

# Problems and perspectives of TB treatment in the Russian Federation

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## Efficacy of TB chemotherapy

	Cohort 2008	Cohort 2009
Among new TB cases	69,6%	8,9%
Among smear positive new TB cases	57,6%	55,8%
Among relapses	52,9%	51,7%
Among smear positive relapses	42,3%	40,7%

*"Branch indicators of antituberculosis activities in 2009-2010", 2011*

## Drug resistance of *M. tuberculosis* in 2009-2010

	2009	2010
Any DR among new TB cases	36,5%	36,9%
MDR among new TB cases	<b>15,7%</b>	<b>17,1%</b>
Any DR among relapses	<b>53,7%</b>	<b>55,5%</b>
MDR among relapses	<b>33,4%</b>	<b>34,7%</b>

*"Branch indicators of antituberculosis activities in 2009-2010", 2011*

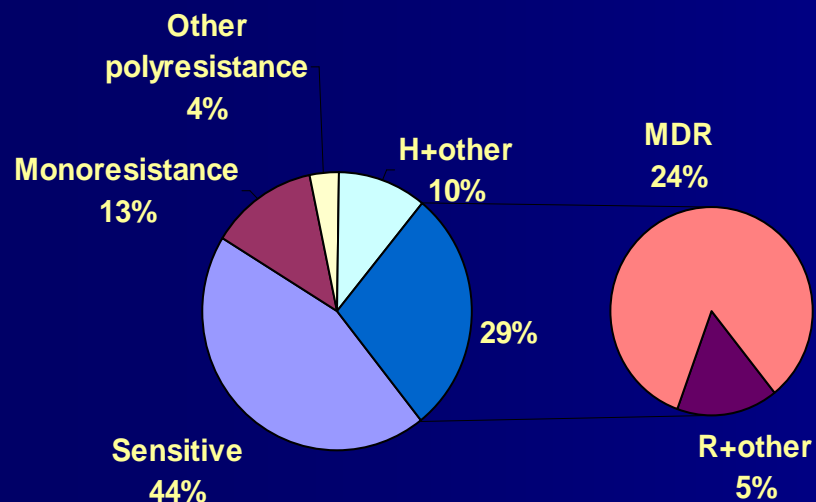
*What are the reasons of low TB  
treatment efficacy  
from clinical points of view?*

## **Clinical reasons of low efficacy of TB treatment:**

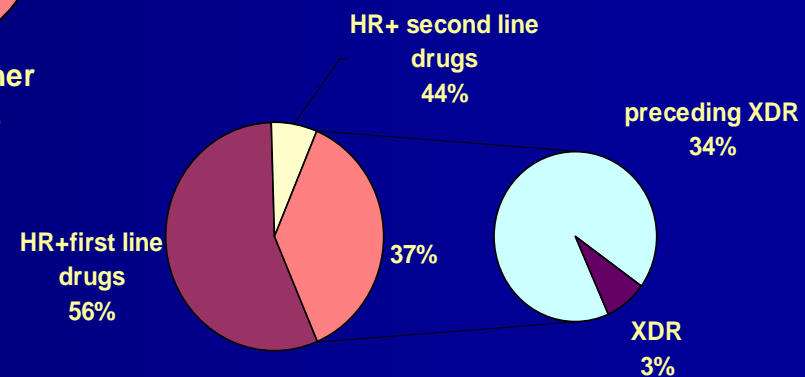
- **Late TB case detection**
- **Low-quality or late DR diagnostics**
- **Inadequate initial regimens of chemotherapy**
- **Inadequate regimens of chemotherapy for DR TB patients**
- **Incomplete treatment**
- **Low-quality anti TB drugs**
- **Insufficient surgical activity**

