point this group is too heterogeneous for correct analysis. Especially important to separate adolescent group aged 15-17, because there is a significant increasing in communication and social activity at this age. Given this information, this section contains summary data, and separate data for children 0-14 years of age and adolescents aged 15-17 years.

TB notification rate among children is another important prognostic indicator based on epidemiological and demographic data. Although this parameter depends to a large degree on TB case finding and registration management among this age group (0-14 year olds), its high level requires special managerial decision-making and implementation of targeted activities.

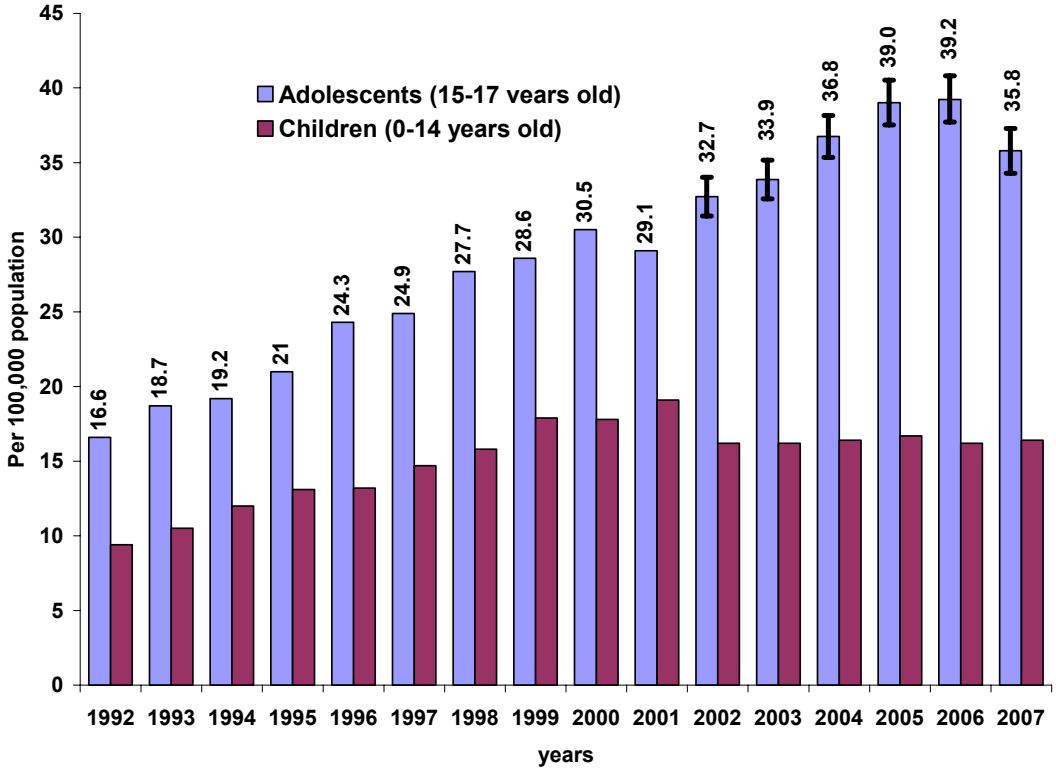
Overall in the RF, from 1992 to 2001, the TB notification rate among children increased almost two-fold (from 9.4 to 19.1 per 100,000 children, Figure 2.18A). Over the last four years, the rate has not substantially changed (16.4 per 100,000 children in 2006), with some minor fluctuations within the limits of expected statistical error (± 0.6 per 100,000 population).

In contrast to children aged 0 to 14 years, adolescents (children aged 15-17 years) before 2007 had an increasing TB notification rate. From 2002 to 2006 TB notification rate in this group increased from 32.7 to 39.2 per 100,000 of average annual number of adolescents. In 2007 the value decreased to 35.8 per 100,000 population. However, in recent years, changes may be partly linked to the significant reduction in the number of adolescent population in 2004-2007 (from 7,462 to 6,133 thousands of thousands as of January 1 of referred years). This may affect the calculation of notification rate due to conditional nature of the definition “average annual population”.

[12] V.A. Aksenova (RIPP) has been participated in preparation of the section 2.4



A) TB notification rate among children



B) TB notification rate among teenagers and children (for comparison)

Figure 2.18 TB notification rate among children 0-14 years of age and adolescents 15-17 years, 1992-2007, the Russian Federation. Lines of variation for 2002-2007 indicate 95% confidence intervals. (Sources: Form #8, population: Forms ##1 and 4).

The notification rate of adolescents more than twice the notification rate of children aged 0 to 14 years, which proves the need for special attention to this group. Note also that the TB

notification rate also significantly varies in the group 0-14 years. Thus, according to the Form # 8 (2007) the high level of indicator may be noted for ages 5-6 years (48.9 per 100,000 of children of that age), and its low value for the age groups 0-4 years (8 per 100,000) and 7-14 years (14.4 per 100,000).

The TB localizations among children got TB disease statistically significant changed in the past three years. The proportion of patients with extra-respiratory[13] tuberculosis (ERTB) in a group of 0-17 years of age decreased from 9.1% (2004) to 7.7% (2007), with significantly decreased number of children with tuberculosis of peripheral lymph nodes. This diagnosis is no longer dominant TB localization for this category of patients, its proportion decreased from 32.6% in 2004 to 21.9% - in 2007 (see Figure 2.24). Significantly increased the proportion and number of children with bone and joint TB (from 24% in 2005 to 35.7% in 2007 among children with ERTB). It should be noted that similar processes (an increase of proportion of patients with bone and joint TB and decreases of peripheral lymph nodes TB in the structure of ERTB) marked, although to the less extent, in adults, especially in the older 45 age group (see below).

The number of children with TB registered in each of the subjects of the Russian Federation is relatively small. For example, according to the form #8 in 2007 in the half of territories the number of reported new cases of children with TB under the age of 15 ranges from 14 to 49 TB cases. This leads to significant differences in indicators by years for each subject of the Russian Federation, as well as among territories. Therefore it is appropriate to assess the trends in TB notification rate among children using groups in several years. Figure 2.19 shows the distribution of territories by the summary level of the indicator, calculated for a period of six years, including years of stabilized notification rate (2002-2007). It is shown that the TB notification rate among children ranges from 71.2 (Kaliningrad region) and 67.2 (Kamchatskii AO) to 4.4 (Lipetsk region) and 4.3 (Pskov region)[14].

[13] Russian statistical TB reports doesn't include directly an information about extra-pulmonary TB cases. TB report includes data about total TB, respiratory TB, pulmonary TB and extra-respiratory TB *(comments of interpreter)*

[14] Data from territories with children population more then 50000

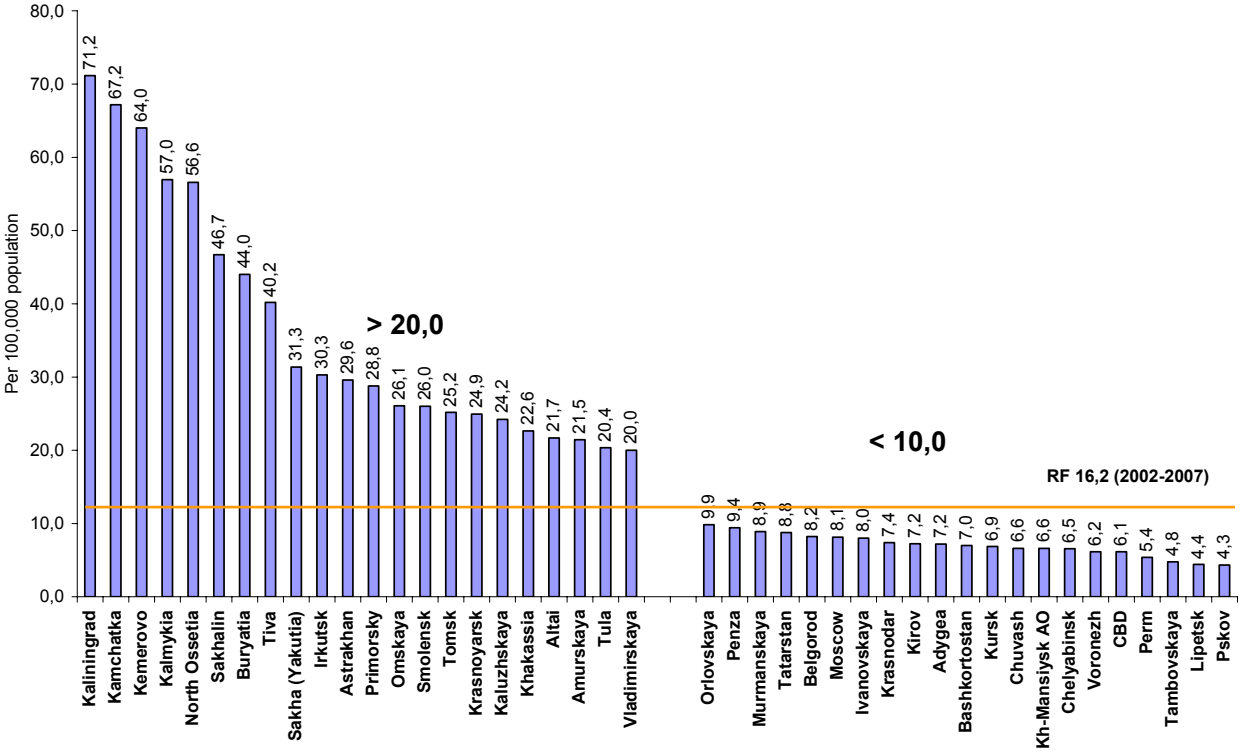


Figure 2.19. Registered TB notification rates among children in the Russian Federation, the combined numbers for the 6-year period 2002-2007 (Sources: Form #8, population: Forms ##1 and 4).

In recent years there are multidirectional trends in this indicator. In some regions of the Russian Federation, there is a marked increase, while in others - the reduction in TB notification rate among children. That trends were registered in the years (2006-2007) of the stabilization of the countrywide TB notification rate - (Figure 2.20).

In 2002-2007 in Vladimir and Smolensk regions, Republics of Mari El and Kalmykiya there have been a significant increase in the incidence of TB among children (2-4 times). At the same time, in the Leningrad region, the Republics of Ingushetia, Tyva, Altai a significant decrease in this indicator was observed (1.5 - 3 times). These phenomena require further research, since they may reflect actual changes in the epidemiological situation or changes in notification and registration of TB by regional services. The latter has a particularly strong impact on the level of detection of the disease among children, because diagnostic process at this age has limited application of radiography and laboratory examination.

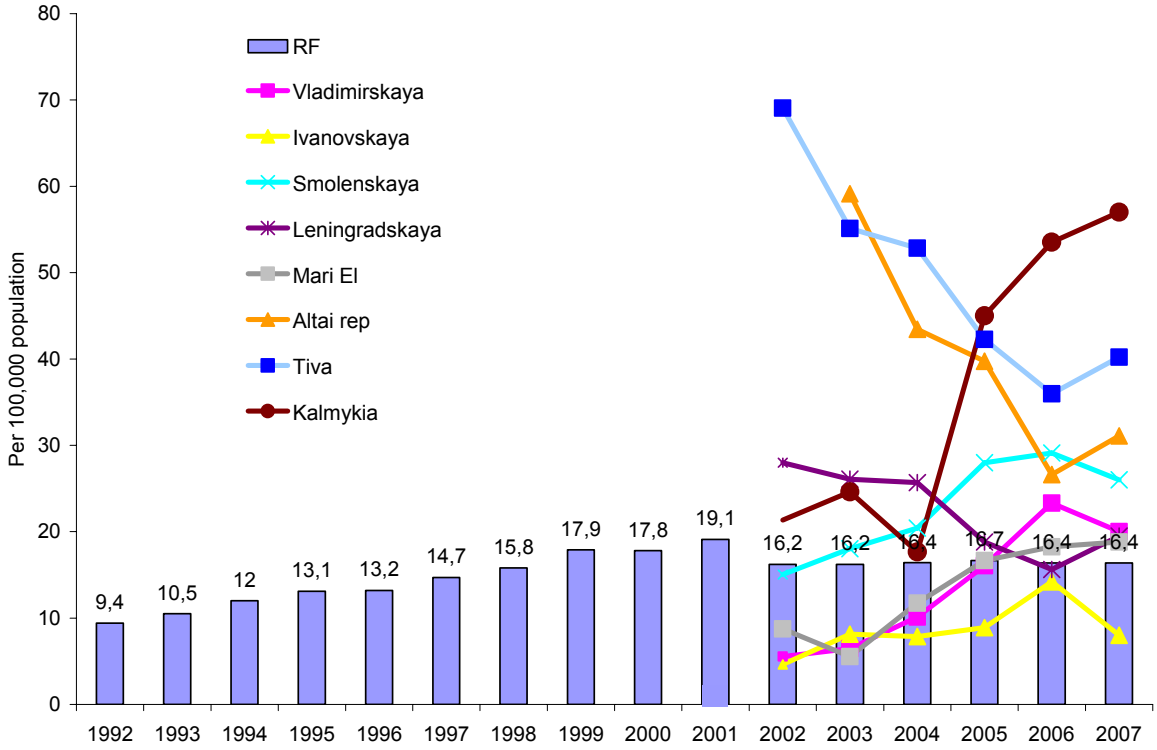


Figure 2.20. TB notification rates among children, 1992-2007, the Russian Federation and some subjects of the Russian Federation. (Sources: Form #8, population: Forms ##1 and 4).

Figure 2.17 shows the notification of tuberculosis among children in the federal regions. To the east of the country in SbFR and FEFR the values of the indicator are almost 2 times higher than in the Urals and in central, southern and western regions of the Russian Federation[15].

These numbers confirm once again the fact that the TB epidemiological situation in the eastern part of Russia is much more severe than in the western part.

[15] TB notification rate among children for western regions is defined here without Kaliningrad oblast located far West from other territories and has the high level of the rate.

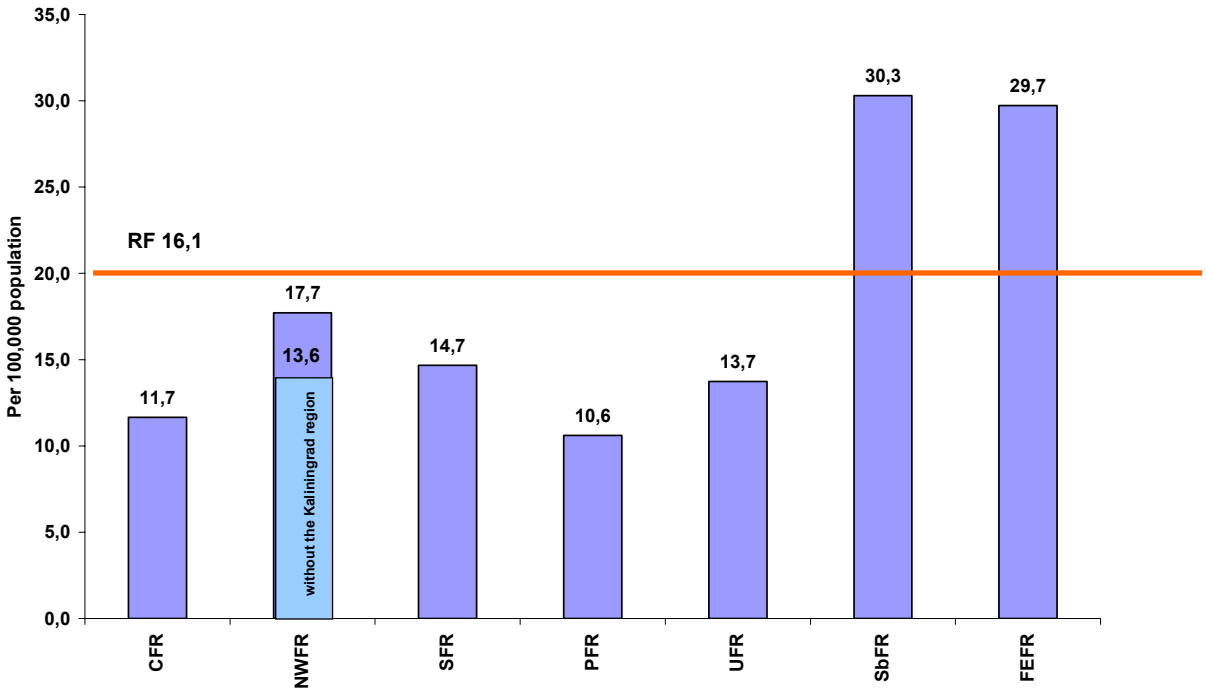


Figure 2.21. Tuberculosis notification rates among children in the federal districts of the Russian Federation, 2007. Data on NWFR are given with and without the Kaliningrad region. (Sources: Form #8, population: Forms ##1 and 4).

2.5. Structure of new TB cases in the Russian Federation

Pulmonary TB (PTB) is traditionally recognized as the epidemiologically most dangerous form of the disease.

Among all new cases registered at TB services, 89.3% (2007) are pulmonary TB. This percentage varies quite broadly by subjects of the Russian Federation (Figure 2.22): from 75-78% (Magadan region, Republic of North Osetiya and the city of St. Petersburg) to 94-97% (Krasnodar krai, the Republic of Khakasia, Chukotsky and JewishAutonomous Regions). At the present time, this percentage depends to a large degree on the capacity of a territory to detect TB of the extra-pulmonary organs: both of respiratory sites[16] (TB of the upper respiratory tract and bronchi, intrathoracic lymph nodes and pleura) and of extra-respiratory sites (TB of the bones and joints, urogenital organs, CNS, etc.). This capacity depends on the presence of necessary experts and their qualifications, as well as the presence of adequate primary knowledge about extra-pulmonary TB among PHC staff and specialists such as urologists, gynecologists and physicians of other fields of expertise.

The notification rate of extra-respiratory TB (ERTB) is relatively low. The rate remained stable in the period of 1992-2002, at about 3.3 per 100,000 population, and by 2007, declined slightly to 2.8 (Figure 2. 23). The percentage of such cases among all new cases in the

[16] Without lung parenchyma lesion

Russian Federation decreased substantially from 10.2% in 1992 to 3.5% in 2007; as a result, the notification rate of ERTB in recent years has not had much of an impact on the trend in the overall TB notification rate in the country. It could be possible that this rate is underestimated due to registration specifics of the combined pathology of pulmonary TB and TB of other organs. Unfortunately, reporting documents available at the present time only record the major pathology, which in most cases is a pulmonary TB. Furthermore, a considerable number of cases with ERTB also is remained undetected due absence of knowledge about early detection methods among GHC physician, and sometimes ignoring of this problem.

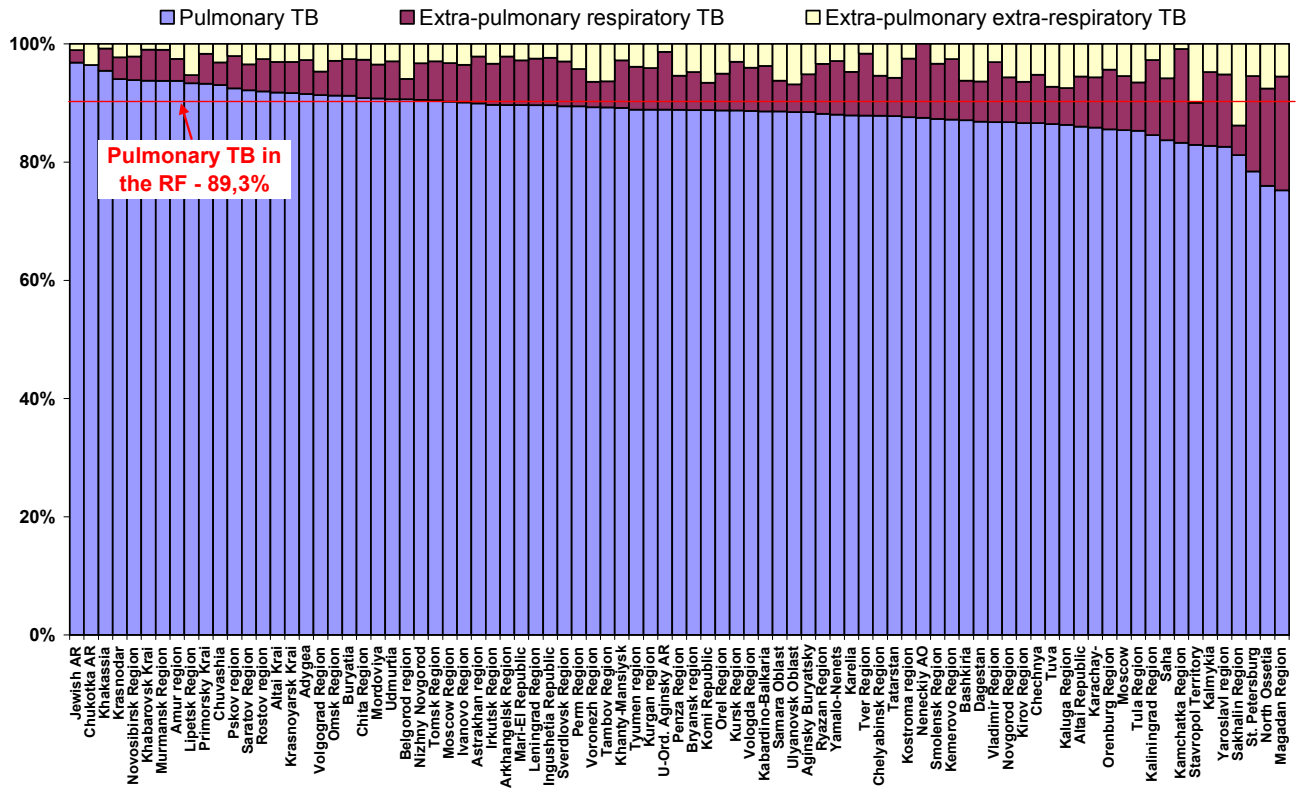


Figure 2.22. TB sites among new cases, by territories of the Russian Federation, 2007. Pulmonary TB, respiratory TB of extra-pulmonary sites and extra-respiratoryTB (see text). (Source: Form #33).

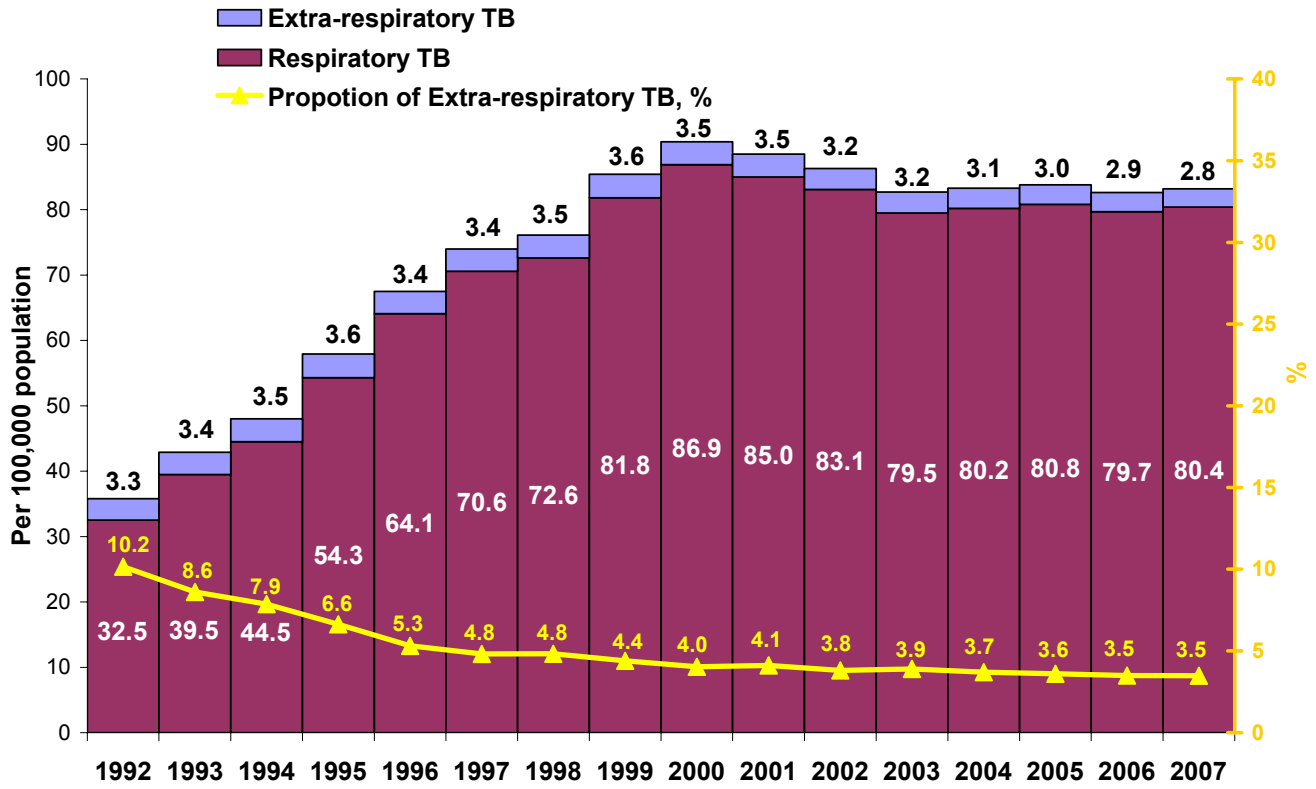


Figure 2.23. TB notification rates of respiratory and extra-respiratory TB, and the percentage of extra-respiratory TB among all cases, 1992-2007 (Sources: Form #8, population: Forms ##1 and 4).

It appears necessary to introduce the concept of combined site TB cases into the TB recording and reporting forms. This would allow for more accurate calculation of the level of extra-pulmonary and extra-respiratory TB in the country. Such a measure is important for defining the need for extra-respiratory TB specialists in the regions, and then conducting training courses on the issue of extra-respiratory TB diagnostics for physicians of all fields of expertise.

The timely detection of extra-respiratory TB is also critical due to the high level of disability in such patients (9).

In 2007 among sites of new extra-respiratory TB cases (Figure 2.24), urogenital TB is the most common (34.9%), with other common forms being TB of the bones and joints (29.4%), TB of the peripheral lymphatic nodes (15.0%) and ocular TB (7.4%).

The clinical structure (localization) of new extra-respiratory cases is different in males and females. Males more often than females have TB of the bones and joints. Females more frequently have urogenital TB. Among all children aged 0-17 with extra-respiratory TB, as mentioned earlier, TB of the bones and joints is the most common form of TB.

It should be noted that according to the form #8, there is some increase (1.2 times) of the proportion of tuberculosis of bones and joints among patients with ages younger than 18

years and older than 45 years. In the same groups the percentage of peripheral lymph node tuberculosis slightly decreased.

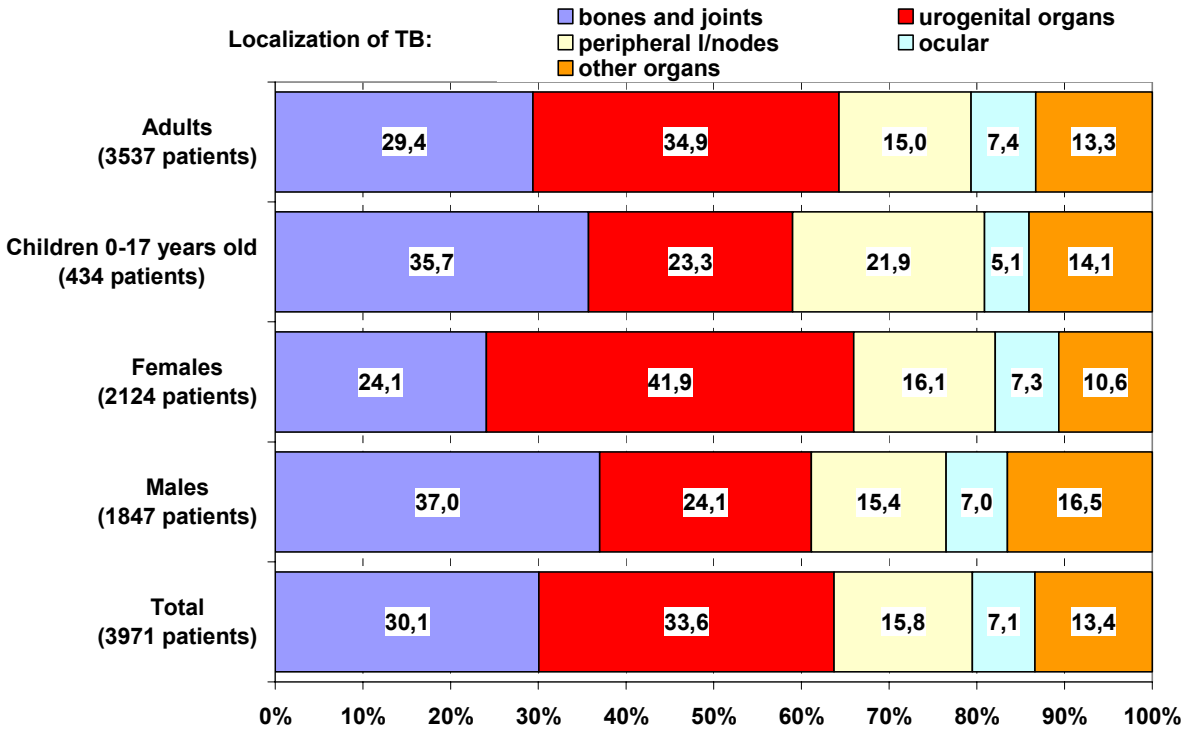


Figure 2.24. Clinical structure (sites) of new extra-respiratory TB cases, Russia, 2007. (Source: Form #8).

The effectiveness of TB detection activities is reflected in the proportion of severe pulmonary TB forms among new cases.

TB cases with pulmonary tissue destruction (cavern) and fibro-cavernous TB[17] (FCTB) are registered in TB reporting forms. Special attention is paid to the most epidemiologically dangerous cases – bacteriological positive TB cases which are laboratory confirmed.

The percentage of destructive forms of pulmonary TB among new cases in Russia overall has practically not changed over the last 9 years. It remains at the level of 49-52% (49.4% in 2007).

At the same time, this rate differs substantially by territory (Figure 2.25). A high rate of destructive forms of pulmonary TB can be partly accounted for by late detection of TB. On the other hand, a low rate may reflect either successful early detection activities, or low effectiveness or limited use of x-ray diagnostics when evaluating TB patients.

[17] These are the most severe pulmonary TB forms registered in statistical reports. “Fibro-cavernous” is defined as chronic TB with extended lung cavitations and fibrosis *(interpreter notes)*

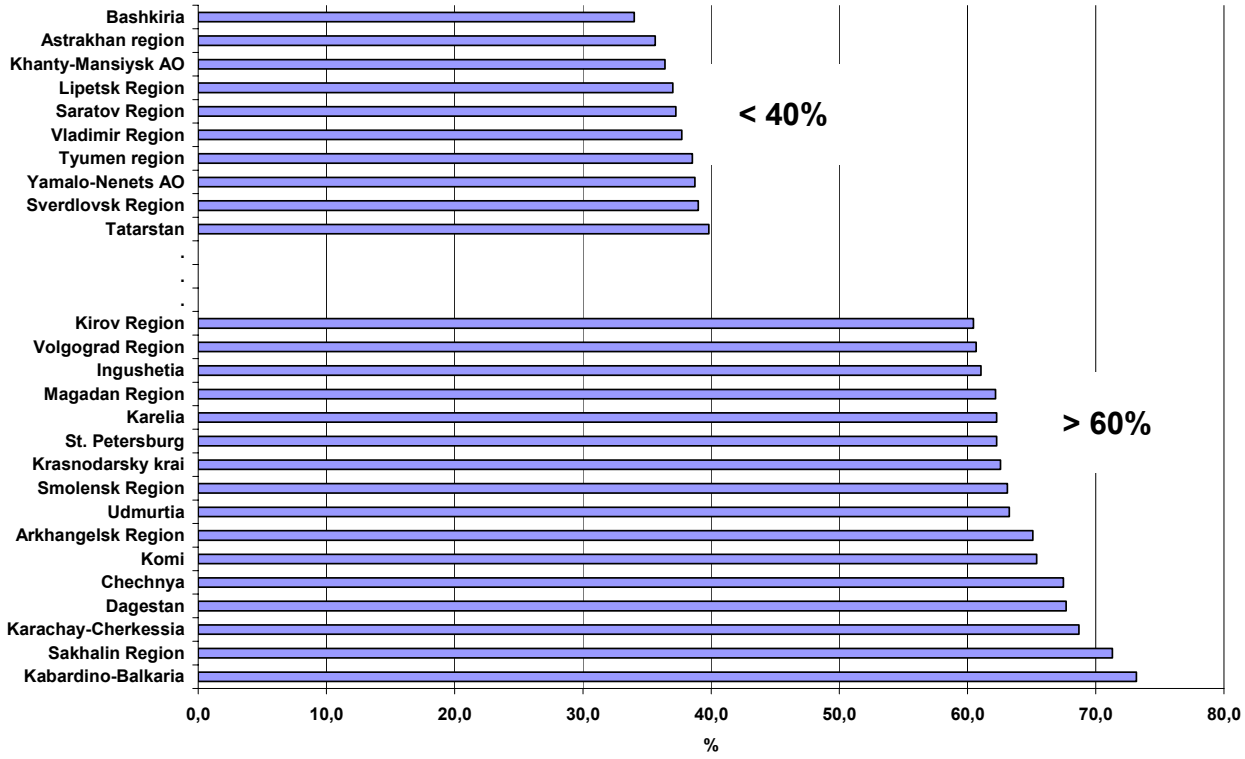


Figure 2.25. The percentage of new pulmonary TB cases with lung destruction in the territories of the Russian Federation, 2007. Only territories with rates < 40% and > 60% are shown. (Source: Form #33)

An important indicator which reflects late TB detection is the percentage of fibro-cavernous TB (FCTB) cases among all detected TB cases (Figure 2.26). After an increase in the percentage of such cases starting at the end of the 80's to the end of the 90's, a steady decline in the percentage of this extremely severe form of pulmonary TB has been observed since 1999. Declined in the early 2000's to 2.4%, after 2003 the proportion of F-C TB remains statistically unchanged around this value (2.2% -2.4%, 2.4% in 2007). This may be the result of improved effectiveness of TB detection activities performed by TB services during last three years.

As a proportion of lung destructive forms of TB, the proportion of FCTB varies considerably by territory of the Russian Federation. In some territories it is over 7% (Kamchatka oblast – 8.4%, Kamchatka region – 8.0%, Nizhny Novgorod – 7.0%), in other regions this form of pulmonary TB has either not been registered at all (for example, in Yamal-Nenets autonomous region), or does not exceed 0.5% (Orenburg region – 0.1%, Arkhangelsk region – 0.2%, Rostov region - 0,3%, Perm and Pskov regions - 0.4%), which may be caused by a effective work of TB services or by defects of diagnosis.

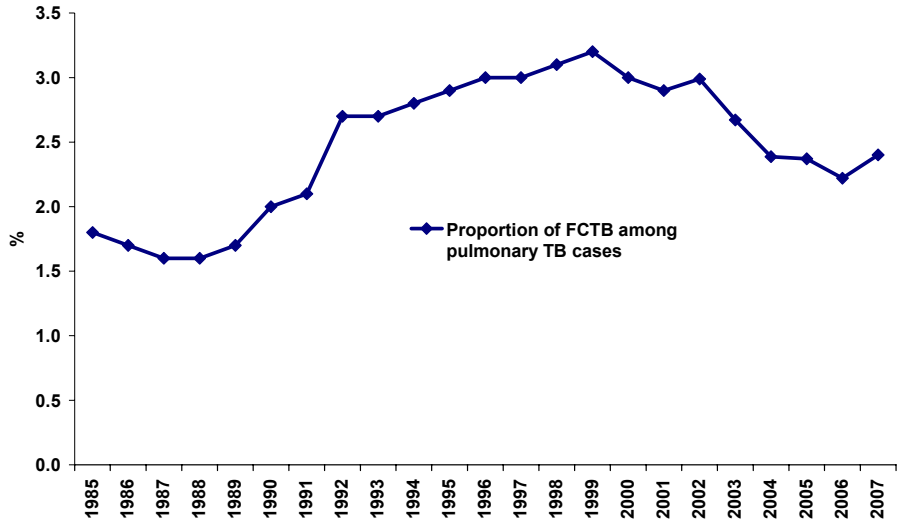


Figure 2.26. The percentage of new cases with FCTB among pulmonary TB registered at MoH&SD facilities (source: Form #33).

2.6. The notification of MbT+ TB patients

In assessing the epidemiological situation, the cases of tuberculosis confirmed by laboratory methods, i.e. new cases of MbT+TB are considered with special attention. Important characteristics are the notification rate of MbT+ TB patients and proportion of MbT+ TB patients among new TB cases.

In recent years, similar to the overall notification rate, there has been a stabilization of the notification rate of tuberculosis, confirmed by laboratory methods. The notification rate of MbT+ TB diagnosed by all methods remains at 32 - 35 per 100K population. At the same time, in 2000-2007 increased the notification rate of sputum smear positive TB identified using microscopy (ss+ TB) - from 13.6 to 20.6 in institutions MoH&SD, see Figure 2.27. The latter fact indicates not only increase in the number of particularly epidemiologically dangerous patients, but also the improvement of laboratory diagnosis of tuberculosis, resulting in higher proportion of notified MbT+ TB. This relates, in particular, to great work being done in the past three years in the Russian Federation to equip the clinical diagnostic and bacteriological laboratories and staff training from projects of the IBRD and Global Fund.

Current tuberculosis registration system in Russia has slightly redundant reporting; so there are several options for calculating the proportion of MbT+ among new TB cases. Depending on the reporting form used, the data of different groups of patients are being used for calculation (all patients or patients only from the civilian population), different forms of tuberculosis (all cases, RTB and PTB), and different methods for determining MbT+ (all methods, microscopy or smear, culture).

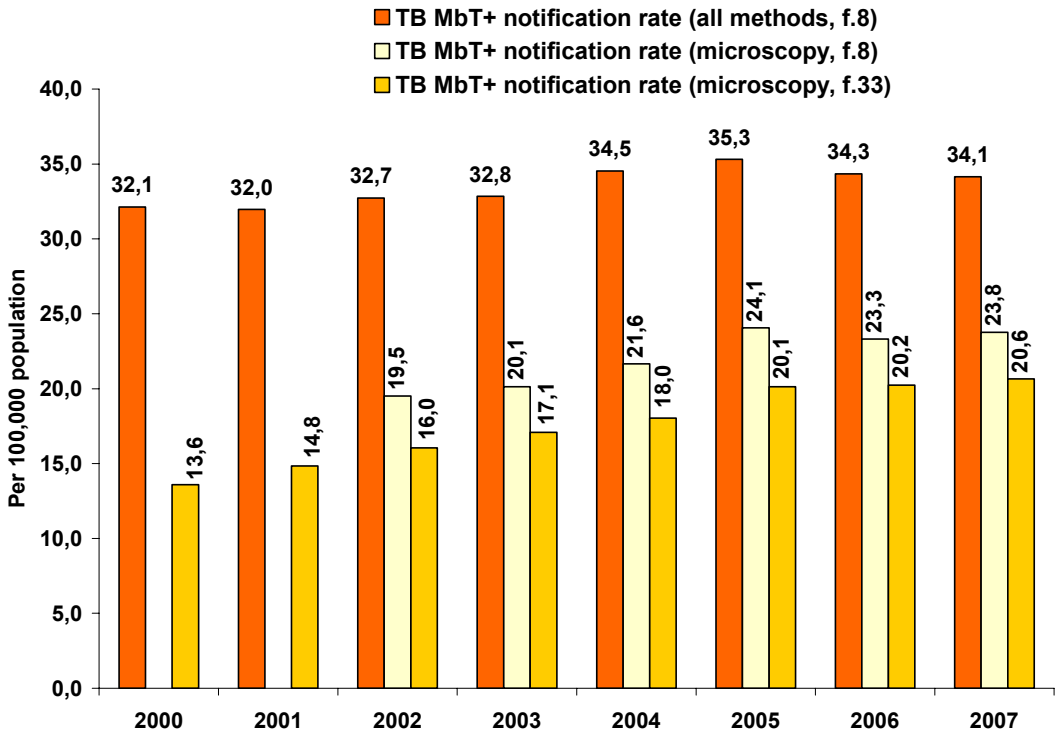


Figure 2.27. Notification rates of MbT+ TB cases of all localizations, confirmed by any method (Form #8), and notification rates of MbT+ PTB cases diagnosed by microscopy (ss+ TB), for the entire population and for the permanent resident population only, registered at MoH&SD facilities (Forms ##8 and 33. Data on population: Forms ##1 and 4)

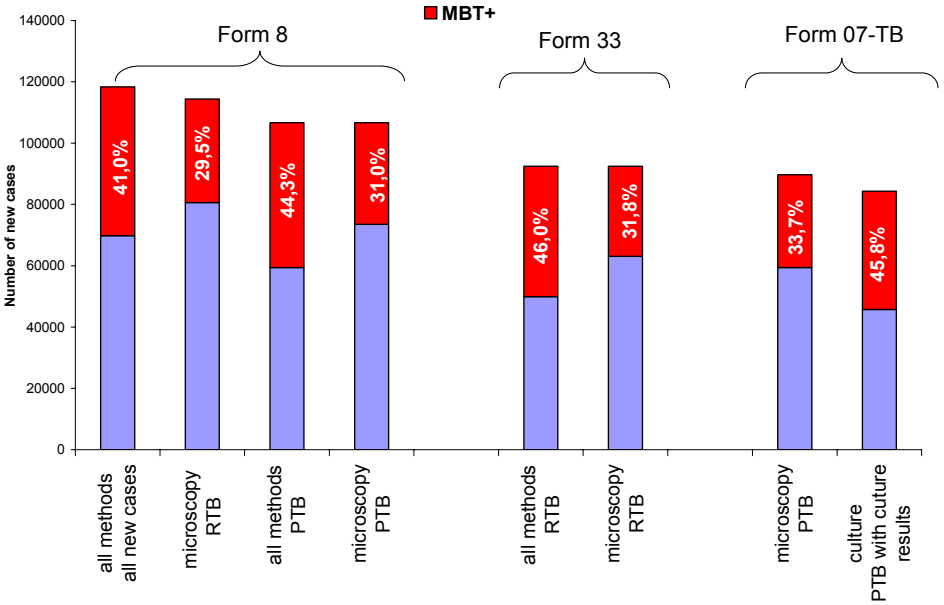


Figure 2.28. The percentage of bacteriological positive cases confirmed by different methods among new cases, new cases of respiratory TB (RTB) and pulmonary TB (PTB), the Russian Federation. Sources: Forms ##8, 33 and 07-TB, 2007.

Figure 2.28 presents the most commonly used approaches. The use of reporting form #8 allows for the calculation of the percentage of new bacteriological positive cases confirmed by any method among all new cases (41.0%)[18]. Of special interest is the percentage of

[18] All percentage values of MbT+ patients in the description of Figure 2.28 are specific for 2007 .

bacteriological positive TB cases among pulmonary TB cases (44.3%); of these, 31.0% were confirmed by microscopy (ss+ TB). Form #33 allows the calculation of the value of the given indicator for the permanent resident population (i.e., cases registered at MoH&SD facilities). Of key interest is the percentage of bacteriological positive cases confirmed by microscopy - ss+ TB (31.8%) among pulmonary TB cases, and by all methods among respiratory TB cases (46.0%).

Form #07-TB, approved by MoH Executive Order #50 of 13.02.04 [16] reflects laboratory tests results most fully and precisely. Used for many years in the Russian TB Service annual report Forms ## 8 and 33 contain aggregate information, which is formed by the end of December. Therefore, these reports do not include data on the results of culture for the majority of newly diagnosed patients, registered in November and December of the year, i.e. MbT+ data contained in those forms are not complete[19]. Besides, these forms do not include data on the number of patients tested by culture, and the results of these tests. In the Form #7-TB that are reported in one quarter after the end of the reporting year, complete annual data on new cases with MbT+ PTB diagnosed by both microscopy and culture methods (latter indicator - the number of new MbT+ cases diagnosed by culture - is also impossible to obtain from a Forms ## 33 and 8). In addition, Form #7-TB provides information on coverage of new cases by laboratory tests, by both microscopy and culture.

According to the Form #7-TB in 2007 in the civilian sector the proportion of registered new cases of pulmonary tuberculosis with MbT+ determined by microscopy is equal to 33.7% (as in 2006), and by the culture method among PTB who had culture performed – 45.8% (44.4% in 2006). According to the data of this reporting forms coverage by microscopy and culture in the territories is quite high: 98.2% of new cases with PTB by sputum microscopy, and by culture 87.2% of new cases with positive microscopy.

Figure 2.29 also shows that from 2000 to 2004 a gradual increase in the proportion of MbT+ among the new cases was observed. In circumstances of the stabilization of the epidemic process, this meant improving work of laboratory services in TB detection. However, in the past three years the value of the indicator has not changed and remains at low level. It is significantly lower internationally accepted values (50% for microscopy and 75% for culture).

Only in 20 territories (Figure 2.30) the proportion of new TB cases with MbT+ determined by any method exceed 50%, in five territories - no more than 30%. In 8 territories the proportion of patients with ss+ (Figure 2.31) was more than 50% and in 12 - less than 25%. Only in 20 territories, the proportion of new TB cases with MbT+ confirmed by culture was more than 55% (Figure 2.32). In 10 territories this indicator does not exceed 25%. However, the low proportion of MbT+ determined by culture, based on a relatively recently

[19] The same situation can be noted also for drug resistance TB data

introduced Form #7-TB, now may also reflect the poor quality of filling forms on culture results, i.e. show insufficient collaboration between the laboratory and epidemiological surveillance services.

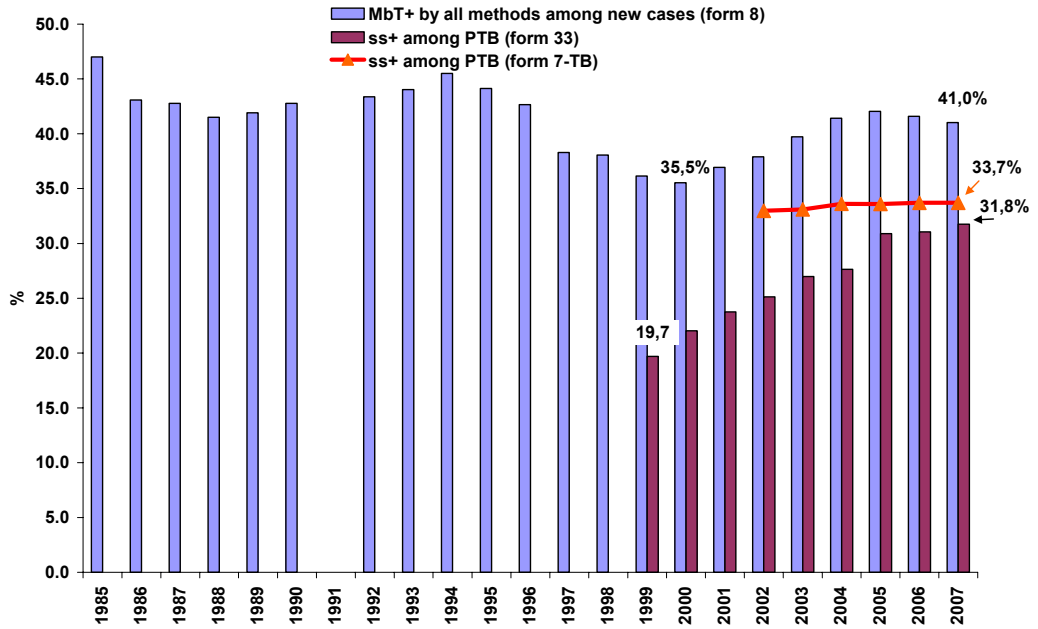


Figure 2.29. Proportion of bacteriologically positive new pulmonary TB cases. The Russian Federation. Based on data on bacteriologically positive cases confirmed by any method among all new TB cases (Form #8) and confirmed by microscopy among new PTB and RTB cases (Forms #33 and #7-TB, respectively[20])

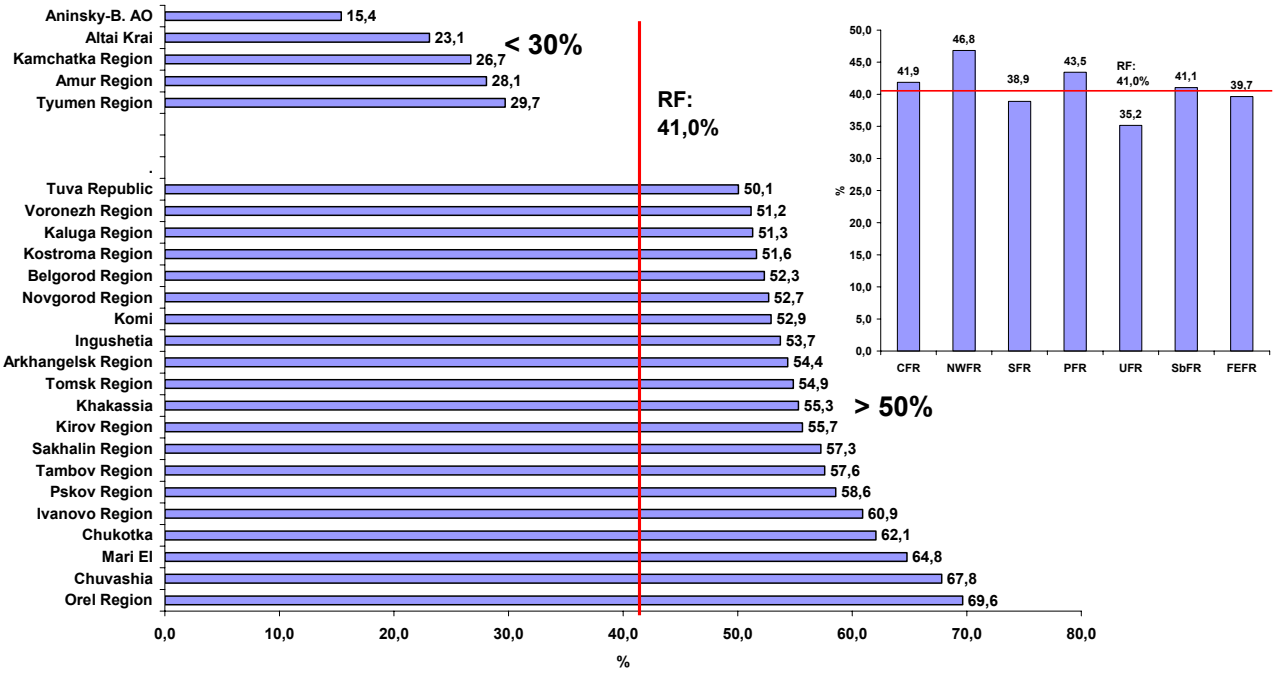


Figure 2.30. The percentage of new bacteriological positive TB cases confirmed by any method, (a) for groups of territories with the lowest (<30%) and highest (> 50%) values of indicator, and (b) by the Federal Regions. The Russian Federation, 2007 (source: Form #7-TB)

[20] Data from Form #07-TB for 2002, 2003, 2004, 2005 and 2006 are collected from 23, 24,34, 67 and 84 territories, respectively.

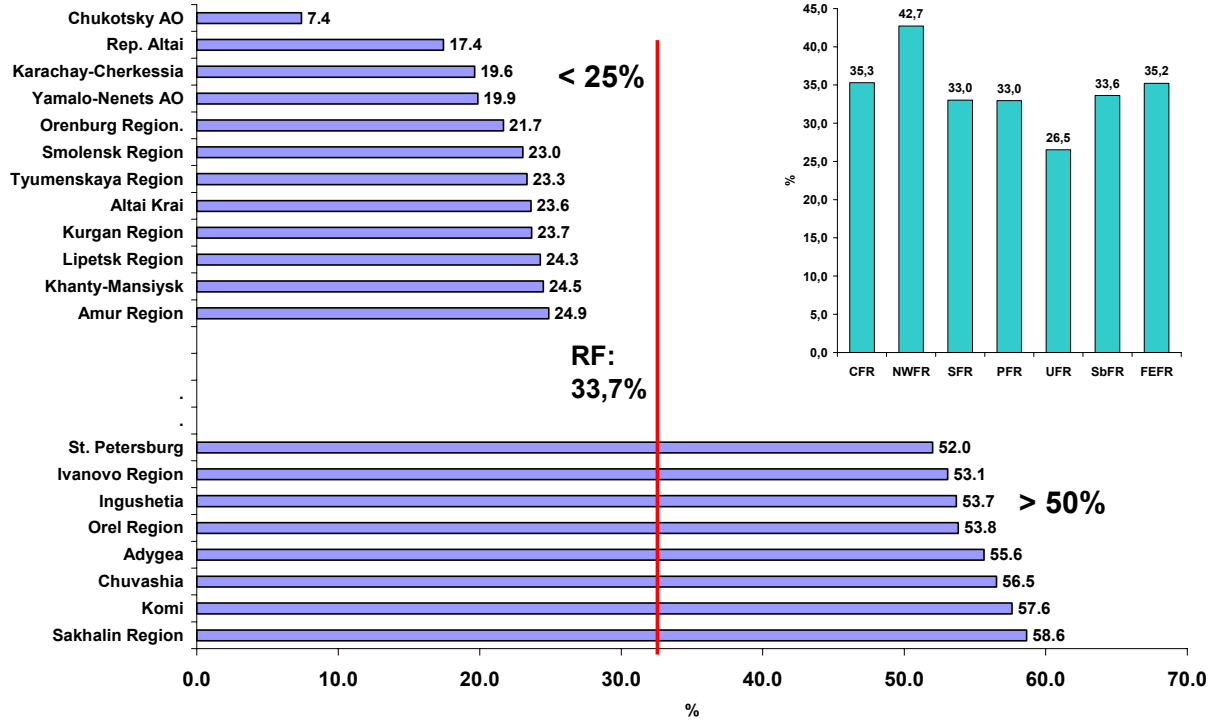


Figure 2.31. The proportion of smear-positive new respiratory TB cases with ss+, 2007, (a) for territories with the <25% and >50% values of indicator, and (b) by the Federal Regions. The Russian Federation (source: Form #7-TB).

In general, the figures show the need for further work to improve laboratory services, particularly in Southern and Ural Federal Regions. It is also obvious that quality of laboratory tests (microscopy and culture) in NWFR is high, where the proportion diagnosed MBT+ is relatively high compared with other regions of Russia.

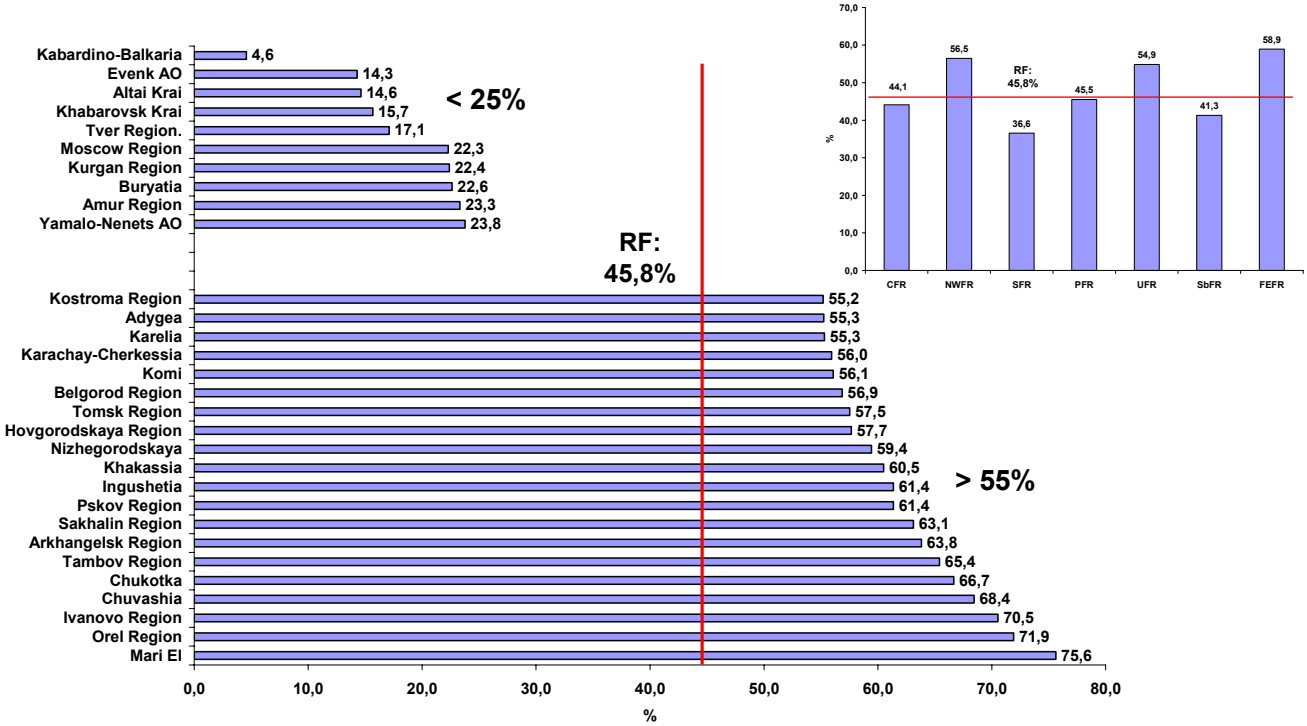


Figure 2.32. The proportion of new RTB MbT+ cases diagnosed by culture, 2007. (a) territories with value >55% and <25%, (b) by Federal Regions. Russian Federation. (source: Form #7-TB).

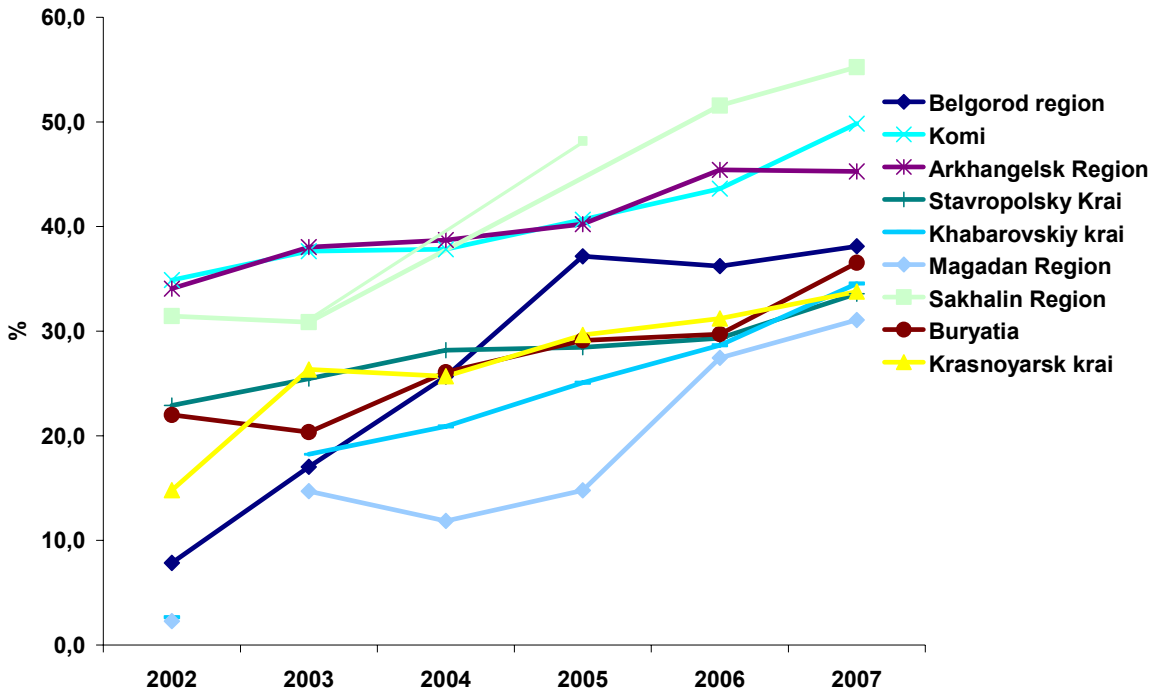


Figure 2.33. Increase in registration of new ss+ respiratory TB cases in territories of the Russian Federation. Proportion of ss+ TB cases among new respiratory TB cases. (Source: Form #33)

In recent years, a considerable positive trend has been observed in many territories in the rate of detection of smear-positive (ss+) TB cases (Figure 2.33). The proportion of such cases increased by 1.5-5 times over a 5 year period in these territories,.

An important indicator that reflects the performance of bacteriology services is the relationship of the number of MbT+ cases to the number of cases with destructive pulmonary TB (among new cases). This represents how often bacterial excretion is being diagnosed in especially severe forms of pulmonary TB.

From Figure 2.34, it is seen that over the last three years the value of this indicator in Russia overall has reached or even slightly exceeded 100%. However, in 2007 in 7 territories, it was lower than 70% (55-67%), providing evidence that laboratories are not performing effectively enough. Note that in 2006 there were 10 such territories. In 18 territories in 2007 this indicator exceeded 125% (in 2006 - in 12 territories) that can demonstrate the quality work of these laboratories and / or if there are problems with X-ray diagnosis.

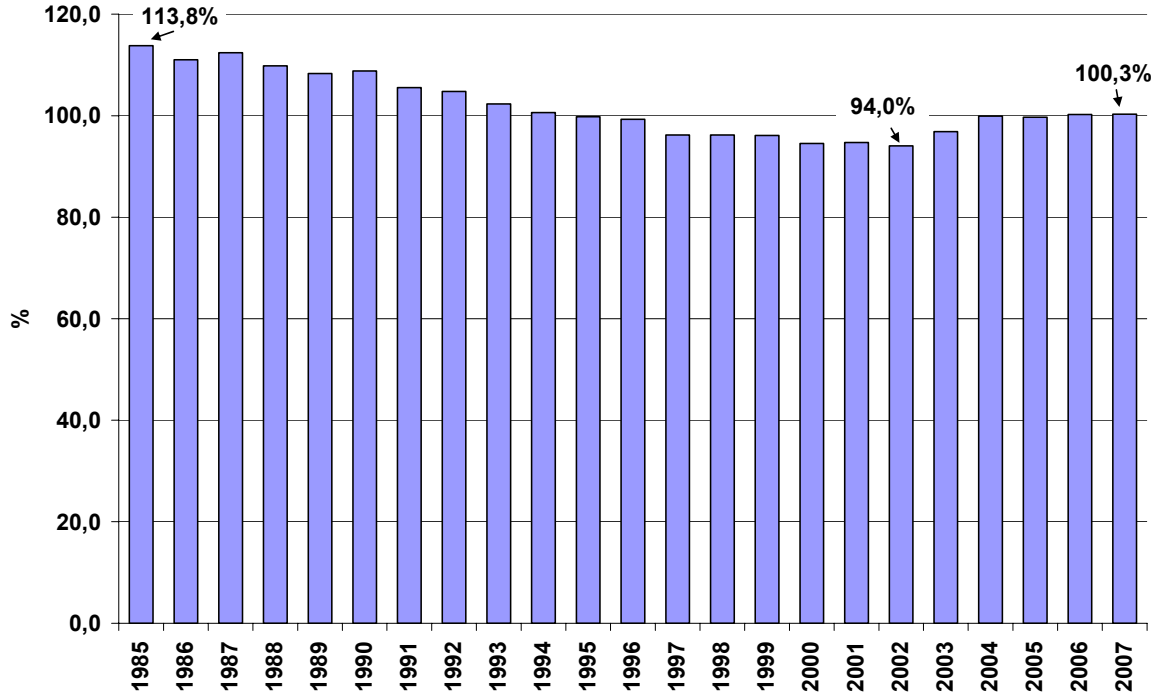


Figure 2.34. The relationship of the number of MbT+ cases to the number of destructive forms among respiratory TB cases registered at MoH&SD facilities (Source: Form #33).

Note that the relationship of the number of MbT+ cases to the number of destructive forms among new cases is an integral indirect indicator reflecting all technical stages of laboratory testing: the collection of samples, preparation of samples for testing, the testing itself, as well as qualification of the personnel and assurance of correct performance of all technical stages in work of laboratory. In recent years, the system of external laboratory quality control is beginning to operate in the country. It provides verification of the potential capabilities of laboratories to perform on necessary level of analysis of presence of *Mycobacteria Tuberculosis* in a given sample, which is among the most important parts of the whole technology process. Details of this system will be described in section 9 “Laboratory testing quality assessment”.

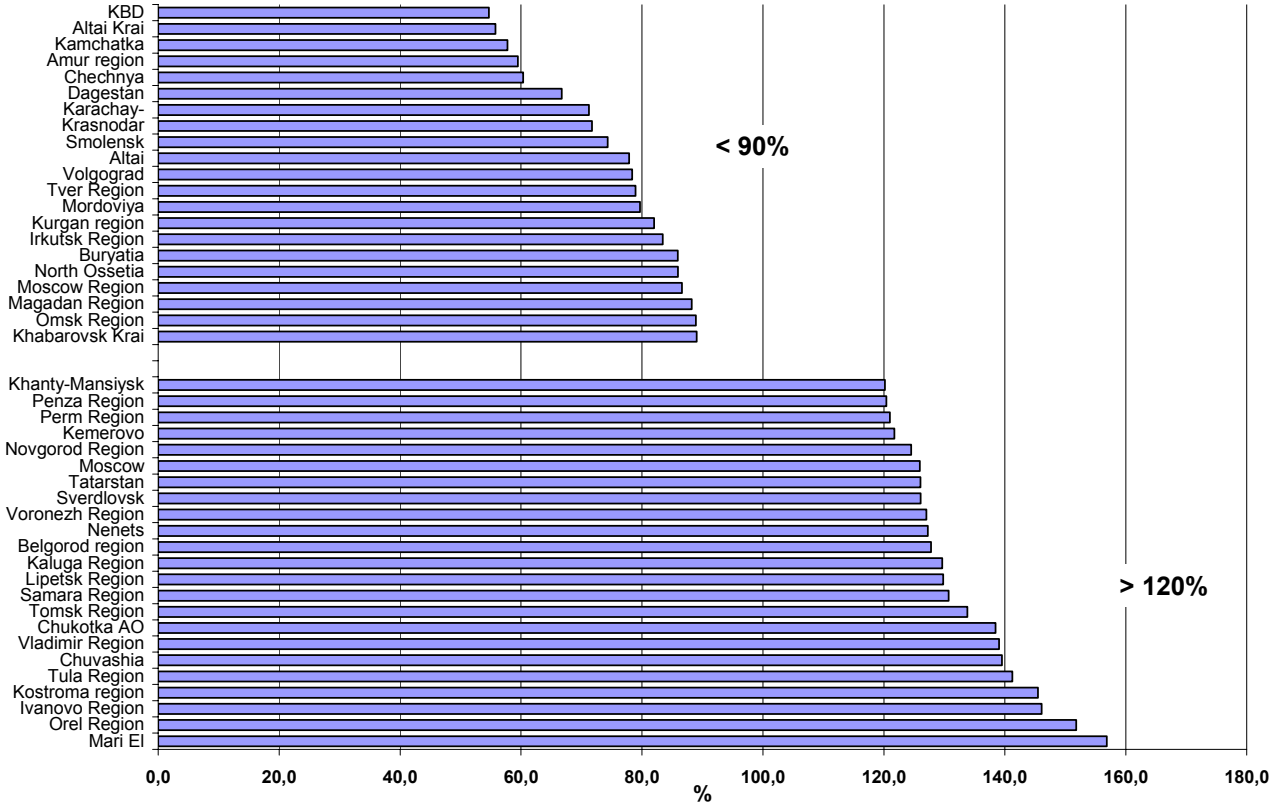


Figure 2.35. The relationship of MbT+ cases to TB cases with destructive forms among respiratory TB cases registered at MoH&SD facilities, 2007. Two groups of territories are shown: with low, and high value of indicator. (Source: Form #33)

2.7. TB notification rates among contacts

Form #33 contains a very important information block: the number of TB patients having had contact with MbT+ patients and MbT- patients. Up to the beginning of the 21st century, the TB notification rate among individuals who were exposed to MbT+ patients exceeded 800 per 100,000 annual average number of contacts. In recent years the value of indicator began to decline, reaching in 2007 the level of 774.1[21] per 100 thousands contacts (with 805.6 in 2006), although the decrease is still not statistically significant.

In 2007 there were notified 2,177 TB cases , with the average annual number of contacts equal to 281,221 people. The notification rate among contact children significantly decreased in 2007: from 588.3 in 2006 to 512.9[22] per 100 thousand contact children in 2007 ($p < 0.05$), although it still remains high. Overall notification rate among contacts was 11.2 times higher than notification rate among permanent population in 2007, those of contact children - 32 times, adolescents - 28 times higher than the corresponding notification rates in the Russian Federation.

[21] Here and below (including a figure 2.36) data for 2007 on the notification rate among contacts does not include the Republic of North Ossetia data, which requires to be verified (for example, the number of TB cases diagnosed in 2007 from adults contacts was 881, while the value ranged between 0 and 2 in the previous years).
[22] 440 TB cases among contact children from about 77,000 average annual number of contacts

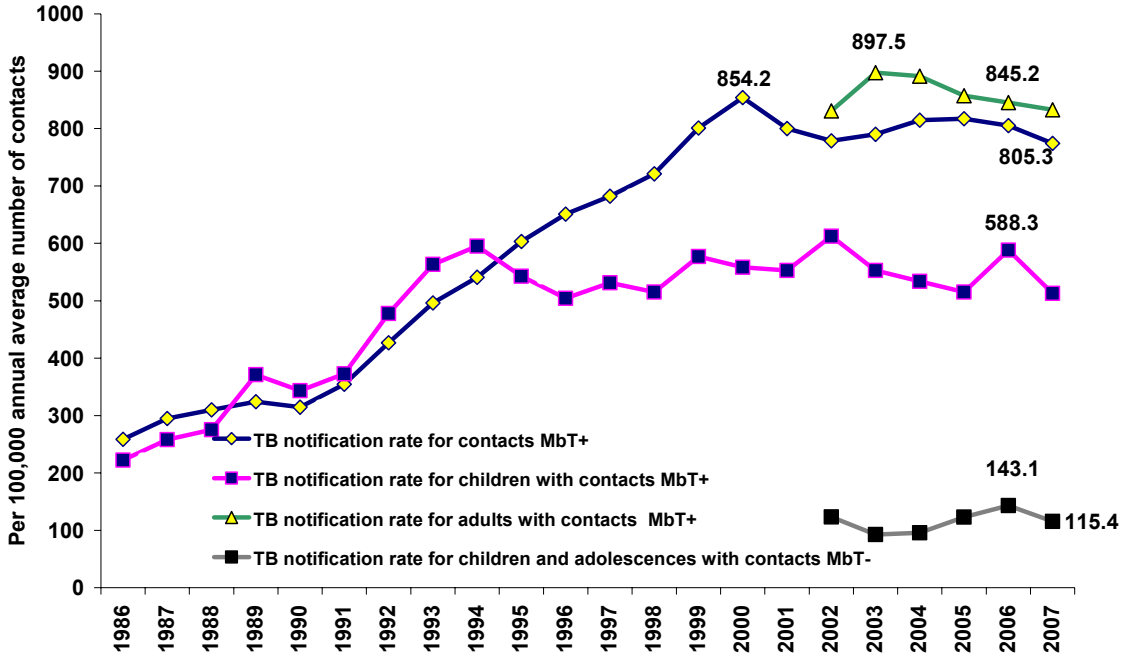


Figure 2.36. TB notification rates among adults, adolescents and children exposed by MbT+ and MbT- patients in the Russian Federation (Source: Form #33, 2007; data for 2007 does not include the Republic of North Ossetia, see footnote 21).

2.8. TB case detection management

The level of TB notification rates and the diagnosed TB forms in a region to a large degree depend upon case-finding management [5].

In the RF at present, the main method of TB detection remains radiological method. Along with the film fluorography, a digital fluorography started to actively developed. A digital fluorography done in the GHC polyclinics to those who sought medical assistance and was not surveyed in current year by x-ray, as well as to high-risk groups for TB (patients with diabetes, patients receiving corticosteroids, on radiation therapy, etc.).

In 1985-1987, the highest coverage of the population by TB screening was achieved, reaching 75% of the population. During the first post-soviet years, the situation changed dramatically: the planned and the actual scope of screening activities decreased, and less than half of the population subject to evaluation was screened.

By 2000s, the population coverage by active screening has increased slightly and has become stable in the range of 57-59% (57.8%, 2006). Meanwhile, the percentage of TB cases detected during screening among all new cases does not exceed 55% (Figure 2.37, Table 2.2).

In assessing the amount and quality of the TB detection among the population of the Russian Federation in the past two years (2006-2007) it must be emphasized that at this time modernization was done in primary health care institutions (suppliyng of digital fluorography equipment with help of the national project «Health») and bacteriological laboratories of TB

services (delivery of equipment and staff training from the IBRD loan and GF grant). Through these activities, as well as with the implementation of subprogram «Urgent measures to combat tuberculosis in Russia» of the Federal Purpose Program «Preventing and combating of social diseases (2002-2006)», it became possible to increase in 2007 the proportion of the population covered by screening up to 63.2% (p<0001), the proportion of TB cases detected by these screening increased from 53% in 2002-2005 to 57.2% in 2007 (p<0.001).

In 2007, the proportion of new cases detected by screening was less than 40% in 6 regions of the Russian Federation: Moscow and Smolensk region, the Republics of Adygeya, Kabardino-Balkaria, Ingushetia and Chechnya. In 2003-2006 the number of such territories has gradually decreased from 21 to 10 territories.

In the Russian Federation in 2007 it remained relatively high rate of TB detection both by all methods (0,6 per 1,000 examined) and by fluorography (0.9 per 1,000 examined) and microscopy (2.2 per 1,000 examined) TB screening methods.

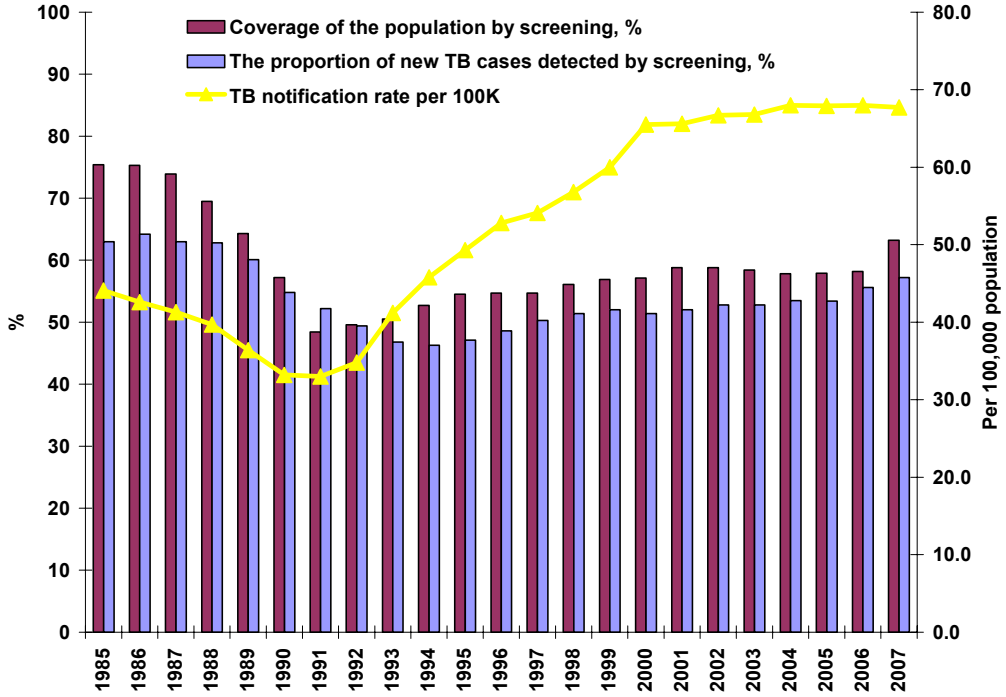


Figure 2.37. Active TB screening in the Russian Federation. Coverage by screening, percentage of new TB cases detected by active screening[23], TB notification rates from Form #33 (Source: Form #33, (4)).

According to the Form #33 (MoH&SD, 2007) and including cases of postmortem TB diagnosis, in 2007 55.8% of new TB cases were detected by active screening, 41.8% were “passively” detected when they sought medical assistance with complaints and 2.5% were

[23] From the line of Form 33 “detected patients with TB for the first time in their lives, out of the number of persons screened for TB“

diagnosed post-mortem (2,439 cases). Data from the territorial Form #8 for 2007 indicate 2,465 TB cases diagnosed post-mortem.[24]

Table 2.2. Characteristics of testing of the population of the Russian Federation for TB, 2005-2007. (Sources Forms ## 33 and 30)

Indicators	2005	2006	2007
Screened for early detection of tuberculosis: all total	82,833,191	82,957,322	89,916,567
% of total population	57.9	58.2	63.2
The number of patients with TB disease detected by active screening	51,591	53881	55031
% of patients detected by screening	53.4	55.6	57.2
detection per 1,000 screened	0.62	0.65	0.61
including: covered by fluorography	59,586,046	59,904,093	61,054,847
% of all examined	71.9	72.2	67.9
% of total population	41.6	42.0	42.9
% of the population 15 years and older	49.0	49.3	50.3
The number of patients with TB disease detected by fluorography	48,923	51,160	52,334
detection per 1,000 examined	0.8	0.9	0.9
% of all detected by screening	94.8	94.9	95.1
including: tuberculin skin test for children	21,149,813	20,521,136	19,584,049
% of all examined	25.5	24.7	21.8
% of total population	14.8	14.4	13.8
% of population aged 0-14	98.0	97.3	93.8
including: tested by microscopy	973,256	919,996	980,025
% of all examined	1.2	1.1	1.1
% of total population	0.68	0.65	0.69
of them in the general health care network	600,098	627,412	732,026
% of all examined by microscopy	61.7	68.2	74.7
The number of TB patients who were detected by microscopy method	1851	2242	2123
detection per 1,000 examined	1,9	2,4	2,2
% of all detected by screening	3,6	4,2	3,9

2.9. TB relapse cases

There are two ways to define “relapse” in the RF. The first way[25] is based on dispensary follow up definitions (Executive Order #109 (15)). In this way, a relapse case is a re-registered (repeatedly registered) TB case in a person who has had a history of being followed up in a dispensary group including confirmed or “active” TB cases[26]. That is, an “appearance of new evidence of active TB in a person with a previous history of TB and cured; such a patient is from follow up group no. III or had been remove from the registry due to cure”.

[24] The contribution of FSIN to this number is not large - about 16%. In 2006, 173 TB cases were detected postmortem in the penitentiary system, equating to 1.1% of all new cases detected in the penitentiary system. See chapter 6.

[25] That is a more “traditional” view which was used years before new orders 2003-2004 (*interpreter notes*)

[26] Russian TB service uses the term “active TB” which means TB cases confirmed by doctor committee based on clinical, laboratory and x-Ray evidences and be registered as TB cases (*interpreter notes*)

The second Russian definition of “relapse” is based on treatment history of the patient (Executive Order #50 (16), see Annex). According to this Order, a relapse is defined as a “new episode of disease in patients with a previous effective course of chemotherapy, and new evidence of confirmed TB in the form of positive results of sputum microscopy or culture tests and/or clear clinical-radiological evidence of TB”.

Both definitions include references to a previous cure or successful course of chemotherapy during previous TB disease episode. Therefore, at present time in the reduction of duration of follow up after therapy in group I (according to Executive Order #109), both definitions of relapses have become closer each other. Therefore, the number of relapses registered in the forms based on dispensary follow up (Form 33) and in the forms of treatment monitoring (#7-TB and #8-TB) should concur after 2004. The level of relapses is an important indicator of problems in dispensary activities and treatment management.

Two types of relapses are considered in the dispensary follow up system: “early” relapses – those in dispensary follow up group III at the time of new TB diagnosis; and “late” relapses – relapses among individuals previously removed from a dispensary follow up group[27].

Figure 2.38 demonstrates an increase in relapses in 2004 -2005 followed in 2007 by a significant decrease in 2007 (from 9.2 in 2006 to 9.0 per 100,000 population, or from 13,171 to 12,771 relapse cases).

If consider separately the structure of relapses, the so-called “early” (among those in the dispensary group III) and “late” (from those removed from the registry) relapses, it could be noted that the increase in relapses rate in 2004-2006 occurred because of an increase in early relapses, which can be related not only to ineffective treatment, but also with the defects in formation of III dispensary group during re-arranging groups in 2004 (Figure 2.39)

[27] Until 2004, late relapse cases also included relapse cases from the follow up group VIIA, including cured before persons with significant residual effects of TB

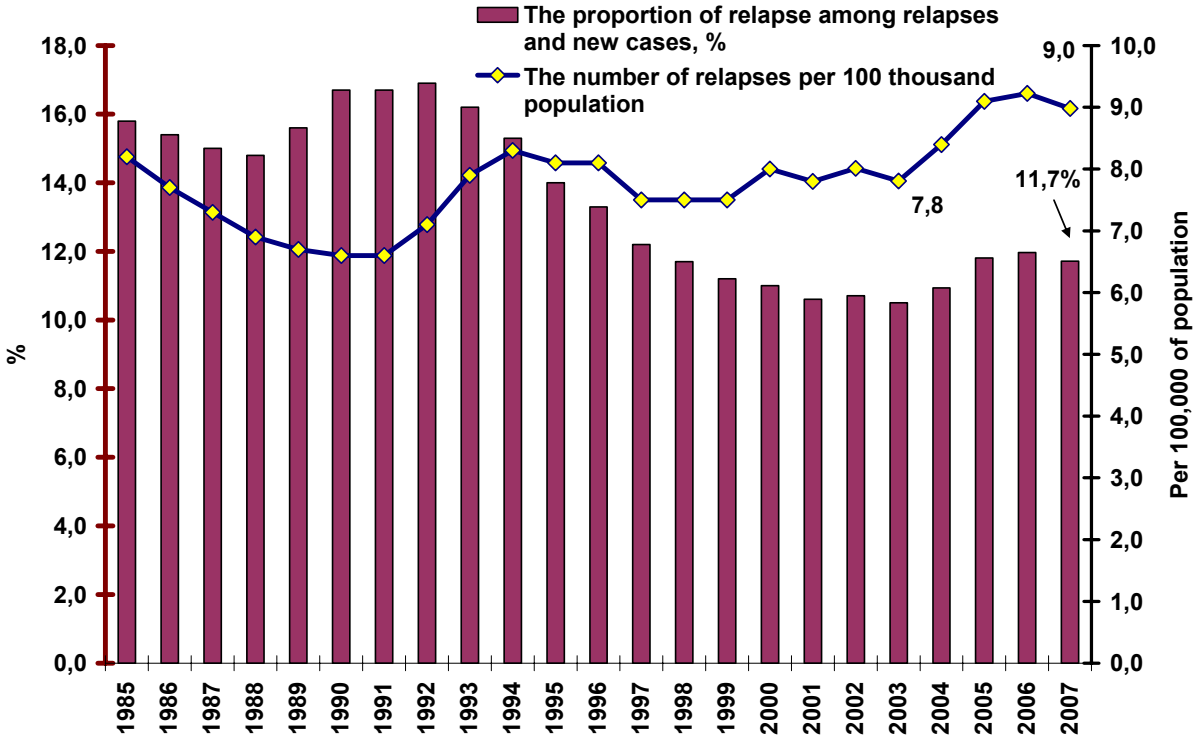


Figure 2.38. TB relapse cases. The percentage of relapses among combined relapse and new cases; the relapse rate per 100,000 population, the Russian Federation (Source: Form #33).

An increase of the number of early RTB relapses has been observed in 75 territories of the Russian Federation in 2003-2006. The highest increase was reported in the Republic of Kalmykia (by 3.8 times), Khabarovsk krai (by 3.7), Republic of Kareliya (by 3.5), Chelyabinsk region (by 3.4) and in the Republic of Altai (by 3.1). In 9 territories, there was a reported decrease in the number of early relapses, most strongly in Belgorod, Tambov and Orel regions and the Republic of Tyva.

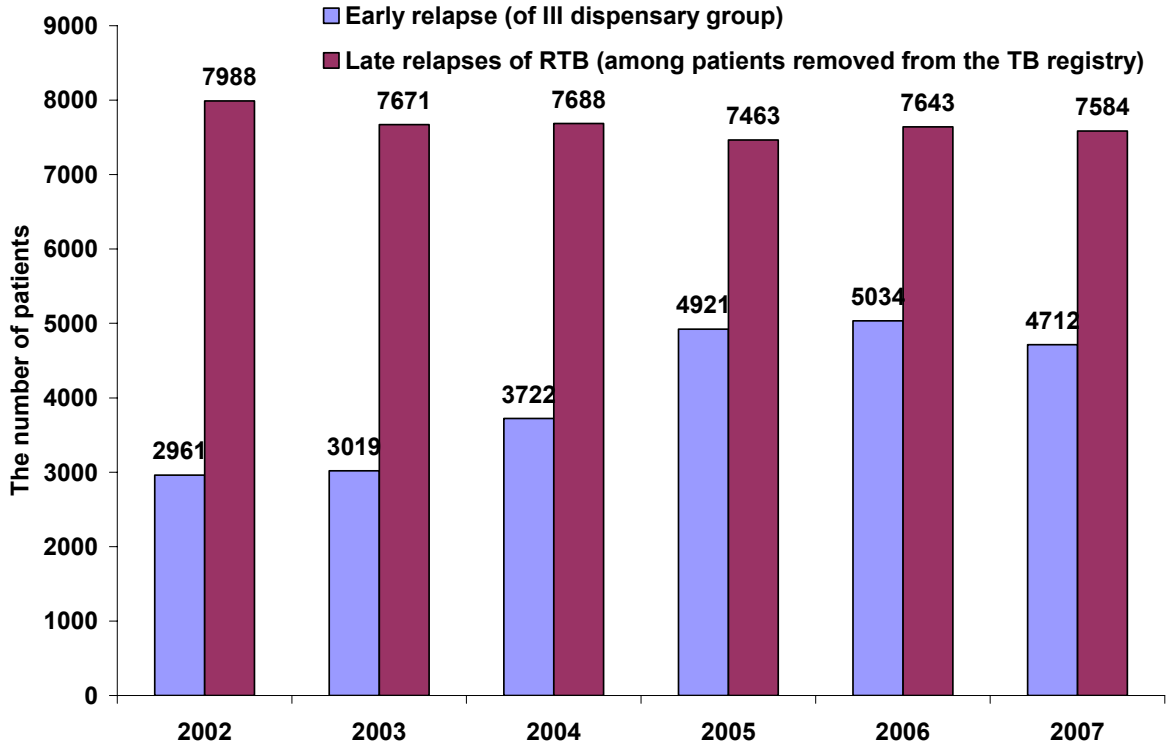


Figure 2.39. Number of early and late relapse cases of respiratory TB, the Russian Federation (Source: Form #33)

Reducing the rate of early relapses, marked by the Russian Federation as a whole in 2007 compared to 2006 was registered in 49 federal regions. At the same time, in 33 territories, this indicator is still increasing.

