Epidemiology of Tuberculosis and HIV Co-infection in the Russian Federation
Challenges and Solutions

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### VISION

**A world free of tuberculosis**
- zero deaths, disease and suffering due to tuberculosis

### GOAL

**End the global tuberculosis epidemic**

### MILESTONES FOR 2025

- 75% reduction in tuberculosis deaths (compared with 2015);
- 50% reduction in tuberculosis incidence rate (compared with 2015);
- (less than 55 tuberculosis cases per 100 000 population);
- No affected families facing catastrophic costs due to tuberculosis

### TARGETS FOR 2035

- 95% reduction in tuberculosis deaths (compared with 2015);
- 90% reduction in tuberculosis incidence rate (compared with 2015);
- (less than 10 tuberculosis cases per 100 000 population);
- No affected families facing catastrophic costs due to tuberculosis
Population of RF

Total population in 2013 – 143 347 059
TB incidence and Mortality Rates in the RF (per 100 000 population)

Source: Form № 8, Rosstat
TB Incidence by Federal Districts of the Russian Federation in 2013 (per 100 000 population)

Source: Form №8
TB Incidence by Federal Entities of the Russian Federation in 2013 (per 100,000 population)

Source: Form №8
TB Mortality Rates by Federal Districts of the Russian Federation in 2013 (per 100 000 population)

As reported by Rosstat [http://www.gks.ru/](http://www.gks.ru/)
TB Mortality Rates by Federal Entities of the Russian Federation in 2013 (per 100 000 population)

As reported by Rosstat http://www.gks.ru/
Percentage of New Pulmonary MDR-TB cases in the RF, 2006-2013

Source: Form № 7-TB
Percentage of Pulmonary MDR-TB Cases of all Relapse Cases, 2006-2013

2006: 25.5%
2007: 24.8%
2008: 29.3%
2009: 33.4%
2010: 34.7%
2011: 36.9%
2012: 39.1%
2013: 38.7%

Civilian sector
Penitentiary sector

Источник: Форма № 7-ТБ
Countries That Had reported At Least One XDR-TB Case 
By the End of 2012
TB is one of the leading causes of death in HIV-infected people worldwide. One fourth of HIV-positive individuals die from TB.

About 1/3 of 34 million HIV+ individuals worldwide are infected with TB.

HIV infection is the most potent factor causing progression of latent TB infection to active TB disease.

In HIV+ individuals, the rates of progression to active TB disease are 20-30 times higher.

Around 10% of people infected with TB actually develop the disease in their lifetimes, in HIV-infected individuals this risk increases up to 5-10% within a year.

Global tuberculosis report 2013. WHO
Incidence of Tuberculosis and HIV-infection in the Russian Federation (per 100,000 population)

Source: Forms №8 and № 61
Prevalence of Tuberculosis and HIV Infection, Russian Federation (per 100,000 population)

Source: Form № 33 and 61
New TB/HIV co-infection cases in the Russian Federation, 1999-2013 (Including Data from the Penitentiary System since 2007)

In 2013, 13 437 cases of TB/HIV co-infection were detected including those in the penitentiary system.

Source: Form № 61
In 2013, there were 33 894 HIV/TB notified patients including those in the penitentiary system.
Distribution of the Number of New HIV/TB Cases by Federal Districts of the Russian Federation in 2013

- Сибирский: 28,60%
- Приволжский: 23,60%
- Уральский: 19,80%
- Центральный: 13,50%
- Северо-Западный: 7,60%
- Южный: 3,60%
- Дальневосточный: 2,30%
- Северо-Кавказский: 1,00%

RF - 9167 individuals (100%)

Source: Form № 33
Percentage of New HIV/TB Cases Among All New Notified TB Cases by Federal Districts, 2013

