CAN ZERO DEATHS BECOME A REALITY?

LESSONS FROM TOMSK, RUSSIAN FEDERATION

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CASCADES – IMPROVING TB CARE
PARIS, FRANCE
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BACKGROUND
Fig. 2.1. Notification rates for new TB cases and unemployment in the Russian Federation, 1985–2010, all sectors
(Sources: Form No. 8 and [29, 38], population data: Forms No. 1 and No. 4)

Source: Russian Ministry of Health and Social Development 2012
Fig. 10.7. Multidrug resistance in all groups of RTB MB+ patients with respiratory tuberculosis: the share in RTB patients and the number of MDR-TB cases registered per 100,000 population (the indicator of registered MDR-TB prevalence in the population), the Russian Federation (Source: Form No. 33)

Source: Russian Ministry of Health and Social Development 2012
MDR-TB is too expensive to treat in poor countries; it detracts attention and resources from treating drug-susceptible disease.

- World Health Organization
  Groups At Risk, 1996

"ADVISED BY THE WHO TO
FOCUS ON
DRUG-SENSITIVE
TB ONLY"
Tomsk Oblast Population: 1,073,600
Area = 317,000 km²
TB Incidence per 100,000 – Tomsk Prison Sector

Source: Tomsk Oblast Tuberculosis Services
### TB Incidence, Prevalence, and Mortality in Tomsk, Russian Federation

**Penal Sector, 1998**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Section TB case notification/100,000</td>
<td>3,565</td>
</tr>
<tr>
<td>Holding Section TB Prevalence/100,000</td>
<td>3,743</td>
</tr>
<tr>
<td>Prison TB case notification/100,000</td>
<td>4,042</td>
</tr>
<tr>
<td>Prison TB Prevalence/100,000</td>
<td>21,581</td>
</tr>
<tr>
<td>TB Mortality/100,000</td>
<td>353</td>
</tr>
<tr>
<td>Percentage of MDR-TB among new cases</td>
<td>28</td>
</tr>
<tr>
<td>Percentage of MDR-TB among re-treatment cases</td>
<td>54</td>
</tr>
</tbody>
</table>

Source: Tomsk Oblast Penitentiary Tuberculosis Services, Tomsk, Russian Federation, July 2005.
MDR-TB prevalence among all smear-positive new and re-treatment cases 2001, Tomsk Oblast (n=1303)

Source: Tomsk Oblast Tuberculosis Services
Resistance patterns of Tomsk Cohort (244)

First-line drugs

INH 100%  RIF 100%  EMB 77%  PZA 66%  SM 99%

Second-line drugs

KM 49%  CM 10%  CS 2%  FQ 6%  Ethio 54%

Source: Tomsk Oblast Tuberculosis Services, Tomsk, Russian Federation, 2005.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>32</td>
</tr>
<tr>
<td>Male</td>
<td>86%</td>
</tr>
<tr>
<td>Prison</td>
<td>45%</td>
</tr>
<tr>
<td>Civilian</td>
<td>55%</td>
</tr>
<tr>
<td>Employed</td>
<td>17%</td>
</tr>
<tr>
<td>Married</td>
<td>38%</td>
</tr>
<tr>
<td>Disability</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Homeless</strong></td>
<td><strong>3.3%</strong></td>
</tr>
<tr>
<td>Previous treatments:</td>
<td>2 (1-6)</td>
</tr>
<tr>
<td>Yrs with TB before MDR Rx</td>
<td>3.3 (0.1-28.3)</td>
</tr>
<tr>
<td>TB contact</td>
<td>67%</td>
</tr>
<tr>
<td>HCW</td>
<td>2.5%</td>
</tr>
<tr>
<td>Previous prison</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Low BMI</strong></td>
<td><strong>42%</strong></td>
</tr>
<tr>
<td>Co-morbidity</td>
<td></td>
</tr>
<tr>
<td>Abnormal LFTs</td>
<td>18%</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>50%</td>
</tr>
<tr>
<td>Alcohol hx</td>
<td>35%</td>
</tr>
<tr>
<td>Alcohol during Rx</td>
<td>32%</td>
</tr>
<tr>
<td>IVDU</td>
<td>18%</td>
</tr>
<tr>
<td>Tobacco use</td>
<td>88%</td>
</tr>
<tr>
<td>Cavitary and bilateral disease</td>
<td>66%</td>
</tr>
</tbody>
</table>

Source: Shin et al., IJTLT 2006
If the patient has the right to care (as is legally the case in the Russian Federation), what needs to be done in order to ensure that they receive care?

