TB IN EMERGENCIES

Disease Control in Humanitarian Emergencies (DCE)
Department of Epidemic and Pandemic Alert and Response (EPR)
Health Security and Environment Cluster (HSE)

(Acknowledgements WHO Stop TB Programme – WHO/STB)
Why TB?

- >33% of the global population infected with TB bacillus
- 5 – 10% become infected some time during their life
  - HIV much greater percentage, synergy
- Every second someone is infected (3 600 during this lecture or 173 000 during this two day course)
- Drug resistance – MDR-TB, XDR,
- Cure depends on consistent Rx
- Emergencies interrupt programmatic work
Outline of lecture

- Infection
- Diagnosis
- Treatment; drugs, strategies, compliance
- Prevention
- Starting programmes
- Considerations in Emergencies
- STOP TB strategy – 6 components
What causes TB?

- Airborne infectious disease caused by *Mycobacterium tuberculosis*
- Preventable and curable
- People ill with TB bacteria in their lungs can infect others when they cough, talk, spit, sneeze
- Left untreated, each person with active TB disease will infect between 10 - 15 people every year.
- If detected early and fully treated, people quickly become non-infectious and eventually cured.
- Multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB), HIV-associated TB, and weak health systems are major challenges.
Forms of tuberculosis

Pulmonary tuberculosis:

- Tuberculosis affects the lungs in 80% of cases.
- Pulmonary tuberculosis in adults is often *sputum smear-positive* and therefore *highly infectious*.
- Other pulmonary cases, which are only sputum culture-positive or culture-negative are 7 to 10 times less infectious (but now sputum negativity now higher due to HIV prevalence).

Extra-pulmonary tuberculosis:

- Affects various organs, patients with extra-pulmonary tuberculosis hardly ever spread the disease to other persons.
Stages of TB disease (i)

Tuberculosis infection

- Individual infected due to exposure to microorganisms from infectious TB patient.

- The immune system "walls off" the TB bacilli which, protected by a thick waxy coat, can lie dormant for years.

- Their presence is indicated only by a significant size of tuberculin skin test (TST) induration.
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Stages of TB disease (ii)

Tuberculosis disease

- Development of actual disease occurs in only some (about 10%) of infected persons, mainly during first 5 years of infection.

- When immune system is weakened, chances of developing disease are greater.
Increased risk of tuberculosis in emergencies

- War may disrupt treatment
  - Fourfold increase in new cases in Bosnia since 1991
  - Increase in incidence & CFR in Somalia

- Crowding may promote transmission

- High prevalence of HIV infection may increase incidence of new clinical & infectious cases & promote transmission

- Not a leading cause of mortality in acute phase of emergencies
TB symptoms (adults)

2 weeks or more of:

- Persistent Cough (usually with sputum, sometimes bloodstained)
- Fever
- Chest pain

May also have

- Significant weight loss
- Fever / night sweats
- Breathlessness
- Loss of appetite
- Fatigue
Diagnosis - sputum

Two* sputum samples examined by light microscopy for acid fast bacilli (AFB) using the Ziehl-Neelsen stain.

* Formerly three, this new definition of sputum smear TB case is recommended by WHO and was endorsed by the Strategic Technical and Advisory Group for Tuberculosis in June 2007.
Diagnosis – X-ray

- Non-specific
- Expensive
- May not be available
- Diagnosis of pulmonary TB in adults must be confirmed by smear examination if possible.
- In smear-negative patients or children with symptoms suggestive of TB clinical signs, X-ray is helpful.
- Also useful in diagnosis of miliary or extra-pulmonary tuberculosis.
Diagnosis - Tuberculin skin test (TST)

- A positive test in non-vaccinated child < 5 years = usually recent infection with TB and much higher risk of developing TB disease.
- TST alone cannot be used in establishing diagnosis.
- The value of positive TST in diagnosis is when used with other clinical features identified in child.
TB treatment

Determined by:

- Site of the disease (pulmonary/extrapulmonary)
- Bacteriological status assessed by microscopy (i.e. sputum positive or negative).
- History of previous anti-TB treatment (relapse, failure, interruption)
- Based on above, patients placed in categories which then determine the combination of drugs and duration of treatment
TB treatment regimens

Long duration, multiple drugs, direct observation required

Initial intensive phase:
- 3-5 drugs given under daily direct observation
- 2-3 months duration
- Reduces the # of TB organisms to very low levels

Continuation phase:
- 2-3 drugs given 3 times per week (ideally supervised)
- 4-6 months duration
- or 2 drugs daily X 6 months in fixed-dose combinations (FDCs) (unsupervised)
Essential anti-tuberculosis drugs

