Costs of inpatient treatment for multi-drug resistant tuberculosis in South Africa

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TB in South Africa

- High incidence of TB: 1% or 430,000 cases / year
- High rates TB/HIV co-infection
  - TB leading cause of death for PLWHA
  - 60% of TB patients are co-infected with HIV
- 'High-burden MDR-TB' country
  - 9,070 cases diagnosed in 2009

WHO Global TB Control, 2011

Costs of TB and MDR-TB treatment

Drug-sensitive TB

- Outpatient care by nurses
- 6-month regimen
- Total cost $437/case
- <$30 for full course of drugs
- No recent estimates for South Africa

Sinanovic et al 2003; Meyer-Rath et al 2012

MDR-TB

- Inpatient care by doctors
- 18-24 month regimen
- Systematic review found 4 cost estimates globally; range $2,791 to 16,881/case
- No cost estimates for So. Africa
- 55% of national TB control budget spent on MDR-TB

Fitzpatrick & Floyd, 2012; WHO 2011

Objectives

- Estimate the cost of inpatient treatment for MDR-TB in South Africa
- Generate baseline for evaluating alternatives to inpatient model

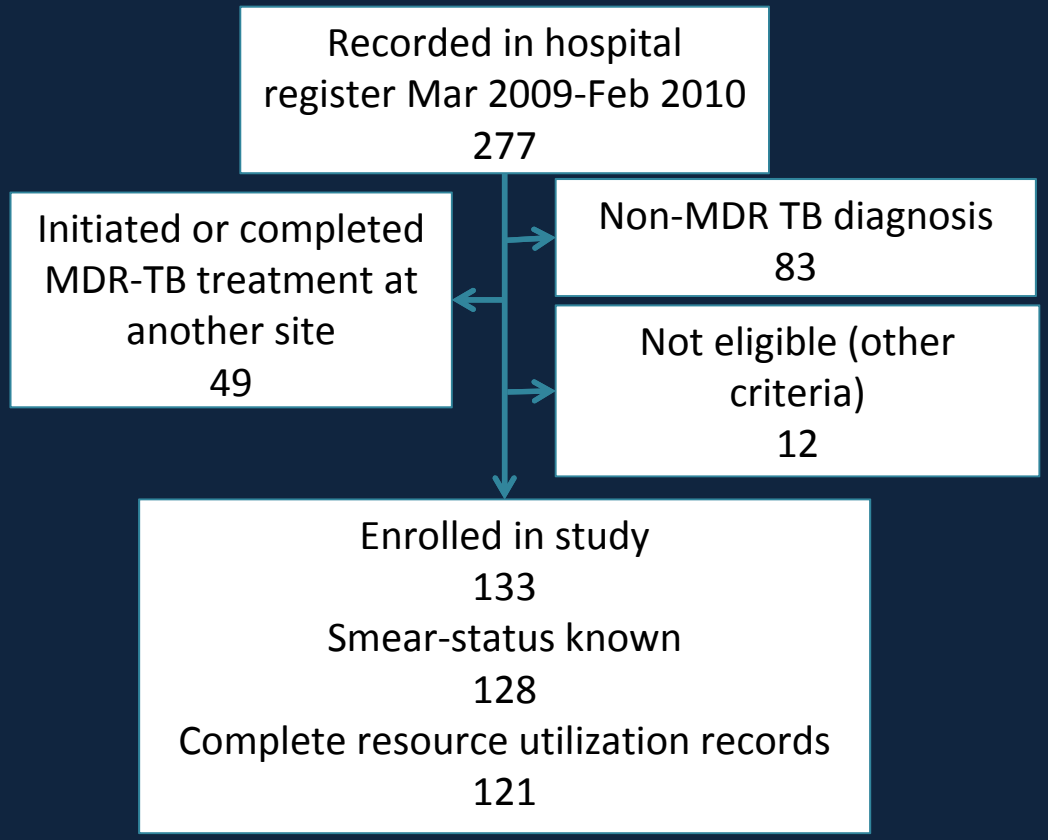
Methods: Site and Sample

- M/XDR-TB Hospital in the North West Province of South Africa
- All admitted patients with MDR-TB
  - March 2009-February 2010
  - Excluded transfers in or out (incomplete costs)
- Reviewed medical records for resource utilization and outcomes
- Data collected up to 12 months from admission or until the earliest of discharge, abscondment, or death

Methods: Unit costs and Analysis

- Costs of hospital stay/day collected from hospital expenditure and assets records
- Costs for drugs, laboratory tests, radiography, and surgery collected from public sector databases
- Costs are reported in USD 2011 prices, ZAR 7.23:$1, 3% discount rate for buildings/equipment
- Cost per patient admitted estimated, stratified by sputum smear status and outcome

