

# TB TEACHING POINTS

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# TB TEACHING POINTS

- “I went to South Africa and spent 5 months in a shanty community---22 bed TB & HIV hospital.”



**Community Health Workers, Cape Town, SA**

## Co-infection: HIV and Tuberculosis

- One-third of 33.2 million HIV positive TB patients globally will develop active tuberculosis at a rate of 10% per year.
- In sub-Saharan Africa 50% of TB cases are also HIV positive.
- HIV and TB enhance each other.
- Public Health infrastructure, education, and economic development are lacking in endemic areas.

**Estimated TB incidence, prevalence and mortality, 2009**

Uncertainty bounds for the table below are available in the *Global tuberculosis control 2010* (Table 1, page 5).

WHO region	Incidence <sup>1</sup>			Prevalence <sup>2</sup>		Mortality (excl. HIV)	
	No. in thousands	% of global total	Rate per 100 000 pop <sup>3</sup>	No. in thousands	Rate per 100 000 pop <sup>3</sup>	No. in thousands	Rate per 100 000 pop <sup>3</sup>
Africa	2 800	30%	340	3 900	450	430	50
The Americas	270	2.9%	29	350	37	20	2.1
Eastern Mediterranean	660	7.1%	110	1 000	180	99	18
Europe	420	4.5%	47	560	63	62	7
South-East Asia	3 300	35%	180	4 900	280	480	27
Western Pacific	1 900	21%	110	2 900	160	240	13
<b>Global total</b>	<b>9 400</b>	<b>100%</b>	<b>140</b>	<b>14 000</b>	<b>164</b>	<b>1 300</b>	<b>19</b>

<sup>1</sup> Incidence is the number of new cases arising during a defined period.

<sup>2</sup> Prevalence is the number of cases (new and previously occurring) that exists at a given point in time.

<sup>3</sup> Pop indicates population.

**Table 35-5. Geographic Distribution\* of Persons Infected with Both *Mycobacterium tuberculosis* and Human Immunodeficiency Virus, Ages 15-49, 1992†**

Region	HIV-infected (thousands)	TB-infected (%)	Dual Infections	
			N (thousands)	% of Total
Africa	6,500	48	3,120	77.8
The Americas‡	1,000	30	300	7.5
Eastern Mediterranean	50	23	11	0.3
Southeast Asia and Western Pacific§	1,020	40	408	10.2
Europe and Others	1,550	11	170	4.2
Total	10,120	34	4,009	100

\*World Health Organization regions.

†Reproduced with permission from Raviglione, M. C., Narain, J. P., Kochi, A.: HIV-associated tuberculosis in developing countries: Clinical features, diagnosis and treatment. Bull. WHO 70:515-526, 1992.

‡Excludes United States and Canada.