2.10. Estimations of TB incidence

Real TB incidence differ from the TB notification rate in any country of the world. This difference depends first of all on the effectiveness of the work performed by healthcare facilities in TB detection, which varies significantly by RF territory.

Various Russian and international techniques exist for estimating the TB incidence (Figure 2.40).

According to the available data (3, 4), the proportion of non-detected cases may be estimated on the basis of data on spontaneously cured TB cases (follow up group IIIA for children and adolescents and VIIB until 2004 for adults), on cases of TB diagnosis post-mortem, and on the percentage of fibro-cavernous TB, as indicators of delayed TB detection. Based mainly on the first component, it was estimated that 12-15% of TB cases do not get registered in the RF.

Another Russian approach (13) is based on the relationship established in 1987 between incidence and mortality, which is believed to most precisely reflect the real statistical relationship between the indicators. Using this approach, the estimated incidence is calculated

on the basis of the annual data on mortality and the relationship of mortality and incidence rates for 1987. Using the baseline relationship, and assuming that an observed mortality rate is more likely to be nearer to the true value than a notification rate, the estimation of the incidence level is performed for other years. The results calculated using this technique show that in 2007 the notification rate was 16% lower than the actual incidence (estimation – 98.7 per 100,000 population).

When estimating the TB incidence in different countries, it is especially important to take into consideration the differences in conditions of detection and the procedures for registration of new TB cases that are specific to the country. The WHO (14) has developed a system for evaluating the real values of the main indicators (incidence, smear-positive incidence, mortality and prevalence), on the basis of which the estimated TB data is published in its annual reports.

Therefore, when comparing countries, in addition to the “TB notification rate”, the estimated value of the TB incidence (“estimated TB incidence rate”) is used in international publications, and in WHO publications in particular.

Since the most of WHO methods of estimation of real incidence are not applicable in the Russian Federation (they are based on a number of indicators which are impossible to obtain in Russia, for example, a so-called “annual risk of infection”), the following simplified method is used (presentation of C. Dye at a workshop in Moscow, 2006)[28].

First, as estimated by Russian experts (academician A. M. Khomenko), stated in joint Russia - WHO report in 1997, it can be assumed that in 1995 about 25% of TB cases were not detected, and 5% of registered as TB patients actually had a different diagnosis. Thus, in 1995 about 78% of new TB patients were detected from patients with real TB disease in the population. For other years recalculation of notification rate was done on the basis of multiplying this coefficient by an averaged for three years incidence (including relapses with MbT+). For 2006 for the Russian Federation estimated incidence of TB (including relapses with MbT+ identified by microscopy) was equal to 107 per 100,000 population, which means that in 2006 in the country's approximately 20% of new cases were not registered.

Based on the obtained estimates, with the help of more complicated algorithms, the incidence of TB with MbT+ (48 in 2007), TB prevalence (125) and mortality (17) per 100,000 population can be estimated.

Data obtained this way are published in WHO reports in a section on estimated TB incidence, including relapse MbT+ cases confirmed by microscopy[29] (Figure 2.40).

[28] The applicable methods of TB rates estimation for Russia were defined on WHO EURO region Workshop in Berlin (April 2009) after this publication – *interpreter notes*

[29] Until 2008, WHO published reports with estimated incidence of TB in Russia on the basis of incorrect baseline data from 1997, not 1995. After studying by members of the WHO TB RF in 2007 materials from the meeting in

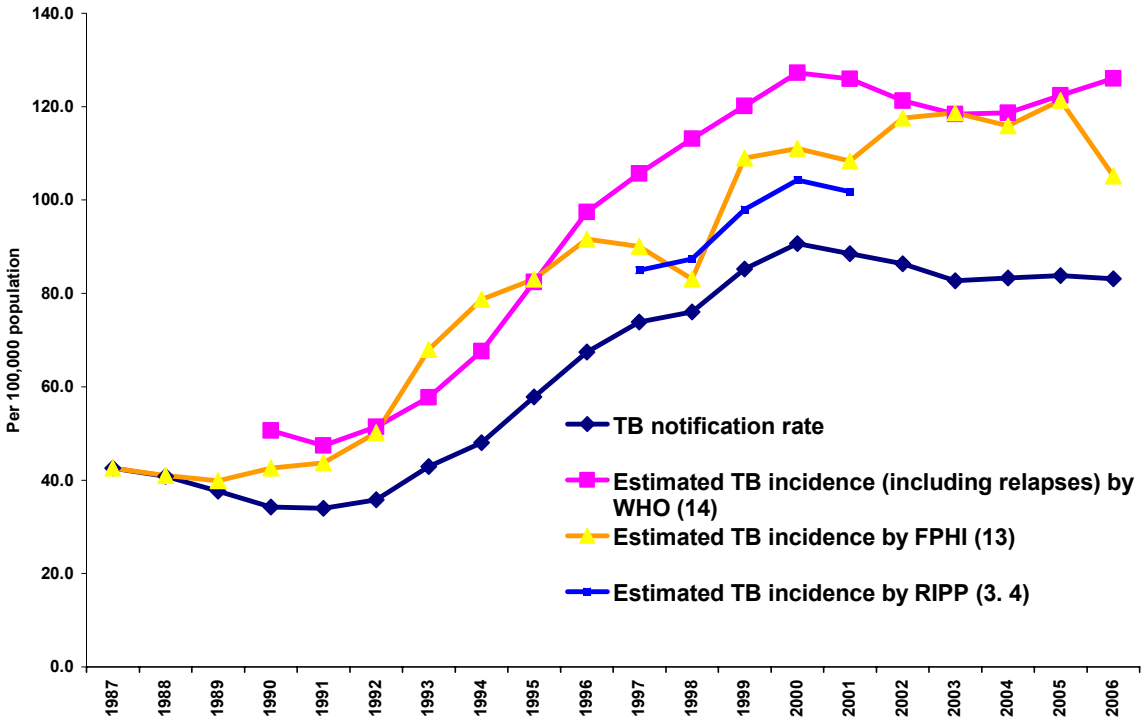


Figure 2.40. TB notification rates in the RF and estimated incidence by RIPP (3,4), FPHI (13) and WHO (14). The last estimate also includes relapses.

Of course, all these approaches are approximate. However, more precise methods of estimation have not yet been developed, and in the meantime it is essential to have at least an approximate estimation of the real incidence.

Evaluation of the real incidence of TB is used to calculate the performance of one of the two main objectives of the WHO World Health Assembly: “detect at least 70% of patients with ss+ TB”. This means detection of at least 70% of ss+ TB patients actually existing in the population with MbT+ identified by microscopy. Their number is calculated using the above methods of assessment (see Figure 2.41).

However, this WHO objective is often wrongly understood as a “to confirm in laboratory the diagnosis of TB in 70% of new patients with tuberculosis”, i.e. to achieve the level of microbiological confirmation of diagnosis in 70% of new cases.

The indicator recommended by the WHO in the Russian Federation in 2006 was relatively low, 47% (Figure 2.42) in contrast to European countries (57%) and the world (62%) [17]. At the same time, as already mentioned in section 2.6, the proportion of detected MbT+ among all TB patients Russian Federation is also not enough high - 41% (33,7% for ss+).

1997 and presenting the results at WHO Headquarters, the assessment has been clarified. Incorrect assessment of incidence also has been published in the previous edition of the analytical review “TB in the Russian Federation in 2006”.

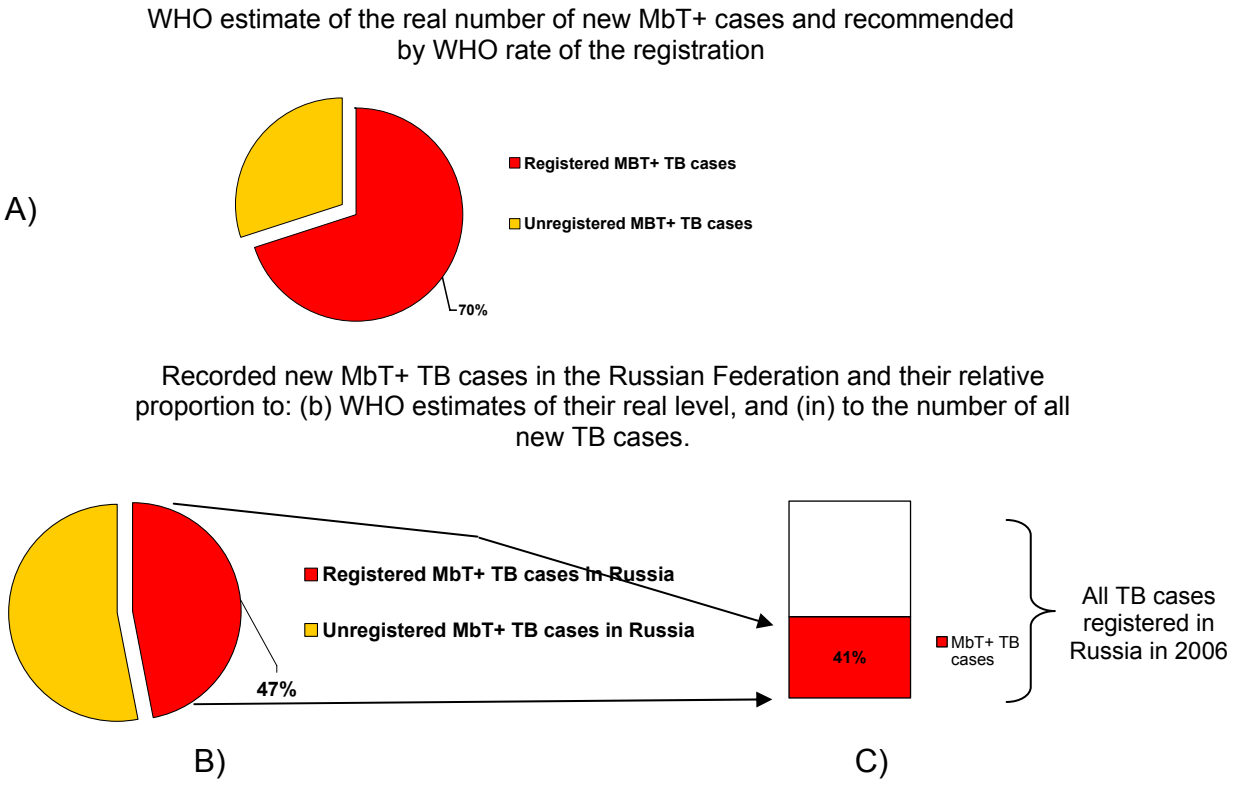


Figure 2.41. The scheme: (a) The WHO estimates of the real number of new MbT+ cases and recommended by WHO rate of the registration; calculation of the proportion of registered in the Russian Federation number of new MbT+ cases relatively to (b) to WHO estimates, and (c) all registered in the country new cases (2006).)

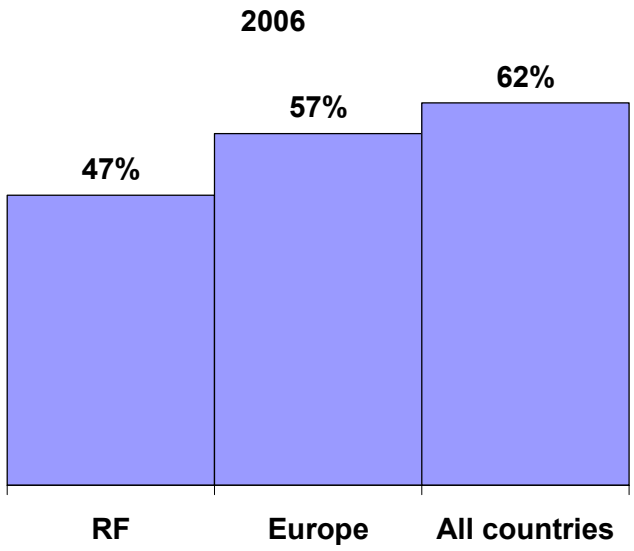


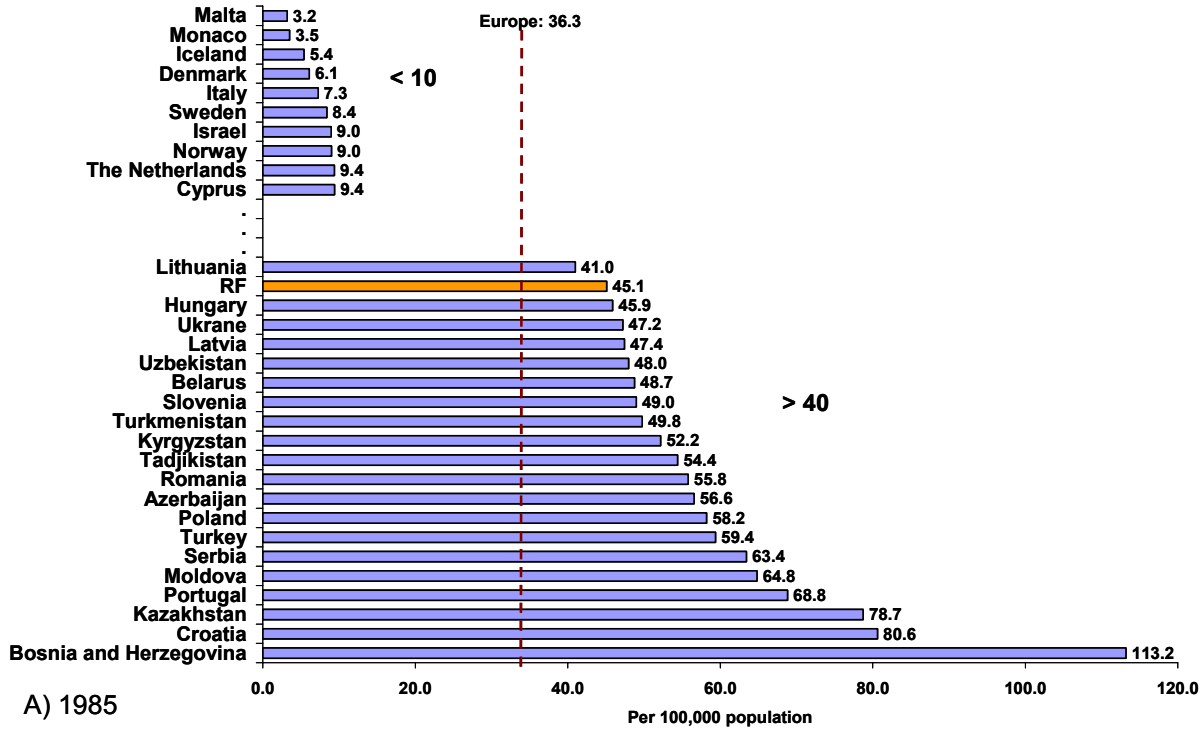
Figure 2.42. The proportion of detected and registered MbT+ cases from estimated MbT+ cases in the population. The Russian Federation, Europe and all World. (Source: WHO Global report [17])

2.11. Comparison of the TB notification rate in the Russian Federation with other countries of the WHO European region and around the world

The Russian Federation is among the 22 countries with the highest TB burdens according to WHO estimate (14). The total number of new cases in these countries (not notifyed, but estimated according to the assessment of WHO), represents 80% from estimated overall number of new TB cases in the world.

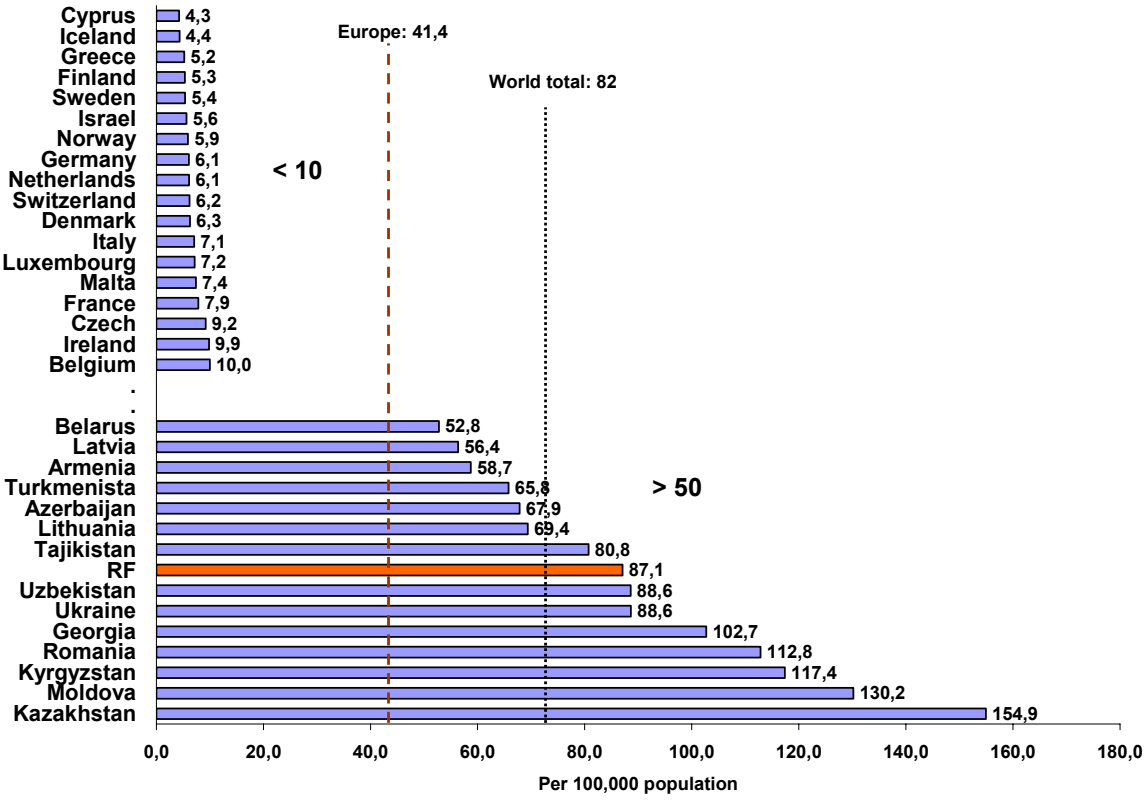
Our country was included in this list due to the high number of annually registered new cases and relapses. At the same time, when considering the country's population size together with the notification rate, the result is not among the highest in the world. Russia's contribution to the total number of TB cases in the 22 high-burden countries is not great – only 3.1% (2006); and among all detected cases in the world, it is 2.3%.

However, if consider the countries of the WHO European region (17), the "contribution" of the Russian Federation in the overall level of the spread of the disease currently is very significant - 35%. Russia does not only detect one third of all new TB cases in the region, but it holds the eighth highest position (87.1[30] per 100,000 population, 2006) in terms of notification rates (including relapses), after Kazakhstan (154.9), Moldova (130.2), Kyrgyzstan (117.4), Romania (112.8), Georgia (102.7), Ukraine and Uzbekistan (88.6 per 100,000 population), Figure 2.43B. Noteworthy is that of the 15 countries with the highest notification rates in the region (more then 50 per 100,000), 14 are former Soviet Union (FSU) republics. In 1985, in terms of notification rates, Russia was only in the 20th position (Figure 2.43A).



A) 1985

[30] Published in [17] levels of notification rate include both new cases and MbT+ relapses.



B) 2006

Figure 2.43. TB notification rates in the countries of the WHO European region in 1985 and 2005. Rates include new TB cases and TB relapses. Countries with the lowest notification rates (< 10) and the highest notification rates (>40 in 1985, and >50 in 2006) are indicated. Source: (17)

In 1990s notification rates increased in almost all of the republics of the former USSR by almost 2-2.5 times (Figure 2.44). At the same time, in all non-FSU countries of the former Warsaw Pact, with the exception of Romania and Bulgaria, there has been a considerable decrease in TB notification rates over the same time period – by 1.5-2 times[31]

[31] The definitions of a TB case in the FSU countries and the non-FSU Warsaw Pact countries do not differ substantially. However, changes that have occurred in the quality of new TB case registration over the years may have had an impact on the trends in TB notification rates.

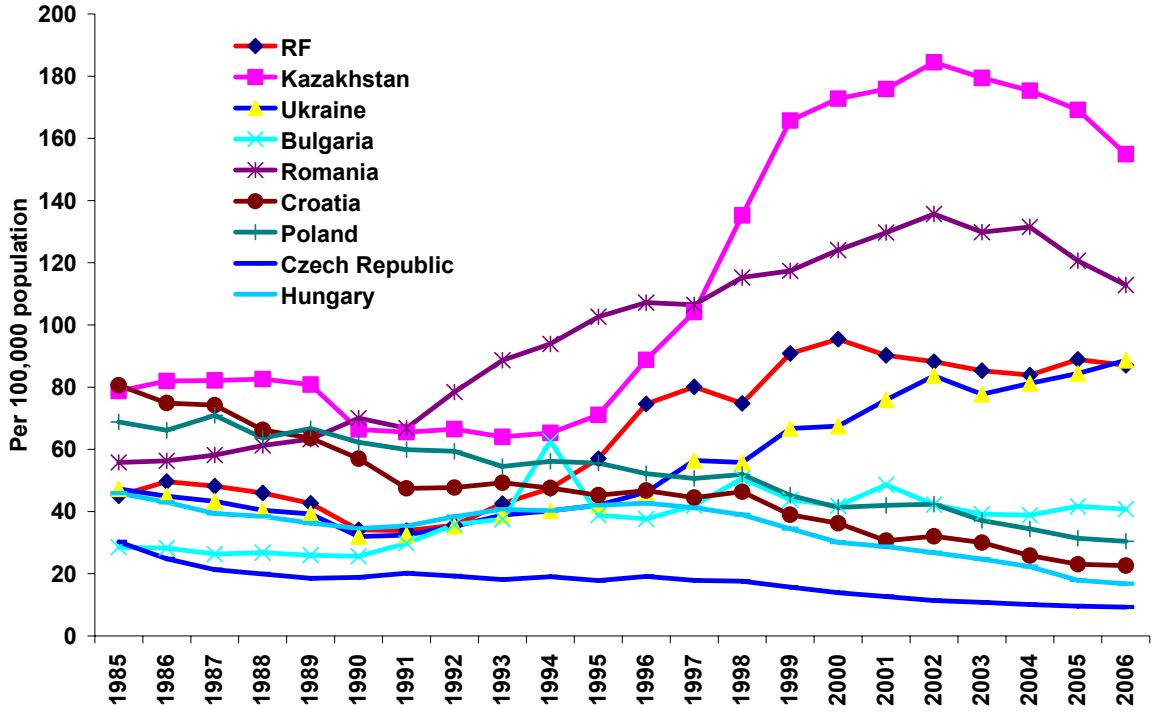


Figure 2.37 Changes in notification rates in select countries of the WHO European region,1985-2006 (Source: (17))

3. TB mortality in the RF

Borisov S.E., Belilovsky E.M, Skachkova E.I., Son I.M., Danilova I.D., Jakubowiak W.

3.1. General information. Recent trends and territorial differences

Information on patients who have died of TB is contained in three forms: #5, #33 and #8.

Form 5 includes data on all deaths, with indication of the cause of death. This form contains information essential for TB services on the persons who have died of TB. These data provide basis for calculating the mortality rate from tuberculosis in the Russian Federation. Reported data are based on the information contained in the registration form #106/u-98 «The medical certificate of death», which in sent for state registration to the authorities in the civil registry and then to the Federal State Statistics Service. The data on each death is copied by the regional dispensaries in order to control the numbers in each dispensary group.

Form 8 contains information only on TB patients with a post-mortem diagnosis, regardless of whether the patient was from the permanent resident population or under another jurisdictional entity with its own TB service (FSIN, Ministry of Internal Affairs, etc.)

Form 33 contains information on all TB patients who have died of TB, registered at MoH&SD facilities in the territory. The data in this form are separate for patients who have died of TB and those of other causes. This form allows for the calculation of the TB mortality rate for the resident population and the mortality rate of TB patients from other causes of death. In addition, the form contains information on patients who died of TB and were not registered at MoH&SD facilities.

Since these forms are filled out in various ways and by different facilities, the resulting data may differ to some extent.

Thus, in 2007, from Form 5, there were 25,900 registered cases of death caused by TB [18]; and from Form 33 – 24,703 cases [45][32].

For a complete analysis, TB patients who died of TB and of other causes should both be considered.

According to Form 33, in 2007, 41% of TB patients registered at MoH&SD facilities died of other causes (non-TB diseases and external factors). Over the last decade, this rate has been rather constant, in the range of 38-41%. According to 2007 data, the mortality rate of non-TB diseases and external factors among TB cases (50.0 per 1,000 registered TB cases at

[32] Sum of persons who died from TB and who were and were not registered in MoH&SD facilities, and also TB civilians postmortem detected as TB case, see form #33.

MoH&SD facilities, 13,821 cases) exceeds the overall mortality rate of the general population in the RF by approximately 3.4 times [33] (14.7 per 1,000 population, 2007). This shows that TB patients are in a high risk group of death not only from TB, but from other causes; it is essential to pay special attention to studying and resolving this problem.

The problem of reducing the mortality rate of TB patients needs to be addressed in two ways - reducing mortality from tuberculosis and other causes. Addressing these challenges requires two different events: for the first objective the organization of early detection and increasing of effectiveness of TB treatment are important, for the second objective - the effective treatment of co-morbidities (concomitant diseases), as well as social and psychological support of patients with tuberculosis are the priorities.

Sometimes in assessing the success of TB the indicator of overall mortality rate of TB patients is being used, regardless of the cause of death. This indicator is important in terms of monitoring changes in the number of infectious TB patients in the region. Besides, the cause of death is not always registered correctly, which leads to the wrong classification of the cause of death from tuberculosis and death from other causes.

It is generally accepted that epidemiological situation with tuberculosis significantly depends on mortality from TB. This indicator depends on the quality of registration less than TB morbidity, but the reliability of the data must be verified.

After a long period of decreasing the mortality rate from tuberculosis until the beginning of 90 years (from 18.6 to 7.7 per 100 thousand population, see Figure 3.1), the rate began to rapidly increase until the beginning of the XXI century and exceeded the value 20.0, after which there was some stabilization. This indicator reached maximum in 2005, when the death rate from tuberculosis increased by more than 2.5 times compared with 1991 and was equal to 22.6 per 100 thousand population.

Two periods could be distinguished in comparing the dynamics of the overall mortality and mortality from TB (Figure 3.1). Before the 1991 decrease of mortality from tuberculosis paralleled increasing mortality among the population, demonstrating high efficiency of anti-TB interventions during those years. In the 1990s and the beginning of the XXI century changes of both indicators took same direction. During those years, the mortality rate from tuberculosis had greater influence from a general socio-economic situation in the country, rather than from efficiency of work of TB services.

Since 2005, the mortality rate from tuberculosis started to decline significantly (20.0 and 18.6 per 100 thousand population in 2006 and 2007 respectively [19, 32]), that was linked

[33] A more correct value of this parameter can be obtained by comparing the mortality rates among the general population and among TB patients, which are standardized by age and gender. It is not possible to do this simply on the basis of existing reporting forms; a special analysis is required. However, in general, such a modification will not change the conclusion on the high mortality rate among TB patients who die of non-TB causes, compared to the overall mortality rate among the general population.

to significant reduction of overall mortality rate in the country (from 16.1 in 2005 to 14.7 in 2007 per 1,000 population).

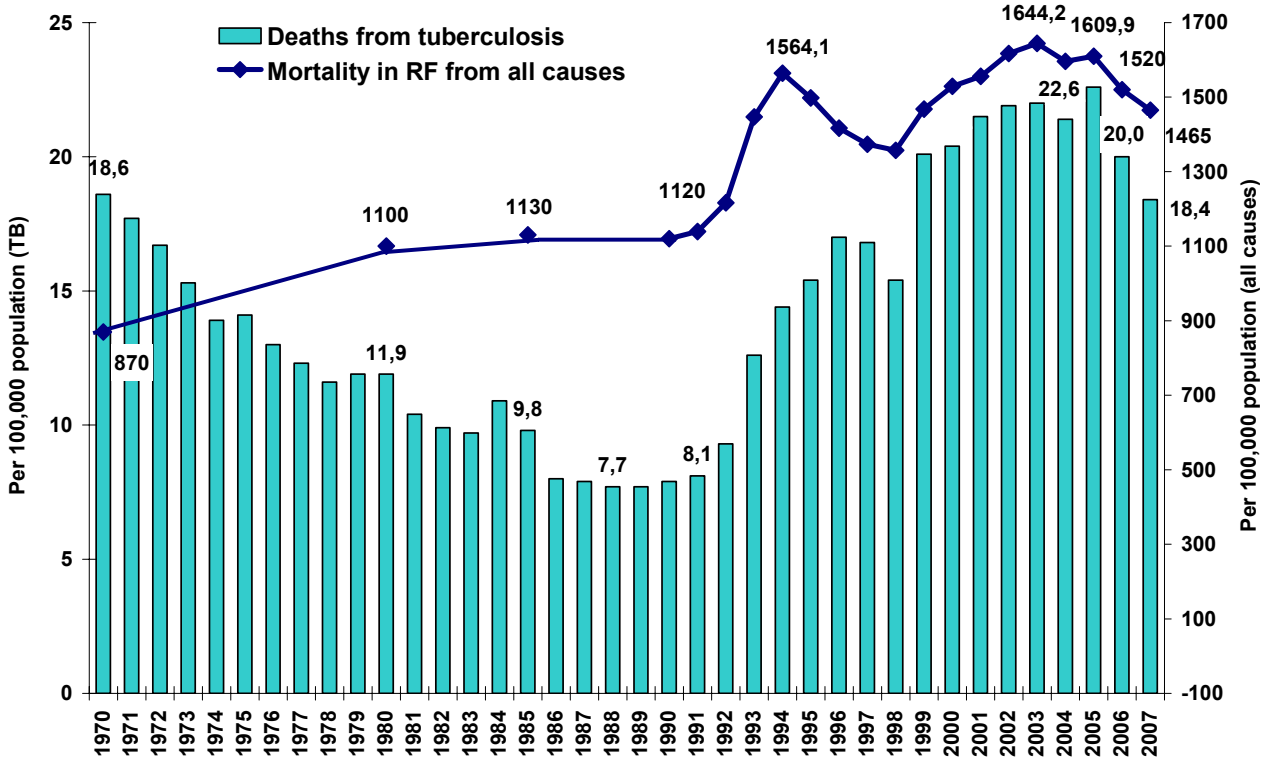


Figure 3.1. Mortality rates from TB and other causes in the RF (Source: Form #5 [19, 32] and [38].

The level and the structure of the TB mortality rate in the RF once again prove the need to pay special attention to this disease. TB is the leading cause of death among infectious diseases in the RF, accounting for 83% (2006) of deaths from "several infectious and parasitic diseases" (A00-B99 by IDC 10), reviewed in the reporting forms [19][34].

Mostly persons of productive (working) age die of TB (89%, Figure 3.2). In all other registered classes of diseases which cause fatal outcome, on the other hand, the majority of patients who die (over 70%) are older persons. Exception is only died from external causes[35] (81% working ages). The peak of the TB mortality rate falls in the 45-54 years old age group: about 40 per 100,000 population of the given age (Figure 3.3.). Reducing the mortality rate, which is observed since 2006, was mostly in this age group. Overall reduction of mortality observed in 40-64 years old age group. Mean age of those died from the "several infectious and parasitic diseases", was 44.1 years in 2006, 80% of them died from TB [19]. At the same time, mean age of those died from shown in Figure 3.2 groups of diseases almost always was greater than or equal to 60 years old. (Exception - only those who died from external causes -

[34] Further on the list of infectious diseases are: septicemia -4.1%, viral hepatitis -3.1%, diseases caused by the human immunodeficiency virus (HIV) – 6.9%, intestinal infections -1.3% of those who died of the given class of diseases, and etc.

[35] The main part (63%) of external causes of death are poisonings including alcoholic intoxication, suicides, accidental faults and road accidents

45.1 years).

It should be noted that in the Russian Federation [31] the overall proportion of deaths from TB is equal to 1.3% from all deaths, while the proportion of deaths from tuberculosis among the most socially active age groups 25-45 years is as high as 5-6%. For women aged 25-29 years, the proportion of deaths from infectious diseases is as high as 9.5% (tuberculosis accounts for at least 80% of cases of these deaths), which is comparable to the proportion of women's deaths in this age group from the leading cause of mortality in Russia - cardiovascular diseases (11.4%). According to the WHO estimate from 1999 [39], in the world tuberculosis was the cause of death in 9% of women died at the age of 15-44 years, while the military conflicts accounted for women deaths in only 4%, and cardiovascular disease - in 3% of deaths.

These facts emphasize that TB is not only a medical, but also is a social and economic problem, since it involves the most economically active segment of the population.

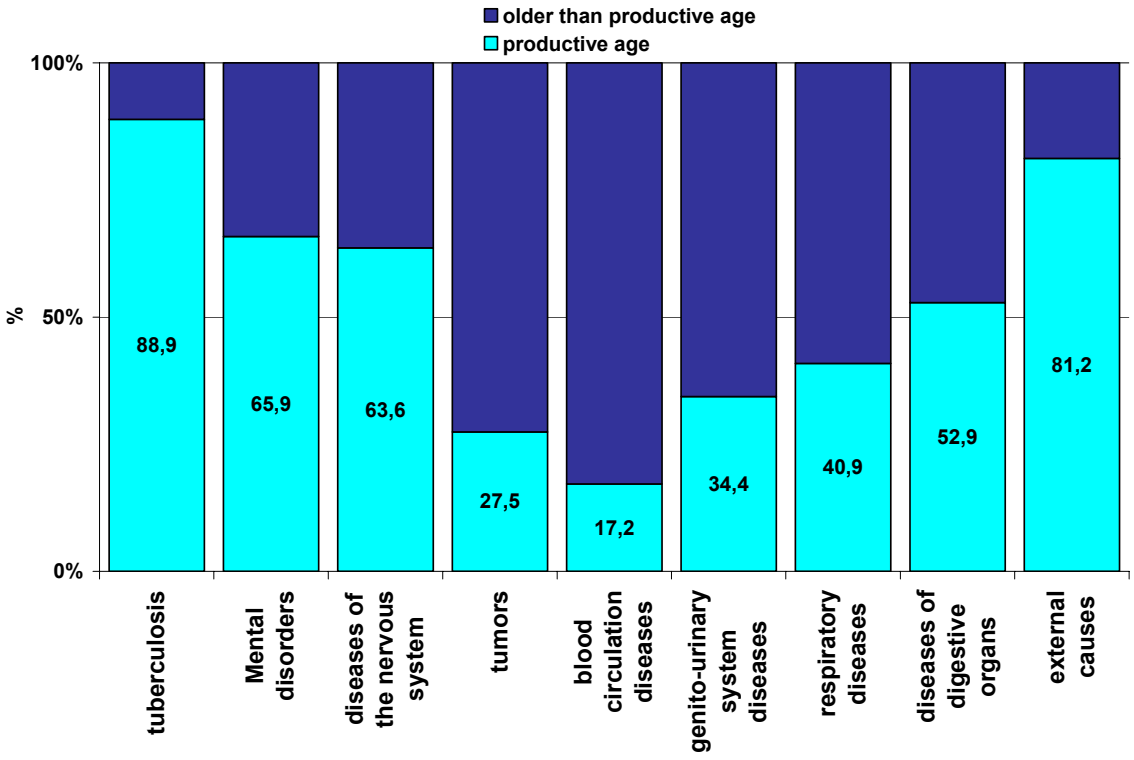


Figure 3.2. The percentage of persons who died at productive age by the main classes of cause of death, RF, 2006 (Source: [18], population: Form #4)

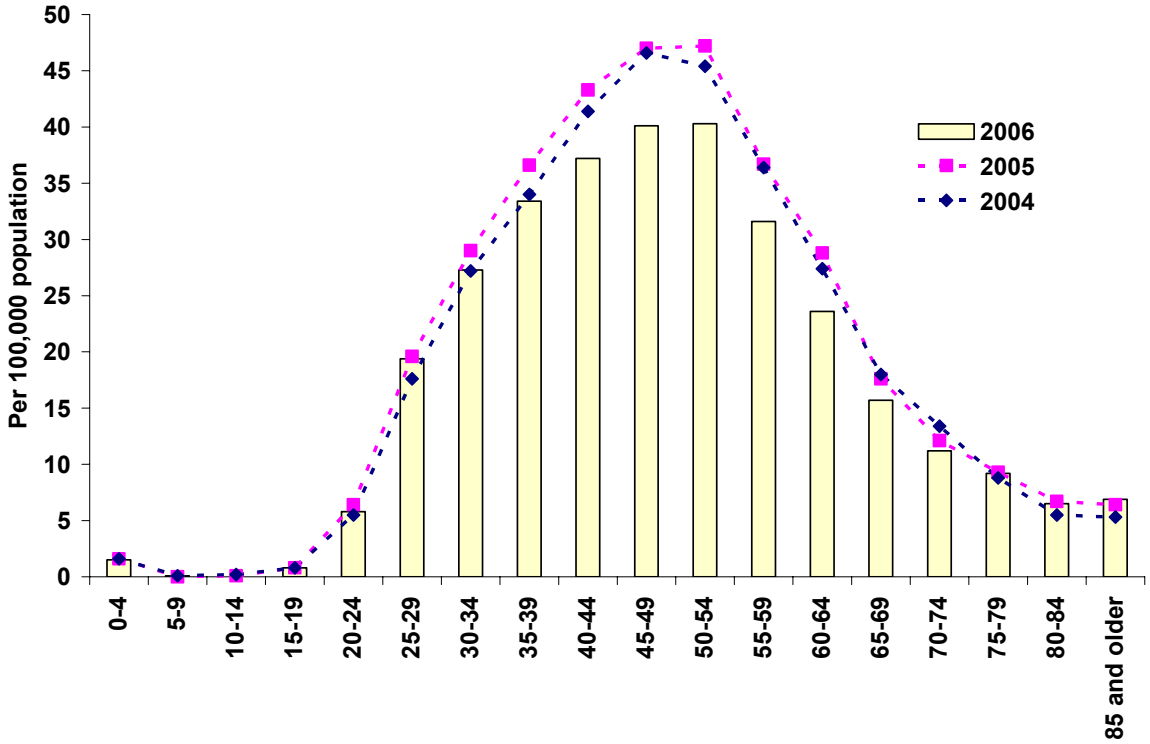
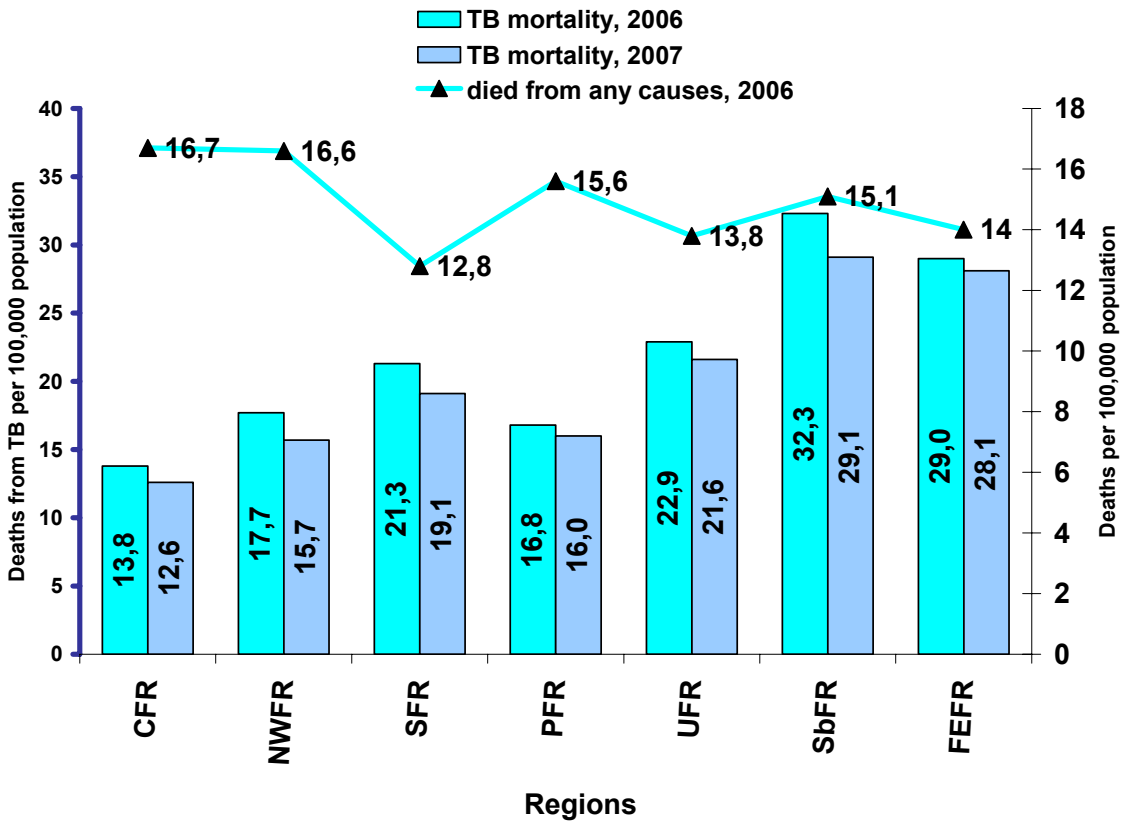
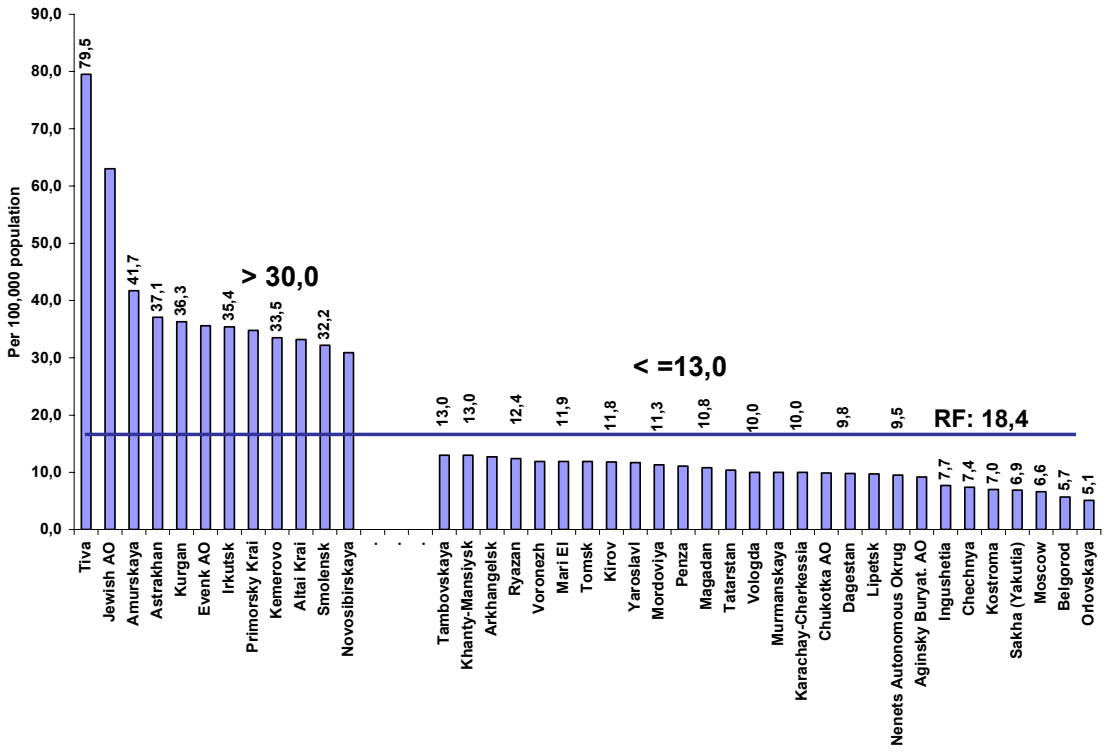


Figure 3.3. Age-specific TB mortality rates, RF, 2004-2006 (Source: [19])

Like the TB notification rate, the TB mortality rate gradually increases from the west to the east (from 12.6 to 28-29 per 100 thousand population Figure 3.4A). This does not correspond to the distribution of mortality rates for all causes of death, which is at its highest in the Central and North-West Federal regions (about 17 per 1,000 population). Indirectly, it means that if in recent years, socio-economic factors (see above) have been responsible for the overall TB mortality trend in the RF, then the interregional differences primarily depend on the effectiveness of TB control activities in the respective territories. To a lesser degree is the rate dependent on the socio-economic level of the territory, which defines the general health level and, therefore, the mortality rate from deaths of all causes.



A) By region



B) By territory

Figure 3.4. The distribution of TB mortality rates by federal region and by territory with mortality rates > 40 and < 15 per 100,000 population, 2007. (Source: [18])

The variance of registered TB mortality rates in the territories of the RF is large [31]: more than 10 times difference is observed for territories with low mortality rates (Orel region. -

5.1; Belgorod region. - 5.7, Moscow - 6.6; Republic of Sakha-Yakutia - 6.9; Kostroma region. - 7.0;) and for areas with high rates of mortality from tuberculosis (Republic of Tuva - 79.5, Jewish AO - 63.0, Amur region – 41.7, Astrakhan region. – 37.1). Such variance in rates may reflect the real and consistent pattern of TB mortality, as well as certain defects in the registration of causes of death.

With general decline in mortality from tuberculosis in 2007 in Russia, the mortality rate exceeded 40 per 100 thousands population only in 4 regions, while in 2005 – in 13 regions.

The Figure 3.5 compares the relationships between TB mortality rates in the Federal Regions of the Russian Federation and prevalence of HIV infection among new TB cases, the factor that potentially has important impact on population mortality. The figure demonstrates the lack of an apparent link between the prevalence of HIV infection and TB mortality rates.

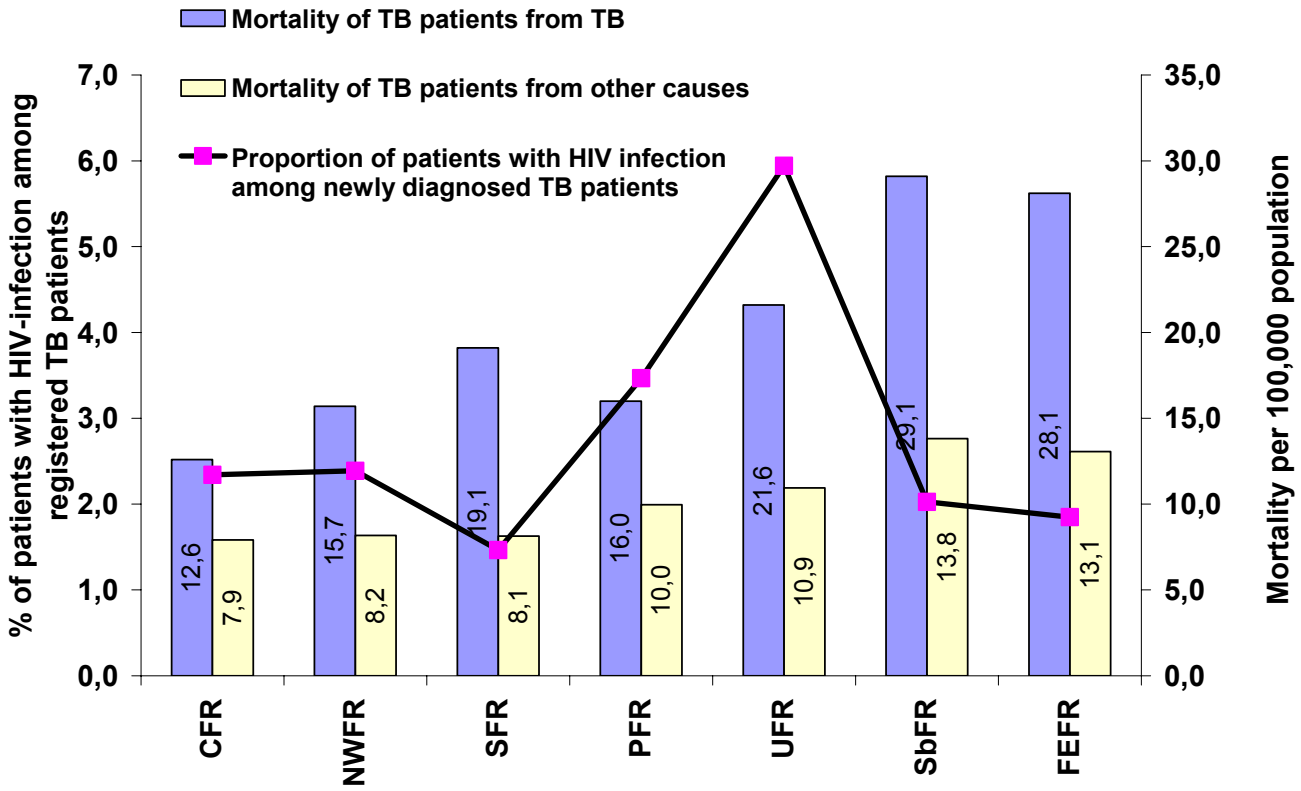


Figure 3.5. Comparison of the Federal Regions by the death rate from tuberculosis [32], death rates of TB patients from other causes registered in MoH&SD facilities (Form # 33) and the proportion of HIV-infected among new TB cases (Form # 33). Russian Federation, 2007 (Sources: [32], Form #33).

3.2. TB mortality rate components

When analyzing TB mortality and determining strategies to decrease the rate, it is essential to consider the structure of this rate. TB mortality has three main components: 1 – patients with post-mortem diagnosis (previously not registered as TB case), 2 - patients who have died within the first year after registration and 3 – the other (remainder) cases of death from tuberculosis (Figure 3.6). Various factors affect each of the components.

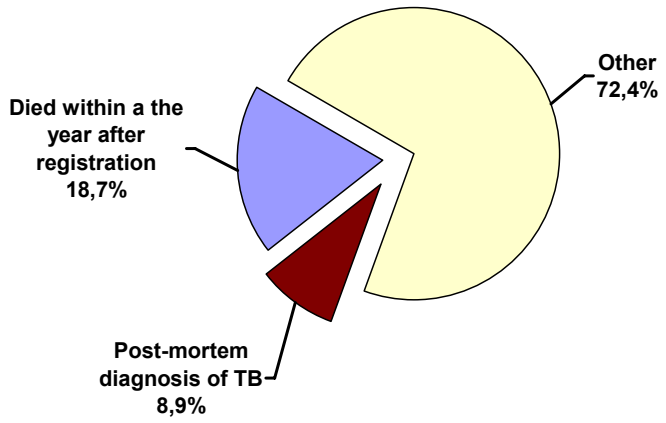


Figure 3.7. Components of the TB mortality rate among the permanent resident population. RF. 2007. (Source: Form 33)

The number of TB patients with postmortem diagnosis (8.9%, 2007) depends on timely detection and indicates possible problems with detection and diagnosis of TB in a region, and in particular – problems in the quality of activities at PHC facilities, effectiveness of educational activities among the general public, and other factors.

The number of patients who have died within a year following registration (18.7%, 2007) indirectly reflects the effectiveness of activities in detection management and treatment of new cases.

And finally, the percentage of remaining patients who have died of TB (about 70%) depends on the effectiveness of treatment activities performed for relapse cases, re-treatment cases and chronic cases, as well as on the quality of dispensary work and prophylactic activities.

It should be noted that indicators calculated as a percentage of different patient groups that have died of TB can be used as a source of information for defining different managerial activities in order to decrease the general mortality level. They can be used to define targeted resources to allocate to timely detection and adequate treatment activities (i.e. these indicators are of managerial and economical importance).

However, the correctness of use the percentage of cases with post-mortem diagnosis and the percentage of cases that have died within the first year following registration for the comparison of territories and for the analysis of trends remains questionable. This is due to the

fact that an increase in the percentage of one of the mortality components could occur either when the absolute number of this category of patients is increased or when the number of patients from another category is decreased.

The change in the mortality structure that occurred between 2003 and 2004 in Orel oblast can be used as an example. During those years, a considerable decrease in the number of patients who died from TB was reported in the oblast: from 40 to 26 persons. This happened due to a decrease in the third component – deaths among re-treatment cases and patients with chronic TB. So although the number of those who died within the first year following registration decreased from 15 to 13, and their proportion to the number of new cases also decreased from 3.4% to 3.0%, the percentage of deaths within the first year following registration (among all TB deaths) increased from 37.5% to 50%. Also, the percentage of patients with port-mortem TB diagnosis among those who died of TB increased sharply (from 17.5% to 34.6%), yet the number of such patients did not greatly increase: from 7 to 9 (within statistical error of measurement).

In order to compare territories by the number of cases who died within the first year following registration and the number of cases of post-mortem TB diagnosis, we review the relationship of these categories of deceased patients to the number of new cases registered the same year.

The ratio indicator of number of cases who died of TB within the first year following registration to the number of new cases (see fig. 3.7) for the civil population[36] (in the form # 33) increased in the Russian Federation from 4.1% in 1999 to more than 5% in 2005 (see note to fig. 3.7). The indicator decreased during last two years (up to 4.3% in 2007); this may indicate influence of improved overall situation in the country (overall mortality rate decrease), and effective diagnosis and treatment of tuberculosis. The increase of the proportion of died within one after TB registration in the FEFO was related to a sharp deterioration in this indicator in the Khabarovsk region in the past two years (from 2% to 6.4%). A highest level of this rate was observed in Leningrad (12%), Arkhangelsk (11.7%), Tver (8.4%), Murmansk (7.8%) and Ulyanovsk (7.5%) regions, republics of Udmurtia (7.4%), and Karelia (7.1%). In general, half the territories of Russia have the value of this indicator in the range from 2.8% to 5.7% (25% and 75% quartiles).

At the same time, a low rate of this ratio indicator in a territory may indicate successful treatment monitoring, as well as low quality of registration of number of patients who died within the first year following registration.

A more precise value of this parameter can be obtained with the help of cohort analysis. This approach, implemented using reporting Form #8-TB, allows for the calculation of the

[36] The TB mortality rates for penitentiary system, see in the Chapter 6.

percentage of patients who died from the fixed cohort of new cases rather than the calculation of an abstract relationship of number of patients who died within the first year following registration to the number of new cases (which are not directly related to each other). So, for example, the results of processed data on the cohort of new pulmonary smear-positive TB cases detected in 2006 show that death from TB occurred in 9.2% of cases for the given group of patients (see Chapter 5).

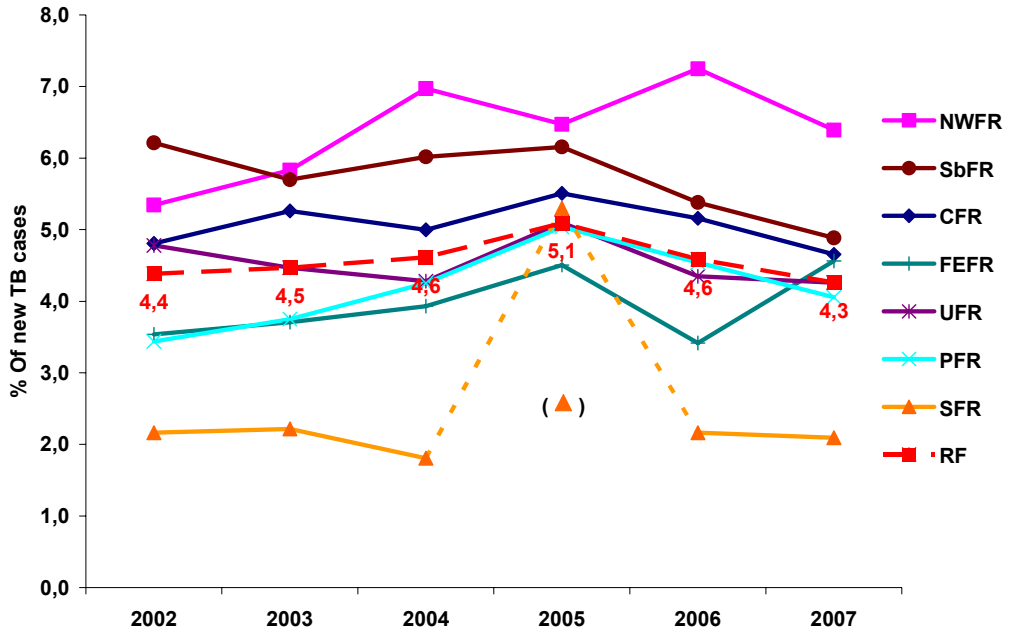


Figure 3.7. The ratio indicator of number of patients who died of TB within the first year following registration as TB case to number of new TB cases. Resident population, the Federal Regions, and the Russian Federation. Data for 2005 for SFR are dotted, since these require clarification on number of deaths within the first year following registration in Rostov region[37]. Value in parentheses shows the value for the Region after averaging data from the Rostov region for 2005, based on data for 2004 and 2006. The rate for the Russian Federation for 2005 (5.1%) is given after the noted above recalculation. On the form #33 for 2005 the value will be 5.5%. (Source: Form # 33).

The Figure 3.8 compares the relationships between TB mortality rates in the Federal Regions of the Russian Federation and prevalence MDR among newly diagnosed TB patients. The figure shows that registered MDR TB rate currently does not affect mortality rate among new TB cases (correlation coefficient in the Regions of the Russian Federation is about 0.15). This can be attributed primarily to the significant variations in laboratory quality, including drug susceptibility testing (see Chapters 8 and 9).

From 1999 to 2004 there has been an increase in the percentage of cases with post-mortem diagnosis among new cases (from 2.2% to 2.8%, see fig.3.9). From 2006 this indicator started to decrease (to 2.1% in 2007). Variation of this indicator is quite high in different

[37] TB death data for Rostov region in form #33 are: 2004 – 24, 2005 – 415 and 2006 – 20 TB death cases registered during 1 year after registered as TB case

subjects of the Russian Federation - between 0% (seven Regions) to more than 6% in Moscow (9.8%), Kaliningrad (7.2%), Sakhalin (6.0%) regions, and in the Republic of Adygea (6.6%). The decline was observed in 50 regions out of 89 in 2006. However, in 2007, percentages of postmortem diagnosis between the permanent resident population and the entire population in the Central and North-West Federal Region increased (from 1.9% to 3.1-3.7%).

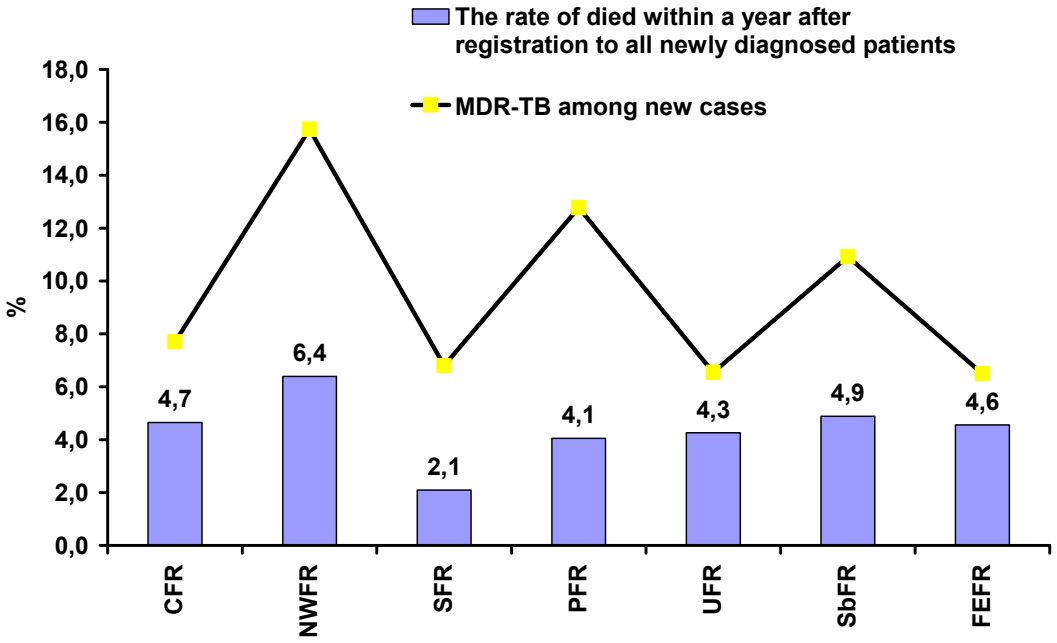


Figure 3.8. Comparison of the percentage of deaths within the first year following registration among new TB cases and MDR TB prevalence among new MBT+ cases, Federal Regions of the Russian Federation, 2007 (Source: Form # 33).

Figure 3.10 presents the variability in the percentages of post-mortem TB cases by federal regions. It can be hypothesized that the data for the Southern FR are underestimated due to the traditionally low percentage of post-mortem examination of patients in those regions. In addition, we should note a relatively high percentage of postmortem diagnosis in the permanent resident population in the Siberian region.

The data from Form 33 show that after years of decrease in the percentage of patients who died of active TB in hospitals (Figure 3.11) from 80% (1991) to 66,3% (2004), there has been a slight increase in rate (up to 67.7%) in 2007. This may indicate defects in treatment management at the inpatient treatment stages as well as defects in defining the indications for hospitalization.

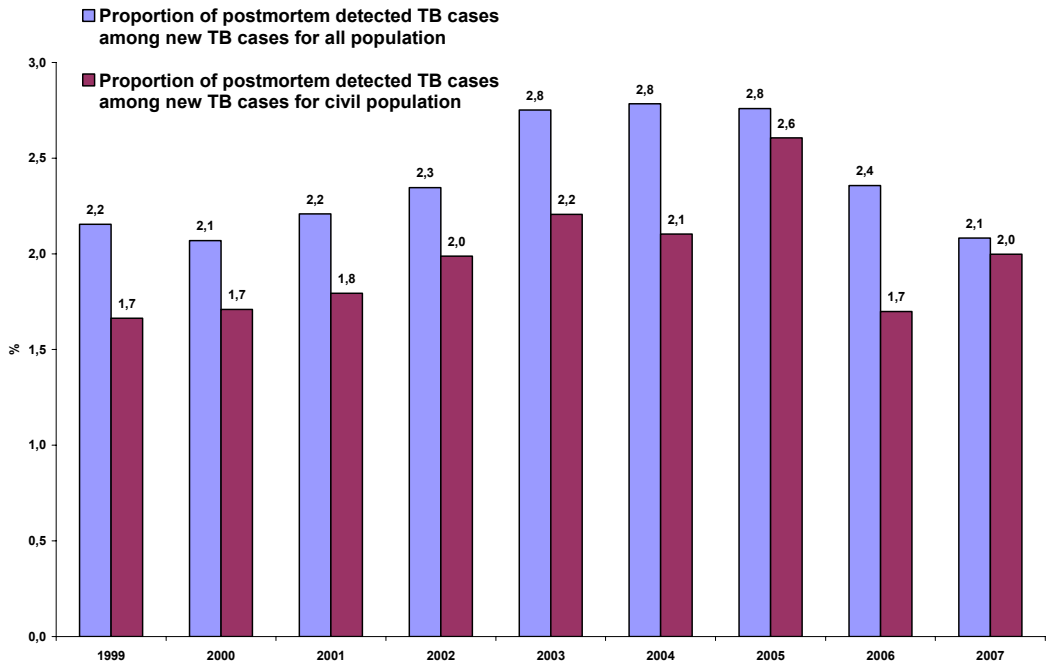


Figure 3.9. The percentage of patients with post-mortem diagnosis among new TB cases for the entire population (1999-2004 - Form # 33, 2005 and beyond - Form # 8) and for the permanent resident population[38] (Source: Form #33)

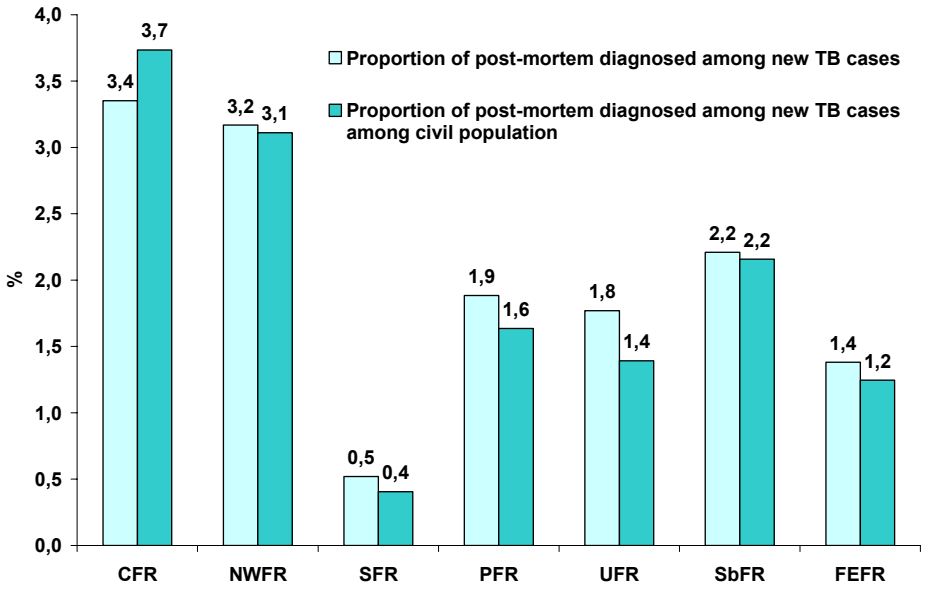


Figure 3.10. The percentage of patients with post-mortem diagnosis among new TB cases for the entire population (Form 8) and for the permanent resident population (Form 33), Federal Regions of the Russian Federation, 2007.

[38] Data on the resident population for 2005 does not correspond with the general pattern of rate variability. This may be related to the introduction of the new reporting Form #33 in 2005. At that time, the instructions were not yet specified for filling out the lines which should contain the information on cases of death.

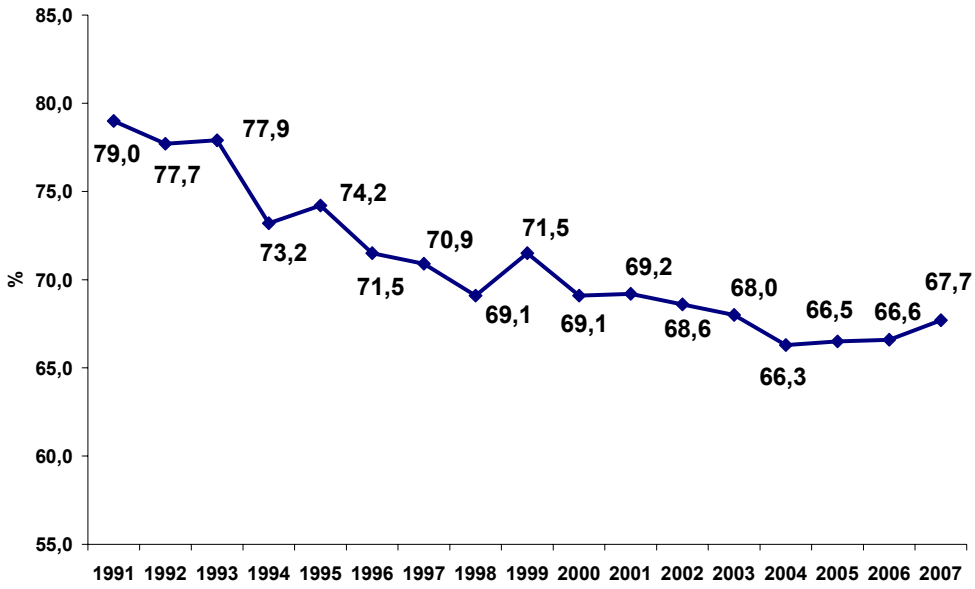


Figure 3.11. The percentage of patients who died in in-patient clinics among all deaths caused by TB in the permanent resident population (Source: Form 33)

Therefore, it is evident that particular components of the mortality rate, similar to the rate overall, can be effectively used for the purpose of TB control activities. The level of the rate proves that at the present time, TB is a major socio-medical and economic problem in the country.

4. TB prevalence in the Russian Federation

Belilovsky E.M, Borisov S.E., Skachkova E.I., Son I.M., Danilova I.D.

4.1. General information. Structure of the indicator and recent trends

The prevalence of TB among the population is an important and integral indicator reflecting the effectiveness of treatment and follow up activities.

In most countries of the world, data on TB prevalence are estimated as the number of cases who at the end of the year are still considered to be cases, per 100,000 population. In this case, individuals previously registered as TB cases and included in one of the cohorts for treatment are included. By the end of the year, such cases are not yet cured; they are still alive and have not been transferred out. The relationship of prevalence to incidence reflects the duration of the course of the disease and, to some extent, the duration of patient treatment. Due to the lack of a developed system of follow up for TB cases, in most foreign countries, this rate, as a rule, is estimated only by the means of mathematical calculations based on incidence data [14]. The relationship of prevalence to incidence in the world has decreased over the last 15 years from 2-2.5 to 1.2-1.7, which demonstrates the global trend towards a decrease in disease duration and treatment course duration.

In Russia, which has a developed system of dispensary follow up of TB patients, the prevalence rate is calculated on the basis of the number of patients included in dispensary follow up groups I and II, which include TB patients with so called “active” forms of TB[39]. Data on the number of cases of tuberculosis among the civilian population are reported in form #33, while the population of FSIN - in the form #4-tub (see Chapter 6). Chapter 4 provides information only on the civilian population based on form #33.

Therefore, the prevalence rate depends entirely on the methodological approaches and rules to the formation of the follow up groups. The most recent major changes of the approaches to the formation of the follow up groups occurred in 2004, in line with MOH Order #109 [15].

Figure 4.1 provides data on TB prevalence in the RF based on patient numbers in those follow up groups which in the corresponding years included patients with “active forms” of TB or confirmed TB . Until 2004, TB prevalence was calculated on the basis of patient populations of the follow up groups I and II defined by the MOH orders issued prior to 2004. During these years, follow up group I included patients under the basic (for new cases) and relapse courses of treatment (IA) and patients with chronic forms of TB (IB). The second group included patients with so called “abating” TB, which is patients with a completed course of

[39]The calculation of TB prevalence does not involve follow up groups with persons at risk of TB or at risk of TB reactivation (III, VI, V, IV and «0»), see Annex

treatment and could be seen as a group of individuals at risk of relapse. From the international perspective, those patients would not be considered as TB patients. In 2004, the “abating” TB patient group was abolished, and in line with the Executive Order #109 [15], a new system of dispensary grouping was introduced (see Annex). According to this system TB patients (with “active” TB forms) were distributed throughout the following groups: IA (new cases), IB (relapses), IC (patients with an interrupted course of treatment and evading evaluation) and lastly, group II – chronic TB.

The TB prevalence rate, calculated on the basis of follow up groups I and II as defined by MOH orders prior to 2004, decreased regularly until 1992, at which point it reached 172.1 per 100,000. The rate then began to increase sharply, and at the beginning of the 21st century it reached the level of 271.1 per 100,000 population, having returned to the level seen in 1979 [4].

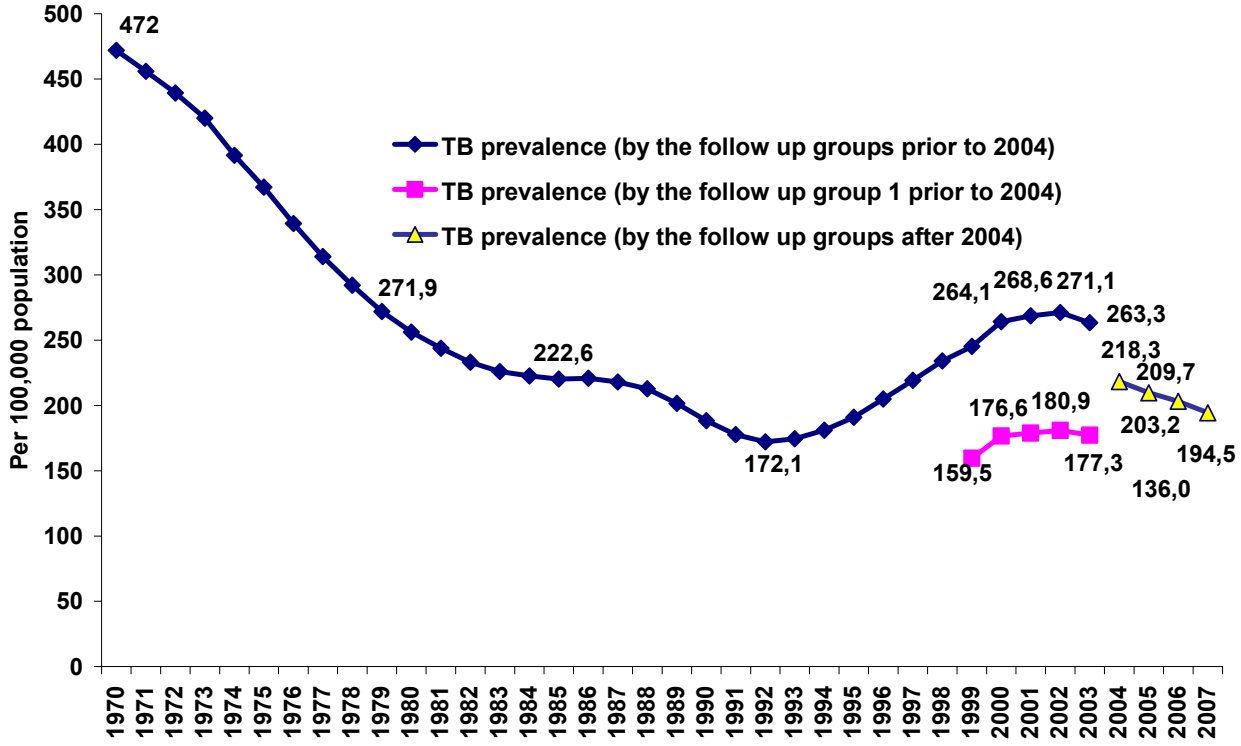


Figure 4.1. TB prevalence among civilian population in the Russian Federation. Calculations are based on the size of all TB patient follow up groups (I and II), and only on follow up group I before the 2004 revision in the follow up groups (Source: Form #33)

Since 1999, the reporting forms have included a separate piece of information on the number of patients registered in follow up group I only – i.e., those under treatment. This allows for the calculation of the prevalence close to the definition accepted in other countries (see Figure 4.1). In 2003, the prevalence, calculated on the basis of follow up group I only, was 180.9 per 100,000 population.

After the revision of the follow up groups in 2004, the prevalence decreased from 271.1 (2002) to 218.3 (2004) per 100,000 population. During recent years the prevalence rate steadily declined and by 2007 it reached 194.5 per 100,000 population (at the end of 2007 in MoH&SD facilities there were registered 276,554 TB patients).

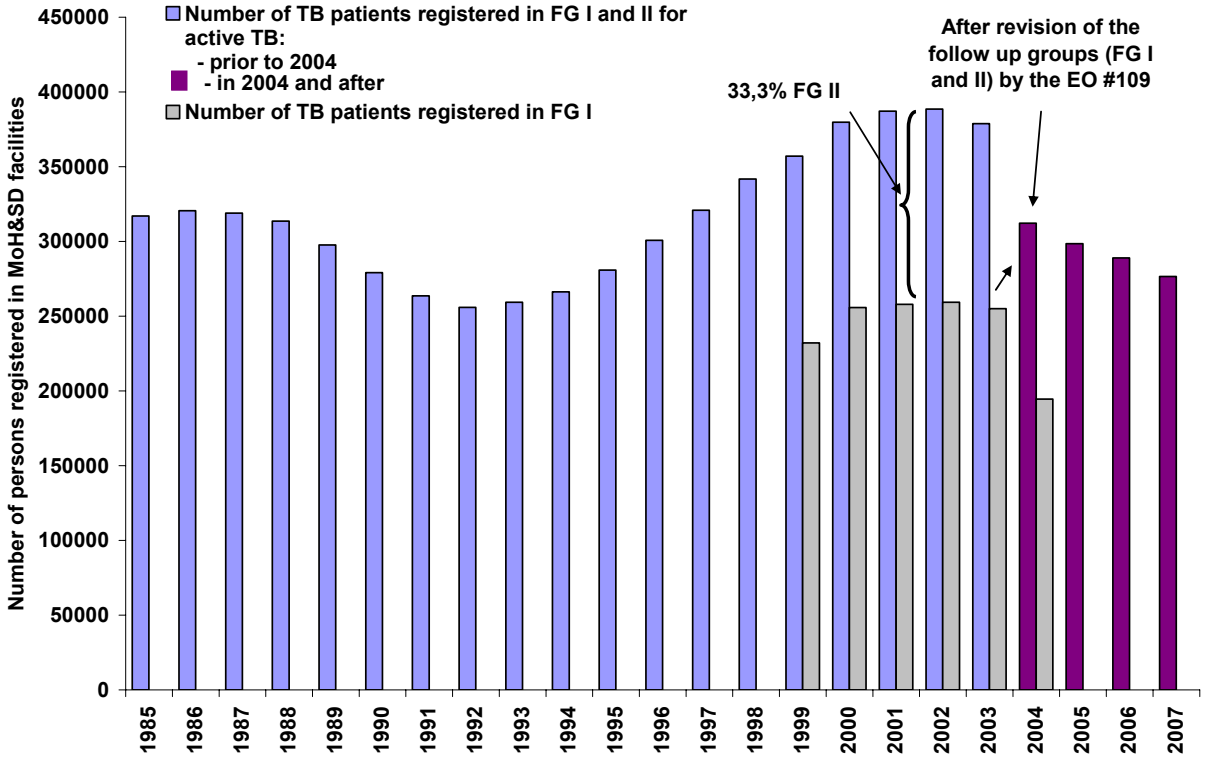


Figure 4.2. Number of TB patients persons registered in some FG before and after groups' revision in 2004 (see text), civilian population. (Source: Form #33).

Data on the size of the follow up group patient populations (Figure 4.2) make evident several important issues regarding the formation over the last few years of the follow up group for "active" forms of TB. The group of "abating" TB cases, abolished in 2004, used to account for one third of the prevalence rate (33.3% in 2001). After it was abolished in line with MOH Order #109, patients from the former group I were divided into two new groups - I and II (taking into account the flow of patient populations – detection, transfers in and out, cures, etc.). At the same time, analysis of the reporting forms demonstrates that after the revision of the follow up groups in 2004, the number of registered TB patients substantially increased (for the sake of comparison, calculation of the number of active cases according to the definitions of Order #109 takes into consideration only group I before 2004, and both groups I and II after). In 2003, in follow up group I (i.e. active TB patients) there were 255,006 patients. After 2004, the number of active TB patients increased to 298,509 (follow up groups I and II in 2005). The

phenomenon of the increase in the number of TB patients by almost 22% from 2003 to 2005 requires additional analysis and evaluation[40].

4.2. TB prevalence in the Russian Federation territories

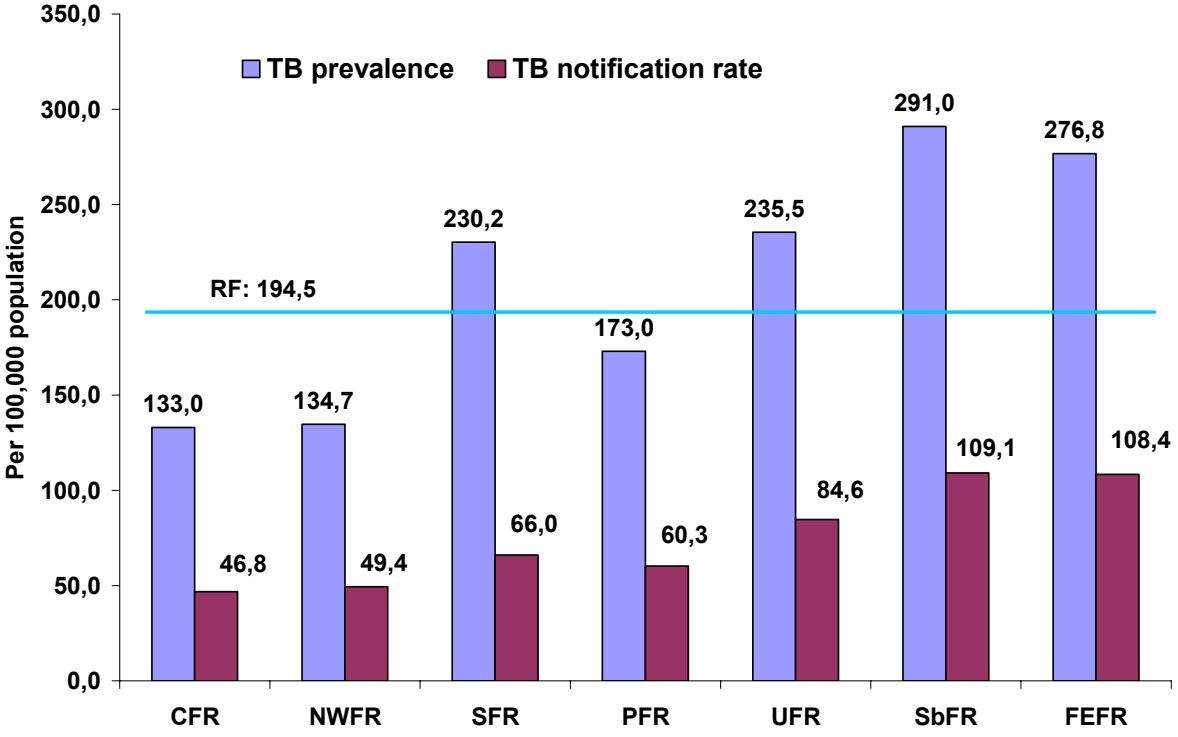
Similar to TB notification and mortality rates, TB prevalence rates also differ substantially by territory in the Russian Federation (Figure 4.3).

As seen with notification rates, prevalence rates in general increase from west (133-134 per 100,000 population) to east across the country. In SbFR and FEFR, the rate reaches 291.0 and 276.8 per 100,000 population, respectively. At the same time, a high level of TB prevalence and its great elevation over TB notification rates were reported in the territories of the Southern federal region – 230.2 (with the TB notification rate at 60.0) per 100,000 population. In nine territories, a low prevalence was reported, not exceeding 120 per 100,000 population: in Orel, Ivanovo, Belgorod, Vologda, Arkhangelsk, Kaluga, and Kostroma oblasts, in the cities of St-Petersburg and Moscow and the Republics of Mari-El and Tatarstan. At the same time, in 11 territories the prevalence exceeded 300 per 100,000 of population: Tuva, Kalmykiya, Chechnia and Khakasiya, Irkutsk, Sakhalin, Omsk, Kurgan and Amur oblasts, Altai krai and Jewish AO.

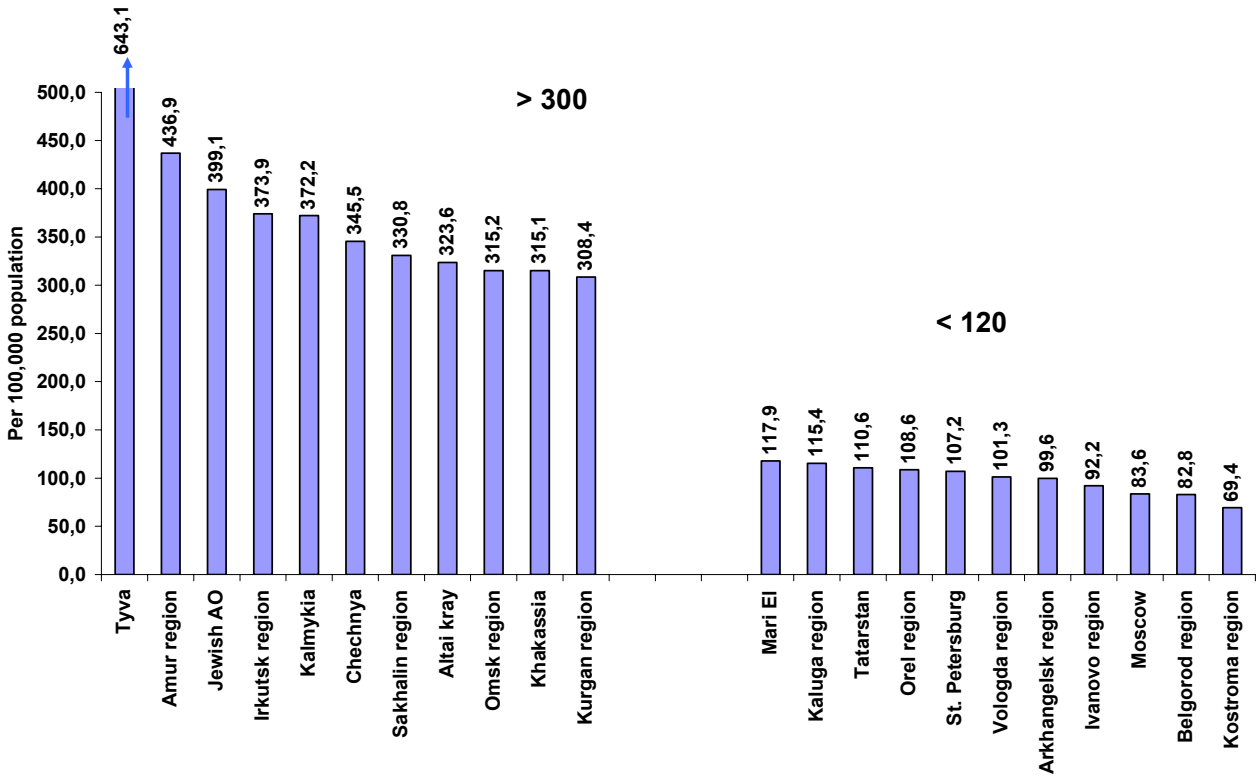
Substantial differences in prevalence rates are related to regional policies in the formation of follow up groups I and II. For example, in Kostroma, Yaroslavl and Vladimir oblasts - territories bordering one another - the rates in 2007 were 69.4, 122.3 and 139.4 per 100,000, respectively. Such variability in TB prevalence rates cannot be explained by epidemiological reasons only.

Some contribution to the overall incidence of tuberculosis among the population of the Russian Federation has made the prison system (see Chapter 6). Although in 2001 the TB patients, registered at FSIN facilities contributed almost 28%, while in 2007 - only 13.9% of the total number of 321,258 patients registered at the end of the year in the forms ## 33 and 4-tub. Prevalence of tuberculosis in the country taking into account these patients is 225.9 per 100,000 population.

[40] In Figure 4.2, the size of TB patient populations in the follow up groups in and after 2004 are denoted by dark-violet columns



A) By federal region



B) By territories with a prevalence < 300 or > 120 per 100,000 population

Figure 4.3. The TB prevalence in the federal regions and territories of the Russian Federation, 2007. Comparison of the prevalence and notification rates for civilian population of the federal regions (Sources: Form #33, population – Forms ##1 and 4)

4.3. Structure of TB patients who are registered in MoH&SD facilities

Figure 4.4 shows the distribution of TB patients within the follow up groups in 2007. As seen from the chart, patients with chronic RTB make a considerable proportion (37.1% among all patients or 39.5% among RTB), which is the result of ineffective treatment in previous years. A significant number of patients with chronic TB observed during many years is a permanent risk factor for the spread of tuberculosis and, above all, with MDR TB (see Chapter 8). This indicates the persistence of challenging epidemiological situation with tuberculosis in the population of the Russian Federation.

