

# **TB in the Workplace**

## **Risks in Prisons in Europe**

**Jaap Veen, MD, PhD**

**17<sup>th</sup> Tuberculosis Symposium  
Muenchenwiler  
March 20, 2008**

# Prison Population rate 2007

Prison populations grew 66% in Europe over last 18 months

**KING'S College LONDON**  
International Centre for Prison Studies  
**World Prison Population List (seventh edition)**  
Roy Walmsley



# Prisons:

extreme risk environment for infectious diseases

- limited access to health care
- poor nutrition
- overcrowding
- continued drug use
- unsafe injection practices
- unprotected sex
- tattooing

## Risk factors

- proximity
- high risk sexual behaviour
- injection drug use

Niveau, 2006



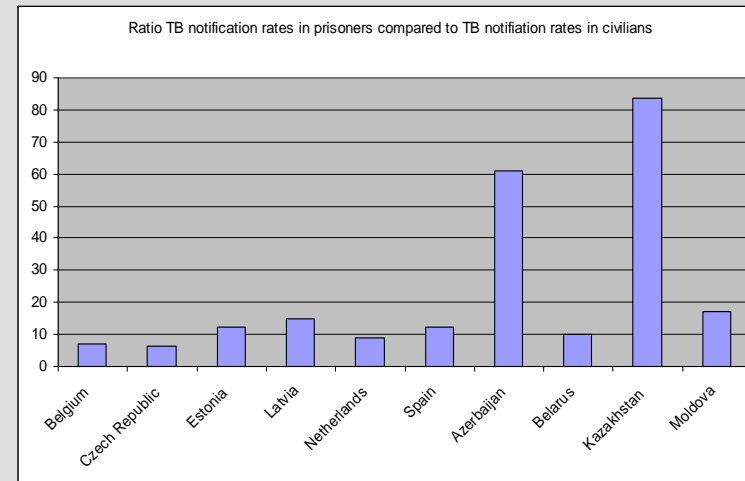
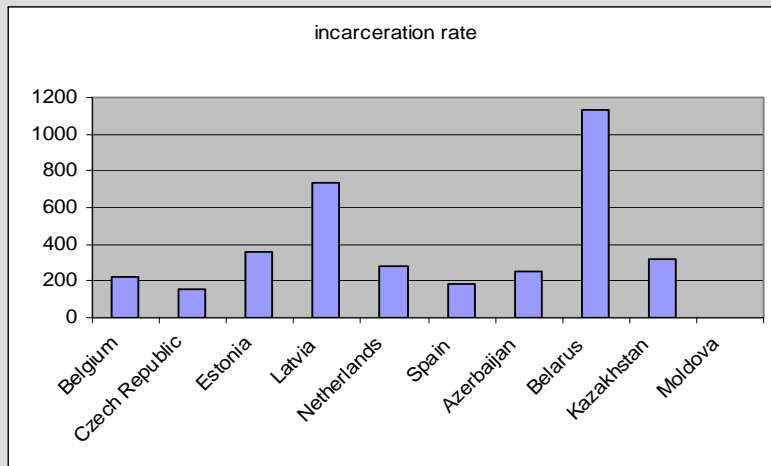
# Median rates of incarceration and TB in Europe in 2002

Aerts et al, 2006

Total prison population in Europe in 2002: 2.1 million  
Passing through every year: 10.5 million

Incarceration rate  
239/100,000 (17-1128)

TB Notification rate  
232/100,000 (0-17,808)



**Prisons are bad for TB and TB is bad for  
prisons**

**H.Reyes, 1997**

**TB is Public Health problem**

**Western Europe:**

- Foreign born
- Homeless people
- Drug addicts
- Prisoners

**Eastern Europe**

- General high burden
- Growing HIV epidemic
- Prisoners



# What drives the epidemic?

## USA

- Number of admissions
- Age > 30 years
- Length of stay (Bellin, 1993)

## Hongkong

- > 2 year incarceration
- Not having CXR < 2 years (Leung, 2005)

## Italy

- Age
- Foreign born
- Education
- Length of detention – risk ↑ 11% per year (Carbonara, 2005)



# Complications

## **Multi Drug Resistant TB:**

- On average 1 out of 2-3 patients in Eastern Europe can not be treated by the usual drugs