## DR patterns of *M. tuberculosis* among new TB cases in the regions supervised by CTRI RAMS (2010)

DST results

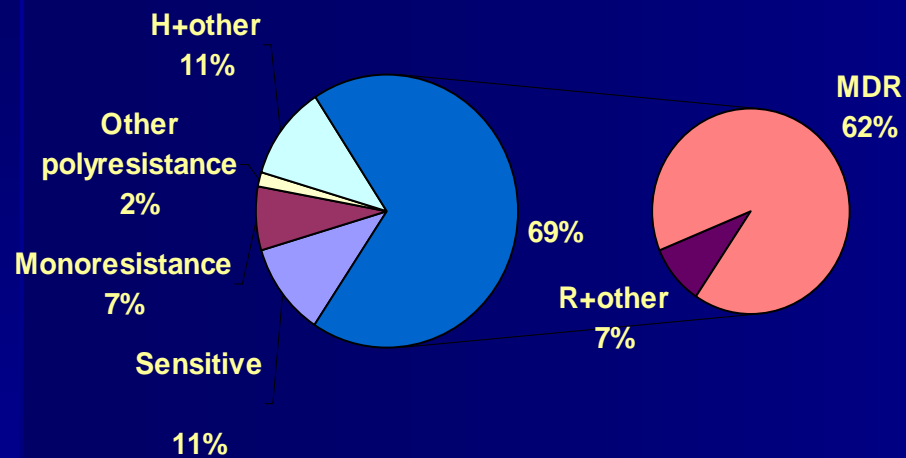


MDR patterns

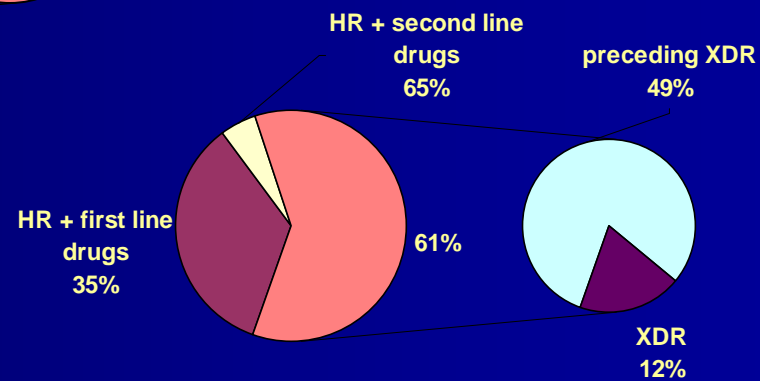


## DR patterns of *M. tuberculosis* among retreatment TB cases in the regions supervised by CTRI RAMS (2010)

### DST results



### MDR patterns



## ***Efficacy of I standard treatment regimen with correction during detection of DR of M. tuberculosis (MBT)***

1325 patients  
Long-term results after 2-3 years

Cured - **91,9%**

Orel : 93,5%

Tomsk: 91,3%