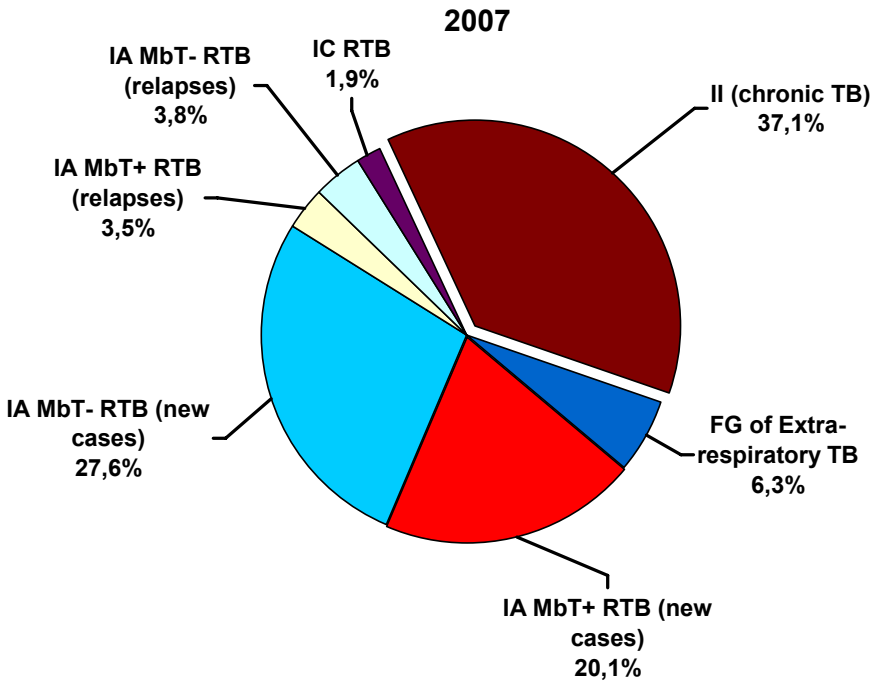


Figure 4.4. The distribution of TB patients within the follow up groups, the Russian Federation, 2007. (Source: Form #33)

The proportion of patients with chronic RTB in the Russian Federation increased by 2006 from 40.4% to 43.1%, then it slightly decreased in 2007 to 39.5%. The decline of this rate was observed this year in more than 40 territories of the Russian Federation.

In 12 territories the proportion of chronic RTB forms is less than 25%: the Rrepublic of Chuvashia (5.6%), Mary El (7.8%), Karelia (20.1%), Adygeya (24.3%), Orel (7,8%), Kirov (15.5%), Kurgan (19.6%), Tomsk (19.7%), Sakhalin (24.1%), Belgorod (21%), Murmansk (22.8%) and Vologda (24.3%) regions. In the Tyumen and Chelyabinsk regions and in Republic of Ingushetia the proportion of RTB chronic forms exceeded 60%.

The prevalence of bacteriological positive (MbT+) cases in the country is considerable (Figure 4.5). The revision of the follow up groups practically did not have an impact on this rate, which has been declining since 2002 (89.2 per 100,000 population), and reached 80.9 per 100,000 population in 2007. The prevalence of MbT+ cases exceeds the notification rate

of MbT+ cases by 2.4 times (at the end of the 90's, by 2.7-2.8 times). Since the relationship of TB prevalence to TB notification rate should be about 1.5-2, the accumulation of a so called "bacillary" patients' pool (registered MbT+ patients) indirectly demonstrates the insufficient effectiveness in treatment of MbT+ patients. Noteworthy is that in some areas, including Orel oblast and the Republic Mary El, for patients with respiratory TB this relationship decreased since 2002 from 2.4-3 to 1.1-1.5.

In addition, a limited increase in the proportion of MbT+ patients among groups of patients with respiratory TB has been observed over the last three years: from 42.1% in 2004 to 43.8% in 2007.

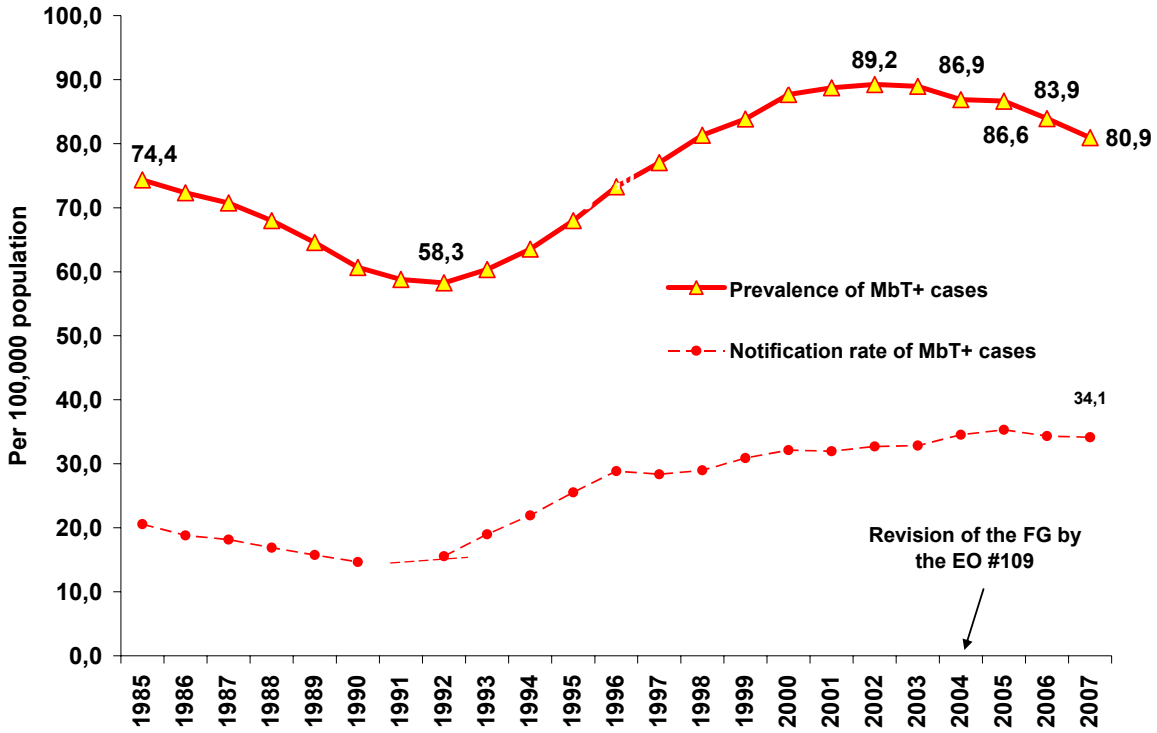


Figure 4.5. MbT+ cases prevalence and notification rate according to Form #8, the Russian Federation. (Source: Forms ##33 and 8), FG – follow up groups, EO – executive order

Similar situation was observed among patients with destructive TB forms (Figure 4.6).

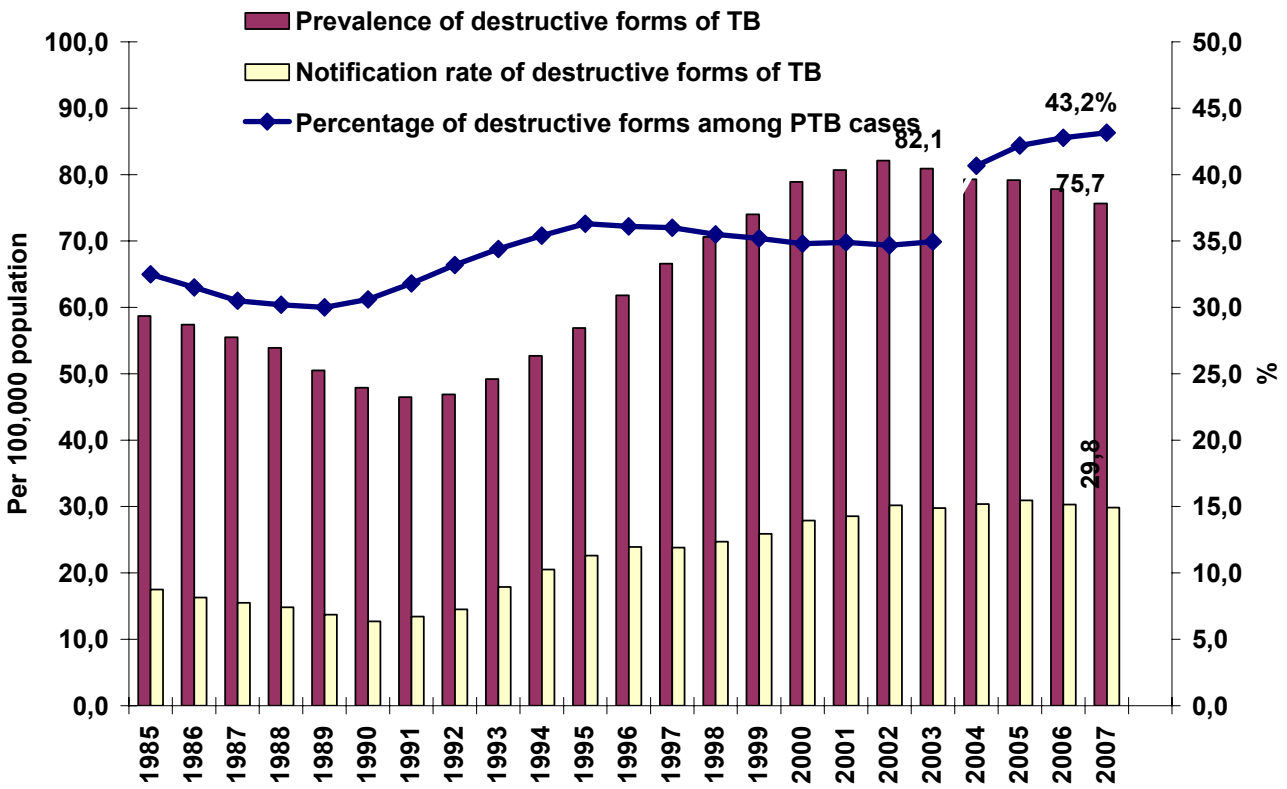


Figure 4.6. Prevalence and notification rates of destructive forms of pulmonary TB and their proportion among pulmonary TB patients, the Russian Federation. Follow up groups were revised in 2004 in line with Executive Order #109. (Sources: form #33, population – forms ##1 and 4)

The highest prevalence of destructive pulmonary TB forms was reported in 2002 (82.1 per 100,000 population), after that a decrease to 75.7 per 100,000 population in 2007 was observed. However, this rate is 2.5 times higher than the notification rate for destructive TB forms in the Russian Federation. This is an indication of an excessive accumulation of severe pulmonary TB forms in the patient population due to problems in treatment and insufficient follow up activities. This may also be the result of the fact that after 2004 (revision of patients' follow up groups), an increase was observed in the percentage of pulmonary TB patients having destructive TB forms: from 40.7% to 43.2% в 2007.

The percentage of cases with destructive forms of pulmonary TB varies significantly by territory in the Russian Federation. The lowest rates in 2007 are reported in the territories of UFR and CFR (36.3% and 38.3%, respectively), the highest – in NWFR (48.7%) and in the east of the country (SbFR - 47.3%, FEFR - 49.0%). Figure 4.7 shows the territories with the highest and lowest values of this rate (>50% and <30%).

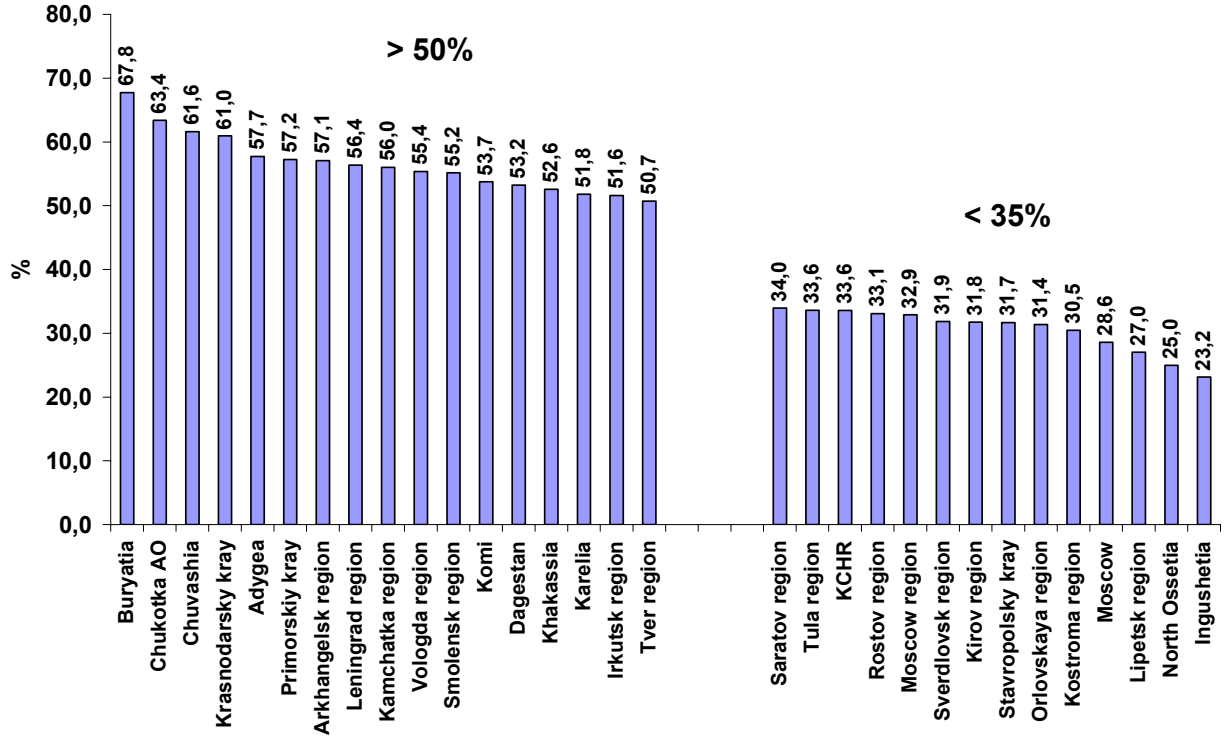


Figure 4.7. The percentage of pulmonary TB patients having destructive TB forms, in the Russian Federation territories with rates > 50% and <30% (Source: Form #33)

In 2004-2007, over 13% of pulmonary TB patients were reported to have fibro-cavernous TB, the most severe form of tuberculosis (13.6% in 2007). As mentioned in Chapter 2, the presence of a large number of FTC cases shows that there were problems in a regional service both with early detection, and with treatment efficacy. The overall level of fibro-cavernous TB in the country reaches 24 per 100,000 population. The greatest notification rate of this form of TB is registered in SFR, SbFR and FEFR – 34.9, 42.8 and 46.6 per 100,000 population, respectively.

Proportion of FCTB cases among all groups of TB patients is much higher than the proportion of this TB form among new TB cases (2.2%), according to data from MoH&SD facilities[41]. As found in [4], a relatively large number of patients with fibro-cavernous TB (up to 70%) form during one year. Figure 4.8 shows the prevalence and notification rates of fibro-cavernous TB over the past years to illustrate the problem of the accumulation of patients with severe TB forms in the process of treatment and follow up. Prevalence of fibro-cavernous TB cases exceeds notification rates of these forms by 16-18 times in recent years. Especially remarkable difference exists in this relationship in the Southern FR, where the proportion of fibro-cavernous TB patients among all TB groups exceeds proportion of fibro-cavernous TB patients among new cases by 35 times. More than 50 times exceed of prevalence over notification rate of FC TB was registered in Rostov oblast (888 registered fibro-cavernous TB

[41] Form #33

patients by the end of 2007), Perm oblast (731), Krasnodar krai (2,474) and the Republic of Dagestan (1,063 registered fibro-cavernous TB patients). The smallest difference between prevalence and notification rate of FC TB (<8 times) with low prevalence of fibro-cavernous TB (less than 12 per 100,00 population) was observed in such territories as Tomsk oblast (5.2 times), Lipetsk oblast (5.9 times), Orel oblast (6.3 times), Kaluga oblast (7.8 times), Kursk oblast (6.6 times) and the Republic of Komi (7.9 times).

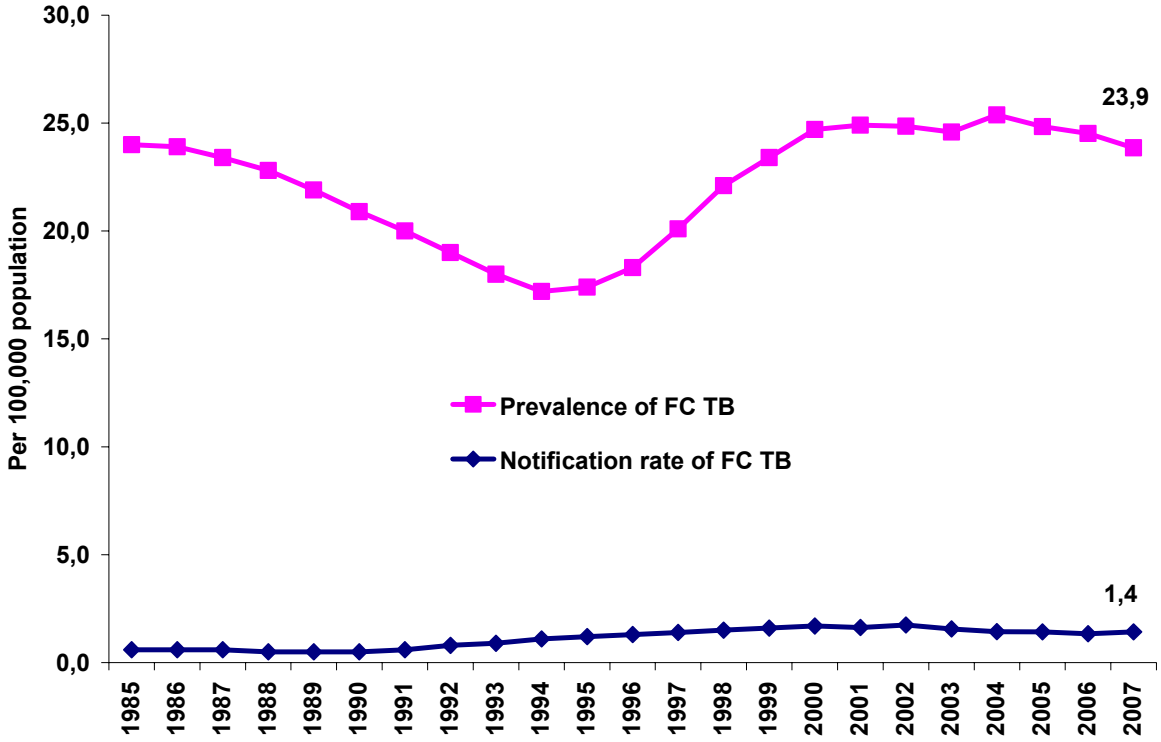


Figure 4.8 Prevalence and notification rates of fibro-cavernous TB (FC TB) among the permanent resident population of the RF. (Source: Form #33, population – Forms ##1 and 4)

Even considering some possible misrepresentations made in the registration of fibro-cavernous TB at the time of TB notification and registration, these data indirectly make evident the “extremely low TB treatment effectiveness” in recent 10-15 years [4] and emphasize the necessity to take additional measures to improve TB treatment effectiveness in many regions in Russia.

The revision of the follow up groups in 2004 had an impact on the registered TB prevalence among children. The rate dropped from 40.4 in 2002 to 23.5 in 2004. In 2007 there were registered 21.3 children aged 0-14 per 100,000 children population.

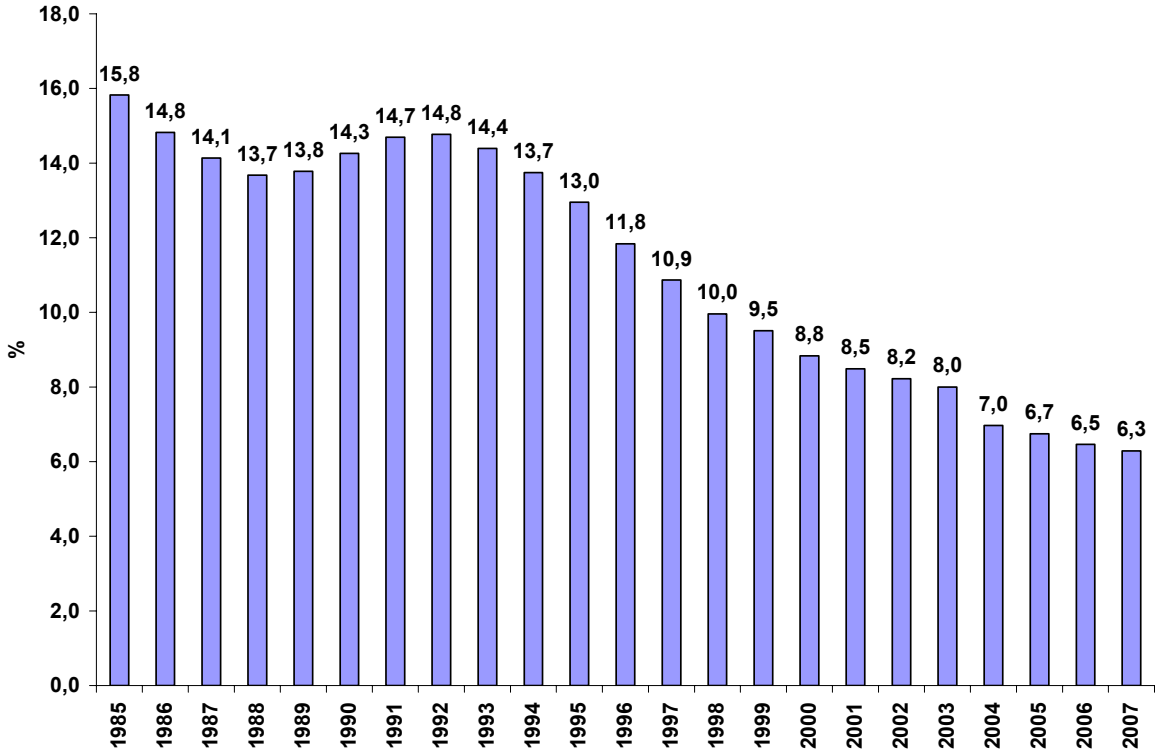


Figure 4.9. Extra-respiratory TB prevalence rates, in comparison to respiratory TB prevalence rates in percent, the Russian Federation (Source: Form #33)

The extra-respiratory TB prevalence rate has decreased in recent years from 14.2 in 2004 to 11.5 per 100,000 population in 2007. Its proportion among RTB decreased during the past 15 years and in 2007 reached 6.3% (Figure 4.9). The reason for reducing the ERTB rate, as in the case of incidence rate (see Chapter 2.5), at present can be linked not only to the epidemiological reasons, but mostly to incomplete registration of cases of ERTB due to lack of qualified personnel and accepted practice of the registration of associated cases of ERTB and RTB as cases of «tuberculosis of the respiratory system». Note that the prevalence rate of ERTB tuberculosis more than 4 times exceeds its notification rate, which also reflects the accumulation of chronic forms of ERTB because of problems with the organization of its treatment.

Data on the prevalence of tuberculosis of all localizations indirectly reflect the fact of not enough effective treatment in Russia. With the high rate of mortality from tuberculosis, there has been a significant accumulation of MbT+ TB cases and cases with severe forms of tuberculosis (with destruction and the fibro-cavernous TB), an increase in the number of patients with MDR TB (see Chapter 8). Prevalence rate (taking into account ways of its formation) can be effectively used for TB control and for evaluation of epidemiological situation in the territories and evaluation of the impact of TB control activities.

5. Monitoring of treatment effectiveness in Russia

E.M. Bogorodskaya, M.V. Shilova, S.E. Borisov, I.D. Danilova, W. Jakubowiak, E.M. Belilovsky

5.1. General information on the indicators of treatment effectiveness

Treatment is one of the main components of TB control activities. Assessment of its effectiveness is a complicated multifactor task based on a system of indicators reflecting different stages of the management which can be divided into several groups:

- indicators which reflect effectiveness of separate courses of treatment;
- indicators which reflect effectiveness of certain stages of treatment, including inpatient, out-patient and sanatorium;
- indicators which reflect effectiveness of the work with patients as a whole, from the moment of detection to completion of the follow up, which to a certain extent is the assessment of the dispensary work with the patients,
- indicators of effectiveness of treatment facility performance (effectiveness of the work performed in inpatient clinics and sanatoriums) and their departments,
- Aggregated indicators that reflect the work of the service as a whole in organization and treatment management of tuberculosis patients [4, 15, 16, 20, 28]

To obtain the necessary assessment of the effectiveness of the organization and conducting of treatment of TB patients and to establish adequate management solutions, indicators for monitoring of the treatment should reflect the following information.

1. The basic conditions necessary for treatment organization:

- **Availability of trained medical personnel.** The basis of all activities for treatment of TB patients is availability of sufficient number of qualified TB physicians in order to ensure the adequacy and effectiveness of treatment. The lack of motivated staff makes all the attempts to organize high-quality treatment for patients unsuccessful.
- **Availability of TB treatment facilities.** Providing high-quality inpatient and outpatient treatment for TB patients requires a well-organized, modern, and meeting sanitary rules network of TB treatment facilities.
- **Supply of anti-TB drugs in the territory (institution).** Full or partial absence in the treatment facility of at least one TB drug makes impossible implementation of a standard treatment regimen, resulting in low efficiency of chemotherapy.
- **Guarantee of an complex or comprehensive treatment of the patient.** Chemotherapy alone can cure the majority of newly diagnosed patients. However, some of the patients are detected in the late stages of the disease, when fibrosis change with reduction of capillary bed are developed in the organs and tissues, and the penetration of anti-TB drugs in place of

specific inflammation becomes impossible. Similar changes are formed in the lung tissue in patients with ineffective treatment. In addition, some patients had adverse effects to anti-TB drugs treatment, and have particular features of immune response. Some patients have slow repair of lung tissue. Therefore, effective treatment in addition to chemotherapy requires necessary conditions for providing pathogenetic treatment, collapse therapy, and surgery by indication.

2. Characteristics of the course of chemotherapy.

Chemotherapy is one of the main methods of treatment for tuberculosis, which leads to recovery of a significant proportion of newly diagnosed patients and patients with relapse of tuberculosis with various manifestations of tubercular process, thereby helping to prevent the spread of infection among the population. To evaluate the effectiveness of chemotherapy the indicators that reflect the following characteristics should be considered:

- **The selection of patients for treatment and coverage of TB patients by treatment.** One of the serious problems is the initial patients' denial of the treatment, or impossibility of treatment because of different reasons. The proportion of patients who are not enrolled in treatment (especially new cases and relapses) is an important prognostic indicator of the situation with TB in the region.
- **Adequacy of chemotherapy (doses and regimens)**. Indication of the necessary quantity of drugs and their doses according to the severity of the disease or patient group depending upon the previous treatment history (new case, relapse, etc.) is an important component of treatment success and the prevention of treatment failure and development of drug resistance. The introduction of standardized treatment regimens by Executive Order #109 [15] laid the foundation for a decrease in errors in drug indications and doses.
- **Control over anti-TB drugs administration**. Supervised anti-TB drugs administration guarantees compliance with the indications made by a physician. Therefore such a component needs to be evaluated.
- **Duration and uninterrupted treatment.** One of the most serious problems affecting treatment effectiveness is patient compliance to treatment (patient motivation to be cured) or compliance with the indications made by a physician. Evaluation of treatment interruptions during a course of therapy is an important element of treatment monitoring which requires constant control and evaluation. Completion of the indicated course of treatment without interruptions is one of the most important factors of treatment management.
- **Continuity of treatment.** As a rule, several types of facilities (inpatient and outpatient clinics, dispensaries, sanatoriums, TB cabinets, and others) are involved in planning, implementation and monitoring of the treatment process. In addition, institutions of general health care network can be involved in controlled distribution of anti-drugs (such as medical

outpatient points, rooms or clinics, family doctors offices, district hospitals, etc). Also TB patients may get transferred to analogous facilities in other territories or between different jurisdictional entities (e.g. transfer from a treatment facility in the civilian sector to one in the penitentiary system, and vice versa). In such cases, it is very important to evaluate and monitor the actual treatment continuation and its continuity when changing treatment facilities.

3. The results of treatment.

- **Intermediate and final evaluation of treatment outcomes**. The outcome of any particular treatment course should be evaluated and defined. The intermediate evaluation of treatment (e.g. smear conversion at the end of the intensive phase) is also important, especially in epidemically dangerous TB patients. This could be estimated, for example, by indicator of bacteriological conversion at the end of intensive phase. Such data might be essential for the timely correction of a therapy course or approaches to treatment management in the region (at the facility level).

The indicators of treatment effectiveness used by Russian TB services before 2004 included only part of above-mentioned information. However, they did not reflect the impact of a single course of chemotherapy, which makes the base for the effectiveness of all treatment in general, and of follow up. Among the information required for monitoring of the treatment the reporting forms received only interim and final integrated assessment of the effectiveness of treatment.

Before 2005 in the Russian Federation four indicators of the effectiveness of treatment have been examined: (see (20, 28))

1. Bacteriological conversion confirmed by all methods among new TB cases
2. Closure of cavernous lesions among new cases
3. Clinical cure based on dispensary follow up
4. Bacteriological conversion for all TB patients

The first two indicators reflect treatment effectiveness of new respiratory TB patients with bacillary excretion confirmed by all methods (microscopy and/or culture) – for first indicator and cavernous lesions in lung tissue - for the second indicator. Considered only patients registered within a year prior to the reporting year. These indicators only partially use the cohort principle (annual cohort). For calculation, new TB patients transferred in from other territories are added into the cohort and some patients of the previous year (who died from causes other than TB, transferred out, etc.) are excluded from the cohort. Besides, these indicators did not reflect the effectiveness of the treatment of patients, but only the elimination of one of the signs of disease.

The indicators above examined target the evaluation of treatment effectiveness of a new TB patient over 12-24 months of treatment, not taking into account the number of courses

of chemotherapy (cases of treatment) provided over this period of time, bringing them closer to the indicators of dispensary (follow up) activities. And finally, these indicators are limited by the evaluation of treatment effectiveness only for new MbT+ cases and new cases with cavernous TB, not evaluating effectiveness of treatment of other groups of patients. That excluded from the evaluation 50-60% of new cases and 80-85% of all registered patients.

Indicators 3 and 4 cumulatively reflect the dispensary work effectiveness on organization of treatment. The indicator of clinical cure considers transfer of a case from a follow up group with so called “active” forms of TB (follow up groups I and II, which include patients with confirmed TB), to the follow up group which consists of groups previously had TB and followed up as TB risk group (e.g., group III). The indicator of bacteriological conversion shows the removal of a patient from the registry of MbT+ cases a certain time after obtaining a number of negative laboratory test results.

These rates, which do not have analogs in other countries, are convenient for the cumulative demonstration of effectiveness of dispensary treatment management for all groups of patients - new cases, relapses and chronic cases. They also help in controlling the pool of MbT+ cases, indirectly evaluating the timeliness of TB detection, evaluating the results of the complex treatment of some patients with respiratory TB, and observing the flow of patients in TB dispensaries.

However, all these indicators do not allow for evaluation of treatment effectiveness of main course of treatment for all groups of patients, which is basis for clinical cure and success of all dispensary work (21).

Therefore, of all types of information essential for treatment monitoring defined in the beginning of section 5, the treatment indicators used prior to 2004 were able to provide data only on the final outcome of treatment and not for all patient groups, not showing the effectiveness of main (base) treatment courses. In part, the preliminary results of treatment of MbT+ patients can be assessed using existing in the form # 33 in 1999-2003 data on the number of patients who converted within 4 months (identified by microscopy method). However, the use of these data without the use of cohort analysis greatly reduced their value.

Noteworthy is that until 2004, international indicators of treatment outcomes were not used in the Russian Federation. This made it difficult and at times impossible to compare the effectiveness of treatment management activities in the Russian Federation to the results achieved in other countries. Furthermore, it hampered the use in the Russian Federation of advanced expertise from abroad in the field. In particular, the lack of such indicators complicated rendering assistance to our country by foreign agencies (IBRD Project, Global Fund grant, and others), since it was impossible to evaluate the effectiveness.

At the same time, statistical data reviewed in the previous sections on TB mortality and prevalence in the Russian Federation in 90s indirectly show that treatment effectiveness has not been particularly high: there has been a high level of TB mortality, a substantial accumulation of MbT+ cases and cases with severe forms of TB (with destructive and fibro-cavernous TB) among patients of follow up groups 1 and 2, and an increase in MDR TB cases.

As a result of Executive Order #50 (16) issued in 2004, a system of new recording and reporting forms of TB detection and treatment monitoring was introduced. It was based on cohort analysis and evaluation of effectiveness of a particular course of treatment. As a result, the possibility arose to evaluate and monitor a large amount of the aforementioned information essential for effective treatment monitoring (see Appendix 1).

The organization of treatment monitoring and statistical reporting, adopted in the Russian Federation according to recent executive orders, correspond with fundamental WHO recommendations, supplemented upon substantially by the existing capacities of TB services. WHO recommendations are designed for all countries regardless of the presence or absence of developed TB services in a country. The system of treatment monitoring applied in Russia, as compared to the basic WHO recommendations, includes also the assessment of effectiveness, which is performed on the basis of culture examination methods and clinical-radiological evidence. It performs a separate evaluation of cases that have died of TB and other causes and reviews cohorts of smear-negative relapses.

5.2. Evaluation of treatment effectiveness on the basis of indicators used in the Russian Federation prior to 2004

Treatment effectiveness of new TB cases, as defined by the criteria of closure of cavernous lesions and bacteriological conversion [20], declined from 1992 to 2004 by 1.2 times. Closure of cavernous lesions was reported in 76.6% of cases in 1992 and in 63% of cases in 2004. Bacteriological conversion was reported in 86.8% of cases in 1992 and in 73.5% in 2004 (Figure 5.1).

In 2005-2006, due to the introduction of new Reporting Form #33, it was not possible to evaluate bacteriological conversion and closure of cavernous lesions for new TB cases due to the lack of corresponding data. However, in order to ensure continuity of the rates, it is planned to resume collection of the indicated data starting in 2008.

The integrated “dispensary” rates of clinical cure and bacteriological conversion should be analyzed separately for the period of time prior to revision of the dispensary follow up group system in 2004 and for the period after it (see Figure 5.2). Prior to 2004, the conversion rate practically did not change, and the clinical cure rate of respiratory TB patients after some decrease in the beginning of the 1990’s started increasing slowly after 1998. After 2004 (year

of the revision of the follow up groups), these rates indicate an increase in effectiveness of the work performed with patients from follow up groups I and II, as well as both MbT+ patients and TB patients with destructive process in the lungs. In 2007, 35.1% of patients from follow up groups I and II had bacteriological conversion, and 31.6% of respiratory TB patients were transferred to follow up group III (clinically cured TB patient group) during the year. For new cases registered in IA dispensary group, this indicator increased from 40.7% in 2005 to 47.9% in 2007.

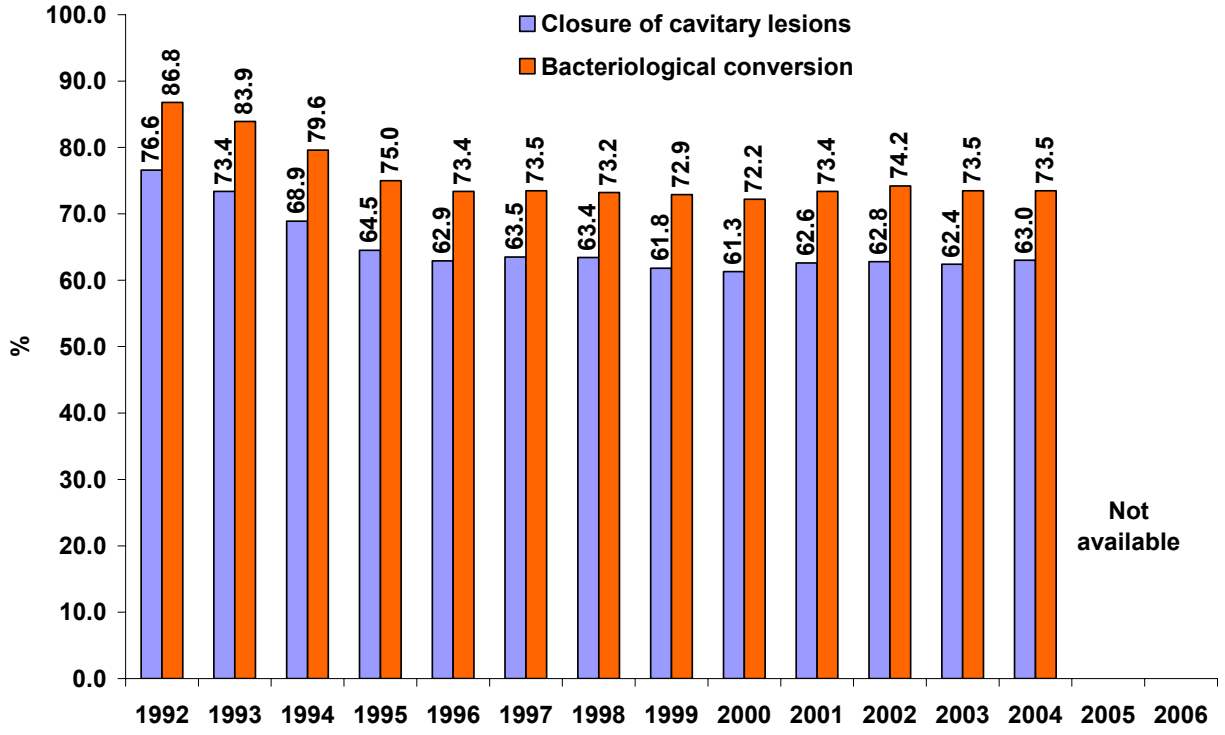


Figure 5.1. Treatment effectiveness of new respiratory TB patients, 1992-2004. Data for 2005-2007 in the reporting forms are not available. (Source: Form #33).

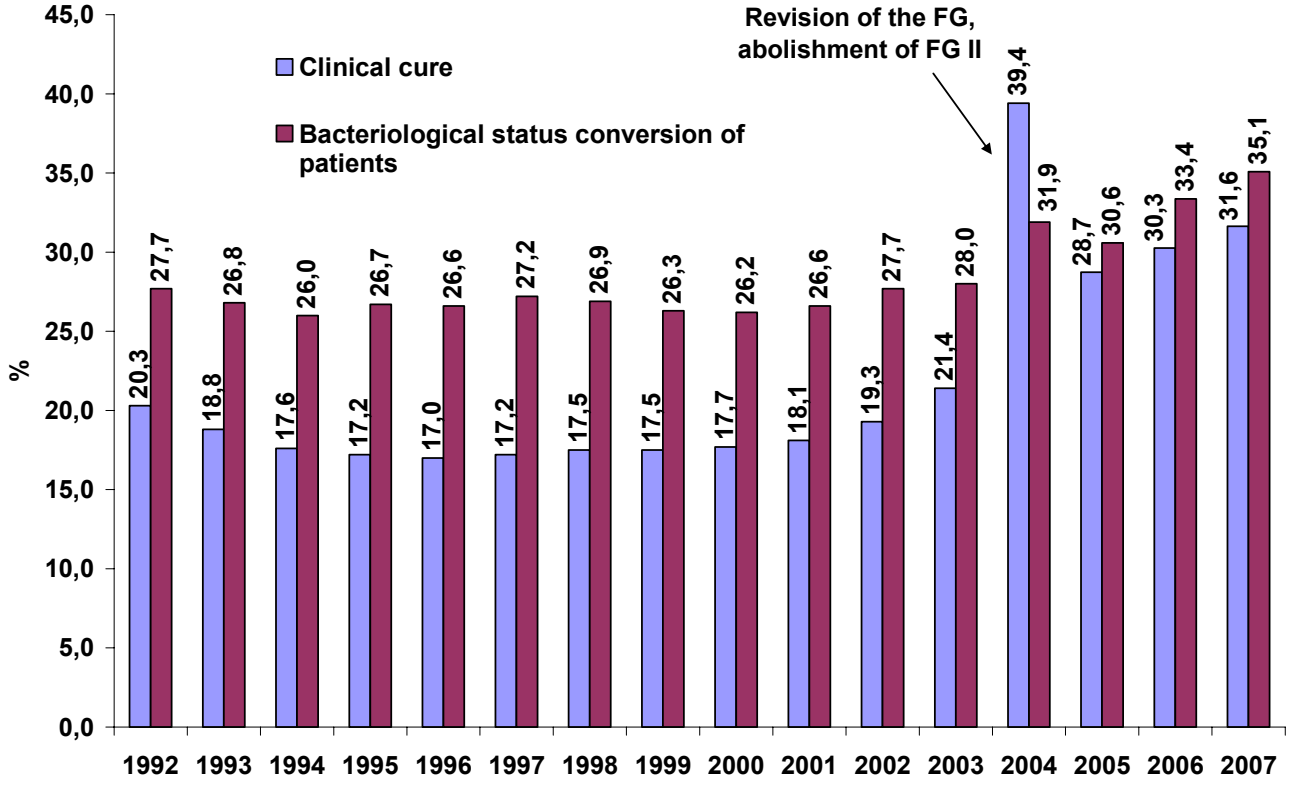


Figure 5.2. Clinical cure and bacteriological conversion of respiratory TB patients in the Russian Federation, 1992-2007. (Source: Form #33), FG – follow up group

5.3. Evaluation of surgical treatment effectiveness

Data on surgical TB treatment present in the existing federal reporting forms allow only for the calculation of the coverage of patients receiving this type of treatment. Indicators that directly show the effectiveness of the given type of treatment are lacking in the MoH&SD forms.

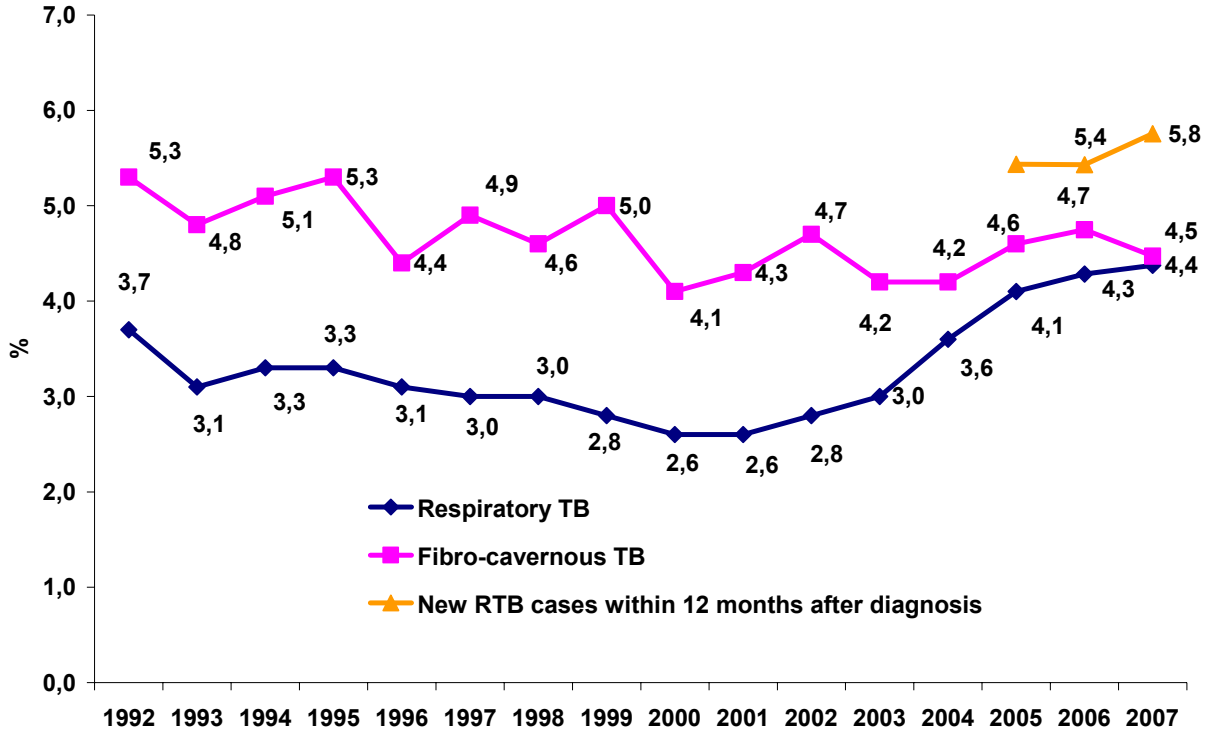


Figure 5.3. The percentage of cases with respiratory TB (RTB), fibro-cavernous TB, and new respiratory TB cases receiving surgical treatment within 12 months after diagnosis, the Russian Federation (Source: #Form 33)

The data from Form #33 indicate an increase in the proportion of patients with respiratory TB treated surgically, from 2.6% in 2001 up to 4.4% in 2007 (Figure 5.3). After some increase in the proportion of patients with fibro-cavernous TB treated surgically in 2004-2006 from 4.2% to 4.7%, in 2007 decreased to 4.5% (statistically not-significant, $p>0.05$). The proportion of patients surgically treated remains high among patients with TB of the bones and joints (14.1%), urogenital TB (6.0%) and TB of the peripheral lymphatic nodes (23.2%)[42].

Beginning in 2006, the reporting forms allow for the calculation of the percentage of patients who had surgical treatment within a year after diagnosis (5.8% in 2007).

It is advisable to develop and implement at the regional level indicators for sentinel monitoring (in separate selected territories) of surgical treatment effectiveness which should include the following basic evaluations:

[42] Form #33 for 2007.

- post-surgical mortality,

- rates of post-surgical complications,

- effectiveness of surgical interventions as measured by indicators of bacteriological conversion and closure of cavernous lesions,

- descriptive indicators by the types of surgical interventions performed.

It would be rational to process these data applying the cohort principle (for quarterly or annual cohorts) and separately for different patient groups (new cases, relapses, etc.)

The analysis of such information from representative part of Russian regions will substantially increase the effectiveness of monitoring and evaluation of the surgical methods of TB treatment in the Russian Federation.

5.4. Evaluation of chemotherapy effectiveness for patients registered in 2005-2006 on the basis of cohort analysis

In 2005-2007, practically throughout the entire country[43], a new methodology and statistical system of treatment monitoring based on cohort analysis was introduced [16]. It was fully consistent with the system of centralized control of treatment of patients [15].

Implementation of the new system of treatment monitoring has been controlled by the research institutes of phthisiopulmonology and tuberculosis (Research Institute of Phthisiopulmonology of the Sechenov Moscow Medical Academy, Novosibirsk TB Research Institute, St. Petersburg Research Institute of Phthisiopulmonology, Central TB Research Institute, Russian Academy of Medical Sciences, Ural Research Institute of Phthisiopulmonology), and, within the framework of the IBRD and GFATM projects, FPHI. The WHO TB Control Program in the RF has provided consultative and technical support to the implementation of the new system.

According to data on cohort of 2006 (MoH&SD facilities) main treatment course of **all new PTB cases (regardless on MbT status)** was evaluated as effective in 66.9% of cases (see Figure 5.3). The best treatment results were obtained in SFR and PFR (71.8% and 69.7%, respectively). Overall, the effectiveness of treatment above 80% was registered in 9 (10.7%) territories, above 70% - in 33 (39.3%) subjects of the Russian Federation. Most commonly an effective treatment outcome rate was observed in 50 - 60% of cases (in 43 subjects or 51.2% of the territory), and less than 50% effective treatment outcome rate was observed in 7 (8.3%) subjects of the Federation.

The treatment failure was registered in 12.1% of patients. This rate varied by the federal districts from 9.9% in the CFR to 17.0% in the UFR. Overall, 4.7% of new PTB cases died of tuberculosis. The highest mortality rate was registered in NWFR (7.6%), the smallest - in SFR

[43] In 2005– in 67 territories; in 2006– in 87 territories of 89; in 2007 – all 86 territories of RF

(2.3%). The cause of death was registered as “tuberculosis” in 59.8% of all death cases of TB patients.

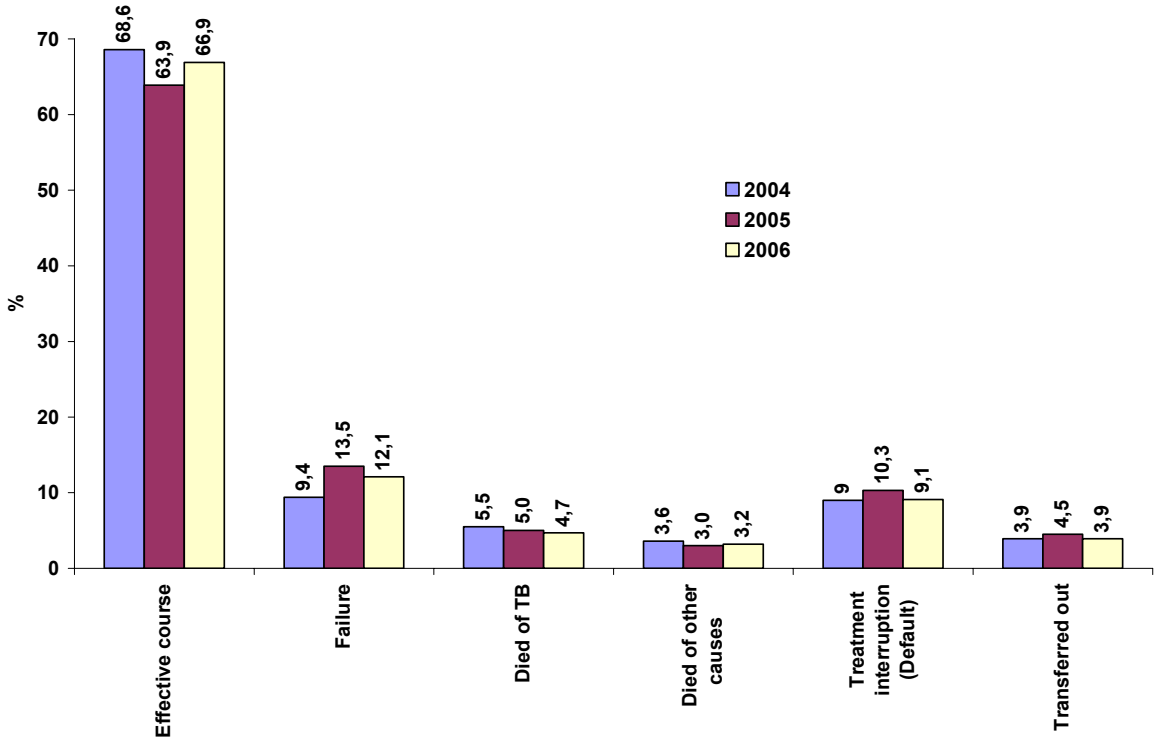


Figure 5.4. Outcomes of courses of chemotherapy among cohorts of new PTB cases registered for chemotherapy in 2004-2006 in MoH&SD facilities; the size of cohorts 2004-2006 - 17,880, 74,078 and 85,322 patients, respectively. The Russian Federation (Source: Form # 8-TB).

Treatment default had 9.1% of patients and transferred out 3.9%. Of these two groups one third of patients was ss+ at the time of registration.

The deterioration of performance indicators for the treatment of new PTB cases’ cohorts before 2006 was attributable to the inclusion of new territories in the implementation of the order #50 (Picture 5.8). Cohorts of 2005 and 2006 were virtually identical in size, differing only by 15%. In 2006, the effectiveness of the treatment of new PTB cases on average increased by 4.7% in the Russian Federation. This was due to a decrease of transferred out, default and failure patients for 10-13%. In general, this reflects the results of great work of TB services staff on monitoring the treatment of patients. An important role here, apparently, has played a social support for TB patients, which in 2007 was done in more than 50 territories of the Russian Federation at the expense of the budgets of the Russian Federation, GF grant, assistance from WHO and other international organizations [8]. In addition, also had its impact an implementation of article 10 of the Federal Law from 18.06.2001, #77-FZ “On prevention of the spread of tuberculosis in the Russian Federation” on compulsory engagement on a court order of patients who maliciously refuse treatment in mandatory hospital TB treatment [11].

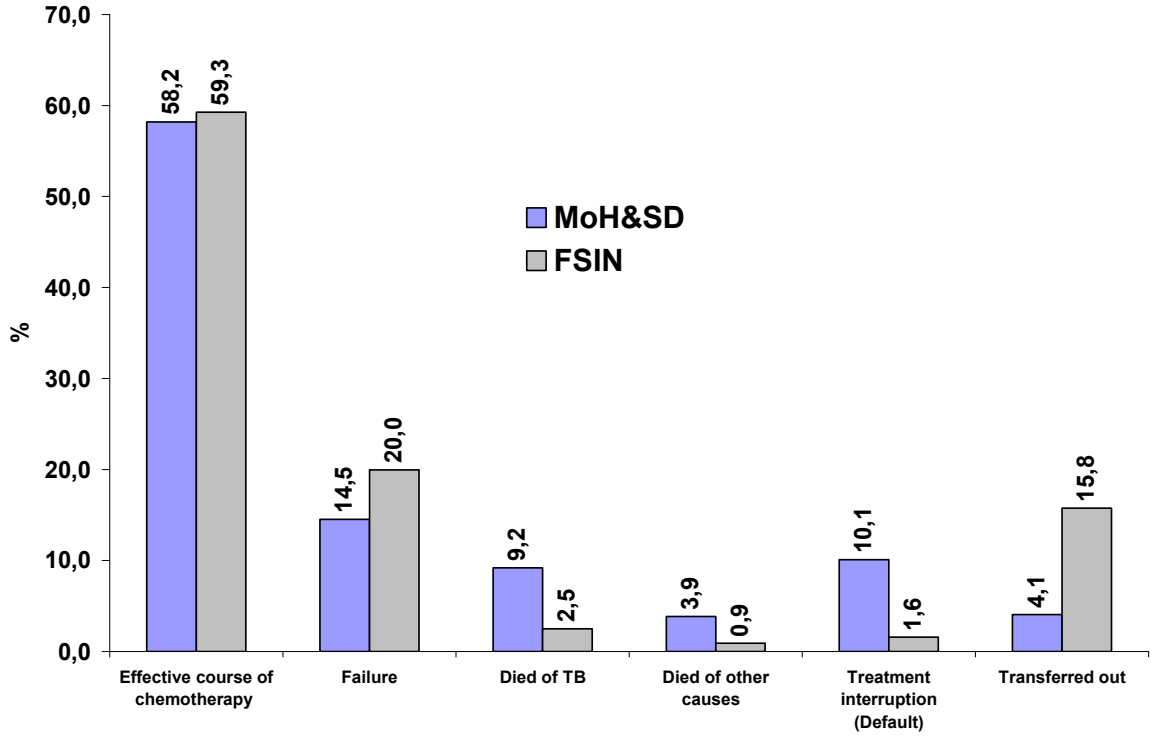
In the new ss+ TB cases' cohort of 2006 (**patients with newly diagnosed ss+ PTB)** the main course of treatment, defined on the basis of all clinical, laboratory and radiological features was effective in 52.2% of cases, while the conversion rate by sputum microscopy was 58,2% (Table 5.2. and Figure 5.5, respectively). Treatment failure was registered in 14.5% of patients, treatment interruption - in 10.1%, died of tuberculosis – 9.2%, died from other causes - 3.9% of patients.

Bacteriological conversion confirmed by culture in cohort of new PTB cases with positive culture was registered in 61.4% of patients; by the federal regions - from 51.3% (SbFR) to 68.9% (SFR). Cavities closed in 52.8% of patients; by the federal regions - from 51.3% (FEFR) to 68.9% (SFR).

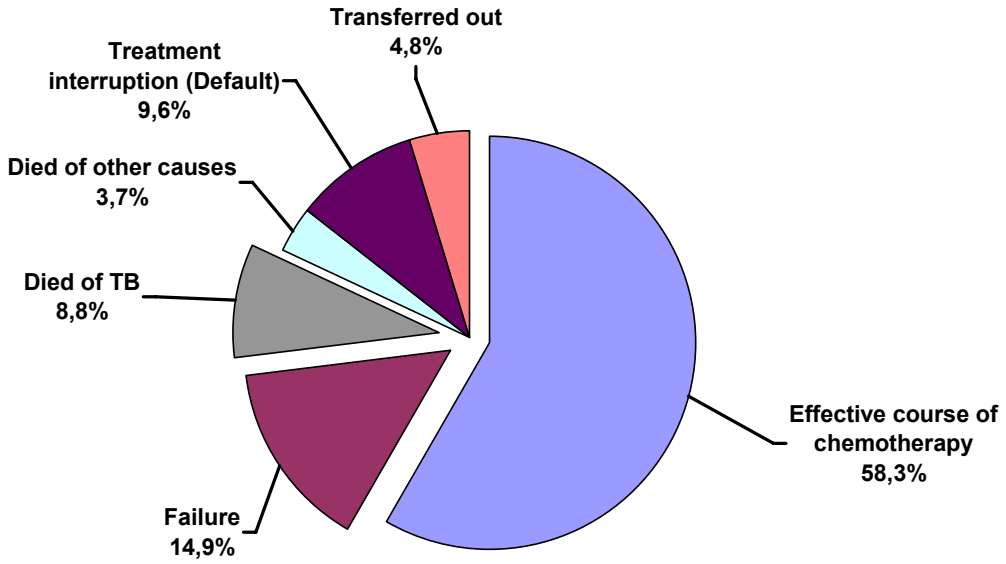
Overall in the Russian Federation (MoH&SD facilities and FSIN) the effectiveness of the treatment of cohort of 2006 with positive sputum microscopy remains low (58.3%) (see Table. 5.2). In the civilian sector this was due to a high proportion of treatment interruptions (10.1%) and deaths from tuberculosis (9.2%), especially when compared to the prison sector. At the same time, the effectiveness of treatment in the prison sector significantly underestimated due to the high percentage of transferred (15.9%) and treatment failures (20.0%). However, the results of treatment of patients from FSIN facilities do not have a significant impact on the effectiveness of treatment across the country because of the small size of cohorts in the prison system.

Table 5.2. The effectiveness of the treatment cohort of new ss+ PTB cases. Cohort of 2006.

Department	Cohort size	Effective course of chemotherapy	Failure	Died of TB	Died of other causes	Default	Transferred out	Including subtable (1001)	
								Effective course of chemotherapy	Failure
	abs	%	%	%	%	%	%	%	%
MoH&SD	28,804	58.2	14,5	9.2	3.9	10.1	4.1	52,2	20,5
FSIN (penitentiary system)	1,959	59.3	20,0	2,5	0,9	1,6	15,8	no data*	no data*
The Russian Federation overall	30,763	58.3	14.9	8.8	3.7	9.6	4.8	no data*	no data*



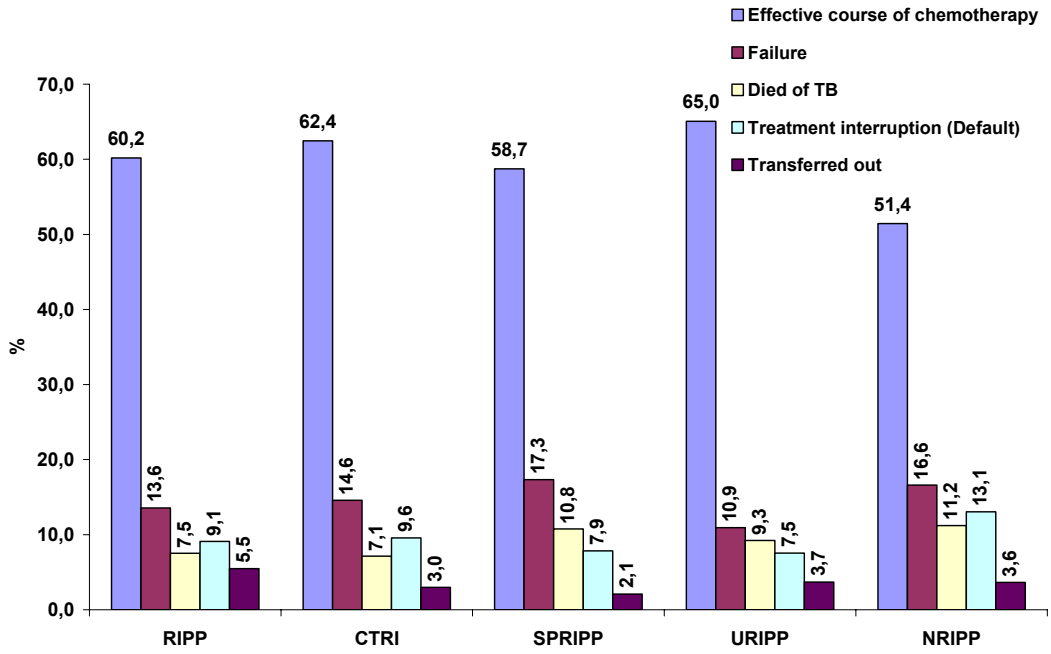
A) Facilities of the MoH&SD and FSIN, Russia



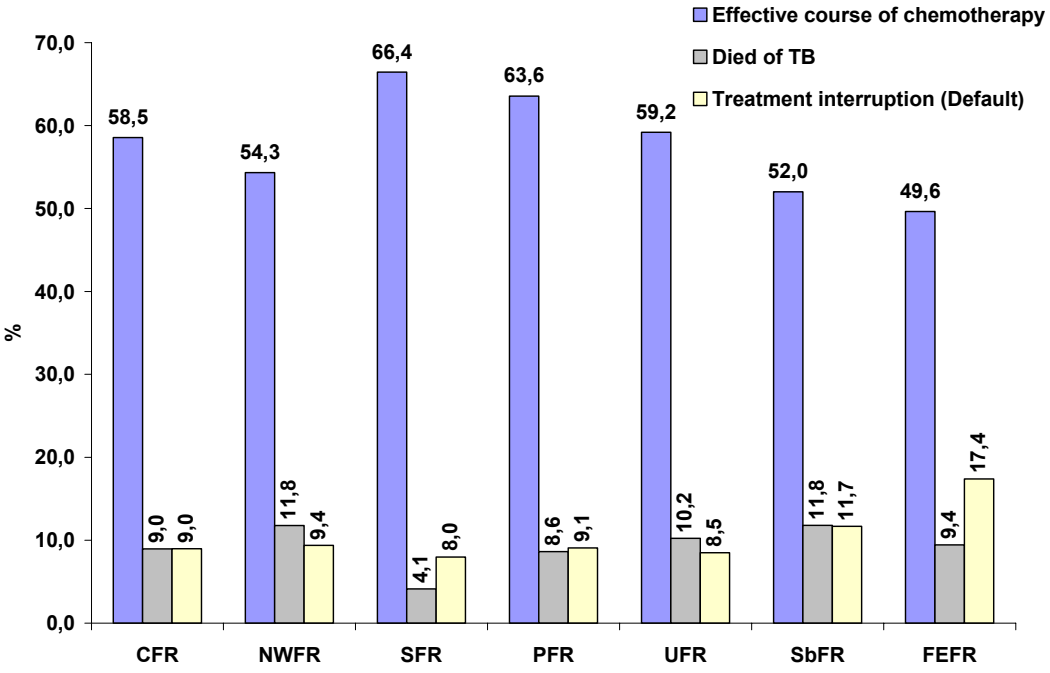
B) Russia overall

Figure 5.5. Treatment outcomes of new pulmonary smear-positive TB cases. Cohort of 2006. MoH&SD: 28,804 patients, FSIN 1,959 patients. (Source: Form #08-TB)

Treatment outcomes differ substantially by territory and region. Figure 5.6 presents the basic treatment outcomes by federal research institute supervisory zone and by federal region.



A) MoH&SD and FSIN facilities



B) MoH&SD facilities

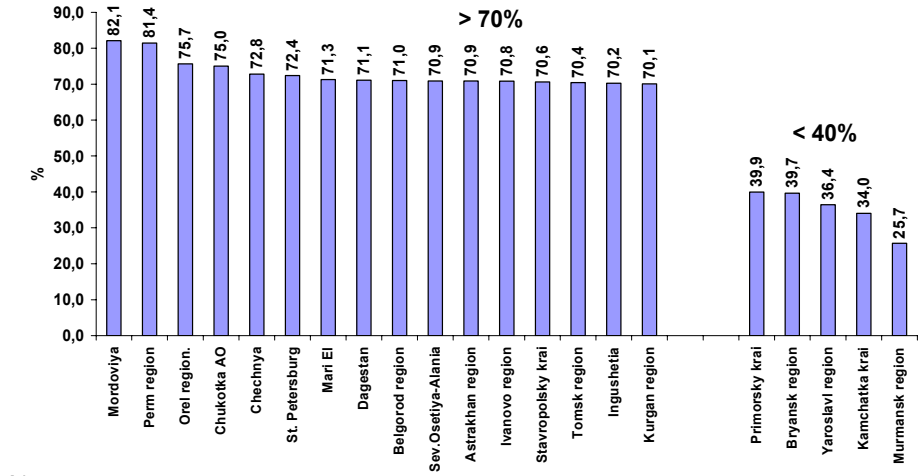
Figure 5.6. Treatment outcomes by federal research institute supervisory zone (A) and by federal region (B). 2006 cohort, new pulmonary ss+ TB cases . MoH&SD 28,804 patients, FSIN 1,959 patients. (Source: Form #08-TB)

In many territories high levels of mortality (9-12%) and treatment default (9-17%) were reported. This has a significant impact on the effectiveness of the treatment course, which ranges from 49.6 to 66.4%.

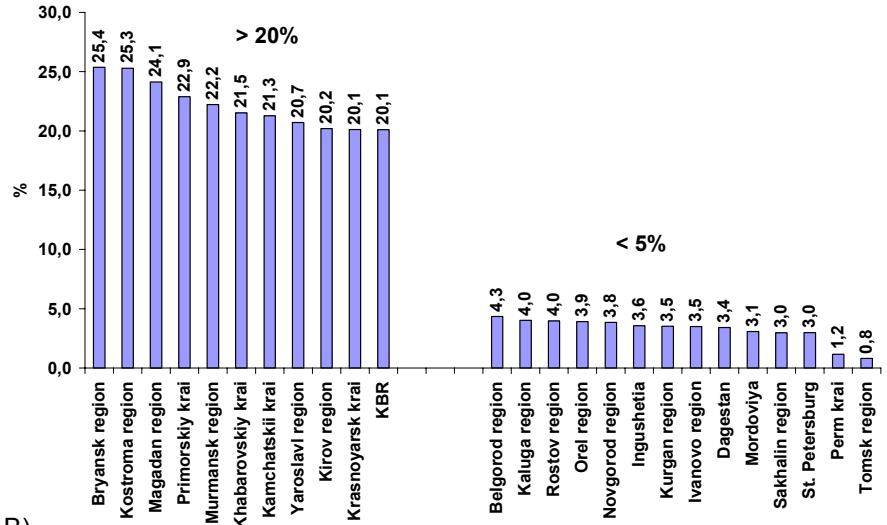
Figure 5.7 presents data by territory with the highest and lowest percentages of patients with effective courses of chemotherapy, treatment interruptions and TB mortality. Only those

territories in which the number of patients in the 2005 annual cohort exceeded 50 were used in analysis. Note that according to the independent monitoring carried out by Russian experts and specialists from the WHO TB in the Russian Federation in frame of IBRD grant (33), it was shown that in some areas is the effectiveness of treatment was somewhat overstated due to improper evaluation of the results. However, the quality of data obtained in 2006-2007 has already been enough high for a generalized analysis of the monitoring of treatment in the country as a whole and in individual regions.

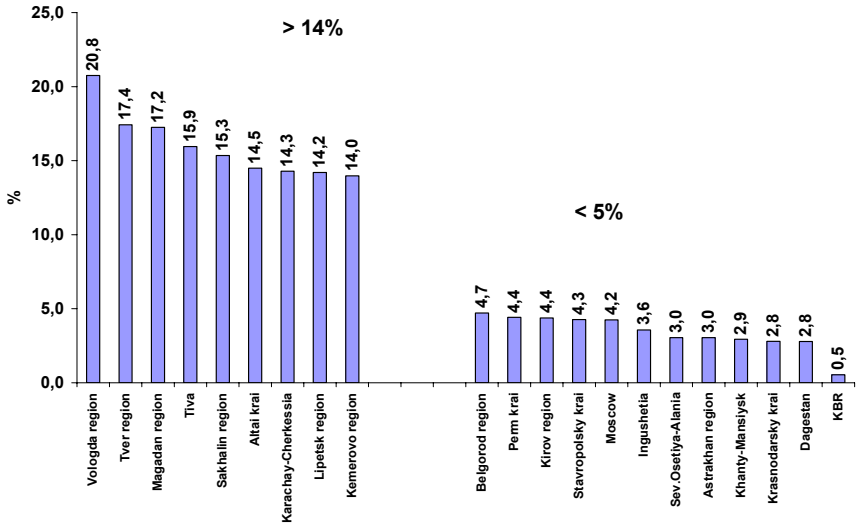
As seen in the figures above, only in four territories the rate of effective treatment exceeded 80% and approached the internationally accepted standards. Ineffective treatment in the territories is mainly due to the high percentage of treatment interruptions and mortality. In 11 territories the proportion of patients with treatment interruptions exceeded one fifth of all patients registered for treatment. Only in 14 territories the treatment interruptions rate was registered below the desired 5%. In nine territories, every 8^{th} or even every 7^{th} patient from the cohort of new pulmonary smear-positive (by microscopy) TB cases died. Only in 12 territories the proportion of died patients in cohort of 2006 was below the desired 5%.



A)



B)



C)

Figure 5.7. The highest and lowest percentages of patients with an effective course of chemotherapy[44] (A), treatment interruptions (B), and patients who died of TB (C). The cohort consists of new pulmonary AFB smear-positive (by microscopy) TB cases detected in 2006. Only Russian territories with an annual cohort size over 50 are included. MoH&SD facilities. (Source: Form #08-TB)

[44] Not taking into consideration data from the table (1001) p.1, gr.1 Form # 8-TB

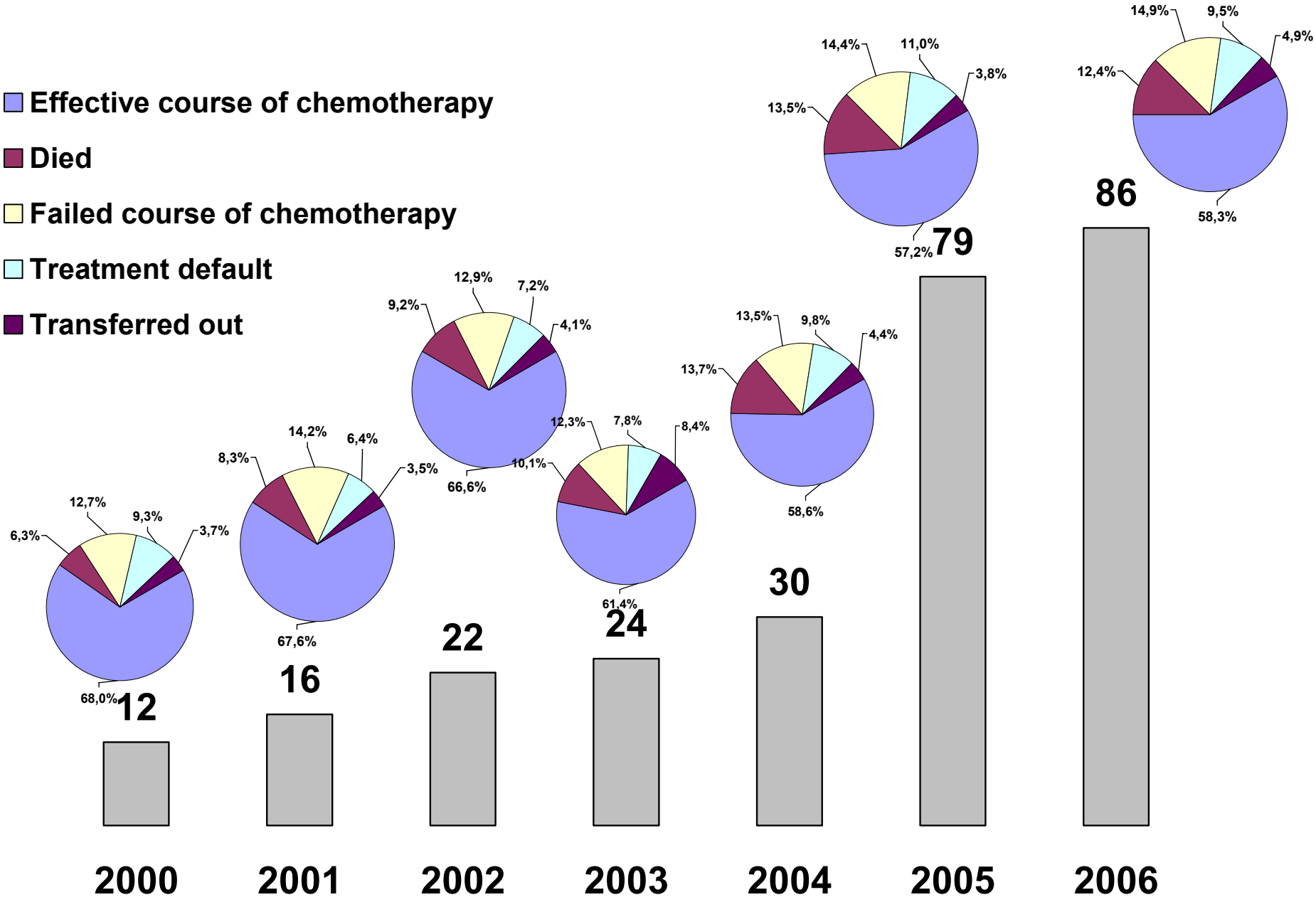


Figure 5.8. Treatment outcomes in the territories which performed cohort evaluation of treatment effectiveness. Cohorts of 2000-2006, new ss+ PTB cases. Grey columns represent the number of territories performing the cohort analysis (Source: Form #08-TB)

In conclusion, it should be noted that as the cohort method of monitoring of treatment and the inclusion of an increasing number of areas were implemented, indicators of effectiveness of treatment worsened until 2005 (Picture 5.8). It was a natural and temporary process associated with inclusion the territories, where at that time there was no enough trained personnel, and monitoring of treatment of patients was just started. Great work on strengthening the monitoring of treatment in all subjects of the Federation led to a slight increase in cure rates (up to 58.3% in the country).

5.5. Some aspects of joint evaluation of indicators from cohort analysis of treatment effectiveness and traditional indicators of TB treatment and follow up effectiveness implemented in Russia before 2004

In the comparison of data on treatment effectiveness from Form 33 and the cohort analysis in 29 RF territories, the following results were obtained [21]. According to data from the reporting forms of Executive Order #50 [16], a year after treatment initiation, 58.6% of new MbT+ cases had successful courses of chemotherapy confirmed by smear microscopy. According to Form #33, in 2005 in the Russian Federation in general, only 25.5% of new pulmonary MbT+ cases registered the previous year were transferred to the follow up group III (“cured TB”). Such a major difference and a low rate of clinical cure according to the data of Form 33 is evidence of serious treatment shortcomings. Thus, no more than 50% of patients with laboratory and clinical and radiological confirmation of effective chemotherapy reflected in the forms of the cohort analysis can be found in Form #33. Therefore, only partially being observed are the underlying provisions of Executive Order #109 [15] and regulating the duration of the follow up in group I as being as long as “the basic course of chemotherapy but no more than 24 months”. The time of staying in follow up group I in 29 territories in many cases is not determined by the necessary duration of the basic chemotherapy course, but is substantially prolonged.

It would be interesting to study the treatment effectiveness of the same cohort of patients, which initiate treatment as new cases and then continue as patients with a failed first course of therapy. Such patients have re-treatment courses of therapy (after failed chemotherapy, after treatment interruptions, surgical treatment, MDR treatment, etc.) which can increase overall treatment effectiveness by at least 10-12% [22]. The analysis of the overall effectiveness of the dispensary follow up and reporting of patients will become possible if the cohort principle is used not only for the evaluation of the

effectiveness of particular courses of chemotherapy, but also for the evaluation of the effectiveness of the dispensary follow up of patient treatment overall.

Thus, the data from TB treatment monitoring reporting forms allow to make conclusions about the presence of some problems with treatment management in the Russian territories that should be solved. The obtained information is essential for making managerial decisions and defining the targeted activities for improvement of treatment control in the country.

6. TB control in the penitentiary system

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In Russia, like in many countries in the world, TB prevalence in the penitentiary facilities has a major impact on the overall TB epidemiological situation in the country. This is related to the factors of TB dissemination in the closed environments of prisons and pre-trial detention centers ("SIZO"), which result in the levels of practically all epidemiological indicators among these population groups being considerably higher than in the civilian society.

The overall level of health indicators among inmates and those suspected and accused of crimes held in the penitentiary facilities of Russia, as well as persons in correctional facilities around the world, differ considerably from the respective national rates. This is related to the high concentration in the given facilities of antisocial population groups, who are more likely to suffer from socially transmitted diseases. Most incarcerated persons previously were not covered by civilian healthcare services and find out about diseases they have only after medical evaluation in penitentiary facilities.

Today, the penitentiary facilities are subordinate to FSIN, which is under the jurisdiction of the Ministry of Justice (MoJ) of the Russian Federation. TB control activities are performed in close collaboration and on the basis of a compatible organizational–methodological and regulatory base with the MoH&SD, MoJ and Ministry of Internal Affairs (MoIA) (See Figure 6.1).

Statistical reporting on TB in the penitentiary facilities is generated on the basis of the relevant MoH&SD and MoJ Executive Orders ([15], [16]; MoJ Executive Orders #640/190 of October 17, 2005). The main TB epidemiological data in the penitentiary facilities and data measuring the outcomes of TB activities performed by FSIN medical services are contained in the annual aggregated report form 4-TUB, and starting in 2004, in the reporting cohort analysis forms (#07-TB, #08-TB, #02-TB and #10-TB) in accordance with Executive Order #50.

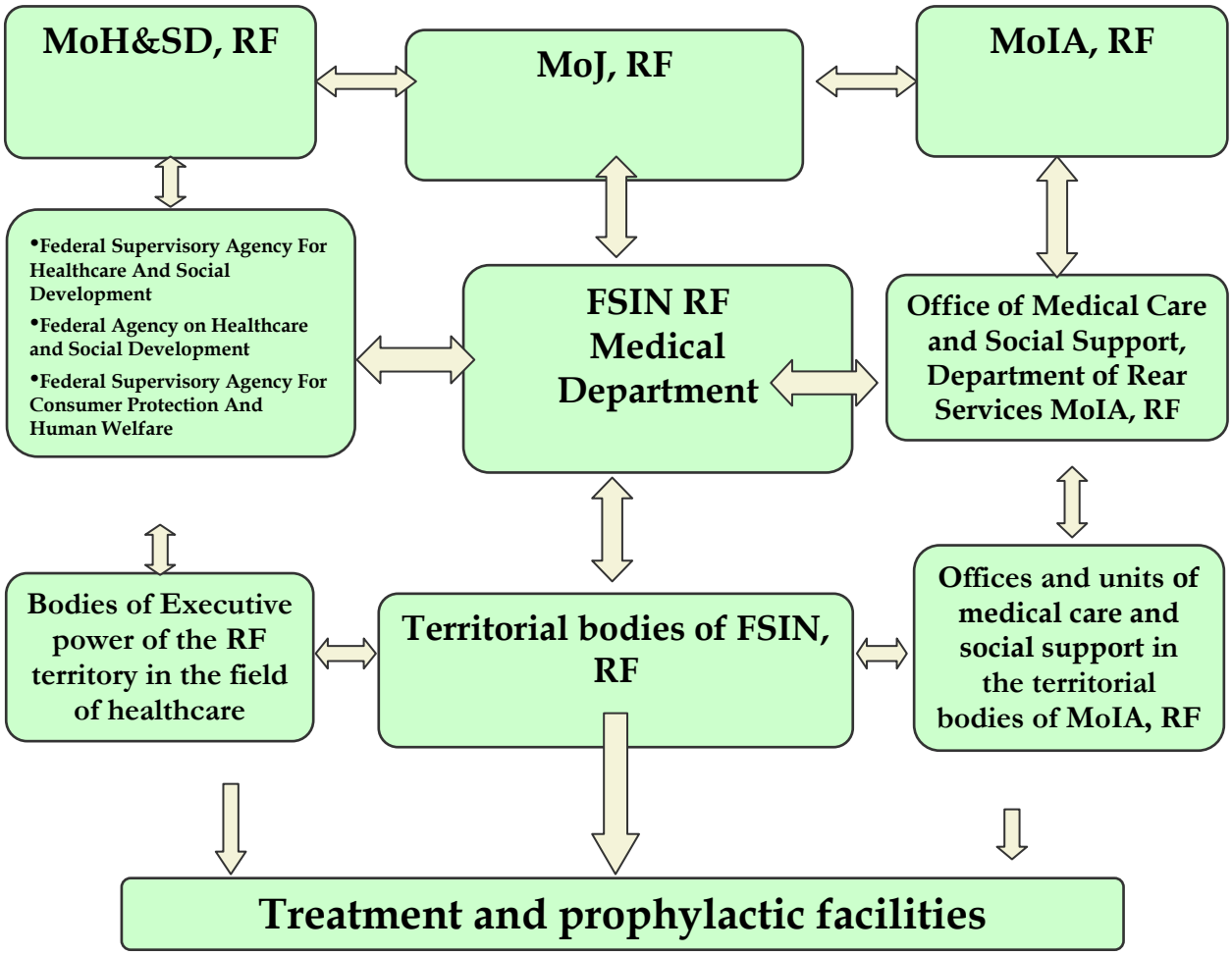


Figure 6.1. The structure of interdepartmental interaction, MoJ – Ministry of Justice, MoIA – Ministry of Internal Affairs

Using data received from the medical departments of FSIN in each territory, the surveillance departments of the head territorial TB dispensaries fill in Reporting Form #8 for all new cases, which contains summary data from FSIN, civilian services and other departments involved in TB activities. These data go to the MoH&SD and FPHI for processing and analysis of the TB notification rate in the territory.

In Chapter 2.1, the major impact of the TB situation in the penitentiary system on the overall epidemiological situation in the RF territories was discussed. New TB cases detected in the penitentiary system accounted for up to 30% (1999) of all new cases in the RF.

An improvement in TB activities in prisons and detention centers and the successful introduction of a system of interdepartmental interaction in the

implementation of the up-to-date TB control strategy in the penitentiary system resulted in an improvement in TB indicator levels, including a decrease in TB notification rates, prevalence and mortality rates. By 2006, the percentage of new cases diagnosed in penitentiary facilities decreased to 11.7% of all new TB cases in the country.

Figure 6.2 shows that according to FSIN reporting forms, over the last eight years there has been a more than three-fold decrease in TB notification rates in the penitentiary facilities– from 4,347 in 1999 to 1,387 per 100,000 prisoners[45] in 2007 (15,427 TB cases, including 5,863 in SIZO and 9,564 in correctional colonies).

At the same time, it should be noted that the notification rate in the correctional colonies and SIZO detention centers should be estimated and analyzed separately due to the fact that TB notification rates in those facilities are affected by varying factors, and different approaches are used when calculating notification rates in the detention centers and colonies[46] (see table 6.1.)

Table. 6.1. Number of TB patients in FSIN facilities

Year / FSIN facility	2001	2002	2003	2004	2005	2006	2007
SIZO	12,138	6,072	6,011	5,392	5,061	4,969	4,830
CC	86,629	79,068	64,089	45,523	43,309	42,462	39,874
Total in FSIN	98,767	85,140	70,100	50,915	48,370	47,431	44,704

The number of TB cases in the SIZO detention centers is largely determined by the TB epidemic among the civilian population. According to existing FSIN regulations, all newly admitted detainees must undergo fluorography examinations. The percentage of TB cases detected at the time of incarceration at detention facilities is quite high. The number of defined TB patients incarcerated at the detention centers is much higher than the number of patients transferred to the FSIN entities according to MoH&SD forms indirectly provides evidence that a considerable part of the cases detected in the SIZO detention centers are persons who developed the disease prior to detention (See the text below and Figure 6.10). Therefore, it is wise to review data on TB detection rates in

[45] In the correctional colonies, the calculation of notification and mortality rates are performed per annual average number of inmates; the calculation of prevalence, per number of inmates at the end of the year. In the pre-trial detention centers, the notification rate is calculated per number of new individuals detained in the current year, which gives a more accurate number of persons detained in the detention centers during the year

[46] See the footnote above

the detention centers as an integral part of the TB detection process in the civilian society.