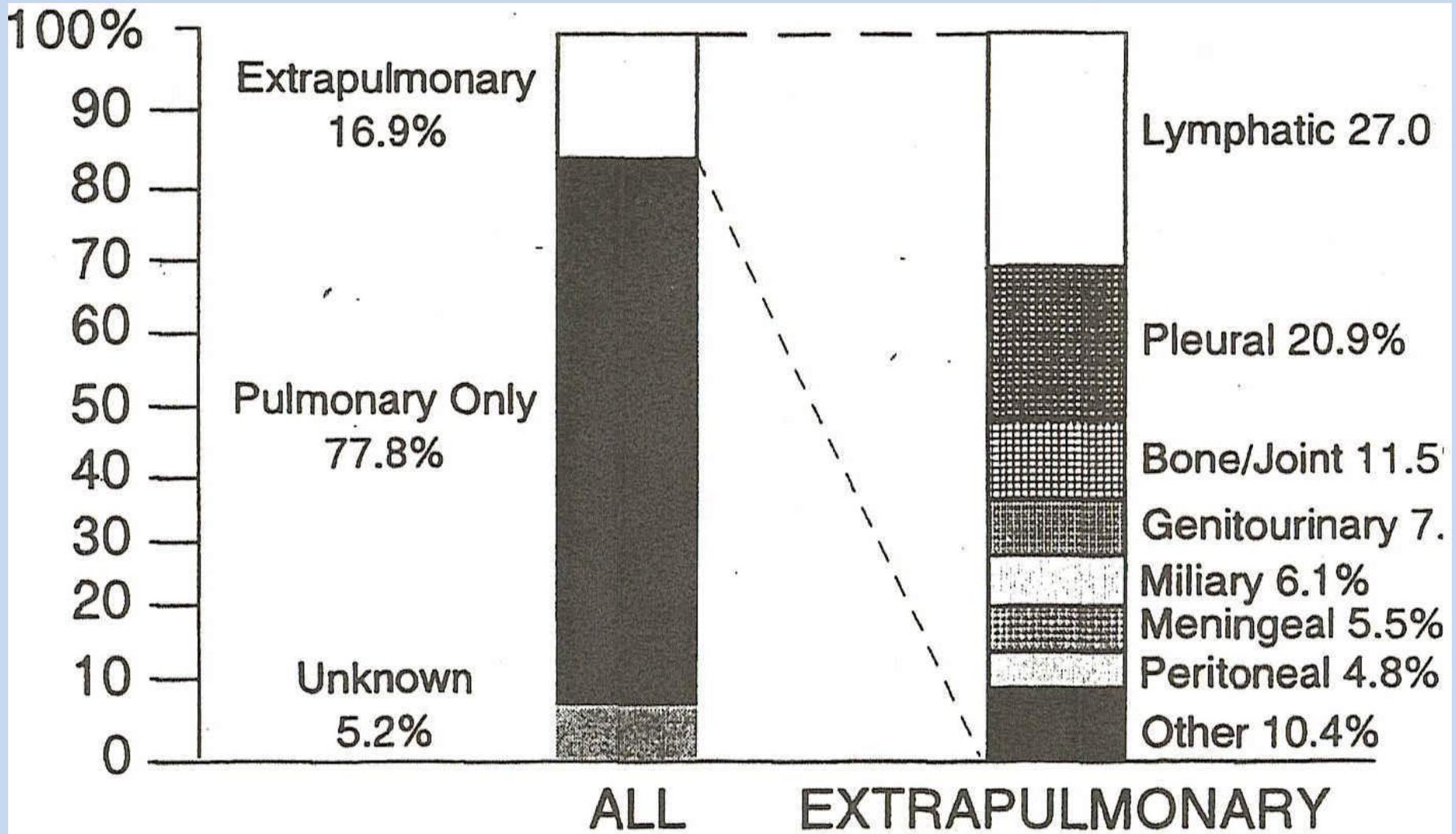
§Excludes Japan, Australia, and New Zealand.

# TB Teaching Points (cont.)

- “Shortly after I returned to America on December 2007, I started having G.I. symptoms. Ulcerative colitis/Crohn’s Disease was diagnosed.”

# TB Teaching Points (cont.)

- 30,000 inflammatory colon disease/yr in USA
- <500 cases estimated of bowel TB



# TB Teaching Points (cont.)

- “They began treating me with prednisone.”

? In this specific case, was it appropriate?

# Medical Conditions Which Increase the Risk of Developing Clinical TB once TB Infection has Occurred:

- HIV infection 10-170
- Silicosis 2-30
- Abnormal chest radiograph showing fibrotic lesions
- Diabetes mellitus 3
- Prolonged corticosteroid therapy 3
- Immunosuppressive therapy
- Hematologic and reticuloendothelial diseases 10
- End-stage renal disease 2-16
- Intestinal bypass 30
- Post-gastrectomy 6
- Chronic malabsorption syndromes
- Carcinomas of the oropharynx and upper gastrointestinal tract
- Being 10 % or more below ideal body weight 2
- TNF antagonist 20-30
- Alcoholic intake 3-10

# TB Teaching Points (cont.)

- “I was considered for a colectomy, but first treatment with Remicade and prednisone was recommended.”