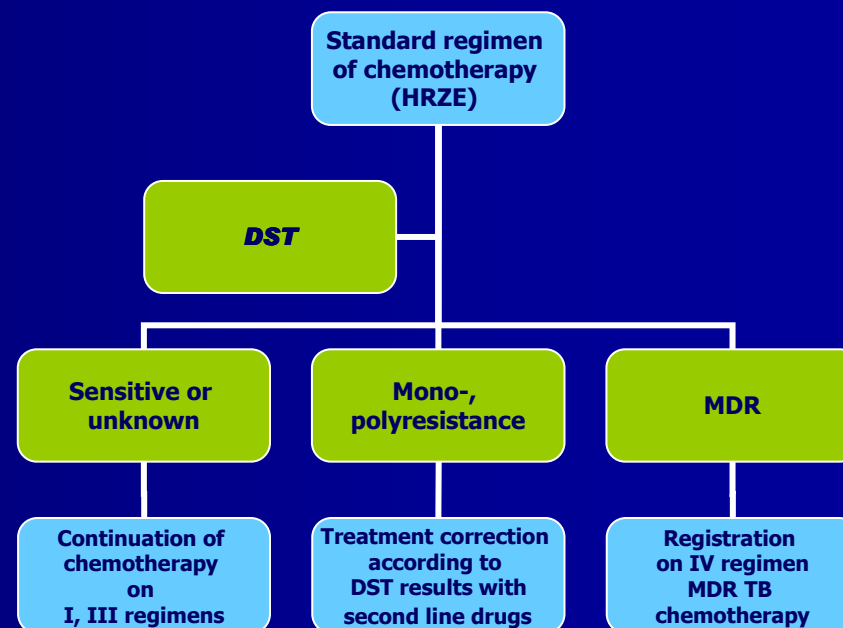
Among new TB cases: 93,6%

Among retreatment TB cases : 80,6%

Amplification of DR: **2,1%**

Mean time of amplification–  
20 months

*Algorithm of TB treatment  
on I, III standard regimens  
with correction of chemotherapy*





# **Efficacy of IIB treatment regimen**

**IIB** treatment regimen **HREZ+ [Fq][K][Eto]**:  
under high risk of MDR TB

- 2002 -2004 – 197 patients (Orel)
- 2008 – 273 patients (region B)

## **Evaluation:**

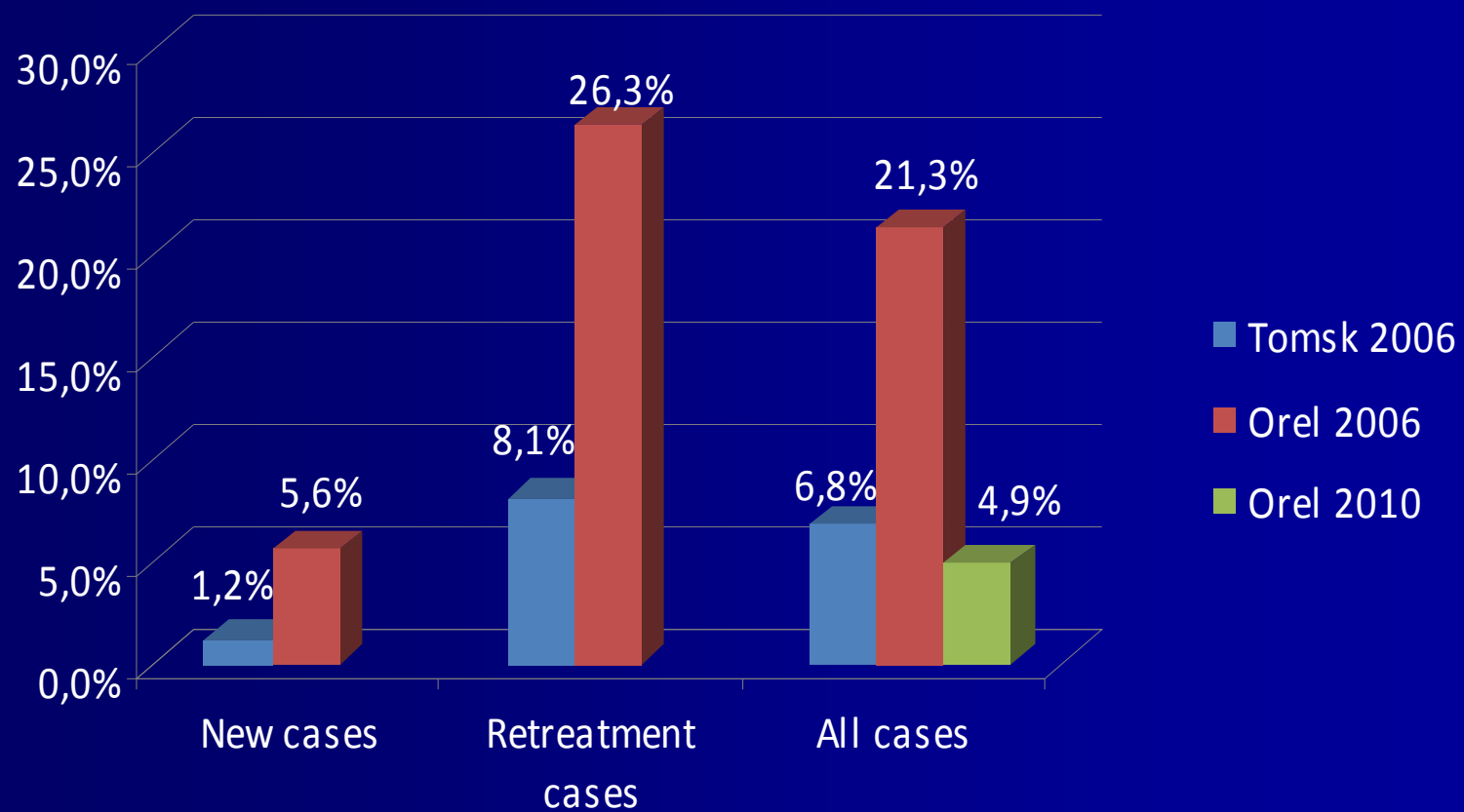
- long-term results (after 2-3 years)
- frequency of amplifications