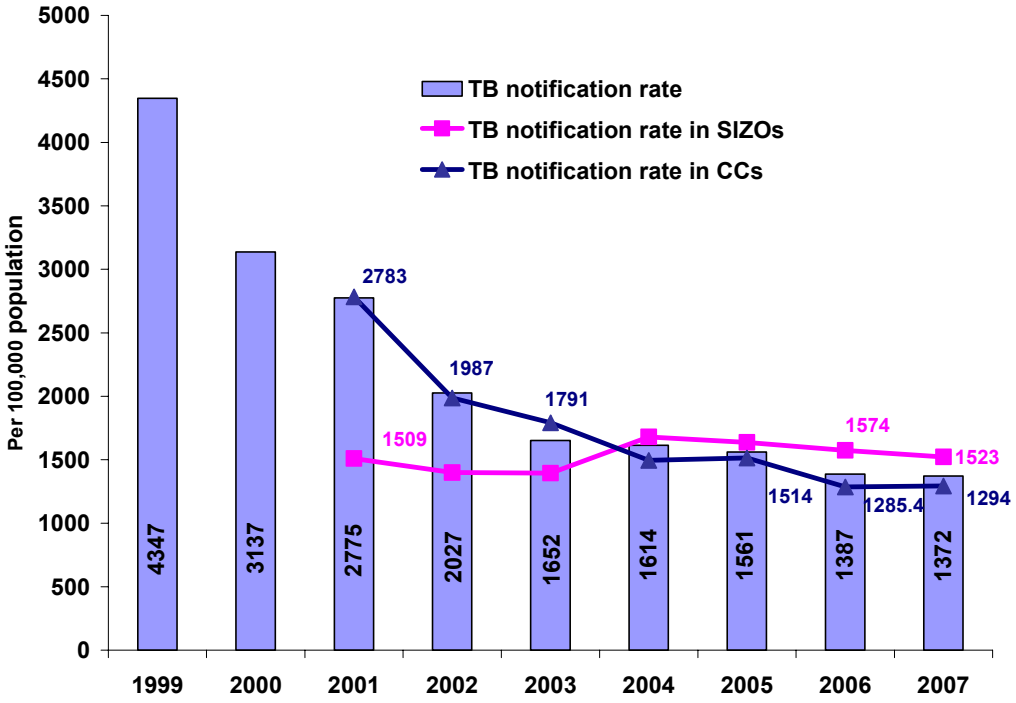


Figure 6.2. TB notification rates per year in FSIN facilities: total, in SIZO (pre-trial detention centers) and CC (correctional colonies). (Source: Form #4-TB. Calculation of TB notification rates. See footnote on p. 87)

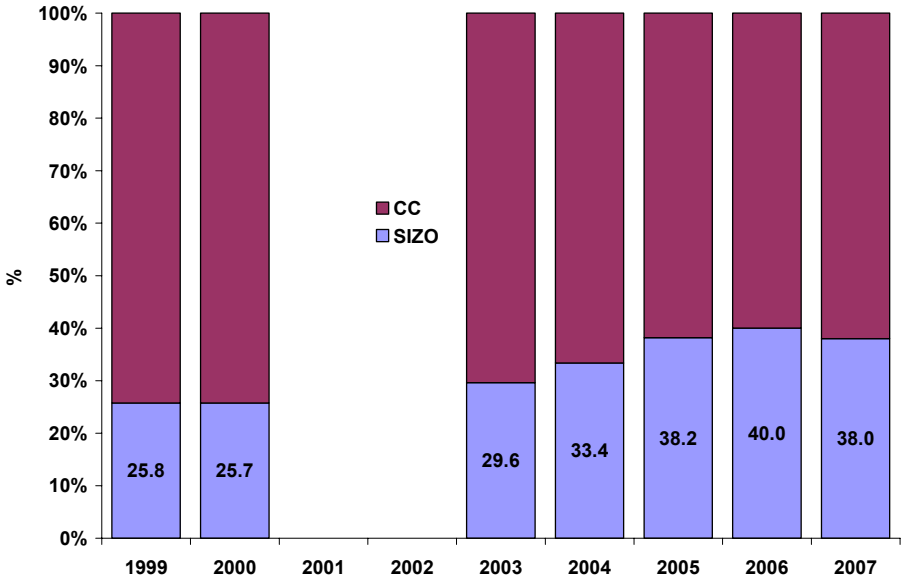


Figure 6.3. The proportion of new cases detected in the facilities of FSIN, the Russian Federation (Source: Form #4-TUB.)

From this point of view, the constant yearly increase in the proportion of cases detected in the detention centers (SIZO) among all new cases detected in correctional facilities FSIN (Figure 6.3) is interesting. Over the last few years, this indicator has increased from 25.8% (1999) to 40% (2006), and slightly decreased in 2007.

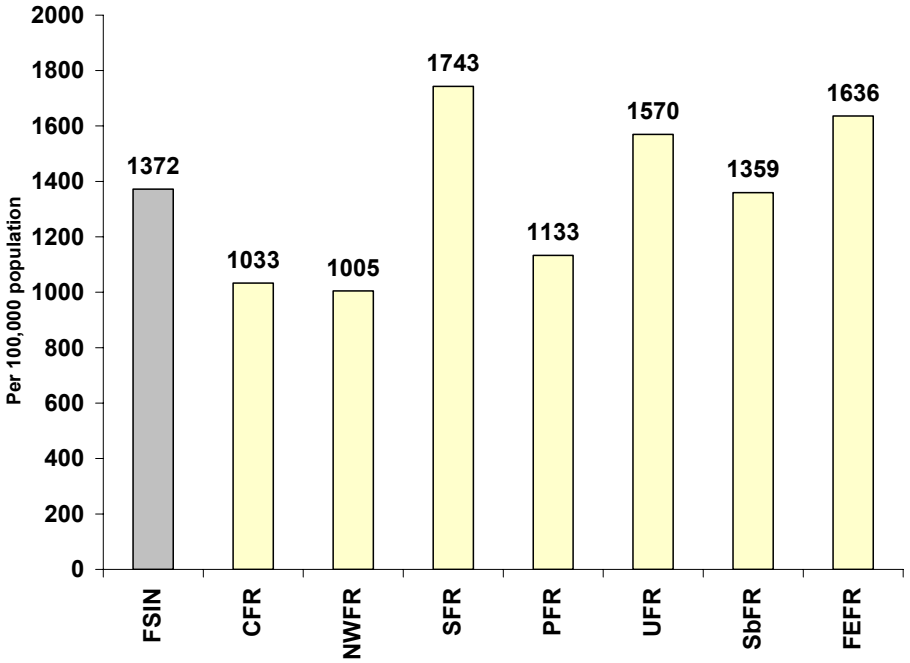


Figure 6.4. TB notification rates registered in FSIN institutions in the federal regions of the Russian Federation, 2007 (Source: Form 4-TUB and data on the number of FSIN population)

In general, the distribution of TB notification rates by federal region (Figure 6.4) changed in last years. During last three years notification rates decreased in SbFR, which by 20007 is not anymore among regions with the highest values of this indicator. Similar to what is seen with the civilian population, the high value of the indicator is in the FEFR (1,536 per 100,000 FSIN population). Maximum rates are still reported in the correctional facilities of the Southern region (1,743 per 100,000)

The structure of the new TB cases detected in the FSIN facilities to a large degree is determined by the diagnostic capacities of the FSIN service.

The percentage of patients with destructive processes in the lungs is relatively low (Figure 6.5). In 2006, 28.8% of patients were registered with pulmonary tissue destruction among patients with respiratory TB overall (24.0% in SIZO and 31.9% in CC).

The percentage of extra-respiratory TB among new cases is small: 0.4% in 2006 (3.6% for the civilian population, see above). These data make evident problems in detection of extra-respiratory TB in FSIN facilities.

Figure 6.5. The proportion of destructive TB forms among new respiratory TB cases detected in the facilities of FSIN, the Russian Federation, 2006 (Source: Form 4-TUB)

Improvement of laboratory services in Russian FSIN facilities increased in testing of active TB patients by bacteriological methods from 58% in 2004 to 98.8% in 2007. Among new TB cases 55.7% were tested in 2004, and 90.8% in 2007 (See table 6.2 and fig. 6.6). These results were achieved, in particular, through the provision of equipment for the IBRD loan. These funds allowed equipping of 518 clinical-diagnostic laboratories in correctional institutions and additional equipping of 65 regional bacteriological laboratories for the diagnosis of tuberculosis.

Table 6.2 Implementation of the bacteriological testing of TB patients in the FSIN system. The data for all FSIN institutions. (Source: FSIN approved forms for laboratory tests)

	2005	2006	2007
The proportion of TB patients tested by microbiological methods (%)	75.3	94.0	96.8
Of thesenew TB cases (%)	62.7	91.5	90.8
Confirmation of the diagnosis by bacteriological methods (% of tested)	42.2	51.8	40
Confirmation of the diagnosis of bacteriological methods among new TB cases(% of tested)	37	44	35.5
Drug resistance to any first-line drugs among new TB cases (%)	51	49.6	52.7
MDR TB cases among new TB cases (abs. number)	755	875	879
MDR TB among new TB cases (%)	17.8	20.3	21.2
Drug resistance to any first-line drugs among all patients (number of patients)	9,978	11,720	11,023
MDR TB among all TB patients (abs. number)	4,243	5,720	5,229
MDR TB among all TB patients (%)	42.5	48.8	47.4

Of patients with active TB evaluated by bacteriological methods, 40% of cases were bacteriological positive in 2007. Among new TB cases 35.5% were bacteriological positive. The slight decrease in indicator of bacteriological confirmation of diagnosis in patients with TB in 2007 compared to 2006 was related to the reconstruction of bacteriological laboratories of FSIN in Russia with GF grant funds.

A *mycobacteria TB* being spread in the FSIN system have a high level of drug resistance to the main TB drugs. Thus, drug resistance among new MbT+ cases in 2007 was at 52.7%. MDR in this group of patient was at 21.2% (879 patients). Among all patients, drug resistance was found in 11,023 TB patients registered in 2007; of them, 47.4% patients had MDR TB (5,229 patients).

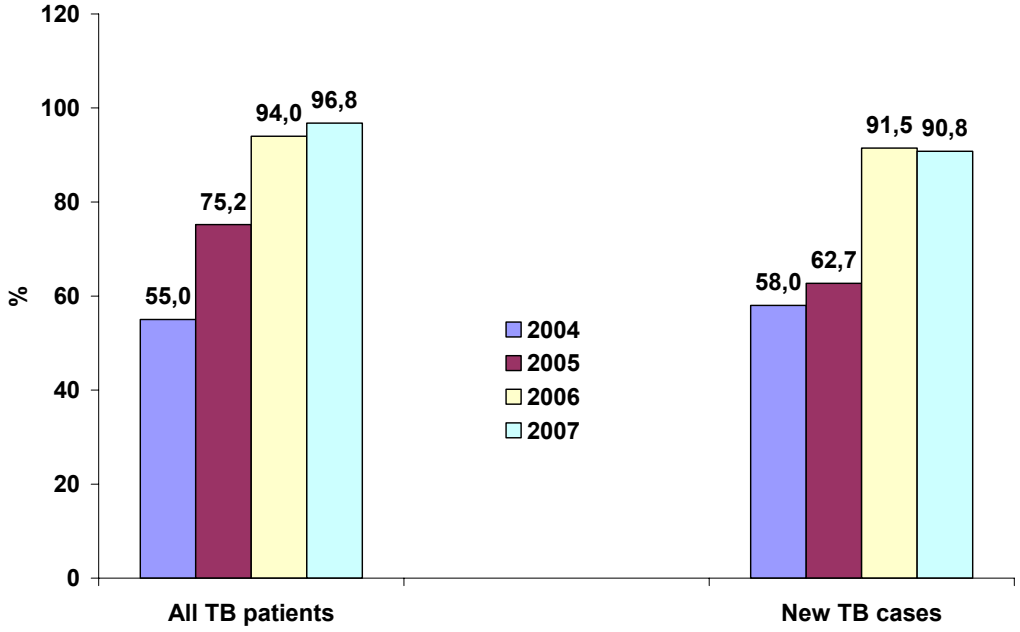


Fig. 6.6. Coverage by bacteriological testing of TB patients in FSIN institutions, Russia, 2004-2007. (Source: see text).

A rapid decrease in mortality rates has been reported in FSIN facilities during last years (Figure 6.7). After a threefold decrease in the rate since 1999, in 2006 it reached the level of 79.1, and then slightly increased to 81.3 per 100,000 FSIN population. Presumably, this increase was attributable to an increase in the number of patients with TB-HIV co-infection.

Over the last few years, TB prevalence has decreased to from 8,408 in 2002 to 5,040 per 100,000 FSIN population (form #4-TUB). The number of patients with active

TB in the system of FSIN decreased more than twofold from 98,767 in 2001 to 44,704 in 2007 (Figure 6.8).

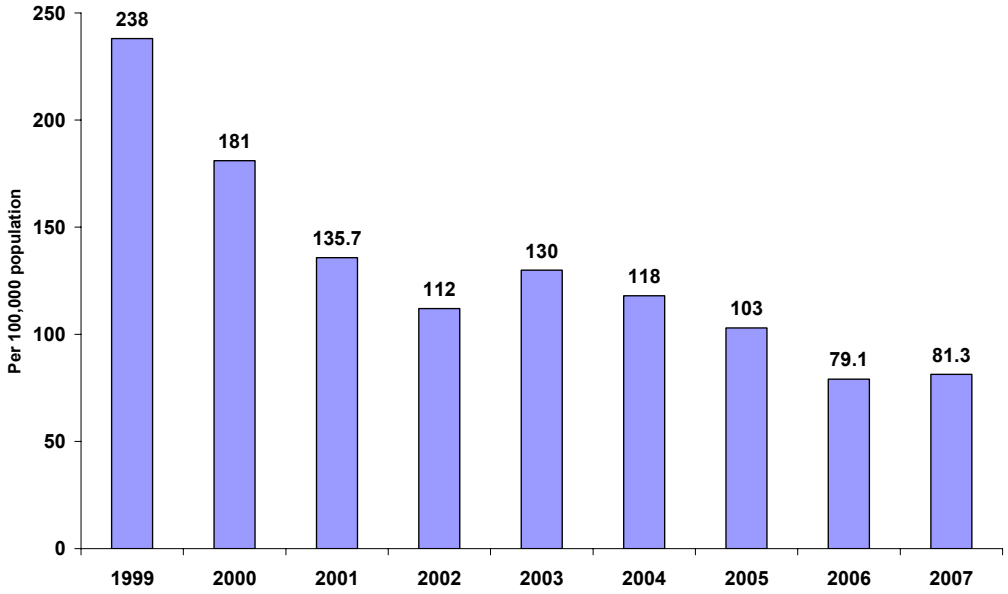


Figure 6.7. TB mortality rates in FSIN facilities, the Russian Federation (Source: Form #1 med)

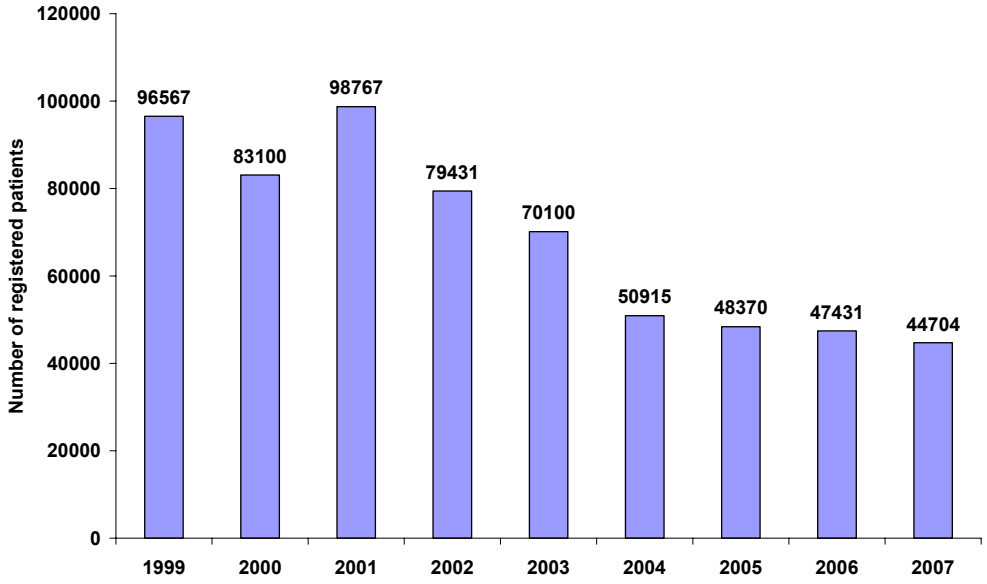


Figure 6.8. The number of TB patients registered in FSIN facilities (Source: Form #4-TUB)

Noteworthy is the prevalence of TB/HIV co-infection among TB patients in the penitentiary system. It is evident from Figure 6.9 that in recent years, while the number of TB patients has decreased, the number of HIV-infected individuals has increased and the percentage of co-infected cases among TB patients has increased from 3.7% in 2002 to 7.9% in 2007 (for information on TB-HIV co-infection see also Chapter 7).

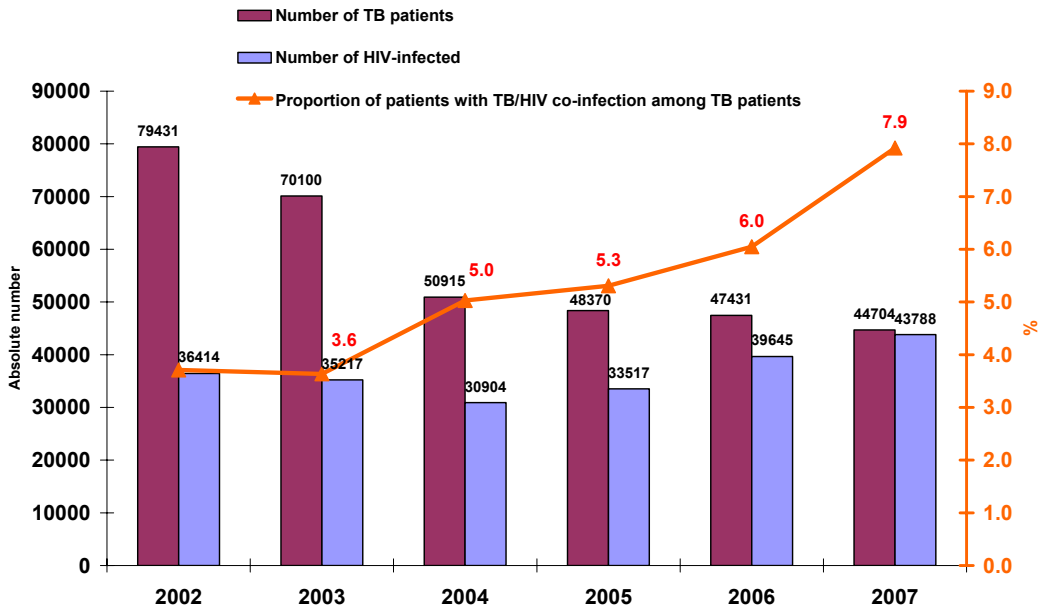


Figure 6.9. The number of TB cases, HIV-infection cases, and the percentage of TB patients with HIV co-infection in FSIN facilities, the Russian Federation (Source: Forms #4-TUB and #1-med)

An important component of TB activities is the continuity of work performed by different services. This is most relevant to the interaction between civilian (MoH&SD) and penitentiary (FSIN) services, due to the substantial number of TB patients who flow between the facilities of these services.

Every year over 21 thousands cases of tuberculosis are coming in detention centers (in 2007, 21,749 patients were transferred in to FSIN, and 17,046 patients were released from prison system). According to the MoHSD (Form #33) in FSIN 4,140 TB patients were transferred out, i.e. more than 17 thousands patients before detention did not seek for medical care in civilian health care and did not receive adequate treatment before being arrested (see Fig. 6.10). Thus, according to MoH&SD and FSIN reporting forms, the SIZO detention centers admit almost 4 times as many TB cases than get officially transferred there from the MoH&SD facilities. From the other side, almost 40% of patients released from detention centers and correctional colonies do not follow up for registration at the TB dispensaries of the MoH&SD. These data demonstrate that in Russia there is still much work to improve the interaction between the two services.

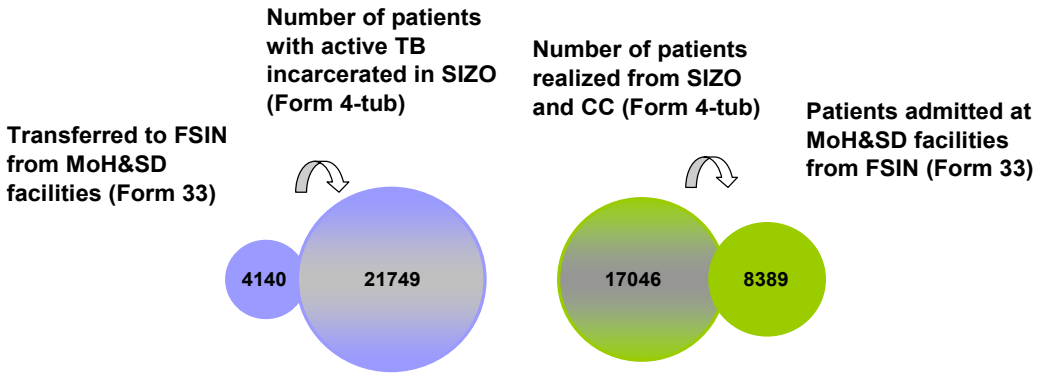


Figure 6.10. Flow of TB patients between the facilities of MoH&SD and FSIN, 2007 (Sources: Form #33 and #4-TUB)

Treatment effectiveness among new cases in FSIN is relatively low. Closure of cavernous lesions in 2004 and 2005 was reported in 69.2% and 49.5% of cases, respectively, and bacteriological conversion was reported in 70.2% and 58.3% of cases, respectively.

As mentioned earlier in chapter 5, the previous system of treatment effectiveness evaluation, as well as notification system, had certain limitations and drawbacks. Over the last three years in the Russian Federation, in both the civilian and penitentiary systems, introduction of new statistical reporting procedures on TB has been initiated due to the implementation of the modified strategy for TB detection and treatment.

The introduction of this strategy was initiated in the penitentiary system in 2005. The new recording and reporting forms issued upon Executive Order #50 [12] provide an opportunity to perform informative and online monitoring of TB detection and treatment on the basis of cohort analysis and adequate laboratory data.

In 2006, data on TB notification according to the Form #07-TB were submitted from 72 territories[47]. In this year the number of new cases registered by this form not significantly (1.5%) differed from data from Form 4-TUB – 15,974 and 15,223.cases, respectively. This discrepancy might be related to the still existing differences and drawbacks in the process of registration of new TB patients with Form 089, in Journal #03-TB and by the data of regional Central Consultative Committees of Physicians, which control the diagnostics and treatment process in Russia.

In 2007, the data on TB notification (the form #7-TB) have been submitted from FSIN from all subjects of the Russian Federation (11,708 new cases).

[47] Information was collected by the five federal research institutes of TB and phthisiopulmonology

Data from Form #7-TUB has allowed for the calculation of the percentage of patients with the most epidemically dangerous TB form – pulmonary TB (78.9%) – and the percentage of smear-positive TB patients (ss+ or confirmed by microscopy) – 21%.

Figure 6.11 shows the territories with the highest (> 30%) and lowest (< 12%) percentages of TB diagnosis confirmation by microscopy by data from 2006. The fact that the number of territories with a low rate is considerable is an indication of both registration problems of MbT+ cases and inadequate organization of laboratory TB diagnostics.

The new reporting system has allowed for the obtainment of data on treatment effectiveness on the basis of cohort analysis. The treatment effectiveness among new MbT+ cases confirmed by microscopy in the 2006 cohort in FSIN facilities was 59.3% (58.2% in MoH&SD facilities) [48]. At present, the poor treatment outcome rates are also a reflection of the fact that the new approaches to treatment monitoring and evaluation are still in the initial implementation phase. At the same time, in the penitentiary facilities has been observed a relatively low rates of treatment interruption – 1.6% (compared to 10.1% at MoH&SD facilities) and low mortality rates, both of TB – 2.5%, and of other causes – 0.9% (compared to 9.2% and 3.9%, respectively, in MoH&SD). (See Chapter 5)

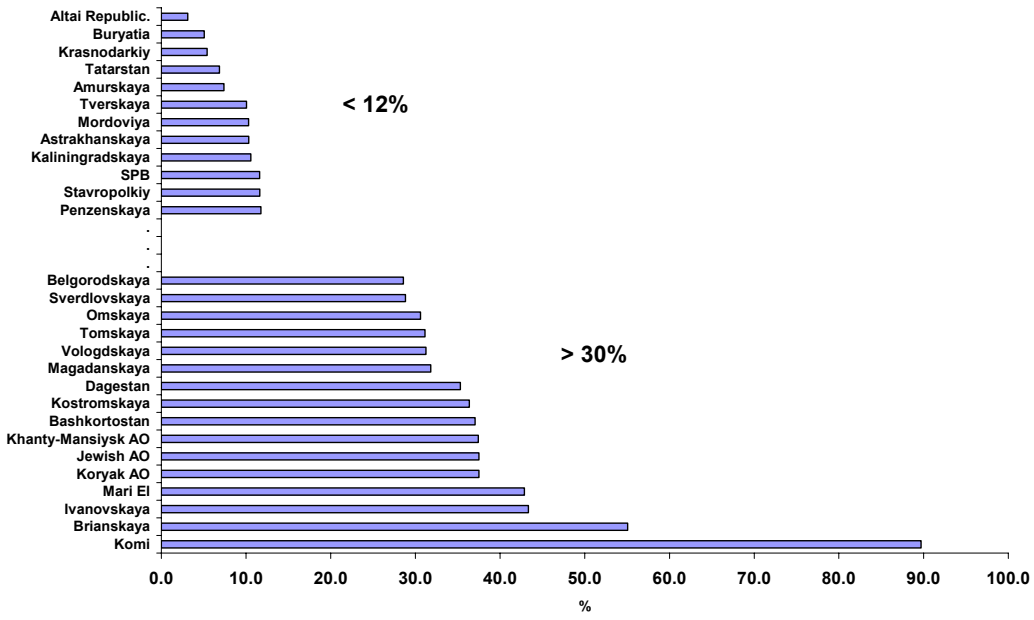


Figure 6.11. The percentage of new smear positive cases among all new pulmonary TB cases. Data of FSIN in the Russian Federation territories. Shown only are territories with rates > 30% and < 12% (Source: Form #07-TB)

[48] According to data from 56 territories

Therefore, the data show major improvements in the TB situation in the penitentiary system. The obtained results also indicate that in FSIN facilities, it is critical to continue efforts to improve diagnostic methods and case recording, increase treatment effectiveness, and strengthen interaction with civilian and other services.

7. HIV in Russian Federation and its effect on TB incidence

O.P. Frolova E.M. Belilovsky, W. Jakubowiak, I.G. Shinkareva, W. van Gemert, E.D. Yurasova

7.1 The recording and reporting system of TB - HIV co-infection in the Russian Federation

HIV infection was first recorded in Russia, in 1987. From the same time tuberculosis was detected among patients with HIV infection. Information on TB-HIV cases started to be reported from 1999 when the national reporting form #61 «Data on patients with HIV» was approved.

Basic information for the analysis of the epidemiological situation of TB-HIV co-infection (tuberculosis associated with HIV infection) can be obtained from the reporting form #61, where the following types of information are available (values for 2007 are given in brackets):

1. Total number of patients with HIV infection, regardless if they are registered or not as HIV-infected case by infectious disease doctor . This section includes the total number of persons with identified antibodies to HIV by immunoblotting (397,208 people), the number of new cases of HIV infection reported during reporting year (49,282 people), and the number of deaths among patients with HIV infection during reported year (11,159 people).

2. The number of HIV patients who were on dispensary registration with infectious disease physician (included in a register of HIV infected cases). In particular, this section provides information on total number of patients on dispensary registration, including those who were transferred or died during the year (267,513 people), patients newly taken on dispensary registration (38,767 people), and died during reported year, among registered (8,547 people), including death from HIV infection (2,610 persons). There is also information on the number of HIV patients who was on dispensary registration (in the register of HIV infected persons) by the end of the reporting year (253,417 people).

Thus, further details will be given divided into «the total number of HIV patients» and «on dispensary registration with infectious disease physician because of HIV infection» (or “registered cases”).

It is important to note that the analysis of estimates of prevalence of HIV and associated infections in Russian publications does not use the number of patients registered at the end of the year (as in TB reporting forms), but rather the total number

of patients were in register or were HIV infected during the reporting year, i.e. this number includes those who died and was transferred during the reporting year (until December 31).

Since 2005 data on the number of HIV screened TB patients and results of screening of TB patients for HIV infection were included in the reporting form #33 “TB patients’ information”.

In order to assess the significance of HIV-associated tuberculosis in Russia, a uniform system of registration of cases of tuberculosis in patients with HIV infection was created in 2004. Since this year the country in accordance with the Order #547 of the Ministry of Health of Russia (13/11/2003), new registration form «Personal registration card of patients with tuberculosis associated with HIV infection» was implemented (registration form MoH Russian Federation #263/u-TB). This form is filled for all co-infection cases, regardless place of diagnosis, and this form should be sent to TB physician responsible in particular subject of Federation for coordinating TB management in patients with HIV. In addition, these cards are filled for the cases of deaths of patients with co-infection (Fig. 7.1). Mostly responsible TB physician is an employee of the TB services (in other cases – employee of the AIDS Center). Typically, TB physician receive these responsibilities according to regional Order.

According to the Order #547, responsible TB physicians send duplicates of cards (registration cards of co-infection with codes instead of patients’ names) to the Center for TB Care to HIV patients MoHSD Russia (FCTB-HIV). FCTB-HIV formes unified register of co-infection cases. Based on the analysis of cards, evaluation and correction of activities in the territories on this issue, analysis of characteristics of patients with co-infection, analysis of emerging trends and changes in its characteristics are done.

Since 2005, sections of AIDS centers’ annual report (form #61) dealing with co-infection are filled in subjects of Federation based of data received from the regional TB physicians responsible in Federation’s subjects for the coordination of TB care to patients with HIV.

In 2006, FSIN administration sent the instruction for institutions within its jurisdiction (#1022-471 dated February 22, 2006). This instruction obligated agencies to fill in and send the registration form 263/u-TB (on TB cases associated with HIV infection) in common registration system, namely, the above-mentioned TB physicians in the subjects of the Federation.

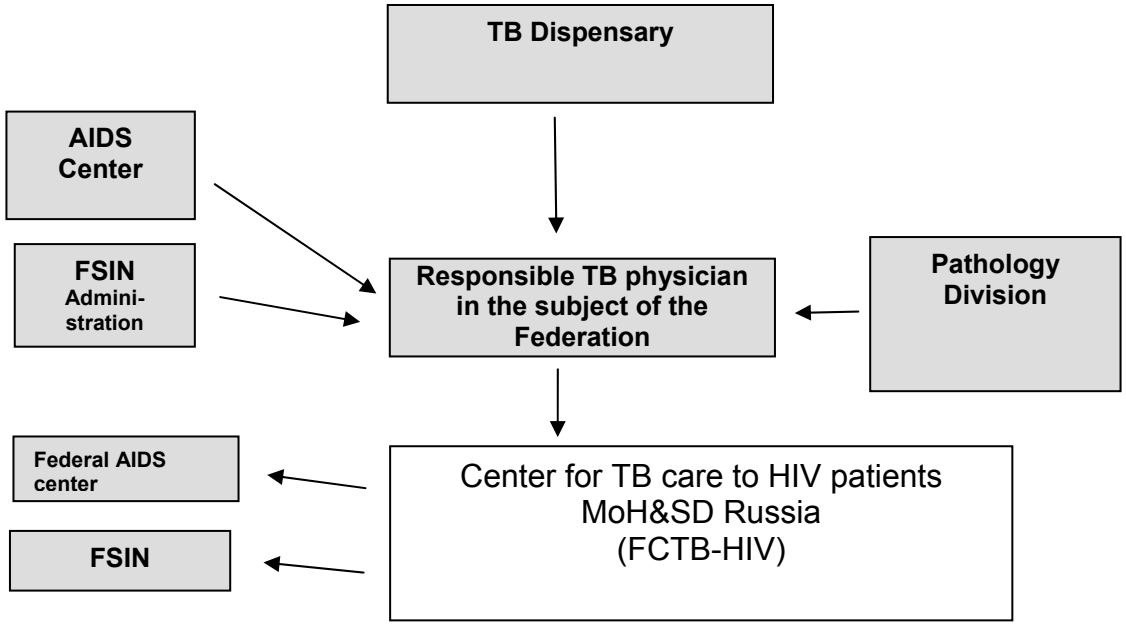


Fig. 7.1. The scheme of flow the registration forms on patients with tuberculosis associated with HIV infection in Russia.

The introduction of a unified system of registration and coordination of TB care to HIV-infected caused increased registered number of cases of co-infection (see fig. 7.3). According to the data of FCTB-HIV, for the past three years the majority of the subjects of the Federation took part in a work on a uniform registration system (2004 - 73% in 2007 - 77%).

7.2 The problems of data collection on the TB-HIV incidence

Ways to obtain information on the number of tuberculosis cases associated with HIV are quite complex worldwide, and do not fully reflect the true situation. This reflects the fact that the registration of such cases is being done by independent institutions (either institutions doing prevention and treatment of tuberculosis, or institutions deal with HIV infection). Respectively, these institutions notify co-infection cases independently of one another. Such situation is observed in almost all countries of the world, because of the need to ensure confidentiality of data on patients with HIV infection, in particular, even the fact of HIV testing and its results, therefore, more information is available on the testing of TB patients for HIV infection.

Besides, the complexity of the registration of co-infection in part relate to a lack of clear definitions for the cases of HIV infection. For example, AIDS or HIV/AIDS are not included as separate diseases in ICD-10, and do not have clear definitions in clinical

classifications by WHO and MoHSD of Russia, so in calculation of proportions or rates incompatible data are used.

Thus, the proportion of tuberculosis disease among HIV-infected patients is calculated in different ways (in some countries only cases of immunodeficiency caused by HIV infection is taken into account). So, published data are difficult to compare. This is why in the world for assessment of the number of cases of co-infection data on testing of TB patients for HIV infection are being used, and not vice versa. Although, we'll show later that the total number of co-infection cases registered by Russian TB institutions comprise only 42% of registered HIV cases among the permanent population of the country.

7.3 General information about the spread of tuberculosis associated with HIV infection in the Russian Federation

According to the form #61/u 397,208 subjects were registered with HIV infection in Russia in 2007, of whom HIV was newly diagnosed in 49,282 (34.7 per 100,000). Figure 7.2 demonstrates dynamics of the incidence of HIV infection for the period from 1999 to 2007 [24].

Analysis of data from the reporting form #61 showed that the number of tuberculosis patients with HIV co-infection in Russia is growing (Figure 7.3). In 2007 there were 5,985 new cases of co-infection (2005 – 2,926; 2006 – 3,907), of which 1,157 were diagnosed in the FSIN system[49]. The total number of patients with co-infection reached 14,293 persons in 2007, and among the civilian population – 11,431[50].

Thus, of the total number of TB patients registered with the system of institutions MoHSD Russia (according to the reporting form #33) the proportion of patients with HIV co-infection was 4.1% (Fig. 7.4).

[49] Information about tuberculosis and HIV co-infection in the prison system is given in Chapter 6
[50] See section 7.1 about the approach used in calculating the prevalence of HIV infection.

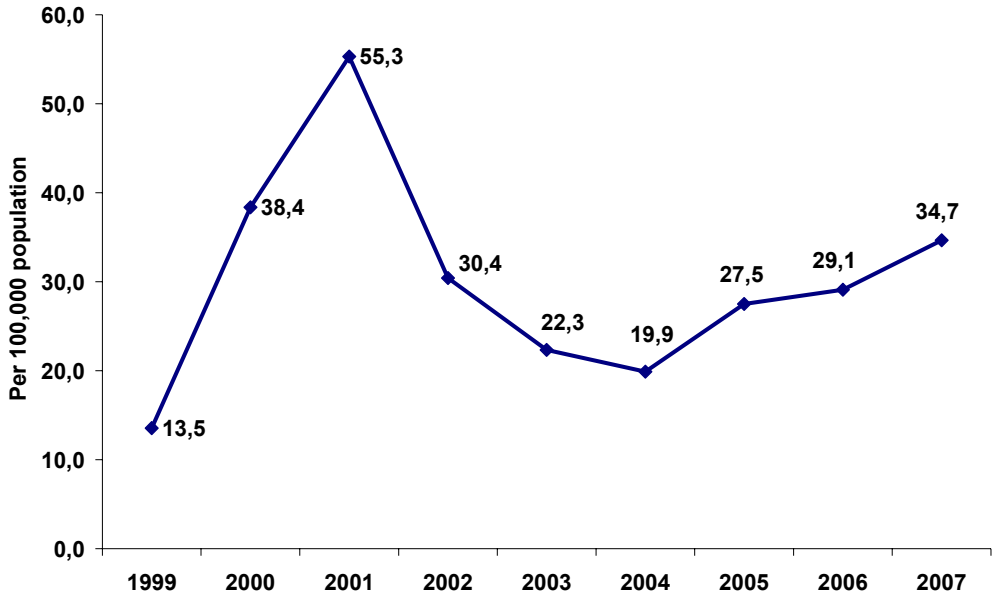


Figure 7.2. The incidence of HIV infection in the Russian Federation, 1999-2007. (Source: Form #61).

The most important factor influencing the incidence of TB among patients with HIV infection, is the growing number of patients and the proportion of persons with late stages of HIV infection (stages 4Б, 4В and 5 [25]), see Fig. 7.3. The proportion of patients with the late HIV stages patients in care in the AIDS Centers was, respectively, 3.5%, 5.7% and 8.3% in 2005-2007. Almost half of patients with late stages of HIV infection taken into HIV care were diagnosed with HIV during the diagnosis or treatment for tuberculosis (1,553 of 3,143 patients) during the reporting year.

As mentioned earlier, another factor that had a significant impact on increase in the number of reported cases of co-infection was the improvement of the system of registration of these cases in the country, namely, the introduction in 2005 of a unified system of registration of patients with co-infection, including data from the civil and penitentiary services.

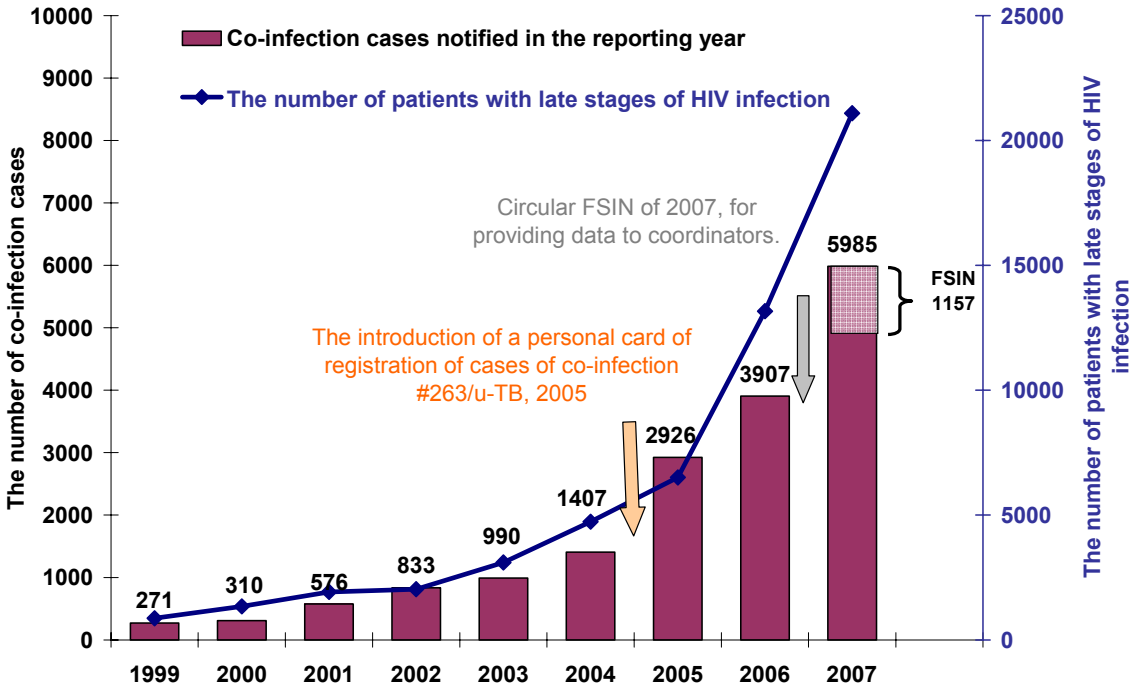


Figure 7.3. Comparison of trends in detection of new cases of TB associated with HIV infection, and the number of patients with late stages of HIV infection in the Russian Federation. Data for 2007 shows proportion of co-infections in FSIN. (Source: Form #61).

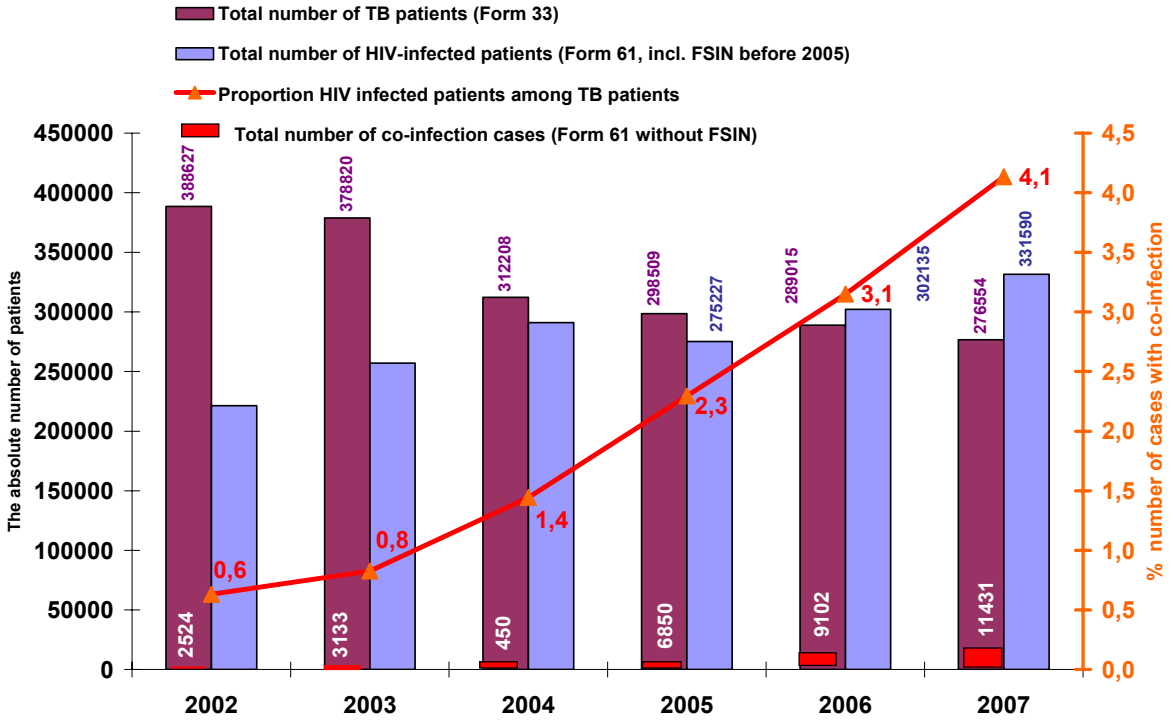


Figure 7.4. Tuberculosis and HIV infection in the Russian Federation among the civilian population. (Source: the forms #61 and #33).

Among all patients with co-infections in 2007, about 64% had late stage of HIV infection, and this proportion is increasing annually (2005 – 55.1%, 2006 – 61.2%). On the other hand, among the 21,097 patients with advanced stage of HIV infection (4Б, 4В and 5), tuberculosis was registered in 43.4% of cases (9,152 persons), i.e., tuberculosis is one of the most common associated diseases of HIV infection.

Given such epidemiological situation with HIV infection, as HIV disease would progress to the later stages, the number of new cases of tuberculosis each year would increase by 10-15% (15-20 thousands of cases). As a result, over the next 5-10 years about 150,000 additional people would get the disease. Thus, additional measures are necessary to optimize the prevention, detection and treatment of HIV infection and tuberculosis associated with HIV infection.

As shown in Figure 7.5 (according to the reporting form #61) the majority of patients with HIV in Russia are dying of other causes (in 2006 – 67.8% in 2007 - 69.5% or 5,937 persons), in particular, injuries and drugs overdosing. This is explained by the fact that one of the main routes of HIV infection transmission is injection drug use. In turn, according to data from 2006, among those who died because of HIV infection, in 59.1% of cases the cause of death was tuberculosis (mycobacterial) TB-HIV infection, i.e. TB is the leading cause of death of patients with HIV infection, died of causes associated with HIV [27].

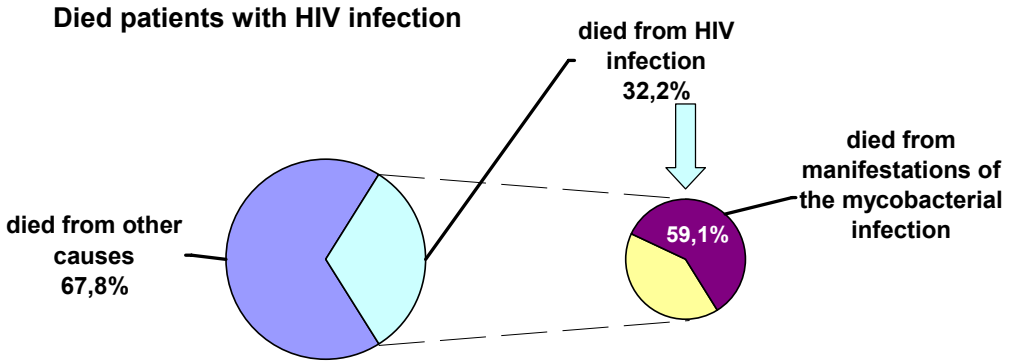


Figure 7.5. Causes of death of patients with HIV infection in the Russian Federation, 2006 (Source: Form #61).

Overall in 2007, 2,750 cases of tuberculosis and HIV co-infection died (from the civilian population), representing 24.1% of all reported cases of TB HIV co-infection. Of these, TB was the main cause of death in 74% of cases (2,194 persons). Thus, among

patients with co-infections, tuberculosis is also the leading main cause of death. All this confirms once again the significance of TB and HIV co-infection problem in Russia.

In assessing of the epidemiological situation with tuberculosis, it is important to bear in mind that data on deaths from tuberculosis, provided by Rosstat (21,942 cases in 2007 with the code A15-A19 of the ICD-10) do not include deaths from B20.0 code for ICD-10. The total number of deaths due to “only tuberculosis” and “combined with HIV” is about 10% more.

Since 2005 information on screening of TB patients for HIV infection was included in the reporting form #33 which is completed by TB control institutions. Coverage of HIV screening among new TB cases in 2007 was 90.9% (in 2005 – 88.5%, 2006 – 89.9%). Of these, the presence of antibodies to HIV by the immunoblotting was confirmed in 2.8% of cases (2,401 patients), in 2005 - 1.8%, in 2006 - 2.3%, respectively. The situation in Russia demonstrates good collaboration among institutions providing care for TB and HIV[51].

A comparison of data from reporting forms #33 and #61 shows that the form #33 does not contain complete information on the spread of HIV among TB patients (only 42%, table 7.1). This is due to the fact that this form does not take into account the patients with co-infection, such as those treated in the AIDS Centers or those diagnosed with HIV infection before diagnosis of tuberculosis.

Key indicators on the co-infection from national statistical reporting forms #61/u and #33/u, are shown in Table 7.1.

[51] In the WHO global report similar information is provided under section “Collaborative TB / HIV activities” [17].

Table. 7.1. Basic data on TB and HIV co-infection in Russia in 2005-2007.

Years	2005	2006	2007	
Indicators	The Russian Federation			Range in territories, 25% и 75% quartiles[1]
Form #61				
Total number cases of TB associated with HIV infection	6,850	9,102	14,293, of these 11,431 - permanent residents	
Proportion (%) of cases of TB associated with HIV infection, of the total number of registered TB patients	2.3%	3.2%	4.1% (for the permanent population)	(0.7%; 3.8%)
Cases of TB associated with HIV infection notified in reported year	2,926	3,907	5,985	
Cases of TB associated with HIV infection notified in reported year, per 100,000 population	2.1	2.7	4.2	(1.0; 5.0)
The number of HIV-infected patients tested for TB	88,742	111,162	146,105	
Proportion (%) of registered HIV-infected patients tested for TB by all methods	37.8%	46.8%	54.6%	(55.9%; 83.3%)
Form #33				
The number of TB patients registered by the end of reported year tested for antibodies to HIV	218,481	220,634	218,866	
Proportion (%) of all registered patients with tuberculosis tested for antibodies to HIV	73.2%	76.3%	79.1%	(70.3%; 89.9%)
The number of positive results by the immunoblot analysis to HIV antibody	3,533	3,804	4,792	
Proportion (%) of positive results by the immunoblot analysis to HIV antibody among all tested patients with tuberculosis	1.6%	1.7%	2.2%	(0.2%; 1.9%)
Number of new TB cases tested for antibodies to HIV	85,537	87,041	87,448	
Proportion (%) of new tB cases tested for antibodies to HIV	88.5%	89.9%	90.9%	(87,4%; 98,2%)
The number of new TB cases who had a positive result of immunoblot analysis for antibodies to HIV	1,544	1,979	2,401	

7.4. The prevalence of tuberculosis with HIV co-infection in the Russian Federation

Russian nationwide indicators on the prevalence of TB associated with HIV infection reflect only the situation in the country on the whole, while data on individual subjects of the Federation may significantly differ from each other as well from the

nationwide data. Table 7.1 shows the variation of basic indicators of the territories, which demonstrates that even in that half of the subjects of the Federation (in 43 out of 86), which has the closest value to the national indicators, regional indicators could be 10 times higher than national indicators.

Fig. 7.6 shows 21 territories, in which 80% of all TB patients, associated with HIV infection was registered in the country. This list should be taken into account during planning of the federal and regional programs.

Fig. 7.7 shows data from 21 territories with the highest proportion of cases co-infections (more than 4%) of all TB patients registered by the institutions of the MoHSD, regardless of the prevalence of the co-infection. In these territories co-infection with HIV has the greatest impact on the spread of tuberculosis, and regional TB services should pay particular attention to the problem of co-infection.

An analysis of the epidemiological situation in the Federal Regions shows that the highest incidence of co-infection is registered in the Urals Federal Region. Five of six subjects of the Federation of this Region are among 21 areas (Fig. 7.6) that make most substantive contribution to the total number of TB patients with HIV co-infection in the country (their proportion in the total number of patients is about 30%).

Fig. 7.8 demonstrates association of the frequency of TB registration depending on stage of HIV infection. Fig. 7.8a shows that in territories with the highest level of registration of new co-infection cases per 100 thousand population, as a rule, the high level of late stage of HIV infection is observed (as per 100 thousand population). And similarly (Fig. 7.8b), in areas with the largest number of patients with late stages of HIV infection, the highest incidence of co-infection is registered.

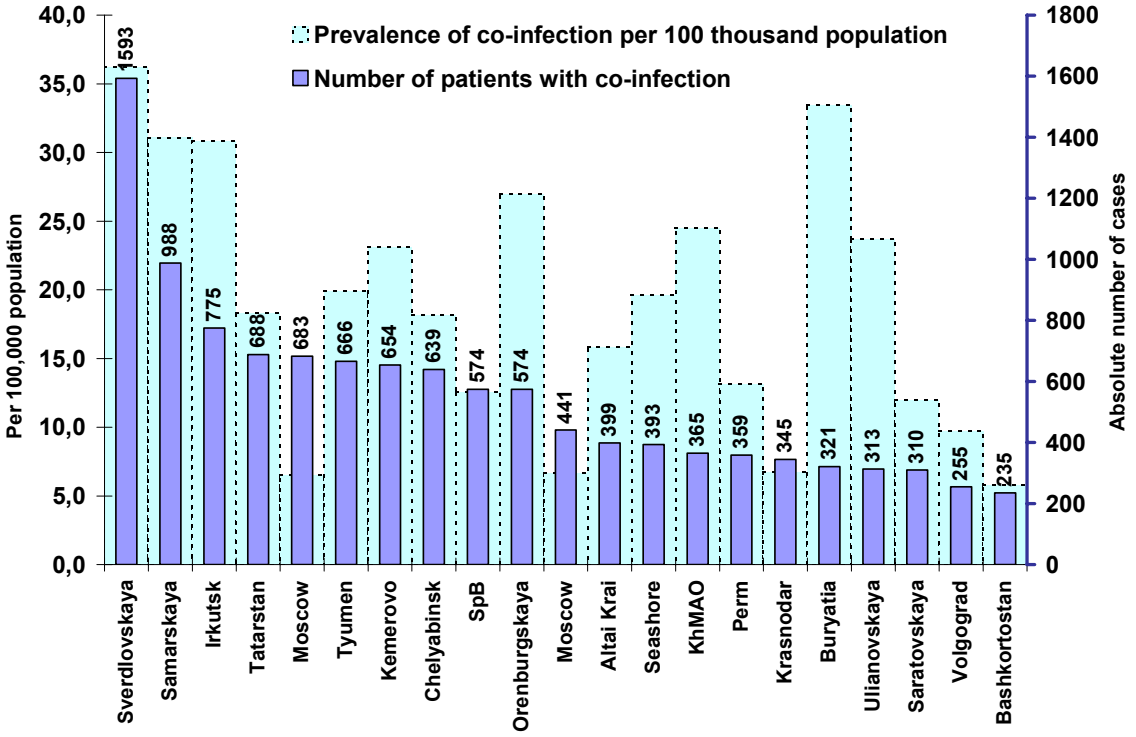


Figure 7.6. Territories with the highest number of cases of co-infections (235 cases and more), 2007. (Source: Form #61).

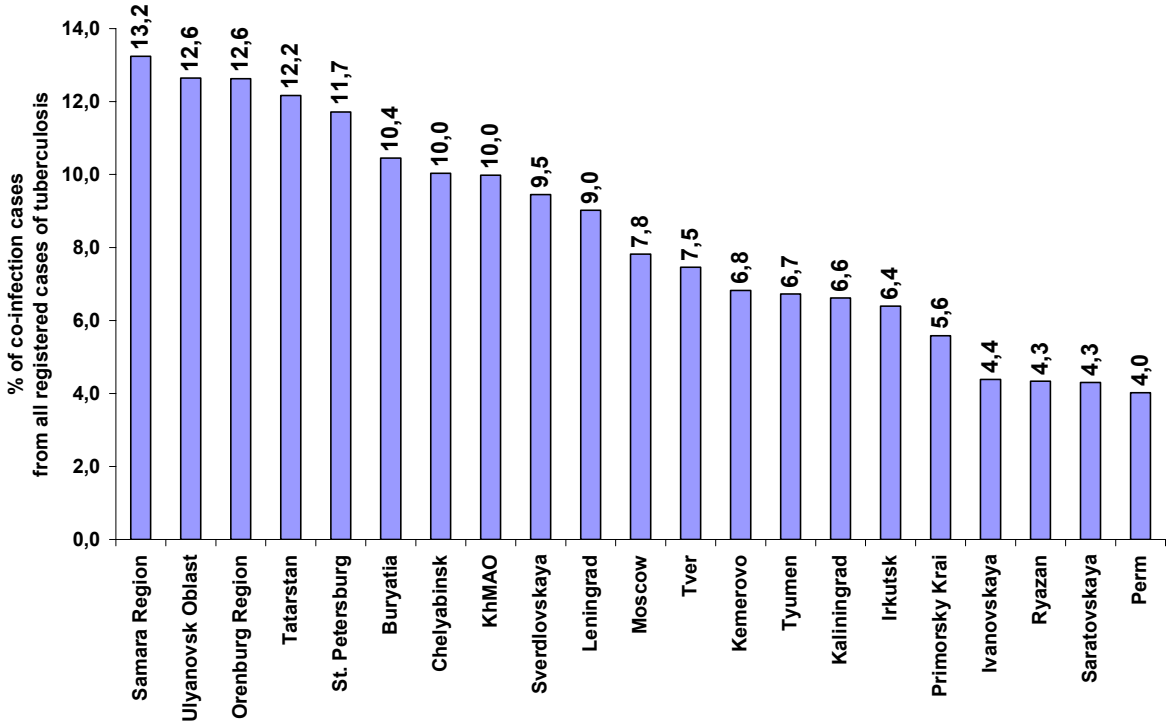
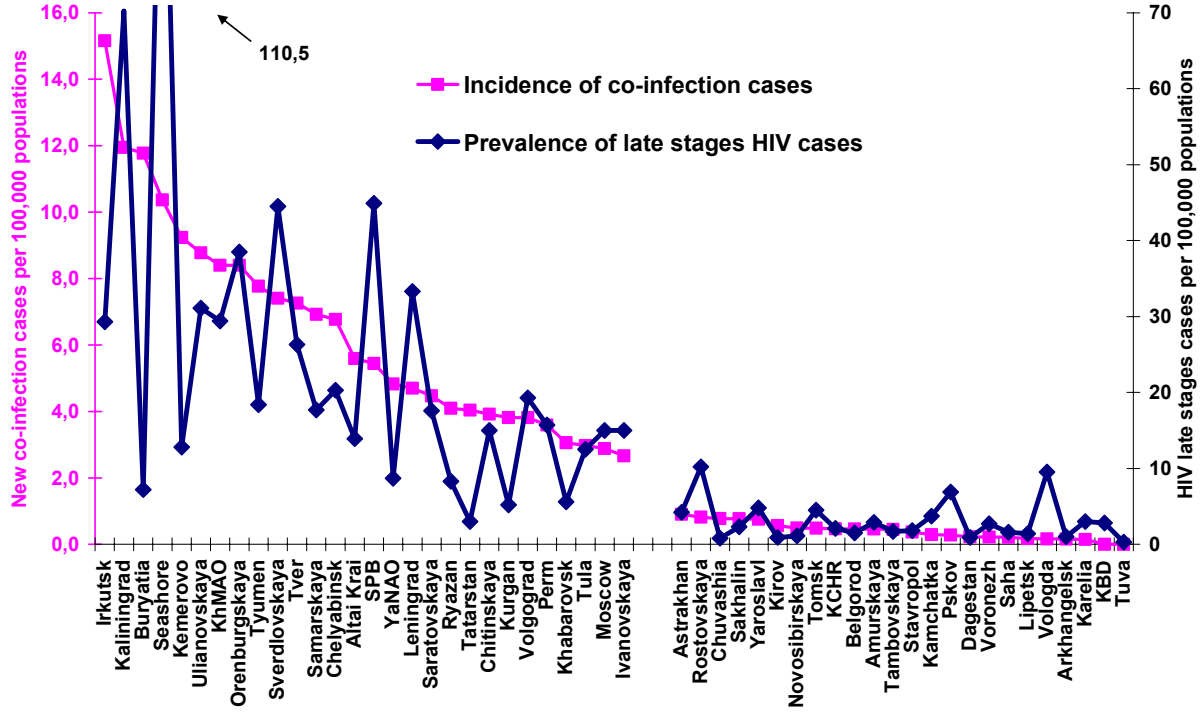


Figure 7.7. Territories with the highest proportion of cases with co-infection among all TB patients registered with the institutions of the MoHSD (4% and more). 2007 (Sources: form #61 and #33).

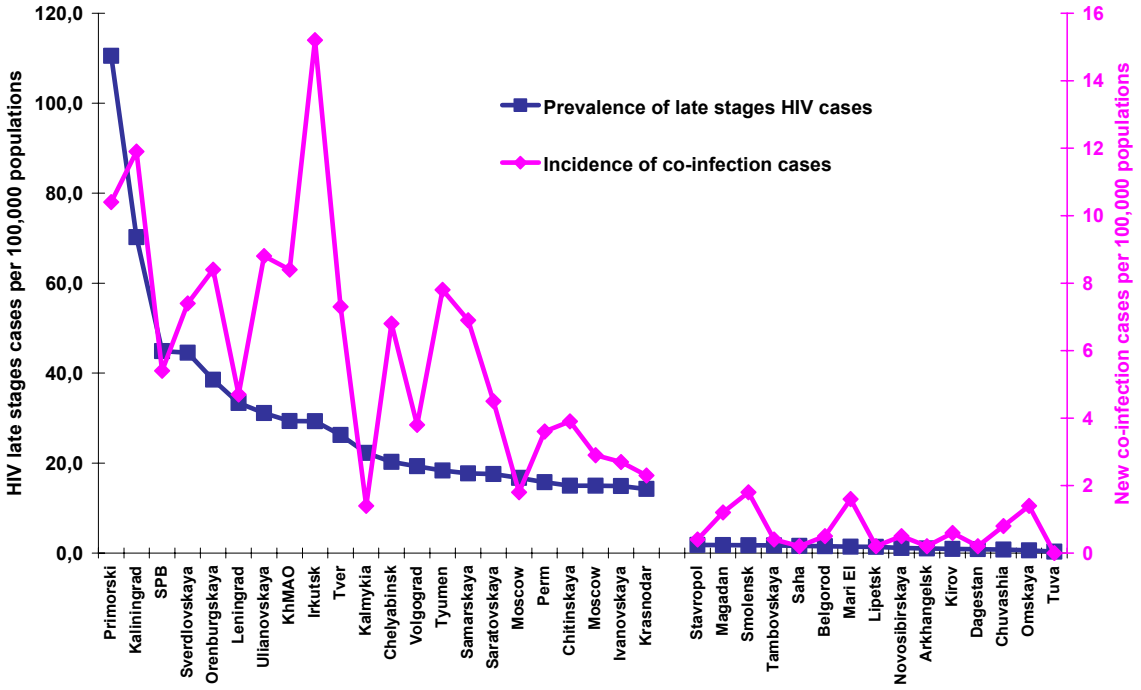
Thus, it is important for the TB specialists in territories, where HIV infection started to spread at a later time, to bear in mind that in the coming years, this problem will also be significant for them.

In addition, these graphs show a large scattering of the frequency of cases of co-infection in the territories with a similar epidemiological situation of HIV infection. There are peaks on the graph 7.8a that correspond to areas with the highest number of cases of co-infection. It may also be the result of effective notification of cases. These territories has in staff TB specialists who had several courses of improving qualification, and who are responsible for the coordination of TB care to patients with HIV infection. On the other hand, insufficient number of diagnosed cases of co-infection associated with a high prevalence of late stages of HIV infection in some regions (graph 7.8b) can be seen as a sign of lack of effective detection of tuberculosis. At the same time the ways of HIV infection transmission in these territories should be taken into account. For example, in Kalmykia, a low prevalence of tuberculosis among HIV-infected is due to the fact that HIV infection transmission occurred in most cases in early childhood as a result of in-hospital transmission of HIV infection in the city of Elista. As a result, these patients were kept in a fairly isolated environment from childhood, reducing the likelihood of exposure to TB infection. In this regard, the development of immunosuppression in these patients does not lead to the development of tuberculosis disease.

The significant increase in the number of cases of co-infection among the permanent population (from 2 to 5 times) in 2006-2007 was observed in the Kursk, Ryazan, Novgorod, Kirov, Penza, Volgograd, Irkutsk and Omsk regions, the Republics of Adygeya, Dagestan, Ingushetia, Kalmykia and Mari El. Development of immunosuppression in a larger number of patients with HIV infection seems to contribute to this. In some regions increase in number of registered cases of co-infection is related to the release of the letter of FSIN that requires transfer of the registration forms on co-infection to the TB specialist responsible for coordinating of TB care to the patients with HIV in the regions. Thus, the increase in the number of registered cases (from 1.5 to 5 times) due to data from FSIN (penitentiary system) happened in Vladimir, Lipetsk, Bryansk, Novosibirsk, Tomsk, Ryazan, Vologda regions, and the Republics of Karelia, Dagestan and Mari-El.



a) Association of the frequency of registration of new co-infection cases and late stages of HIV infection (more than 2.5 and less than 1 per 100 thousands population, ranged by incidence of co-infection cases).



b) The frequency of registration of new co-infection cases in the territories, depending on the prevalence of late stages of HIV infection (more than 14 and less than 2 per 100 thousands population, ranged by prevalence of late stages of HIV).

Figure 7.8. The incidence of co-infection, depending on the late stages of HIV infection in Russia in 2007 (Source: Form #61).

Figure 7.9 shows the territories in which more than a quarter of all patients with co-infection die because of manifestations of mycobacterial infection (code of the ICD-10 B20.0). In all of these territories a high prevalence of HIV infection is observed. From one side, high percentage of deaths may be an indication of late detection of TB in patients with immunosuppression, from the other side, these indicators must be assessed only in connection with the number of performed autopsies of patients died from HIV infection. In several subjects of the Federation autopsies are not performed at all. The most “favorable” situation is observed in those territories of Russia, where the autopsies after death from HIV infection are not performed, and where there are no trained TB physicians responsible for the coordination of TB care to patients with HIV, so tuberculosis with atypical clinical course on the late stages of HIV infection is not diagnosed neither in life nor the post mortem.

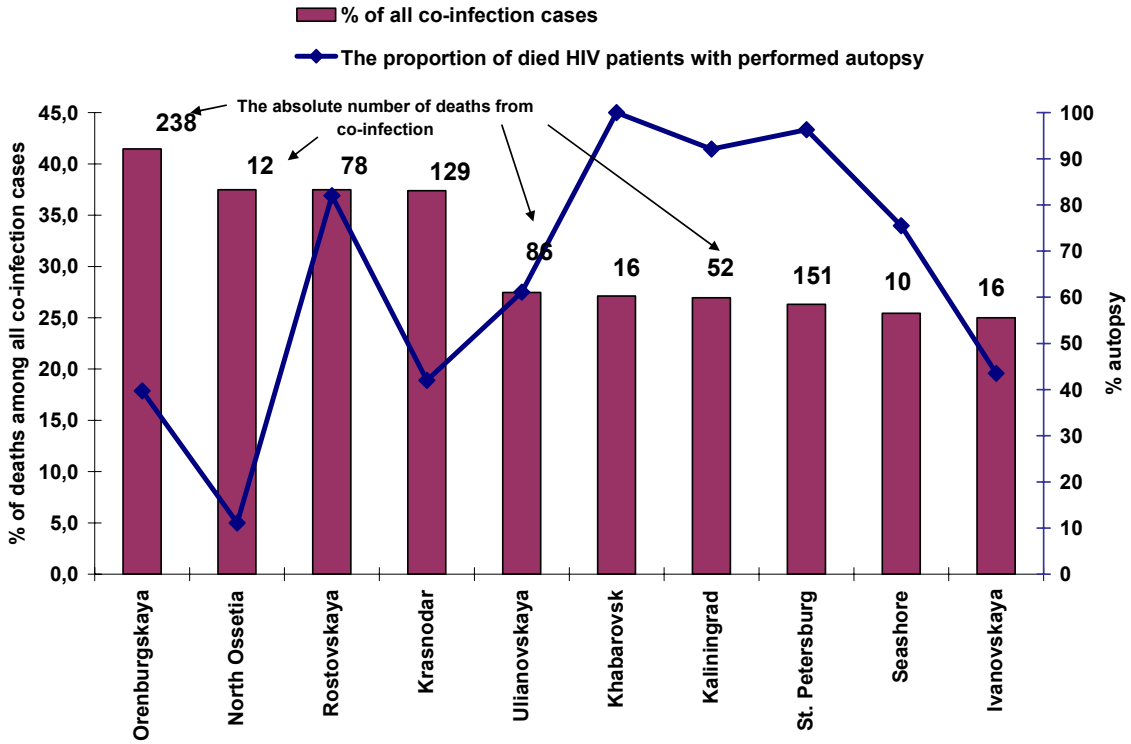


Figure 7.9. The proportion of deaths from HIV infection with manifestations of mycobacterial infection (code of the ICD-10 B20.0) among all reported cases of co--infection and the proportion of deaths of patients with HIV infection, which had autopsies performed according to the reporting form #61 in 2007. Shown only Russian territories with the level of the indicator over 25% and the number of deaths of more than 9 people.

Given the significant scattering of the indicators on TB-HIV co-infection in the subjects of the Federation, it is appropriate to provide a differentiated approach to the organization of outpatient and inpatient care to these patients. It is important to take into

account the prevalence of HIV infection in the territory, the duration of its registration in the region, and prevalence of *M. tuberculosis* infection in the population. Such recommendations are given in the manual for doctors entitled: “Organization TB care to patients with HIV” prepared by the thematic working group of MoHSD and WHO in 2006 [26].

Regardless of the prevalence of HIV infection in the subject of the Federation, it is important to have a trained physician, responsible for coordinating TB care to the patients with HIV. Only expert with experience of diagnosis of tuberculosis with atypical clinical course at late stages of HIV infection can timely diagnose and effectively treat tuberculosis.

7.5. Comparison of definitions and systems for the registration of cases of TB-HIV co-infection in Russia and other countries

Usually in the world for assessment of the spread of TB-HIV co-infection cases, the proportion of tested for HIV among TB patients, and cases of HIV infection among TB patients are being determined [17]. These indicators for some countries in the world, Russia and the regions (based on 2006 data) are shown in Table 7.2.

Obviously, these indicators have several limitations.

First, the registered number of cases of co-infections reflects only the information that was reported by TB Services. According to the Russian data, this number is less than half of the really diagnosed number of co-infection. This is why Russia has established a system that allows consolidating of information on cases of co-infection from TB physicians, infectious disease physicians, pathologists, and FSIN physicians into a single database.

Secondly, it is impossible to assess the significance of the TB-HIV co-infection problem in the region by assessing only the proportion of patients with HIV infection among TB patients. For example, analyzing the data from table 7.2, it seems that the problem of co-infections in Russia is not yet as serious as for the U.S. But in reality it is more important particularly for Russia, since the proportion of cases of co-infections in the United States is calculated using substantially lower absolute number of TB patients, compared to the number of TB patients in Russia. In the U.S. the number of new tuberculosis cases is about 14,000 per year, and in Russia - about 120,000.

Therefore, the rate of co-infection per 100 thousands people in Russia in 2005 was to 2.1 (4.2 in 2007) that is much more than in the U.S. - 0.4[52] [32].

Table. 7.2. Tuberculosis and HIV co-infection in the world, 2006

Region / country	Estimates of the number of new cases of TB-HIV co-infection	Estimates of the proportion of patients with HIV infection among reported cases of tuberculosis, %	TB patients tested for HIV infection		The number of positive results of testing of TB patients for HIV infection	The percentage of positive results of testing of TB patients for HIV infection
			N	%		
World	709,013	7.7	687,174	12.0	186,217	27.1
Africa	605,989	22.0	287,945	22.0	150,739	52.3
S. Africa	200,693	44.0	110,235	53.0	58,249	53.0
USA	1,398	11.0	8,273	60.0	1,035	12.5
WHO European Region	12,842	3.0	192,965	45.5	5,281	2.7
Russian Federation	5,803*	3.8	87,041	57.0*	3,533 (2005)**	4.1

* This assessment (5,803) and the percentage of TB patients tested for HIV infection (57%) was calculated for Russia not entirely correctly, because of the inconsistency of requested data and the system of statistical recording in the country. At the same time, according to the reporting form #33 the coverage of HIV infection testing for newly diagnosed tuberculosis patients in Russia was in 2006 – 89.9%, in 2007 – 90.9%, and the coverage of all registered TB patients was, respectively - 76.3% and 79.1%.

** In the past two years (2005 and 2006) data from the reporting forms #33 on the total number of TB patients with a positive result of immunoblotting were forwarded to the Global Report.

Conclusion

In summary, tuberculosis combined with HIV infection is of great importance for Russia. In the absence of adequate interventions, increase of co-infections can cause serious harm to the health of the country's population.

In order to improve the monitoring of TB associated with HIV infection, it is necessary to implement a uniform system of registration of co-infection. It should be based on universal definition of cases of HIV infection and take into account updated information in the field of HIV infection and tuberculosis.

[52] In 2005, the United States there were registered 1,035 new cases of TB associated with HIV infection [32]. These data include all states, except California.

8. Multidrug-resistant Tuberculosis

I.M.Son, E.M. Belilovsky, E.I. Skachkova, S.A. Popov, I.D. Danilova, W. van Gemert, W. Jakubowiak

8.1. MDR TB indicators used in the Russian Federation

The problem of the spread of multidrug-resistant tuberculosis (MDR TB), when M. tuberculosis is resistant to at least two main anti-TB drugs - isoniazid and rifampicin, attracts serious attention during last years. MDR TB patients need an expensive and long-term treatment, a more thorough monitoring and support, and lethality rate of MDR TB case treatment is high. High level of MDR TB has serious impact on the transmission of tuberculosis in the community through the accumulation of TB infection in the population because of decreased effectiveness of treatment.

Drug resistance is classified in international practice for primary and acquired drug resistance [15]. Primary drug resistance (drug resistance among new TB cases) is defined as the resistance of *M. tuberculosis*, isolated from a patient who never took anti-TB drugs or received TB treatment for less than one month. In this case, patient presumably was infected with drug-resistant strains of *M. tuberculosis*. Primary drug resistance is the characteristic of mycobacterial population circulating in the territory, and this indicator is important in assessment of the epidemiological situation. Acquired (secondary) resistance was defined as the resistance of *M. tuberculosis* detected in a patient with tuberculosis at the time of his/her registration for treatment (usually re-treatment course) who ever received anti-TB drugs for a month or more [10]. Secondary drug resistance is considered as an indirect indicator of the ineffectiveness of ongoing treatment. Recently, the term “secondary DR” is increasingly replaced with the term “DR among re-treatment cases”. In the latest Global WHO/IUATLD drug resistance report [30] MDR TB diagnosed in re-treatment patients and patients receiving treatment for more than one month don’t be recommended to be considered as MDR acquired as a result of treatment. It is believed that such patients could be previously infected with an MDR TB strain. Nevertheless, any treatment, especially ineffective, leads to increasing of drug resistance. Therefore, MDR TB in re-treatment patients and patients receiving treatment for more than a month is called in practice secondary resistance, which is important from an epidemiological point of view. In all cases, the basis of the MDR TB registration is personal register.

The Russian national statistics data on MDR TB among the civilian population started to be registered from 1999 (reporting form #33). In addition, since 2005 data on MDR are included in the form #7-TB for cohort analysis. In FSIN institutions information on the MDR TB was introduced in report form (#4-tub) three years ago. The first time the reliability of these data in the countrywide has been inadequate, and information on the MDR TB rate in the Russian Federation for the years 1999-2005 only approximately reflected the real rate and its change from year to year and by region. Conducted in 2005-2007 measures to improve the quality of laboratories and registration of cases of MDR TB, bringing to the international standard laboratory techniques, correctness and accuracy of reporting data suggest recently data in the reporting forms more accurately reflect the prevalence of this form of TB. Although registered rates of MDR TB still may significantly differ from actual proportion of patients with MDR *M. tuberculosis* in the population.

As a rule, currently in Russia and around the world for TB control “extensive” indicators reflecting the proportion of registered TB patients with MDR TB among different types of patients are used. As will be shown, in the Russian Federation three indicators are used in practice:

- the proportion of MDR TB among new MbT+ RTB cases (from the form #33),
- the proportion of MDR TB among new PTB cases, with MDR determined prior to or less than a month after the start of treatment with first-line drugs, and who has been examined by drug susceptibility test (DST) (from form #7-TB), and finally,
- the proportion of MDR TB among RTB patients registered by the end of the reporting year (from the form #33).

The first two indicators show the potential complexity of organization of the treatment of newly diagnosed patients, and can be used to predict the effectiveness of treatment and planning appropriate treatment plan.

Features of the form #33, as well as rules of the registration of MDR TB are such that in calculation of the percentage of MDR TB among newTB cases based on these, the denominator includes all new MbT+ RTB cases, regardless of whether drug sensitivity test was performed. As the proportion of MbT+ patients for whom DST was performed is significantly below 100% (see below), the evaluation of prevalence of MDR TB among new cases, calculated by data of form #33 is underestimated. Moreover, calculation of this indicator is done among all MbT+ patients, regardless of whether they had culture, i.e. patients with MbT+ confirmed only by microscopy are also taken into account. Finally, instructions to the form do not indicate at what stage of treatment test

should be done. As a result, the reporting form has data not only on new cases with primary MDR TB (i.e. who had DST before treatment, or within a month after the beginning of treatment) and those who have MDR TB diagnosed during the course of treatment (one month more after beginning of the treatment). Thus, the form #33 does not allow determining the countrywide rate of the primary MDR TB, defined as the proportion of MDR TB among new MbT+ TB cases not previously treated or treated with first-line drugs for less than 1 month [15, 30].

Less deficiencies has another extensive indicator calculating proportion of MDR TB among new TB cases by the form #7-TB, implemented in Russia according to the Order #50 [16] in 2004-2005.

This form includes information on the number of patients who received DST, which is used as the denominator to calculate the proportion of patients with MDR TB. Besides, in accordance with the instruction and structure of the registration form #01-TB, which is used as a baseline for reporting form #7-TB, data on MDR TB should include newly notified patients who had DST performed before treatment, or less than 1 month after the start of treatment. This information reflects the level of primary MDR TB. In addition, the form #7-TB allows calculating the proportion of MDR TB for the PTB, as is accepted in the world, not only for the RTB, as is the case when using the indicator of the form #33. This form is collected in TB institutions of the MoHSD, and FSIN (see Chapter 1); however, later in this chapter information is provided only on the basis of form #7-TB from institutions of the MoHSD, i.e. for the civilian population. This is due to still insufficient use of the reporting form #7-TB by FSIN for collection of the data on DST. Information about MDR TB in FSIN institutions is collected using separate internally approved forms. The results of the analysis of the data from these forms are given in Chapter 6 of the review.

Third extensive indicator, the proportion of patients with MDR TB among all TB patients registered at the end of the year, reflects the overall severity of the spread of MDR TB in the population. This extensive indicator, as the absolute number of MDR TB, is important to know for the organization of treatment and assessment of the economic costs of treating patients in this category.

The proportion of patients with MDR TB among all TB patients can be evaluated in the Russian Federation only on the basis of the reporting form #33. In accordance with the structure of the reporting form, the indicator can be calculated only for RTB patients, regardless DST performance for these patients. It is important to note that the quality of collected statistical data on MDR TB among all TB patients in the regions of

the Russian Federation is still not high enough. This is due to the current problems in the laboratories, and the organization of testing, use of the results, as well as registration of MDR TB cases. Currently there is no protocol and regulations on the rules of MDR TB registration. In Russia there are no approved instructions describing the required frequency of DST during TB treatment, or ensuring DST at registration for re-treatment courses and dispensary registration, particularly in patients with chronic forms of tuberculosis. No unified recording forms to calculate the number of patients with drug resistance exists, and there are contradictions in the reporting forms regarding patients with MDR TB. In these conditions, some regions can only provide information on the number of MDR TB strains obtained from patients, but not the number of patients with MDR TB.

Extensive indicators, calculated as a percentage of MDR TB among the various categories of TB patients have a great organizational and epidemiological significance. Their growth means that the region may have problems with the required level of effectiveness of treatment for TB patients. Solving these problems requires certain organizational and treatment interventions, as well as additional funding.

Recent publications in Russia note the use of intensive indicators: the incidence of MDR TB and MDR TB prevalence among TB patients at the end of the year (per 100,000 population) [34]. These indicators are focused on the social significance of this form of the disease.

The incidence of MDR TB is an epidemiological indicator showing the rate of occurrence of new cases of MDR TB among the healthy population from transmissibility resulting from the treatment of infections and as a result of inadequate measures of infection control.

And finally, the prevalence of MDR TB (the number of patients with MDR TB who are registered at the end of the year, per 100,000 population) allows to assess the extent of the source of MDR TB in the territory. Unlike most countries in the world (see below section 8.4), where this indicator is calculated on the basis of special models, formulas and ratings, a registration system for TB patients in Russia allows more accurate calculation of the prevalence of MDR TB. The value of this indicator (together with the absolute value of MDR TB, and their proportion in different categories of TB patients) for the reporting time is an essential information for planning of management and treatment activities and assessment of the financial costs for dealing with the current situation.

The applicability and value of some indicators can be illustrated by the scheme in Fig. 8.1. As has been said, in general, the speed of increasing of MDR TB rate depends on the adequacy of treatment and effective infection control. At the same time, increase of the proportion of MDR TB can occur not only because of inadequate and ineffective treatment, but even given the successful treatment of drug-sensitive tuberculosis because of elimination ("washing out") of drug susceptible TB from the population of patients (see Fig.8.1 and Fig.8.1b). Figure 8.1b shows that, after treatment with first-line drugs a certain number of patients with MDR TB remains in the region (excluding died and transferred), and cases of MDR TB emerged as a result of treatment (number of which depends on adequacy and efficiency of therapy) are added.

Then (see Fig. 8.1c), in the absence of appropriate treatment of patients with MDR TB and poor infection control, new patients with drug-sensitive TB emerge, and at the same time the proportion of new patients infected with MDR TB is increasing.

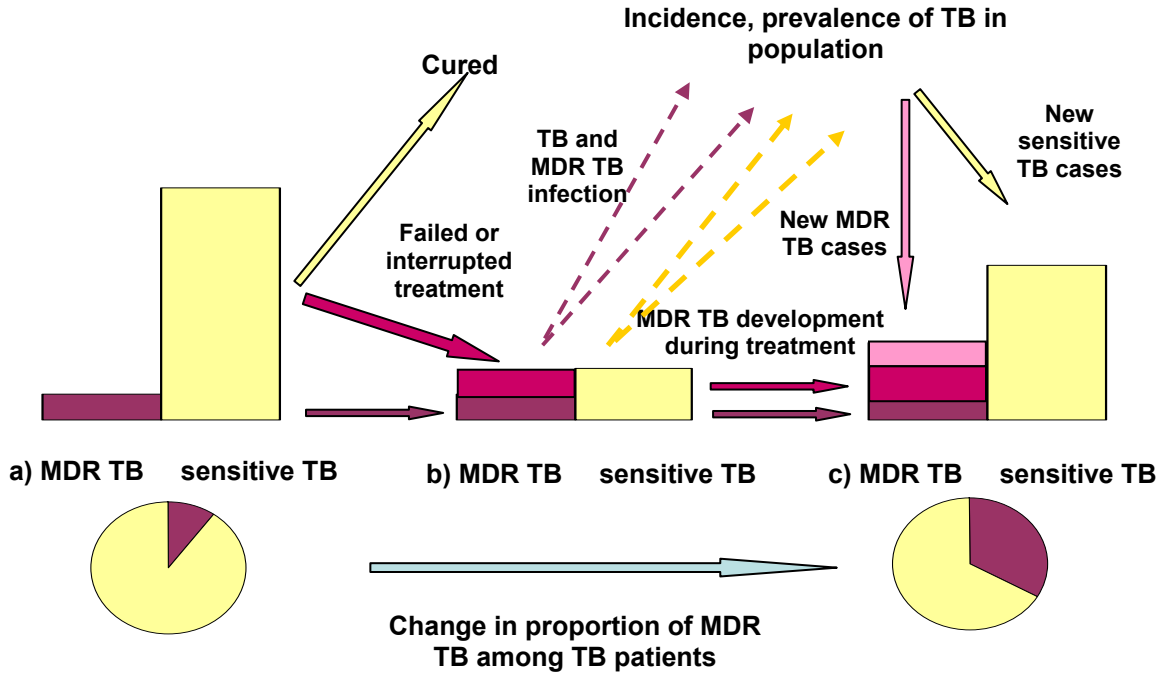


Fig. 8.1 The scheme of epidemic process of MDR TB transmission in conditions of effective treatment with first-line drugs. a) before treatment, b) the result of effective treatment with first-line drugs, c) the spread of MDR TB in the population.

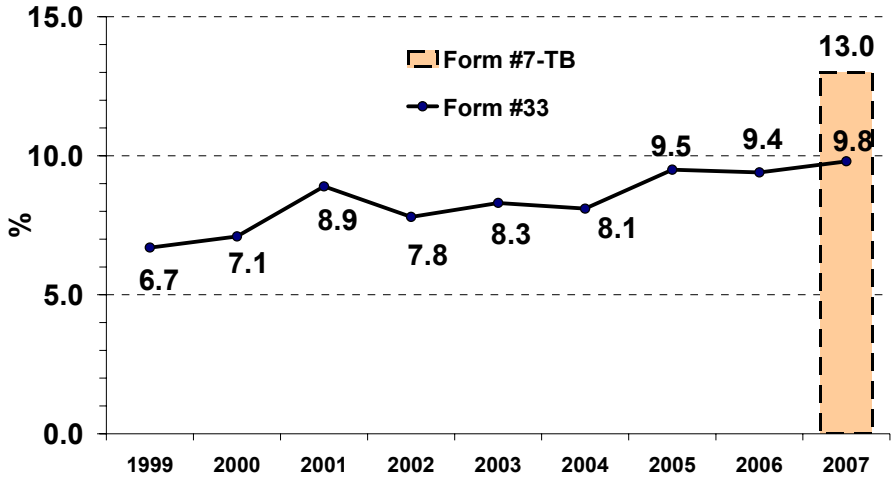
8.2. MDR TB among new TB cases

According to the form #33 in the Russian Federation from 1999 to 2007 has been an increase in the proportion of MDR TB among all reported new MbT+ PTB cases (from 6.7% to 9.8%; in 2007 registered 4,149 new cases of MDR TB, fig. 8.2). Increase

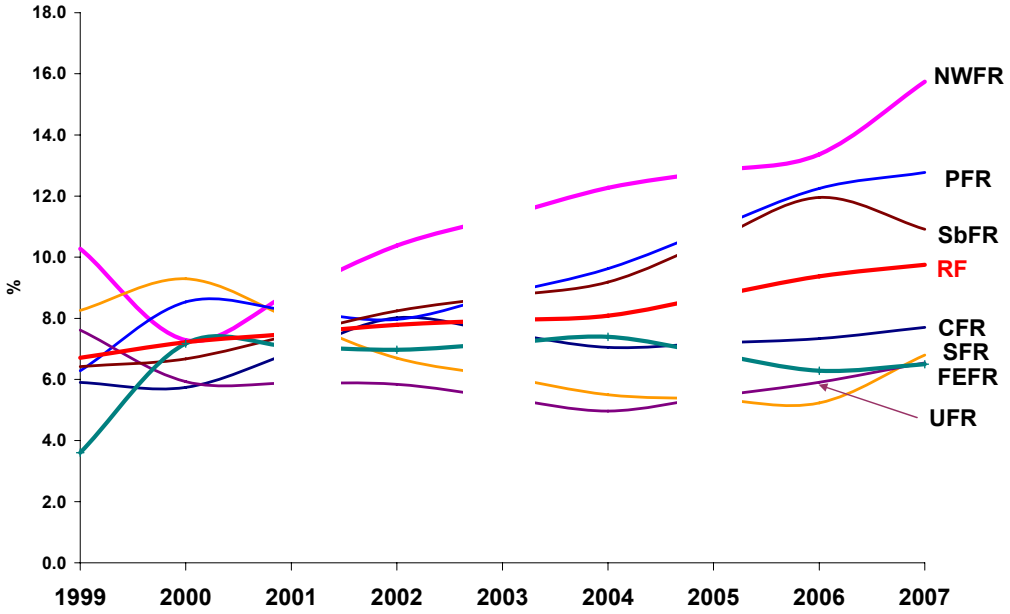
of this indicator can reflect not only the increase in the proportion of TB resistant to the main anti-TB drugs, but also improving the quality of laboratories' work and registration of cases of MDR TB, i.e. improving of the detection of patients with MDR TB.

Primary MDR TB rates based on the reporting form #7-TB, shows that in 2007 13% of new TB cases had MDR TB before treatment start or for no more than a month before treatment began (see Fig. 8.2). This form contains information that 30,370 PTB patients had DST performed in reported year in the Russian Federation, and 3,959 patients had MDR TB detected.

Proportion of MDR TB among new TB cases calculated from data on form #33 and form #7-TB has a significant variation in the territories (see fig. 8.2b and 8.3 - 8.6). Thus, the highest rate of MDR TB in the Russian Federation is registered in the North-West Russia, the Volga region and Siberia. This indicator in these Federal Regions over the past 4-5 years exceeded the nationwide rates and determined its increase countrywide (Figure 8.2b). In 2007, in NWFR, PFR, and SbFR the following rates of MDR TB among new PTB cases were registered (Form #33): 15.7%, 12.8% and 10.9%, respectively (Fig. 8.3). It should be noted respective high rates of MDR TB incidence in Siberia (more than 5 per 100 thousands) and in the territories NWFD, PFD and FEFR (3-4 per 100 thousand population). This suggests high risk of MDR TB acquisition in these regions. The proportion of new PTB patients with MDR TB from new patients with performed DST in NWFR, PFR, and SbFR was 20.5%, 13.9% and 14.8%, respectively, in 2007(see fig. 8.4). Territories of North-West Russia have high rates of MDR TB among new MbT+ cases. Among 10 subjects of the Federation with the highest value of the indicator calculated based on form #7-TB in 2007, six subjects were parts of NWFR (NW Federal Region includes total ten territories): Arkhangelsk (27.4%), Kaliningrad (26,6%) and the Murmansk regions (15.4%), St. Petersburg city (26.4%), the Republic of Karelia (21.2%) and Komi (14.4%). In addition, territories with highest indicator include Samara Region (28.0%), the Republics of Sakha (30.2%) and Tyva (34.6%).



a) The Russian Federation(Sources: forms #33 and #7-TB).



b) By the Federal Regions. (Source: Form #33).

