Tuberculosis in South Africa- from a treatable disease to total drug resistance

Prof Nico C Gey van Pittius, PhD
South Africa - 2007

Population = 48.5 million

Estimated incidence of TB =

461 000 new cases of TB per year

(948 new cases per 100 000 pop/year)

% of all TB cases that are HIV+ = 73%

Number of people that die of TB every year in South Africa = around 112 000

MDR-TB among all new TB cases = 1.8%

Estimated incidence of ss+ MDR cases = 10 708

South Africa reports the highest number of confirmed MDR-TB and XDR-TB cases in the region.
Only one of these countries are not in Africa
Estimated HIV prevalence in TB cases, 2007

TB is leading cause of death among HIV+ people – 90% of them will die within months if not treated

WHO report 2009
Global geographical distribution of HIV-positive TB cases, 2005.

TB case load 2006 in low and high HIV communities

- **low HIV - Tygerberg** – < 10% TB-HIV co-infection – 658 / 100 000
- **high HIV - Khayelitsha** – 67% TB-HIV co-infection – 1 568 / 100 000
- **Europe** – <50 / 100 000, **USA** – <39 / 100 000
Geographical distribution of estimated number of HIV-positive TB cases, 2007. For each country (red circles) and WHO region (grey circles), the number of incident TB cases arising in people with HIV is shown as a percentage of the global total of such cases.
MDR-TB in South Africa -
Chewing away at our ability to combat the disease

South African National Tuberculosis Program Budget for 2008 - WHO report
XDR-TB in South Africa

First documented XDR-TB case in South Africa 1997

Study:
699 MDR-TB cases
June 2005 to December 2006

MDR-TB
556 cases (80%)

“pre-XDR-TB”
102 cases (14%)

XDR-TB
41 cases (6%)

Pre XDR-TB = MDR-TB + Oflox
MDR-TB + Kanamycin
MDR-TB + Amikacin
MDR-TB + Capreomycin

Mlambo CK, Warren RM, Poswa X, Victor TC, Duse AG, Marais E.
Genotypic diversity of extensively drug-resistant tuberculosis (XDR-TB) in South Africa.
The new threat - “TDR-TB”

The rise of ‘Totally Drug Resistant TB’

No official definition - “totally untreatable XDR-TB” or “super XDR-TB” (resistant to all 2\textsuperscript{nd} line drugs?)

- 1972: RIF included in treatment
- 1985: First MDR-TB case
- 1997: First XDR-TB case
- 2009: First ‘TDR-TB’ case
Cape Town - South Africa

DST/NRF Centre of Excellence for Biomedical Tuberculosis Research

Division of Molecular Biology and Human Genetics

MRC Centre for Molecular and Cellular Biology

Prof Paul van Helden
Immunology of TB

Grand Challenges in Global Health

WP1
Profiling of pathogen response
- identification of antigen specific T cell responses

WP2
Profiling of host response to infection
Identification of relevant host markers

WP3 - Natural history studies of TB
WP4 - Impact of HIV and response to treatment
WP5 - Protective immunity following vaccination with BCG

Management coordination

African field studies
correlates of protection and disease

Biomarkers of protection and disease

Two year Follow-up

- 400 TB patients
- 3100 LTBI
- 6321 LTBI Adolescents
- 720 HIV+ LTBI
- 5675 neonates following BCG vaccination

Max-Planck-Institut für Infektsionsbiologie

Immunology of TB
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