\*Surgery for ulcerative colitis – My Experience\*

# TB Teaching Points (cont.)

## TNF Antagonists\*

- Remicade
- Embrel
- Humera
- Simponi
- Others

\*Used for:

Rheumatoid Arthritis, Rheumatoid Spondylitis,  
Inflammatory Bowel Disease, and Psoriasis

# TB Teaching Points (cont.)

- “Prior to treating me with Remicade, a TB skin test and a chest x-ray were done.”

# Medical Conditions Which Increase the Risk of Developing Clinical TB once TB Infection has Occurred:

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# TB Teaching Points (cont.)

- “Then the doctors decided treat me with INH and B6 for Latent TB Infection.”

? Knowing course of this case, was this appropriate?

?What are 2 reasons this was not appropriate in this specific case?

# TB Teaching Points (cont.)

- “I had chest congestion and treatment with a fluroquinolone for pneumonia was started. I became much improved.”

? Knowing course of this case, was this drug appropriate?

# Antituberculosis Drugs Currently in Use in the United States

First-line Drugs	Second-line Drugs
Isoniazid	Cycloserine
Rifampin	Ethionomide
Rifapentine	Levofloxacin*
Rifabutin*	Moxifloxacin*
Ethambutol	Gatifloxacin*
Pyrazinamide	p-Aminosalicylic acid
	Streptomycin
	Amikacin/kanamycin*
	Capreomycin

\*Not approved by the United States Food and Drug Administration for use in the treatment of tuberculosis.

# TB Teaching Points (cont.)

- “A lung biopsy confirmed TB!”

\*A CXR is positive in 40-70% of Extrapulmonary TB cases.\*

# TB Teaching Points (cont.)

- “One month later MDR-TB was diagnosed.”

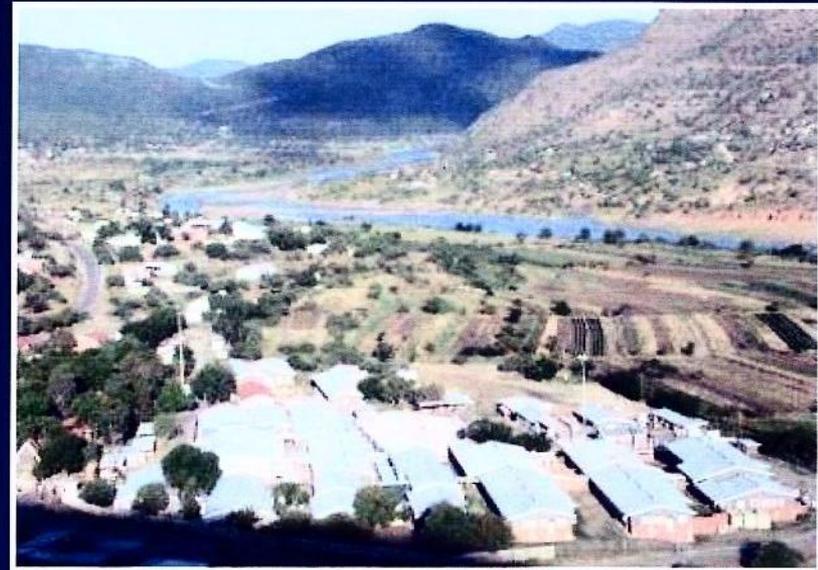
# XDR-TB in Southern Africa

## August 2006



### Church of Scotland Hospital, Tugela Ferry, KwaZulu-Natal Province, South Africa

- 53 of 544 patients defined as XDR-TB cases
- 52 of the 53 patients died on average within 25 days, including those on antiretroviral therapy
- Further investigations being carried out
- XDR-TB likely in bordering African countries