Fig. 8.2. Changes in the proportion of patients with MDR TB in new TB cases. The Russian Federation and the Federal Regions, 1999-2007[53]. Source: Form #33 (the percentage to RTB MbT+ patients confirmed by culture), the form #7-TB (the percentage to patients with PTB MbT+ patients confirmed by culture and had drug sensitivity test performed).

[53].Data for the Federal Regions for 2001, 2003 and 2005 are not given since the value of the proportion of MDR TB in these Regions had a significant impact from inflated figures from the form #33 in the following territories: in 2001 - Krasnoyarsk region (4 times excess of the usual value of indicator during one year), 2003 - Volgograd and the Chita region (iexcess of 2.5-4 times), in 2005 - Primorsky and Khabarovsk Krai (excess of 2 and 55 times). The validity of the registration of the above values of MDR TB in the form of #33 requires clarification.

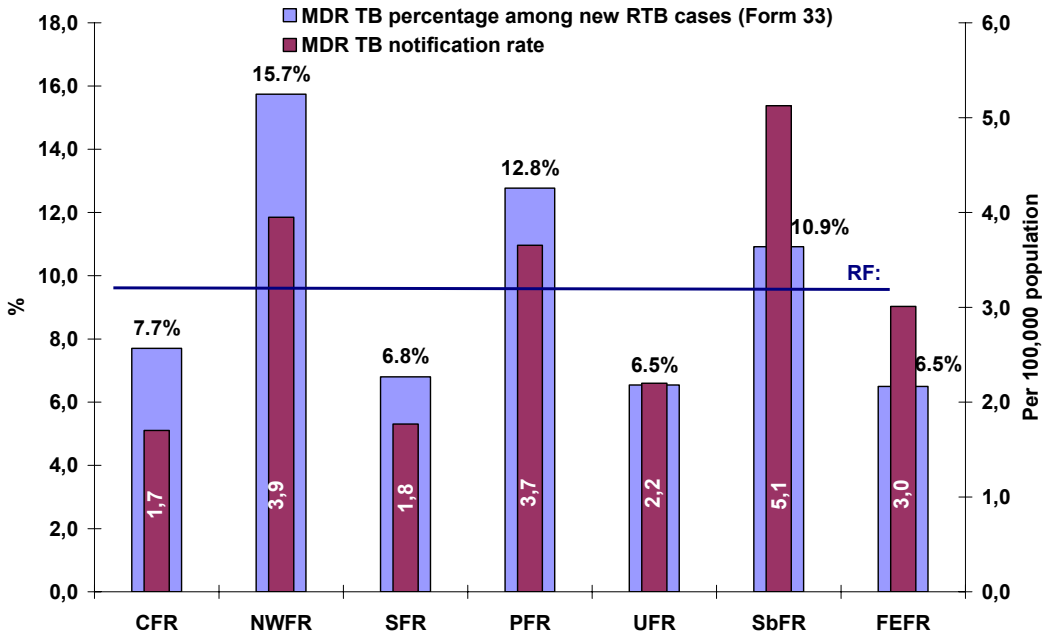


Fig. 8.3. MDR TB notification rate (new TB cases with MDR TB) and prevalence of MDR TB among new RTB cases , 2007, the Federal Regions of the Russian Federation. (Source: form #33, the population: form #1).

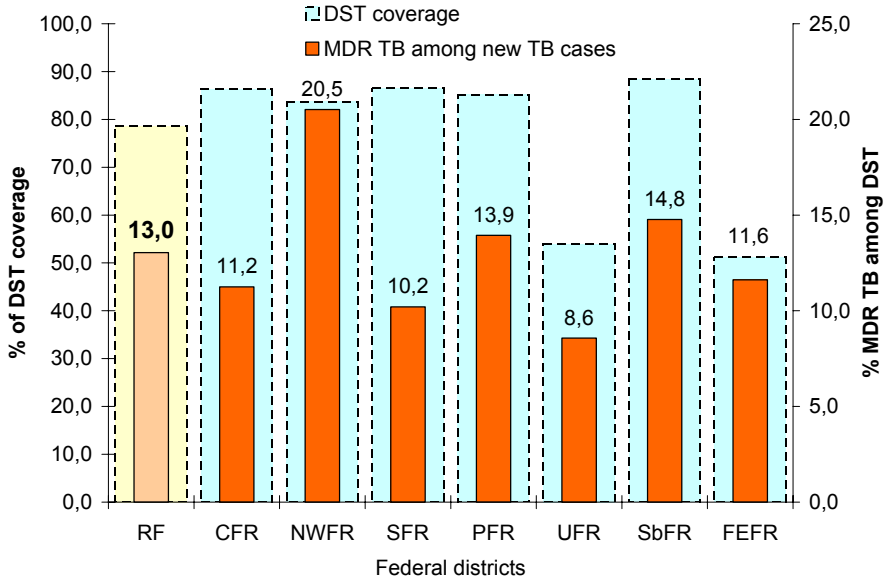


Fig. 8.4. Coverage for drug sensitivity tests (DST) of MbT+ patients cretion and prevalence of MDR TB among new TB patients with pulmonary tuberculosis who had DST, 2007, Federal Regions and the Russian Federation. (Source: form #7-TB).

Fig. 8.6 listed the subjects of the Federation, in which 80% of all cases of MbT+ MDR TB among the newly diagnosed patients in the country is recorded. Given that the treatment of patients with this form of TB requires a significant investment in second-line drugs and specific activities for the management of treatment, shown information is

important for planning the allocation of adequate financial resources and activities to enhance the skills of existing staff. Seven subjects are notable from this list, since more than a third of all patients with MDR TB in the Russian Federation are registered there: Kemerovo, Samara, Novosibirsk and Kaliningrad regions, Krasnoyarsk and Krasnodar Krays and Moscow city (total for permanent population, migrants and BOMZH).

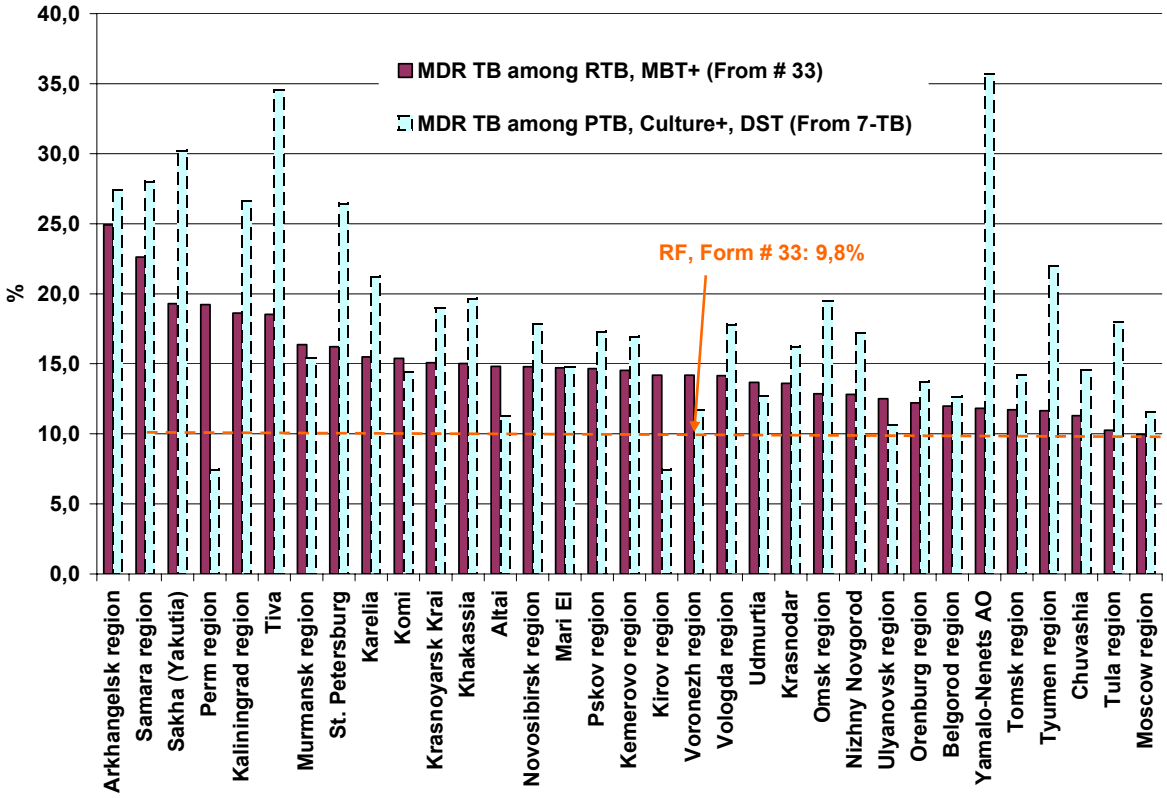


Fig. 8.5. The territories of the Russian Federation with the highest prevalence of MDR TB among new TB patients[54], 2007. Shown MDR TB proportions among new MbT+ TB cases with RTB and PTB (for PTB only patients with performed DST are considered). (Sources: form #33 and #7-TB).

[54] The graph includes territories with more than 5 registered patients with MDR TB during 2007.

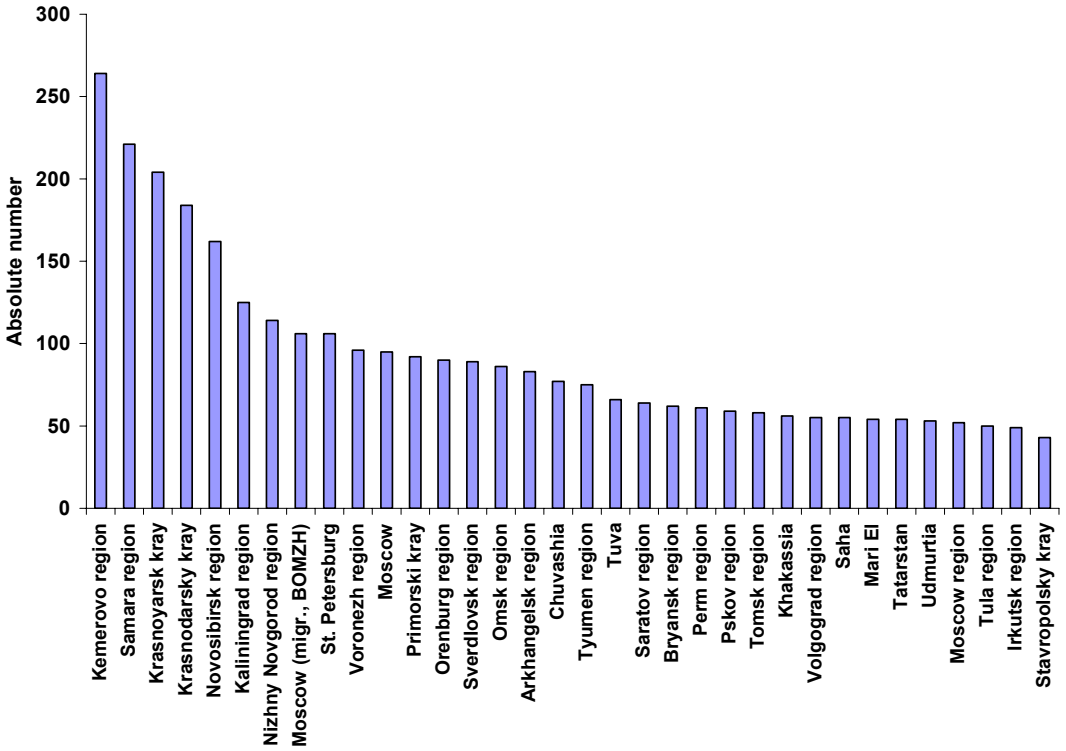


Fig. 8.6. The subjects of the Russian Federation, with the highest number of reported cases of MDR TB among new PTB cases before treatment (including 80% of all MDR TB cases among new TB cases in the Russian Federation). 2007 (Source: the form #7-TB).

The process of registration of new TB cases with MDR TB in the national reporting forms has not yet been polished, which affects the quality and variability of the data in forms #33 and #7-TB. This fact, together with various methodological approaches to the forming of reports and the frequency of their submission (see above) and not yet complete coverage of Russian territories by high-quality reporting with form #7-TB (in 2007 data on the MDR TB were absent from 9 territories) explains the difference in the absolute number of patients with MDR TB, diagnosed before the start of treatment.

As mentioned, the report form #7-TB, in contrast to the form #33, includes all registered within a year of patients with MDR TB. In the form #33 MDR TB patients whose status was established laboratories in the last 1-3 months of the year can be not registered yet. However, the number of new TB cases with MDR TB reported in the form #33 exceed number in the form #7-TB. This may be the result of an incorrect calculation of the numbers in the form #33 (inclusion in the form #33 of “suspected” or so-called “clinical” MDR TB, or those new TB cases who have MDR TB diagnosed during treatment or one more than one month after the beginning of treatment), or

organizational and methodical problems because of the poor collaboration between the staff (statisticians), organizational and methodological divisions (OMD which are TB management and statistical departments of regional TB dispensaries) and laboratory services (information on DST coverage and DST results is received in OMD not complete or received late).

This means that some efforts are necessary for improving the quality of work of bacteriological laboratories and improving the statistical system of registration and collection of information on MDR TB in Russia's regions and the implementation of the country's ongoing monitoring of the quality of laboratory examinations, DST and DST data collection.

MDR TB rates in Russia's regions are quite high (see Section 8.4). The main reasons for such high rates in the Russian territories include the following:

- Problems with treatment organization in previous years (see Chapter 5), in particular, the high level of treatment interruptions, and violation of standard regimens of treatment,

- A significant number of patients with chronic forms of tuberculosis registered on the Russian territories (see Chapter 4), as a result of ineffective treatment,

- Non-sufficient infection control in healthcare settings and in the organization and conduct of anti-epidemic measures at the local level;

- The lack in territories of an effective drug policy on the availability and applicability of anti-TB drugs.

8.3. Prevalence of MDR TB among all TB patients in the Russian Federation

As mentioned above, the spread of MDR TB among all TB patients can be evaluated with an extensive parameter - the proportion of them among all RTB patients, and with an intensive parameter - the prevalence of MDR TB per 100 thousand population.

According to the form #33, the number of patients with MDR TB and their proportion among RTB patients continues to increase: in 2007 were registered 24,445 cases of MDR TB, and their proportion was 21.4% (Fig. 8.7 and 8.8). There is considerable variation in indicators' values in the country - from 3% to 50% patients with MDR among RTB patients.

Half the subjects of the Russian Federation have proportion of MDR TB from 16% to 31% (25% and 75% quartiles). The highest proportion of MDR TB among RTB

patients (from 40 to 48%) have Arkhangelsk, Tomsk, Novgorod, Murmansk Region, the Republic of Altai, Chukotka Autonomy okrug.

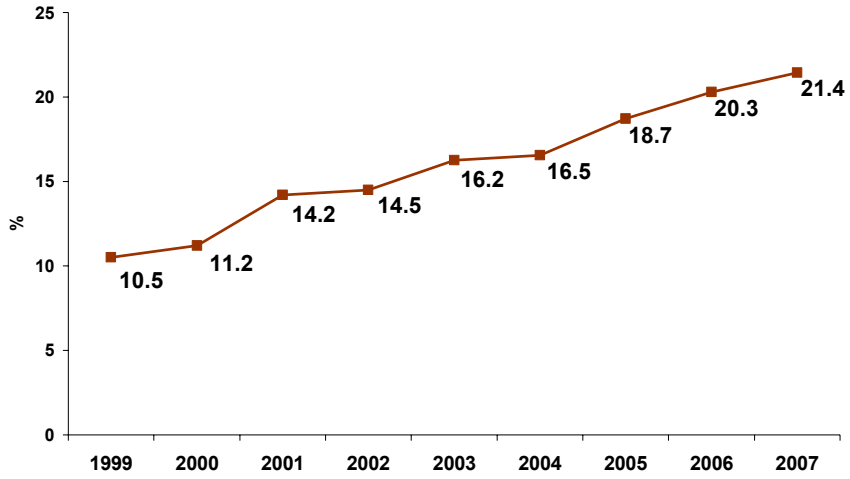


Fig. 8.7. Multiple drug resistance among all MBT+ patients with RTB. Russian Federation. (Source: Form #33).

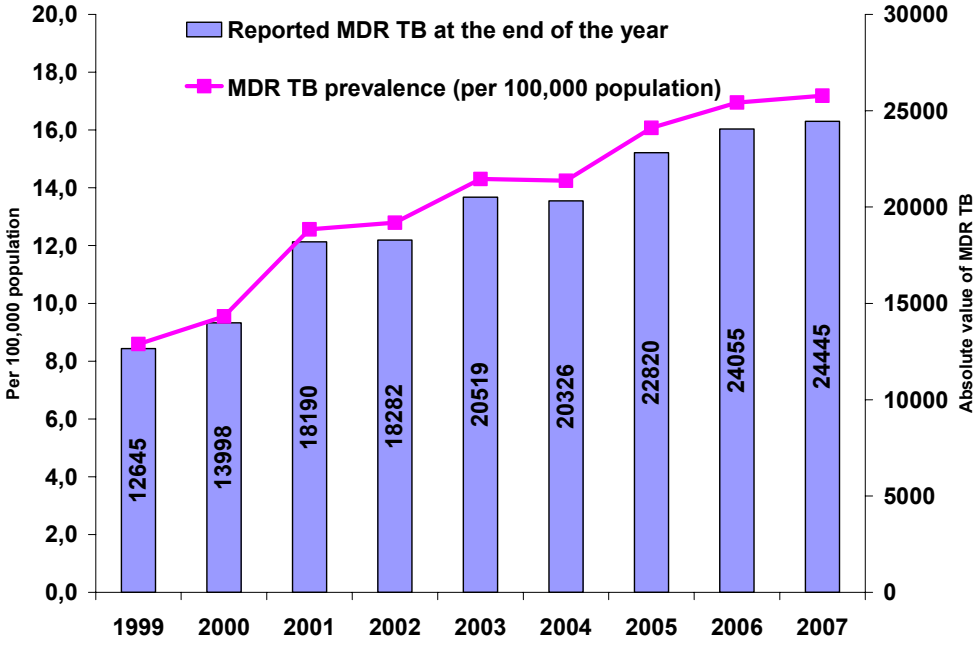


Fig. 8.8. The number of patients with MDR TB and MDR TB prevalence in the Russian Federation in the 1999-2007 (Source: Form #33).

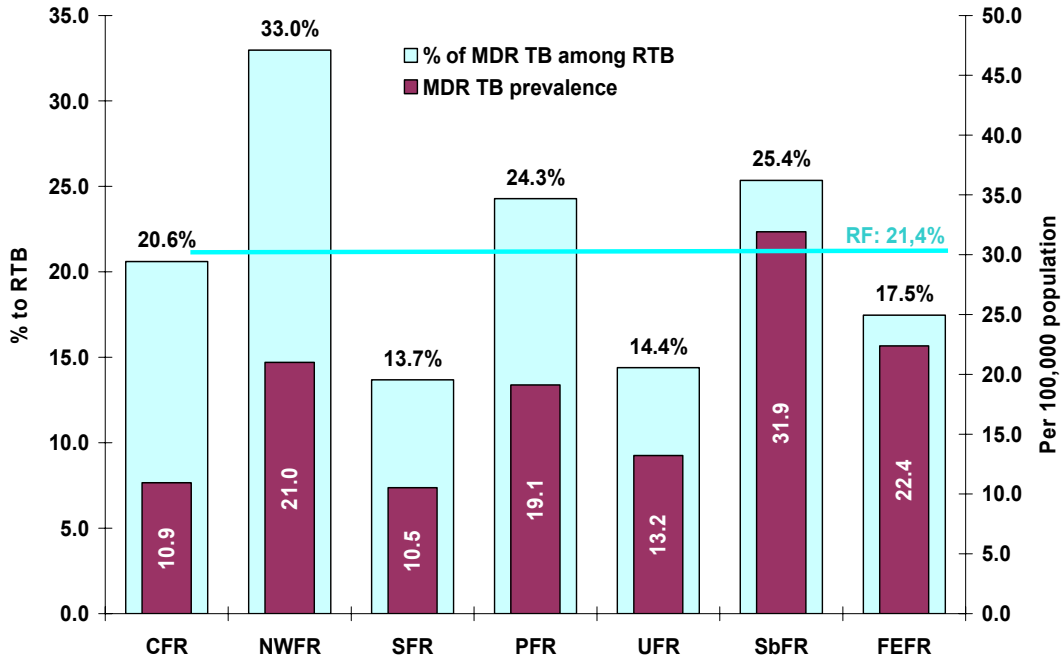


Fig. 8.9. The proportion of MDR TB among MbT+ RTB patients and the prevalence of MDR TB in the Federal Regions of the Russian Federation. (Source: Form #33).

The highest proportion of MDR TB among RTB patients seen in NWFR (33%), PFR (24.3%) and the SbFR (25.7%), while the prevalence of MDR TB among the population - in the SbFR and FEFR - 31.9 and 22.4 per 100 thousand population, respectively (Fig. 8.9).

Fig. 8.10 shows data on 38 subjects of the Russian Federation, in which registered 80% of all MDR TB patients registered in the country at the end of 2007. This information is important in the allocation of resources for the acquisition of expensive second-line TB drugs and for the relevant activities of the organization treatment of such patients. The graph shows marked in green those territories, whose application for the purchase of medicines through international funds has been approved by the Green Light Committee (GLC)[55] (5,036 registered cases of MDR TB), and marked in yellow – those territories whose application is under consideration (569 patients). In addition to shown on the graph territories, another 10 areas (in which 1,572 MDR TB patients are registered) will receive second-line drugs through the GLC, while applications from 4 more territories are under consideration (registered – 328 MDR TB patients).

[55] GLC is a group of independent international experts on policy, research and clinical aspects of tuberculosis. One of the activities is to increase the availability of expensive second-line drugs needed to treat MDR TB. Decrease of prices of these drugs has been made possible through close cooperation GLC with pharmaceutical companies.

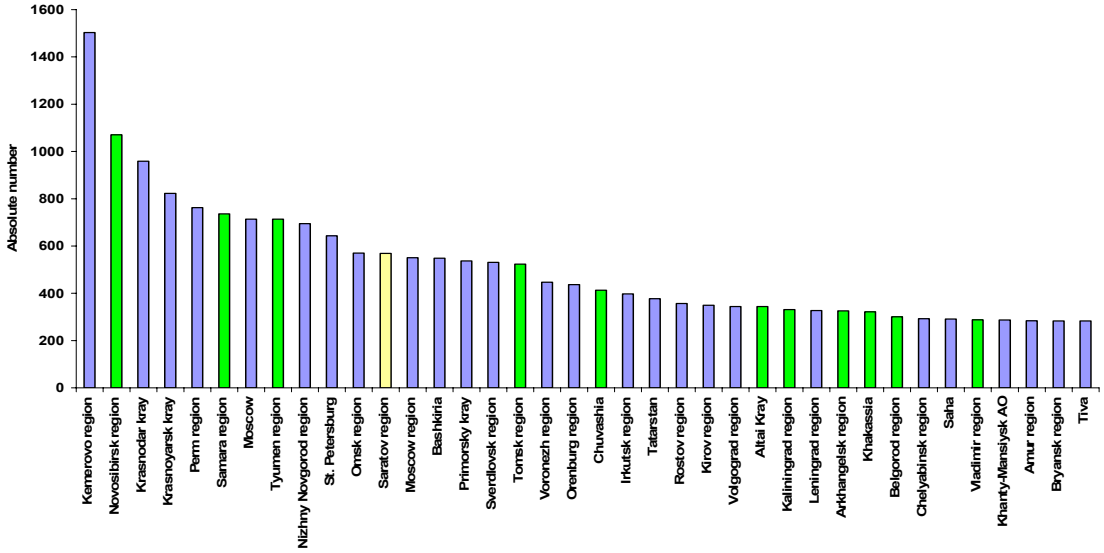


Fig. 8.10. The subjects of the Russian Federation with the highest number of patients with MDR TB registered at the end of 2007 (80% of all patients with MDR TB in the Russian Federation). Territories with GLC application approved by the end of 2007 are marked in green; territories applying to the GLC are marked in yellow. (Sources: the number of patients with MDR TB - a form #33, data about applications to the GLC - WHO TB control program in the Russian Federation).

8.4. The assessment of the MDR TB spread in the world

The spread of MDR TB in countries of the world is described by three indicators: the proportion of MDR TB among newly diagnosed patients, the proportion of MDR TB among re-treatment patients, and the proportion of MDR TB among all registered TB cases. In all cases denominator indicates the number of patients with performed DST.

However, because to the absence of dispensary management system in most countries around the world, for calculating of MDR rates among re-treatment patients, results of tests that first time demonstrated MDR TB for this patient ("incident of MDR TB") or test results received by the start of the next course of TB treatment are used.

The Fourth Global TB drug resistance report WHO/IUATLD [30] published the latest data on the spread of drug resistant TB (particularly MDR TB) received from countries around the world on the basis of information ongoing routine data collection systems for MDR or special sampling studies. The survey data from 2,509,545 cases of TB from 114 countries[56] were obtained and processed, and the following weighted average population rates of MDR were received: for new cases - 2.9% (95% CI[57] 2.2-3.6) for re-treatment cases -- 15.3% (9.6-21.1), for all cases - 5.3% (3.9-6.6).

[56] Covered 48% of the world's population

[57] CI - confidence interval

Fig. 8.11 and table 8.1 show MDR TB rates among new and re-treatment cases of tuberculosis in areas where these rates exceed 5% and 30%, respectively. Among those areas four are the subjects of the Russian Federation (Tomsk, Ivanovo, Orel regions and the Republic of Mari El). In these territories the laboratory studies on rates of drug-resistant TB were done in accordance with internationally accepted protocols under external quality control for laboratories.

The highest MDR TB rate among new cases in the Global Report was registered for the Republic of Moldova - 19.4% (16.5-22.6) and Baku city (Azerbaijan) - 22.3% (18.5-26.6). For re-treatment patients, the high levels of MDR TB was reported from Estonia - 52.1% (39.9-64.1%), Baku (Azerbaijan) - 55.8% (49.7-62.4%) and Tashkent (Uzbekistan) - 60.0 % (48.8-70.5).

Fig. 8.11 shows the areas with the highest proportion of MDR TB among new cases of MBT+ pulmonary tuberculosis.

At the same time, in most countries of the world there are no data on the spread of MDR TB for all territories, and data are available only from selected regions of the country, or there is a poor quality or lack of laboratory data, or data from the international reference laboratories are not available. This is why WHO widely uses mathematical evaluation of the spread of MDR among the above-mentioned categories of patients [29].

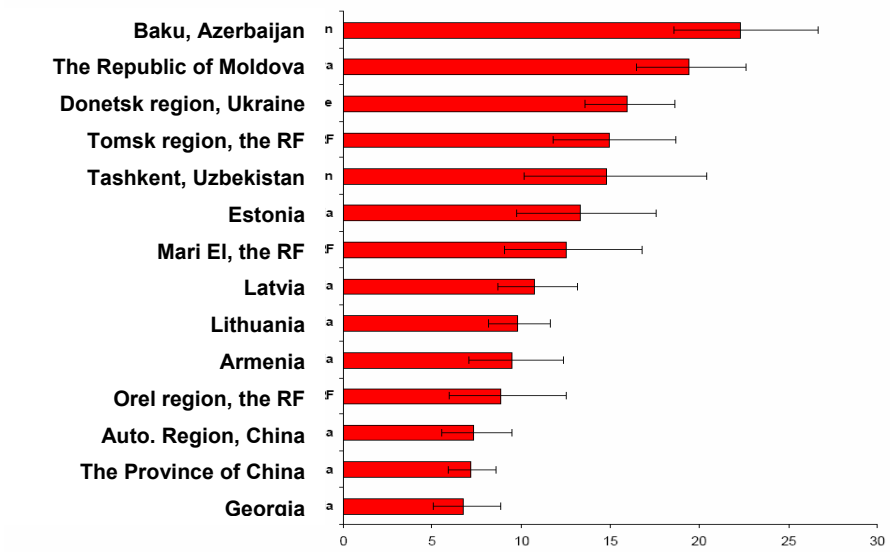


Fig. 8.11. The percentage of MDR TB among new TB cases, information for 2002-2007. (Source: [30]).

The results of the estimation of MDR TB level based on notified MDR TB data and 9 other epidemiological factors are given in Table 8.2

Table 8.1. Proportions of notified MDR TB cases, depending on the history of treatment in countries and WHO regions, and the territories of these countries. Weighted averages are given for the WHO regions, 1994-2007 [30]

WHO region, country	For new TB cases, %	For re-treatment TB cases, %	For all TB cases, %
All world	2.9 (2.2-3.6)*	15.3 (9.6-21.0)	5.3 (3.9 – 6.6)
Africa	1.5 (1.0-2.0)	5.8 (3.9 – 7.7)	2.2 (1.4 -3.1)
America	2.2 (0.6 – 3.8)	13.2 (3.5 – 22.8)	4.0 (1,7 – 6,2)
The countries of Eastern Europe. including	10.0 (3.8 – 16.1)	37.7 (12.3 – 63.0)	22.6 (8.6 – 36.6)
Armenia	9.4	43.2	22.3
Azerbaijan, Baku	22.3	56.8	39.1
Estonia	13.3	52.1 (39.9-64.1)	20.4
Kazakhstan	14.2	56.4	34.1
Latvia	10.8	36.3	15.2
Lithuania	9.8	47.5	19.4
The Republic of Moldova	19.4	50.8	41.8
Ukraine, Donetsk	16.0	44.3	25.3
Uzbekistan	14.8	60.0	28.4
Russia, Ivanovo Region	12.3	58.1	26.3
Russia, Orel region	8.8	16.7	9.5
Russia, Mari El	12.5	-	-
Russia, Tomsk region	15.0	-	-
Rest of Europe	0.9 (0.5 – 1.2)	7.7 (5.7 – 9.8)	1.5 (1.1 – 2.0)
* 95% confidence interval			

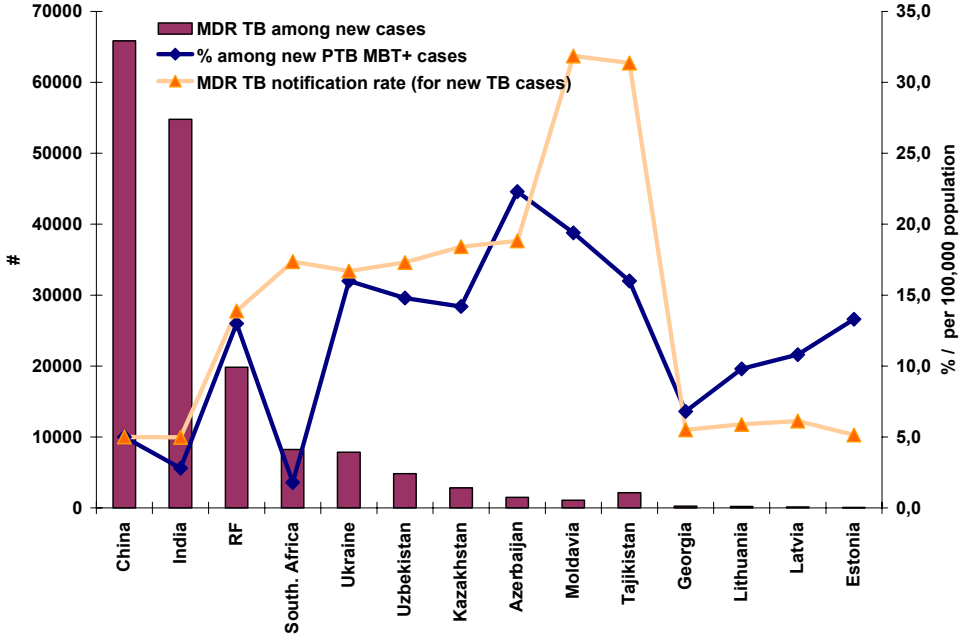
Table 8.2. The estimation of MDR TB rates among the various categories of patients in some regions and countries, 2006 ([30])

MDR TB	Among new TB cases		Among re-treatment cases		Among all cases	
Regions and countries	# (95% CI*)	% (95% CI)	# (95% CI*)	% (95% CI)	# (95% CI*)	% (95% CI)
All countries in the world (n = 185)	285718 (256072, 399224)	3,1 (2,9, 4,3)	203230 (172935, 242177)	19,3 (18,2, 21,3)	489139 (455093, 614215)	4,8 (4,6, 6,0)
Developed market economy countries	724 (573, 942)	0,8 (0,7, 1,1)	413 (330, 528)	8.2 (6,8, 10,2)	1317 (1147, 1557)	1,2 (1,1, 1,5)
Central Europe	416 (166, 2,170)	1,0 (0,4, 5,0)	785 (303, 2625)	9,8 (3,9, 31,3)	1201 (623, 3694)	2,4 (1,3, 7,2)
Eastern Europe	43878 (35881, 54877)	13,0 (11,8, 15,3)	36179 (29216, 43769)	45,5 (41,8, 49,4)	80057 (71893, 97623)	19,2 (18,0, 22,2)
Latin America	7196 (5850, 10360)	2,3 (1,9, 3,3)	4873 (4001, 5937)	14,4 (12,4, 16,9)	12070 (10523, 15526)	3,5 (3,0, 4,4)
Africa with low HIV prevalence	16430 (8137, 64077)	2,9 (1,5, 11,1)	9040 (4733, 15901)	28,9 (15,5, 48,9)	25475 (15737, 73132)	4,2 (2,6, 11,.9)
Africa with high HIV prevalence	5311 (3705, 14948)	1,5 (1,1, 4,3)	3105 (2169, 5527)	12,4 (8,9, 21,4)	8415 (6889, 18758)	2,2 (1,9, 5,0)
Armenia	211 (125, 310)	9,4 (7,1, 12,2)	170 (109, 235)	43,2 (37,9, 48,7)	381 (273, 501)	14,5 (11,6, 18,0)
Azerbaijan	1487 (926, 2090)	22,3 (18,9, 26,0)	910 (588, 1245)	55,8 (51,5, 60,0)	2397 (1744, 3074)	28,9 (25,1, 33,2)
Belarus	695 (115, 2906)	11,6 (2,0, 46,9)	401 (95, 847)	40,2 (10,2, 78,4)	1096 (371, 3272)	15,7 (5,4, 46,5)
Bulgaria	332 (53, 1454)	10,7 (1,8, 44,7)	119 (28, 262)	37,8 (9,2, 76,6)	451 (143, 1563)	13,2 (4,2, 44,1)
China	65853 (41883, 90663)	5,0 (4,6, 5,5)	64694 (41304, 88232)	25,6 (23,7, 27,5)	130548 (97633, 164900)	8,3 (7,0, 10,2)
China, Hong Kong	38 (21, 59)	0,9 (0,6, 1,2)	43 (19, 75)	8,0 (4,3, 13,3)	81 (51, 117)	1,6 (1,1, 2,4)
Czech Republic	13 (4, 24)	1,2 (0,5, 2,5)	10 (3, 19)	30,0 (11,9, 54,3)	23 (11, 37)	2,2 (1,1, 3,6)
Estonia	69 (40, 104)	13,3 (9,7, 17,5)	59 (36, 86)	52,1 (39,9, 64,1)	128 (91, 172)	20,3 (15,9, 25,7)
Georgia	259 (153, 383)	6,8 (5,1, 8,7)	393 (247, 551)	27,4 (23,6, 31,4)	652 (467, 847)	12,4 (9,9, 15,4)
Germany	99 (58, 146)	1,8 (1,4, 2,4)	56 (32, 87)	12,4 (8,5, 17,1)	155 (107, 210)	2,7 (2,1, 3,5)
India	54806 (33723, 78291)	2,8 (2,3, 3,4)	55326 (34714, 77769)	17,2 (15,0, 19,7)	110132 (79975, 142386)	4,9 (3,9, 6,2)
Israel	30 (13, 52)	5,7 (3,0, 9,7)	0 (0, 3)	0,0 (0,0, 63,2)	30 (13, 52)	5,6 (2,8, 8,9)
Kazakhstan	2836 (1681, 4158)	14,2 (10,8, 18,3)	3773 (2388, 5225)	56,4 (50,8, 61,9)	6608 (4806, 8534)	24,8 (20,0, 30,4)
Kyrgyzstan	949 (154, 3580)	14,7 (2,6, 53,4)	419 (99, 872)	40,0 (9,9, 78,2)	1368 (443, 4026)	18,2 (6,2, 51,5)
Latvia	141 (87, 201)	10,8 (8,8, 13,0)	77 (47, 108)	36,3 (29,3, 43,7)	218 (156, 284)	14,3 (11,9, 17,3)
Lithuania	206 (128, 292)	9,8 (8,3, 11,6)	219 (139, 301)	47,5 (42,8, 52,3)	425 (313, 545)	16,6 (13,6, 20,5)
Peru	2353 (1446, 3375)	5,3 (4,3, 6,4)	1619 (996, 2321)	23,6 (19,3, 28,3)	3972 (2842, 5192)	7,7 (6,3, 9,4)
Moldavia	1077 (684, 1504)	19,4 (16,7, 22,3)	959 (611, 1298)	50,8 (48,6, 53,0)	2035 (1504, 2581)	27,4 (23,8, 31,4)
Russian Federation	19845 (12376, 27566)	13,0 (11,3, 14,8)	16192 (10265, 22900)	48,6 (41,2, 56,1)	36037 (28992, 50258)	19,4 (17,1, 24,6)
South Africa	8238 (4952, 11848)	1,8 (1,4, 2,3)	5796 (3542, 8303)	6,7 (5,5, 8,1)	14034 (10019, 18409)	2,6 (2,1, 3,2)
Ukraine	7866 (4948, 11029)	16,0 (13,7, 18,4)	5563 (3547, 7697)	44,3 (39,9, 48,8)	13429 (9810, 17150)	21,7 (18,8, 25,1)
Great Britain	63 (33, 101)	0,7 (0,4, 1,0)	11 (3, 21)	2,6 (1,0, 5,2)	74 (42, 113)	0,8 (0,5, 1,0)
USA	159 (99–226)**	1,1 (0,9–1,4)**	34 (19–53)**	5,2 (3,5–7,4)**	159 (133, 190)	1,2 (1,0, 1,4)
Uzbekistan	4844 (2707, 7477)	14,8 (10,2, 20,4)	4985 (3094, 7059)	60,0 (48,8, 70,5)	9829 (6891, 13073)	23,9 (18,4, 30,3)

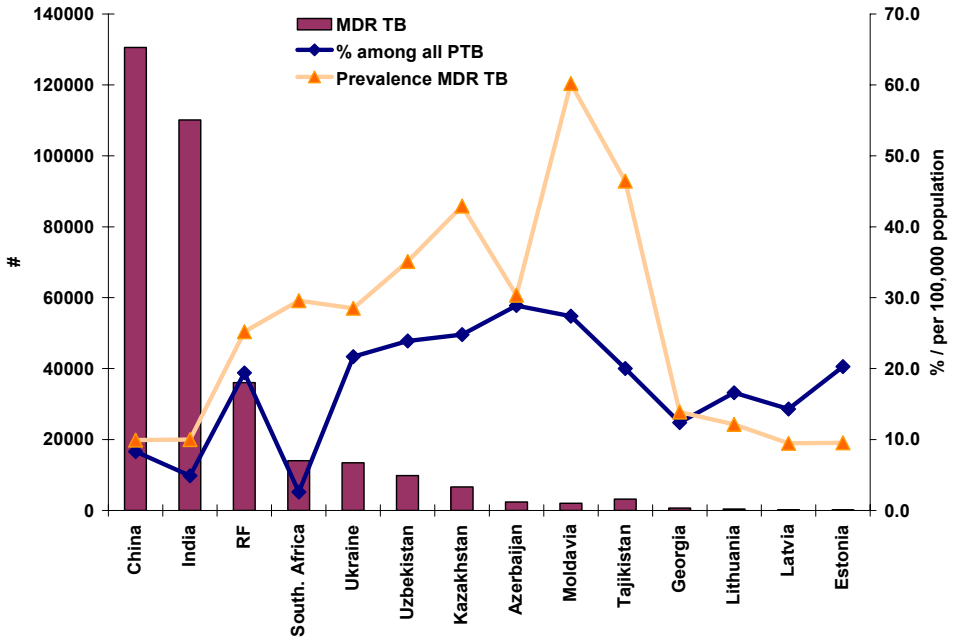
*CI – 95% confidence interval

** Estimation for the United States on new and re-treatment TB cases is given only for 2004, on all cases – for 2006.

These data [30] suggest that there were 489.139 cases of MDR TB in the world by 2006, representing 4.8% of all TB patients. Among the new TB cases, these numbers are 285.718 and 3.1%, respectively.



a) for new TB cases



b) for all cases of tuberculosis

Fig. 8.12. Multidrug resistance in the world. WHO estimates for 2006 [30]. The number and proportion of patients with MDR TB and the number of MDR TB patients in terms of population (the notification rate and prevalence of MDR TB). (Sources: [30]. population: WHO data).

The results of the mathematical estimation [30] suggests that the largest “MDR TB burden” globally has India and China - 50% of all cases of MDR TB in the world, and the Russian Federation – accounts for 7% in the world (see fig. 8.12b). The impact of MDR TB on the local population of a country (“local MDR TB burden”) is better reflected in the intensive indicators per 100 thousand population: notification rate (see fig. 8.12a) and prevalence (Fig. 8.12b). These indicators are the highest in Kazakhstan. Republic of Moldova. Tajikistan. Ukraine. Azerbaijan. South Africa and the Russian Federation.

It should be noted that the estimation of MDR TB burden strongly depends on the availability of some local data. Therefore, the highest MDR TB rates are registered among those of above mentioned countries that provide reliable and detailed information allowing statistically significant estimation of parameters.

Conclusion

The Russian Federation uses several different indicators, reflecting the spread of MDR TB. Despite the differences in the indicators, they all demonstrate increasing of MRD TB rates.

At the same time, collected data, on the basis of which until recently the indicator were calculated, not enough accurately reflected the real situation on the MDR TB spread. The implementation of new statistical tools in 2006-2007, based on the forms from Order #50 MoHSD allows a realistic assessment of the situation with MDR TB and increasing of the effectiveness of MDR TB control in Russia.

9. An external quality control of *M. tuberculosis* detection and of drug sensitivity testing in the Russian Federation

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Evaluation of epidemiological situation in the region, which is needed for the planning of TB programs, and clinical decisions on the treatment management of a particular patient are based on the results of laboratory tests. In this regard, the reliability of the results of clinical laboratory is a priority, and measures to ensure the quality of clinical laboratory tests are the main focus of each laboratory and are necessary for the successful implementation of the TB program as a whole. One of the most important parts in ensuring the quality of clinical laboratory diagnosis is an external quality control (EQC).

Information about the quality of laboratory studies are closely related to the indicators, essential for assessing epidemiological situation with tuberculosis, so this issue of an analytical review includes aggregate data on assessment of the quality of laboratory tests from the Federal System of External Quality Control in Clinical Laboratory Examinations (FSEQC or “FSVOK” on Russian) in 2007 [35, 36].

9.1 Organization of external quality assessment

An external quality control (EQC) of clinical laboratory examinations performed in Russia since 1995 under FSEQC, currently consisting of 86 sections of laboratory diagnostics and covering all types of clinical and laboratory testing. Practical activities of FSEQC are carried out by the Center of external quality control of clinical laboratory examinations.

Since 2001, FSEQC conducting an external evaluation of the quality of laboratory tests performed for diagnosis of tuberculosis. There are currently seven sections of FSEQC that focus on microbiological and molecular-genetic tests for diagnosis of tuberculosis. Since 2005, the external evaluation of the quality of drug susceptibility testing of *Mycobacteria tuberculosis* is conducted by FSEQC in collaboration with supra-national WHO laboratories. In 2007 and 2008 with the support of Russian Health Care Foundation and by the Global Fund FSEQC have been assessing the quality of:

- Microscopic detection of acid-fast bacilli (AFB) by Ziehl-Neelsen stain (ZN),
- Identify AFB using fluorescent microscopy,

- Culture detection of MbT,

- Drug susceptibility testing of *Mycobacteria tuberculosis*.

9.2 The quality of microscopic detection of AFB

In 2007 control samples on sections FSEQC “Microscopic identification of *Mycobacteria* by Ziehl-Neelsen stain” and “Identification of *Mycobacteria* by fluorescent microscopy” were sent, respectively, to 1,090 and 105 laboratories, representing 80 subjects of the Federation. Each laboratory received two sets of control samples (smears), consisting of not-stained negative smears and smears with low AFB content (6-60 AFB in 100 fields), as well as stained and not-stained smears with high AFB content (110-600 AFB in 100 fields), total 8 smears in each set. The availability in sets of stained and not-stained smears allowed, among other things, to asses quality of staining in a laboratory test. In kits for fluorescent microscopy only not-stained smears were included.

Based on the laboratory results were identified characteristics:

- Sensitivity of the tests (the percentage of detected positive smears) separately for the samples with low and high AFB content,

- Specificity of the tests (percentage of samples not containing AFB identified as negative),

- The quality of the laboratory staining (from the difference of the sensitivity of the detection of samples stained in the expert laboratory in FSEQC and samples stained in the tested laboratory for samples containing ABF).

Microscopic identification of Mycobacteria with Ziehl- Neelsen stain

Of the 1090 laboratories, to which the kits of control samples were sent, 925 (85%) of laboratories sent the results of testing of control samples, including 623 laboratory GHC institutions, 50 regional laboratories (leading regional TB control centers or TB dispensaries of the administrative subjects of the Federation) and 108 - regional institutions of TB services including regional, city, rayon TB dispensaries and TB hospitals as well as TB sanatoriums.

These laboratories of GHC represented 90% of the subjects of the Federation, and regional laboratories of TB Services - 58% of the subjects. In the absence of government statistics on the number of laboratories of GHC conducting Ziehl-Neelsen tests in each of the subjects, coverage of GHC laboratories included in the testing was estimated as the number of such per 100 thousand population of the territory. The average level of coverage of laboratories of GHC was 0.4 laboratories for 100 thousand population. The average in

Russia territorial level of participation of laboratories of GHC in the EQA equal to 0.4 per 100 thousand population, was exceeded in 41 subjects of the Federation.

At the same time the number of laboratories of GHC and TB Services equipped from IBRD project for detection of tuberculosis by microscopy reaches 2,400 and more than twice exceed the number of participants in this section FSEQC in 2007.

An analysis of results from the laboratory showed (Fig. 9.2a) that, in general, the sensitivity and specificity of tests in the laboratories of all types of institutions is quite high (specificity - 95,8%[58], sensitivity - 83,5-97,0%). At the same time, laboratories of GHC demonstrated a lower sensitivity in detection smears with low AFB content compared to the laboratories of TB services (82.3 and 88.6% respectively, p <0.01). This indicator in the laboratories of the regional TB laboratory services is not statistically different from the district level laboratories (91.6 and 87.2%, p> 0.05).

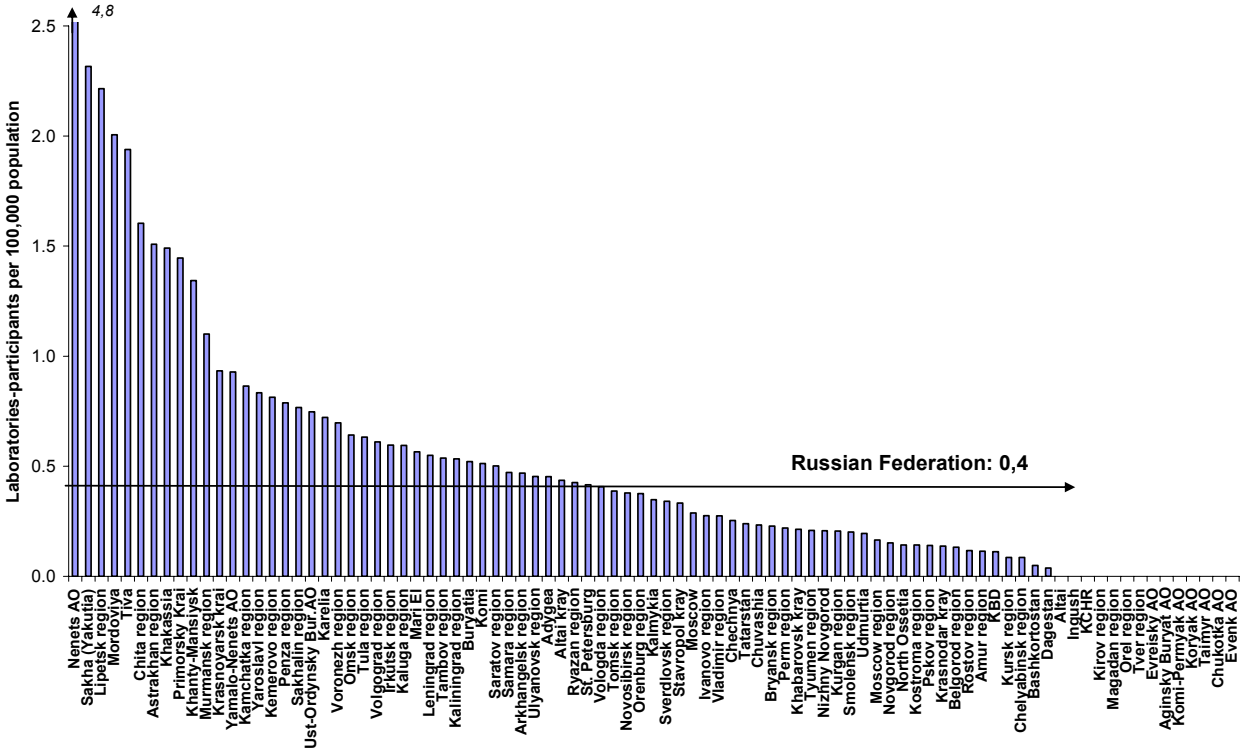


Fig. 9.1. Coverage by EQC of laboratories of GHC in the subjects of the Federation, the number of participating laboratories per 100 thousand population in the subject (Source: FSEQC).

Specificity of testing in the laboratories of GHC and TB Services not much varied and was 95.9 and 96.3%, respectively.

[58] Here and below average indicators for the laboratory were calculated as a proportion of the total number of the correct answers from all laboratories to the total number of tests in all laboratories, as the percentage

Differences in sensitivity of detection of AFB in smears stained in the tested laboratories and in expert laboratory FSEQC are indicative of the quality of smears staining in the tested laboratories: the lower the sensitivity of detection of AFB in smears stained in tested laboratories, as compared with the sensitivity of detection in the samples stained in expert laboratories, the lower is the quality of smear staining. In the laboratories of GHC and in the laboratories of the TB service this difference was 4.6-5% on average. The difference between average results in laboratories of GHC and TB Services of regional and rayon (district) levels were insignificant.

To estimate the number of territories, in laboratories of which EQC revealed problems with the quality of Ziehl-Neelsen tests, there have been established expert criteria for satisfactory results for sensitivity and specificity of testing[59]:

- The sensitivity of detecting smears with low AFB content ("sensitivity 1") must be over 85%

- The sensitivity of detecting smears with high AFB content ("sensitivity 2") stained in the tested laboratory should be more than 90%,

- The sensitivity of detecting smears with high AFB content stained in an expert laboratory FSEQC ("sensitivity 3"), should be more than 95%,

- The quality of staining, considered as the difference between the "sensitivity 3" and "sensitivity 2", should be less than 10%,

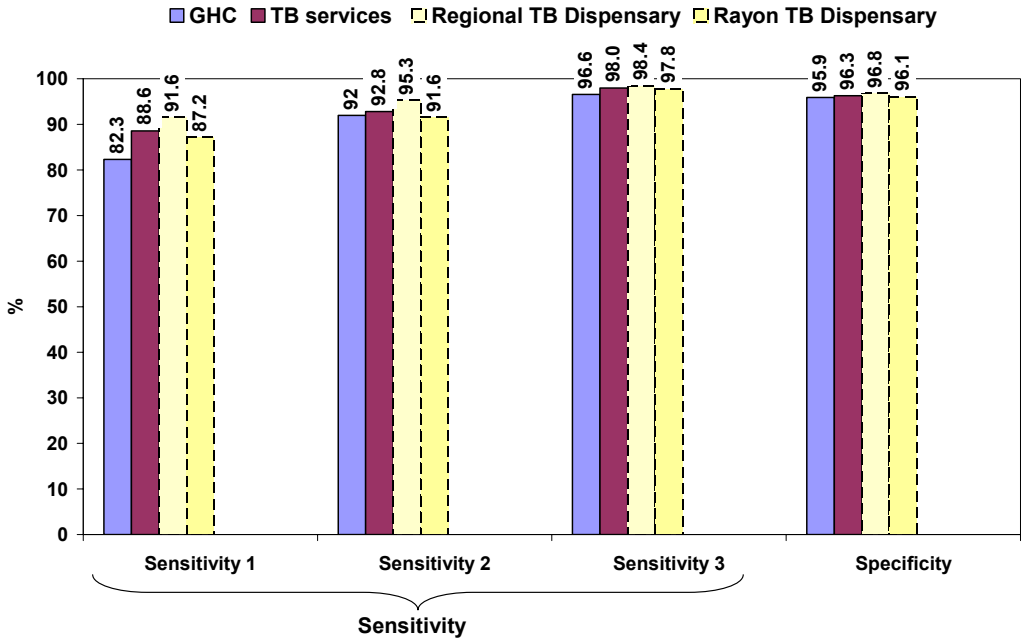
- Specificity should be more than 95%.

Data FSEQC across regions (Fig. 9.2b) show that the quality of testing significantly varies by territory. Only in 40.3% of regions average sensitivity of laboratories of GHC in detecting smears with low AFB content exceeded 85%, which was adopted as satisfactory. The proportion of regions in which the laboratory of TB Services exceeded the criterion was higher - 70.7%. The proportion of regions in which laboratory of GHC showed a satisfactory quality of staining was 67.5%. In the laboratories of rayon TB Services staining quality was satisfactory in only 55.6% of the territories, while the percentage of territories in which the quality of staining in the regional TB Services was satisfactory was 88.6%. The proportion of regions in which the laboratories showed a satisfactory level of specificity, in the case of laboratories of GHC was 67.5%, TB Services – 77.6%.

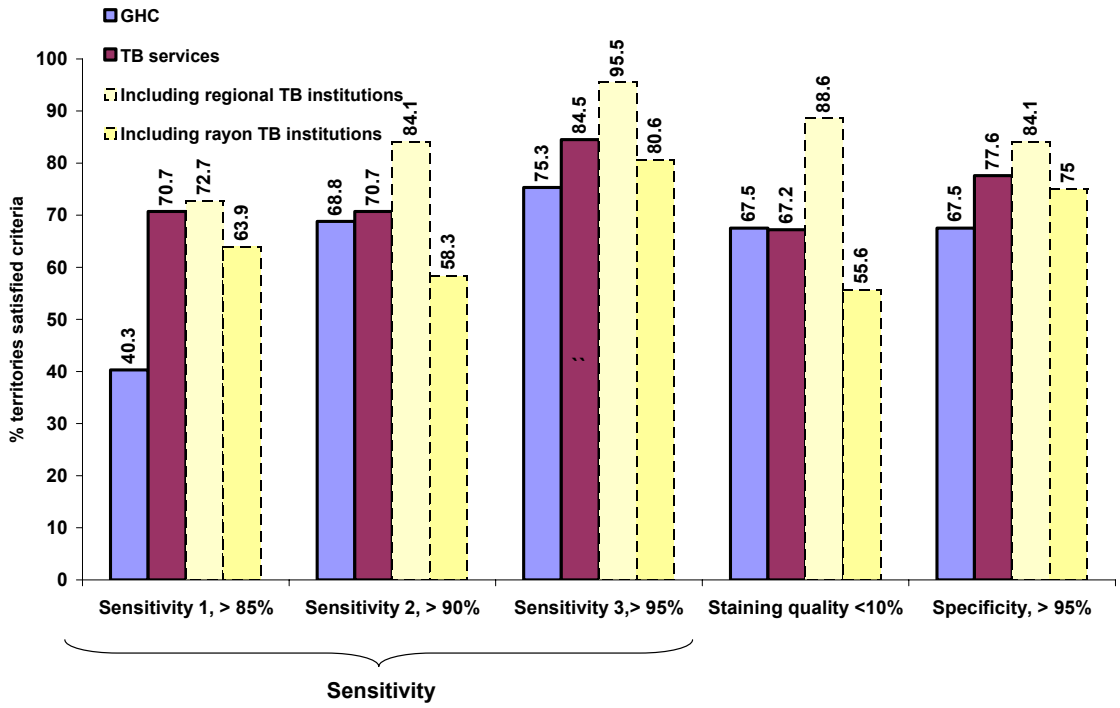
Certainly, these results only approximately reflect the quality of testing in the subjects of the Federation, in particular, because of the large variability in the number of participated laboratories in each territory (from 1 to 30). Nevertheless, if consider only the 41 territories

[59] Each criterion was evaluated overall in all participating laboratories of each tested territory

that had more than 0.4 laboratory of GHC per 100 thousand population included, the results will be similar.



a) Summary data on all laboratories



b) Assessment of the results of testing in the territories. The proportion of territories with laboratories met the criteria.

Fig. 9.2 The results of the evaluation of microscopy testing with Ziehl-Neelsen stain, 2007. Laboratories of GHC and TB services in the territories of the Russian Federation. Sensitivity 1 - sensitivity of detecting smears with low AFB content; Sensitivity 2 - sensitivity of detection detecting smears with high AFB content with staining in the tested laboratory; Sensitivity 3 - sensitivity of detecting smears with high AFB content stained in an expert laboratory FSEQC

Identification of *Mycobacteria* by fluorescent microscopy method

Control samples from section FSEQC “Identification of *Mycobacteria* by fluorescent microscopy method” were sent to 105 laboratories. The results of their testing were received from 95 laboratories (90.5%). Among them, 26 laboratories were GHC laboratories from 16 territories in Russia, and 66 laboratories were laboratories of TB Services from 37 territories, among which 31 were from regional, and 35 – rayon TB laboratory services.

Overall, the sensitivity of detection of AFB by fluorescent microscopy in control samples with both low and high AFB content was higher than that by the Ziehl-Neelsen stain method (92.0% versus 83.5% by Ziehl-Neelsen stain for samples with low AFB content and 96.5 % versus 92.8% by Ziehl-Neelsen stain for samples with high AFB content, respectively). Similar ratios were observed for both laboratories of GHC and TB services.

The average specificity of testing was comparable with the specificity of testing by Ziehl-Neelsen - 93.3%. There were no significant differences between GHC and TB Services laboratories.

9.3 The quality of culture testing for detection of *Mycobacteria tuberculosis*

In 2007, sets of control sample on FSEQC section “Culture detection of *Mycobacteria tuberculosis*” were sent to 120 bacteriological laboratories. The sets contained samples with low and high content of *Mycobacteria tuberculosis*, as well as samples containing fast growing non-tuberculosis *Mycobacteria*, easily differentiable from *Mycobacteria tuberculosis* by fast growth and morphology of the colonies, and the bacteria *E. coli* that differs from *Mycobacteria tuberculosis* by the rate of growth, colonies morphology and a lack of acid-fast staining. The results of testing of control samples were received from 100 laboratories (83.3%). TB Services laboratory, medical institutions of FSIN, Research Institutes of Tuberculosis, the Ministry of Defense and the Federal Medico-Biological Agency participated in this section FSEQC (Table 9.1). In 2007, laboratories of 37.2% leading TB regional institutions (TB dispensaries) of subject of Russian Federation participated in this section of the FSEQC.

Table. 9.1. Participants of section FSEQC "Culture Identification of MbT"

Type of institution	Number of participants
Regional TBD[60]	32
Rayon (district) TBD	45
Phthisiopulmonology and tuberculosis research Institutes	2
FSIN	17
Other	4
Total	100

Of the 77 laboratories of TB Services, only 13 correctly identified all of the 10 samples, the sensitivity of detection of *M. tuberculosis* for samples with low content of *M. tuberculosis* was 61.7% for laboratories of regional TB Dispensaries, and 58.9% for the laboratories of district TB Dispensaries. The sensitivity of detection in samples with high content of *Mycobacteria* was 79.7% and 76.7%, respectively. The ability of laboratories to correctly identify the fast growing non-tuberculosis *Mycobacteria* - *M. smegmatis* and bacteria *E.coli* (specificity) was only 83.6% and 77.8%, respectively, for laboratories of regional and rayon TB Dispensaries.

Figure 9.3 shows the percentage of laboratories of regional and rayon TB Dispensaries demonstrated satisfactory results for the identification of *Mycobacteria* in samples with low content of *M. tuberculosis* (identification of *M. tuberculosis* in more than two samples of four, or more than 50%) - 53,2%, and 44,4% for the regional and rayon TB Dispensaries, respectively, and in samples with high contents of AFB (identification of *Mycobacteria tuberculosis* in two samples of the two, or 100%) - 71.9% and 64.4%, respectively. Only 62.5% and 45.5% of regional and district level laboratories did not detect *M. tuberculosis* in all samples contained non-tuberculosis *Mycobacteria* and/or bacteria *E.coli.* The percentage of laboratories of rayon TB Dispensaries with satisfactory results was slightly lower than the percentage of laboratories at the regional level, although this difference was not statistically significant.

[60] TBD – TB Dispensary

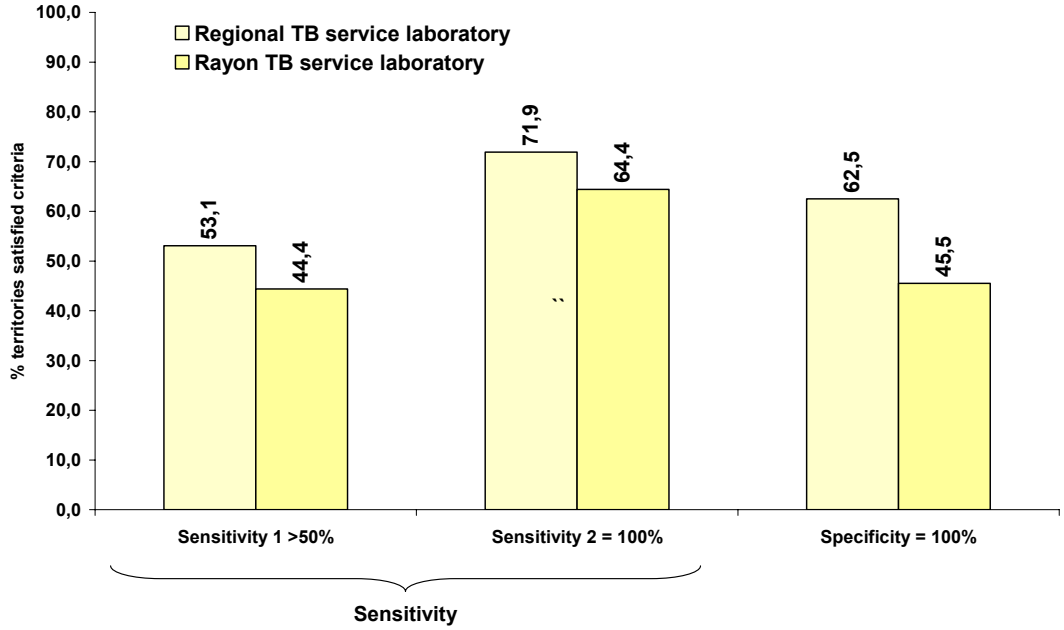


Fig. 9.3 Percentage of laboratories with satisfactory results of culture testing by the results of FSEQC. The Russian Federation, 2007. 77 laboratories of TB Services on rayon and regional levels. (Source: FSEQC).

Sensitivity 1 – correct detection of *M. tuberculosis* in the samples with low concentration of MBT, sensitivity 2 - correct detection of *M. tuberculosis* in the samples with high concentration of MBT, the specificity - the correct identification of the samples that did not contain *M. tuberculosis*.

A major concern cause the high level of false-positive results in laboratories at both levels. Such result may be related both to inadequate training of laboratory specialists, and to cultures cross-contamination, which may result from the lack of effective biosafety engineering systems, and conditions of facilities in many laboratories.

9.4 Testing of drug susceptibility of *Mycobacteria tuberculosis*

For the external assessment of the quality of drug susceptibility testing (DST), in 2007 sets of control samples, consisting of 20 strains of *M. tuberculosis*, were sent to 120 FSEQC participants. The results of testing of control samples were received from 102 laboratories, including 41 TB Services laboratory facilities at the regional level (42% of the regional TB Dispensaries), 35 - from district level TB Services laboratories and 26 institutions belonging to other agencies, including laboratories of FSIN medical institutions and FMBA (Federal Medical-Biological Agency).

Analysis of the results of studies of control samples in laboratories of TB services showed that 8 regional laboratories and 3 rayon-level laboratories showed excellent results

- correctly identified the sensitivities of all of the control strains to all four drugs. Another 9 regional laboratories and 15 rayon-level laboratories showed good results: the effectiveness of the study of sensitivity to isoniazid and rifampicin was 95% or more (no more than 1 error for isoniazid and rifampicin). Overall, the proportion of laboratories with good and excellent results of EQC was 41.5% in the laboratories at the regional level, and 51.4% in rayon-level laboratories. However, the percentage of laboratories with unsatisfactory test results (less than 90% efficiency for isoniazid and rifampicin) was 34.1% in the laboratories at the regional level, and 42.9% in rayon-level laboratories (see fig. 9.4).

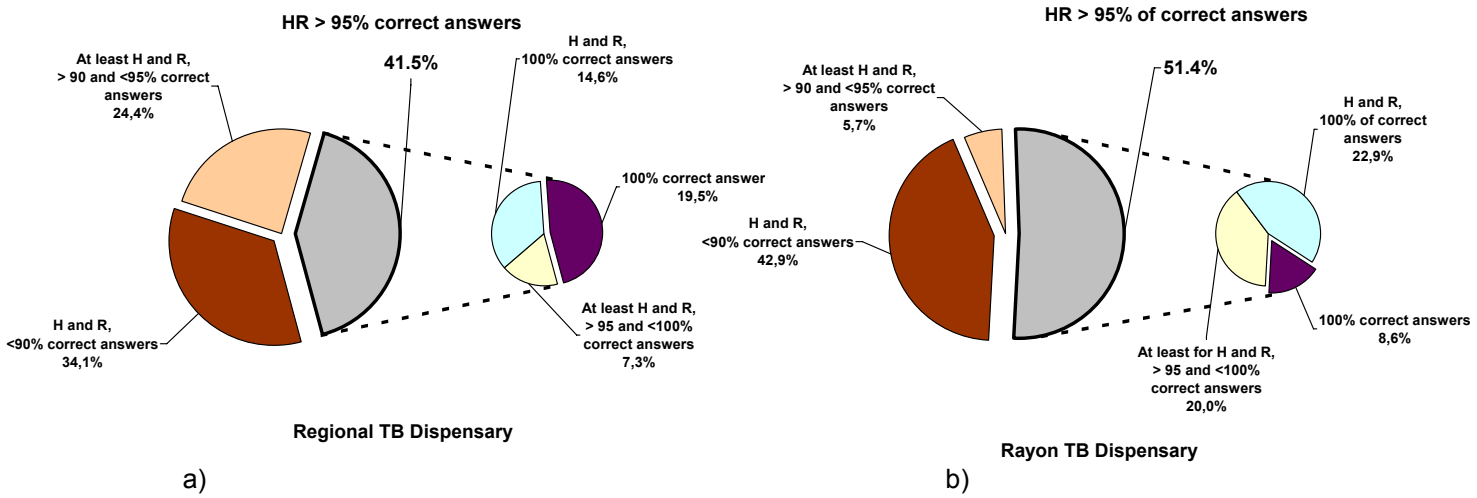


Fig. 9.4. The results of EQC studies of drug sensitivity of M. tuberculosis, 102 TB services laboratories, the Russian Federation, 2007. Proportion of laboratories that have the following results:
- All the correct results for determining the sensitivity to all anti-TB drugs - an excellent result;
- All the correct results for determining the sensitivity to H (isoniazid) and R (rifampicin) - a good result
- 95% or more correct results for determining the sensitivity to H (isoniazid) and R (rifampicin) - a good result
- 90 - 95% correct results for determining the sensitivity to H (isoniazid) and R (rifampicin) - a satisfactory result
- Less than 90% of correct results for determining the sensitivity to H (isoniazid) or R (rifampicin) - an unsatisfactory result.

Conclusion

External quality assessment is an integral part of quality assurance systems of each clinical laboratory. However, proportion of laboratories performing tests for the diagnosis of tuberculosis that took part in the relevant FSEQC assessments in 2007 was insufficient. The number of laboratories conducting Ziel-Nielsen staining and taking part in the EQC in 2007 did not exceed 0.5 per 100 thousand population in most regions. Only 41% of regional

bacteriological laboratories participated in EQC of drug sensitivity testing, and 37.2% - in EQC of culture identification of *Mycobacteria tuberculosis*.

Analysis of the FSEQC results on assessment of the quality of laboratory examinations has revealed significant problems in the laboratories of both GHC and TB Services, especially on the rayon level. Obviously, the existence of these problems can lead to significant errors in determining such epidemiological indicators as the number of newly diagnosed patients, the proportion of patients with positive microscopy and culture, and the prevalence of drug resistance of *M. tuberculosis*.

10. The network of TB service facilities. Resources

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Changes in the TB epidemiological situation are directly related to the capacities of TB services to perform effective and comprehensive TB control activities. Therefore, it is interesting to know how many resources are being used by TB services to fight the epidemic.

10.1. In-patient and sanatorium care

As of December 31, 2007, in TB services in the Russian Federation were 71,358 hospital beds for adult TB patients (which is 646 beds less than in 2006) and 6,771 beds for children; 7,980 sanatorium beds for adults and 15,555 for children (table 10.1). In addition, TB services had 6,703 other beds for adults and 495 beds for children available, of which 5,175 were located at central district hospitals (CDH) (of these 176 – for children); 1,280, at polyclinics of the research institutes (of these 164 – for children); and 401, at clinics of higher education facilities (of these 60 – for children). At TB dispensaries, there were 54,687 beds (64.1% of all beds).

Table 10.1. The number of TB Dispensaries and the number of beds in TB service in the Russian Federation (Source: the state statistical registration form #30)

Indicators	Years (as of 1 January of that year)					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**
The number of TB dispensaries	**482**	**479**	**470**	**466**	**386**	**354**
The number of TB beds: hospital	**81,425**	**80,246**	**79,273**	**78,710**	**78,775**	**78,129**
per 10000 population	**5.7**	**5.6**	**5.5**	**5.5**	**5.2**	**5.**
The number of TB beds: hospital for adults	**74,208**	**73,316**	**72,450**	**72,286**	**71,994**	**71,358**
per 10000 adult population	6.6	6.5	6.3	6.3	6.3	6.2
The number of TB beds: hospital for children 0-14 years	**7,217**	**6,930**	**6,823**	**6,424**	**6,781**	**6,771**
per 10000 children 0-14 years	3.0	3.0	3.1	3.0	3.2	3.2
The number of TB sanatoriums	**206**	**205**	**198**	**193**	**191**	**185**
including those for children	**143**	**143**	**141**	**140**	**140**	**135**
The number of TB beds: sanatorium for adults	**9,766**	**9,317**	**8,792**	**8,697**	**8,070**	**7,980**
per 10000 adult population	0.9	0.8	0.8	0.8	0.7	0.7
The number of TB beds: sanatorium for children 0-14 years	**17,126**	**17,083**	**16,507**	**16,306**	**16,130**	**15,555**
per 10000 children aged 0-14 years	7.1	7.4	7.4	7.6	7.7	7.4

With the adoption of the Federal Law of 06.10.2003 #131-FZ «On General Principles of Local Self-Government in the Russian Federation», local authorities refer to the level of the Russian Federation, the specialized agencies of health, including TB. The process of building the relationship between municipal and regional levels of health care is in the formative stage and requires the development of such a mechanism of interaction on levels of health management, where the availability and quality of care will be improved. At the same time, the TB service operates as part of the health care system, which for 15 years had serious ideological and structural changes.

Currently in the process of transition from a decentralized model to a centralized service (zonal) model, where the manager of the sole financier and anti-government institutions is the subject of the Russian Federation. Some clinics in the transfer of the ownership of the subject (from the municipal jurisdiction) loses its legal independence, becoming a branch of zonal or regional TB dispensaries headaches (see Table 10.1). This decreases the number of beds in the TB dispensaries. For 10 years, with increasing incidence and prevalence of tuberculosis, the number of TB beds for adults has decreased by 28%. As a result, the number of patients with active tuberculosis per bed increased by 3 times.

Simultaneously with the decrease in the number of beds the average number of days of bed in the year increased, the turnover of beds and reduced average length of patient stay in bed. However, this did not happen. In 2007 on average adult bed worked for 316.4 days per year (321.1 in 2006), for children - 307.2 (313.0 in 2006), turnover of beds for adults was 3.5 (3, 7 in 2006), children bed - 3.4 (3.3 in 2006). Average length of stay of patients in 2007 was equal to 91.2 days for adults and 90.8 for children.

This could be explained by the decrease in the number of patients who needed care, and as a consequence of the decrease in the number of newly diagnosed patients and patients with active tuberculosis. However, in the Russian Federation there is continued to be registered quite high number of patients with active chronic forms of tuberculosis, including patients with MDR TB, treatment of which requires a longer period. Most likely, the above trends are linked to the deterioration of work to starting treatment and retaining patients on treatment.

Alarming decrease of 10,2% of the TB offices (cabinets), from 2,050 in 2005 to 1,840 in 2007. This slightly increased the number of visits to doctors working in outpatient clinics of anti-TB dispensaries (16,320.5 thousands visits in 2006, 16,372.1 thousand visits in 2007), and decreased the number of visits at home with 701.8 thousands visits in 2006 to 682.8 thousands visits in 2007.

In total, in the Russian Federation there are operates 56 tuberculosis sanatoriums for adults, of which 50 are year-round, and 6 - seasonal. Tuberculosis sanatorium for adult TB patients operate in less than half (37) territorys of the Russian Federation. This make difficult the provision to TB patients sanatoria and rehabilitation measures in the subjects that do not have their own TB sanatoria, reduces the accessibility of sanatorium stage of treatment for TB patients.

The situation is exacerbated by the continuing decline in the number of tuberculosis sanatoria beds. In 2002, there were functioning 9,766 year-round tuberculosis sanatorium beds. By 2007 the number of year-round sanatorium beds decreased by 18.3%. Overall in 2007, there were working 9,440 TB sanatorium beds (7,980 year-round and 1,460 seasonal).

On average, in the Russian Federation in 2007 per 1 adult patient in the TB sanatorium there were 49.8±24.9 bed-days (in year-round sanatoriums - 47.7±22.3, in seasonal sanatoriums – 84.0±15.8). In 2007 sanatorium treatment received 43,187 patients.

Specialized sanatoriums for patients with tuberculosis of bones and joints for adults are located in Tambov, Kaliningrad, Rostov, Ulyanovsk regions, Perm Krai, Republic of Buryatia and Tuva. Total number of beds in these sanatoriums was 935 beds in 2007. During the period of maximum deployment there were operated 965 beds.

A total of 135 year-round children's tuberculosis sanatoria operates in the Russian Federation. For children there are also two specialized sanatoriums for the treatment of tuberculosis of bones and joints: in Ryazan and Tyumen regions. The average length of stay of a child in sanatoria is 71.6±55.0 days.

According to the state statistical reporting form #47 in 2007 in children's tuberculosis sanatorium there were admitted 57,292 children. Most of these patients are children from a different “risk groups” for TB (inlcuding social).

During the period from 1999 to 2007 the total number of patients with active tuberculosis, hospitalized in tuberculosis sanatoriums decreased by more than 1.5 times (from 29,525 to 18,609), and the number of children - nearly 4 times (from 4,157 to 1,062) .

10.2. Human Resources

Based on statistical reporting form #47 as of December 31, 2007, the Russian Federation TB services had 48,225 posts, including 14,952 physician posts, including 6,524 posts in dispensaries, and 33,273 mid-level medical worker posts, including 9,900 posts in dispensaries. There were 8,565 physicians ,including 8,363 in dispensaries (sharing efforts ratio 1.7) and 31,990 mid-level medical workers working in the service.

The number of TB staff decreases every year. Some of them get transferred to the staff of hospitals, at the time of conversion of TB dispensaries, which have a legally independent status, into departments of central municipal hospitals. From 2000 to 2007, the number of persons employed in TB services of the MoH decreased by 8.2%, including physicians – by 14.0%. The TB physician to population ratio is 0.6 physicians per 10,000 population. Among TB physicians, 63.6% have received certification of specialization, and 32.3% have received the highest category.

Table 10.2. Characteristics of human resource capacity of TB Services, the Russian Federation, 2004-2006. (Source: Form #17 "Information on medical and pharmaceutical personnel")

Year	Number of TB physicians, total	Including on the main work in the institutions of human resources training, research institutes and head institutions	of the total number of physicians have qualification category			Certificate of the specialist
			Highest	1	2	
2004	9,062	581	2,477	2,139	793	7,418
2005	9,027	501	2,647	2,117	757	7,527
2006	8,813	483	2,712	2,075	755	7,563
2007	8,565	458	2,773	2,037	641	7,612

In line with the country's program for provision of free medical care to all citizens, approved by RF government regulation #461 on July 28, 2005, specialized medical care for TB patients is to be financed from the budgets of the RF territories.

In the joint letter of the Deputy Minister of Healthcare and Social Development V.I. Starodubov (# 4076-BC) and the director of the Mandatory Health Insurance Federal Fund A.M. Taranov (# 3986/40-3/и), dated August 22, 2005, standards were presented for the provision and financing of specific components of TB services:

а) for TB inpatient clinics:

hospitalization rate – 4.0 hospitalizations per 1,000 population per year;

average duration of stay in an inpatient clinic for 1 patient – 79.4 days;

number of bed-days per 1,000 population: total – 317.7; of them for adults – 299.07; and for children – 18.68;

bed occupancy – 340 days a year;

bed turnover – 4.28 patients a year;

cost standard per 1 bed-day of hospitalization – 491.20 rubles;

б) for daytime inpatient clinics at the TB polyclinics (dispensary departments, TB units):

number of patient-days per 1,000 population: total - 16,8; including those for adults– 11.8; for children – 5.0;

working days – 300 days a year (6-day working week);

cost standard per 1 patient/day – 168.82 rubles;

в) for TB polyclinics:

number of visits a year per 1,000 population: total – 185.6; including those for adults – 167.4; for children – 18.1;

cost standard per 1 visit: for adults – 105.15 rubles, for children – 104.81 rubles.

The function of a TB specialist is calculated on the basis of the following standards: per 1 position there are 30 round-the-clock beds or 30 beds at a daytime inpatient clinic or 5.4 thousand appointments a year. There should be 0.67 TB specialists per 10,000 population.

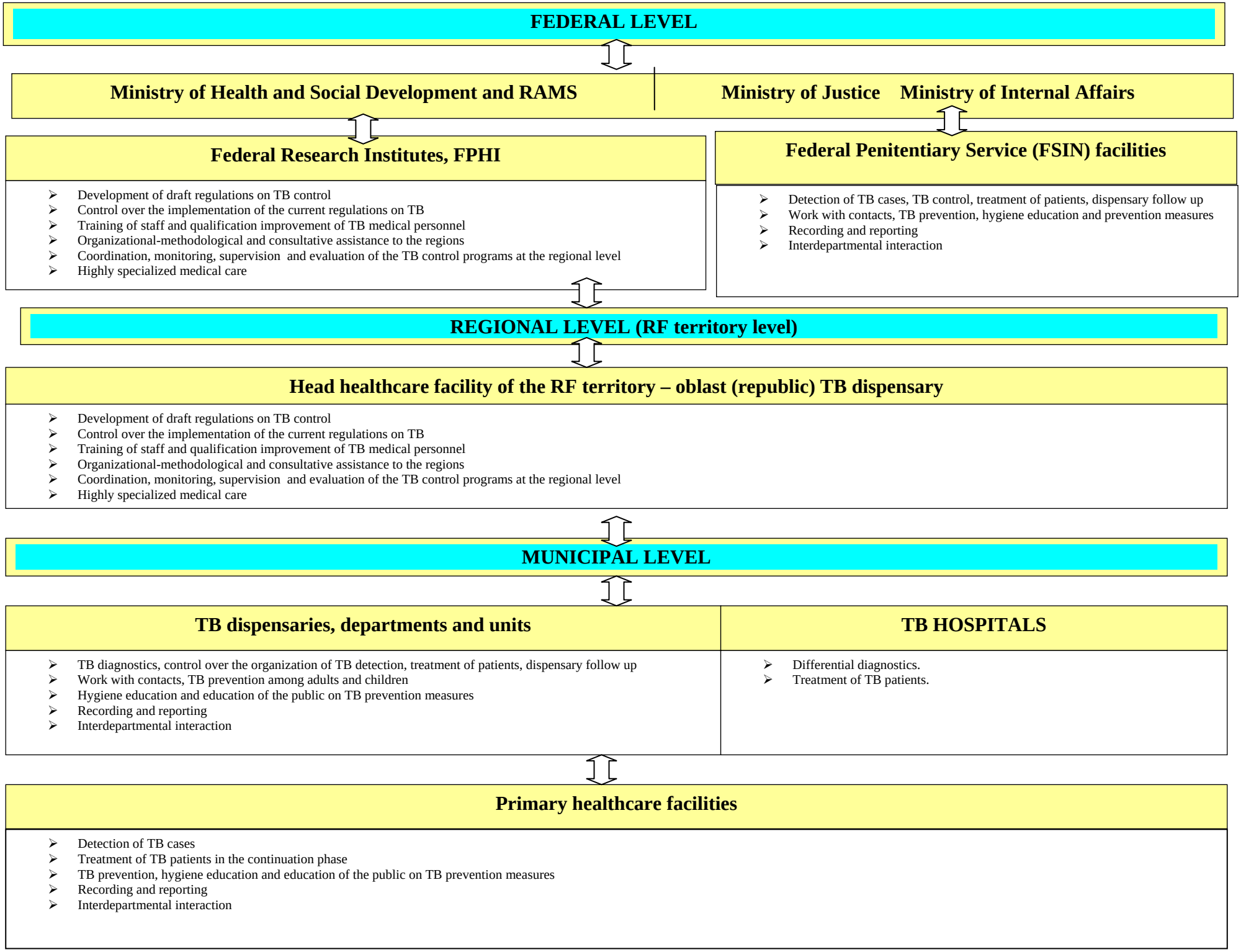
In total, the per person standard of TB services financing is 178.39 rubles per person per year, or 10.1% of the healthcare budget of the RF territory. The given standard does not take into account municipal coefficients and costs related to the provision of necessary drugs to those categories of the population eligible for state social care in the form of social services.

The standards of sanatorium care for TB patients were not provided.

In accordance with the above mentioned regulations overall in Russia, the number of TB specialists reaches 89.6% of the benchmark standard. The number of inpatient TB beds meets 61.6% for adults, for children – 91.8% of the standard.

The structure of TB care provision at all levels can be presented in the following chart, which shows the functional responsibilities of the main treatment and prophylactic facilities involved in TB care.

(Abbreviations on the chart: RAMN – Russian Academy of medical science, FPHI – Federal public health institute)


FEDERAL LEVEL
Ministry of Health and Social Development and RAMS
Ministry of Justice
Ministry of Internal Affairs
Federal Research Institutes, FPHI
Development of draft regulations on TB control
Control over the implementation of the current regulations on TB
Training of staff and qualification improvement of TB medical personnel
Organizational-methodological and consultative assistance to the regions
Coordination, monitoring, supervision and evaluation of the TB control programs at the regional level
Highly specialized medical care
Federal Penitentiary Service (FSIN) facilities
Detection of TB cases, TB control, treatment of patients, dispensary follow up
Work with contacts, TB prevention, hygiene education and prevention measures
Recording and reporting
Interdepartmental interaction
REGIONAL LEVEL (RF territory level)
Head healthcare facility of the RF territory – oblast (republic) TB dispensary
Development of draft regulations on TB control
Control over the implementation of the current regulations on TB
Training of staff and qualification improvement of TB medical personnel
Organizational-methodological and consultative assistance to the regions
Coordination, monitoring, supervision and evaluation of the TB control programs at the regional level
Highly specialized medical care
MUNICIPAL LEVEL
TB dispensaries, departments and units
TB diagnostics, control over the organization of TB detection, treatment of patients, dispensary follow up
Work with contacts, TB prevention among adults and children
Hygiene education and education of the public on TB prevention measures
Recording and reporting
Interdepartmental interaction
TB HOSPITALS
Differential diagnostics.
Treatment of TB patients.
Primary healthcare facilities
Detection of TB cases
Treatment of TB patients in the continuation phase
TB prevention, hygiene education and education of the public on TB prevention measures
Recording and reporting
Interdepartmental interaction

Conclusion

The first years of the 21st century in the Russian Federation have been characterized by a certain stabilization of the main epidemiological TB rates and indicators, reflecting the effectiveness of TB activities. At the same time, the situation remains quite severe.

Numerous factors have an impact on the spread of TB and require thorough study. At the same time quality of data analysis depends substantially on an effectiveness of functioning statistical system, which includes recording and reporting forms and indicators. ensured adequate measures and evidence based decisions

This review has been devoted to assessing the TB situation in the Russian Federation with an emphasis on the use of existing statistical reporting data on TB and the main available indicators, which we believe have allowed us to conduct an adequate analysis of the information.

The facts revealed in the analytical review tell us that the TB situation in the Russian Federation is quite complex and that there is a need for further improvement of TB control activities and implementation of modern strategies to fight this disease. In doing such, it is important to apply both the rich expertise of Russian phthisiology and the international experience, including experience of neighboring European countries.

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Annex 1

Definitions used in the Russian Federation for dispensary groups and patient groups based on registration history and treatment outcomes

Definitions approved by the Russian Ministry of Health Executive Order #109 of 23.03.2003 "On improvement of TB activities in the Russian Federation" (16).

1. Groups of dispensary follow up and TB registration for adult patients of TB facilities.

Group Zero (0) - for the follow up of persons with unspecified TB activity (cases suspected of TB) and in need of differential diagnosis of TB of any site; persons in need of specifying of TB activity are included in group 0 subgroup A (0-A); persons in need of differential diagnostics of TB and other diseases are included in group 0 subgroup B (0-B).