## ***Long-term results of I and IIB treatment regimens***

Regimen	Patients	Cured total	Cured with mono- and polyresistance	Cured with MDR	Amplification
<b>I regimen Tomsk, Orel</b>	<b>1325</b>	<b>91,9%</b>	<b>87,6%</b>	<b>79,2%</b>	<b>2,1%</b>
<b>IIB regimen Orel, 2002-204</b>	<b>197</b>	<b>81,7%</b>	<b>88,1%</b>	<b>58,3%</b>	<b>15,4%**</b>
<b>IIB regimen Region A, 2007</b>	<b>237</b>	<b>63,7%</b>		<b>54,5%</b>	<b>16,7%</b>
P1-2		<0,001	>0,05	<0,05	<0,05

**\*\*Mean time of amplification – 9 months**

## ***Share of XDR TB among MDR TB cases***



## ***Risk factors of XDR TB development (CTRI RAMS, 2011)***

Analytical investigation «*case-control*»

*174 patients with MDR TB were divided into two groups:*

*1-st -96 MDR TB patients*

*2-nd – 78 XDR TB patients*

- Primary MDR (OR=3,07,  $p<0,05$ ),
- Widespread destructive process in the lungs (OR=2,1,  $p=0,01$ ),
- More than 2 chemotherapy courses in the medical history (OR=7,37,  $p<0,001$ ),
- Using of second line drugs in previous chemotherapy courses (OR=5,72,  $p<0,001$ ).

Best solution of a DR TB treatment problem is a therapy based on the results of rapid methods of DR MBT diagnostics

## Rapid diagnostics of DR MBT

### Molecular – genetic methods:

- TB-biochip ( **HR Fq** ) : 24 h
- Hain Lifescience ( **HRE Fq Am/Cap** ) : 5h
- Gene Xpert MTB/RIF ( **R** ) : 1,5 h

## ***Diagnostics and treatment of MDR/XDR TB patients (CTRI RAMS)***

Express-detection of DR MBT ( «TB Biochip» ) :

H → polyresistance ( HS, HE, HES)

HR → MDR TB

HR Fq → XDR TB



## Comparison of biochip and culture data

DR	Biochip technology	Absolute concentrations method	Concordance
Rifampicin resistance	62	59	95.2%
Isoniazid resistance	96	85	88.5%
FQ resistance	31	27	87.1%



Treatment tactics in 2 groups  
of MDR/ XDR TB patients  
based on rapid detection of MTB resistance using

