Tuberculosis as an Occupational Disease

Molebogeng Malotle
Introduction

• TB is a major global health problem

• Causes ill-health in millions of people each year

• Ranks the second leading cause of death from infectious disease worldwide

• WHO declared TB as global public health emergency in 1993
Introduction

• Millennium Development Goals target of halting and reversing TB incidence by 2015 achieved

• TB incidence declined at a rate of 2.2% btw 2010 & 2011.

• Globally, the TB mortality rate fallen by 41% since 1990

• World is on track to reach the global target of a 50% reduction by 2015.
TB burden globally (2011)

- 8.7 million incident cases of TB
- TB global incidence  125/100 000 pop
- 1.4 million deaths from TB
- 3.7% of new TB cases had MDR TB
TB burden in South Africa (2011)

• 3rd highest TB incidence in the world

• 0.5 million incident cases of TB

• Incidence 993/100 000 population

• Mortality 49/100 000 population

• 1.8% of new TB cases had MDR TB
TB in healthcare settings

• TB in healthcare settings recognized & accepted as an occupational hazard & disease

• High TB burden puts HCWs at increased risk of infection

• TB requires vigilance in the workplace
Transmission in health care facilities

• Transmission in health care settings reported from every country of the world

• In South Africa the presence of drug-resistant TB, compounds the potential risk posed to HCWs
Transmission in other settings

Mining sector

• Mining sector contributes significantly to the high burden

• Estimated TB incidence of 3-7,000 cases/100,000 population.

• SA's gold mines are estimated to have the highest number of new TB cases in the world

Non mining sector

• Foundries, sandstone factories

• ceramics/potteries

• refractories and sandblasting
Risk associated with occupational TB

Risk varies by:

• Settings, occupational groups, prevalence of TB in community, number of patients, effectiveness of ICMs

• Personal health status- (HIV, previous TB disease last 2yrs), diabetes mellitus

• Environmental factors- enclosed space, inadequate ventilation, specimen handling and improper performing of procedures
HCWs who work in:

• laboratories,
• medical wards and emergency rooms,
• staff required to perform procedures (e.g. intubations, bronchoscopy and chest physiotherapy) likely to cause droplet aerosol,

appear to be at greater risk

CDC: Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health care facilities.
In South Africa the presence of drug-resistant TB, which is dependent on workplace and individual factors, compounds the potential risk posed to HCWs.
TB Burden among HCWs in S.A

• Study by URC. LLC (URC) and Desmond Tutu TB Center in 5 Prov in SA found that average burden of TB in HCWs was 2% compared to 0.9% in general pop

• O ‘Donnell et al- HCWs had 5 to 6 folds increased rate of hospital admission with MDR- or XDR-TB compared to non-HCWs

  – Incidence of TB attributable to health care work is 5.8% (range 0-11%)

• High TB incidence in SA could be responsible for high TB incidence among HCWs
### TB Burden among HCWs

<table>
<thead>
<tr>
<th>Prevalence/Incidence</th>
<th>Setting</th>
<th>Author</th>
</tr>
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<tbody>
<tr>
<td>1 25 – 5361/100 000</td>
<td>51 studies (LMIC Countries)</td>
<td>Joshi R et al, PLoS Medicine, 2006</td>
</tr>
<tr>
<td>1133/100 000</td>
<td>HCWs at hospitals in KZN</td>
<td>S Naidoo, COEHR, UKZN, IJTLD, 2006</td>
</tr>
<tr>
<td>4477/100 000</td>
<td>Desmond Tutu HCW research staff (182)</td>
<td>M Claase, DTTC, US, <em>in press</em>, 2008</td>
</tr>
<tr>
<td>5%</td>
<td>TB/HIV care association community health workers (215)</td>
<td>K Kranzer et al, DT HIV Foundation, SAMJ 2010</td>
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**Dr Shahieda Adams**  
TB in health care workers  
Centre for Occupational and Environmental Health Research  
25 MARCH 2011
High incidence of hospital admission with MDR/XDR TB among SA HCWs studies
O’Donnel et al 2010

<table>
<thead>
<tr>
<th>Annual incidence per 100,000 persons</th>
<th>HCWs</th>
<th>General population</th>
<th>Relative Risk</th>
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<tbody>
<tr>
<td>MDR or XDR-TB incidence</td>
<td>71.9/100 000</td>
<td>13.2/100 000</td>
<td>5.44 (4.76 – 6.19)</td>
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<tr>
<td>MDR-TB incidence</td>
<td>64.8/100 000</td>
<td>12.1/100 000</td>
<td>5.34 (4.64 – 6.12)</td>
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<tr>
<td>XDR-TB incidence</td>
<td>7.2/100 000</td>
<td>1.1/100 000</td>
<td>6.54 (4.14 – 9.81)</td>
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Dr Shahieda Adams, UCT
Why is Occupational TB of public health importance?

• OTB in health care settings is preventable through adequate Infection Control Measures (ICMs)

• Curable disease using standard TB treatment regimen

• If inappropriately managed may result in:
  – Fatal outcomes
  – Lead to immense suffering, distress to affected HCWs, co-workers and family members and
  – Loss of valuable HCWs
Policy framework for TB in HCWs in South Africa

- Occupational Health and Safety Act no. 85 of 1993
- Hazardous Biological Agent Regulations
- In 2009, WHO policy - “TB infection control in health care facilities, congregate settings and households”
- Compensation for Occupational Injuries and Diseases Act
- Tuberculosis Strategic Plan for South Africa, 2007-2011
Programmatic interventions for TB control in HCWs

• Regular risk assessments conducted every 2yrs or reviewed when HCW with suspected TB is identified

• Cornerstones of control measures for TB in health facilities
  - **Administrative** (patients triaging, early diagnosis, treatment and management)
  - **Engineering** (neg. pressure, local exhaust ventilation, and UV treatment of ventilated air)
    NB, natural ventilation, exposure to sunlight are still the best
  - **PPE** (respirator with a capacity to filter 1 micron particle e.g N95 respirator)
• Access to Medical Surveillance programme (MSP)
  – Pre- employment
  – Periodic and medical examination
  – TB screening for HCWs in high risk areas

• Occupational TB cases to be reported to IC programme

• MSP- keep all records of HCWs diagnosed with TB
Compensation

• HCWs diagnosed with TB - to be reported to office of Compensation Commissioner

• Circular instruction No. 178-Pulmonary TB in HCWs
  - W.CL. 1 Employer and the doctors report
  - W.CL. 14 To be completed by HCW
  - W.CL. 22 To be completed by the doctor
  - W.CL. 110 Exposure history
  - W.CL. 26 Progress medical report and final medical report
Challenges in Controlling TB in HCWs

• Burden of TB HIV
  – In the general population
  – In healthcare facilities
• Poorly designed infrastructure
• Overcrowded facilities
• Stigma & association with HIV
• Lack of Medical Surveillance Programmes
• Poor data management/ notification system
• TB notification form – no occupational history
Conclusion

• Evidence on exposure of HCWs to TB in workplace and their increased vulnerability in SA

• Train HCWs in infection control measures

• Critical need to implement adequate infection control measures

• Also monitor healthcare compliance in infection control measures
Cont.....

• Knowledge of and policies on TB control in healthcare facilities should be translated into programmatic intervention

• Interventions should be standardized across the healthcare system

• Employers have legal obligation to protect HCWs and workers in general
In combating diseases especially infectious diseases such as TB,

• HCWs form an integral part in the fight against such diseases.

• Dire need to have a healthy workforce that must protect its health as well as the health of patients

• as unhealthy workforce can result to high absenteeism and low morale
Acknowledgements

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Thank you