I-A (MbT+)[61] **-** for the follow up of new TB cases MbT+.

I-A (MbT-) - for the follow up of new TB cases MbT-.

I-Б (MbT+) - for the follow up of TB relapses MbT+.

I-Б (MbT-) - for the follow up of TB relapses MbT-.

I-B - for the follow up of patients with premature treatment interruptions and patients avoiding evaluation. Patient transfer to group I-B occurs 1 month after a failed contact.

II-A - for the follow up of patients with chronic TB who may be cured with intensive treatment.

II-Б - for the follow up of patients with chronic TB in need of rehabilitation, symptomatic treatment and when indicated – in need of TB therapy.

III - for persons with non-active TB indications after clinical cure.

2. Groups of dispensary follow up and registration of children and adolescents at TB facilities

Group Zero (0) – follow up of children and adolescents referred to TB services for specifying the nature of a positive sensitivity to tuberculin and/or for differential diagnostics for the purpose of confirmation or exclusion of TB of any site.

Group I A - patients with active forms of disseminated and complicated TB of any site.

Group I Б - patients with active TB at any site with small and non-complicated TB forms.

Group II - patients with active TB at any site with chronic disease.

Group III - children and adolescents at risk of TB relapse at any site. It includes 2 subgroups: **III-A –** new cases with residual post-TB changes; **III-Б –** persons transferred from groups I and II, as well as from subgroup III-A.

Group IV - children and adolescents in contact with sources of TB infection. It has two subgroups: **IV-A –** persons in contact with MbT+ family members, relatives and household, as well as in contact with MbT+ individuals at the facilities for children and adolescents; children and adolescents living in the territory of TB facilities; **IV-Б –** persons in contact with active MbT- TB patients; from families of livestock farmers working at farms with unfavorable TB situations, as well as from families with livestock having TB.

[61] MbT - mycobacteria of tuberculosis, see the list of abbreviations

Group V – children and adolescents with complications after TB vaccinations. It includes 3 subgroups: **V-A** – patients with generalized and extended lesions; **V-Б –** patients with local and circumscribed lesions; **V-B –** patients with non-active localized complications, both new cases and transferred from groups V-A and V-B.

Group VI – persons at high risk of localized TB. It includes 3 subgroups: **VI-A –** children and adolescents at an early stage of primary TB infection (conversion of tubercular tests); **VI-Б –** previously infected children and adolescents with hyperergic reaction to tuberculin; **VI-B –** children and adolescents with increasing tuberculin sensitivity.

3. General definitions.

Chemotherapy regimen – The combination of TB drugs, duration of their administration, time and scope of follow up evaluations, as well as organizational forms of treatment, based on patient group.

Tuberculosis of uncertain activity – Uncertain changes in TB activity in the lungs and other organs.

Active tuberculosis – a specific inflammatory process caused by TB mycobacteria (MbT) which can be detected by a complex of clinical, laboratory and radiological evidences.

Chronic course of active TB forms – long-term (over 2 year), undulating course of the disease with the alternation of remissions and exacerbations, when the clinical, radiological and bacteriological evidence of TB process activity persists.

Clinical cure – disappearance of all evidence of the active TB process as the result of a performed basic course of the comprehensive treatment. Declaration of a clinical cure from TB and the moment of completion of the effective course of the comprehensive treatment are defined by the lack of evidence of any TB process developing within 2-3 months.

Criteria of treatment effectiveness are:

- disappearance of clinical and laboratory signs of TB inflammation;
- continued cessation of bacterial excretion confirmed by microscopy and culture tests;
- regression of radiological manifestations of TB (focal, infiltrative, destructive);
- rehabilitation of patient functional and working abilities

Patients with bacterial excretion (bacteriological positive TB patients) – TB patients who have MbT detected in their biological fluids and/or pathological material. Among extrarespiratory TB cases, patients with bacterial excretion are those who have MbT detected in fistula discharge, in urine, menstrual blood and discharges of other organs.

Multi-drug resistance – Resistance to both isoniazid and rifampicin, with or without resistance to any other TB drugs.

Polyresistance – Resistance to any two or more TB drugs without resistance to both isonizid and rifampicin.

Bacteriological conversion (dispensary follow up definition) – disappearance of MbT from bodily fluids and pathological discharges excreted into the external environment. This requires confirmation by two consecutive microscopy and culture tests with an interval of 2-3 months after the first negative test result.

Residual post-TB effects – dense calcinated foci and foci of varying size, fibrotic and cirrhotic changes (including residual sanified lesions), plural thickenings, post-surgical changes in the lungs, pleura and other organs, as well as functional deviations after clinical cure. Single (as many as 3) small (up to 1 cm), dense and calcinated foci, circumscribed fibrosis (within 2 segments) are considered to be minor residual effects. All other residual effects are considered major.

Destructive TB – an active form of the TB disease course with cavitations confirmed by a complex of radiological methods of examination. The main detection method for destructive changes in the organs and tissues is x-ray examination (radiological - radiograms, tomograms).

Exacerbation (progressing) – appearance of new evidence of the active TB process after a period of improvement, and aggravation of the disease during follow up in groups I and II prior to the diagnosis of clinical cure. Exacerbation is evidence of failing treatment which requires treatment adjustment.

Relapse – appearance of new evidence of active TB in persons with a previous history of TB and cured; these are patients from follow up group III or purged from the registry due to cure.

Definitions approved by Russian Ministry of Health Executive Order # 50 of 13.02.2004 "On the introduction of recording and reporting documentation for TB monitoring" (16).

1. Groups of patients by their registration for treatment:

New cases – patients who have never had treatment for TB or have taken TB drugs for less than one month[62].

Relapses – new episodes of disease in patients with a previous effective course of chemotherapy and new evidence of active TB, including positive results of sputum microscopy or culture tests and/or clear clinical-radiological evidence of TB.

Treatment after failure – treatment after a previous ineffective course of chemotherapy (persistent bacterial excretion or a new episode of bacterial excretion confirmed by any method at month 5 or later during treatment, or clinical and radiological confirmation of a failed course).

Treatment after default – treatment of patients after a treatment interruption for 2 months or more.

Transferred out (for treatment continuation) – patients who have arrived from another administrative territory or another department (another registry), where they had initiated a chemotherapy course; these patients are registered for the continuation of treatment and the corresponding information on those patients is available.

Other – patients who do not meet any of the definitions given above, but for whom a decision has been made about provision of a chemotherapy course.

2. **Treatment outcomes**

Successful course of chemotherapy confirmed by smear microscopy - a treatment outcome, in which a patient had positive sputum smear microscopy results prior to treatment initiation, received all doses of the drugs indicated in the treatment regimen, and by the end of the course had at least two negative sputum microscopy results registered at month 5 and later during treatment.

Successful course of chemotherapy confirmed by culture - a treatment outcome, in which a patient had positive culture results prior to treatment initiation, and by the end of the course had at least two negative sputum culture results registered at month 5 and later during treatment.

Successful course of chemotherapy with clinical and radiological confirmation -

a treatment outcome, in which a patient:

[62] According to Executive Order #109 (11), the Central Consultative Committee of Physicians makes decisions about the registration of new cases and patients' removal from the registry when a TB specialist or other expert from a TB facility (TB ward) presents the case to the Committee review.

- had negative results of sputum smear microscopy and culture before treatment initiation, received all doses of the drugs indicated in the treatment regimen, and had negative sputum microscopy and culture results registered at all stages of treatment;

- had positive sputum microscopy and/or culture results prior to treatment initiation, received all doses of the drugs indicated in the treatment regimen, but did not have the necessary number of negative sputum microscopy and culture results registered at month 5 and later during treatment.

Failed course of chemotherapy - a treatment outcome when a patient remains smear positive or becomes smear positive at month 5 or later during treatment.

Failed course of chemotherapy confirmed by sputum culture - a treatment outcome when a patient had positive culture results at the beginning of treatment and the results remain positive at month 5 or later during treatment

Failed course of chemotherapy with clinical and radiological confirmation - a treatment outcome when a patient had negative smear microscopy and culture results at the beginning of treatment, and the results remained negative at all stages of treatment, but there was clear clinical and radiological evidence of progressive TB at month 5 or later during treatment.

Died of TB - a treatment outcome registered in the case of patient death from TB during the treatment course.

Died of other causes - a treatment outcome registered in the case of patient death during the course of treatment of causes other than TB.

Chemotherapy default (interruption) - a treatment outcome in which a patient has interrupted the course of chemotherapy for 2 or more months.

Transferred out - patients who have left the administrative territory or was transferred from one department to another (e.g.: released from a prison where TB treatment was initiated) and the final treatment outcome is unknown.

Cohort – patients registered during a specified quarter.

Basic course of chemotherapy of TB patients – a complex of treatment activities, which includes intensive and continuation phases for the achievement of clinical cure of the active TB disease course.

Table 1. TB notification in Russsia, 2003-2007

(territorial notification rate, form #8)

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases all localization										incl. Respiratory TB										incl. Pulmonary TB			
		#					per 100K					#					per 100K					#		per 100K	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2006	2007	2006	2007
	RUSSIA	**118564**	**118924**	**119226**	**117646**	**118367**	**82.7**	**83.3**	**84.0**	**82.6**	**83.23**	**113993**	**114504**	**114941**	**113509**	**114396**	**79.5**	**80.2**	**81.0**	**79.7**	**80.4**	**105587**	**106663**	**74.1**	**75.0**
	REGION: Central	23120	23266	22687	22012	23332	61.1	61.8	60.6	59.0	62.7	22162	22304	21719	21125	22482	58.6	59.3	58.0	56.7	60.4	19676	20996	52.77	56.4
1	**Regions: Belgorod**	1029	1077	879	942	879	68.0	71.2	58.2	62.3	58.1	984	1046	846	895	832	65.1	69.2	56.0	59.2	55.0	853	800	56.4	52.9
2	Bryansk	1125	1156	1194	1168	1259	82.2	85.4	89.2	88.2	95.6	1052	1105	1116	1108	1204	76.9	81.6	83.3	83.7	91.4	1030	1131	77.77	85.8
3	Vladimir	1233	1084	1085	1189	1161	81.6	72.5	73.3	81.1	79.5	1207	1056	1058	1151	1133	79.8	70.6	71.5	78.5	77.6	1071	1037	73.05	71.0
4	Voronezh	1731	1588	1643	1509	1597	73.2	67.8	70.7	65.5	69.6	1658	1525	1566	1440	1512	70.1	65.1	67.4	62.5	65.9	1345	1441	58.37	62.8
5	Ivanovo	728	587	647	672	578	64.0	52.3	58.4	61.4	53.1	695	562	612	650	561	61.1	50.1	55.3	59.4	51.6	609	525	55.67	48.3
6	Kaluga	675	745	827	741	721	65.3	72.7	81.2	73.2	71.5	629	688	774	695	681	60.8	67.1	76.0	68.7	67.5	635	633	62.77	62.7
7	Kostroma	385	401	352	327	304	52.7	55.6	49.4	46.3	43.3	371	391	342	312	298	50.8	54.2	47.9	44.2	42.4	294	274	41.67	39.0
8	Kursk	913	896	978	932	892	74.7	74.2	82.1	79.2	76.2	876	868	942	904	866	71.6	71.9	79.1	76.8	74.0	838	795	71.18	67.9
9	Lipetsk	936	831	850	877	943	77.6	69.5	71.7	74.5	80.3	884	787	808	833	904	73.3	65.8	68.2	70.8	77.0	807	892	68.54	76.0
10	Moscow	3774	3677	3553	3483	3921	57.0	55.5	53.6	52.5	59.0	3646	3536	3433	3368	3814	55.1	53.4	51.8	50.7	57.4	3139	3590	47.3	54.0
11	Orel	520	522	500	496	481	60.9	61.7	59.7	59.7	58.2	502	498	478	478	461	58.8	58.9	57.0	57.6	55.8	441	435	53.12	52.6
12	Ryazan	944	977	947	927	971	77.6	81.3	79.7	78.7	82.8	908	939	911	892	944	74.7	78.2	76.7	75.8	80.5	835	873	70.93	74.5
13	Smolensk	1013	1040	975	1009	899	97.5	101.4	96.3	100.9	90.5	979	1005	937	979	876	94.2	98.0	92.5	97.9	88.2	901	802	90.13	80.7
14	Tambov	873	894	792	738	750	74.8	77.6	69.6	65.7	67.1	823	844	754	705	709	70.6	73.3	66.3	62.7	63.5	656	670	58.38	60.0
15	Tver	1043	1118	1119	1138	1104	71.7	77.9	79.0	81.4	79.4	1020	1105	1102	1118	1089	70.1	77.0	77.8	79.9	78.3	1049	993	75.01	71.4
16	Tula	1572	1756	1485	1261	1228	94.9	107.5	92.2	79.3	77.7	1518	1674	1419	1218	1166	91.6	102.5	88.1	76.6	73.8	1133	1070	71.25	67.7
17	Yaroslavl	916	904	884	806	819	67.5	67.2	66.3	60.9	62.0	875	844	837	755	788	64.5	62.8	62.8	57.0	59.7	658	699	49.7	52.9
18	**City: Moscow**	3710	4013	3977	3797	4825	35.7	38.6	38.2	36.4	46.2	3535	3831	3784	3624	4644	34.0	36.8	36.3	34.7	44.5	3382	4336	32.41	41.5
	REGION: Nortwestern	8886	8993	8951	8684	8426	64.0	65.3	65.4	63.9	62.2	8530	8692	8641	8364	8135	61.4	63.1	63.2	61.5	60.0	7558	7257	55.62	53.6
19	**Republics: Kareliya**	548	532	527	477	491	77.0	75.4	75.3	68.6	70.8	521	505	500	459	468	73.2	71.5	71.4	66.0	67.5	429	435	61.7	62.8
20	Komi	907	843	862	796	926	89.7	84.2	87.0	81.2	95.0	852	807	817	744	879	84.3	80.6	82.5	75.9	90.2	689	827	70.32	84.9
21	**Regions: Arkhangelsk**	954	953	858	942	756	72.0	72.7	66.1	73.3	59.1	931	924	839	921	740	70.2	70.5	64.6	71.6	57.8	872	688	67.82	53.7
	Nenetsky AD	20	20	21	23	17	47.9	47.7	50.0	54.8	40.5	19	17	19	23	17	45.5	40.6	45.3	54.8	40.5	22	15	52.41	35.7
22	Vologda	677	690	633	564	575	53.7	55.2	51.0	45.8	46.8	641	657	597	534	552	50.8	52.5	48.1	43.4	45.0	489	510	39.7	41.5
23	Kaliningrad	1109	1206	1185	1265	1256	116.5	127.3	125.7	134.8	134.0	1077	1174	1165	1225	1227	113.1	123.9	123.6	130.5	130.9	1048	1088	111.7	116.1
24	Leningrad	1141	1201	1249	1207	1134	68.6	72.5	75.8	73.6	69.2	1105	1178	1225	1180	1104	66.4	71.1	74.3	71.9	67.4	1106	1027	67.41	62.7
25	Murmansk	588	580	574	500	497	66.4	66.2	66.1	58.1	58.0	570	559	549	482	490	64.4	63.8	63.2	56.0	57.2	448	461	52.05	53.8
26	Novgorod	503	496	463	451	444	73.2	73.1	69.1	68.2	67.5	492	486	453	430	422	71.6	71.6	67.6	65.0	64.2	408	395	61.68	60.1
27	Pskov	612	574	641	623	642	81.3	77.3	87.7	86.6	90.0	595	562	620	607	631	79.0	75.7	84.9	84.4	88.5	585	603	81.36	84.5
28	**City: St-Petersburg**	1847	1918	1959	1859	1705	39.8	41.6	42.7	40.6	37.3	1746	1840	1876	1782	1622	37.6	39.9	40.9	38.9	35.5	1484	1223	32.43	26.8
	REGION: Southern	16755	16512	16346	16298	17521	77.0	76.1	75.5	73.4	76.9	16080	15852	15696	15621	16855	73.9	73.0	72.5	70.4	74.0	14690	15823	66.16	69.5
29	**Republics: Adygeya**	367	388	340	346	411	82.3	87.2	76.6	78.3	93.2	356	355	321	336	401	79.8	79.8	72.4	76.0	90.9	306	382	69.24	86.6
30	Dagestan	1716	1599	1553	1644	1582	66.2	61.2	59.0	62.0	59.5	1598	1486	1463	1539	1485	61.7	56.9	55.6	58.1	55.9	1423	1371	53.7	51.6
31	Ingushetiya	355	289	246	183	214	75.2	60.4	50.8	37.4	43.4	332	280	236	180	209	70.3	58.5	48.7	36.7	42.4	153	192	31.24	39.0
	Чечня				912	1004				77.7	84.8				864	952				73.6	80.4	805	870	68.61	73.5
32	Kabardino-Balkariya	431	452	468	488	491	47.9	50.3	52.3	54.7	55.1	407	433	450	473	473	45.2	48.2	50.3	53.0	53.1	438	437	49.07	49.0
33	Kalmykiya	376	372	376	369	365	129.1	128.2	130.0	128.2	127.1	353	356	353	347	348	121.2	122.7	122.0	120.5	121.2	304	307	105.6	106.9
34	Karachaevo-Cherkessiya	248	266	246	212	219	56.7	61.1	56.8	49.3	51.1	232	244	222	189	207	53.0	56.0	51.3	43.9	48.3	165	188	38.36	43.9
35	North Osetiya - Alaniya	547	558	522	439	512	77.2	79.1	74.2	62.5	73.0	508	516	474	391	479	71.7	73.1	67.4	55.7	68.3	338	333	48.16	47.5
36	**Krai: Krasnodarsky**	3620	3573	3276	3105	3676	70.8	70.0	64.3	60.9	72.1	3530	3482	3175	3015	3604	69.0	68.2	62.3	59.1	70.7	2915	3483	57.17	68.3
37	Stavropolsky	1895	1544	1888	1797	1828	69.4	56.7	69.6	66.4	67.7	1745	1414	1749	1645	1682	63.9	51.9	64.4	60.8	62.3	1547	1572	57.17	58.2

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases all localization										incl. Respiratory TB										incl. Pulmonary TB			
		#					per 100K					#					per 100K					#		per 100K	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2006	2007	2006	2007
38	**Regions: Astrakhan**	912	880	881	875	872	90.9	88.0	88.4	88.0	87.7	892	857	857	854	856	88.9	85.7	86.0	85.9	86.1	788	793	79.26	79.8
39	Volgograd	2801	2969	3041	2807	3099	104.4	111.4	115.0	106.8	118.3	2723	2875	2939	2735	2985	101.5	107.9	111.1	104.1	113.9	2636	2879	100.3	109.9
40	Rostov	3487	3622	3509	3121	3248	79.6	83.3	81.2	72.8	76.0	3404	3554	3457	3053	3174	77.7	81.7	80.0	71.2	74.2	2872	3016	66.95	70.5
	REGION: Privolzhsky	23478	23286	23539	23815	22681	75.7	75.6	76.9	78.3	74.7	22434	22294	22555	22853	21774	72.4	72.4	73.7	75.1	71.8	21341	20494	70.13	67.5
41	**Republics: Bashkortostan**	2421	2428	2300	2231	2114	59.1	59.4	56.5	55.0	52.2	2298	2290	2199	2109	2004	56.1	56.1	54.0	52.0	49.5	1974	1883	48.65	46.5
42	Mariy El	442	431	480	469	582	61.0	59.9	67.2	66.1	82.4	422	411	467	454	565	58.3	57.1	65.4	64.0	80.0	413	522	58.24	73.9
43	Mordoviya	723	689	598	588	583	82.1	79.1	69.4	69.0	68.8	694	663	572	574	564	78.8	76.1	66.4	67.4	66.5	546	533	64.07	62.9
44	Tatarstan	2464	2298	2308	2298	2207	65.3	60.9	61.3	61.1	58.7	2285	2160	2165	2171	2088	60.5	57.3	57.5	57.7	55.5	2021	1953	53.74	51.9
45	Udmurtiya	1291	1347	1317	1269	1254	82.5	86.5	85.0	82.3	81.5	1238	1296	1277	1221	1222	79.1	83.3	82.5	79.2	79.5	1151	1152	74.68	74.9
46	Chuvashiya	954	1084	1054	1052	994	72.9	83.2	81.3	81.6	77.3	926	1043	1017	1028	965	70.8	80.1	78.5	79.7	75.0	1006	931	78.03	72.4
47	**Regions: Kirov**	966	851	906	1014	911	64.9	57.9	62.4	70.7	63.8	915	800	853	968	864	61.4	54.4	58.7	67.5	60.6	889	806	61.95	56.5
48	Nizhniy Novgorod	2966	2867	2918	2844	2512	84.8	82.8	85.1	83.7	74.3	2865	2763	2826	2754	2446	81.9	79.8	82.4	81.1	72.3	2623	2325	77.23	68.8
49	Orenburg	1909	1997	2124	2371	2312	88.0	92.6	99.1	111.2	108.8	1836	1911	2042	2297	2233	84.6	88.6	95.2	107.8	105.1	2072	2035	97.2	95.7
50	Penza	1048	1038	1056	1026	985	72.6	72.6	74.6	73.2	70.6	994	997	1009	972	938	68.9	69.8	71.3	69.3	67.2	889	886	63.41	63.5
51	Perm (Permsky krai)	2733	3056	3048	3200	2827	97.5	109.9	110.5	116.8	103.5	2636	2961	2923	3075	2723	94.1	106.5	105.9	112.2	99.7	2775	2535	101.3	92.8
	Komi-Permsky AD	156	193	159			115.5	144.4	119.7			156	190	154			111.5	142.2	231.9						
52	Samara	2432	2230	2421	2535	2518	75.4	69.5	75.8	79.6	79.2	2340	2156	2327	2441	2395	72.5	67.2	72.8	76.7	75.3	2323	2290	72.96	72.0
53	Saratov	2167	2012	2019	1902	1771	81.7	76.4	77.1	73.1	68.2	2073	1929	1934	1819	1716	78.1	73.2	73.9	69.9	66.1	1746	1646	67.11	63.4
54	Uliyanovsk	962	958	990	1016	1111	70.1	70.6	73.7	76.5	84.1	912	914	944	970	1051	66.5	67.3	70.3	73.0	79.5	913	997	68.71	75.4
	DISTRIC: Urals	12215	12842	12656	12574	12717	99.0	104.4	103.2	102.8	104.0	11754	12380	12234	12149	12297	95.3	100.7	99.8	99.3	100.5	10972	11295	89.66	92.4
55	**Regions: Kurgan**	1206	1298	1252	1347	1320	119.4	130.1	127.0	138.2	136.2	1158	1234	1199	1291	1273	114.6	123.6	121.6	132.5	131.3	1208	1018	123.9	105.0
56	Sverdlovsk	4504	4435	4606	4620	4913	100.9	99.9	104.2	104.9	111.7	4358	4309	4470	4487	4789	97.7	97.1	101.2	101.9	108.8	4164	4461	94.53	101.4
57	Tyumen	3677	3991	3918	3949	3404	112.1	121.0	118.2	118.4	101.8	3565	3905	3835	3845	3290	108.7	118.4	115.7	115.3	98.4	3597	3060	107.9	91.5
	Khanty-Mantyisky AD	1200	1354	1389	1423	1299	82.9	92.6	94.3	95.9	87.3	1168	1331	1371	1400	1267	80.7	91.0	93.0	94.4	85.1	1307	1161	88.12	78.0
	Yamalo-Nenetsky AD	492	450	514	439	400	96.1	86.7	97.5	82.1	74.3	476	435	505	422	390	93.0	83.8	95.8	78.9	72.4	378	359	70.71	66.7
58	Chelyabinsk	2828	3118	2880	2658	3080	78.9	87.5	81.3	75.4	87.6	2673	2932	2730	2526	2945	74.5	82.3	77.1	71.7	83.8	2003	2756	56.84	78.4
	REGION: Siberian	25732	25581	26371	25888	25067	128.9	128.9	133.6	131.9	128.0	24868	24762	25617	25229	24429	124.6	124.8	129.8	128.5	124.7	23672	22817	120.6	116.5
59	**Republics: Altai**	225	296	298	260	237	110.8	145.4	145.9	126.9	115.4	213	283	290	246	224	104.9	139.0	142.0	120.0	109.1	222	204	108.3	99.3
60	Buryatiya	1446	1474	1531	1672	1397	148.0	151.7	158.5	173.9	145.5	1395	1432	1490	1631	1362	142.8	147.4	154.2	169.6	141.9	1515	1269	157.5	132.2
61	Tyva	832	782	769	759	731	271.9	254.7	249.6	245.7	236.2	777	725	715	703	690	253.9	236.1	232.1	227.5	223.0	647	653	209.4	211.0
62	Khakasiya	719	752	736	637	548	132.2	138.8	136.4	118.5	102.1	694	735	714	625	544	127.6	135.7	132.3	116.3	101.4	598	513	111.3	95.6
63	**Krai: Altai**	3354	3727	3716	3605	3317	129.3	144.8	145.5	142.3	131.5	3278	3622	3639	3546	3229	126.4	140.7	142.5	140.0	128.0	3337	3064	131.7	121.4
64	Krasnoyarsky	3189	3089	3199	3021	3009	108.0	105.3	109.7	104.2	104.0	3073	2960	3089	2926	2925	104.1	100.9	105.9	100.9	101.1	2770	2789	95.52	96.4
	Taimyrsky AD	26	33	26	24		65.7	83.7	66.4	62.0		24	31	25	24		60.7	78.7	63.8	62.0		17		43.95	
	Evenkiysky AD	37	24	26	22		210.5	137.4	149.9	128.4		37	23	25	21		210.5	131.7	144.1	122.6		21		122.6	
65	**Regions: Irkutsk**	3256	3140	3126	3159	3439	126.7	123.0	123.3	125.3	136.8	3154	3059	3033	3077	3336	122.8	119.8	119.6	122.1	132.7	2879	3122	114.2	124.2
	Ust-Ordynsky Buryatskiy AD	195	196	255	210	226	144.7	145.9	190.3	156.9	168.8	193	193	255	206	223	143.2	143.7	190.3	153.9	166.6	190	199	141.9	148.6
66	Kemerovo	4171	3772	4478	4349	4041	144.7	131.7	157.3	153.5	143.0	4072	3681	4390	4242	3948	141.3	128.5	154.2	149.8	139.7	3875	3579	136.8	126.6
67	Novosibirsk	3678	3803	3774	3647	3501	137.2	142.6	142.1	137.9	132.6	3574	3711	3689	3572	3439	133.3	139.1	138.9	135.0	130.2	3434	3288	129.8	124.5
68	Omsk	2457	2419	2406	2466	2582	118.9	117.9	117.9	121.5	127.5	2321	2299	2301	2408	2520	112.3	112.0	112.8	118.6	124.4	2287	2383	112.7	117.6
69	Tomsk	1115	1099	1111	1115	1059	106.9	105.8	107.3	107.9	102.5	1079	1066	1076	1089	1033	103.4	102.6	103.9	105.4	100.0	1027	979	99.36	94.8
70	Chita	1290	1228	1227	1198	1206	112.3	107.7	108.4	106.5	107.5	1238	1189	1191	1164	1179	107.8	104.3	105.2	103.5	105.1	1081	974	96.07	86.8
	Aginsky Buryatsky AD	92	96	71	95	78	126.9	131.3	96.1	127.2	103.9	86	89	68	91	74	118.6	121.7	92.1	121.9	98.5	80	69	107.1	91.9
	REGION: Far Estern	8363	8432	8670	8366	8614	125.6	127.5	132.0	128.2	132.3	8150	8209	8473	8162	8416	122.4	124.1	129.0	125.0	129.3	7673	7974	117.5	122.5
71	**Republic: Sakha (Yakutiya)**	745	877	798	782	736	78.5	92.3	84.0	82.3	77.5	693	826	767	734	697	73.0	87.0	80.7	77.3	73.4	635	633	66.85	66.6
72	**Krai: Primorsky**	3056	3170	3354	3325	3586	148.4	155.1	165.4	165.2	178.8	2996	3124	3298	3267	3534	145.5	152.9	162.7	162.3	176.2	3090	3358	153.5	167.4

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases all localization										incl. Respiratory TB										incl. Pulmonary TB			
		#					per 100K					#					per 100K					#		per 100K	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2006	2007	2006	2007
73	Khabarovsky	1874	1730	1838	1721	1806	131.0	121.5	129.8	122.2	128.5	1838	1693	1807	1701	1792	128.5	118.9	127.6	120.7	127.5	1624	1708	115.3	121.5
74	**Regions: Amur**	1445	1332	1303	1251	1233	161.0	149.5	147.3	142.5	141.0	1405	1292	1264	1223	1208	156.5	145.0	142.9	139.3	138.1	1175	1171	133.8	133.9
75	Kamchatka	302	326	342	288	281	84.8	92.2	97.5	82.7	81.0	299	320	335	284	279	83.9	90.5	95.5	81.6	80.4	246	240	70.65	69.1
	Koryaksky AD		87	106	98			361.1	450.8	428.3			86	106	97			356.9	450.8	423.9		81		354	
76	Magadan	143	144	143	138	130	79.4	81.6	82.6	81.2	77.1	141	130	140	130	124	78.3	73.6	80.9	76.4	73.6	114	108	67.04	64.1
77	Sakhalin	435	523	555	584	503	80.3	97.7	104.9	111.5	96.5	418	498	527	550	448	77.2	93.0	99.6	105.0	86.0	527	427	100.6	81.9
78	**Autonomous region: Jewish**	327	298	298	245	310	172.0	157.5	158.8	131.7	167.0	325	295	296	244	306	170.9	155.9	157.7	131.1	164.8	235	301	126.3	162.1
79	**Autonomous REGION: Chukot**	36	32	39	32	29	68.9	62.7	77.0	63.4	57.4	35	31	39	29	28	67.0	60.7	77.0	57.4	55.5	27	28	53.46	55.5

Tabl.2. Extra-respiratory TB notification rate in Russia 2004-2007

(territorial notification rate, form#8)

№ № пп.	Federal regions, ares of the Russian Federation	ERTB all localizations								TB of meninx and CNS				TB of bones and joints				TB genitourinary organs			
		#				per 100K				#		per 100K		#		per 100K		#		per 100K	
		2004	2005	2006	2007	2004	2005	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	RUSSIA	**4420**	**4285**	**4137**	**3971**	**3.1**	**3.0**	**2.9**	**2.8**	**188**	**204**	**0.1**	**0.1**	**1062**	**1194**	**0.7**	**0.84**	**1538**	**1336**	**1.1**	**0.9**
	REGION: Central	962	968	887	850	2.5	2.6	2.4	2.3	42	37	0.1	0.1	239	279	0.6	0.7	310	284	0.8	0.8
1	**Regions: Belgorod**	31	33	47	47	2.0	2.2	3.1	3.1	2	3	0.1	0.2	16	22	1.1	1.5	17	9	1.1	0.6
2	Bryansk	51	78	60	55	3.7	5.8	4.5	4.2	0	0	0.0	0.0	7	11	0.5	0.8	39	32	2.9	2.4
3	Vladimir	28	27	38	28	1.9	1.8	2.6	1.9	1	1	0.1	0.1	8	12	0.5	0.8	20	10	1.4	0.7
4	Voronezh	63	77	69	85	2.7	3.3	3.0	3.7	1	1	0.0	0.0	6	15	0.3	0.7	44	50	1.9	2.2
5	Ivanovo	25	35	22	17	2.2	3.1	2.0	1.6	0	1	0.0	0.1	2	4	0.2	0.4	6	7	0.5	0.6
6	Kaluga	57	53	46	40	5.5	5.2	4.5	4.0	0	0	0.0	0.0	7	3	0.7	0.3	27	32	2.7	3.2
7	Kostroma	10	10	15	6	1.4	1.4	2.1	0.9	0	0	0.0	0.0	6	5	0.8	0.7	2	0	0.3	0.0
8	Kursk	28	36	28	26	2.3	3.0	2.4	2.2	3	2	0.3	0.2	10	11	0.8	0.9	7	6	0.6	0.5
9	Lipetsk	44	42	44	39	3.7	3.5	3.7	3.3	0	1	0.0	0.1	13	12	1.1	1.0	13	10	1.1	0.9
10	Moscow	141	120	115	107	2.1	1.8	1.7	1.6	14	8	0.2	0.1	52	53	0.8	0.8	19	20	0.3	0.3
11	Orel	24	22	18	20	2.8	2.6	2.2	2.4	1	0	0.1	0.0	10	10	1.2	1.2	3	5	0.4	0.6
12	Ryazan	38	36	35	27	3.1	3.0	3.0	2.3	3	2	0.3	0.2	10	15	0.8	1.3	8	1	0.7	0.1
13	Smolensk	35	38	30	23	3.4	3.7	3.0	2.3	0	1	0.0	0.1	3	7	0.3	0.7	4	2	0.4	0.2
14	Tambov	50	38	33	41	4.3	3.3	2.9	3.7	0	1	0.0	0.1	5	3	0.4	0.3	20	25	1.8	2.2
15	Tver	13	17	20	15	0.9	1.2	1.4	1.1	0	0	0.0	0.0	7	5	0.5	0.4	6	5	0.4	0.4
16	Tula	82	66	43	62	5.0	4.1	2.7	3.9	1	0	0.1	0.0	7	15	0.4	0.9	31	38	1.9	2.4
17	Yaroslavl	60	47	51	31	4.4	3.5	3.8	2.3	2	3	0.2	0.2	15	9	1.1	0.7	10	8	0.8	0.6
18	**City: Moscow**	182	193	173	181	1.8	1.9	1.7	1.7	14	13	0.1	0.1	55	67	0.5	0.6	34	24	0.3	0.2
	REGION: Nortwestern	301	310	320	291	2.2	2.3	2.3	2.1	22	15	0.2	0.1	84	83	0.6	0.6	94	84	0.7	0.6
19	**Republics: Kareliya**	27	27	18	23	3.8	3.8	2.6	3.3	1	0	0.1	0.0	4	4	0.6	0.6	2	4	0.3	0.6
20	Komi	36	45	52	47	3.6	4.5	5.3	4.8	2	1	0.2	0.1	8	13	0.8	1.3	22	18	2.2	1.8
21	**Regions: Arkhangelsk**	29	19	21	16	2.2	1.5	1.6	1.2	1	0	0.1	0.0	8	5	0.6	0.4	5	6	0.4	0.5
	Nenetsky AD	3	2			7.2	4.8											0	0	0.0	0.0
22	Vologda	33	36	30	23	2.6	2.9	2.4	1.9	1	0	0.1	0.0	6	5	0.5	0.4	8	8	0.6	0.7
23	Kaliningrad	32	20	40	29	3.4	2.1	4.3	3.1	1	0	0.1	0.0	15	14	1.6	1.5	12	5	1.3	0.5
24	Leningrad	23	24	27	30	1.4	1.5	1.6	1.8	2	5	0.1	0.3	5	7	0.3	0.4	10	4	0.6	0.2
25	Murmansk	21	25	18	7	2.4	2.9	2.1	0.8	3	2	0.3	0.2	7	2	0.8	0.2	6	2	0.7	0.2
26	Novgorod	10	10	21	22	1.5	1.5	3.2	3.3	0	0	0.0	0.0	2	2	0.3	0.3	6	11	0.9	1.7
27	Pskov	12	21	16	11	1.6	2.9	2.2	1.5	3	0	0.4	0.0	8	8	1.1	1.1	2	2	0.3	0.3
28	**City: St-Petersburg**	78	83	77	83	1.7	1.8	1.7	1.8	8	7	0.2	0.2	21	23	0.5	0.5	21	24	0.5	0.5
	REGION: Southern	660	650	677	666	3.0	3.0	3.1	2.9	25	22	0.1	0.1	205	229	0.9	1.0	216	174	1.0	0.8
29	**Republics: Adygeya**	33	19	10	10	7.4	4.3	2.3	2.3	2	1	0.5	0.2	1	0	0.2	0.0	7	5	1.6	1.1
30	Dagestan	113	90	105	97	4.3	3.4	4.0	3.6	8	8	0.3	0.3	41	38	1.6	1.4	19	5	0.7	0.2
31	Ingushetiya	9	10	3	5	1.9	2.1	0.6	1.0	1	0	0.2	0.0	1	2	0.2	0.4	1	0	0.2	0.0
	Чечня	71	51	48	52			4.1	4.4	0	1	0.0	0.1	27	20	2.3	1.7	4	3	0.3	0.3
32	Kabardino-Balkariya	19	18	15	18	2.1	2.0	1.7	2.0	0	3	0.0	0.3	10	11	1.1	1.2	2	1	0.2	0.1
33	Kalmykiya	16	23	22	17	5.5	7.9	7.6	5.9	0	0	0.0	0.0	3	4	1.0	1.4	14	7	4.8	2.4
34	Karachaevo-Cherkessiya	22	24	23	12	5.0	5.5	5.3	2.8	0	0	0.0	0.0	7	1	1.6	0.2	2	2	0.5	0.5
35	North Osetiya - Alaniya	42	48	48	33	5.9	6.8	6.8	4.7	3	1	0.4	0.1	12	12	1.7	1.7	14	8	2.0	1.1
36	**Krai: Krasnodarsky**	91	101	90	72	1.8	2.0	1.8	1.4	4	5	0.1	0.1	19	17	0.4	0.3	32	27	0.6	0.5
37	Stavropolsky	130	139	152	146	4.8	5.1	5.6	5.4	2	1	0.1	0.0	25	19	0.9	0.7	65	72	2.4	2.7
38	**Regions: Astrakhan**	23	24	21	16	2.3	2.4	2.1	1.6	0	0	0.0	0.0	4	4	0.4	0.4	8	4	0.8	0.4
39	Volgograd	94	102	72	114	3.5	3.8	2.7	4.4	2	1	0.1	0.0	34	68	1.3	2.6	23	22	0.9	0.8
40	Rostov	68	52	68	74	1.6	1.2	1.6	1.7	3	1	0.1	0.0	21	33	0.5	0.8	25	18	0.6	0.4
	REGION: Privolzhsky	992	984	962	907	3.2	3.2	3.2	3.0	24	44	0.1	0.1	208	225	0.7	0.7	465	389	1.5	1.3
41	**Republics: Bashkortostan**	138	101	122	110	3.4	2.5	3.0	2.7	0	1	0.0	0.0	36	29	0.9	0.7	49	42	1.2	1.0
42	Mariy El	20	13	15	17	2.8	1.8	2.1	2.4	0	1	0.0	0.1	6	4	0.8	0.6	4	4	0.6	0.6
43	Mordoviya	26	26	14	19	3.0	3.0	1.6	2.2	0	0	0.0	0.0	4	7	0.5	0.8	10	10	1.2	1.2

№ № пп.	Federal regions, ares of the Russian Federation	ERTB all localizations								TB of meninx and CNS				TB of bones and joints				TB genitourinary organs			
		#				per 100K				#		per 100K		#		per 100K		#		per 100K	
		2004	2005	2006	2007	2004	2005	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
44	Tatarstan	138	143	127	119	3.7	3.8	3.4	3.2	1	5	0.0	0.1	32	45	0.9	1.2	54	33	1.4	0.9
45	Udmurtiya	51	40	48	32	3.3	2.6	3.1	2.1	1	0	0.1	0.0	15	10	1.0	0.7	17	8	1.1	0.5
46	Chuvashiya	41	37	24	29	3.1	2.8	1.9	2.3	1	5	0.1	0.4	6	9	0.5	0.7	12	7	0.9	0.5
47	**Regions: Kirov**	51	53	46	47	3.4	3.6	3.2	3.3	2	2	0.1	0.1	5	10	0.3	0.7	16	20	1.1	1.4
48	Nizhniy Novgorod	104	92	90	66	3.0	2.7	2.6	2.0	2	3	0.1	0.1	11	16	0.3	0.5	58	34	1.7	1.0
49	Orenburg	86	82	74	79	4.0	3.8	3.5	3.7	2	11	0.1	0.5	11	20	0.5	0.9	25	26	1.2	1.2
50	Penza	41	47	54	47	2.9	3.3	3.8	3.4	0	0	0.0	0.0	20	16	1.4	1.1	23	22	1.6	1.6
51	Perm (Permsky krai)	95	125	125	104	3.4	4.5	4.5	3.8	3	4	0.1	0.1	9	4	0.3	0.1	79	64	2.9	2.3
	Komi-Permsky AD	3	5			2.2	3.8														
52	Samara	74	94	94	123	2.3	2.9	2.9	3.9	3	1	0.1	0.0	17	23	0.5	0.7	58	77	1.8	2.4
53	Saratov	83	85	83	55	3.1	3.2	3.2	2.1	4	3	0.2	0.1	23	13	0.9	0.5	45	30	1.7	1.2
54	Uliyanovsk	44	46	46	60	3.2	3.4	3.4	4.5	5	8	0.4	0.6	13	19	1.0	1.4	15	12	1.1	0.9
	DISTRIC: Urals	462	422	425	420	3.8	3.4	3.5	3.4	27	29	0.2	0.2	84	107	0.7	0.9	142	122	1.2	1.0
55	**Regions: Kurgan**	64	53	56	47	6.4	5.3	5.7	4.8	1	0	0.1	0.0	10	9	1.0	0.9	32	30	3.3	3.1
56	Sverdlovsk	126	136	133	124	2.8	3.1	3.0	2.8	8	6	0.2	0.1	19	26	0.4	0.6	45	37	1.0	0.8
57	Tyumen	86	83	104	114	2.6	2.5	3.1	3.4	16	19	0.5	0.6	20	24	0.6	0.7	31	20	0.9	0.6
	Khanty-Mantyisky AD	23	18	23	32	1.6	1.2	1.6	2.2	0	0	0.0	0.0	9	12	0.6	0.8	2	1	0.1	0.1
	Yamalo-Nenetsky AD	15	9	17	10	2.9	1.7	3.2	1.9	2	1	0.4	0.2	6	2	1.1	0.4	7	2	1.3	0.4
58	Chelyabinsk	186	150	132	135	5.2	4.2	3.7	3.8	2	4	0.1	0.1	35	48	1.0	1.4	34	35	1.0	1.0
	REGION: Siberian	819	754	659	638	4.1	3.8	3.3	3.3	38	45	0.2	0.2	178	203	0.9	1.0	224	198	1.1	1.0
59	**Republics: Altai**	13	8	14	13	6.4	3.9	6.8	6.3	0	1	0.0	0.5	5	2	2.4	1.0	1	3	0.5	1.5
60	Buryatiya	42	41	41	35	4.3	4.2	4.3	3.6	0	0	0.0	0.0	8	17	0.8	1.8	17	10	1.8	1.0
61	Tyva	57	54	56	41	18.6	17.6	18.2	13.2	7	5	2.3	1.6	22	12	7.1	3.9	3	1	1.0	0.3
62	Khakasiya	17	22	12	4	3.1	4.1	2.2	0.7	0	0	0.0	0.0	7	2	1.3	0.4	0	1	0.0	0.2
63	**Krai: Altai**	105	77	59	88	4.1	3.0	2.3	3.5	3	2	0.1	0.1	25	58	1.0	2.3	20	16	0.8	0.6
64	Krasnoyarsky	129	110	95	84	4.4	3.8	3.3	2.9	0	2	0.0	0.1	33	32	1.1	1.1	34	31	1.2	1.1
	Taimyrsky AD	2	1	0		5.1	2.5	0.0													
	Evenkiysky AD	10	1	1		5.7	5.7	5.8													
65	**Regions: Irkutsk**	81	93	82	103	3.2	3.7	3.2	4.1	11	16	0.4	0.6	29	38	1.1	1.5	23	27	0.9	1.1
	Ust-Ordynsky Buryatskiy AD	3	-	4	3	2.2	0.0	3.0	2.2	1	0	0.7	0.0	1	2	0.7	1.5	2	0	1.5	0.0
66	Kemerovo	91	88	107	93	3.2	3.1	3.8	3.3	4	6	0.1	0.2	5	10	0.2	0.4	45	40	1.6	1.4
67	Novosibirsk	92	85	75	62	3.4	3.2	2.8	2.3	7	3	0.3	0.1	15	11	0.6	0.4	22	19	0.8	0.7
68	Omsk	120	105	58	62	5.8	5.1	2.9	3.1	5	9	0.2	0.4	11	7	0.5	0.3	34	28	1.7	1.4
69	Tomsk	33	35	26	26	3.2	3.4	2.5	2.5	0	0	0.0	0.0	6	8	0.6	0.8	11	8	1.1	0.8
70	Chita	39	36	34	27	3.4	3.2	3.0	2.4	1	1	0.1	0.1	12	6	1.1	0.5	14	14	1.2	1.2
	Aginsky Buryatsky AD	7	3	4	4	9.6	4.1	5.4	5.3	1	0	1.3	0.0	1	1	1.3	1.3	0	1	0.0	1.3
	REGION: Far Estern	223	197	204	198	3.4	3.0	3.1	3.0	10	12	0.2	0.2	62	68	0.9	1.0	87	85	1.3	1.3
71	**Republic: Sakha (Yakutiya)**	51	31	48	39	5.4	3.3	5.1	4.1	2	2	0.2	0.2	14	16	1.5	1.7	8	5	0.8	0.5
72	**Krai: Primorsky**	46	56	58	52	2.2	2.8	2.9	2.6	0	2	0.0	0.1	34	31	1.7	1.5	17	15	0.8	0.7
73	Khabarovsky	37	31	20	14	2.6	2.2	1.4	1.0	3	3	0.2	0.2	5	2	0.4	0.1	6	4	0.4	0.3
74	**Regions: Amur**	40	39	28	25	4.5	4.4	3.2	2.9	2	3	0.2	0.3	6	11	0.7	1.3	16	8	1.8	0.9
75	Kamchatka	6	7	4	2	1.7	2.0	1.1	0.6	3	0	0.9	0.0	0	1	0.0	0.3	0	0	0.0	0.0
	Koryaksky AD	1	0	1		4.1	0.0	4.3		1		4.3		0		0.0		0		0.0	
76	Magadan	14	3	8	6	7.9	1.7	4.7	3.6	0	0	0.0	0.0	0	1	0.0	0.6	7	3	4.1	1.8
77	Sakhalin	25	28	34	55	4.6	5.3	6.5	10.6	0	0	0.0	0.0	3	5	0.6	1.0	30	50	5.7	9.6
78	**Autonomous region: Jewish**	3	2	1	4	1.6	1.1	0.5	2.2	0	1	0.0	0.5	0	1	0.0	0.5	0	0	0.0	0.0
79	**Autonomous REGION: Chukot**	1	0	3	1	1.9	0.0	5.9	2.0	0	1	0.0	2.0	0	0	0.0	0.0	3	0	5.9	0.0

Tabl. 3. TB notification and prevalence among children in Russia, 2003-2007

(notification rate - territorial, form#8, prevalence - form #33)

№№ пп.	Federal regions, ares of the Russian Federation	New cases of TB, children (0-14 years old)										Registered by the end of the year, children (0-14 years old)									
		количество					Notification rate, per 100K					#					Prevalence, per 100K				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2005	2005
	RUSSIA	**3685**	**3583**	**3530**	**3423**	**3422**	**16.2**	**16.4**	**16.66**	**16.39**	**16.39**	**8304**	**5229**	**4758**	**4653**	**4457**	**35.8**	**23.5**	**22.1**	**22.3**	**21.3**
	REGION: Central	475	519	560	559	544	9.3	10.5	11.7	11.9	11.7	1103	741	683	670	677	21.2	14.8	14.1	14.2	14.5
1	**Regions: Belgorod**	20	23	17	16	17	8.7	10.4	8.0	7.7	8.2	29	29	20	20	17	12.3	12.9	9.2	9.5	8.2
2	Bryansk	36	31	38	56	33	16.7	15.1	19.3	29.5	17.7	102	46	53	76	52	46.3	21.9	26.4	39.4	27.9
3	Vladimir	14	21	32	45	38	6.6	10.3	16.3	23.5	20.0	25	25	41	64	61	11.5	12.1	20.6	33.2	32.1
4	Voronezh	14	21	23	12	18	4.2	6.6	7.5	4.0	6.2	57	45	38	20	17	16.7	13.8	12.2	6.7	5.8
5	Ivanovo	13	12	13	20	11	8.3	8.0	9.1	14.4	8.0	34	29	18	26	20	21.3	19.0	12.3	18.5	14.5
6	Kaluga	22	16	28	17	32	14.8	11.3	20.4	12.7	24.2	68	34	37	24	32	44.7	23.5	26.6	17.8	24.2
7	Kostroma	9	8	14	6	16	8.2	7.7	13.9	6.1	16.5	19	12	8	4	14	17.0	11.3	7.8	4.0	14.5
8	Kursk	12	13	8	3	11	6.5	7.4	4.8	1.8	6.9	18	23	14	9	14	9.5	12.9	8.2	5.5	8.7
9	Lipetsk	16	19	20	16	7	9.0	11.1	12.1	10.0	4.4	55	39	26	23	13	30.2	22.4	15.5	14.2	8.2
10	Moscow	64	76	84	98	68	7.2	8.8	9.9	11.7	8.1	140	94	101	126	103	15.5	10.8	11.8	15.0	12.3
11	Orel	14	9	11	12	11	11.1	7.4	9.4	10.6	9.9	26	11	9	15	14	20.1	8.9	7.6	13.1	12.5
12	Ryazan	17	24	22	18	23	10.1	15.0	14.3	12.1	15.6	44	27	32	16	26	25.6	16.5	20.4	10.6	17.6
13	Smolensk	27	29	38	38	33	18.5	20.9	28.5	29.5	26.0	86	43	43	39	46	57.4	30.3	31.7	29.9	36.3
14	Tambov	16	13	8	6	7	9.4	8.0	5.1	4.0	4.8	22	14	10	9	7	12.5	8.4	6.3	5.9	4.8
15	Tver	22	22	12	26	19	10.7	11.1	6.3	14.0	10.3	46	33	19	27	28	21.8	16.4	9.8	14.4	15.2
16	Tula	46	39	24	32	39	21.1	18.8	12.0	16.5	20.4	92	85	69	50	58	41.3	40.0	33.9	25.5	30.3
17	Yaroslavl	29	37	36	26	31	15.6	20.7	20.7	15.3	18.3	66	51	39	29	33	34.7	28.0	22.2	16.9	19.5
18	**City: Moscow**	84	106	132	112	130	6.8	8.8	11.1	9.4	10.9	174	101	106	93	122	14.0	8.3	8.9	7.8	10.2
	REGION: Nortwestern	370	396	371	343	315	18.7	20.9	20.2	19.1	17.7	804	512	450	367	330	39.8	26.5	24.1	20.3	18.6
19	**Republics: Kareliya**	22	13	12	15	13	19.7	12.2	11.7	15.0	13.1	61	38	24	30	22	53.4	35.0	23.0	29.8	22.3
20	Komi	40	41	37	34	27	22.9	24.4	22.7	21.5	17.2	95	56	44	38	34	53.2	32.8	26.6	23.7	21.7
21	**Regions: Arkhangelsk**	24	27	45	27	24	11.1	13.1	22.6	13.9	12.5	40	30	47	31	31	18.0	14.2	23.2	15.8	16.1
	Nenetsky AD	-	3	2	0	1	0.0	32.8	22.5	0.0	11.6	0	3	3	1	1	0.0	32.4	33.3	11.4	11.6
22	Vologda	28	39	21	21	23	14.1	20.5	11.4	11.6	12.9	44	37	31	28	22	21.7	19.1	16.6	15.4	12.3
23	Kaliningrad	67	106	101	105	91	46.8	77.1	76.0	81.2	71.2	118	97	80	68	61	80.6	69.2	59.3	52.0	47.7
24	Leningrad	61	57	40	32	39	26.8	26.2	19.2	15.8	19.5	142	85	54	30	38	60.7	38.3	25.4	14.6	19.0
25	Murmansk	10	8	7	4	11	7.2	6.0	5.4	3.2	8.9	22	10	11	6	12	15.3	7.3	8.4	4.7	9.7
26	Novgorod	13	5	8	6	10	13.0	5.2	8.7	6.7	11.4	34	12	15	12	14	33.2	12.3	16.1	13.3	15.9
27	Pskov	10	6	5	7	4	9.4	5.9	5.1	7.5	4.3	23	16	13	14	8	21.1	15.4	13.1	14.7	8.6
28	**City: St-Petersburg**	95	94	95	92	73	17.0	17.4	18.0	17.7	14.1	225	131	131	110	88	39.5	23.8	24.6	21.1	17.0
	REGION: Southern	626	594	524	510	579	15.8	15.5	14.1	13.4	14.7	1333	872	764	891	882	33.1	22.4	20.3	24.4	22.4
29	**Republics: Adygeya**	4	4	3	2	5	5.2	5.4	4.2	2.8	7.2	8	7	2	0	3	10.2	9.3	2.7	0.0	4.3
30	Dagestan	133	111	133	105	99	18.4	15.8	19.4	15.7	15.0	226	192	213	173	155	30.9	26.9	30.7	25.7	23.5
31	Ingushetiya	46	37	23	13	22	29.3	24.2	15.6	9.1	15.6	95	60	41	40	42	59.7	38.7	27.3	27.7	29.7
	Чечня				38	64				10.4	17.5				183	182	184.2			50.4	49.7
32	Kabardino-Balkariya	21	11	16	11	10	11.0	6.0	9.2	6.6	6.1	30	25	33	30	14	15.4	13.4	18.5	17.7	8.6
33	Kalmykiya	16	11	27	31	32	25.1	18.0	45.8	54.3	57.0	44	21	36	42	39	67.7	33.7	60.0	72.5	69.4

№ № пп.	Federal regions, ares of the Russian Federation	New cases of TB, children (0-14 years old)										Registered by the end of the year, children (0-14 years old)									
		количество					Notification rate, per 100K					#					Prevalence, per 100K				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2005	2005
34	Karachaevo-Cherkessiya	11	12	11	12	10	12.4	14.1	13.4	15.1	12.8	55	29	26	25	29	60.7	33.4	31.0	30.9	37.1
35	North Osetiya - Alaniya	63	82	70	45	69	46.3	62.5	55.3	36.5	56.6	171	143	91	74	80	123.7	107.0	70.6	59.4	65.6
36	**Krai: Krasnodarsky**	91	91	45	37	56	11.1	11.4	5.8	4.8	7.4	184	83	51	37	59	22.1	10.3	6.5	4.8	7.8
37	Stavropolsky	54	43	45	44	46	11.8	9.7	10.5	10.5	11.1	129	72	77	67	74	27.6	16.0	17.7	15.9	17.9
38	**Regions: Astrakhan**	54	53	43	49	48	30.7	31.0	25.8	30.0	29.6	101	57	46	57	59	56.5	32.9	27.3	34.7	36.4
39	Volgograd	47	52	34	37	39	11.4	13.1	8.9	9.9	10.6	87	61	46	55	45	20.6	15.1	11.8	14.6	12.2
40	Rostov	86	87	74	86	79	13.1	13.8	12.1	14.5	13.5	203	122	102	108	101	30.3	19.0	16.5	18.0	17.2
	REGION: Privolzhsky	639	571	566	542	473	12.7	11.8	12.2	12.0	10.6	1370	836	776	729	643	26.5	17.0	16.4	16.0	14.4
41	**Republics: Bashkortostan**	46	48	46	48	47	6.0	6.6	6.6	7.1	7.0	140	104	87	85	82	18.0	14.0	12.2	12.3	12.2
42	Mariy El	7	14	19	20	20	5.7	12.0	17.0	18.5	18.8	13	17	26	28	21	10.3	14.2	22.8	25.6	19.7
43	Mordoviya	18	14	18	11	16	13.4	11.0	14.9	9.5	14.1	50	27	33	21	26	36.2	20.7	26.7	17.8	22.8
44	Tatarstan	100	71	72	62	51	15.2	11.3	11.9	10.5	8.8	159	87	78	58	42	23.6	13.5	12.6	9.7	7.2
45	Udmurtiya	25	21	22	29	34	9.2	8.0	8.7	11.7	13.9	81	37	30	39	43	29.1	13.9	11.6	15.6	17.5
46	Chuvashiya	18	12	12	16	13	8.0	5.6	5.8	8.0	6.6	63	27	27	27	20	27.1	12.2	12.8	13.3	10.2
47	**Regions: Kirov**	30	35	29	19	14	13.4	16.5	14.3	9.7	7.2	70	45	36	30	28	30.5	20.7	17.4	15.1	14.5
48	Nizhniy Novgorod	116	83	70	63	65	23.3	17.4	15.2	14.1	14.7	215	155	131	115	107	42.3	31.9	28.1	25.5	24.1
49	Orenburg	49	41	49	45	42	12.9	11.3	14.0	13.2	12.5	95	45	63	63	60	24.5	12.1	17.7	18.3	17.9
50	Penza	29	28	26	26	17	13.8	14.0	13.7	14.2	9.4	43	19	23	24	14	19.9	9.3	11.8	12.9	7.8
51	Perm (Permsky krai)	33	51	40	52	23	7.0	11.2	9.1	12.1	5.4	82	65	59	63	34	17.0	14.1	13.2	14.5	8.0
	Komi-Permsky AD	1	4	3			3.6	15.1	23.2			8	4	5			28.4	14.9	19.3		
52	Samara	83	63	90	77	73	17.5	13.7	20.2	17.7	16.9	147	81	97	101	90	30.3	17.4	21.5	23.0	20.8
53	Saratov	61	50	44	48	36	15.1	13.0	11.9	13.4	10.2	163	80	47	49	51	39.5	20.3	12.4	13.5	14.4
54	Uliyanovsk	24	40	29	26	22	11.3	20.0	15.3	14.4	12.4	49	47	39	26	25	22.5	22.9	20.1	14.1	14.1
	DISTRIC: Urals	262	278	267	261	258	12.8	14.1	13.9	13.8	13.7	602	428	420	458	435	28.8	21.3	21.6	24.1	23.2
55	**Regions: Kurgan**	49	52	46	43	28	29.4	32.7	30.2	29.2	19.3	147	76	64	76	52	85.8	46.8	41.2	50.9	35.9
56	Sverdlovsk	94	97	98	93	118	13.9	14.8	15.3	14.8	18.8	163	137	162	177	210	23.6	20.6	25.1	28.0	33.5
57	Tyumen	92	83	78	90	78	14.7	13.6	13.1	15.3	13.3	205	141	114	129	110	32.1	22.8	18.9	21.8	18.8
	Khanty-Mantyisky AD	18	15	16	15	18	6.2	5.3	5.8	5.5	6.6	46	21	22	22	26	15.7	7.4	7.9	8.0	9.5
	Yamalo-Nenetsky AD	24	32	26	31	19	21.3	29.1	24.1	29.2	18.0	47	46	37	42	26	41.1	41.4	34.0	39.3	24.6
58	Chelyabinsk	27	46	45	35	34	4.7	8.3	8.4	6.7	6.5	87	74	80	76	63	14.8	13.2	14.7	14.4	12.1
	REGION: Siberian	922	852	865	924	941	26.9	25.8	27.0	29.5	30.3	2196	1293	1176	1136	1137	62.8	38.5	36.2	35.9	36.6
59	**Republics: Altai**	28	20	18	12	14	60.0	43.8	39.8	26.7	31.1	72	36	20	17	14	152.0	78.2	44.2	37.7	31.1
60	Buryatiya	63	45	77	94	79	31.8	23.7	41.8	52.1	44.0	219	87	83	83	65	108.4	44.9	44.5	45.7	36.2
61	Tyva	49	46	36	30	33	55.7	53.4	42.7	36.2	40.2	166	87	68	50	52	186.7	100.0	79.8	59.9	63.3
62	Khakasiya	28	32	39	21	20	28.7	34.0	42.7	23.6	22.6	42	29	35	19	27	42.2	30.3	37.8	21.1	30.6
63	**Krai: Altai**	92	80	88	98	80	22.5	20.3	23.1	26.3	21.7	183	99	100	96	76	43.9	24.8	25.8	25.5	20.6
64	Krasnoyarsky	165	148	136	126	113	32.5	30.3	28.9	27.5	24.9	322	181	160	165	148	62.1	36.4	33.4	35.6	32.7
	Taimyrsky AD	1	4	3	6		11.1	45.6	35.2	72.8		5	6	7	7		54.5	67.5	80.9	83.5	
	Evenkiysky AD	3	1	1	1		71.4	24.6	25.3	26.0		6	1	1	1		140.4	24.2	25.0	25.6	
65	**Regions: Irkutsk**	110	117	70	126	130	23.0	25.4	15.7	29.1	30.3	357	269	182	185	221	73.2	57.5	40.3	42.2	51.5
	Ust-Ordynsky Buryatskiy AD	7	11	6	7	15	19.6	32.3	18.5	22.3	48.6	26	26	18	8	17	71.1	74.7	54.2	25.2	55.0

№ № пп.	Federal regions, ares of the Russian Federation	New cases of TB, children (0-14 years old)										Registered by the end of the year, children (0-14 years old)									
		количество					Notification rate, per 100K					#					Prevalence, per 100K				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2005	2005
66	Kemerovo	135	144	200	214	271	29.3	32.4	46.2	50.3	64.0	309	165	226	238	263	65.7	36.5	51.6	55.6	62.1
67	Novosibirsk	76	59	52	70	49	18.8	15.1	13.7	18.7	13.2	148	96	75	82	61	35.9	24.2	19.5	21.8	16.5
68	Omsk	100	101	79	67	79	29.3	30.9	25.0	21.8	26.1	247	161	135	120	123	70.6	48.3	42.1	38.7	40.6
69	Tomsk	41	29	36	27	38	25.0	18.3	23.3	17.8	25.2	74	51	53	49	55	44.3	31.8	34.0	32.1	36.4
70	Chita	35	31	34	39	35	15.0	13.8	15.6	18.2	16.5	57	32	39	32	32	24.0	14.0	17.6	14.8	15.1
	Aginsky Buryatsky AD	2	1	8	5	4	10.2	5.3	43.6	27.7	22.2	4	2	8	3	3	19.9	10.4	43.0	16.6	16.7
	REGION: Far Estern	389	372	376	283	311	33.5	33.2	34.7	26.8	29.7	893	546	488	401	352	75.4	48.0	44.3	37.5	33.6
71	**Republic: Sakha (Yakutiya)**	131	128	105	96	65	58.0	58.3	49.0	45.8	31.3	257	154	115	96	72	112.1	69.3	53.0	45.4	34.7
72	**Krai: Primorsky**	81	61	79	62	83	25.0	19.6	26.3	21.2	28.8	208	94	94	67	78	62.8	29.6	30.7	22.7	27.0
73	Khabarovsky	66	52	43	30	39	29.1	23.7	20.2	14.4	18.9	114	64	42	39	39	49.2	28.8	19.5	18.6	18.9
74	**Regions: Amur**	22	35	31	12	31	13.7	22.6	20.7	8.2	21.5	64	68	67	49	37	39.2	43.3	44.0	33.2	25.6
75	Kamchatka	48	55	54	34	36	81.0	96.6	97.7	62.9	67.2	116	97	79	53	39	191.3	167.4	141.1	97.2	72.8
	Koryaksky AD	0	19	34	15				694.1	321.3		0	40	56	37		0.0	769.4	1118.9	772.1	
76	Magadan	20	16	23	12	16	66.2	55.4	82.9	44.8	60.8	53	25	31	21	14	171.0	84.9	109.6	77.2	53.2
77	Sakhalin	11	17	35	29	37	12.5	20.1	42.8	36.3	46.7	52	33	51	68	69	57.5	38.3	61.4	84.4	87.1
78	**Autonomous region: Jewish**	8	4	6	7	4	23.0	11.9	18.6	22.3	12.9	18	5	8	7	3	50.6	14.7	24.3	22.1	9.7
79	**Autonomous REGION: Chukots**	2	4	0	1	0	18.5	38.5	0.0	9.9	0.0	11	6	1	1	1	99.2	57.1	9.7	9.9	9.9

Tabl.4. MbT+ TB notification rates in Russia 2003-2007.

(territorial notification rate, form #8)

№ № nn.	Federal regions, ares of the Russian Federation	New cases MbT+										Proportion of patients MbT+ to all new cases					New cases MbT+ confirmed by microscopy (ss+)									
		#					per 100K					%					#				per 100K				% of PTB	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2006	2006
	RUSSIA	**47110**	**49265**	**50116**	**48938**	**48567**	**32.8**	**34.5**	**35.3**	**34.28**	**34.15**	**39.7**	**41.4**	**42.0**	**41.6**	**41.0**	**30890**	**34148**	**33080**	**33789**	**21.6**	**24.05**	**23.17**	**23.76**	**31.3**	**31.7**
	REGION: Central	10088	10410	10336	9916	9770	26.7	27.7	27.6	26.54	26.25	43.6	44.7	45.6	45.0	41.9	6315	6988	6732	6896	16.8	18.66	18.02	18.53	34.2	32.8
1	**Regions: Belgorod**	431	483	454	472	460	28.5	31.9	30.04	31.23	30.39	41.9	44.8	51.6	50.1	52.3	247	297	320	295	16.3	19.65	21.17	19.49	37.5	36.9
2	Bryansk	602	686	671	625	623	44.0	50.7	50.11	46.94	47.3	53.5	59.3	56.2	53.5	49.5	514	447	406	423	38.0	33.38	30.5	32.1	39.4	37.4
3	Vladimir	666	565	599	578	473	44.1	37.8	40.48	39.25	32.4	54.0	52.1	55.2	48.6	40.7	435	449	398	386	29.1	30.34	27.03	26.45	37.2	37.2
4	Voronezh	847	785	873	803	817	35.8	33.5	37.57	34.71	35.6	48.9	49.4	53.1	53.2	51.2	385	443	433	464	16.4	19.06	18.72	20.22	32.2	32.2
5	Ivanovo	420	355	389	424	352	36.9	31.6	35.13	38.55	32.4	57.7	60.5	60.1	63.1	60.9	258	251	280	228	23.0	22.67	25.46	20.96	46.0	43.4
6	Kaluga	312	417	437	393	370	30.2	40.7	42.93	38.75	36.7	46.2	56.0	52.8	53.0	51.3	232	348	323	348	22.6	34.19	31.85	34.49	50.9	55.0
7	Kostroma	204	171	178	180	157	27.9	23.7	24.96	25.39	22.4	53.0	42.6	50.6	55.0	51.6	120	122	111	108	16.6	17.1	15.66	15.38	37.8	39.4
8	Kursk	360	428	404	462	418	29.4	35.5	33.91	39.02	35.7	39.4	47.8	41.3	49.6	46.9	233	263	323	304	19.3	22.07	27.28	25.97	38.5	38.2
9	Lipetsk	319	355	359	367	364	26.5	29.7	30.29	31.08	31.0	34.1	42.7	42.2	41.8	38.6		178	192	198		15.02	16.26	16.87	23.8	22.2
10	Moscow	1263	1169	1195	1121	1209	19.1	17.6	18.03	16.91	18.2	33.5	31.8	33.6	32.2	30.8	843	982	892	989	12.7	14.81	13.46	14.88	28.4	27.5
11	Orel	372	349	356	361	335	43.6	41.2	42.48	43.3	40.5	71.5	66.9	71.2	72.8	69.6	261	269	268	219	30.8	32.1	32.14	26.49	60.8	50.3
12	Ryazan	389	397	303	295	403	32.0	33.0	25.5	24.96	34.4	41.2	40.6	32.0	31.8	41.5	299	255	271	318	24.9	21.46	22.93	27.13	32.5	36.4
13	Smolensk	378	405	401	385	304	36.4	39.5	39.61	38.28	30.6	37.3	38.9	41.1	38.2	33.8	105	173	196	164	10.2	17.09	19.49	16.51	21.8	20.4
14	Tambov	474	525	445	370	432	40.6	45.6	39.12	32.73	38.7	54.3	58.7	56.2	50.1	57.6	313	272	259	277	27.2	23.91	22.91	24.8	39.5	41.3
15	Tver	405	461	494	431	378	27.8	32.1	34.89	30.64	27.2	38.8	41.2	44.1	37.9	34.2	262	303	348	338	18.3	21.4	24.74	24.31	33.2	34.0
16	Tula	665	741	642	619	603	40.1	45.4	39.85	38.69	38.2	42.3	42.2	43.2	49.1	49.1	473	411	365	392	29.0	25.51	22.82	24.8	32.2	36.6
17	Yaroslavl	312	289	333	272	295	23.0	21.5	24.98	20.48	22.3	34.1	32.0	37.7	33.7	36.0	132	179	155	216	9.8	13.43	11.67	16.36	23.6	30.9
18	**City: Moscow**	1669	1829	1803	1758	1777	16.1	17.6	17.31	16.86	17.0	45.0	45.6	45.3	46.3	36.8	1175	1346	1192	1229	11.3	12.92	11.43	11.77	35.2	28.3
	REGION: Nortwestern	3898	4057	4050	4000	3945	28.1	29.4	29.61	29.35	29.1	43.9	45.1	45.2	46.1	46.8	2617	2958	2898	2746	19.0	21.62	21.26	20.27	38.3	37.8
19	**Republics: Kareliya**	249	239	249	235	241	35.0	33.9	35.56	33.69	34.8	45.4	44.9	47.2	49.3	49.1	181	201	196	178	25.6	28.7	28.1	25.68	45.7	40.9
20	Komi	397	395	388	370	490	39.3	39.5	39.16	37.56	50.3	43.8	46.9	45.0	46.5	52.9	273	297	286	399	27.3	29.98	29.03	40.94	41.5	48.2
21	**Regions: Arkhangelsk**	464	461	415	493	411	35.0	35.2	31.97	38.18	32.1	48.6	48.4	48.4	52.3	54.4	338	322	378	301	25.8	24.81	29.27	23.51	43.3	43.8
	Nenetsky AD	11	10	11	17	14	26.3	23.9	26.21	40.49	33.4	55.0	50.0	52.4	73.9	82.4	10	11	10	9	23.9	26.21	23.82	21.45	45.5	60.0
22	Vologda	294	311	293	284	263	23.3	24.9	23.62	22.99	21.4	43.4	45.1	46.3	50.4	45.7	220	174	186	174	17.6	14.03	15.06	14.17	38.0	34.1
23	Kaliningrad	477	563	525	595	529	50.1	59.4	55.71	63.31	56.4	43.0	46.7	44.3	47.0	42.1	469	413	394	360	49.5	43.82	41.92	38.41	37.6	33.1
24	Leningrad	534	516	592	525	459	32.1	31.2	35.91	31.94	28.0	46.8	43.0	47.4	43.5	40.5	346	383	313	249	20.9	23.23	19.04	15.2	28.3	24.2
25	Murmansk	249	301	266	232	248	28.1	34.3	30.62	26.83	28.9	42.3	51.9	46.3	46.4	49.9	175	183	166	175	20.0	21.07	19.2	20.42	37.1	38.0
26	Novgorod	285	276	241	229	234	41.5	40.7	35.99	34.42	35.6	56.7	55.6	52.1	50.8	52.7		239	219	229		35.69	32.91	34.82	53.7	58.0
27	Pskov	325	302	362	353	376	43.2	40.7	49.54	48.72	52.7	53.1	52.6	56.5	56.7	58.6		259	258	227		35.45	35.61	31.82	44.1	37.6
28	**City: St-Petersburg**	624	693	719	684	694	13.4	15.0	15.66	14.93	15.2	33.8	36.1	36.7	36.8	40.7	474	487	502	454	10.3	10.61	10.96	9.932	33.8	37.1
	REGION: Southern	6302	6801	6270	6182	6813	29.0	31.3	28.96	27.11	29.9	37.6	41.2	38.4	37.9	38.9	4421	5013	4523	5330	20.4	23.15	19.83	23.4	30.8	33.7
29	**Republics: Adygeya**	165	174	177	146	162	37.0	39.1	39.9	32.98	36.7	45.0	44.8	52.1	42.2	39.4	150	169	146	161	33.7	38.1	32.98	36.49	47.7	42.1
30	Dagestan	450	591	504	606	634	17.4	22.6	19.15	22.95	23.8	26.2	37.0	32.5	36.9	40.1	590	490	550	631	22.6	18.62	20.83	23.73	38.7	46.0
31	Ingushetiya	106	143	144	91	115	22.4	29.9	29.74	18.69	23.3	29.9	49.5	58.5	49.7	53.7	135	122	84	102	28.2	25.19	17.25	20.7	54.9	53.1
	Чечня				341	353				29.33	29.8				37.4	35.2			341	353			29.33	29.82	42.4	40.6
32	Kabardino-Balkariya	117	164	149	187	188	13.0	18.3	16.64	20.92	21.1	27.1	36.3	31.8	38.3	38.3	126	124	154	172	14.0	13.85	17.23	19.3	35.2	39.4
33	Kalmykiya	85	110	67	90	118	29.2	37.9	23.16	31.18	41.1	22.6	29.6	17.8	24.4	32.3	19	13	35	80	6.5	4.5	12.1	27.9	11.5	26.1
34	Karachaevo-Cherkessiya	67	100	59	63	89	15.3	23.0	13.63	14.6	20.8	27.0	37.6	24.0	29.7	40.6	24	11	15	28	5.5	2.5	3.5	6.5	9.1	14.9
35	North Osetiya - Alaniya	265	170	171	193	171	37.4	24.1	24.31	27.48	24.4	48.4	30.5	32.8	44.0	33.4	135	155	156	150	19.1	22.0	22.2	21.4	46.2	45.0
36	**Krai: Krasnodarsky**	1312	1297	1274	1130	1395	25.7	25.4	24.99	22.17	27.3	36.2	36.3	38.9	36.4	37.9	697	782	656	977	13.7	15.34	12.87	19.15	22.5	28.1
37	Stavropolsky	767	743	543	575	723	28.1	27.3	20.01	21.22	26.8	40.5	48.1	28.8	32.0	39.6	388	366	409	592	14.3	13.49	15.09	21.92	26.4	37.7
38	**Regions: Astrakhan**	307	311	342	320	321	30.6	31.1	34.33	32.19	32.3	33.7	35.3	38.8	36.6	36.8	123	291	298	312	12.3	29.21	29.97	31.38	37.8	39.3
39	Volgograd	1137	1466	1247	1264	1453	42.4	55.0	47.14	47.96	55.5	40.6	49.4	41.0	45.0	46.9	811	1213	781	913	30.4	45.85	29.63	34.85	29.6	31.7
40	Rostov	1524	1532	1593	1176	1091	34.8	35.2	36.88	27.33	25.5	43.7	42.3	45.4	37.7	33.6	1223	1277	898	859	28.1	29.57	20.87	20.09	31.3	28.5
	REGION: Privolzhsky	9072	9713	10068	10127	9856	29.3	31.5	32.89	33.19	32.5	38.6	41.7	42.8	42.5	43.5	5589	6102	6139	6132	18.1	19.93	20.12	20.21	28.8	29.9
41	**Republics: Bashkortostan**	903	788	879	779	661	22.0	19.3	21.59	19.17	16.3	37.3	32.5	38.2	34.9	31.3	487	505	497	454	11.9	12.4	12.23	11.21	25.2	24.1
42	Mariy El	345	297	333	316	377	47.6	41.3	46.63	44.41	53.3	78.1	68.9	69.4	67.4	64.8	164	183	183	225	22.8	25.62	25.72	31.84	44.3	43.1
43	Mordoviya	254	286	210	250	208	28.8	32.8	24.37	29.18	24.5	35.1	41.5	35.1	42.5	35.7	274	202	156	129	31.4	23.44	18.21	15.22	28.6	24.2
44	Tatarstan	812	920	905	916	876	21.5	24.4	24.04	24.35	23.3	33.0	40.0	39.2	39.9	39.7	529	519	543	545	14.0	13.78	14.44	14.49	26.9	27.9
45	Udmurtiya	569	643	650	576	609	36.4	41.3	41.97	37.3	39.6	44.1	47.7	49.4	45.4	48.6	232	395	357	372	14.9	25.51	23.12	24.19	31.0	32.3
46	Chuvashiya	477	521	614	660	674	36.5	40.0	47.38	51.07	52.4	50.0	48.1	58.3	62.7	67.8	500	554	500	492	38.4	42.75	38.69	38.25	49.7	52.8
47	**Regions: Kirov**	468	471	508	538	507	31.4	32.0	34.98	37.29	35.5	48.4	55.3	56.1	53.1	55.7	243	285	303	307	16.5	19.63	21	21.51	34.1	38.1
48	Nizhniy Novgorod	1056	1181	1105	1130	1147	30.2	34.1	32.23	33.13	33.9	35.6	41.2	37.9	39.7	45.7	684	768	722	704	19.8	22.4	21.17	20.82	27.5	30.3
49	Orenburg	558	607	809	861	801	25.7	28.1	37.73	40.27	37.7	29.2	30.4	38.1	36.3	34.6	224	253	392	387	10.4	11.8	18.34	18.21	18.9	19.0
50	Penza	523	559	517	474	483	36.3	39.1	36.53	33.67	34.6	49.9	53.9	49.0	46.2	49.0	247	315	317	332	17.3	22.26	22.51	23.78	35.7	37.5
51	Perm (Permsky krai)	1155	1349	1323	1396	1290	41.2	48.5	47.95	50.8	47.2	42.3	44.1	43.4	43.6	45.6	761	724	893	803	27.4	26.24	32.49	29.4	32.2	31.7
	Komi-Permsky AD	121	154	123			89.6	115.3	185.2			77.6	79.8	77.4			54	75			40.4	112.9				
52	Samara	1091	1032	1213	1166	1111	33.8	32.2	37.96	36.56	35.0	44.9	46.3	50.1	46.0	44.1	556	709	626	635	17.3	22.19	19.63	19.98	26.9	27.7
53	Saratov	529	674	633	702	681	19.9	25.6	24.19	26.91	26.2	24.4	33.5	31.4	36.9	38.5	421	409	393	435	16.0	15.63	15.07	16.76	22.5	26.4
54	Uliyanovsk	332	385	369	363	431	24.2	28.4	27.47	27.17	32.6	34.5	40.2	37.3	35.7	38.8	267	281	257	312	19.7	20.92	19.24	23.61	28.1	31.3
	DISTRIC: Urals	4354	4586	4557	4593	4472	35.3	37.3	37.16	37.51	36.6	35.6	35.7	36.0	36.5	35.2	2853	2738	2834	2821	23.2	22.33	23.15	23.07	25.8	25.0
55	**Regions: Kurgan**	490	526	514	486	421	48.5	52.7	52.13	49.6	43.4	40.6	40.5	41.1	36.1	31.9	217	201	245	214	21.7	20.39	25	22.08	20.3	21.0
56	Sverdlovsk	1863	1856	1893	1909	1902	41.7	41.8	42.84	43.29	43.2	41.4	41.8	41.1	41.3	38.7	1048	1097	1091	1053	23.6	24.82	24.74	23.93	26.2	23.6
57	Tyumen	950	1141	1064	1098	1011	29.0	34.6	32.09	33.04	30.2	25.8	28.6	27.2	27.8	29.7	608	728	727	689	18.4	21.96	21.88	20.6	20.2	22.5

№ № пп.	Federal regions, ares of the Russian Federation	New cases MbT+										Proportion of patients MbT+ to all new cases					New cases MbT+ confirmed by microscopy (ss+)									
		#					per 100K					%					#				per 100K				% of PTB	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2006	2006
	Khanty-Mantyisky AD	383	493	462	502	453	26.5	33.7	31.35	33.96	30.4	31.9	36.4	33.3	35.3	34.9	255	271	276	278	17.4	18.39	18.67	18.68	21.1	23.9
	Yamalo-Nenetsky AD	133	134	138	145	123	26.0	25.8	26.19	27.32	22.8	27.0	29.8	26.8	33.0	30.8	62	85	89	78	11.9	16.13	16.77	14.48	23.5	21.7
58	Chelyabinsk	1051	1063	1086	1100	1138	29.3	29.8	30.67	31.15	32.4	37.2	34.1	37.7	41.4	36.9	980	712	771	865	27.5	20.11	21.83	24.6	38.5	31.4
	REGION: Siberian	10521	10538	11287	10591	10293	52.7	53.1	57.19	53.83	52.5	40.9	41.2	42.8	40.9	41.1	7214	8086	7611	7328	36.3	40.97	38.68	37.41	32.2	32.1
59	**Republics: Altai**	90	122	142	68	82	44.3	59.9	69.55	33.26	39.9	40.0	41.2	47.7	26.2	34.6	71	94	50	35	34.9	46.04	24.45	17.04	22.5	17.2
60	Buryatiya	475	503	549	572	579	48.6	51.8	56.82	59.38	60.3	32.8	34.1	35.9	34.2	41.4	324	417	400	489	33.3	43.16	41.53	50.94	26.4	38.5
61	Tyva	388	373	419	373	366	126.8	121.5	136	120.9	118.3	46.6	47.7	54.5	49.1	50.1	186	243	248	232	60.6	78.88	80.39	74.97	38.3	35.5
62	Khakasiya	323	362	373	334	303	59.4	66.8	69.13	62.06	56.5	44.9	48.1	50.7	52.4	55.3	312	275	235	201	57.6	50.97	43.66	37.46	39.3	39.2
63	**Krai: Altai**	1054	1027	1098	920	766	40.6	39.9	42.98	36.17	30.4	31.4	27.6	29.5	25.5	23.1	819	906	802	691	31.8	35.47	31.53	27.38	24.0	22.6
64	Krasnoyarsky	1320	1234	1377	1359	1375	44.7	42.1	47.23	46.76	47.5	41.4	39.9	43.0	45.0	45.7	727	831	872	905	24.8	28.5	30.01	31.27	31.5	32.4
	Taimyrsky AD	15	16	13	11		37.9	40.6	33.18	28.21		57.7	48.5	50.0	45.8			12	11			30.63	28.21		64.7	
	Evenkiysky AD	18	10	15	8		102.4	57.3	86.46	46.3		48.6	41.7	57.7	36.4		7	9	7		40.1	51.87	40.51		33.3	
65	**Regions: Irkutsk**	1232	1259	1198	1229	1342	48.0	49.3	47.24	48.64	53.4	37.8	40.1	38.3	38.9	39.0	876	904	899	935	34.3	35.64	35.58	37.19	31.2	29.9
	Ust-Ordynsky Buryatskiy AD	102	86	95	67	110	75.7	64.0	70.91	50.06	82.2	52.3	43.9	37.3	31.9	48.7	58	68	36	85	43.2	50.75	26.9	63.49	18.9	42.7
66	Kemerovo	2172	2024	2281	2204	2006	75.3	70.7	80.13	77.65	71.0	52.1	53.7	50.9	50.7	49.6	1446	1840	1538	1368	50.5	64.63	54.18	48.4	39.7	38.2
67	Novosibirsk	1496	1589	1726	1416	1495	55.8	59.6	64.98	53.44	56.6	40.7	41.8	45.7	38.8	42.7	1124	1054	966	988	42.1	39.68	36.45	37.41	28.1	30.0
68	Omsk	873	887	957	963	963	42.2	43.2	46.9	47.33	47.5	35.5	36.7	39.8	39.1	37.3	637	729	770	690	31.0	35.72	37.85	34.06	33.7	29.0
69	Tomsk	674	717	674	684	581	64.6	69.0	65.1	66.14	56.2	60.4	65.2	60.7	61.3	54.9	485	434	462	452	46.7	41.92	44.67	43.75	45.0	46.2
70	Chita	424	441	493	469	435	36.9	38.7	43.55	41.57	38.8	32.9	35.9	40.2	39.1	36.1	207	359	369	342	18.2	31.71	32.71	30.48	34.1	35.1
	Aginsky Buryatsky AD	38	27	27	25	12	52.4	36.9	36.56	33.68	16.0	41.3	28.1	38.0	26.3	15.4	22	20	23	10	30.1	27.08	30.98	13.31	28.8	14.5
	REGION: Far Estern	2875	3159	3547	3529	3416	43.2	47.8	53.99	53.9	52.5	34.4	37.5	40.9	42.2	39.7	1880	2262	2343	2535	28.4	34.43	35.79	38.95	30.5	31.8
71	**Republic: Sakha (Yakutiya)**	312	357	388	388	330	32.9	37.6	40.83	40.84	34.7	41.9	40.7	48.6	49.6	44.8	152	186	224	219	16.0	19.57	23.58	23.05	35.3	34.6
72	**Krai: Primorsky**	1152	1272	1472	1469	1546	55.9	62.2	72.6	72.74	77.1	37.7	40.1	43.9	44.2	43.1	855	1002	1043	1092	41.8	49.42	51.65	54.44	33.8	32.5
73	Khabarovsky	522	563	659	676	612	36.5	39.5	46.53	47.87	43.5	27.9	32.5	35.9	39.3	33.9	344	421	466	561	24.2	29.7	33.0	39.9	28.7	32.8
74	**Regions: Amur**	359	357	400	361	346	40.0	40.1	45.23	40.97	39.6	24.8	26.8	30.7	28.9	28.1	209	263	190	263	23.5	29.7	21.6	30.1	16.2	22.5
75	Kamchatka	98	128	106	102	75	27.5	36.2	30.23	29.21	21.6	32.5	39.3	31.0	35.4	26.7	63	67	78	71	17.8	19.1	22.3	20.5	31.7	29.6
	Koryaksky AD	0	35	31	30		0.0	145.3	131.8	129.4		0.0	0.0	0.0	30.6		21	18	26		87.2	76.6	112.1		32.1	
76	Magadan	66	59	61	65	52	36.6	33.4	35.23	37.89	30.9	46.2	41.0	42.7	47.1	40.0	40	17	29	35	22.7	9.8	16.9	20.8	25.4	32.4
77	Sakhalin	209	285	304	325	288	38.6	53.2	57.43	61.76	55.3	48.0	54.5	54.8	55.7	57.3	151	219	225	199	28.2	41.4	42.8	38.2	42.7	46.6
78	**Autonomous region: Jewish**	136	117	137	122	149	71.5	61.8	73.01	65.4	80.3	41.6	39.3	46.0	49.8	48.1	57	78	80	93	30.1	41.6	42.9	50.1	34.0	30.9
79	**Autonomous REGION: Chukots**	21	21	20	21	18	40.2	41.1	39.51	41.56	35.7	58.3	65.6	51.3	65.6	62.1	9	9	8	2	17.6	17.78	15.83	3.962	29.6	7.1

Tabl 5. TB notification rate in Russia 2003-2007 (civilian population)

(MoH&SD institutions, form #33)