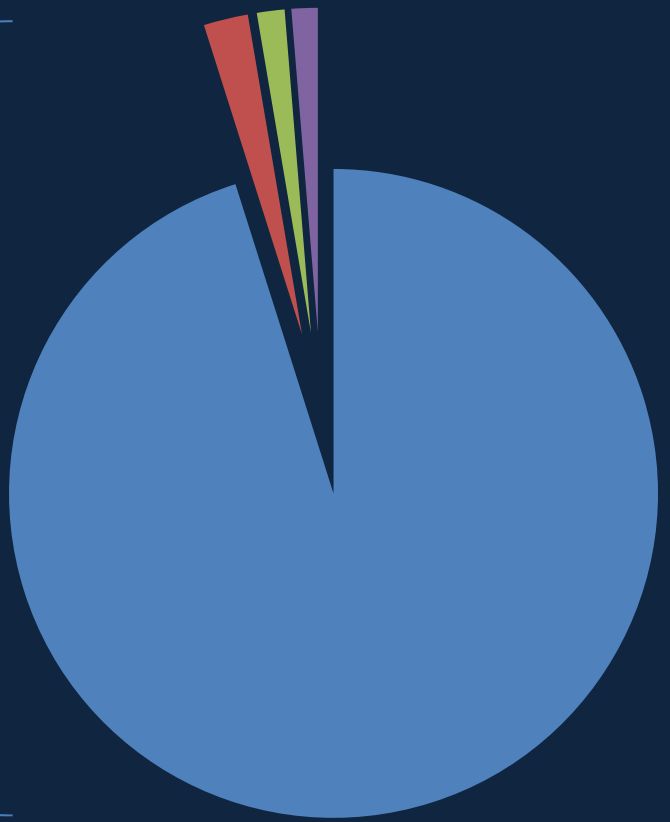
Results: Study Sample



- N=128 (121 for cost estimates)
- Median age 39; 45% female; 64% unemployed
- 50% smear-, 50% smear+ at admission
- 83% previous TB
- 64% HIV infected

Results: Average inpatient cost per patient

$17,164



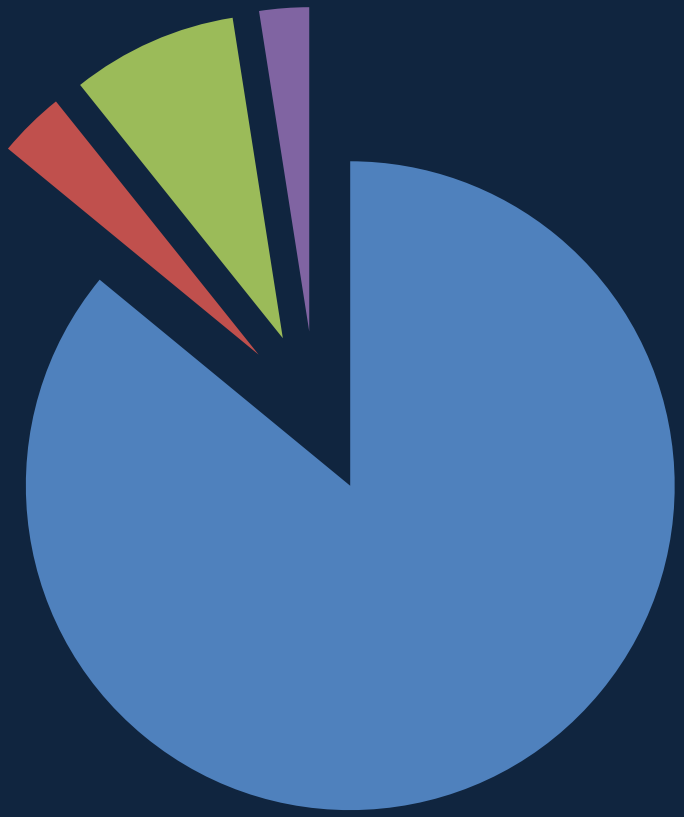
- Hospital stay 'hotel costs'
- MDR-TB drugs
- TB laboratory monitoring
- Other costs

Results: Resource utilization and cost by smear status at admission

Cost	All patients (n=121)	Smear positive (n=55)	Smear negative (n=61)
Number of days in hospital	105 [52]	125 [58]	95 [35]*
Number of injections	52 [41]	57 [42]	52 [40]*
Number of cultures	4.1 [1.9]	4.8 [2.0]	3.8 [1.4]*
Number of drug sensitivity tests	6.7 [8.3]	12.2 [8.4]	2.3 [4.7]*
Average cost/patient	$17,164	$20,440	$15,450

* Significant difference between smear-positive and smear-negative subjects at p-value<0.05

Results: Average inpatient costs by patient outcomes



- Culture converted, discharged (86%) $17,327
- Absconded (3%) $5,837
- Died in hospital (8%) $12,623
- Still admitted at 12 months (2%) $41,749

Limitations

- Single site in one province, small sample
- Cost of MDR-TB inpatient phase only
  - Patients should be in outpatient care for 18-21 months following discharge
- Survivor bias
  - Treatment initiated a median of 99 days after patient tested for MDR-TB
  - 40% of MDR-TB patients die within 30 days of testing

Gandhi et al. 2010

Conclusions

- Average 12-month cost of inpatient treatment for MDR-TB: $17,164
  - 40 x the full cost of treating drug-sensitive TB
  - 25 x the annual cost of first-line ART
- Will new guidelines reduce cost?

Sinanovic et al. 2003; Meyer-Rath et al. 2012; Long et al. 2011

MULTI-DRUG RESISTANT TUBERCULOSIS

A POLICY FRAMEWORK ON DECENTRALISED AND DEINSTITUTIONALISED MANAGEMENT FOR SOUTH AFRICA

August 2011

Now the hard part: **implementation**

- hiring and training new staff
- equipping clinics and hospitals
- managing drug supplies

Cost savings to be used for prevention of drug-resistant TB

Health Economics and Epidemiology Research Office

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