## **TB/HIV**

- A rapidly approaching epidemic that will kill the majority of TB/HIV infected prisoners



# Multi Drug Resistant TB:

Samara, Russia

	New	Previously treated
civilian	19.8%	45.5%
prison	37.3%	55.3%

Drobniewski,  
2005

TB in the Workplace: Risks in Prisons in Europe



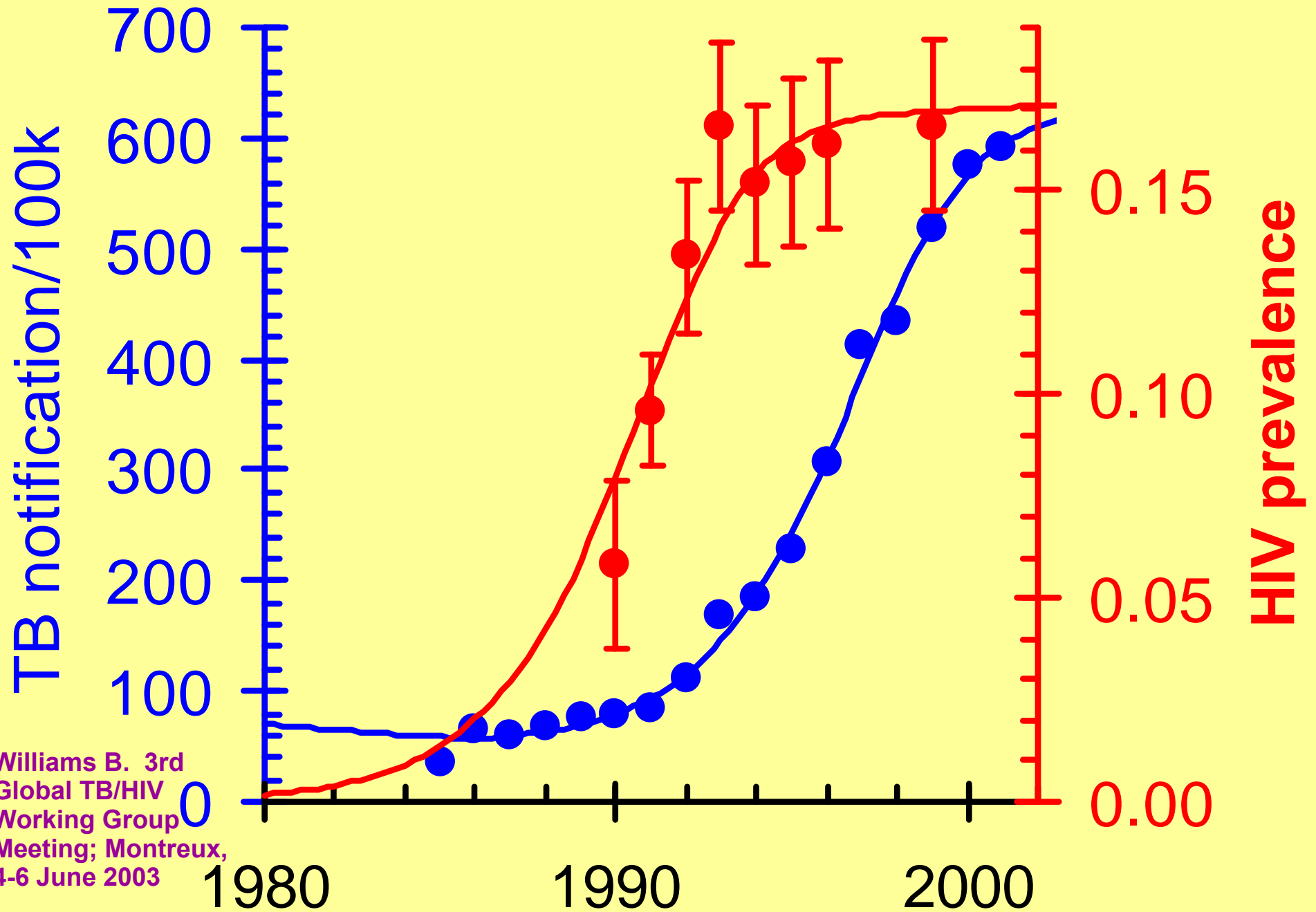
## Multi Drug Resistant TB:

	<b>New SS +</b>	<b>Retreatment SS +</b>	<b>Chronic TB</b>
<b>Any resistance</b>	<b>73,6%</b>	<b>94,6%</b>	<b>100,0%</b>
<b>MDR</b>	<b>19/72 26,4%</b>	<b>78/108 72,2%</b>	<b>45/53 84,9%</b>
<b>Poly resistance (incl. MDR)</b>	<b>66,7%</b>	<b>92,6%</b>	<b>98,2%</b>
<ul style="list-style-type: none"> <li>• <i>to 2 drugs</i></li> <li>• <i>to 3 drugs</i></li> <li>• <i>to 4 drugs</i></li> </ul>	<p><b>20,8%</b></p> <p><b>22,2%</b></p> <p><b>23,6%</b></p>	<p><b>11,1%</b></p> <p><b>19,4%</b></p> <p><b>62,0%</b></p>	<p><b>3,8%</b></p> <p><b>20,8%</b></p> <p><b>73,6%</b></p>

**Drug resistance survey in Pavlodar, Kazakhstan, KNCV 2003**



# TB / HIV

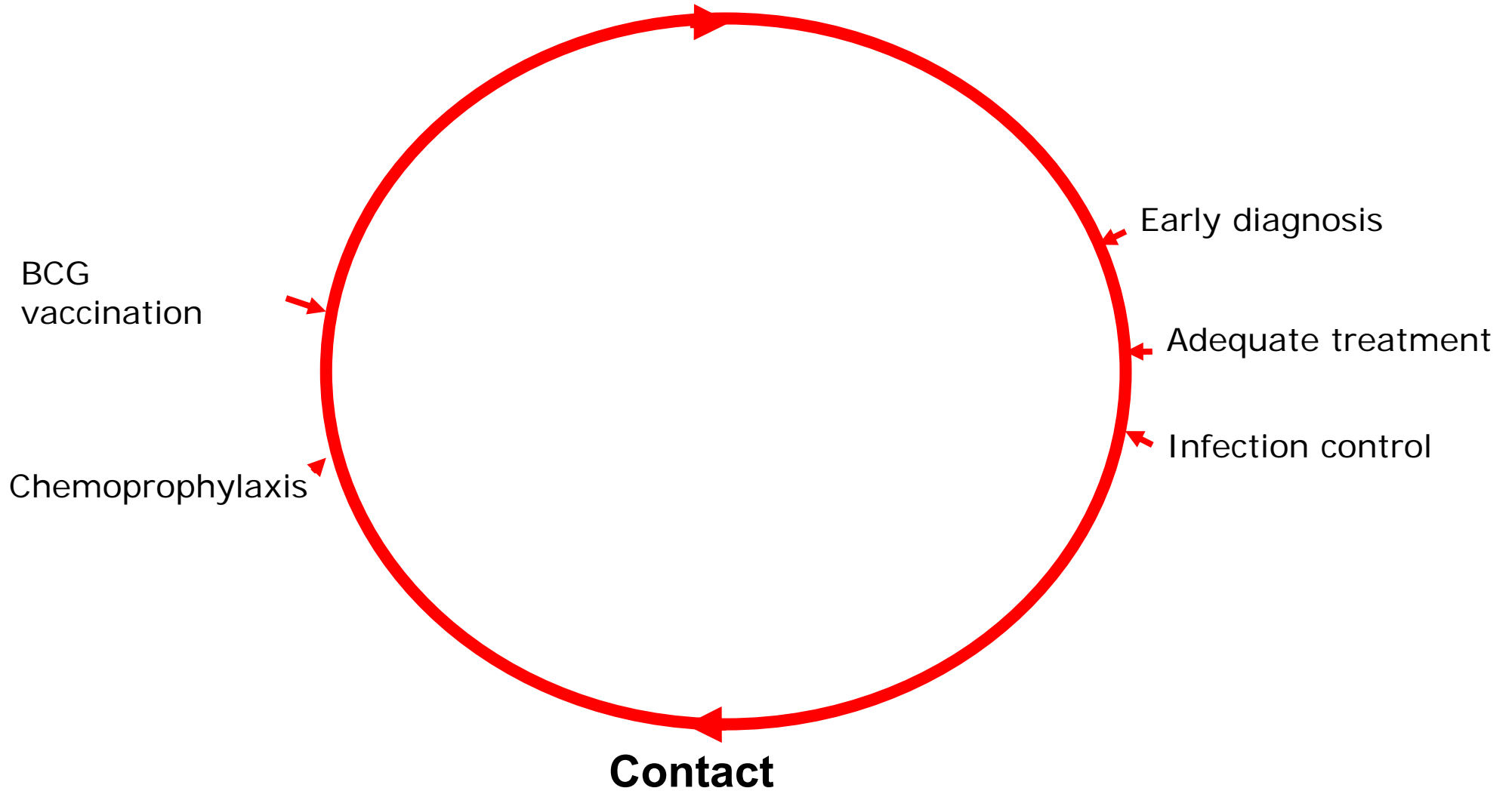


Williams B. 3rd  
Global TB/HIV  
Working Group  
Meeting; Montreux,  
4-6 June 2003

# Tuberculosis Control

Cycle of transmission

**Source of Infection**



# How to prevent nosocomial infection

## Early diagnosis of TB in prisoners

- Screening at entry
- Screening at periodic intervals

## Methods:

- Tuberculin Skin Tests / (IGRA)
- Chest X-ray
- Questionnaires
- Self-referrals



**Table 2** TB screening strategies in prisons of the WHO European Region, 2002

	On entry <i>n</i> (%)	During imprisonment <i>n</i> (%)
TST and CXR on tuberculin positives	4 (18.2)	3 (13.6)
CXR alone	2 (9.1)	2 (9.1)
CXR and bacteriology for suspects	11 (50.0)	7 (31.8)
Symptom screening and CXR for suspects	2 (9.1)	1 (4.5)
Symptom screening and bacteriology for suspects	1 (4.5)	1 (4.5)
Screening not done	1 (4.5)	7 (31.8)
Information not available	1 (4.5)	1 (4.5)
Total	22 (100.0)	22 (100.0)

TB = tuberculosis; WHO = World Health Organization; TST = tuberculin skin test; CXR = chest X-ray.

Aerts et al, 2006



# How to prevent nosocomial infection

Early and adequate treatment

Drug intake under observation (DOT)



# How to prevent nosocomial infection

## Infection control

- engineering
- administrative guidelines
