

TB, HIV and Drug Resistant TB

Defining the Dimensions of the Problem

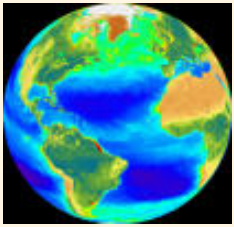


Gerald Friedland MD

Yale School of Medicine

Nelson R Mandela School of Medicine

TF CARES



3 Global Epidemics

TB, HIV and Drug Resistant TB

1. 2 billion people are infected with *M. TB*

8 - 9 million new active TB cases a year

~2 million people die a year

2. 35-40 million persons infected with HIV

5 million new infections per year

3 million deaths per year

3. Now joined by an epidemic of drug resistant TB “perfect storm”

Definitions

- **MDR-TB: multiple drug resistant TB**
resistance to at least **isoniazid and rifampin**
two most potent of four first line TB drugs
reduced treatment options
- **XDR-TB: extensively drug resistant TB**
MDR+ resistance to **fluoroquinolones and injectables**
(amino glycosides and capreomycin)
two most potent of six second line TB drugs
minimal treatment options

Definitions (2)

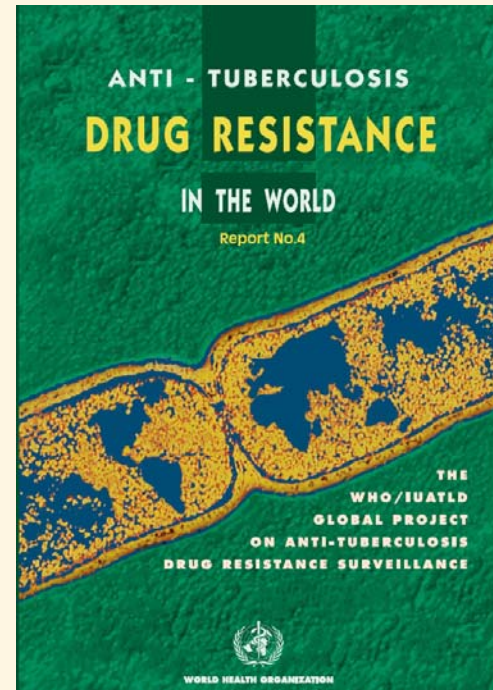
- **Acquired resistance**
 - Resistance as a result of **treatment failure**
 - The predominant mechanism in past and many areas
 - A consequence of program and/or patient limitations
- **Primary resistance**
 - Resistance as a result of **transmission of resistant organisms**
 - The predominant mechanism in areas of high HIV prevalence and/or congregate settings, ie prisons
 - A consequence of increased susceptibility, rapid progression to disease and absence of infection control