<table>
<thead>
<tr>
<th>District</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Уральский</td>
<td>24.2%</td>
</tr>
<tr>
<td>Сибирский</td>
<td>15.1%</td>
</tr>
<tr>
<td>Приволжский</td>
<td>14.4%</td>
</tr>
<tr>
<td>Северо-Западный</td>
<td>14.3%</td>
</tr>
<tr>
<td>Центральный</td>
<td>12.5%</td>
</tr>
<tr>
<td>Южный</td>
<td>10.6%</td>
</tr>
<tr>
<td>Дальневосточный</td>
<td>4.7%</td>
</tr>
<tr>
<td>Северо-Кавказский</td>
<td>3.6%</td>
</tr>
<tr>
<td>РФ</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Source: Form № 33
Distribution of Notified HIV/TB Cases by Federal Districts of the Russian Federation as of 31 December 2013

RF - 22576 individuals (100%)

Source: Form № 33
Percentage of HIV/TB Patients among All Notified TB Patients as of December 31, 2013 by Federal Districts of the Russian Federation

Source: Form № 33
Number of Notified HIV/TB Patients as of December 31, 2013 by Federal Districts of the Russian Federation

Total – 22,576 patients

Source: Form № 33
Entities of the Russian Federation with the Biggest Number of Notified HIV/TB Cases as of 31 December 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Свердловская обл</td>
<td>2467</td>
</tr>
<tr>
<td>Иркутская обл</td>
<td>2089</td>
</tr>
<tr>
<td>Кемеровская обл</td>
<td>1336</td>
</tr>
<tr>
<td>Тюменская обл</td>
<td>1199</td>
</tr>
<tr>
<td>Московская обл</td>
<td>1109</td>
</tr>
<tr>
<td>Самарская обл</td>
<td>1043</td>
</tr>
<tr>
<td>Алтайский край</td>
<td>958</td>
</tr>
<tr>
<td>Санкт-Петербург</td>
<td>931</td>
</tr>
<tr>
<td>Челябинская обл</td>
<td>840</td>
</tr>
<tr>
<td>Москва</td>
<td>828</td>
</tr>
</tbody>
</table>

Source: Form № 33
Entities of the Russian Federation with the Lowest Number of Notified HIV/TB Cases as of 31 December 2013

Source: Form № 33
Number of Patients Who Died From HIV with Manifestations of Mycobacterial Infection (B 20.0) by Federal Districts in 2013

<table>
<thead>
<tr>
<th>District</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Сибирский</td>
<td>1717</td>
</tr>
<tr>
<td>Приволжский</td>
<td>1448</td>
</tr>
<tr>
<td>Уральский</td>
<td>1050</td>
</tr>
<tr>
<td>Северо-Западный</td>
<td>661</td>
</tr>
<tr>
<td>Центральный</td>
<td>582</td>
</tr>
<tr>
<td>Южный</td>
<td>234</td>
</tr>
<tr>
<td>Дальневосточный</td>
<td>98</td>
</tr>
<tr>
<td>Северо-Кавказский</td>
<td>51</td>
</tr>
</tbody>
</table>

Total 5841 patients died (B20.0)

Source: Form № 61
Ratio of Patients Who Died From TB (A 15-19) and From HIV with Manifestations of Mycobacterial Infection (B 20.0) by Federal Districts in 2013

Sources: Form № 61 and Rosstat
MDR TB and HIV-Infection

- High prevalence of MDR-TB among HIV-infected patients
- Challenges of MDR-TB diagnostics
  - low sensitivity of bacteriological methods of mycobacteria detection in HIV-infected individuals (~ 30%)
  - long time required for common bacteriological methods of detection of MDR mycobacteria (2-3 months)
  - low quality of bacteriological tests

In HIV-positive individuals infected with MDR-TB the disease might progress to the lethal form before effective therapy is initiated
Characteristics of DR Patterns in Patients with TB and TB/HIV Depending on the Degree of Immunosuppression

Detection of TB in HIV-infected patients

- Planned chest X-ray (twice a year)
- Tuberculin skin test/Diaskin-test (once a year)

- By screening of clinical symptoms
  (cough, fever, sweats, body weight loss)
- Self-presentation of patients

Active

Passive
Role of Screening Chest X-Ray Depending on the Degree of Initial Immunosuppression