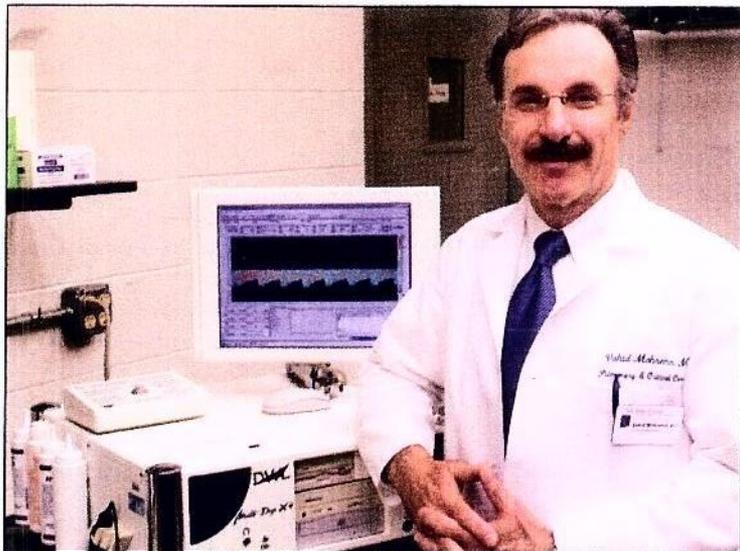


Given the underlying HIV epidemic in Africa,  
drug-resistant TB could have a major impact on mortality  
and requires urgent action on care and prevention



# CHEST *Physician*

THE OFFICIAL NEWS PUBLICATION OF THE AMERICAN COLLEGE OF CHEST PHYSICIANS



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Although more research is needed, the expectation is that sleep apnea treatment will reduce stroke risk, said Dr. Vahid Mohsenin.

## Links Tighten Between Sleep Apnea and Stroke

BY SHARON WORCESTER  
*Elsevier Global Medical News*

SALT LAKE CITY — Studies

expectation is that treatment will reduce the risk of stroke, although more research is needed to confirm this, said Dr. Moh-

## Resistant TB Strain Is Proving Deadly To HIV Patients

*52 of 53 patients killed in outbreak.*

BY FRAN LOWRY  
*Elsevier Global Medical News*

TORONTO — A lethal strain of extensively drug-resistant tuberculosis (XDR-TB), which has been found to be widespread in South Africa and also is present in the United States, kills patients who are coinfecting with HIV almost immediately after they are found to be infected with the disease, according to a late-breaking study presented at the 16th International AIDS Conference.

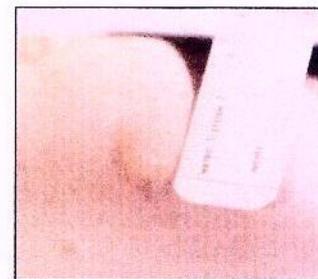
The virulent strain of tuberculosis has been a virtual death sentence, killing 52 of 53 pa-

“These patients did not even appear to be terribly sick. They were not thought to be dying when they were hospitalized,” he said.

There is an epidemic of TB and HIV coinfection in South Africa, Dr. Gandhi said. Although antiretroviral therapy has significantly reduced mortality from HIV in this part of the world, drug-resistant strains of tuberculosis are negating this benefit, with 67% of deaths now attributed to multidrug-resistant (MDR) strains of TB, he said.