*GenoType MTBDRplus / GenoType MTBDRsl*  
and *BACTEC MGIT 960*

**152 patients**

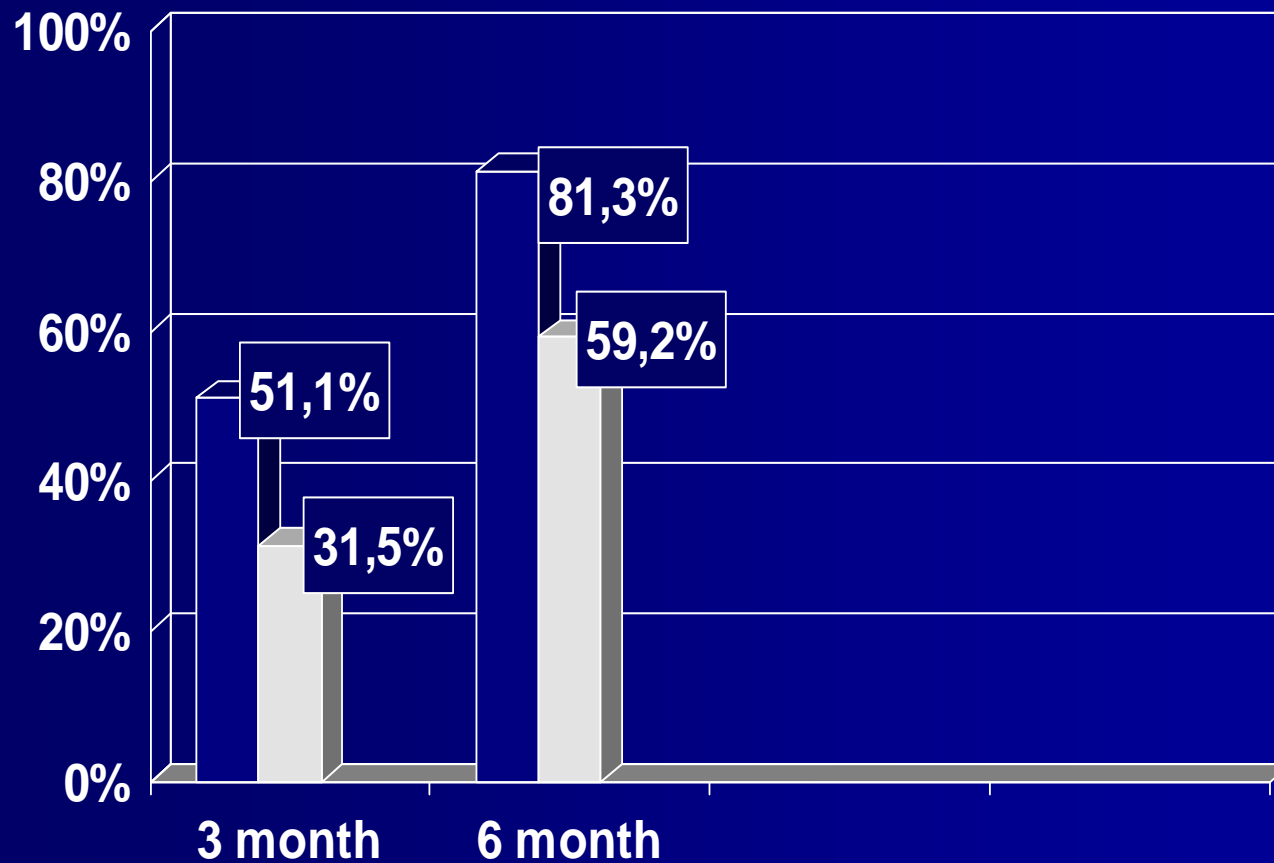
**MDR by  
*GenoType MTBDRplus/  
GenoType MTBDRsl***

**MDR by  
*BACTEC MGIT 960***

**in 3-5 weeks after  
treatment beginning**

**IV regimen  
MDR TB  
chemotherapy**

***Dynamics of smear conversion of MDR TB patients on  
IV regimen of chemotherapy based on the results of  
GenoType MTBDRplus/ GenoType MTBDRsl and  
BACTEC MGIT 960***



## ***Conclusions***

- Level of MDR TB in the Russian Federation is going up
- DR to first and second line drugs accompany MDR frequently
- Treatment of patients with high risk of MDR TB regulated by normative documents is insufficiently effective

## ***Conclusions***

- Using of rapid methods of MDR/XDR TB diagnostics allow to prescribe adequate chemotherapy on first days of treatment
- We hope that implementation of rapid methods of MDR TB diagnostics will increase efficacy of TB treatment in the Russian Federation

***Thank you for attention!***