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases of all forms										detected postmortem	Of them, TB of respiratory organs				Of them, pulmonary TB				Of them, TB of other organs			
		#					per 100K						#		% to all forms		#		% to all forms		#		% to all forms	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	RUSSIA	**95183**	**97322**	**96646**	**96867**	**96251**	**66.4**	**68.21**	**68.08**	**67.9**	**67.68**	**69.1**	**92879**	**92474**	**95.9**	**96.1**	**85780**	**85962**	**88.6**	**89.3**	**3988**	**3777**	**4.1**	**3.9**
	REGION: Central	17940	18208	17668	17642	17429	47.4	48.4	47.2	47.3	46.8	48.6	16803	16637	95.2	95.5	15523	15366	88.0	88.2	839	792	4.8	4.5
1	**Regions: Belgorod**	878	934	772	819	778	58.0	61.8	51.1	54.1	51.4	51.9	773	732	94.4	94.1	735	705	89.7	90.6	46	46	5.6	5.9
2	Bryansk	956	1007	1051	1044	1110	69.9	74.4	78.5	78.8	84.2	88.1	985	1057	94.3	95.2	909	986	87.1	88.8	59	53	5.7	4.8
3	Vladimir	891	820	815	898	877	58.9	54.8	55.1	61.3	60.1	62.5	860	850	95.8	96.9	788	761	87.8	86.8	38	27	4.2	3.1
4	Voronezh	1365	1221	1259	1166	1251	57.7	52.1	54.2	50.6	54.5	54.6	1100	1171	94.3	93.6	1019	1117	87.4	89.3	66	80	5.7	6.4
5	Ivanovo	552	463	496	536	455	48.5	41.3	44.8	49.0	41.8	42.7	516	439	96.3	96.5	478	410	89.2	90.1	20	16	3.7	3.5
6	Kaluga	576	595	589	558	534	55.7	58.0	57.9	55.2	52.9	55.4	512	494	91.8	92.5	476	461	85.3	86.3	46	40	8.2	7.5
7	Kostroma	327	332	293	269	242	44.8	46.0	41.1	38.1	34.5	34.5	254	236	94.4	97.5	236	212	87.7	87.6	15	6	5.6	2.5
8	Kursk	703	728	810	779	763	57.5	60.3	68.0	66.2	65.2	66.6	752	740	96.5	97.0	687	677	88.2	88.7	27	23	3.5	3.0
9	Lipetsk	728	693	685	679	738	60.4	58.0	57.8	57.7	62.9	63.5	635	699	93.5	94.7	617	689	90.9	93.4	44	39	6.5	5.3
10	Moscow	3180	3110	2872	2922	3107	48.0	46.9	43.3	44.0	46.8	50.6	2817	3007	96.4	96.8	2599	2803	88.9	90.2	105	100	3.6	3.2
11	Orel	444	428	416	433	400	52.0	50.6	49.6	52.2	48.4	48.9	415	380	95.8	95.0	380	355	87.8	88.8	18	20	4.2	5.0
12	Ryazan	739	776	790	793	737	60.8	64.6	66.5	67.4	62.9	65.3	759	712	95.7	96.6	708	650	89.3	88.2	34	25	4.3	3.4
13	Smolensk	785	824	771	762	686	75.5	80.3	76.2	76.2	69.0	71.4	733	663	96.2	96.6	652	599	85.6	87.3	29	23	3.8	3.4
14	Tambov	740	780	666	626	633	63.4	67.7	58.5	55.7	56.7	57.3	593	593	94.7	93.7	560	565	89.5	89.3	33	40	5.3	6.3
15	Tver	801	862	881	870	859	55.1	60.1	62.2	62.2	61.8	64.7	851	845	97.8	98.4	786	755	90.3	87.9	19	14	2.2	1.6
16	Tula	1161	1293	1116	978	906	70.1	79.2	69.3	61.5	57.3	60.6	936	847	95.7	93.5	853	773	87.2	85.3	42	59	4.3	6.5
17	Yaroslavl	604	630	599	594	598	44.5	46.8	44.9	44.9	45.3	46.5	550	567	92.6	94.8	464	494	78.1	82.6	44	31	7.4	5.2
18	**City: Moscow**	2510	2712	2787	2916	2755	24.2	26.1	26.8	27.9	26.4	27.3	2762	2605	94.7	94.6	2576	2354	88.3	85.4	154	150	5.3	5.4
	REGION: Nortwestern	7083	7115	7094	6885	6698	51.0	51.6	51.9	50.7	49.4	51.0	6585	6441	95.6	96.2	5842	5792	84.9	86.5	300	257	4.4	3.8
19	**Republics: Kareliya**	438	424	430	396	422	61.5	60.1	61.4	57.0	60.9	61.7	378	402	95.5	95.3	350	371	88.4	87.9	18	20	4.5	4.7
20	Komi	664	650	623	592	670	65.7	64.9	62.9	60.4	68.7	70.8	541	626	91.4	93.4	496	595	83.8	88.8	51	44	8.6	6.6
21	**Regions: Arkhangelsk**	743	718	630	630	562	56.1	54.8	48.5	49.0	43.9	45.1	612	550	97.1	97.9	565	504	89.7	89.7	18	12	2.9	2.1
	Nenetsky AD	20	20	20	23	16	47.9	47.7	47.7	54.8	38.1	40.5	23	16	100.0	100.0	22	14	95.7	87.5	0	0	0.0	0.0
22	Vologda	483	543	483	467	450	38.3	43.4	38.9	37.9	36.7	37.4	438	432	93.8	96.0	399	399	85.4	88.7	29	18	6.2	4.0
23	Kaliningrad	939	993	961	1014	999	98.6	104.8	102.0	108.0	106.6	111.3	978	972	96.4	97.3	813	845	80.2	84.6	36	27	3.6	2.7
24	Leningrad	1014	1038	1085	1011	877	61.0	62.7	65.8	61.6	53.5	57.0	988	855	97.7	97.5	923	786	91.3	89.6	23	22	2.3	2.5
25	Murmansk	385	413	403	376	400	43.5	47.1	46.4	43.7	46.7	48.5	360	396	95.7	99.0	336	375	89.4	93.8	16	4	4.3	1.0
26	Novgorod	389	377	365	360	355	56.6	55.6	54.5	54.4	54.0	54.0	339	335	94.2	94.4	323	308	89.7	86.8	21	20	5.8	5.6
27	Pskov	448	398	490	465	493	59.5	53.6	67.1	64.7	69.1	70.2	453	483	97.4	98.0	433	456	93.1	92.5	12	10	2.6	2.0
28	**City: St-Petersburg**	1580	1561	1624	1574	1470	34.0	33.8	35.4	34.4	32.2	33.0	1498	1390	95.2	94.6	1204	1153	76.5	78.4	76	80	4.8	5.4
	REGION: Southern	13575	13936	13548	14005	15040	62.4	64.2	62.6	63.1	66.0	66.3	13335	14386	95.2	95.7	12441	13472	88.8	89.6	670	654	4.8	4.3
29	**Republics: Adygeya**	249	329	278	283	331	55.8	74.0	62.7	64.0	75.0	77.3	274	322	96.8	97.3	245	303	86.6	91.5	9	9	3.2	2.7
30	Dagestan	1611	1505	1475	1535	1497	62.2	57.6	56.1	57.9	56.3	56.3	1430	1402	93.2	93.7	1328	1300	86.5	86.8	105	95	6.8	6.3
31	Ingushetiya	299	251	215	182	212	63.3	52.4	44.4	37.2	43.0	43.0	179	207	98.4	97.6	152	190	83.5	89.6	3	5	1.6	2.4
	Чечня				902	1001			154.3	76.9	84.6	84.6	854	949	94.7	94.8	795	867	88.1	86.6	48	52	5.3	5.2
32	Kabardino-Balkariya	399	429	425	437	429	44.3	47.8	47.5	49.0	48.1	48.4	422	413	96.6	96.3	388	380	88.8	88.6	15	16	3.4	3.7
33	Kalmykiya	319	332	333	342	336	109.5	114.4	115.1	118.8	117.0	117.0	320	320	93.6	95.2	277	278	81.0	82.7	22	16	6.4	4.8
34	Karachaevo-Cherkessiya	236	250	217	196	212	53.9	57.4	50.1	45.6	49.5	49.5	174	200	88.8	94.3	160	182	81.6	85.8	22	12	11.2	5.7
35	North Osetiya - Alaniya	472	500	482	403	437	66.6	70.9	68.5	57.4	62.3	62.3	355	404	88.1	92.4	302	332	74.9	76.0	48	33	11.9	7.6

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases of all forms										detected postmortem	Of them, TB of respiratory organs				Of them, pulmonary TB				Of them, TB of other organs			
		#					per 100K						#		% to all forms		#		% to all forms		#		% to all forms	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
36	**Krai: Krasnodarsky**	2848	2876	2826	2626	3169	55.7	56.4	55.4	51.5	62.1	62.2	2536	3097	96.6	97.7	2434	2981	92.7	94.1	90	72	3.4	2.3
37	Stavropolsky	1472	1507	1424	1433	1465	53.9	55.4	52.5	53.0	54.2	54.9	1282	1319	89.5	90.0	1187	1215	82.8	82.9	151	146	10.5	10.0
38	**Regions: Astrakhan**	804	784	780	755	755	80.2	78.4	78.3	75.9	75.9	75.9	734	739	97.2	97.9	666	679	88.2	89.9	21	16	2.8	2.1
39	Volgograd	2050	2169	2107	2084	2302	76.4	81.4	79.6	79.3	87.9	88.7	2016	2194	96.7	95.3	1922	2103	92.2	91.4	68	108	3.3	4.7
40	Rostov	2816	3004	2986	2827	2894	64.3	69.1	69.1	65.9	67.7	67.8	2759	2820	97.6	97.4	2585	2662	91.4	92.0	68	74	2.4	2.6
	REGION: Privolzhsky	19231	19209	19310	19399	18294	62.0	62.4	63.1	63.8	60.3	61.3	18473	17436	95.2	95.3	17108	16287	88.2	89.0	926	858	4.8	4.7
41	**Republics: Bashkortostan**	1920	1922	1884	1868	1752	46.9	47.0	46.3	46.0	43.2	43.4	1747	1643	93.5	93.8	1612	1526	86.3	87.1	121	109	6.5	6.2
42	Mariy El	401	392	443	449	541	55.4	54.5	62.0	63.3	76.6	78.3	434	526	96.7	97.2	393	485	87.5	89.6	15	15	3.3	2.8
43	Mordoviya	633	623	531	561	543	71.8	71.5	61.6	65.8	64.1	64.3	547	524	97.5	96.5	519	493	92.5	90.8	14	19	2.5	3.5
44	Tatarstan	2175	2022	2048	2055	1887	57.6	53.6	54.4	54.6	50.2	51.1	1928	1779	93.8	94.3	1792	1657	87.2	87.8	127	108	6.2	5.7
45	Udmurtiya	1094	1130	1116	1075	1090	69.9	72.6	72.1	69.8	70.9	72.3	1030	1058	95.8	97.1	964	988	89.7	90.6	45	32	4.2	2.9
46	Chuvashiya	781	886	875	888	865	59.7	68.0	67.5	68.9	67.3	69.5	864	838	97.3	96.9	843	805	94.9	93.1	24	27	2.7	3.1
47	**Regions: Kirov**	809	790	831	828	718	54.3	53.7	57.2	57.7	50.3	51.6	784	672	94.7	93.6	708	622	85.5	86.6	44	46	5.3	6.4
48	Nizhniy Novgorod	2352	2229	2217	2066	1868	67.2	64.4	64.7	60.8	55.2	57.1	1979	1807	95.8	96.7	1862	1691	90.1	90.5	87	61	4.2	3.3
49	Orenburg	1579	1586	1745	1847	1772	72.8	73.5	81.4	86.6	83.4	83.7	1776	1695	96.2	95.7	1571	1516	85.1	85.6	71	77	3.8	4.3
50	Penza	886	916	939	923	853	61.4	64.1	66.3	65.8	61.1	61.5	869	807	94.1	94.6	759	758	82.2	88.9	54	46	5.9	5.4
51	Perm (Permsky krai)	2182	2438	2318	2473	2167	77.9	87.7	84.0	90.3	79.4	81.6	2359	2075	95.4	95.8	2171	1938	87.8	89.4	114	92	4.6	4.2
	Komi-Permsky AD	148	186	159			109.6	139.2	239.4															
52	Samara	1849	1720	1810	1898	1847	57.3	53.6	56.6	59.6	58.1	59.1	1811	1732	95.4	93.8	1706	1636	89.9	88.6	87	115	4.6	6.2
53	Saratov	1811	1750	1770	1653	1541	68.2	66.4	67.6	63.5	59.4	59.4	1573	1488	95.2	96.6	1511	1420	91.4	92.1	80	53	4.8	3.4
54	Uliyanovsk	759	805	783	815	850	55.3	59.3	58.3	61.3	64.3	65.1	772	792	94.7	93.2	697	752	85.5	88.5	43	58	5.3	6.8
	DISTRIC: Urals	9733	10304	10202	10444	10353	78.9	83.8	83.2	85.3	84.6	85.8	10027	9949	96.0	96.1	9235	9200	88.4	88.9	417	404	4.0	3.9
55	**Regions: Kurgan**	1033	1148	1043	1147	1126	102.3	115.0	105.8	117.7	116.2	117.1	1092	1080	95.2	95.9	975	1001	85.0	88.9	55	46	4.8	4.1
56	Sverdlovsk	3345	3444	3486	3781	3935	75.0	77.6	78.9	85.8	89.4	91.1	3654	3818	96.6	97.0	3351	3520	88.6	89.5	127	117	3.4	3.0
57	Tyumen	3146	3372	3384	3344	2910	95.9	102.2	102.1	100.3	87.0	87.8	3240	2797	96.9	96.1	2998	2587	89.7	88.9	104	113	3.1	3.9
	Khanty-Mantyisky AD	1040	1185	1228	1268	1146	71.9	81.0	83.3	85.5	77.0	77.6	1245	1114	98.2	97.2	1158	1022	91.3	89.2	23	32	1.8	2.8
	Yamalo-Nenetsky AD	403	391	450	369	343	78.7	75.3	85.4	69.0	63.7	64.1	352	333	95.4	97.1	308	302	83.5	88.0	17	10	4.6	2.9
58	Chelyabinsk	2209	2340	2289	2172	2382	61.6	65.7	64.6	61.6	67.7	68.8	2041	2254	94.0	94.6	1911	2092	88.0	87.8	131	128	6.0	5.4
	REGION: Siberian	20864	21642	21718	21546	21371	104.5	109.0	110.0	109.7	109.1	111.5	20910	20751	97.0	97.1	19442	19384	90.2	90.7	636	620	3.0	2.9
59	**Republics: Altai**	225	291	296	257	236	110.8	143.0	145.0	125.4	114.9	115.4	243	223	94.6	94.5	220	203	85.6	86.0	14	13	5.4	5.5
60	Buryatiya	1180	1222	1246	1385	1365	120.8	125.8	129.0	144.0	142.2	144.7	1346	1330	97.2	97.4	1239	1245	89.5	91.2	39	35	2.8	2.6
61	Tyva	685	687	655	637	567	223.9	223.7	212.6	206.2	183.2	183.2	581	526	91.2	92.8	539	490	84.6	86.4	56	41	8.8	7.2
62	Khakasiya	605	671	642	535	507	111.2	123.8	119.0	99.6	94.5	96.0	524	503	97.9	99.2	495	484	92.5	95.5	11	4	2.1	0.8
63	**Krai: Altai**	2865	3141	3074	3102	2891	110.5	122.0	120.3	122.4	114.6	116.4	3046	2803	98.2	97.0	2857	2653	92.1	91.8	56	88	1.8	3.0
64	Krasnoyarsky	2780	2797	2620	2491	2446	94.2	95.3	89.9	85.9	84.5	87.8	2403	2371	96.5	96.9	2253	2243	90.4	91.7	88	75	3.5	3.1
	Taimyrsky AD	26	33	26	24		65.7	83.7	66.4	62.0			24		100.0		17		70.8		0		0.0	
	Evenkiysky AD	37	24	24	22		210.5	137.4	138.3	128.4			21		95.5		21		95.5		1		4.5	
65	**Regions: Irkutsk**	2361	2405	2604	2735	3006	91.9	94.2	102.7	108.5	119.6	122.5	2653	2905	97.0	96.6	2456	2696	89.8	89.7	82	101	3.0	3.4
	Ust-Ordynsky Buryatskiy AD	195	196	253	209	225	144.7	145.9	188.8	156.1	168.1	168.1	205	222	98.1	98.7	189	200	90.4	88.9	4	3	1.9	1.3
66	Kemerovo	3275	3636	3765	3651	3524	113.6	127.0	132.3	128.9	124.7	128.0	3547	3434	97.2	97.4	3196	3073	87.5	87.2	104	90	2.8	2.6
67	Novosibirsk	2926	3017	2947	2913	2869	109.2	113.1	111.0	110.1	108.6	111.2	2840	2808	97.5	97.9	2702	2694	92.8	93.9	73	61	2.5	2.1
68	Omsk	2054	1982	1996	2003	2097	99.4	96.6	97.8	98.7	103.5	106.0	1948	2037	97.3	97.1	1837	1914	91.7	91.3	55	60	2.7	2.9
69	Tomsk	908	905	900	876	851	87.0	87.1	86.9	84.8	82.4	82.9	852	826	97.3	97.1	791	770	90.3	90.5	24	25	2.7	2.9
70	Chita	1000	888	973	961	1012	87.1	77.9	86.0	85.4	90.2	90.7	927	985	96.5	97.3	857	919	89.2	90.8	34	27	3.5	2.7

№ № пп.	Federal regions, ares of the Russian Federation	New TB cases of all forms										detected postmortem	Of them, TB of respiratory organs				Of them, pulmonary TB				Of them, TB of other organs			
		#					per 100K						#		% to all forms		#		% to all forms		#		% to all forms	
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
	Aginsky Buryatsky AD	92	96	71	95	78	126.9	131.3	96.1	127.2	103.9	103.9	91	74	95.8	94.9	80	69	84.2	88.5	4	4	4.2	5.1
	REGION: Far Estern	6742	6896	7100	6937	7057	101.3	104.3	108.1	106.3	108.4	109.8	6740	6866	97.2	97.3	6184	6455	89.1	91.5	197	191	2.8	2.7
71	**Republic: Sakha (Yakutiya)**	658	799	718	692	620	69.4	84.1	75.6	72.8	65.3	65.7	645	584	93.2	94.2	529	519	76.4	83.7	47	36	6.8	5.8
72	**Krai: Primorsky**	2346	2450	2628	2727	2915	113.9	119.9	129.6	135.5	145.3	147.6	2674	2866	98.1	98.3	2433	2719	89.2	93.3	53	49	1.9	1.7
73	Khabarovsky	1510	1443	1521	1405	1470	105.5	101.4	107.4	99.7	104.6	105.2	1386	1456	98.6	99.0	1319	1379	93.9	93.8	19	14	1.4	1.0
74	**Regions: Amur**	1126	1076	1052	1046	991	125.4	120.8	119.0	119.2	113.3	113.8	1018	966	97.3	97.5	971	929	92.8	93.7	28	25	2.7	2.5
75	Kamchatka	245	265	291	253	239	68.8	75.0	83.0	72.7	68.9	69.7	249	237	98.4	99.2	211	199	83.4	83.3	4	2	1.6	0.8
	Koryaksky AD		84	106	97			348.6	450.8	423.9		0.0	96		99.0		80		82.5		1		1.0	
76	Magadan	138	132	119	110	109	76.6	74.8	68.7	64.7	64.7	66.5	102	103	92.7	94.5	92	82	83.6	75.2	8	6	7.3	5.5
77	Sakhalin	396	446	468	447	399	73.1	83.3	88.4	85.4	76.6	79.0	413	344	92.4	86.2	391	324	87.5	81.2	34	55	7.6	13.8
78	**Autonomous region: Jewish**	288	253	264	225	286	151.4	133.7	140.7	120.9	154.1	157.8	224	283	99.6	99.0	211	277	93.8	96.9	1	3	0.4	1.0
79	**Autonomous REGION: Chukots**	35	32	39	32	28	67.0	62.7	77.0	63.4	55.5	57.4	29	27	90.6	96.4	27	27	84.4	96.4	3	1	9.4	3.6

Tabl.6. TB notification rate in Russia 2004-2007 (civilian population)

(MoH&SD institutions, form#33)

№ № пп.	Federal regions, ares of the Russian Federation	New respiratory TB cases MbT+								Proportion of MbT+ cases among new respiratory TB patients				New TB cases MbT+, confirmed by microscopy (ss+)									
		#				per 100K				%				#				per 100K				к ТОД,%	
		2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2006	2007
	RUSSIA	**43311**	**43931**	**43262**	**42553**	**30.4**	**30.9**	**30.5**	**29.9**	**46.5**	**47.5**	**46.6**	**46.0**	**25733**	**28584**	**28844**	**29366**	**18.0**	**20.1**	**20.3**	**20.6**	**31.1**	**31.8**
	REGION: Central	8820	8715	8562	8218	23.4	23.3	23.0	22.1	51.0	52.0	51.0	49.4	5296	5593	5769	5778	14.1	14.9	15.4	15.5	34.3	34.7
1	**Regions: Belgorod**	456	422	416	409	30.2	27.9	27.5	27.0	50.4	57.0	53.8	55.9	232	275	280	279	15.3	18.2	18.5	18.4	36.2	38.1
2	Bryansk	643	636	594	605	47.5	47.5	44.8	45.9	67.3	65.2	60.3	57.2	441	415	378	412	32.6	31.0	28.4	31.3	38.4	39.0
3	Vladimir	454	450	475	399	30.4	30.4	32.4	27.3	57.3	57.0	55.2	46.9	364	370	369	327	24.3	25.0	25.1	22.4	42.9	38.5
4	Voronezh	627	702	668	677	26.8	30.2	29.0	29.5	54.0	59.0	60.7	57.8	317	349	362	376	13.5	15.0	15.6	16.4	32.9	32.1
5	Ivanovo	302	303	341	298	26.9	27.4	31.2	27.4	68.8	65.6	66.1	67.9	220	0	244	216	19.6	0.0	22.2	19.9	47.3	49.2
6	Kaluga	356	369	312	293	34.7	36.3	30.8	29.0	65.9	68.5	60.9	59.3	213	296	257	233	20.8	29.1	25.3	23.1	50.2	47.2
7	Kostroma	150	151	146	128	20.8	21.2	20.7	18.2	46.6	53.4	57.5	54.2	101	39	87	83	14.0	5.5	12.3	11.8	34.3	35.2
8	Kursk	356	376	394	376	29.5	31.6	33.5	32.1	50.7	48.6	52.4	50.8	213	253	241	263	17.7	21.2	20.4	22.5	32.0	35.5
9	Lipetsk	327	323	319	331	27.4	27.2	27.1	28.2	50.3	50.2	50.2	47.4	28	153	168	178	2.3	12.9	14.2	15.2	26.5	25.5
10	Moscow	1068	1079	1056	1094	16.1	16.3	15.9	16.5	35.9	39.1	37.5	36.4	793	891	841	886	12.0	13.4	12.7	13.3	29.9	29.5
11	Orel	306	298	333	293	36.2	35.6	40.1	35.4	75.7	75.6	80.2	77.1	230	222	258	202	27.2	26.5	30.9	24.4	62.2	53.2
12	Ryazan	353	274	272	338	29.4	23.1	23.1	28.8	47.7	36.3	35.8	47.5	262	227	250	275	21.8	19.1	21.2	23.5	32.9	38.6
13	Smolensk	371	361	351	281	36.2	35.7	35.1	28.3	46.9	49.2	47.9	42.4	103	147	177	140	10.0	14.5	17.6	14.1	24.1	21.1
14	Tambov	470	389	339	380	40.8	34.2	30.2	34.0	64.3	61.9	57.2	64.1	185	244	253	241	16.1	21.4	22.4	21.6	42.7	40.6
15	Tver	412	437	370	326	28.7	30.9	26.5	23.4	48.5	50.4	43.5	38.6	230	256	295	298	16.0	18.1	21.0	21.4	34.7	35.3
16	Tula	663	556	556	507	40.6	34.5	35.0	32.1	54.7	52.8	59.4	59.9	405	384	361	331	24.8	23.8	22.6	20.9	38.6	39.1
17	Yaroslavl	246	281	235	254	18.3	21.1	17.7	19.2	43.1	50.3	42.7	44.8	102	133	133	175	7.6	10.0	10.0	13.3	24.2	30.9
18	**City: Moscow**	1260	1308	1385	1229	12.1	12.6	13.3	11.8	49.3	49.9	50.1	47.2	857	939	948	863	8.2	9.0	9.1	8.3	34.3	33.1
	REGION: Nortwestern	3496	3520	3465	3399	25.4	25.7	25.5	25.1	51.1	51.8	52.6	52.8	2161	2340	2364	2275	15.7	17.1	17.3	16.8	35.9	35.3
19	**Republics: Kareliya**	200	220	211	226	28.3	31.4	30.3	32.6	50.4	54.6	55.8	56.2	154	174	170	167	21.8	24.8	24.4	24.1	45.0	41.5
20	Komi	334	304	305	390	33.4	30.7	31.1	40.0	54.2	52.6	56.4	62.3	233	235	236	312	23.3	23.7	24.0	32.0	43.6	49.8
21	**Regions: Arkhangelsk**	364	332	367	329	27.8	25.6	28.5	25.7	52.4	54.1	60.0	59.8	269	247	278	249	20.5	19.0	21.5	19.5	45.4	45.3
	Nenetsky AD	10	11	17	14	23.9	26.2	40.5	33.4	58.8	57.9	73.9	87.5	7	7	10	9	16.7	16.7	23.8	21.4	43.5	56.3
22	Vologda	267	239	242	212	21.4	19.3	19.6	17.3	52.0	53.1	55.3	49.1	186	147	158	140	14.9	11.9	12.8	11.4	36.1	32.4
23	Kaliningrad	523	477	525	462	55.2	50.6	55.9	49.3	54.2	50.5	53.7	47.5	440	382	363	321	46.4	40.5	38.6	34.2	37.1	33.0
24	Leningrad	460	539	491	400	27.8	32.7	29.9	24.4	45.2	50.7	49.7	46.8	310	347	290	216	18.7	21.1	17.6	13.2	29.4	25.3
25	Murmansk	247	216	202	226	28.2	24.9	23.5	26.4	62.7	56.7	56.1	57.1	139	147	146	159	15.9	16.9	16.9	18.6	40.6	40.2
26	Novgorod	233	216	200	193	34.3	32.3	30.2	29.3	63.5	60.8	59.0	57.6	54	0	100	107	8.0	0.0	15.0	16.3	29.5	31.9
27	Pskov	238	314	290	314	32.1	43.0	40.3	44.0	61.5	66.7	64.0	65.0	50	221	212	185	6.7	30.2	29.3	25.9	46.8	38.3
28	**City: St-Petersburg**	630	663	632	647	13.7	14.4	13.8	14.2	42.5	43.0	42.2	46.5	326	440	411	419	7.1	9.6	9.0	9.2	27.4	30.1
	REGION: Southern	5819	5408	5414	5926	26.8	25.0	24.4	26.0	43.7	41.9	40.6	41.2	3612	3383	4027	4630	16.6	15.6	18.6	20.3	30.2	32.2
29	**Republics: Adygeya**	162	142	141	155	36.4	32.0	31.9	35.1	54.7	54.6	51.5	48.1	112	133	122	140	25.2	30.0	27.6	31.7	44.5	43.5
30	Dagestan	560	485	572	587	21.4	18.4	21.6	22.1	40.2	35.0	40.0	41.9	455	181	518	540	17.4	6.9	19.6	20.3	36.2	38.5
31	Ingushetiya	123	129	91	115	25.7	26.6	18.6	23.3	50.6	62.6	50.8	55.6	117	111	84	102	24.4	22.9	17.2	20.7	46.9	49.3
	Чечня			338	353			28.8	29.8			39.6	37.2			338	353			29.1	29.8	39.6	37.2
32	Kabardino-Balkariya	156	141	166	152	17.4	15.7	18.6	17.1	38.0	34.6	39.3	36.8	118	116	134	136	13.1	13.0	15.0	15.3	31.8	32.9
33	Kalmykiya	106	58	81	115	36.5	20.0	28.1	40.0	33.5	18.7	25.3	35.9	19	13	35	78	6.5	4.5	12.1	27.2	10.9	24.4
34	Karachaevo-Cherkessiya	91	57	55	89	20.9	13.2	12.8	20.8	39.7	29.5	31.6	44.5	24	11	15	27	5.5	2.5	3.5	6.3	8.6	13.5
35	North Osetiya - Alaniya	164	160	177	153	23.2	22.7	25.2	21.8	35.8	36.9	49.9	37.9	109	134	147	141	15.4	19.1	20.9	20.1	41.4	34.9
36	**Krai: Krasnodarsky**	1216	1234	1089	1338	23.8	24.2	21.4	26.2	43.6	45.3	42.9	43.2	619	748	625	924	12.1	14.7	12.3	18.1	24.6	29.8
37	Stavropolsky	732	494	496	538	26.9	18.2	18.3	19.9	53.2	38.4	38.7	40.8	388	366	376	443	14.3	13.5	13.9	16.4	29.3	33.6
38	**Regions: Astrakhan**	287	310	273	260	28.7	31.1	27.5	26.2	37.7	41.0	37.2	35.2	117		244	251	11.7		24.5	25.2	33.2	34.0
39	Volgograd	860	854	852	1000	32.3	32.3	32.4	38.2	41.1	42.6	42.3	45.6	471	526	549	651	17.7	19.9	20.8	24.8	27.2	29.7
40	Rostov	1362	1344	1083	1071	31.3	31.1	25.2	25.0	46.4	45.8	39.3	38.0	1063	1044	840	844	24.4	24.2	19.5	19.7	30.4	29.9
	REGION: Privolzhsky	8708	9011	8961	8685	28.3	29.4	29.4	28.6	47.7	49.1	48.5	49.8	4629	5583	5380	5371	15.0	18.2	17.6	17.7	29.1	30.8
41	**Republics: Bashkortostan**	729	831	734	620	17.8	20.4	18.1	15.3	40.9	46.6	42.0	37.7	477	494	475	422	11.7	12.1	11.7	10.4	27.2	25.7
42	Mariy El	280	321	307	367	38.9	44.9	43.3	51.9	75.3	74.7	70.7	69.8	157	177	177	223	21.8	24.8	24.9	31.6	40.8	42.4
43	Mordoviya	264	202	238	200	30.3	23.4	27.9	23.6	44.2	40.0	43.5	38.2	93	202	153	126	10.7	23.4	17.9	14.9	28.0	24.0
44	Tatarstan	859	851	879	832	22.8	22.6	23.4	22.1	45.5	44.6	45.6	46.8	503	501	523	508	13.3	13.3	13.9	13.5	27.1	28.6
45	Udmurtiya	573	586	530	570	36.8	37.8	34.4	37.1	53.1	54.4	51.5	53.9	198	376	331	345	12.7	24.3	21.4	22.4	32.1	32.6
46	Chuvashiya	462	558	607	611	35.5	43.1	47.1	47.5	54.7	66.6	70.3	72.9	457	515	465	455	35.1	39.7	36.0	35.4	53.8	54.3
47	**Regions: Kirov**	442	478	474	437	30.1	32.9	33.0	30.6	59.6	61.8	60.5	65.0	239	262	262	272	16.3	18.0	18.2	19.1	33.4	40.5
48	Nizhniy Novgorod	1010	950	919	921	29.2	27.7	27.1	27.2	47.5	44.6	46.4	51.0	463	647	605	581	13.4	18.9	17.7	17.2	30.6	32.2
49	Orenburg	559	713	768	745	25.9	33.3	36.0	35.1	37.2	42.8	43.2	44.0	170	253	324	355	7.9	11.8	15.2	16.7	18.2	20.9
50	Penza	503	477	444	448	35.2	33.7	31.7	32.1	57.4	53.5	51.1	55.5	232	296	293	301	16.2	20.9	20.8	21.6	33.7	37.3
51	Perm (Permsky krai)	1225	1208	1185	1072	44.1	43.8	43.3	39.3	52.2	54.9	50.2	51.7	657	668	711	637	23.6	24.2	25.9	23.3	30.1	30.7

№ № пп.	Federal regions, ares of the Russian Federation	New respiratory TB cases MbT+								Proportion of MbT+ cases among new respiratory TB patients				New TB cases MbT+, confirmed by microscopy (ss+)									
		#				per 100K				%				#				per 100K				к ТОД,%	
		2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2004	2005	2006	2007	2006	2007
	Komi-Permsky AD	153	119			114.5	179.2			83.6	77.3			54	70			40.4	105.4				
52	Samara	857	949	945	924	26.7	29.7	29.7	29.1	51.9	55.2	52.2	53.3	482	575	490	516	15.0	18.0	15.4	16.2	27.1	29.8
53	Saratov	585	560	607	578	22.2	21.4	23.3	22.3	35.1	33.2	38.6	38.8	251	351	347	374	9.5	13.4	13.3	14.4	22.1	25.1
54	Uliyanovsk	360	327	324	360	26.5	24.3	24.4	27.2	47.2	44.2	42.0	45.5	250	266	224	256	18.4	19.8	16.8	19.4	29.0	32.3
	DISTRIC: Urals	4046	4108	4113	4111	32.9	33.5	33.6	33.6	40.9	41.9	41.0	41.3	2260	2427	2480	2381	18.4	19.8	20.3	19.5	24.7	23.9
55	**Regions: Kurgan**	419	400	397	374	42.0	40.6	40.7	38.6	38.6	40.3	36.4	34.6	117	195	233	199	11.7	19.8	23.8	20.5	21.3	18.4
56	Sverdlovsk	1612	1651	1720	1731	36.3	37.4	39.0	39.3	48.4	49.0	47.1	45.3	950	1016	1063	982	21.4	23.0	24.1	22.3	29.1	25.7
57	Tyumen	1084	1022	1050	978	32.9	30.8	31.5	29.2	33.0	31.0	32.4	35.0	573	639	689	664	17.4	19.3	20.7	19.8	21.3	23.7
	Khanty-Mantyisky AD	483	448	497	447	33.0	30.4	33.5	30.0	41.5	37.0	39.9	40.1	253	266	273	274	17.3	18.1	18.5	18.4	21.9	24.6
	Yamalo-Nenetsky AD	122	133	126	110	23.5	25.2	23.6	20.4	32.4	30.2	35.8	33.0	62	82	76	67	11.9	15.6	14.3	12.4	21.6	20.1
58	Chelyabinsk	931	1035	946	1028	26.1	29.2	26.8	29.2	42.8	48.2	46.3	45.6	620	577	495	536	17.4	16.3	14.0	15.2	24.3	23.8
	REGION: Siberian	9568	9922	9518	9196	48.2	50.3	48.5	46.9	45.9	47.3	45.5	44.3	6507	7198	6714	6621	32.8	36.5	34.1	33.8	32.1	31.9
59	**Republics: Altai**	122	141	68	81	59.9	69.1	33.2	39.4	43.9	49.0	28.0	36.3	71	94	50	35	34.9	46.0	24.5	17.0	20.6	15.7
60	Buryatiya	460	514	569	550	47.3	53.2	59.2	57.3	38.8	42.7	42.3	41.4	309	351	400	486	31.8	36.3	41.5	50.6	29.7	36.5
61	Tyva	353	372	314	297	115.0	120.7	101.6	96.0	55.9	61.8	54.0	56.5	102	204	91	132	33.2	66.2	29.5	42.7	15.7	25.1
62	Khakasiya	346	354	309	293	63.9	65.6	57.5	54.6	52.8	57.1	59.0	58.3	299	269	222	190	55.2	49.9	41.2	35.4	42.4	37.8
63	**Krai: Altai**	924	950	837	720	35.9	37.2	33.0	28.5	30.4	31.6	27.5	25.7	749	770	725	650	29.1	30.1	28.5	25.8	23.8	23.2
64	Krasnoyarsky	1150	1247	1205	1213	39.2	42.8	41.6	41.9	43.0	49.4	50.1	51.2	687	748	750	801	23.4	25.7	25.8	27.7	31.2	33.8
	Taimyrsky AD	16	13	11		40.6	33.2	28.4		51.6	52.0	45.8		0	12	11		0.0	30.6	28.2		45.8	
	Evenkiysky AD	10	13	8		57.3	74.9	46.7		43.5	56.5	38.1		7	9	7		40.1	51.9	40.5		33.3	
65	**Regions: Irkutsk**	1096	1135	1161	1244	42.9	44.8	46.1	49.5	47.1	45.2	43.8	42.8	781	859	842	871	30.6	33.9	33.3	34.6	31.7	30.0
	Ust-Ordynsky Buryatskiy AD	85	95	67	110	63.3	70.9	50.1	82.2	44.0	37.5	32.7	49.5	58	68	36	83	43.2	50.8	26.9	62.0	17.6	37.4
66	Kemerovo	2003	2032	1962	1831	69.9	71.4	69.3	64.8	56.5	55.2	55.3	53.3	1446	1674	1411	1276	50.5	58.8	49.7	45.1	39.8	37.2
67	Novosibirsk	1360	1356	1292	1298	51.0	51.1	48.8	49.2	46.5	47.3	45.5	46.2	908	936	872	875	34.0	35.2	32.9	33.1	30.7	31.2
68	Omsk	724	799	798	778	35.3	39.2	39.3	38.4	38.9	42.3	41.0	38.2	550	614	623	614	26.8	30.1	30.6	30.3	32.0	30.1
69	Tomsk	652	578	582	495	62.8	55.8	56.3	47.9	74.8	66.8	68.3	59.9	429	361	384	380	41.3	34.9	37.1	36.8	45.1	46.0
70	Chita	378	444	421	396	33.2	39.2	37.4	35.3	44.4	47.4	45.4	40.2	176	318	344	311	15.4	28.1	30.5	27.7	37.1	31.6
	Aginsky Buryatsky AD	27	27	24	12	36.9	36.6	32.1	16.0	30.3	39.7	26.4	16.2	16	20	23	10	21.9	27.1	31.0	13.3	25.3	13.5
	REGION: Far Estern	2853	3246	3229	3016	43.1	49.4	49.5	46.3	42.7	47.0	47.9	43.9	1267	2059	2110	2310	19.2	31.3	32.2	35.5	31.3	33.6
71	**Republic: Sakha (Yakutiya)**	330	350	344	285	34.7	36.8	36.2	30.0	44.1	50.9	53.3	48.8	105	169	214	176	11.1	17.8	22.5	18.5	33.2	30.1
72	**Krai: Primorsky**	1131	1351	1363	1357	55.3	66.6	67.7	67.6	47.0	52.4	51.0	47.3	540	903	921	1019	26.4	44.5	45.6	50.8	34.4	35.6
73	Khabarovsky	500	596	602	552	35.1	42.1	42.7	39.3	35.5	39.9	43.4	37.9	294	374	397	503	20.7	26.4	28.1	35.8	28.6	34.5
74	**Regions: Amur**	330	372	350	314	37.0	42.1	39.9	35.9	31.8	36.6	34.4	32.5	189	241	179	231	21.2	27.3	20.3	26.4	17.6	23.9
75	Kamchatka	113	100	96	67	32.0	28.5	27.6	19.3	43.3	35.2	38.6	28.3	59	63	72	64	16.7	18.0	20.6	18.4	28.9	27.0
	Koryaksky AD	35	31	29		145.3	131.8	126.7		42.2	29.2	30.2		21	18	25		87.2	76.6	107.8		26.0	
76	Magadan	55	50	56	45	31.2	28.9	32.9	26.7	46.6	43.5	54.9	43.7	14	17	28	32	7.9	9.8	16.3	19.0	27.5	31.1
77	Sakhalin	264	277	284	229	49.3	52.3	54.2	43.9	62.7	63.0	68.8	66.6	0	212	213	190	0.0	40.1	40.5	36.5	51.6	55.2
78	**Autonomous region: Jewish**	110	130	115	149	58.1	69.3	61.8	80.3	44.0	49.6	51.3	52.7	57	71	78	93	30.1	37.8	41.8	50.1	34.8	32.9
79	**Autonomous REGION: Chukots**	20	20	19	18	39.2	39.5	37.6	35.7	64.5	51.3	65.5	66.7	9	9	8	2	17.6	17.8	15.8	4.0	27.6	7.4

Tabl.7. Notification rate of new cases of destructive PTB and FCTB in Russia 2003-2007 (civilian population)

(MoH&SD institutions, form#33)

№ № пп.	Federal regions, ares of the Russian Federation	Destructive pulmonary TB										Fibro-cavitary TB among new TB cases												
		количество					к ТЛ, %					#					per 100K					% of PTB		
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2005	2006	2007
	RUSSIA	**42710**	**43342**	**44077**	**43166**	**42438**	**51.0**	**50.4**	**51.6**	**50.3**	**49.4**	**2237**	**2055**	**2026**	**1905**	**2022**	**1.6**	**1.4**	**1.4**	**1.3**	**1.4**	**2.4**	**2.2**	**2.4**
	REGION: Central	7784	7893	7678	7610	7354	49.6	49.3	49.7	49.0	47.9	427	431	410	435	427	1.1	1.1	1.1	1.2	1.1	2.7	2.8	2.8
1	**Regions: Belgorod**	384	368	359	373	320	48.9	42.7	51.9	50.7	45.4	15	21	24	25	17	1.0	1.4	1.6	1.7	1.1	3.5	3.4	2.4
2	Bryansk	394	449	483	536	553	51.2	51.0	54.2	59.0	56.1	22	30	39	24	18	1.6	2.2	2.9	1.8	1.4	4.4	2.6	1.8
3	Vladimir	327	330	310	338	287	41.4	45.3	42.7	42.9	37.7	13	10	6	8	15	0.9	0.7	0.4	0.5	1.0	0.8	1.0	2.0
4	Voronezh	589	494	531	540	533	48.7	45.7	48.2	53.0	47.7	22	20	8	39	29	0.9	0.9	0.3	1.7	1.3	0.7	3.8	2.6
5	Ivanovo	226	197	204	234	204	46.4	47.4	47.2	49.0	49.8	5	6	2	6	6	0.4	0.5	0.2	0.5	0.5	0.5	1.3	1.5
6	Kaluga	294	297	312	238	226	58.9	58.0	61.8	50.0	49.0	32	45	31	25	21	3.1	4.4	3.0	2.5	2.1	6.1	5.3	4.6
7	Kostroma	132	109	113	97	88	46.2	38.4	45.4	41.1	41.5	4	0	2	4	2	0.5	0.0	0.3	0.6	0.3	0.8	1.7	0.9
8	Kursk	341	385	405	402	386	55.6	60.0	57.3	58.5	57.0	48	43	50	43	57	3.9	3.6	4.2	3.7	4.8	7.1	6.3	8.4
9	Lipetsk	261	247	232	242	255	39.5	39.0	37.1	39.2	37.0	22	16	16	19	25	1.8	1.3	1.3	1.6	2.1	2.6	3.1	3.6
10	Moscow	1272	1270	1222	1213	1263	45.3	46.6	47.8	46.7	45.1	61	50	54	64	79	0.9	0.8	0.8	1.0	1.2	2.1	2.5	2.8
11	Orel	204	221	206	235	193	50.9	57.1	56.4	61.8	54.4	12	10	5	12	6	1.4	1.2	0.6	1.4	0.7	1.4	3.2	1.7
12	Ryazan	360	382	338	368	343	56.7	57.9	48.8	52.0	52.8	44	39	34	37	38	3.6	3.2	2.9	3.1	3.2	4.9	5.2	5.8
13	Smolensk	424	422	381	384	378	60.3	57.2	57.3	58.9	63.1	19	14	6	10	16	1.8	1.4	0.6	1.0	1.6	0.9	1.5	2.7
14	Tambov	391	420	340	302	321	58.7	59.2	56.2	53.9	56.8	18	17	23	16	10	1.5	1.5	2.0	1.4	0.9	3.8	2.9	1.8
15	Tver	377	407	434	426	413	53.2	51.7	53.2	54.2	54.7	16	16	31	31	16	1.1	1.1	2.2	2.2	1.1	3.8	3.9	2.1
16	Tula	471	539	444	339	359	46.4	49.1	46.7	39.7	46.4	29	51	41	23	25	1.7	3.1	2.5	1.4	1.6	4.3	2.7	3.2
17	Yaroslavl	251	261	272	240	256	54.7	54.4	56.5	51.7	51.8	8	6	5	3	7	0.6	0.4	0.4	0.2	0.5	1.0	0.6	1.4
18	**City: Moscow**	1086	1095	1092	1103	976	49.4	45.8	45.6	42.8	41.5	37	37	33	46	40	0.4	0.4	0.3	0.4	0.4	1.4	1.8	1.7
	REGION: Nortwestern	3634	3607	3594	3438	3403	60.4	59.7	59.3	58.8	58.8	70	62	60	55	63	0.5	0.4	0.4	0.4	0.5	1.0	0.9	1.1
19	**Republics: Kareliya**	248	213	242	233	231	68.3	58.5	68.0	66.6	62.3	4	1	2	3	2	0.6	0.1	0.3	0.4	0.3	0.6	0.9	0.5
20	Komi	372	377	368	339	389	62.4	66.6	67.9	68.3	65.4	2	6	8	14	15	0.2	0.6	0.8	1.4	1.5	1.5	2.8	2.5
21	**Regions: Arkhangelsk**	447	410	355	355	328	69.0	64.6	63.8	62.8	65.1	5	10	8	5	1	0.4	0.8	0.6	0.4	0.1	1.4	0.9	0.2
	Nenetsky AD	11	12	11	17	11	57.9	85.7	61.1	77.3	78.6		0	0	1			0.0	0.0	2.4		0.0	4.5	
22	Vologda	239	245	235	220	217	58.2	53.4	57.9	55.1	54.4	4	1	3	1	5	0.3	0.1	0.2	0.1	0.4	0.7	0.3	1.3
23	Kaliningrad	470	498	447	501	479	59.7	61.5	56.4	61.6	56.7	8	4	11	10	12	0.8	0.4	1.2	1.1	1.3	1.4	1.2	1.4
24	Leningrad	521	531	588	478	406	58.8	57.7	58.9	51.8	51.7	14	17	10	8	9	0.8	1.0	0.6	0.5	0.5	1.0	0.9	1.1
25	Murmansk	167	186	194	192	216	47.2	50.7	53.3	57.1	57.6	11	6	4	6	3	1.2	0.7	0.5	0.7	0.3	1.1	1.8	0.8
26	Novgorod	198	185	162	148	155	57.2	55.9	50.0	45.8	50.3	4	1	3	0	2	0.6	0.1	0.4	0.0	0.3	0.9	0.0	0.6
27	Pskov	215	212	278	253	264	51.3	57.3	61.1	58.4	57.9	4	1	1	0	2	0.5	0.1	0.1	0.0	0.3	0.2	0.0	0.4
28	**City: St-Petersburg**	757	750	725	719	718	62.9	61.6	57.4	59.7	62.3	14	15	10	8	12	0.3	0.3	0.2	0.2	0.3	0.8	0.7	1.0
	REGION: Southern	6551	6583	6777	6830	7457	54.5	53.8	57.1	54.9	55.4	171	158	183	173	229	0.8	0.7	0.8	0.8	1.1	1.5	1.4	1.7
29	**Republics: Adygeya**	139	164	166	158	171	63.2	60.3	68.6	64.5	56.4	6	8	1	7	7	1.3	1.8	0.2	1.6	1.6	0.4	2.9	2.3
30	Dagestan	928	797	860	916	880	66.1	62.6	67.8	69.0	67.7	18	15	13	15	9	0.7	0.6	0.5	0.6	0.3	1.0	1.1	0.7
31	Ingushetiya	151	105	136	111	116	57.9	51.7	73.5	73.0	61.1	4	5	8	5	8	0.8	1.0	1.7	1.0	1.6	4.3	3.3	4.2
	Чечня				512	585				64.4	67.5				11	38				0.9	3.3		1.4	4.4
32	Kabardino-Balkariya	241	281	266	281	278	70.7	74.1	73.9	72.4	73.2	11	9	13	9	12	1.2	1.0	1.5	1.0	1.3	3.6	2.3	3.2
33	Kalmykiya	124	127	107	111	122	46.1	42.6	38.2	40.1	43.9	5	7	9	10	9	1.7	2.4	3.1	3.5	3.1	3.2	3.6	3.2
34	Karachaevo-Cherkessiya	107	133	116	97	125	50.7	59.6	64.8	60.6	68.7	3	1	3	2	1	0.7	0.2	0.7	0.5	0.2	1.7	1.3	0.5
35	North Osetiya - Alaniya	220	177	210	164	178	61.5	50.1	61.9	54.3	53.6	11	8	8	9	6	1.6	1.1	1.1	1.3	0.9	2.4	3.0	1.8
36	**Krai: Krasnodarsky**	1544	1458	1643	1483	1865	60.3	58.1	64.6	60.9	62.6	26	17	31	35	47	0.5	0.3	0.6	0.7	0.9	1.2	1.4	1.6
37	Stavropolsky	555	658	600	529	555	45.6	52.3	50.6	44.6	45.7	22	16	23	18	23	0.8	0.6	0.8	0.7	0.8	1.9	1.5	1.9
38	**Regions: Astrakhan**	243	280	284	257	242	32.7	40.3	41.0	38.6	35.6	11	14	18	13	12	1.1	1.4	1.8	1.3	1.2	2.6	2.0	1.8
39	Volgograd	989	1056	1061	1136	1276	52.9	52.7	57.1	59.1	60.7	48	42	49	30	50	1.8	1.6	1.9	1.1	1.9	2.6	1.6	2.4
40	Rostov	1310	1347	1328	1075	1064	51.1	48.7	48.7	41.6	40.0	6	16	7	9	7	0.1	0.4	0.2	0.2	0.2	0.3	0.3	0.3
	REGION: Privolzhsky	8162	8134	8534	8297	7665	48.4	47.8	50.0	48.5	47.1	333	294	302	262	268	1.1	1.0	1.0	0.9	0.9	1.8	1.5	1.6
41	**Republics: Bashkortostan**	657	588	627	613	519	39.6	35.4	37.9	38.0	34.0	29	25	21	21	18	0.7	0.6	0.5	0.5	0.4	1.3	1.3	1.2
42	Mariy El	182	173	174	196	234	50.1	49.6	44.2	49.9	48.2	3	0	5	2	4	0.4	0.0	0.7	0.3	0.6	1.3	0.5	0.8
43	Mordoviya	318	323	276	314	251	57.4	57.4	58.0	60.5	50.9	47	44	16	17	13	5.3	5.0	1.9	2.0	1.5	3.4	3.3	2.6
44	Tatarstan	749	740	751	743	660	40.4	42.4	43.0	41.5	39.8	3	8	10	9	13	0.1	0.2	0.3	0.2	0.3	0.6	0.5	0.8
45	Udmurtiya	607	645	670	586	625	62.4	62.3	65.4	60.8	63.3	10	8	11	6	12	0.6	0.5	0.7	0.4	0.8	1.1	0.6	1.2
46	Chuvashiya	443	485	504	506	438	60.5	59.0	61.6	60.0	54.4	10	19	13	12	12	0.8	1.5	1.0	0.9	0.9	1.6	1.4	1.5
47	**Regions: Kirov**	399	383	448	393	376	59.3	58.7	63.7	55.5	60.5	5	2	6	5	9	0.3	0.1	0.4	0.3	0.6	0.9	0.7	1.4
48	Nizhniy Novgorod	1212	1163	1194	1065	995	58.7	58.9	59.6	57.2	58.8	134	107	124	106	119	3.8	3.1	3.6	3.1	3.5	6.2	5.7	7.0
49	Orenburg	612	652	759	821	745	46.6	48.0	51.0	52.3	49.1	3	4	5	5	1	0.1	0.2	0.2	0.2	0.0	0.3	0.3	0.1
50	Penza	428	386	407	397	372	55.4	45.9	50.1	52.3	49.1	19	12	18	21	12	1.3	0.8	1.3	1.5	0.9	2.2	2.8	1.6
51	Perm (Permsky krai)	945	1038	1024	1035	886	48.2	47.5	49.3	47.7	45.7	8	11	10	11	8	0.3	0.4	0.4	0.4	0.3	0.5	0.5	0.4
	Komi-Permsky AD	95	84	98			66.9	49.7	66.2			0	3	0			0.0	2.2	0.0			0.0		
52	Samara	685	577	734	733	707	41.4	37.2	45.7	43.0	43.2	27	22	28	25	20	0.8	0.7	0.9	0.8	0.6	1.7	1.5	1.2
53	Saratov	588	617	590	563	529	36.0	38.7	37.3	37.3	37.3	15	14	11	9	12	0.6	0.5	0.4	0.3	0.5	0.7	0.6	0.8

№ № пп.	Federal regions, ares of the Russian Federation	Destructive pulmonary TB										Fibro-cavitary TB among new TB cases												
		количество					к ТЛ, %					#					per 100K					% of PTB		
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2005	2006	2007
54	Uliyanovsk	337	364	376	332	328	51.3	52.5	54.2	47.6	43.6	20	18	24	13	15	1.5	1.3	1.8	1.0	1.1	3.5	1.9	2.0
	DISTRIC: Urals	3781	4031	4003	3930	3746	43.8	43.7	44.0	42.6	40.7	127	115	129	125	131	1.0	0.9	1.1	1.0	1.1	1.4	1.4	1.4
55	**Regions: Kurgan**	431	496	494	537	456	47.6	49.9	55.6	55.1	45.6	15	13	23	13	16	1.5	1.3	2.3	1.3	1.6	2.6	1.3	1.6
56	Sverdlovsk	1450	1400	1324	1389	1373	49.2	45.6	42.5	41.5	39.0	39	33	40	43	49	0.9	0.7	0.9	1.0	1.1	1.3	1.3	1.4
57	Tyumen	989	1153	1162	1140	997	34.8	37.1	38.0	38.0	38.5	42	39	46	51	43	1.3	1.2	1.4	1.5	1.3	1.5	1.7	1.7
	Khanty-Mantyisky AD	319	402	422	421	372	33.4	36.2	37.8	36.4	36.4	15	9	6	10	5	1.0	0.6	0.4	0.7	0.3	0.5	0.9	0.5
	Yamalo-Nenetsky AD	167	150	168	139	117	47.3	45.6	41.5	45.1	38.7	0	0	0	2	0	0.0	0.0	0.0	0.4	0.0	0.0	0.6	0.0
58	Chelyabinsk	911	982	1023	864	920	46.8	47.8	50.3	45.2	44.0	31	30	20	18	23	0.9	0.8	0.6	0.5	0.7	1.0	0.9	1.1
	REGION: Siberian	9968	10192	10318	9858	9632	53.6	52.7	52.8	50.7	49.7	800	735	672	560	621	4.0	3.7	3.4	2.9	3.2	3.4	2.9	3.2
59	**Republics: Altai**	76	100	136	104	104	42.2	41.5	52.3	47.3	51.2	12	15	15	7	5	5.9	7.4	7.3	3.4	2.4	5.8	3.2	2.5
60	Buryatiya	506	627	636	621	640	49.0	61.2	57.6	50.1	51.4	13	34	9	11	27	1.3	3.5	0.9	1.1	2.8	0.8	0.9	2.2
61	Tyva	239	293	272	259	254	41.2	49.7	47.1	48.1	51.8	14	17	13	20	14	4.6	5.5	4.2	6.5	4.5	2.2	3.7	2.9
62	Khakasiya	315	375	361	335	276	57.1	61.4	63.6	67.7	57.0	34	29	11	13	10	6.3	5.4	2.0	2.4	1.9	1.9	2.6	2.1
63	**Krai: Altai**	1574	1597	1563	1522	1291	59.9	55.1	55.6	53.3	48.7	89	77	59	45	43	3.4	3.0	2.3	1.8	1.7	2.1	1.6	1.6
64	Krasnoyarsky	1472	1410	1322	1284	1280	59.2	57.1	56.3	57.0	57.1	86	84	61	48	45	2.9	2.9	2.1	1.7	1.5	2.6	2.1	2.0
	Taimyrsky AD	9	14	11	13		40.9	48.3	57.9	76.5		0	0	0			0.0	0.0	0.0			0.0		
	Evenkiysky AD	26	15	16	17		72.2	68.2	72.7	81.0		1	1	0			5.7	5.7	0.0			0.0		
65	**Regions: Irkutsk**	1245	1258	1345	1305	1491	59.6	58.2	56.7	53.1	55.3	143	148	172	138	156	5.6	5.8	6.8	5.5	6.2	7.3	5.6	5.8
	Ust-Ordynsky Buryatskiy AD	114	105	132	102	113	65.9	61.0	56.4	54.0	56.5	7	14	8	8	2	5.2	10.4	6.0	6.0	1.5	3.4	4.2	1.0
66	Kemerovo	1567	1625	1697	1590	1504	54.1	50.3	51.7	49.7	48.9	133	118	95	64	76	4.6	4.1	3.3	2.3	2.7	2.9	2.0	2.5
67	Novosibirsk	1316	1352	1335	1233	1143	49.6	48.1	48.7	45.6	42.4	75	51	62	45	66	2.8	1.9	2.3	1.7	2.5	2.3	1.7	2.4
68	Omsk	759	709	816	798	875	42.5	41.6	45.5	43.4	45.7	113	106	134	132	128	5.5	5.2	6.6	6.5	6.3	7.5	7.2	6.7
69	Tomsk	462	478	426	406	370	57.2	58.8	53.1	51.3	48.1	14	22	14	13	15	1.3	2.1	1.4	1.3	1.5	1.7	1.6	1.9
70	Chita	437	368	409	401	404	48.2	45.9	46.0	46.8	44.0	74	34	27	24	36	6.4	3.0	2.4	2.1	3.2	3.0	2.8	3.9
	Aginsky Buryatsky AD	43	33	26	32	22	52.4	38.8	43.3	40.0	31.9	1	1	1			1.4	1.4	1.4	0.0	0.0	1.7		
	REGION: Far Estern	2830	2901	3173	3203	3181	47.8	47.2	50.1	51.8	49.3	309	260	270	295	282	4.6	3.9	4.1	4.5	4.3	4.3	4.8	4.4
71	**Republic: Sakha (Yakutiya)**	224	278	249	289	240	47.9	45.7	43.8	54.6	46.2	5	9	3	5	10	0.5	0.9	0.3	0.5	1.1	0.5	0.9	1.9
72	**Krai: Primorsky**	982	1026	1192	1256	1241	46.6	45.3	49.7	51.6	45.6	180	146	174	188	186	8.7	7.1	8.6	9.3	9.2	7.3	7.7	6.8
73	Khabarovsky	534	534	588	566	620	39.4	40.5	42.2	42.9	45.0	34	32	26	26	26	2.4	2.2	1.8	1.8	1.8	1.9	2.0	1.9
74	**Regions: Amur**	525	500	541	513	528	50.4	50.9	56.1	52.8	56.8	47	26	23	12	18	5.2	2.9	2.6	1.4	2.0	2.4	1.2	1.9
75	Kamchatka	126	110	130	125	116	65.3	53.9	57.0	59.2	58.3	11	17	14	24	16	3.1	4.8	4.0	6.9	4.6	6.1	11.4	8.0
	Koryaksky AD		33	43	42			52.4	60.6	52.5		0	7	2	8	0		29.1	8.5	35.0	0.0	2.8	10.0	
76	Magadan	64	52	45	52	51	55.2	49.1	51.7	56.5	62.2	0	0	1	0	1	0.0	0.0	0.6	0.0	0.6	1.1	0.0	1.2
77	Sakhalin	241	288	306	275	231	67.1	72.5	76.7	70.3	71.3	28	23	27	30	17	5.2	4.3	5.1	5.7	3.2	6.8	7.7	5.2
78	**Autonomous region: Jewish**	113	100	105	107	141	44.8	41.2	40.9	50.7	50.9	4	6	1	7	7	2.1	3.2	0.5	3.8	3.8	0.4	3.3	2.5
79	**Autonomous REGION: Chukots**	21	13	17	20	13	77.8	44.8	43.6	74.1	48.1	0	1	1	3	1	0.0	2.0	2.0	5.9	2.0	2.6	11.1	3.7

Tabl.8. TB mortality in Russia 2003-2007

№ № пп.	Federal regions, ares of the Russian Federation	TB mortality (FSSS, vital registration) per 100K					TB patients died during 1 (one) year after registration (form#33) #					TB patients died during 1 (one) year after registration (form#33) % of new TB cases, form #33					Died, unknown to the TB dispensary (postmortem detected) (form #8) #					Died, unknown to the TB dispensary (postmortem detected) (form #8) % of new TB cases, form 8				
		2003	2004	2005	2006*	2007**	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	RUSSIA	**22.0**	**21,4**	**22,6**	**20,0**	**18,4**	**4253**	**4489**	*5300****	**4443**	**4103**	**4.5**	**5**	**5**	**5**	**4.3**	**3263**	**3311**	**3290**	**2773**	**2465**	**2.3**	**2.8**	**2.8**	**2.4**	**2.1**
	REGION: Central	16.0	15.0	15,8	13,8	12,6	944	910	973	910	811	5.3	5	6	5	4.7	1127	1103	895	822	782	3.5	4.7	3.9	3.7	3.4
1	**Regions: Belgorod**	8,9	8,7	9,9	7,6	5,7	23	33	20	25	16	2.6	4	3	3	2.1	13	16	21	19	7	0.8	1.5	2.4	2.0	0.8
2	Bryansk	27,8	24,6	29,1	25,1	20,9	79	84	105	85	70	8.3	8	10	8	6.3	32	30	46	37	51	3.3	2.6	3.9	3.2	4.1
3	Vladimir	20,6	18,3	18,4	18,8	16,3	40	45	52	47	54	4.5	5	6	5	6.2	25	26	25	42	35	2.8	2.4	2.3	3.5	3.0
4	Voronezh	14,3	13.0	14,7	13,2	11,9	50	43	46	33	31	3.7	4	4	3	2.5	12	17	13	10	9	0.7	1.1	0.8	0.7	0.6
5	Ivanovo	18,8	18,5	17,7	13,4	13,1	16	22	21	23	17	2.9	5	4	4	3.7	10	10	12	11	9	1.8	1.7	1.9	1.6	1.6
6	Kaluga	22,4	23,6	22,9	16,6	15.0	30	31	45	31	27	5.2	5	8	6	5.1	42	54	86	24	31	4.0	7.2	10.4	3.2	4.3
7	Kostroma	11,8	8,2	10,5	10,2	7.0	32	24	26	22	15	9.8	7	9	8	6.2	2	5	10	9	13	0.6	1.2	2.8	2.8	4.3
8	Kursk	21,2	22,5	24,2	19,5	18,2	43	38	42	46	26	6.1	5	5	6	3.4	36	36	31	37	30	2.3	4.0	3.2	4.0	3.4
9	Lipetsk	12,4	14,6	11.0	10,4	9,7	29	32	23	26	26	4.0	5	3	4	3.5	5	14	7	5	9	0.5	1.7	0.8	0.6	1.0
10	Moscow	16,8	14,8	17,2	15,4	14,6	225	189	203	221	212	7.1	6	7	8	6.8	323	300	367	342	307	8.1	8.2	10.3	9.8	7.8
11	Orel	6,7	5,7	8.0	6,0	5,1	15	13	11	22	12	3.4	3	3	5	3.0	7	9	6	7	4	1.6	1.7	1.2	1.4	0.8
12	Ryazan	20,8	17,9	18,4	14,4	12,4	35	36	28	29	17	4.7	5	4	4	2.3	18	19	31	36	29	2.0	1.9	3.3	3.9	3.0
13	Smolensk	29,2	34,3	32,3	32,5	32,2	37	41	35	22	30	4.7	5	5	3	4.4	24	27	31	38	23	2.4	2.6	3.2	3.8	2.6
14	Tambov	18,8	17,5	19,3	16,1	13.0	33	27	22	25	26	4.5	3	3	4	4.1	1	3	1	4	7	0.1	0.3	0.1	0.5	0.9
15	Tver	20,3	21,1	21,6	21,8	23,4	63	71	67	79	72	7.9	8	8	9	8.4	21	19	30	31	41	2.4	1.7	2.7	2.7	3.7
16	Tula	31,4	30,7	29,7	25,2	21,7	61	53	91	65	55	5.3	4	8	7	6.1	39	30	53	49	63	1.8	1.7	3.6	3.9	5.1
17	Yaroslavl	14,7	14,3	12,5	12,2	11,7	33	31	33	34	37	5.5	5	6	6	6.2	38	31	36	32	22	4.8	3.4	4.1	4.0	2.7
18	**City: Moscow**	9,6	8,3	8,8	7,3	6,6	100	97	103	75	68	4.0	4	4	3	2.5	479	457	89	89	92	5.3	11.4	2.2	2.3	1.9
	REGION: Nortwestern	19,8	19,4	19,6	17,7	15,7	413	496	459	499	428	5.8	7	6	7	6.4	202	239	336	316	267	2.5	2.7	3.8	3.6	3.2
19	**Republics: Kareliya**	20,6	16,4	20,8	20,6	21,7	22	27	47	37	30	5.0	6	11	9	7.1	6	19	15	19	12	1.1	3.6	2.8	4.0	2.4
20	Komi	17,5	20,8	22.0	19,4	14,2	40	52	50	40	38	6.0	8	8	7	5.7	12	21	46	26	29	1.8	2.5	5.3	3.3	3.1
21	**Regions: Arkhangelsk**	18,9	19,2	19,3	15,1	12,7	71	52	74	62	66	9.6	7	12	10	11.7	14	26	31	36	16	1.5	2.7	3.6	3.8	2.1
	Nenetsky AD	19,2	9,5	16,7	7,1	9,5	0	0	0	0	1	0.0	0	0	0	6.3	0	0	0	0	1	0.0	0.0	0.0	0.0	5.9
22	Vologda	13,6	11,1	11,8	10,2	10.0	34	41	34	54	27	7.0	8	7	12	6.0	9	8	25	9	12	1.7	1.2	3.9	1.6	2.1
23	Kaliningrad	33,6	35,4	33,2	28,8	18,3	68	96	58	71	35	7.2	10	6	7	3.5	58	49	104	91	52	5.6	4.1	8.8	7.2	4.1
24	Leningrad	34,9	33,6	33,7	30,2	24,2	63	85	67	96	106	6.2	8	6	9	12.1	24	21	20	51	75	1.9	1.7	1.6	4.2	6.6
25	Murmansk	9,3	14.0	12,1	10,8	10.0	16	39	37	31	31	4.2	9	9	8	7.8	14	26	30	24	18	1.8	4.5	5.2	4.8	3.6
26	Novgorod	31,9	27,7	26,7	27,5	28,2	16	8	13	21	18	4.1	2	4	6	5.1	7	6	8	5	3	1.8	1.2	1.7	1.1	0.7
27	Pskov	23,4	16,8	17,8	17,4	15,4	29	20	29	29	27	6.5	5	6	6	5.5	12	13	10	12	11	1.6	2.3	1.6	1.9	1.7
28	**City: St-Petersburg**	13,7	13,5	13,8	12,8	13,1	54	76	50	58	50	3.4	5	3	4	3.4	46	50	47	43	39	2.8	2.6	2.4	2.3	2.3
	REGION: Southern	25,1	22,9	23,4	21,3	19,1	301	252	*718****	303	315	2.2	2	5	2	2.1	221	253	204	101	91	0.7	1.5	1.2	0.6	0.5
29	**Republics: Adygeya**	48.0	26,5	27,1	21,0	24,5	14	15	15	20	16	5.6	5	5	7	4.8	22	27	31	23	17	4.4	7.0	9.1	6.6	4.1
30	Dagestan	12,9	13,7	12.0	14,3	9,8	19	9	22	20	20	1.2	1	1	1	1.3	12	0	0	0	0	0.0	0.0	0.0	0.0	0.0
31	Ingushetiya	11,6	13.0	12,2	11,0	7,7	17	7	8	5	5	5.7	3	4	3	2.4	0	0	4	1	2	0.0	0.0	1.6	0.5	0.9
	Чечня			7,2	7,2	7,4	(23)	9	20	19	35				2	0.0				0	0				0.0	0.0
32	Kabardino-Balkariya	20,4	20,3	22,1	15,9	18,4	10	7	7	10	9	2.5	2	2	2	0.0	13	17	0	0	2	1.3	3.8	0.0	0.0	0.4
33	Kalmykiya	33,3	30.0	28,7	23,6	21.0	9	17	9	9	16	2.8	5	3	3	4.8	14	5	21	8	8	3.8	1.3	5.6	2.2	2.2
34	Karachaevo-Cherkessiya	18,5	11.0	15.0	10,9	10.0	12	5	5	7	8	5.1	2	2	4	3.8	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
35	North Osetiya - Alaniya	24,8	22.0	19,6	16,4	17.0	24	7	4	16	17	5.1	1	1	4	3.9	6	7	0	2	0	0.0	1.3	0.0	0.5	0.0
36	**Krai: Krasnodarsky**	23,9	24,4	25,6	22,0	20,5	58	60	103	73	70	2.0	2	4	3	2.2	1	4	41	4	4	0.0	0.1	1.3	0.1	0.1
37	Stavropolsky	20,5	16,2	16,5	12,9	13,6	31	39	47	42	27	2.1	3	3	3	1.8	31	58	47	14	23	1.0	3.8	2.5	0.8	1.3
38	**Regions: Astrakhan**	40,3	38,5	41,7	39,8	37,1	13	12	9	5	10	1.6	2	1	1	1.3	35	42	0	0	0	0.0	4.8	0.0	0.0	0.0
39	Volgograd	31,2	27,3	29,2	25,9	20,8	72	50	74	57	60	3.5	2	4	3	2.6	80	85	60	42	29	2.0	2.9	2.0	1.5	0.9
40	Rostov	32.0	31.0	30,6	30,9	26,8	22	24	*415****	20	22	0.8	1	14	1	0.8	7	8	0	7	6	0.2	0.2	0.0	0.2	0.2
	REGION: Privolzhsky	12,7	17,5	18,6	16,8	16.0	721	817	973	881	742	3.7	4	5	5	4.1	387	455	529	488	427	1.3	2.0	2.2	2.0	1.9
41	**Republics: Bashkortostan**	10,6	13,4	14,7	13,8	13,8	65	63	76	72	47	3.4	3	4	4	2.7	10	12	10	10	10	0.4	0.5	0.4	0.4	0.5
42	Mariy El	11,6	11,1	13,3	11,4	11,9	25	24	18	19	15	6.2	6	4	4	2.8	0	1	12	6	12	0.0	0.2	2.5	1.3	2.1
43	Mordoviya	12,5	13,1	13.0	13,3	11,3	17	18	19	16	7	2.7	3	4	3	1.3	10	22	4	0	2	0.2	3.2	0.7	0.0	0.3
44	Tatarstan	20,8	14,5	14.0	10,2	10,4	48	57	98	73	77	2.2	3	5	4	4.1	31	35	59	35	45	1.3	1.5	2.6	1.5	2.0
45	Udmurtiya	13,5	21,2	21,2	18,0	20,1	62	92	92	70	81	5.7	8	8	7	7.4	34	29	35	46	22	3.1	2.2	2.7	3.6	1.8
46	Chuvashiya	15,6	14,6	14,3	14,3	13,8	35	35	39	42	31	4.5	4	4	5	3.6	12	18	24	20	29	1.5	1.7	2.3	1.9	2.9
47	**Regions: Kirov**	23,1	14,4	13,8	13,5	11,8	44	46	46	40	35	5.4	6	6	5	4.9	15	26	34	34	21	0.7	3.1	3.8	3.4	2.3
48	Nizhniy Novgorod	17,5	24,6	25.0	21,8	20,2	126	137	137	145	105	5.4	6	6	7	5.6	51	76	161	163	127	2.1	2.7	5.5	5.7	5.1
49	Orenburg	14,3	17,7	18,8	19,7	17,2	24	27	51	38	38	1.5	2	3	2	2.1	4	3	3	3	6	0.3	0.2	0.1	0.1	0.3
50	Penza	23,3	14,5	15,1	12,6	11,1	27	45	37	40	33	3.0	5	4	4	3.9	18	9	15	10	5	2.0	0.9	1.4	1.0	0.5
51	Perm (Permsky krai)	33,3	23,2	28.0	23,8	21,8	119	119	163	143	94	5.5	5	7	6	4.3	115	119	85	87	64	2.4	3.9	2.8	2.7	2.3
	Komi-Permsky AD	20,2	35,9				11	9	9			7.4	5	6			8	7	0			5.4	3.6	0.0		
52	Samara	18,4	19,4	21,4	21,2	19,7	38	60	89	94	67	2.1	3	5	5	3.6	64	73	54	50	58	1.2	3.3	2.2	2.0	2.3
53	Saratov	14,9	17,6	18,7	16,9	16,7	46	54	50	31	48	2.5	3	3	2	3.1	18	25	25	17	16	1.0	1.2	1.2	0.9	0.9
54	Uliyanovsk	23,6	14,4	17,7	15,7	15,8	45	40	58	58	64	5.9	5	7	7	7.5	5	7	8	7	10	0.4	0.7	0.8	0.7	0.9
	DISTRIC: Urals	39,5	23.0	25,5	36,2	21,6	435	441	520	454	441	4.5	4	5	4	4.3	390	385	351	212	225	2.0	3.0	2.8	1.7	1.8
55	**Regions: Kurgan**	25,4	40.0	43.0	36,2	36,3	58	48	54	46	56	5.6	4	5	4	5.0	51	27	21	13	9	2.5	2.1	1.7	1.0	0.7
56	Sverdlovsk	20,3	23,9	25,8	22,9	21,4	160	184	209	192	173	4.8	5	6	5	4.4	169	160	242	118	119	3.6	3.6	5.3	2.6	2.4
57	Tyumen	13,8	20,3	23,8	22,3	20,2	113	100	154	111	120	3.6	3	5	3	4.1	22	24	36	28	27	0.7	0.6	0.9	0.7	0.8
	Khanty-Mantyisky AD	10,7	14,5	16,4	15,7	13.0	36	23	48	42	40	3.5	2	4	3	3.5	10	13	7	14	9	1.0	1.0	0.5	1.0	0.7
	Yamalo-Nenetsky AD	19,7	10,4	15.0	14,6	13,5	8	11	10	12	9	2.0	3	2	3	2.6	2	0	11	3	2	0.5	0.0	2.1	0.7	0.5
58	Chelyabinsk	34,5	19,5	21,7	19,6	19.0	104	109	103	105	92	4.7	5	4	5	3.9	148	174	52	53	70	1.4	5.6	1.8	2.0	2.3
	REGION: Siberian	26,6	35,6	37,3	32,3	29,1	1189	1302	1337	1159	1044	5.7	6	6	5	4.9	738	741	836	721	554	3.2	2.9	3.2	2.8	2.2
59	**Republics: Altai**	26,4	24,6	30,9	30,7	19,4	6	12	18	8	7	2.7	4	6	3	3.0	0	5	2	3	1	0.0	1.7	0.7	1.2	0.4
60	Buryatiya	65,4	25,1	23.0	22,4	19,7	30	40	39	32	26	2.5	3	3	2	1.9	18	22	43	37	32	1.4	1.5	2.8	2.2	2.3
61	Tyva	40,4	72,3	71,4	66,7	79,5	25	35	22	29	28	3.6	5	3	5	4.9	32	7	22	14	11	4.7	0.9	2.9	1.8	1.5
62	Khakasiya	34,6	33,4	46,7	28,3	23,5	31	52	35	29	33	5.1	8	5	5	6.5	9	19	22	24	8	1.5	2.5	3.0	3.8	1.5
63	**Krai: Altai**	32,3	39,2	42,6	35,2	33,2	120	149	170	156	126	4.2	5	6	5	4.4	93	93	112	82	60	3.2	2.5	3.0	2.3	1.8
64	Krasnoyarsky	12,6	32,6	32,9	28,4	25,9	194	212	193	146	140	7.0	8	7	6	5.7	82	99	125	109	96	2.9	3.2	3.9	3.6	3.2
	Taimyrsky AD	56,9	7,6	0.0	18,1	13,1	1	0	0	0		3.8	0	0	0		0	0	0	0		0.0	0.0	0.0	0.0	
	Evenkiysky AD	39,5	28,6	51,9	23,4	35,6	1	1	1	1		2.7	4	4	5		0	0	1	0		0.0	0.0	3.8	0.0	
65	**Regions: Irkutsk**	36,3	39,5	45.0	38,5	35,4	182	172	208	185	186	7.7	7	8	7	6.2	135	138	153	148	74	4.9	4.4	4.9	4.7	2.2
	Ust-Ordynsky Buryatskiy AD	42.0	21,6	46,3	41,8	23,9	11	5	8	8	4	5.6	3	3	4	1.8	0	0	2	1	0	0.0	0.0	0.8	0.5	0.0
66	Kemerovo	36,3	43.0	45,5	38,3	33,5	255	309	316	269	225	7.8	8	8	7	6.4	219	193	166	128	94	6.0	5.1	3.7	2.9	2.3
67	Novosibirsk	28,3	40.0	39,5	35,6	30,9	171	166	165	149	137	5.8	6	6	5	4.8	78	72	90	64	67	2.7	1.9	2.4	1.8	1.9
68	Omsk	18,2	28,6	29,4	28,0	26,6	71	72	89	62	73	3.5	4	4	3	3.5	45	69	79	89	97	1.0	2.9	3.3	3.6	3.8
69	Tomsk	29,6	19.0	16,2	12,7	11,9	40	36	34	45	30	4.4	4	4	5	3.5	9	10	10	16	8	1.0	0.9	0.9	1.4	0.8
70	Chita	15,2	27.0	27,6	25,6	18,3	64	47	48	49	33	6.4	5	5	5	3.3	18	14	12	7	6	1.8	1.1	1.0	0.6	0.5
	Aginsky Buryatsky AD	31,8	5,5	5,4	14,7	9,2	0	3	1	4		0.0	3	1	4		0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
	REGION: Far Estern	10,8	30,5	33.0	29,0	28,1	250	271	320	237	322	3.7	4	5	3	4.6	198	135	139	113	119	1.9	1.6	1.6	1.4	1.4
71	**Republic: Sakha (Yakutiya)**	44,3	7,6	8,5	7,3	6,9	11	22	21	19	34	1.7	3	3	3	5.5	10	7	4	8	4	0.0	0.8	0.5	1.0	0.5
72	**Krai: Primorsky**	30,5	43,5	47,8	40,4	34,8	91	100	149	131	106	3.9	4	6	5	3.6	119	52	59	27	76	2.7	1.6	1.8	0.8	2.1
73	Khabarovsky	40,4	27,4	28.0	23,7	27,2	66	69	62	28	94	4.4	5	4	2	6.4	18	8	15	2	8	1.2	0.5	0.8	0.1	0.4
74	**Regions: Amur**	20,5	41,2	47,3	43,2	41,7	42	57	49	21	41	3.7	5	5	2	4.1	25	27	28	29	4	1.9	2.0	2.1	2.3	0.3
75	Kamchatka	105,5	16,7	14,5	15,2	18,2	12	6	10	11	16	4.9	2	3	4		6	9	3	5	3	1.2	2.8	0.9	1.7	1.1
	Koryaksky AD	13,9	87,2	72,3	78,7	112,4	0	3	3	3			4	3	3		0	3	0	0		-	3.4	0.0	0.0	
76	Magadan	19,2	7,9	9,8	10,0	10,8	4	3	4	0	2	2.9	2	3	0	1.8	0	3	4	3	3	0.0	2.1	2.8	2.2	2.3
77	Sakhalin	53,1	18,7	22,3	26,2	22,1	19	9	12	19	17	4.8	2	3	4	4.3	20	27	21	35	13	5.1	5.2	3.8	6.0	2.6
78	**Autonomous region: Jewish**	5,7	65,5	59,2	47,3	63.0	4	5	13	8	12	1.4	2	5	4	0.0	0	1	5	4	7	0.0	0.3	1.7	1.6	2.3
79	**Autonomous REGION: Chuko**	4,1	2.0	7,9	7,9	9,9	1	0	0	0	0	2.9	0	0	0	0.0	0	1	0	0	1	0.0	3.1	0.0	0.0	3.4

* data from [19]
** data from [31]
*** data has to be specified

Tabl.9. TB prevalence in Russia, 2003-2007

(form #33)

№ № пп.	Federal regions, ares of the Russian Federation	TB patients registered by the end of the year										Of them MbT+				
		#					per 100K					per 100K				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	RUSSIA	**378820**	**312208**	**298509**	**289015**	**276554**	**264.8**	**218.3**	**209.7**	**202.5**	**194.5**	**88.3**	**86.9**	**86.6**	**83.9**	**80.9**
	REGION: Central	70041	59214	55480	52827	49504	185.6	156.9	147.8	141.4	133.0	66.9	62.3	59.8	57.1	53.8
1	**Regions: Belgorod**	2052	1869	1525	1522	1254	135.6	123.5	100.9	100.7	82.8	61.9	64.6	58.7	58.3	53.2
2	Bryansk	4029	3049	3104	3365	3284	296.0	224.0	230.5	252.7	249.2	156.6	101.5	106.3	104.3	103.8
3	Vladimir	3220	2306	2158	2159	2035	214.1	153.4	145.1	146.6	139.4	73.6	69.9	69.4	67.7	57.4
4	Voronezh	5390	4339	3918	3575	3532	229.0	184.4	167.9	154.5	153.9	93.2	84.9	85.9	82.2	80.5
5	Ivanovo	2134	1551	1363	1133	1003	188.9	137.3	122.3	103.0	92.2	75.5	67.4	61.3	61.8	58.6
6	Kaluga	2228	1660	1384	1345	1164	216.6	161.3	135.5	132.6	115.4	67.6	74.2	72.4	61.9	61.0
7	Kostroma	1215	812	670	526	487	167.4	111.9	93.4	74.2	69.4	67.0	60.1	51.4	40.6	36.2
8	Kursk	2577	2353	2384	2286	2255	212.2	193.7	198.8	193.1	192.6	77.2	74.8	77.7	76.7	74.4
9	Lipetsk	2980	2330	1992	1910	1826	248.1	194.0	167.4	161.7	155.6	68.1	65.9	64.0	60.5	56.7
10	Moscow	13909	12481	11992	11322	10515	210.0	188.5	180.9	170.8	158.2	51.9	49.9	50.0	46.8	44.0
11	Orel	1765	1463	1083	977	898	207.6	172.1	128.6	117.2	108.6	99.2	82.2	48.9	43.1	38.8
12	Ryazan	2908	2122	2099	1942	1982	240.7	175.6	175.7	164.3	169.1	77.1	79.5	71.3	67.0	78.9
13	Smolensk	3312	2453	2331	2435	2263	320.8	237.6	228.7	242.1	227.8	123.5	113.4	112.5	115.3	106.9
14	Tambov	2247	2062	1855	1726	1538	193.9	177.9	162.0	152.7	137.7	91.6	101.7	90.7	84.9	77.1
15	Tver	3218	2876	2545	2381	2306	222.9	199.2	178.5	169.3	165.8	99.5	81.5	77.4	66.7	56.6
16	Tula	4077	3781	3582	3075	2814	247.9	229.9	220.9	192.2	178.0	91.0	91.1	85.8	80.9	73.0
17	Yaroslavl	1882	1732	1668	1613	1614	139.3	128.2	124.6	121.5	122.3	55.9	53.7	58.1	55.3	55.0
18	**City: Moscow**	10898	9975	9827	9535	8734	104.9	96.0	94.4	91.5	83.6	37.0	35.9	34.2	34.5	32.1
	REGION: Nortwestern	26112	21364	20029	18824	18247	188.8	154.5	145.9	138.1	134.7	65.5	67.8	68.7	66.6	64.3
19	**Republics: Kareliya**	1572	1416	1251	1087	1045	221.8	199.8	177.9	155.8	150.8	78.7	77.6	80.4	75.4	73.1
20	Komi	2534	1902	1723	1607	1631	252.0	189.1	172.9	163.1	167.3	78.7	79.8	74.4	75.8	85.9
21	**Regions: Arkhangelsk**	1847	1611	1534	1451	1275	140.1	122.2	117.6	112.4	99.6	69.7	68.2	70.5	69.5	54.1
	Nenetsky AD	109	100	78	68	63	260.6	239.1	185.9	161.9	150.1	93.2	88.4	69.1	76.2	59.6
22	Vologda	1814	1248	1245	1241	1244	144.5	99.4	100.0	100.5	101.3	47.6	53.8	55.5	59.3	57.1
23	Kaliningrad	2976	2771	2805	2608	2448	313.4	291.8	296.8	277.5	261.2	118.5	133.1	141.0	148.7	144.9
24	Leningrad	3993	2980	2316	2208	2072	240.6	179.5	140.1	134.3	126.5	73.8	74.3	69.8	68.9	64.2
25	Murmansk	1749	1341	1270	1073	1110	198.7	152.4	145.5	124.1	129.5	76.6	82.8	86.7	73.9	76.7
26	Novgorod	1415	1206	1187	1152	1182	207.3	176.7	176.1	173.1	179.7	86.3	85.7	81.6	79.1	75.6
27	Pskov	1300	1217	1289	1245	1341	173.9	162.8	175.0	171.8	188.0	64.3	64.3	71.9	71.8	76.5
28	**City: St-Petersburg**	6912	5672	5409	5152	4899	149.5	122.7	117.6	112.5	107.2	45.5	46.6	47.5	42.9	40.8
	REGION: Southern	61011	52904	51416	54099	52442	280.8	243.5	237.2	237.4	230.2	90.0	86.7	84.1	79.0	77.4
29	**Republics: Adygeya**	691	827	769	726	695	155.2	185.7	173.0	164.0	157.5	95.5	97.7	100.4	90.1	87.7
30	Dagestan	6595	6076	5787	5513	4879	253.5	233.5	220.7	208.7	183.5	50.5	57.0	50.0	50.2	45.9
31	Ingushetiya	1610	1387	1376	1368	1289	338.5	291.6	285.7	280.9	261.6	60.8	56.3	51.3	41.1	40.4
	Чечня	5288	4644	4439	4258	4090				366.2	345.5				88.5	98.2
32	Kabardino-Balkariya	1594	1599	1596	1625	1549	177.3	177.9	177.9	181.8	173.8	42.6	44.3	49.5	55.0	49.3
33	Kalmykiya	1609	1479	1481	1287	1069	553.6	508.9	510.9	445.8	372.2	140.7	154.5	149.4	138.6	132.3
34	Karachaevo-Cherkessiya	1097	957	922	928	955	251.3	219.2	212.2	215.1	222.8	42.1	45.8	38.7	40.6	53.2
35	North Osetiya - Alaniya	1952	1824	1701	1644	1638	276.1	258.0	241.5	234.1	233.5	95.8	84.2	80.6	86.0	81.8
36	**Krai: Krasnodarsky**	12786	9757	9799	9521	9372	250.4	191.1	192.1	186.8	183.7	95.5	93.4	94.4	89.9	88.2
37	Stavropolsky	6978	5816	5656	5443	5448	255.9	213.3	208.1	200.8	201.7	73.1	76.5	65.0	55.0	51.4
38	**Regions: Astrakhan**	3503	2910	2758	2579	2593	349.9	290.6	276.3	259.4	260.8	98.9	100.7	98.5	92.1	85.9
39	Volgograd	8723	7899	7744	7619	7327	326.3	295.5	291.7	289.1	279.7	106.8	104.1	102.4	101.6	98.8
40	Rostov	13873	12373	11827	11588	11538	317.8	283.4	272.9	269.3	269.8	118.2	99.8	100.1	86.1	86.6
	REGION: Privolzhsky	74581	59014	56928	55538	52485	241.3	191.0	185.4	182.0	173.0	80.4	81.8	83.6	83.2	79.4
41	**Republics: Bashkortostan**	7249	5446	5303	5224	5152	177.1	133.1	130.0	128.6	127.2	57.3	54.6	57.2	57.7	53.3
42	Mariy El	747	754	813	787	833	103.5	104.4	113.4	110.6	117.9	77.3	77.2	82.0	74.9	76.8
43	Mordoviya	2242	1882	1651	1620	1469	255.9	214.8	190.5	189.1	173.3	63.7	66.0	59.0	61.0	52.6
44	Tatarstan	7972	5738	5458	4845	4158	211.3	152.1	144.8	128.8	110.6	69.4	67.3	68.3	65.3	58.4
45	Udmurtiya	4260	3992	3872	3725	3662	273.0	255.9	249.4	241.2	238.1	89.9	98.6	106.2	103.2	98.9
46	Chuvashiya	3424	2270	2138	1912	1699	262.4	173.9	164.5	148.0	132.1	84.2	94.1	108.8	107.2	101.4
47	**Regions: Kirov**	3499	2381	2476	2489	2443	236.5	160.9	169.4	172.5	171.2	89.4	92.1	99.4	105.9	108.4
48	Nizhniy Novgorod	9303	7262	7074	6984	6543	267.4	208.7	205.3	204.7	193.5	83.9	84.2	82.1	81.4	78.3
49	Orenburg	5576	4348	4391	4425	4545	257.8	201.1	204.2	207.0	213.8	85.5	85.0	91.5	94.5	92.3
50	Penza	3222	2518	2068	2250	2179	224.4	175.4	145.4	159.8	156.1	71.6	72.4	68.7	64.8	65.7
51	Perm (Permsky krai)	8461	7153	6806	6695	6315	303.1	256.3	245.7	243.6	231.2	118.8	114.3	110.5	105.0	99.1
	Komi-Permsky AD	514	464	442			382.4	345.2	332.8			189.7	216.5	192.0		
52	Samara	6984	6258	6172	6089	5733	217.1	194.5	192.8	190.9	180.4	79.8	84.8	89.0	89.2	86.5
53	Saratov	8358	6226	5926	5996	5555	316.2	235.5	225.7	229.9	214.0	88.3	89.8	89.7	98.9	94.4
54	Uliyanovsk	3284	2786	2780	2497	2199	240.7	204.2	205.8	186.9	166.4	68.9	83.2	82.4	75.9	72.6
	DISTRIC: Urals	38404	30888	30382	29629	28807	311.8	250.8	247.4	242.0	235.5	96.0	94.4	93.0	92.2	92.6
55	**Regions: Kurgan**	3795	3081	2976	2900	2989	378.0	306.9	300.0	295.9	308.4	129.8	124.7	119.1	115.9	115.5
56	Sverdlovsk	13143	11173	11013	11198	11374	295.5	251.2	248.7	253.9	258.5	92.4	91.5	91.6	95.3	96.7
57	Tyumen	13699	10088	9944	9567	8206	416.4	306.6	300.7	287.9	245.3	125.6	118.1	111.0	105.2	101.4
	Khanty-Mantyisky AD	4666	3622	3471	3429	3177	320.4	248.7	236.3	232.0	213.5	111.0	105.3	97.8	95.1	90.4
	Yamalo-Nenetsky AD	1485	1456	1563	1386	1247	288.3	282.7	298.6	261.2	231.5	99.0	98.2	102.0	93.3	84.5
58	Chelyabinsk	7767	6546	6449	5964	6238	217.3	183.2	181.6	168.9	177.4	63.6	67.6	70.7	69.6	72.9
	REGION: Siberian	81355	66745	63462	59485	57011	408.8	335.4	320.6	302.3	291.0	137.3	136.4	136.9	132.0	126.7
59	**Republics: Altai**	802	588	574	545	516	394.7	289.4	281.5	266.5	251.2	117.6	139.8	147.1	102.2	111.5
60	Buryatiya	4640	3739	3332	2857	2689	476.3	383.8	343.8	296.6	280.1	152.3	158.2	169.6	161.9	158.4