Dr. Gandhi and colleagues made their grim discovery after

INSIDE



### Pulmonary Medicine Testing for Alternatives

*Better diagnostic tests for TB will augment or replace the standard skin test. • 4*

### Pediatric Chest Medicine Lasting Impact

*The consequences of chronic lung disease of prematurity are enduring, according to a long-term follow-up. • 7*

### Pulmonary Perspectives Tale Pleurodesis

## RATES OF MDR-TB AMONG NEW CASES OF TB IN SELECTED COUNTRIES/REGIONS

Country/Region	Year	% of MDR among NEW CASES	% of any resistance (1 or more drugs) among NEW CASES
Kazakhstan	2001	14.2	57.1
Israel	2000	14.2	31.2
Russian Fed. – Tomsk Oblast	2002	13.7	37.3
Uzbekistan – Karakalpakstan	2001	13.2	48.1
China – Liaoning	1999	10.4	42.1
Lithuania	2002	9.4	29.2
Latvia	2000	9.3	31.7
China – Henan	2001	7.8	29.9
Ecuador	2002	6.6	23.4
Turkmenistan – Dashoguz	2001	3.8	30.5
India – North Arcot	1999	2.8	27.7
Mexico (Baja CA, Oaxaca, Sinaloa)	1997	2.4	14.1
United States	2001	1.1	12.7

## RATES OF MDR-TB AMONG PREVIOUSLY TREATED CASES OF TB IN SELECTED COUNTRIES/REGIONS

Country/Region	Year	% of MDR among PREVIOUSLY TREATED CASES	% of any resistance (1 or more drugs) among PREVIOUSLY TREATED CASES
Kazakhstan	2001	56.4	82.1
Lithuania	2002	53.3	67.9
Estonia	2000	45.3	58.1
Russian Fed. – Tomsk Oblast	2002	43.6	60.7
Russian Fed. – Orel Oblast	2002	42.4	73.3
Uzbekistan – Karakalpakstan	2001	40.2	79.4
Egypt	2002	38.2	68.2
China – Henan	2001	36.6	60.8
Latvia	2000	27.1	38.1
Ecuador	2002	24.8	47.4
Mexico ( <i>Baja CA, Oaxaca, Sinaloa</i> )	1997	22.4	41.1
United States	2001	5.2	18.8

Source: WHO

For statistics from all geographic regions surveyed by WHO, see [http://www.who.int/gtb/publications/drugresistance/2004/drs\\_report\\_1.pdf](http://www.who.int/gtb/publications/drugresistance/2004/drs_report_1.pdf)

- 1957: JOHN CROFTON ESTABLISHED THAT IF TUBERCULOSIS IS TREATED WITH THREE DRUGS UNDER SUPERVISION FOR EIGHTEEN (18) MONTHS TB IS CURED WITHOUT RELAPSE OR THE DEVELOPMENT OF RESISTANCE. "TB WAS 100% CURABLE".

# TB Teaching Points (cont.)

- “I was started on multiple toxic drugs which had potential CNS toxicity.”

# Antituberculosis Drugs Currently in Use in the United States

First-line Drugs	Second-line Drugs
Isoniazid	Cycloserine
Rifampin	Ethionomide
Rifapentine	Levofloxacin*
Rifabutin*	Moxifloxacin*
Ethambutol	Gatifloxacin*
Pyrazinamide	p-Aminosalicylic acid
	Streptomycin
	Amikacin/kanamycin*
	Capreomycin

\*Not approved by the United States Food and Drug Administration for use in the treatment of tuberculosis.

# TB Teaching Points (cont.)

- “I wouldn’t be here without the comprehensive care that I received. I wish that the people in Africa could receive care like I received.”

# Components for Controlling and Preventing MDR-TB

- Prioritization of TB by policy makers; political will
- Resources for TB control activities
- Effective, well-organized TB control programs
- Accurate reporting systems
- Adequate and accessible laboratory services for TB diagnosis and susceptibility testing
- Supervision of therapy---directly observed therapy (DOT) in context of patient-centered management
- Adherence to published protocols and standards
- Adequate supply of anti-tuberculosis first-and second-line drugs
- Access to specialized centers with expertise in use of second-line drugs and alternate therapies

# TB Teaching Points (cont.)

## APPROXIMATE COST OF XDR-TB

- Meds - \$100,000
- Domiciliary (Hosp. & Home) - \$200,000
- Labs, DOT, Nurse - \$100,000
  
- TOTAL \$400,000