Find programmatic solutions for all barriers to care.
DIAGNOSIS & MEDICINES
TREATMENT
SOLUTIONS

- Improvement of facilities
- Transportation assistance for patients and health workers
- Choice of treatment site
- Food assistance for patients
- Aggressive management of adverse events
- Treatment at home for patients who are unable to ambulate or who live too far
- The use of enablers and incentives
- Social assistance for patients
Case detection and management of TB and MDR-TB in Tomsk Oblast

**General polyclinics:**
- Active and passive

**General hospitals:**
- Passive
- Among TB contacts

**TB dispensary, rural TB offices:**
- Active and passive

**Rural clinics, Hospitals:**
- Active and passive

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**Sites where patients can receive care and food and care**

- PRISON TB Hospital
- TB Hospital
- Day Care Hospital
- TB dispensary
- Rural TB offices, Rural feldsher or doctor clinics

**Ambulatory treatment:**
- Home visits
- Collaboration with Red Cross
- Collaboration with Red Cross

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Collaboration with Red Cross
OUTCOMES
MDR-TB Patient Treatment Outcomes
N=110

- Cured: 80.8%
- Default: 3%
- Failure: 3.50%
- Died: 12.70%

Source: Tomsk Oblast TB Services
TB mortality in the Tomsk Penitentiary System
(1999 – 2006; per 100,000 population)

Source: Tomsk Oblast TB Services
TREATMENT OUTCOMES OF FIRST COHORT (N=244)  
TOMSK, RUSSIA

- Cure: 77.0%
- Failure: 6.6%
- Death: 4.9%
- Default: 11.5%

Source: Shin et al., IJTLID 2006
### Treatment of extensively drug-resistant tuberculosis in Tomsk, Russia: a retrospective cohort study


<table>
<thead>
<tr>
<th></th>
<th>XDR TB (N=29)</th>
<th>Non-XDR TB (N=579)</th>
<th>Total number</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favourable outcome</td>
<td>14 (48%)</td>
<td>386 (67%)</td>
<td>400 (66%)</td>
<td>0.04*</td>
</tr>
<tr>
<td>Cured</td>
<td>13 (45%)</td>
<td>366 (63%)</td>
<td>379 (62%)</td>
<td></td>
</tr>
<tr>
<td>Treatment completed</td>
<td>1 (3%)</td>
<td>20 (3%)</td>
<td>21 (3%)</td>
<td></td>
</tr>
<tr>
<td>Poor outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>9 (31%)</td>
<td>49 (8%)</td>
<td>58 (9%)</td>
<td>0.0008†</td>
</tr>
<tr>
<td>Death</td>
<td>2 (7%)</td>
<td>29 (5%)</td>
<td>31 (5%)</td>
<td>0.65†</td>
</tr>
<tr>
<td>Default</td>
<td>4 (14%)</td>
<td>115 (20%)</td>
<td>119 (20%)</td>
<td>0.42†</td>
</tr>
</tbody>
</table>

Total number of patients=608. Data are numbers (%). MDR=multidrug resistant tuberculosis. XDR TB=extensively drug-resistant tuberculosis. Non-XDR TB=non-extensively drug-resistant tuberculosis. *This value refers to the comparison between favourable and poor outcome. †This value refers to the comparison between each outcome (ie, failure, death, or default) and all other outcomes.

**Table 2: Treatment outcomes of patients with MDR tuberculosis**

Source: Keshavjee et al., *Lancet*, 2008
KNOW YOUR EPIDEMIC
Treatment Outcomes, Civilian Sector
Tomsk Oblast, Russian Federation

Source: Tomsk Oblast TB Services, Analysis by Dr. D Taran, PIH Moscow
“Sputnik” program

- Some patients require assistance to finish treatment
- Need a system of accompaniment to help overcome barriers to treatment (this is different from simple DOT)
  - Social supports
  - Nutritional supports
  - Family support
- One *Sputnik* will look after five to seven patients
- Changes the onus of responsibility for adherence from the patient (“non-compliant”) to the program (programmatic failure)
53 non-adherent patients were enrolled on Sputnik program from December 17, 2006 to November 30, 2008. 2 patients refused to participate. 51 patients stayed on Sputnik program. 5 patients restarted new treatment course with 83% adherence [baseline adherence 0%]. 46 patients continued previous treatment. Adherence increased from 52% before enrolment on the program to 81% while on Sputnik, p<0.0001.
**Table 3**  Treatment outcomes for all patients referred to the Sputnik program ($n = 53$) divided by MDR-TB vs. all others

<table>
<thead>
<tr>
<th>Patients receiving treatment for</th>
<th>All other patients</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDR-TB ($n = 38$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
</tr>
<tr>
<td>Cured/treatment completed*</td>
<td>27 (71.1)</td>
<td>9 (60.0)</td>
</tr>
<tr>
<td>Failure</td>
<td>2 (5.3)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Died†</td>
<td>2 (5.3)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Transfer out</td>
<td>1 (2.6)</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Default‡</td>
<td>6 (15.8)</td>
<td>3 (20.0)</td>
</tr>
</tbody>
</table>

**Note:** No deaths were due to TB; most were due to violent crimes

“Default” includes the 2 patients who refused to participate in the program

Source: Gelmanova et al., IJTL 2011
Treatment Outcomes, Civilian Sector
Tomsk Oblast, Russian Federation
2001-2007

Source: Tomsk Oblast TB Services, Analysis by Dr. D Taran, PIH Moscow
Interrupting transmission: treatment of all patients

Ambulatory care and community based approaches provide a way to treat large numbers of patients rapidly, and safely
Dynamics of Tuberculosis notification rate in Tomsk Oblast, Siberia, and Russian Federation (per 100,000 population)

Source: Tomsk Oblast TB Services
Dynamics of Tuberculosis mortality in Tomsk Oblast, Siberia, and Russian Federation (per 100,000 population)

- Russia
- Siberia
- Tomsk Oblast

MDR-TB treatment began

Source: Tomsk Oblast TB Services
WE ASPIRE TO A WORLD WITH ZERO TB DEATHS

Thank you