Global surveillance indicates substantial and rising numbers of M and XDR TB

- **WHO February 2008**

Newly diagnosed

- **MDR TB 489,000**
- **XDR TB 40,000**



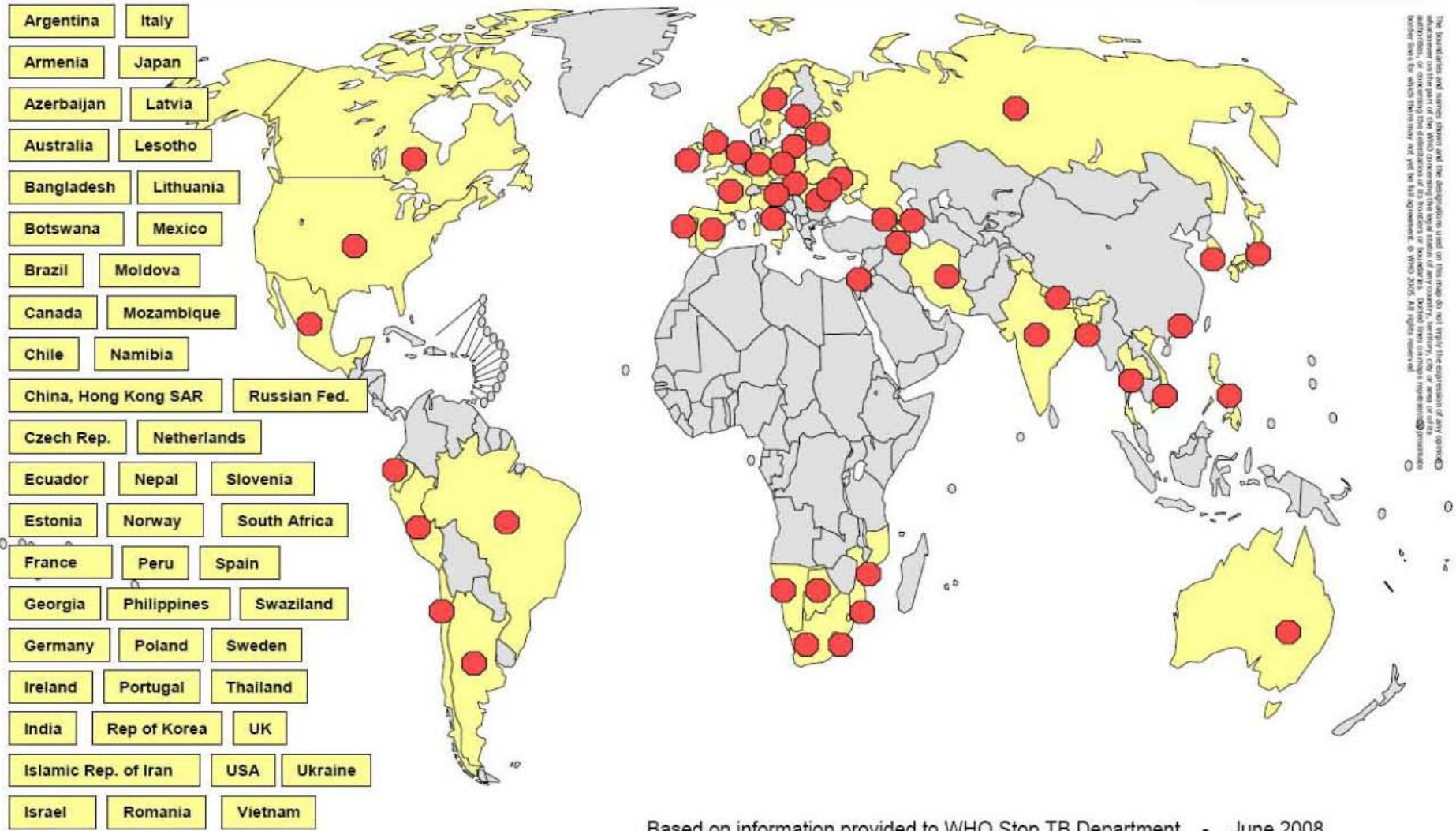
Global Picture

- Estimated that 2/3 of global burden of MDR TB in three countries-India, China and Russian Federation
 - In some countries 25% of new TB cases and 40% of retreatment cases are MDR TB and numbers and rates of XDR TB cases are increasing
- Major unfolding epidemics of M and XDR TB in Africa
- Existing information supports both acquired resistance and primary transmission as sources of M and XDR TB

Countries with confirmed cases of XDR-TB as of November 2008



THE STOP TB DEPARTMENT

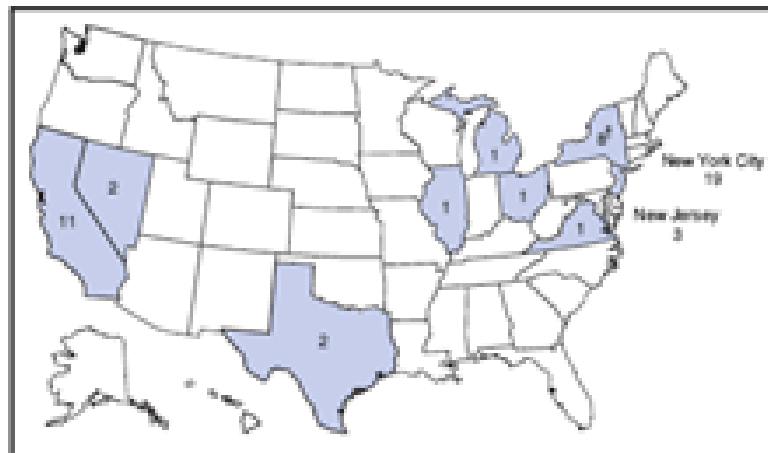


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Based on information provided to WHO Stop TB Department - June 2008

M/XDR TB in US

FIGURE. Number of reported cases of extensively drug-resistant tuberculosis (XDR TB)* — United States, 1993–2006



* XDR TB defined as resistance to at least isoniazid, rifampin, any fluoroquinolone, and at least one second-line injectable drug (kanamycin, amikacin, or capreomycin).

† Excludes New York City.

Airline **S**ingle **P**atient **E**vent
ASPE



Worst Case Scenario

MDR/XDR TB and HIV in Tugela Ferry, SA

Gandhi et al 2006



- MDR/XDR TB – major cause of death
- 53 cases XDR TB
 - 98% rapid mortality
 - All tested HIV+
- Strong evidence for primary resistance nosocomial transmission

Recognition that MDR/XDR TB Widespread in South Africa and Beyond

- XDR TB from ~60 facilities in KZN Province
- 1200 cases of XDR TB anticipated by 2012 in Tugela Ferry if no interventions
- Both hospital and community spread likely
- XDR TB cases found in all 9 South African provinces
- From 2005-07- 17,615 MDR TB cases
996 XDR TB cases
- Mortality: MDR 65% XDR 85%
- Neighboring countries affected:
 - Botswana, Mozambique, Lesotho, Namibia, Zimbabwe, Swaziland

Recognition that MDR/XDR TB Widespread in South Africa and Beyond

- Global epidemic with “hot spots” but full extent unknown-severe infrastructure and diagnostic limitations
- Circumstances favoring occurrence present in hundreds-thousands of communities
- Likely many more Tugela Ferrys
- Potential for enormous morbidity and mortality and reversing gains in TB programs and historic roll out of antiretroviral therapy

What can be done in the short term to reduce the impact of M/XDR-TB?

- Rapid and massive infusion of resources for TB
 - address TB epidemic, strengthen TB programs, integrate TB/HIV
- New Diagnostics
- New drugs for treatment of MDR/XDR TB desperately needed
 - but will remain limited in short term
- Fast-track ARV roll out-universal access

What can be done in the short term to reduce the impact of M/XDR-TB? (2)

- Reduce TB transmission-halt spread of resistant TB in hospital and community settings
 - Earlier diagnosis
 - New diagnostic tests, intensive case finding
 - Airborne infection control strategies
 - Appropriate to environment, feasible and effective
 - Decrease reliance on hospital care
 - Decentralize and provide community based care and treatment