№ № пп.	Federal regions, ares of the Russian Federation	TB patients registered by the end of the year										Of them MbT+				
		#					per 100K					per 100K				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	RUSSIA	**378820**	**312208**	**298509**	**289015**	**276554**	**264.8**	**218.3**	**209.7**	**202.5**	**194.5**	**88.3**	**86.9**	**86.6**	**83.9**	**80.9**
61	Tyva	3222	2558	2174	2026	1990	1051.4	834.7	706.6	656.7	643.1	426.5	409.5	365.0	341.3	327.4
62	Khakasiya	2271	1985	1862	1770	1691	418.5	365.8	344.2	328.9	315.1	160.1	172.5	173.0	182.1	172.4
63	**Krai: Altai**	10895	9528	8786	8526	8165	421.7	368.8	342.5	335.2	323.6	113.0	111.8	112.6	111.9	105.3
64	Krasnoyarsky	11291	8385	7613	7355	7276	383.8	285.0	260.2	253.1	251.4	132.8	117.8	110.8	108.2	106.6
	Taimyrsky AD	120	115	98	78		304.3	291.6	248.9	200.1		91.3	121.7	106.7	92.3	
	Evenkiysky AD	135	102	71	70		771.4	582.9	407.5	405.1		194.3	165.7	109.1	133.1	
65	**Regions: Irkutsk**	10917	9305	9286	9134	9398	426.3	363.4	364.8	361.5	373.9	146.0	143.9	146.2	144.2	149.5
	Ust-Ordynsky Buryatskiy AD	729	669	707	592	605	541.7	497.1	527.2	442.3	451.9	198.4	171.7	197.6	156.9	168.1
66	Kemerovo	12227	9857	9990	8607	7676	425.7	343.2	349.9	303.2	271.6	171.4	174.0	176.9	160.0	146.0
67	Novosibirsk	11023	8405	8044	7189	6880	412.4	314.5	302.1	271.3	260.5	148.3	150.1	149.8	138.2	133.2
68	Omsk	8146	7257	7126	6984	6384	395.7	352.5	348.2	343.3	315.2	94.3	94.6	98.9	105.1	94.5
69	Tomsk	2385	2136	1964	1876	1756	229.2	205.2	189.5	181.4	170.0	118.7	126.3	125.7	126.0	116.1
70	Chita	3536	3002	2711	2616	2590	309.1	262.4	238.7	231.9	230.8	69.2	72.4	77.7	79.1	78.4
	Aginsky Buryatsky AD	330	285	215	192	189	453.7	391.8	292.6	258.6	251.6	96.2	94.9	102.1	75.4	70.6
	REGION: Far Estern	27244	22028	20774	18579	18017	410.7	332.0	315.1	283.8	276.8	127.1	128.4	136.6	133.4	130.3
71	**Republic: Sakha (Yakutiya)**	2397	2037	1955	1974	1854	252.6	214.7	205.6	207.8	195.2	89.3	89.8	91.8	95.4	88.8
72	**Krai: Primorsky**	9102	7383	6729	5388	5660	443.7	359.9	330.5	266.8	282.2	141.3	140.3	159.8	158.3	164.8
73	Khabarovsky	5526	4016	3746	3257	3191	387.2	281.4	263.8	230.6	227.0	106.3	107.0	111.1	105.1	98.7
74	**Regions: Amur**	5273	4329	4205	4184	3821	589.5	484.0	473.8	474.9	436.9	164.9	164.1	174.9	169.3	157.2
75	Kamchatka	1009	894	831	727	654	284.5	252.0	236.0	208.2	188.4	102.6	113.0	102.5	95.1	78.4
	Koryaksky AD		313	324	327			1285.5	1,359.1	1,410.4		0.0	492.9	520.2	500.3	
76	Magadan	595	540	473	362	275	333.6	302.8	270.8	211.0	163.2	101.5	84.7	75.0	57.7	51.0
77	Sakhalin	2075	1940	1940	1859	1724	385.6	360.5	364.4	353.3	330.8	112.6	137.5	137.9	140.1	131.4
78	**Autonomous region: Jewish**	1102	767	788	724	741	580.7	404.2	417.5	388.1	399.1	255.6	228.2	247.9	231.6	252.6
79	**Autonomous REGION: Chuko**	165	122	107	104	97	320.9	237.3	211.0	205.8	192.1	108.9	124.5	110.4	112.8	118.8

Tabl. 10. Prevalence of some TB forms in Russia, 2003-2007

(форма №33)

№№ пп.	Federal regions, ares of the Russian Федерации	Pulmonary TB patients with cavities										FCTB among PTB										MDR TB amomg RTB with MbT+				
		#					per 100K					#					per 100K					%				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	RUSSIA	**116398**	**113444**	**112676**	**111089**	**107610**	**81.4**	**79.7**	**79.2**	**77.8**	**75.7**	**35366**	**36295**	**35351**	**34999**	**33922**	**24.7**	**25.4**	**24.8**	**24.5**	**23.9**	**16.2**	**16.5**	**18.7**	**20.3**	**21.4**
	REGION: Central	19142	18669	17872	17548	16695	50.7	49.7	47.6	47	44.9	5449	5527	5215	5241	5022	14.4	14.6	13.9	14.0	13.5	18.1	17.3	19.3	20.4	20.6
1	**Regions: Belgorod**	689	653	608	589	498	45.5	43.2	40.2	39	32.9	236	258	237	196	172	15.6	17.1	15.7	13.0	11.4	13.4	19.3	22.9	26.4	37.8
2	Bryansk	1232	1286	1306	1375	1411	90.5	95.5	97	103.3	107.1	424	436	406	397	395	31.2	32.0	30.2	29.8	30.0	15.3	7.7	22.0	26.1	21.0
3	Vladimir	763	769	728	762	616	50.7	51.7	49	51.7	42.2	178	172	180	160	154	11.8	11.4	12.1	10.9	10.6	16.7	20.5	27.0	34.8	34.7
4	Voronezh	1697	1515	1437	1469	1416	72.1	64.9	61.6	63.5	61.7	536	494	434	464	487	22.8	21.0	18.6	20.1	21.2	39.9	33.5	32.7	30.1	24.5
5	Ivanovo	495	463	430	439	437	43.8	41.5	38.6	39.9	40.2	114	103	95	102	98	10.1	9.1	8.5	9.3	9.0	21.5	30.9	44.9	43.6	38.5
6	Kaluga	619	539	511	416	413	60.2	52.8	50	41	40.9	221	213	176	168	163	21.5	20.7	17.2	16.6	16.2	10.5	13.3	12.3	13.5	18.2
7	Kostroma	196	164	156	144	135	27.0	22.9	21.7	20.3	19.2	53	50	48	40	30	7.3	6.9	6.7	5.6	4.3	16.9	16.3	22.9	31.7	31.9
8	Kursk	762	854	779	823	848	62.7	71.2	65	69.5	72.4	349	366	349	372	378	28.7	30.1	29.1	31.4	32.3	20.2	3.7	2.9	2.8	5.8
9	Lipetsk	550	500	453	439	435	45.8	42.0	38.1	37.2	37.1	208	187	165	155	147	17.3	15.6	13.9	13.1	12.5	20.1	23.3	22.6	20.2	15.2
10	Moscow	3443	3328	3278	3182	3057	52.0	50.2	49.4	48	46.0	797	870	866	864	859	12.0	13.1	13.1	13.0	12.9	17.1	19.6	17.0	16.4	19.0
11	Orel	329	355	274	257	250	38.7	42.1	32.5	30.8	30.2	110	86	65	52	38	12.9	10.1	7.7	6.2	4.6	15.4	16.1	19.3	20.4	22.5
12	Ryazan	748	830	784	811	814	61.9	69.5	65.6	68.6	69.4	295	309	314	364	347	24.4	25.6	26.3	30.8	29.6	8.9	10.2	9.5	9.6	16.6
13	Smolensk	1239	1121	1138	1142	1095	120.0	110.0	111.7	113.5	110.2	236	224	205	240	237	22.9	21.7	20.1	23.9	23.9	4.5	6.8	6.6	10.5	8.3
14	Tambov	862	905	826	737	684	74.4	79.1	72.2	65.2	61.2	214	287	255	239	201	18.5	24.8	22.3	21.1	18.0	11.2	16.2	25.7	15.3	21.9
15	Tver	1040	1085	1052	1124	1049	72.0	76.1	73.8	79.9	75.4	237	223	225	248	221	16.4	15.4	15.8	17.6	15.9	15.6	7.6	8.1	6.1	2.4
16	Tula	1096	1112	1079	909	848	66.6	68.6	66.5	56.8	53.7	389	389	401	390	338	23.7	23.7	24.7	24.4	21.4	19.7	15.7	20.4	22.2	24.6
17	Yaroslavl	647	582	604	531	551	47.9	43.5	45.1	40	41.7	146	143	158	147	140	10.8	10.6	11.8	11.1	10.6	15.2	16.4	10.6	12.0	16.6
18	**City: Moscow**	2735	2608	2429	2399	2138	26.3	25.1	23.3	23	20.5	706	717	636	643	617	6.8	6.9	6.1	6.2	5.9	19.2	18.3	19.4	23.0	21.5
	REGION: Nortwestern	8446	8370	8495	8111	7887	61.1	61.0	61.9	59.5	58.2	1263	1317	1267	1210	1216	9.1	9.5	9.2	8.9	9.0	21.6	24.0	26.5	28.5	33.0
19	**Republics: Kareliya**	531	473	473	457	449	74.9	67.3	67.3	65.5	64.8	105	103	95	89	83	14.8	14.5	13.5	12.8	12.0	17.2	17.7	23.0	25.4	30.8
20	Komi	747	774	783	727	767	74.3	77.7	78.6	73.8	78.7	82	95	101	87	118	8.2	9.4	10.1	8.8	12.1	18.6	20.8	28.1	26.2	31.8
21	**Regions: Arkhangelsk**	965	911	872	858	670	73.2	69.8	66.8	66.4	52.3	101	96	88	74	44	7.7	7.3	6.7	5.7	3.4	38.8	45.6	52.7	48.3	47.7
	Nenetsky AD	34	38	29	29	23	81.3	90.6	69.1	69.1	54.8	8	9	7	8	9	19.1	21.5	16.7	19.1	21.4	30.8	37.8	51.7	40.6	56.0
22	Vologda	536	560	606	617	624	42.7	45.0	48.7	49.9	50.8	66	79	82	75	78	5.3	6.3	6.6	6.1	6.4	12.7	17.2	20.3	0.0	21.6
23	Kaliningrad	888	925	860	904	912	93.5	97.9	91	96.2	97.3	110	168	151	243	257	11.6	17.7	16.0	25.9	27.4	0.0	5.8	19.4	22.6	24.5
24	Leningrad	1111	1172	1232	1136	1101	66.9	70.9	74.5	69.1	67.2	225	219	166	146	132	13.6	13.2	10.0	8.9	8.1	9.1	17.5	19.6	24.8	31.2
25	Murmansk	425	378	431	391	446	48.3	43.3	49.4	45.2	52.0	112	104	123	93	81	12.7	11.8	14.1	10.8	9.5	36.8	38.4	38.6	39.9	40.4
26	Novgorod	493	461	435	410	382	72.2	68.4	64.5	61.6	58.1	38	38	41	35	39	5.6	5.6	6.1	5.3	5.9	30.7	33.0	29.7	43.2	40.7
27	Pskov	435	477	526	518	546	58.2	64.7	71.4	71.5	76.5	108	86	81	75	88	14.4	11.5	11.0	10.4	12.3	20.2	25.5	22.5	29.9	35.2
28	**City: St-Petersburg**	2315	2239	2277	2093	1990	50.1	48.7	49.5	45.7	43.5	316	329	339	293	296	6.8	7.1	7.4	6.4	6.5	30.6	26.8	21.9	30.1	34.8
	REGION: Southern	22157	20923	20748	21170	21007	102.0	96.5	95.7	92.9	92.2	7753	8046	7865	8029	7939	35.7	37.0	36.3	35.2	34.9	13.0	10.3	10.0	11.3	13.7
29	**Republics: Adygeya**	384	398	385	365	354	86.2	89.6	86.6	82.4	80.2	122	134	132	118	128	27.4	30.1	29.7	26.7	29.0	5.9	7.8	7.0	7.2	6.3
30	Dagestan	3195	2896	2824	2745	2461	122.8	110.5	107.7	103.9	92.6	1566	1461	1343	1179	1063	60.2	56.1	51.2	44.6	40.0	6.2	9.4	6.6	4.9	8.3
31	Ingushetiya	399	279	320	307	257	83.9	57.9	66.5	63	52.2	200	165	167	151	137	42.0	34.7	34.7	31.0	27.8	2.4	2.6	8.1	16.5	24.6
	Чечня				1138	1478				97.9	124.9	497	523	323	418	441				35.9	37.3					
32	Kabardino-Balkariya	571	563	698	876	688	63.5	62.8	77.8	98	77.2	319	342	375	324	321	35.5	38.0	41.8	36.2	36.0	10.7	0.0	0.0	0.0	0.0
33	Kalmykiya	475	539	455	434	394	163.4	185.9	157	150.3	137.2	223	237	242	244	220	76.7	81.5	83.5	84.5	76.6	28.9	24.8	0.0	23.8	21.5
34	Karachaevo-Cherkessiya	228	235	231	231	266	52.2	54.1	53.2	53.5	62.0	91	102	85	81	117	20.8	23.4	19.6	18.8	27.3	16.3	12.6	9.6	12.7	12.7
35	North Osetiya - Alaniya	643	622	669	637	349	90.9	88.3	95	90.7	49.8	287	303	325	362	336	40.6	42.9	46.1	51.5	47.9	8.4	10.4	0.0	1.5	9.4
36	**Krai: Krasnodarsky**	5490	5233	5189	5206	5453	107.5	102.6	101.7	102.1	106.9	2071	2298	2283	2327	2474	40.6	45.0	44.8	45.7	48.5	15.4	16.3	17.1	18.2	21.3
37	Stavropolsky	1699	1786	1637	1515	1518	62.3	65.7	60.2	55.9	56.2	450	481	448	414	400	16.5	17.6	16.5	15.3	14.8	21.5	11.3	10.8	16.9	19.0
38	**Regions: Astrakhan**	1021	1056	1002	916	928	102.0	105.8	100.4	92.1	93.3	458	471	449	440	412	45.7	47.0	45.0	44.3	41.4	7.2	4.1	9.8	13.0	16.9

№ № пп.	Federal regions, ares of the Russian Федерации	Pulmonary TB patients with cavities										FCTB among PTB										MDR TB amomg RTB with MbT+				
		#					per 100K					#					per 100K					%				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
39	Volgograd	3022	3065	3108	3187	3238	113.1	115.4	117.1	120.9	123.6	894	949	957	967	1007	33.4	35.5	36.0	36.7	38.4	18.4	9.6	9.4	10.4	13.4
40	Rostov	5030	4251	4230	3613	3623	115.2	98.1	97.6	84	84.7	1072	1103	1059	1004	883	24.6	25.3	24.4	23.3	20.7	7.8	5.3	6.8	7.9	9.7
	REGION: Privolzhsky	21767	21741	21572	21356	19944	70.4	70.8	70.2	70	65.7	6169	6326	5928	5711	5474	20.0	20.5	19.3	18.7	18.0	19.6	19.4	19.8	22.4	24.3
41	**Republics: Bashkortostan**	2020	2021	2049	2049	1918	49.4	49.5	50.2	50.4	47.3	785	883	828	803	802	19.2	21.6	20.3	19.8	19.8	24.1	24.8	25.0	24.3	25.6
42	Mariy El	282	313	293	300	311	39.1	43.7	40.9	42.2	44.0	61	71	67	61	52	8.4	9.8	9.3	8.6	7.4	19.2	30.0	30.3	33.0	36.9
43	Mordoviya	654	685	568	601	508	74.6	79.0	65.5	70.1	59.9	282	258	225	167	166	32.2	29.4	26.0	19.5	19.6	33.3	11.1	13.2	14.9	16.6
44	Tatarstan	2102	2002	1952	1924	1616	55.7	53.1	51.8	51.1	43.0	475	525	446	452	392	12.6	13.9	11.8	12.0	10.4	16.9	17.0	15.2	15.9	17.3
45	Udmurtiya	1208	1317	1386	1284	1254	77.4	84.8	89.3	83.1	81.5	225	236	291	283	286	14.4	15.1	18.7	18.3	18.6	13.1	12.0	13.7	15.1	16.7
46	Chuvashiya	1078	1086	1096	1035	971	82.6	83.6	84.4	80.1	75.5	188	183	168	159	164	14.4	14.0	12.9	12.3	12.8	0.0	3.4	9.1	23.1	32.4
47	**Regions: Kirov**	746	734	830	766	698	50.4	50.2	56.8	53.1	48.9	109	99	95	96	104	7.4	6.7	6.5	6.7	7.3	22.7	22.6	22.6	22.1	23.0
48	Nizhniy Novgorod	3232	2997	2937	2831	2723	92.9	87.0	85.2	83	80.5	1125	1091	981	956	964	32.3	31.4	28.5	28.0	28.5	26.8	29.4	28.4	29.3	26.3
49	Orenburg	1804	1837	1972	2065	1921	83.4	85.4	91.7	96.6	90.4	254	261	273	254	250	11.7	12.1	12.7	11.9	11.8	24.9	28.6	19.0	18.5	22.6
50	Penza	941	885	801	812	712	65.5	62.2	56.3	57.7	51.0	285	245	221	241	207	19.8	17.1	15.5	17.1	14.8	19.5	16.3	10.8	16.1	16.1
51	Perm (Permsky krai)	2634	2714	2573	2578	2459	94.4	98.0	92.9	93.8	90.0	883	940	827	800	731	31.6	33.7	29.9	29.1	26.8	26.7	20.6	23.1	22.3	28.3
	Komi-Permsky AD	227	218	218			168.9	164.1	164.1			60	70	50			44.6	52.1	37.6			42.7	12.8	22.0		
52	Samara	2122	2064	2246	2321	2272	65.9	64.5	70.2	72.8	71.5	724	723	716	702	660	22.5	22.5	22.4	22.0	20.8	10.5	9.5	16.7	27.7	27.1
53	Saratov	1944	2029	1806	1820	1676	73.5	77.3	68.8	69.8	64.6	543	555	534	491	464	20.5	21.0	20.3	18.8	17.9	14.4	19.0	19.8	21.1	23.3
54	Uliyanovsk	1000	1057	1063	970	905	73.3	78.3	78.7	72.6	68.5	230	256	256	246	232	16.9	18.8	19.0	18.4	17.6	16.0	20.7	21.7	26.5	25.7
	DISTRIC: Urals	9767	9557	9628	9403	9417	79.3	77.8	78.4	76.8	77.0	2922	2989	3055	3077	2845	23.7	24.3	24.9	25.1	23.3	10.5	10.9	10.8	13.0	14.4
55	**Regions: Kurgan**	930	892	946	1017	1051	92.6	89.9	95.4	103.8	108.4	437	411	484	442	449	43.5	40.9	48.8	45.1	46.3	8.1	7.6	7.7	8.1	7.2
56	Sverdlovsk	3557	3265	3227	3215	3300	80.0	73.7	72.9	72.9	75.0	895	947	967	1042	1020	20.1	21.3	21.8	23.6	23.2	8.5	9.9	9.9	11.3	12.6
57	Tyumen	3360	3371	3331	3091	2967	102.1	101.9	100.7	93	88.7	1031	1030	1017	987	795	31.3	31.3	30.7	29.7	23.8	9.6	13.0	12.6	16.9	21.1
	Khanty-Mantyisky AD	1123	1177	1202	1096	1039	77.1	80.1	81.8	74.1	69.8	338	333	309	270	226	23.2	22.9	21.0	18.3	15.2	14.9	16.4	14.9	18.2	21.4
	Yamalo-Nenetsky AD	455	453	476	424	394	88.3	86.6	90.9	79.9	73.2	89	98	117	135	137	17.3	19.0	22.4	25.4	25.4	14.3	15.5	9.3	22.5	25.1
58	Chelyabinsk	1920	2029	2124	2080	2099	53.7	57.1	59.8	58.9	59.7	559	601	587	606	581	15.6	16.8	16.5	17.2	16.5	17.2	10.9	11.1	12.8	11.5
	REGION: Siberian	27057	26238	26099	25384	24519	136.0	132.6	131.9	129	125.2	8822	9072	8951	8722	8390	44.3	45.6	45.2	44.3	42.8	16.1	18.3	23.4	25.8	25.4
59	**Republics: Altai**	168	174	213	214	176	82.7	85.3	104.5	104.7	85.7	116	111	117	108	101	57.1	54.6	57.4	52.8	49.2	33.5	28.5	25.1	20.1	44.3
60	Buryatiya	1552	1737	1749	1737	1683	159.3	179.2	180.5	180.3	175.3	338	392	488	527	517	34.7	40.2	50.4	54.7	53.9	4.1	4.9	8.8	11.7	11.5
61	Tyva	904	925	924	867	825	295.0	300.7	300.3	281	266.6	326	430	401	427	407	106.4	140.3	130.3	138.4	131.5	22.8	42.9	52.7	58.3	27.9
62	Khakasiya	845	722	793	843	830	155.7	133.5	146.6	156.6	154.7	260	270	220	121	152	47.9	49.8	40.7	22.5	28.3	11.2	15.5	24.8	32.2	34.9
63	**Krai: Altai**	4311	4177	4005	3979	3703	166.9	162.8	156.1	156.5	146.8	1533	1447	1283	1169	1058	59.3	56.0	50.0	46.0	41.9	4.6	8.7	15.1	13.2	13.0
64	Krasnoyarsky	4066	3622	3315	3271	3276	138.2	123.8	113.3	112.6	113.2	1009	975	874	849	809	34.3	33.1	29.9	29.2	28.0	14.3	15.5	21.8	25.2	26.8
	Taimyrsky AD	20	27	35	21		50.7	68.6	88.9	53.9		10	8	7	10		25.4	20.3	17.8	25.6	0.0	13.9	81.3	31.0	22.2	0.0
	Evenkiysky AD	54	48	37	44		308.6	275.5	212.4	254.7		18	13	10	9		102.9	74.3	57.4	52.1	0.0	82.4	93.0	36.8	60.9	0.0
65	**Regions: Irkutsk**	4218	4095	4129	4112	4259	164.7	160.9	162.2	162.7	169.4	1333	1512	1631	1594	1690	52.1	59.0	64.1	63.1	67.2	5.8	5.5	7.8	8.3	10.6
	Ust-Ordynsky Buryatskiy AD	281	261	306	314	283	208.8	194.6	228.2	234.6	211.4	79	90	96	88	82	58.7	66.9	71.6	65.7	61.3	6.7	5.7	2.6	4.8	4.9
66	Kemerovo	4139	3966	4005	3609	3298	144.1	138.9	140.3	127.1	116.7	1500	1510	1427	1495	1310	52.2	52.6	50.0	52.7	46.4	17.8	23.5	25.8	30.2	36.7
67	Novosibirsk	3318	3367	3362	3016	2984	124.1	126.5	126.3	113.8	113.0	1027	1031	1015	923	925	38.4	38.6	38.1	34.8	35.0	17.5	23.7	28.8	30.6	30.5
68	Omsk	1893	1869	1958	2156	2017	92.0	91.3	95.7	106	99.6	896	928	1041	1083	1030	43.5	45.1	50.9	53.2	50.8	20.5	22.6	31.0	36.6	30.6
69	Tomsk	692	690	779	735	608	66.5	66.6	75.2	71.1	58.9	127	111	103	102	78	12.2	10.7	9.9	9.9	7.6	38.9	29.2	43.7	45.9	44.0
70	Chita	951	894	867	845	860	83.1	78.7	76.3	74.9	76.6	357	355	351	324	313	31.2	31.0	30.9	28.7	27.9	62.2	21.1	23.3	22.3	16.5
	Aginsky Buryatsky AD	76	69	54	49	42	104.5	93.9	73.5	66	55.9	18	25	31	31	28	24.7	34.4	42.2	41.8	37.3	0.0	5.9	13.3	17.9	30.2
	REGION: Far Estern	8062	7945	8261	8117	8140	121.5	120.5	125.3	124	125.1	2988	3017	3069	3009	3035	45.0	45.5	46.5	46.0	46.6	11.6	13.9	19.8	17.0	17.5
71	**Republic: Sakha (Yakutiya)**	549	556	568	571	589	57.9	58.5	59.7	60.1	62.0	125	126	99	101	109	13.2	13.3	10.4	10.6	11.5	16.6	22.9	21.9	23.2	34.6
72	**Krai: Primorsky**	2947	2783	2913	2992	3060	143.7	136.7	143.1	148.2	152.5	1311	1221	1243	1290	1328	63.9	59.5	61.1	63.9	66.2	10.4	13.6	14.6	18.0	16.4
73	Khabarovsky	1347	1342	1382	1304	1352	94.4	94.5	97.3	92.3	96.2	447	455	427	401	402	31.3	31.9	30.1	28.4	28.6	12.2	5.1	34.3	9.8	10.9

№ № пп.	Federal regions, ares of the Russian Федерации	Pulmonary TB patients with cavities										FCTB among PTB										MDR TB amomg RTB with MbT+				
		#					per 100K					#					per 100K					%				
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
74	**Regions: Amur**	1614	1692	1755	1776	1691	180.4	190.6	197.7	201.6	193.3	615	687	714	655	668	68.8	76.8	80.4	74.3	76.4	8.4	17.1	19.3	22.7	20.7
75	Kamchatka	413	354	330	327	335	116.4	100.5	93.7	93.6	96.5	124	136	156	152	140	35.0	38.3	44.3	43.5	40.3	0.0	0.0	4.7	6.6	3.7
	Koryaksky AD		108	143	116			453.0	599.9	500.3			34	35	44			139.6	146.8	189.8			0.0	0.0	0.0	
76	Magadan	145	131	147	112	94	81.3	75.0	84.2	65.3	55.8	37	17	30	25	27	20.7	9.5	17.2	14.6	16.0	0.6	23.0	32.1	19.2	26.7
77	Sakhalin	703	765	807	714	669	130.6	143.7	151.6	135.7	128.4	203	248	285	258	230	37.7	46.1	53.5	49.0	44.1	18.8	17.7	18.5	18.1	19.7
78	**Autonomous region: Jewish**	301	274	312	268	298	158.6	145.2	165.3	143.7	160.5	111	106	94	97	102	58.5	55.9	49.8	52.0	54.9	13.6	18.5	6.8	3.7	4.9
79	**Autonomous REGION: Chuko**	43	48	47	53	52	83.6	94.7	92.7	104.9	103.0	15	21	21	30	29	29.2	40.8	41.4	59.4	57.4	32.1	41.3	92.9	50.0	43.3

Tabl. 11. MDR TB among new RTB cases 2003-2007 (form #33) .
TB treatment effectiveness indicators in Russia, 2004-2007

№№ пп.	Federal regions, ares of the Russian Federation	MDR TB among new TB cases #					MDR TB among new TB cases % of new RTB cases					Dispensary cure rate of RTB patients %				IA FuG* new cases %		Dispensary MbT+ conversion rate RTB %			
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2004	2005	2006	2007	2006	2007	2004	2005	2006	2007
	RUSSIA	**3438**	**3500**	**4167**	**4056**	**4149**	**8.3**	**8.1**	**9.5**	**9.4**	**9.8**	**39.4**	**28.7**	**30.3**	**31.6**	**45.6**	**47.9**	**31.9**	**30.6**	**33.4**	**35.1**
	REGION: Central	696	622	664	628	633	8.1	7.1	7.6	7.3	7.7	37.0	29.6	30.1	33.9	42.8	48.9	38.7	36.3	37.9	39.9
1	**Regions: Belgorod**	17	28	21	28	49	4.3	6.1	5.0	6.7	12.0	50.9	58.4	51.7	71.9	69.8	86.4	45.6	51.7	48.7	60.8
2	Bryansk	91	7	62	51	47	16.2	1.1	9.7	8.6	7.8	56.2	25.7	17.4	29.3	28.4	49.6	86.6	44.4	42.7	43.3
3	Vladimir	23	28	32	35	32	4.4	6.2	7.1	7.4	8.0	53.5	38.9	33.8	38.3	98.7	57.8	39.3	38.6	37.6	46.4
4	Voronezh	71	89	83	98	96	10.1	14.2	11.8	14.7	14.2	42.8	35.3	34.8	33.3	50.9	48.4	36.4	32.9	35.1	35.4
5	Ivanovo	5	6	10	22	22	1.5	2.0	3.3	6.5	7.4	48.8	37.9	55.6	50.4	71.6	67.4	44.8	48.8	46.6	52.7
6	Kaluga	8	21	18	12	18	3.0	5.9	4.9	3.8	6.1	40.7	45.9	36.5	43.0			32.6	40.8	47.8	39.2
7	Kostroma	4	6	15	15	11	2.2	4.0	9.9	10.3	8.6	53.4	45.6	58.5	45.4	84.9	65.6	27.3	42.3	55.0	55.1
8	Kursk	42	16	29	9	10	12.7	4.5	7.7	2.3	2.7	27.2	21.8	25.6	23.4	38.2	35.5	29.7	28.9	33.3	35.6
9	Lipetsk	45	35	45	26	20	16.2	10.7	13.9	8.2	6.0	42.4	43.1	36.3	43.2	57.4	61.4	35.9	42.8	48.4	50.8
10	Moscow	117	111	76	72	109	10.1	10.4	7.0	6.8	10.0	24.7	18.8	20.8	25.7	24.2	30.4	26.7	25.0	31.1	30.9
11	Orel	10	16	20	28	17	3.0	5.2	6.7	8.4	5.8	38.2	49.6	42.8	43.6	44.3	46.0	53.4	89.7	87.8	103.9
12	Ryazan	15	13	5	2	21	4.4	3.7	1.8	0.7	6.2	51.9	30.8	38.6	29.0	52.1	43.0	28.1	30.7	28.6	18.2
13	Smolensk	9	6	10	10	1	2.7	1.6	2.8	2.8	0.4	46.2	26.7	18.6	25.9	21.8	35.2	28.0	24.9	22.6	23.5
14	Tambov	20	29	58	16	20	4.7	6.2	14.9	4.7	5.3	38.4	36.3	31.7	40.1	45.0	57.3	31.5	37.7	33.6	42.1
15	Tver	32	28	2	3	2	8.6	6.8	0.5	0.8	0.6	30.6	33.6	34.0	32.6	44.1	43.2	43.1	35.0	42.5	42.9
16	Tula	73	64	64	48	52	12.6	9.7	11.5	8.6	10.3	32.2	27.8	35.0	34.1	49.9	44.9	40.0	37.9	41.5	45.3
17	Yaroslavl	23	16	17	14	15	8.9	6.5	6.0	6.0	5.9	27.9	25.8	29.0	32.3	76.0		29.5	23.5	29.0	29.1
18	**City: Moscow**	91	103	97	139	91	7.6	8.2	7.4	10.0	7.4	31.9	25.6	30.5	37.1	35.5	47.1	35.7	36.1	36.8	41.0
	REGION: Nortwestern	296	429	394	463	535	8.8	12.3	11.2	13.4	15.7	38.2	30.5	31.8	32.0	41.9	42.0	29.0	29.4	33.6	37.1
19	**Republics: Kareliya**	25	10	29	20	35	11.8	5.0	13.2	9.5	15.5	25.7	28.7	36.2	30.1	45.3	36.2	27.8	26.3	34.8	33.8
20	Komi	23	51	32	26	60	6.9	15.3	10.5	8.5	15.4	40.1	26.6	28.7	32.8	36.5	41.5	30.9	31.7	27.3	34.9
21	**Regions: Arkhangelsk**	52	54	80	75	82	14.4	14.8	24.1	20.4	24.9	43.8	37.8	37.1	46.5	51.5	62.1	32.6	30.3	35.4	58.5
	Nenetsky AD	2	3	0	3	5	18.2	30.0	0.0	17.6	35.7	25.1	31.8	45.4	40.6	52.2	55.0	44.7	36.4	55.7	84.2
22	Vologda	16	24	30	25	30	6.7	9.0	12.6	10.3	14.2	61.0	28.2	30.6	30.8	40.7	37.0	21.3	23.1	20.6	26.5
23	Kaliningrad	0	90	87	87	86	0.0	17.2	18.2	16.6	18.6	27.7	20.2	33.5	35.5	41.1	43.9	21.4	17.1	21.6	27.9
24	Leningrad	19	22	27	40	39	3.9	4.8	5.0	8.1	9.8	45.8	49.8	40.7	39.1	55.8	57.3	29.1	40.4	43.7	43.4
25	Murmansk	27	73	36	26	37	13.8	29.6	16.7	12.9	16.4	34.7	21.1	24.9	18.2	33.0	25.9	20.1	13.6	27.9	16.4
26	Novgorod	26	26	26	24	15	10.8	11.2	12.0	12.0	7.8	39.4	27.3	25.6	25.6	30.7	34.6	47.1	43.9	43.8	48.0
27	Pskov	29	15	18	48	46	11.0	6.3	5.7	16.6	14.6	32.6	24.0	30.2	26.4	42.7	37.8	54.0	40.6	47.1	49.2
28	**City: St-Petersburg**	79	64	29	92	105	13.6	10.2	4.4	14.6	16.2	35.9	30.6	29.1	29.6	38.4	37.6	25.8	31.4	37.3	37.4
	REGION: Southern	538	320	284	283	403	9.7	5.5	5.3	5.2	6.8	35.4	25.5	26.4	26.8	34.4	36.0	33.9	30.8	34.3	34.1
29	**Republics: Adygeya**	9	18	7	8	3	6.2	11.1	4.9	5.7	1.9	28.6	35.7	34.5	38.7	45.7	51.2	36.1	28.6	30.0	29.8

№ № пп.	Federal regions, ares of the Russian Federation	MDR TB among new TB cases										Dispensary cure rate of RTB patients				IA FuG* new cases		Dispensary MbT+ conversion rate RTB			
		#					% of new RTB cases					%				%		%			
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2004	2005	2006	2007	2006	2007	2004	2005	2006	2007
30	Dagestan	17	45	9	2	10	3.8	8.0	1.9	0.3	1.7	30.8	29.2	28.0	35.1	21.1	45.6	31.5	38.4	31.9	46.2
31	Ingushetiya	7	1	1	1	4	7.1	0.8	0.8	1.1	3.5	25.3	14.2	10.3	16.1	35.8	24.0	38.1	52.4	50.6	40.1
	Чечня	3	0	0	0	0	0.6	0.0	0.0	0.0	0.0	21.5	18.5	19.6	17.7	32.7	27.7	34.2	24.0	35.6	13.2
32	Kabardino-Balkariya	7	0	0	0	0	6.0	0.0	0.0	0.0	0.0	18.9	24.2	20.7	21.4	26.8	27.4	34.6	12.6	22.0	42.6
33	Kalmykiya	8	0	0	7	10	10.4	0.0	0.0	8.6	8.7	31.3	24.1	41.2	47.6	59.5	74.7	29.3	27.8	42.6	46.4
34	Karachaevo-Cherkessiya	3	0	1	0	8	4.6	0.0	1.8	0.0	9.0	28.5	18.3	16.3	12.7	22.6	19.0	51.7	49.3	40.1	32.4
35	North Osetiya - Alaniya	8	7	0	15	6	3.3	4.3	0.0	8.5	3.9	28.5	29.8	21.3	21.4	31.2	30.3	31.0	30.2	26.4	28.0
36	**Krai: Krasnodarsky**	142	122	137	138	182	11.4	10.0	11.1	12.7	13.6	46.2	24.6	25.3	29.7	37.5	43.9	27.3	23.7	26.5	29.0
37	Stavropolsky	69	13	30	29	31	10.7	1.8	6.1	5.8	5.8	31.3	19.6	24.0	20.7	29.9	26.5	31.8	34.2	38.9	36.1
38	**Regions: Astrakhan**	29	17	19	18	15	11.4	5.9	6.1	6.6	5.8	45.1	31.2	34.8	33.2	58.8	51.5	33.5	32.6	36.1	39.8
39	Volgograd	198	60	40	29	53	23.1	7.0	4.7	3.4	5.3	32.6	24.6	25.5	27.1	34.9	39.2	31.9	30.6	30.0	36.5
40	Rostov	41	37	40	36	81	3.0	2.7	3.0	3.3	7.6	34.8	27.2	25.6	25.7	27.6	28.0	42.9	34.5	40.9	37.6
	REGION: Privolzhsky	720	838	966	1098	1109	8.8	9.6	10.7	12.3	12.8	44.7	29.3	30.0	32.4	41.4	45.1	29.9	28.4	31.6	34.9
41	**Republics: Bashkortostan**	80	60	79	123	56	9.6	8.2	9.5	16.8	9.0	58.2	39.5	38.6	39.7	54.5	56.6	36.9	34.8	35.8	37.9
42	Mariy El	29	27	41	39	54	9.0	9.6	12.8	12.7	14.7	50.9	44.1	51.4	54.0	67.6	68.9	47.5	44.9	57.7	58.7
43	Mordoviya	45	12	11	13	5	18.9	4.5	5.4	5.5	2.5	40.4	36.3	29.4	38.5	44.4	53.6	43.3	42.2	42.2	51.1
44	Tatarstan	46	58	74	48	35	6.0	6.8	8.7	5.5	4.2	55.0	34.8	42.0	49.6	57.7	70.8	34.1	28.7	32.5	42.1
45	Udmurtiya	24	25	59	26	78	4.6	4.4	10.1	4.9	13.7	24.6	20.3	23.0	20.1	33.2	28.8	22.2	18.9	26.8	26.2
46	Chuvashiya	0	0	28	77	69	0.0	0.0	5.0	12.7	11.3	57.2	33.5	47.6	55.9	55.1	67.5	23.2	21.9	41.0	49.7
47	**Regions: Kirov**	70	74	66	67	62	16.7	16.7	13.8	14.1	14.2	53.5	21.8	22.5	22.0	26.2	26.3	26.5	21.7	18.7	23.7
48	Nizhniy Novgorod	140	165	150	140	118	15.0	16.3	15.8	15.2	12.8	39.3	21.1	20.5	21.7	29.9	35.3	25.2	24.7	27.5	29.0
49	Orenburg	76	55	74	81	91	14.1	9.8	10.4	10.5	12.2	54.3	34.4	35.9	30.9	51.4	43.7	36.4	34.3	36.6	39.7
50	Penza	44	40	6	25	30	9.3	8.0	1.3	5.6	6.7	47.8	48.9	27.3	32.4	35.7	44.3	41.9	46.8	46.7	45.4
51	Perm (Permsky krai)	93	141	165	134	206	8.6	11.5	13.7	11.3	19.2	37.2	26.5	27.4	30.5	36.5	38.3	31.8	31.6	33.6	38.4
	Komi-Permsky AD	22	9	18			18.2	5.9	15.1			43.0	25.5					38.5	43.3		
52	Samara	32	43	138	208	209	3.7	5.0	14.5	22.0	22.6	33.7	27.9	27.1	33.4	32.3	41.0	30.9	30.5	30.0	32.2
53	Saratov	36	89	36	83	51	7.1	15.2	6.4	13.7	8.8	47.9	26.6	23.1	25.7	31.8	34.8	19.1	17.2	17.5	20.8
54	Uliyanovsk	5	49	39	34	45	1.7	13.6	11.9	10.5	12.5	35.1	20.0	35.4	39.3	48.6	55.1	16.8	22.7	33.4	32.1
	DISTRIC: Urals	206	201	181	243	269	5.5	5.0	4.4	5.9	6.5	41.9	26.7	28.8	30.8	98.1	70.3	31.8	30.6	31.9	33.6
55	**Regions: Kurgan**	26	28	22	12	9	6.8	6.7	5.5	3.0	2.4	48.5	29.0	32.0	27.4	36.2	33.7	35.4	35.0	29.6	35.2
56	Sverdlovsk	67	64	80	104	112	4.3	4.0	4.8	6.0	6.5	32.4	23.6	24.0	25.5		65.5	34.6	33.2	33.3	36.3
57	Tyumen	49	63	40	96	114	5.5	5.8	3.9	9.1	11.7	50.6	28.2	30.0	40.6	53.9	90.3	26.8	24.7	28.6	30.3
	Khanty-Mantyisky AD	16	22	20	44	43	4.4	4.6	4.5	8.9	9.6	47.7	30.0	28.9	36.0	43.2	54.5	29.6	28.8	28.7	34.7
	Yamalo-Nenetsky AD	13	11	11	26	13	11.3	9.0	8.3	20.6	11.8	26.8	21.6	27.4	28.8	34.2	36.0	32.1	24.8	30.5	27.1
58	Chelyabinsk	64	46	39	31	34	7.0	4.9	3.8	3.3	3.3	40.1	28.5	34.3	27.8		88.5	33.7	33.2	35.4	33.1
	REGION: Siberian	810	879	1208	1138	1004	8.7	9.2	12.2	12.0	10.9	39.0	30.0	31.9	32.9	49.1	52.7	28.7	29.7	32.2	33.9

№ № пп.	Federal regions, ares of the Russian Federation	MDR TB among new TB cases										Dispensary cure rate of RTB patients				IA FuG* new cases		Dispensary MbT+ conversion rate RTB			
		#					% of new RTB cases					%				%		%			
		2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2004	2005	2006	2007	2006	2007	2004	2005	2006	2007
59	**Republics: Altai**	3	2	13	6	12	3.5	1.6	9.2	8.8	14.8	70.8	46.4	43.8	47.2	68.9	79.8	31.4	39.5	44.5	34.8
60	Buryatiya	23	14	11	19	13	5.3	3.0	2.1	3.3	2.4	42.1	44.4	53.8	50.5	82.0	144.9	28.3	27.1	39.6	36.1
61	Tyva	51	44	66	46	55	14.4	12.5	17.7	14.6	18.5	37.4	36.1	32.4	23.9	44.8	33.7	33.2	37.9	34.6	27.5
62	Khakasiya	12	17	56	55	44	4.0	4.9	15.8	17.8	15.0	38.8	28.9	28.8	29.3	37.3	42.1	23.2	29.6	22.4	31.8
63	**Krai: Altai**	16	49	65	30	11	1.7	5.3	6.8	3.6	1.5	34.8	30.6	28.9	31.5	47.1	53.4	23.0	23.2	27.5	26.8
64	Krasnoyarsky	101	91	184	201	183	8.5	7.9	14.8	16.7	15.1	42.9	31.7	24.9	24.5	32.3	33.4	32.2	34.4	32.9	35.0
	Taimyrsky AD	0	12	1	1		0.0	75.0	7.7	9.1		37.1	36.8	45.0		62.9		23.8	44.4	43.6	
	Evenkiysky AD	0	10	1	4		0.0	100.0	7.7	50.0		37.0	50.0	27.9		26.5		44.4	66.7	33.3	
65	**Regions: Irkutsk**	29	60	43	50	49	2.7	5.5	3.8	4.3	3.9	27.2	20.4	21.8	21.1	28.6	28.8	22.4	23.1	24.9	24.3
	Ust-Ordynsky Buryatskiy AD	67	1	0	1	2	66.3	1.2	0.0	1.5	1.8	24.7	22.4	39.3	30.4	47.1	38.6	35.6	21.9	38.4	39.6
66	Kemerovo	171	262	261	265	266	8.9	13.1	12.8	13.5	14.5	45.4	28.2	40.7	42.5	60.6	59.3	31.4	30.9	39.0	41.0
67	Novosibirsk	108	142	203	162	192	8.3	10.4	15.0	12.5	14.8	49.7	32.7	39.1	40.3	60.0	66.6	26.0	27.9	30.1	33.4
68	Omsk	52	75	175	192	100	7.2	10.4	21.9	24.1	12.9	28.3	22.8	22.8	30.4	64.8	90.8	32.2	30.7	27.6	38.0
69	Tomsk	67	80	77	83	58	11.1	12.3	13.3	14.3	11.7	48.5	49.6	51.0	54.3	58.8	64.1	39.9	42.7	43.7	49.4
70	Chita	177	43	54	29	21	48.2	11.4	12.2	6.9	5.3	29.9	30.5	25.8	30.1	34.2	40.7	30.6	31.3	31.5	35.2
	Aginsky Buryatsky AD	0	0	0	0	3	0.0	0.0	0.0	0.0	25.0	41.9	51.8	50.1	47.4	75.5	68.9	53.6	42.0	58.0	47.7
	REGION: Far Estern	172	211	470	203	196	6.6	7.4	14.5	6.3	6.5	39.6	30.2	37.2	34.3	54.9	62.9	27.3	25.3	30.6	29.2
71	**Republic: Sakha (Yakutiya)**	32	32	30	34	55	11.0	9.7	8.6	9.9	19.3	49.1	38.1	33.4	38.0	44.9	46.0	41.5	41.5	39.7	41.6
72	**Krai: Primorsky**	60	88	153	103	89	5.9	7.8	11.3	7.6	6.6	36.3	33.3	53.0	39.2	87.4	154.7	28.6	21.4	32.3	26.5
73	Khabarovsky	23	4	226	9	5	5.1	0.8	37.9	1.5	0.9	54.2	37.4	41.4	40.5	55.8	59.8	28.2	28.5	33.5	31.4
74	**Regions: Amur**	15	30	17	8	22	4.5	9.1	4.6	2.3	7.0	32.0	20.3	19.6	24.7	29.7	38.1	15.9	15.6	17.8	22.5
75	Kamchatka	0	0	2	3	0	0.0	0.0	2.0	3.1	0.0	34.4	32.7	36.4	33.9	62.1	61.6	19.9	29.5	31.2	28.8
	Koryaksky AD		0	0	0			0.0	0.0	0.0		66.7	23.5	19.9		37.5		55.0	22.1	24.2	
76	Magadan	2	10	9	11	5	3.2	18.2	18.0	19.6	11.1	23.9	24.8	43.1	51.9	50.5	88.0	40.1	43.7	62.6	56.2
77	Sakhalin	18	23	16	29	15	9.0	8.7	5.8	10.2	6.6	22.4	18.0	19.9	22.2	26.1	28.0	27.7	33.5	29.9	38.7
78	**Autonomous region: Jewish**	17	18	1	1	0	12.5	16.4	0.8	0.9	0.0	54.5	24.6	31.7	30.3	41.6	39.1	27.5	19.6	26.0	21.1
79	**Autonomous REGION: Chuko**	5	6	16	5	5	23.8	30.0	80.0	26.3	27.8	56.8	46.0	29.0	29.7	47.4	48.3	31.9	42.0	42.9	25.9

* - FuG - follow up group

Tabl.12. Treatment outcomes, MoH&SD institutions, cohort analysis

Cohort of new PTB ss+ cases, form #8-TB

№№ пп.	Federal regions, ares of the Russian Federation	2005 %							2006 %						
		Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло	Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло
				от ТБ	не от ТБ	Всего					от ТБ	не от ТБ	Всего		
RUSSIA		**57.2**	**14.4**	**9.9**	**3.7**	**13.5**	**11.0**	**3.8**	**58.2**	**14.5**	**9.2**	**3.9**	**13.1**	**10.1**	**4.1**
	REGION: Central	59.8	14.2	8.4	4.0	12.3	9.0	4.7	58.5	12.9	9.0	4.7	13.7	9.0	5.9
1	**Regions: Belgorod**	72.2	9.3	4.2	2.7	6.9	6.9	4.6	71.0	11.6	4.7	5.1	9.8	4.3	3.3
2	Bryansk	32.1	32.7	8.2	2.5	10.7	24.2	0.3	39.7	18.7	7.0	6.7	13.7	25.4	2.6
3	Vladimir	66.9	12.1	10.8	2.9	13.6	6.6	0.8	69.0	9.5	10.9	2.5	13.4	5.6	2.2
4	Voronezh	63.3	9.7	7.9	6.0	13.9	7.1	6.0	62.2	12.3	5.9	4.4	10.3	9.4	5.9
5	Ivanovo	70.9	12.8	7.7	3.8	11.5	2.6	2.1	70.8	13.6	7.4	3.1	10.5	3.5	1.6
6	Kaluga	59.8	11.3	13.1	6.2	19.2	6.9	2.7	62.9	12.9	11.3	5.6	16.9	4.0	3.2
7	Kostroma	45.9	20.3	17.6	2.7	20.3	12.2	1.4	43.7	12.6	10.3	6.9	17.2	25.3	1.1
8	Kursk	57.6	16.7	6.8	3.0	9.8	11.4	4.5	57.0	12.3	11.0	6.6	17.5	9.6	3.5
9	Lipetsk	69.8	6.5	5.9	4.1	10.1	8.3	5.3	63.9	3.2	14.2	6.5	20.6	7.1	5.2
10	Moscow	61.8	13.8	10.3	4.2	14.5	6.5	3.5	55.0	15.1	13.5	5.5	19.0	5.5	5.4
11	Orel	81.2	6.9	4.9	5.3	10.2	1.2	0.4	75.7	9.4	7.5	3.1	10.6	3.9	0.4
12	Ryazan	47.3	20.5	8.2	7.5	15.8	15.1	1.4	43.2	21.2	6.3	7.2	13.5	19.8	2.3
13	Smolensk	60.0	11.3	14.7	3.3	18.0	6.7	4.0	55.1	13.3	11.7	5.6	17.3	7.7	6.6
14	Tambov	60.0	15.8	8.4	5.3	13.7	5.8	4.7	62.8	8.5	9.8	6.8	16.7	8.1	3.8
15	Tver	62.2	14.4	5.9	3.2	9.0	12.8	1.6	56.1	9.0	17.4	8.4	25.8	7.4	1.6
16	Tula	57.0	11.5	11.5	2.6	14.1	13.7	3.7	56.1	11.3	9.0	1.7	10.7	18.5	3.5
17	Yaroslavl	30.4	29.5	7.1	4.5	11.6	25.9	2.7	36.4	24.3	8.6	5.7	14.3	20.7	4.3
18	**City: Moscow**	57.6	11.5	4.3	3.2	7.5	4.8	18.5	68.6	12.8	4.2	3.8	8.0	8.1	2.4
	Moscow (imigrants+homeless)	42.9	8.7	0.5	0.5	1.0	0.0	47.4	40.7	12.6	6.3	1.2	7.4	0.2	39.1
	REGION: Nortwestern	50.2	18.2	12.5	3.9	16.4	12.4	2.7	54.3	18.0	11.8	3.9	15.7	9.4	2.2
19	**Republics: Kareliya**	52.0	14.3	17.1	4.6	21.7	6.9	5.1	58.2	5.9	13.5	7.1	20.6	10.0	5.3
20	Komi	49.6	19.1	8.6	4.3	12.9	12.6	5.8	68.9	12.1	7.0	2.2	9.2	6.6	3.3
21	**Regions: Arkhangelsk**	48.0	25.6	17.7	2.0	19.7	5.5	1.2	48.2	27.3	12.9	2.5	15.5	7.6	1.4
22	Vologda	56.5	11.2	9.9	7.5	17.4	13.0	1.9	61.6	6.3	20.8	5.0	25.8	6.3	0.0
23	Kaliningrad	36.0	29.7	9.9	5.2	15.1	18.0	1.2	45.9	27.8	10.5	6.0	16.5	9.2	0.5
24	Leningrad	48.0	14.7	16.3	4.0	20.3	13.7	3.3	52.3	16.5	12.8	4.9	17.7	13.2	0.4
25	Murmansk	28.9	19.5	14.8	2.0	16.8	30.2	4.7	25.7	33.3	12.5	0.7	13.2	22.2	5.6
26	Novgorod	73.0	11.5	9.2	2.3	11.5	3.4	0.6	69.8	13.7	8.8	1.6	10.4	3.8	2.2
27	Pskov	66.4	9.2	10.1	3.4	13.4	9.2	1.7	56.7	10.9	12.2	4.2	16.4	9.7	3.4
28	**City: St-Petersburg**								72.4	13.7	7.3	2.1	9.3	3.0	1.6
	REGION: Southern	67.9	13.2	4.6	2.8	7.4	7.1	4.3	66.4	14.5	4.1	2.5	6.6	8.0	4.4

№ № пп.	Federal regions, ares of the Russian Federation	2005 %							2006 %						
		Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло	Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло
				от ТБ	не от ТБ	Всего					от ТБ	не от ТБ	Всего		
29	**Republics: Adygeya**	76.3	8.8	3.8	1.3	5.0	6.3	3.8	69.6	10.1	7.4	2.7	10.1	7.4	2.7
30	Dagestan	71.1	20.6	2.8	0.4	3.2	3.4	1.7	71.1	20.6	2.8	0.4	3.2	3.4	1.7
31	Ingushetiya	77.0	7.4	2.5	6.6	9.0	3.3	3.3	70.2	9.5	3.6	6.0	9.5	3.6	7.1
32	Чечня	72.4	13.1	4.5	0.9	5.4	3.2	5.9	72.8	7.1	5.9	1.8	7.7	6.5	5.9
33	Kabardino-Balkariya	79.6	11.2	1.0	2.0	3.0	4.1	2.0	44.6	29.3	0.5	2.7	3.3	20.1	2.7
34	Kalmykiya	60.9	4.3	4.3	8.7	13.0	21.7	0.0	51.4	34.3	0.0	0.0	0.0	8.6	5.7
35	Karachaevo-Cherkessiya	47.1	23.5	11.8	5.9	17.6	0.0	11.8	42.9	21.4	14.3	0.0	14.3	7.1	14.3
36	North Osetiya - Alaniya	63.2	22.8	1.8	0.6	2.3	9.4	2.3	70.9	11.7	3.0	1.3	4.3	7.4	5.7
37	**Krai: Krasnodarsky**	60.1	12.2	3.5	4.3	7.7	15.4	4.5	54.1	20.6	2.8	4.3	7.1	14.1	4.1
38	Stavropolsky	71.1	6.0	6.0	3.7	9.7	8.3	4.9	70.6	4.5	4.3	4.3	8.5	11.6	4.8
39	**Regions: Astrakhan**	56.7	10.0	3.8	5.0	8.8	13.8	10.8	70.9	11.7	3.0	1.3	4.3	7.4	5.7
40	Volgograd	71.5	6.2	7.0	5.8	12.8	4.1	5.4	68.4	11.6	5.1	2.5	7.6	6.5	5.9
41	Rostov	68.1	15.6	6.2	2.2	8.4	4.6	3.4	69.5	15.1	5.3	2.0	7.3	4.0	4.1
	REGION: Privolzhsky	55.4	14.3	9.5	3.4	12.8	14.6	2.9	63.6	12.2	8.6	3.6	12.3	9.1	2.7
42	**Republics: Bashkortostan**	78.3	6.7	7.5	1.7	9.2	2.5	3.3	69.5	10.3	9.4	2.7	12.2	6.7	1.5
43	Mariy El	67.2	6.8	10.2	6.8	16.9	8.5	0.6	71.3	9.6	8.1	3.8	12.0	6.2	1.0
44	Mordoviya	70.1	5.4	11.6	2.7	14.3	6.8	3.4	82.1	0.6	8.6	4.3	13.0	3.1	1.2
45	Tatarstan	27.2	29.7	14.1	3.7	17.8	22.3	3.1	60.2	8.8	11.1	5.9	17.0	10.4	3.8
46	Udmurtiya	55.4	13.6	14.6	2.3	16.9	8.9	5.2	60.6	11.3	12.5	3.7	16.2	8.3	3.7
47	Chuvashiya	70.2	16.9	4.3	1.8	6.1	5.3	1.6	63.3	18.0	6.5	4.1	10.6	6.5	1.5
48	**Regions: Kirov**								65.0	7.1	4.4	1.0	5.4	20.2	2.4
49	Nizhniy Novgorod	32.9	9.3	12.7	4.7	17.4	35.1	5.4	42.2	19.8	10.6	5.0	15.6	17.8	2.7
50	Orenburg	72.8	8.0	7.3	4.6	11.9	1.5	5.7	66.5	5.3	9.3	6.4	15.7	7.5	5.0
51	Penza	53.5	16.4	6.7	4.7	11.4	16.7	2.0	63.2	15.0	7.9	2.9	10.7	8.9	2.1
52	Perm (Permsky krai)								81.4	7.4	4.4	1.2	5.6	1.2	4.4
53	Samara	68.1	12.3	9.8	3.1	12.9	4.3	2.5	62.8	11.8	12.0	4.2	16.2	6.4	2.8
54	Saratov	51.1	12.3	10.0	3.4	13.4	19.7	3.4	54.8	18.5	6.5	3.7	10.2	14.8	1.8
55	Uliyanovsk	64.1	15.1	7.5	0.6	8.1	12.8	0.0	46.1	24.4	11.0	3.5	14.6	13.8	1.2
	DISTRIC: Urals	59.0	16.8	11.9	2.3	14.2	7.0	3.1	59.2	13.0	10.2	4.1	14.3	8.5	5.1
56	**Regions: Kurgan**	70.8	10.4	11.9	0.5	12.4	5.4	1.0	70.1	14.1	6.7	1.4	8.1	3.5	4.2
57	Sverdlovsk	43.9	25.5	14.3	5.1	19.4	6.1	5.1	59.7	13.2	12.2	5.0	17.2	6.0	3.9
58	Tyumen								68.0	9.5	6.1	3.0	9.1	11.3	2.2
	Khanty-Mantyisky AD	46.0	30.2	1.6	3.2	4.8	12.7	6.3	58.8	5.9	2.9	4.4	7.4	19.1	8.8
	Yamalo-Nenetsky AD	56.0	0.0	28.0	4.0	32.0	8.0	4.0	54.2	12.5	8.3	6.9	15.3	9.7	8.3
59	Chelyabinsk	32.4	38.8	9.1	4.1	13.2	8.7	6.8	50.9	14.0	11.2	3.8	15.0	12.5	7.6
	REGION: Siberian	55.4	13.6	11.9	4.0	15.9	11.3	3.8	52.0	16.7	11.8	4.1	15.9	11.7	3.7

№ № пп.	Federal regions, ares of the Russian Federation	2005 %							2006 %						
		Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло	Успешное лечение	Неуспешное лечение	Умерло			Прервало	Выбыло
				от ТБ	не от ТБ	Всего					от ТБ	не от ТБ	Всего		
60	**Republics: Altai**	65.9	14.1	9.4	2.4	11.8	7.1	1.2	48.0	28.0	10.0	2.0	12.0	10.0	2.0
61	Buryatiya	39.7	18.7	6.8	5.1	11.9	26.6	3.1	55.9	12.8	7.5	4.5	12.0	17.0	2.3
62	Tyva								49.3	18.1	15.9	5.8	21.7	10.9	0.0
63	Khakasiya	52.9	27.2	11.4	2.6	14.0	4.4	1.5	52.7	26.1	7.2	4.1	11.3	8.1	1.8
64	**Krai: Altai**	51.9	16.0	12.8	3.2	16.0	11.1	4.9	52.6	13.5	14.5	3.5	18.0	10.4	5.5
65	Krasnoyarsky	61.7	6.8	10.0	3.0	13.1	16.8	1.6	53.2	10.4	9.4	4.1	13.5	20.1	2.8
	Taimyrsky AD	81.8	0.0	0.0	0.0	0.0	18.2	0.0	81.8	9.1	0.0	9.1	9.1	0.0	0.0
	Evenkiysky AD	66.7	0.0	33.3	0.0	33.3	0.0	0.0	25.0	50.0	25.0	0.0	25.0	0.0	0.0
66	**Regions: Irkutsk**	52.4	9.9	14.7	4.7	19.3	15.9	2.4	50.1	12.7	13.0	5.0	18.0	16.9	2.3
	Ust-Ordynsky Buryatskiy AD	60.3	7.4	11.8	4.4	16.2	10.3	5.9							
67	Kemerovo	53.8	14.6	14.7	4.4	19.1	8.9	3.6	44.2	26.1	14.0	4.1	18.1	8.2	3.5
68	Novosibirsk	57.1	14.1	11.2	4.2	15.4	6.8	6.6	57.3	13.8	12.7	3.0	15.7	6.3	6.9
69	Omsk	48.2	18.0	8.8	3.7	12.5	14.2	7.0	45.3	21.3	8.5	4.2	12.7	17.8	2.8
70	Tomsk	69.7	12.6	9.1	2.9	12.0	3.4	2.3	70.4	15.6	9.3	1.1	10.4	0.8	2.7
71	Chita	68.5	7.9	11.7	6.0	17.7	4.1	1.9	59.1	6.5	13.5	8.0	21.5	6.8	6.2
	Aginsky Buryatsky AD	80.0	0.0	5.0	10.0	15.0	5.0	0.0							
	REGION: Far Estern	51.2	15.5	11.7	3.9	15.5	13.3	4.5	49.6	16.5	9.4	3.6	13.0	17.4	3.5
72	**Republic: Sakha (Yakutiya)**	69.7	10.8	7.7	3.1	10.8	4.1	4.6	67.8	13.1	5.5	3.5	9.0	7.0	3.0
73	**Krai: Primorsky**	46.4	15.8	14.1	4.6	18.7	14.5	4.6	34.0	25.5	12.8	6.4	19.1	21.3	0.0
74	Khabarovsky	44.9	17.0	8.2	3.5	11.7	19.4	7.0	50.6	13.2	7.6	2.5	10.1	21.5	4.6
75	**Regions: Amur**	47.7	19.2	15.0	3.6	18.7	10.4	4.1	39.9	19.3	10.3	4.2	14.5	22.9	3.4
76	Kamchatka	29.5	29.5	11.4	2.3	13.6	22.7	4.5	50.6	13.2	7.6	2.5	10.1	21.5	4.6
	Koryaksky AD								62.2	18.9	5.6	1.7	7.2	7.8	3.9
77	Magadan	29.2	16.7	4.2	0.0	4.2	50.0	0.0	44.8	10.3	17.2	3.4	20.7	24.1	0.0
78	Sakhalin	74.9	8.4	8.9	3.9	12.8	3.9	0.0	67.8	7.4	15.3	3.0	18.3	3.0	3.5
79	**Autonomous region: Jewish**	58.8	17.6	9.8	0.0	9.8	9.8	3.9	51.3	22.4	7.9	6.6	14.5	9.2	2.6
80	**Autonomous REGION: Chukot**	50.0	33.3	0.0	0.0	0.0	0.0	16.7	75.0	12.5	0.0	0.0	0.0	12.5	0.0

Tabl.13. Evaluation of TB detection and in-patient treatment coverage in Russia, 2003-2007

№№ пп.	Federal regions, ares of the Russian Federation	Coverage of the population by screening (f.30)				Proportion of TB patients detected during screening of all new cases and postmortem det.					Hospitalization of new RTB cases					Hospitalization of new RTB cases with MbT+				
		% of average population				% (form #33)					% (form #33)					% (form #33)				
		2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	RUSSIA	**57.8**	**58.2**	**58.2**	**63.2**	**51.6**	**52.4**	**52.0**	**54.7**	**56.0**	**83.9**	**84.2**	**85.4**	**83.9**	**84.7**	**94.2**	**93.7**	**94.3**	**93.0**	**94.2**
	REGION: Central	49.3	49.0	50.2	51.6	40.1	42.3	43.6	44.0	46.7	89.4	90.0	90.3	90.8	90.1	96.1	96.6	96.5	96.1	96.8
1	**Regions: Belgorod**	67.3	63.0	64.0	64.4	52.2	57.4	56.8	57.4	62.9	94.2	95.4	97.7	96.8	96.6	95.2	98.9	98.8	98.8	97.6
2	Bryansk	46.8	46.8	47.7	49.3	30.3	36.9	40.4	36.0	40.5	80.6	83.4	87.2	89.1	84.8	85.6	90.5	92.1	94.3	90.1
3	Vladimir	47.1	47.2	46.1	48.0	34.2	37.1	39.1	41.1	42.2	93.9	90.9	87.5	87.1	85.8	96.3	96.0	97.8	90.3	94.2
4	Voronezh	63.9	64.6	65.1	67.8	66.6	65.7	67.0	65.8	69.5	96.4	97.3	97.2	98.8	97.0	98.7	99.2	98.6	99.1	99.6
5	Ivanovo	70.0	68.1	67.6	63.9	44.1	46.3	41.2	44.4	44.8	94.4	96.6	98.1	95.7	96.4	97.4	99.0	99.7	98.8	98.0
6	Kaluga	43.4	43.2	44.0	44.9	45.1	45.6	41.4	39.0	49.7	87.0	86.3	92.2	86.3	87.7	95.8	93.8	95.7	98.4	100.0
7	Kostroma	50.7	51.6	53.4	52.8	40.1	45.4	42.9	39.0	46.3	96.5	95.3	98.2	95.3	89.8	98.9	100.0	100.0	100.0	100.0
8	Kursk	55.4	53.9	54.6	54.8	42.4	41.8	46.5	47.4	50.5	93.3	96.4	96.9	96.1	93.0	99.7	99.7	100.0	97.2	95.2
9	Lipetsk	65.6	70.0	79.5	85.2	57.5	57.9	60.0	61.1	68.3	95.9	97.7	94.6	94.5	84.1	99.6	98.5	96.6	97.2	97.3
10	Moscow	40.1	38.8	39.8	41.1	31.4	35.7	37.1	35.6	34.1	77.7	77.7	80.3	78.6	76.1	95.1	91.9	91.5	91.7	92.4
11	Orel	58.0	57.4	55.3	56.0	37.0	37.1	39.6	39.9	42.8	96.5	95.3	93.7	95.7	95.0	96.7	96.4	95.3	94.6	96.2
12	Ryazan	57.5	59.2	61.4	63.2	52.8	49.4	56.6	55.7	57.6	96.0	96.2	96.3	97.0	96.8	99.4	100.0	99.6	100.0	99.4
13	Smolensk	61.6	48.7	57.9	49.0	32.2	31.6	36.0	36.9	37.4	85.8	81.8	73.1	86.5	85.8	89.7	89.2	93.1	86.0	91.5
14	Tambov	60.0	59.5	58.9	59.6	49.0	53.5	53.4	58.1	53.6	98.7	97.8	97.1	96.3	98.3	99.1	98.9	99.5	100.0	100.0
15	Tver	56.0	57.9	59.3	59.7	42.0	41.4	41.6	38.9	43.9	90.5	87.6	87.3	87.0	99.4	96.8	98.5	96.1	97.0	102.1
16	Tula	57.0	55.3	54.0	53.7	49.1	45.7	41.2	46.4	40.3	86.8	90.2	89.8	93.8	93.7	96.6	96.8	95.1	97.1	98.0
17	Yaroslavl	52.6	50.5	50.4	51.0	39.5	39.8	40.9	41.9	42.0	91.5	94.0	92.3	92.7	96.1	97.3	98.4	97.9	96.6	99.2
18	**City: Moscow**	38.9	40.4	41.9	45.1	23.9	31.2	34.5	38.0	46.5	91.8	94.1	93.5	94.8	96.0	97.4	99.1	98.5	98.6	99.4
	REGION: Nortwestern	53.6	54.0	54.6	55.1	39.6	39.7	41.3	46.9	45.9	84.7	84.3	83.5	81.6	81.2	93.0	93.8	93.2	92.1	93.4
19	**Republics: Kareliya**	54.9	54.6	53.8	51.5	32.3	38.9	46.9	40.6	46.5	79.1	77.8	77.9	76.7	75.1	92.9	88.5	90.5	91.0	93.4
20	Komi	63.3	61.6	64.3	70.5	41.9	39.5	41.7	39.5	45.9	97.5	98.7	96.5	99.3	92.7	98.5	99.1	99.7	101.0	97.9
21	**Regions: Arkhangelsk**	55.9	53.4	52.7	51.7	35.7	38.6	32.2	35.7	40.0	88.4	81.0	73.6	61.8	61.8	95.8	94.5	94.6	86.4	89.1
	Nenetsky AD	78.9	78.0	83.6	81.0	85.0	85.0	75.0	95.7	64.7	100.0	100.0	100.0	100.0	106.3	100.0	100.0	100.0	100.0	100.0
22	Vologda	61.6	62.2	62.6	63.1	44.2	42.3	41.7	49.3	50.8	96.4	94.9	93.1	95.2	91.7	92.9	97.8	100.0	97.5	99.5
23	Kaliningrad	47.8	52.3	52.7	51.8	43.1	33.7	36.3	58.5	49.9	81.1	84.1	79.2	79.0	81.3	93.7	96.0	89.9	90.3	93.7
24	Leningrad	48.2	49.9	49.7	51.5	36.2	42.6	43.1	47.3	40.9	77.2	79.5	85.6	81.5	80.0	85.1	97.8	91.5	90.8	90.0
25	Murmansk	53.6	49.4	50.1	49.3	35.2	32.5	38.1	39.9	45.0	53.6	46.7	43.6	53.6	62.9	75.4	61.9	62.5	70.8	84.5
26	Novgorod	66.1	66.1	65.8	65.6	45.7	45.2	46.1	48.9	48.2	97.6	97.0	97.2	95.6	96.1	98.8	100.0	98.6	96.0	100.0
27	Pskov	57.3	54.1	54.7	55.7	52.1	52.0	42.1	42.9	42.7	89.1	92.0	95.5	84.8	81.6	97.0	96.6	99.4	93.8	91.7
28	**City: St-Petersburg**	49.3	51.0	52.3	52.5	37.2	39.3	44.6	49.9	47.4	85.9	86.2	85.6	84.8	84.5	95.9	94.9	97.0	96.8	94.9
	REGION: Southern	57.5	59.2	58.2	57.3	48.1	49.5	47.2	50.6	52.3	82.8	84.8	88.4	85.0	86.3	93.8	92.7	95.9	90.7	93.5
29	**Republics: Adygeya**	49.5	49.3	53.3	52.6	38.1	38.4	39.9	42.5	38.1	93.8	92.9	94.2	102.6	90.7	100.0	99.4	97.2	97.9	100.0
30	Dagestan	67.8	80.2	70.8	71.5	43.7	45.0	43.1	41.8	41.8	73.3	73.6	81.4	77.6	85.0	92.2	77.1	97.5	83.0	93.7
31	Ingushetiya	39.9	40.2	39.5	39.5	27.8	46.2	46.8	28.6	32.5	52.3	70.4	81.1	64.2	72.9	64.3	85.4	82.2	75.8	76.5
	Чечня			9.3	15.8	6.4	3.5	6.2	10.3	7.8	28.4	60.3	54.7	74.8	82.0	53.0	91.8	87.2	96.4	89.5

№ № пп.	Federal regions, ares of the Russian Federation	Coverage of the population by screening (f.30)				Proportion of TB patients detected during screening of all new cases and postmortem det.					Hospitalization of new RTB cases					Hospitalization of new RTB cases with MbT+				
		% of average population				% (form #33)					% (form #33)					% (form #33)				
		2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
32	Kabardino-Balkariya	41.2	45.4	37.1	37.2	34.2	32.1	33.1	28.4	38.1	95.2	90.3	96.3	99.5	98.5	100.0	100.0	100.0	100.0	100.0
33	Kalmykiya	67.1	66.2	66.3	65.3	43.8	50.1	44.4	47.7	52.4	83.5	81.3	85.2	84.1	87.5	97.4	90.6	94.8	85.2	89.6
34	Karachaevo-Cherkessiya	58.2	58.9	59.4	53.5	38.1	46.4	44.7	46.4	46.7	81.8	82.1	91.2	79.9	79.0	98.5	94.5	100.0	100.0	92.1
35	North Osetiya - Alaniya	61.8	60.2	59.4	59.8	31.6	32.0	80.5	85.1	81.7	85.2	84.9	98.4	93.0	88.1	89.5	84.1	96.3	0.0	98.7
36	**Krai: Krasnodarsky**	57.9	57.5	55.9	62.6	49.1	47.7	43.8	48.4	52.6	73.1	74.1	79.3	79.4	75.9	87.6	89.2	88.3	89.0	88.3
37	Stavropolsky	64.3	69.4	70.5	70.1	50.4	49.9	0.1	52.4	52.9	83.4	90.2	89.3	89.5	91.4	99.5	93.9	97.4	97.4	96.1
38	**Regions: Astrakhan**	58.7	61.0	55.3	50.3	54.9	51.4	49.1	52.5	53.8	85.2	89.4	103.7	88.8	89.0	97.3	97.9	101.3	99.3	91.5
39	Volgograd	57.3	51.5	56.0	56.9	46.7	49.9	47.4	52.8	58.3	81.7	82.7	76.5	82.9	82.3	90.5	93.7	97.8	95.0	93.9
40	Rostov	51.4	51.9	51.2	53.5	56.6	59.5	72.4	68.5	68.8	97.8	98.0	101.4	92.5	98.8	100.0	100.0	100.0	100.0	100.0
	REGION: Privolzhsky	65.7	66.3	66.0	62.6	54.0	55.1	54.4	54.8	55.8	87.3	87.6	89.0	86.9	89.6	95.5	94.4	95.6	93.8	95.8
41	**Republics: Bashkortostan**	65.6	63.1	64.1	59.8	51.6	53.6	53.5	53.7	54.7	92.8	90.4	92.8	93.8	97.3	100.0	100.0	100.0	100.0	100.0
42	Mariy El	0.0	60.9	65.4	64.6	45.9	48.5	46.0	45.4	56.1	96.1	97.6	94.7	83.4	95.8	96.3	99.3	97.8	93.2	98.6
43	Mordoviya	71.1	72.4	74.2	73.3	53.8	54.4	56.4	56.9	61.8	95.9	95.8	94.9	94.0	95.8	100.0	97.7	99.0	98.3	99.5
44	Tatarstan	67.4	67.0	65.5	58.9	53.4	56.4	55.3	55.9	55.3	86.8	86.2	90.1	86.0	87.5	95.7	95.3	97.6	95.2	96.0
45	Udmurtiya	63.5	64.1	65.6	66.9	43.7	45.7	46.6	50.2	48.8	90.7	87.8	89.9	90.3	87.5	93.7	94.6	92.0	94.2	92.8
46	Chuvashiya	63.3	63.0	58.5	60.6	42.9	41.7	42.6	47.4	48.0	92.4	90.1	90.9	90.5	90.5	97.9	96.1	96.8	97.7	94.4
47	**Regions: Kirov**	59.8	58.4	60.3	61.7	43.8	48.9	48.5	56.5	56.4	94.3	93.4	96.4	94.0	94.2	97.4	94.3	97.3	90.7	98.6
48	Nizhniy Novgorod	50.1	50.4	50.5	48.5	49.6	51.6	50.0	48.0	48.1	73.9	74.8	77.0	70.4	80.0	92.5	88.6	94.1	87.6	91.7
49	Orenburg	70.6	69.6	69.2	66.8	61.3	61.6	57.6	58.0	58.7	89.7	90.0	85.3	80.3	86.5	99.8	92.8	99.0	95.4	96.1
50	Penza	53.0	52.4	131.2	137.3	57.5	58.9	61.3	53.1	60.7	99.4	99.5	99.4	99.9	100.0	100.0	99.6	99.4	100.0	100.0
51	Perm (Permsky krai)	68.8	69.0	0.0	0.0	51.2	54.4	52.8	53.5	56.1	92.0	91.6	90.7	92.4	91.8	98.0	96.5	93.0	95.9	98.8
	Komi-Permsky AD					51.9	57.5	51.6			100.0	95.6	94.8			100.0	92.8	93.3		
52	Samara	75.8	75.1	75.5	71.4	63.7	61.9	59.6	61.3	61.0	74.8	75.2	79.4	77.1	79.2	81.6	81.4	87.1	83.5	87.4
53	Saratov	90.2	88.9	86.3	65.8	68.9	68.1	71.7	68.5	67.6	85.9	89.5	93.7	89.3	91.7	98.8	99.3	97.3	92.3	95.8
54	Uliyanovsk	71.6	67.6	65.7	68.0	47.2	46.1	40.6	45.2	45.2	88.9	91.3	96.1	97.9	98.0	96.6	100.0	99.1	99.4	104.2
	DISTRIC: Urals	63.8	63.3	64.0	66.7	51.7	53.6	52.9	54.4	54.6	83.7	83.6	84.1	83.4	86.2	96.6	93.9	95.3	95.6	95.0
55	**Regions: Kurgan**	68.4	61.9	61.1	58.9	48.5	52.6	48.7	54.2	58.5	82.9	81.3	78.8	82.0	75.1	89.3	83.1	84.8	98.0	90.6
56	Sverdlovsk	57.8	59.3	60.1	61.2	44.4	49.1	47.5	49.8	51.5	95.7	96.0	94.7	94.7	94.7	98.2	97.4	98.6	97.7	98.2
57	Tyumen	76.2	74.5	75.6	78.0	58.8	58.2	59.1	60.4	54.3	60.9	61.6	62.0	63.9	68.9	93.6	88.7	88.9	87.8	86.9
	Khanty-Mantyisky AD	79.6	79.4	79.0	80.0	61.9	67.1	64.0	66.3	62.8	70.3	70.8	68.2	69.2	71.0	87.1	90.9	87.1	81.5	85.7
	Yamalo-Nenetsky AD	82.7	85.8	82.0	88.3	54.3	55.2	59.1	57.0	56.2	65.2	64.9	56.7	65.3	71.2	100.0	81.1	78.2	69.8	89.1
58	Chelyabinsk	58.7	58.2	58.9	65.0	54.5	54.1	54.2	53.2	58.1	98.8	98.9	104.1	95.0	98.6	100.0	98.9	100.4	99.7	99.0
	REGION: Siberian	60.1	60.3	61.4	61.0	45.8	48.6	49.1	50.8	53.4	79.8	79.3	80.2	77.5	77.9	91.6	91.9	92.0	91.6	92.5
59	**Republics: Altai**	67.6	73.3	68.6	71.9	52.9	46.3	47.7	52.3	0.0	88.3	96.8	89.6	90.5	89.2	95.3	98.4	95.0	100.0	98.8
60	Buryatiya	62.6	60.5	59.7	61.3	56.4	57.1	51.5	54.9	56.7	88.4	87.3	75.9	82.8	67.2	96.8	90.2	96.5	96.0	89.6
61	Tyva	70.8	80.6	85.9	87.7	43.4	53.5	49.6	57.9	57.1	86.4	90.6	87.0	90.9	89.7	88.7	94.9	92.2	100.0	100.0
62	Khakasiya	60.5	50.2	63.2	63.3	49.2	39.4	35.5	38.3	49.3	90.7	93.1	91.1	90.8	83.9	100.0	99.4	98.3	96.4	92.8
63	**Krai: Altai**	58.7	58.2	62.2	57.8	47.8	51.0	51.6	54.3	55.0	56.4	57.3	56.1	54.6	57.0	81.1	82.3	78.9	84.8	88.6
64	Krasnoyarsky	54.1	53.1	54.3	47.2	43.6	45.5	46.2	46.9	57.3	90.4	88.6	92.4	91.7	94.0	94.0	97.0	97.4	95.1	97.8

№ № пп.	Federal regions, ares of the Russian Federation	Coverage of the population by screening (f.30)				Proportion of TB patients detected during screening of all new cases and postmortem det.					Hospitalization of new RTB cases					Hospitalization of new RTB cases with MbT+				
		% of average population				% (form #33)					% (form #33)					% (form #33)				
		2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
	Taimyrsky AD	78.7	82.3	79.5		69.2	66.7	65.4	62.5		100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0	
	Evenkiysky AD	71.2	70.6	70.7		43.2	29.2	42.3	54.5		100.0	100.0	95.7	95.2		100.0	100.0	100.0	100.0	
65	**Regions: Irkutsk**	55.3	56.7	51.8	59.2	34.8	34.0	36.9	39.0	45.5	86.7	82.4	92.0	83.1	81.8	90.9	92.5	98.1	93.8	93.0
	Ust-Ordynsky Buryatskiy AD	97.5	81.2	81.8	84.5	39.0	41.3	51.0	50.5	59.6	93.8	97.9	92.5	97.6	90.5	100.0	100.0	101.1	100.0	100.0
66	Kemerovo	56.7	56.4	60.6	63.7	36.8	43.3	43.7	44.6	46.5	86.9	86.7	83.9	83.0	83.5	96.2	96.2	93.8	90.8	94.4
67	Novosibirsk	63.5	67.5	59.9	63.0	51.1	55.9	56.1	57.5	58.4	78.5	79.3	80.1	78.5	76.7	92.5	92.3	92.3	92.5	87.1
68	Omsk	69.6	69.2	77.7	76.7	54.8	59.5	67.2	62.0	62.2	73.4	69.5	80.0	65.0	74.9	92.0	88.8	91.5	92.5	92.5
69	Tomsk	52.8	53.3	56.5	44.9	47.9	48.7	44.7	52.0	52.5	64.6	69.3	59.2	58.9	64.9	76.1	76.1	71.5	73.5	84.8
70	Chita	73.8	72.1	72.9	72.9	53.7	55.3	55.9	59.3	62.4	85.6	84.9	90.1	91.4	91.8	99.2	98.1	96.6	96.7	96.2
	Aginsky Buryatsky AD	85.9	80.1	83.1	87.0	59.8	54.2	54.9	52.6	65.4	95.3	95.5	97.1	100.0	100.0	97.3	100.0	100.0	100.0	100.0
	REGION: Far Estern	60.5	61.8	62.4	62.6	51.3	39.2	38.7	53.3	53.9	74.8	75.3	78.0	79.0	76.9	91.6	89.5	89.2	88.5	88.8
71	**Republic: Sakha (Yakutiya)**	70.2	72.2	69.7	69.8	46.0	52.4	50.8	46.3	56.6	91.1	88.9	91.7	98.3	93.8	99.3	99.4	100.0	98.0	99.6
72	**Krai: Primorsky**	54.9	54.4	53.3	55.0	47.0	46.1	45.8	46.5	48.5	75.8	74.2	76.9	78.3	75.6	93.1	90.9	88.7	88.3	86.1
73	Khabarovsky	64.2	65.9	68.4	70.1	58.0	0.0	0.0	64.7	61.9	79.7	83.7	84.9	86.4	87.4	96.5	94.8	95.0	94.5	98.0
74	**Regions: Amur**	62.8	64.2	65.0	65.5	56.8	54.7	55.0	66.3	63.1	52.9	55.5	62.5	59.6	50.7	79.4	72.7	79.0	74.6	77.4
75	Kamchatka	38.5	50.2	52.7	47.1	39.9	46.1	49.0	54.1	57.0	82.6	75.9	87.7	77.5	79.7	87.9	77.0	95.0	78.1	94.0
	Koryaksky AD			59.6			50.6	43.4	61.9			90.4	92.5	85.4			94.3	100.0	75.9	
76	Magadan	68.6	67.0	66.5	67.7	69.6	65.2	61.0	58.4	46.4	96.3	96.6	100.0	102.0	99.0	100.0	90.9	100.0	94.6	100.0
77	Sakhalin	60.6	60.1	66.9	60.1	45.7	43.1	46.6	41.7	41.5	78.1	72.7	76.8	80.9	82.3	85.4	87.5	81.2	84.5	86.0
78	**Autonomous region: Jewish**	59.0	58.0	60.7	60.9	54.9	54.3	54.3	45.4	49.5	66.4	72.0	52.3	59.4	71.7	83.8	87.3	72.3	86.1	79.9
79	**Autonomous REGION: Chuk**	82.8	95.1	84.1	92.6	25.7	62.5	48.7	68.8	51.7	100.0	100.0	102.6	100.0	100.0	100.0	100.0	105.0	100.0	100.0