- personal protection

# TB as Occupational Health Risk

## New York State prison 1997:

- 30% of new infections in staff due to occupational exposure (Steenland K, 1997)

## Botswana

- minimum point prevalence among prison guards 2662/100,000 (CDC, 2003)

# TB as Occupational Health Risk

## Samara (Russian Federation)

- Incidence general population  
69.3/100,000
- Incidence medical facility staff  
741.6/100,000
- Proportions:
  - PHC staff 29%
  - Hospital staff 39%
  - TB facility staff 47% (Drobniewski, 2008)



# Security vs occupational health

## Guidelines for

- Prison administration

- Security

- Transfers between institutions
    - Punishment

- Medical administration

- Occupational Health

- Segregation of patients
    - Screening/protection of staff



# Occupational Health in European prisons

## TB/LTBI screening of staff in 2002

- annually 50%
- occasionally 23%
- Never 14%

## Availability of

- Health Education 60%
- Guidelines 69%

Aerts et al, 2006



# DUBLIN DECLARATION ON HIV/AIDS IN PRISONS IN EUROPE AND CENTRAL ASIA

**Good Prison Health is Good Public Health**

Dublin, Ireland. 2004

## **Principle 4:**

**Protecting the health of prisoners, and reducing the transmission of disease in prisons, also protects the health of prison staff**

Prison staff benefits from enhancing the health status of prisoners, and reducing the incidence of disease in penal institutions. Therefore, improving health care and prevention programmes for prisoners is an integral part of enhancing workplace health and safety for prison staff.



# TB as Occupational Health Risk

## Simple interventions:

- early diagnosis
- segregation of infectious cases
- education/ training staff
- low cost engineering controls:
  - exhaust ventilation
  - improved natural ventilation
  - sunlight
- administrative controls



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