Zimina V.N., Kravchenko A.V. Batyrov F.A, 2011
Frequency of Positive Mantoux Skin Tests with 2 TE in Patients with HIV/TB and TB

- TB: 91.4%
- CD4 > 500: 94.1%
- CD4: 350-499: 78.6%
- CD4: 200-349: 46.8%
- CD4: 100-199: 44.4%
- CD4 < 100: 10.9%

Zimina V.N., Batyrov F.A., 2011

Frequency of Positive Diaskin-Test® in patients with HIV/TB and TB

- TB: 84.6%
- CD4 500-200: 100.0%
- CD4 199-100: 36.4%
- CD4 < 100: 5.3%

Kalinkin A.V.
Abstract of the thesis for the degree candidate of med. science 2010
Algorithm for etiological TB diagnostics in HIV-infected patients

Sputum or any other diagnostic material examination in patients with TB-HIV must include MGM tests to allow detection of an agent and identification of DR at least to rifampicin.
Concept of etiological diagnostics of TB and DR-TB

- TB detection by means of molecular-genetic and bacteriological methods.
- DST for all patients: new and previously treated.
- Introduction of molecular-genetic and rapid methods of culture on liquid media in all regional laboratories.
- **Priority use of molecular-genetic methods for the diagnostics of DR in patients with high risk of MDR-TB and HIV-infected patients.**
Access to a comprehensive evaluation of patients regardless of geographical specifics of their places of residence and social status.
REGULATIONS FOR ACTIVITY ARRANGEMENTS

TB care unit for HIV-infected patients

A unit is to be established for provision of primary specialized care to patients with TB-HIV co-infection.
Functions of the unit

- Follow-up of patients with TB-HIV co-infection;
- Management of DOT in patients with TB-HIV co-infection;
- Epidemiological analysis of TB –HIV co-infection epidemiology in the population of the catchment area;
- Monitoring and analysis of:
  - Performance of preventive activities among persons with family contacts of TB-HIV patients;
  - Performance of the healthcare facilities in the field of vaccination of children born from mothers with TB including TB-HIV co-infection;
  - Isolation of newborns from mothers with TB including TB-HIV (for 2 months after TB vaccinations);
  - Follow-up of individuals in close family contacts with TB-HIV patients, performance of preventive and health-improving activities for this population group;
- **Provision of managerial, methodological and consultative assistance to the Center for prevention and control of AIDS and infectious diseases in the field of care delivery to patients with TB-HIV co-infection;**
- **Managerial and methodological support of TB activities which are being performed among HIV-infected patients;**
- Other functions in accordance with the legislation of the Russian Federation.
TB-HIV prevention activities in the Russian Federation

- Interaction of TB service and AIDS Centers
- Preventive TB treatment of patients with HIV-infection
- TB detection in HIV-infected individuals
- HIV testing in all TB patients (in 2013 - 82.7% of all TB patients were tested for HIV)
- Multidisciplinary approach to management of patients with TB-HIV
- Treatment of TB-HIV patients based on the general principles of TB treatment considering drug-to-drug interaction
Activities on TB detection among HIV-infected

- Development and introduction of modern recommendations on TB detection among HIV-infected patients.

- Training of the medical staff of TB facilities and AIDS centers on modern methods of TB detection and diagnostics in HIV-infected individuals.

- Training of the medical staff of non-TB facilities on TB detection and diagnostics.

- Maintaining TB alertness: provision of TB detection and diagnostic algorithms to the district general practitioners and family doctors.
In the not-tuberculosis medical organizations

Evaluate TB suspects with the use of rapid molecular-genetic methods of TB and DR-TB detection.
Federal Law No. 323 "On the fundamentals of health protection in the Russian Federation“ p.2 article 76: «clinical recommendations(protocols)... developed and approved by healthcare professional non-commercial organisations»
Russian Society of Phthisiologists (RSP) together with the Federal AIDS Center developed

Federal Clinical Recommendations (protocols) for the diagnostics and treatment of TB in HIV-infected individuals

www.roftb.ru
www.femb.ru
Thank you for your attention!