- Rifampicin (R)
- Isoniazid (H)
- Pyrazinamide (Z)
- Ethambutol (E)
- Streptomycin (S)
- Thiacetazone
- Fixed-dose combinations (FDCs) highly recommended
## Categories for TB treatment

<table>
<thead>
<tr>
<th>I</th>
<th>New sputum smear-positive pulmonary TB</th>
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<tbody>
<tr>
<td></td>
<td>New smear-negative pulmonary TB with extensive lung involvement</td>
</tr>
<tr>
<td></td>
<td>New cases of severe forms of extra-pulmonary TB</td>
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<tr>
<td>II</td>
<td>Previously treated sputum smear-positive</td>
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<tr>
<td></td>
<td>(relapse, treatment failure, return after treatment interruption)</td>
</tr>
<tr>
<td>III</td>
<td>New smear-negative pulmonary TB (other than in category I)</td>
</tr>
<tr>
<td></td>
<td>Less severe forms of extra-pulmonary TB</td>
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</tbody>
</table>
## Treatment regimens for each category (2007)

<table>
<thead>
<tr>
<th>TB treatment category</th>
<th>Initial phase</th>
<th>Continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2HRZE(^a) OR 2H(_3)R(_3)Z(_3)E(_3)(^a)</td>
<td>4H(_3)R(_3)</td>
</tr>
<tr>
<td>II</td>
<td>2SHRZE/1HRZE(^b) (if ss+ after 2SHRZE)</td>
<td>5H(_3)R(_3)E(_3)</td>
</tr>
<tr>
<td>III</td>
<td>2HRZE(^b) OR 2H(_3)R(_3)Z(_3)E(_3)(^b)</td>
<td>4H(_3)R(_3)</td>
</tr>
</tbody>
</table>

Nomenclature 3 = 3 times per week rather than daily (for 3 X per week regimen, dose range higher for H, Z and E)

a. Streptomycin can replace ethambutol. In TB meningitis, streptomycin should replace ethambutol.
b. Ethambutol may be omitted during initial phase for patients with non-cavitary, smear-negative PTB who are known HIV negative and for young children with primary TB.
Improving compliance

- DOTS (Directly Observed Therapy)
- home visits to trace non-compliers and defaulters
- staff/patient relations
- continuing education for staff, patients, families
- acceptable clinic setting
- incentives???
- prophylaxis
TB Prevention

- Diagnosis and treatment of infectious cases
- BCG is effective in preventing severe forms of TB such as tuberculous meningitis in children.
- Vaccination of newborns and children up to 5 years of age if unvaccinated
- Good ventilation
- Prevent overcrowding
Starting a TB Control Programme
Three Questions

● Does the agency have the commitment & resources to continue a TB programme for at least 12-15 months?

● Is the area or camp expected to remain stable for at least 12-15 months?

● Can the agency assure a good quality programme, either working alone or in a supporting role?
TB Control in Emergency Settings

- TB control is not an emergency priority (measles prevention, diarrheal diseases, pneumonia, malaria, outbreak detection and control)
- Implement only when there is security, stability, and funding
- Involve host country National Tuberculosis Programme
- Most effective strategy for prevention is treatment of infectious patients
- Most effective strategy for treatment is DOTS
- MDG target related.
TB control objectives

- Reduce transmission of TB
- Achieve high treatment compliance
- Prevent development of resistant organisms (MDR-TB and XDR-TB)
TB control targets

- Halt and reverse incidence by 2015 (global target related to MDG)

- Halve prevalence and death rate by 2015 compared with their level in 1990 (2 impact targets)

- Detect at least 70% of new smear-positive cases in DOTS programmes and to successfully treat at least 85% of detected cases (2 outcome targets)
Stop TB strategy

1. Pursue high-quality DOTS expansion and enhancement

2. Address TB/HIV, MDR-TB and other challenges
   - Implement collaborative TB/HIV activities
   - Prevent and control multidrug-resistant TB
   - Address prisoners, refugees and other high-risk groups and special situations

3. Contribute to health system strengthening
   - Actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery, and information systems
   - Share innovations that strengthen systems, including the Practical Approach to Lung Health (PAL)
   - Adapt innovations from other fields

4. Engage all care providers
   - Public-Public, and Public-Private Mix (PPM) approaches
   - International Standards for Tuberculosis Care (ISTC)

5. Empower people with TB, and communities
   - Advocacy, communication and social mobilization
   - Community participation in TB care
   - Patients' Charter for Tuberculosis Care

6. Enable and promote research
   - Programme-based operational research
   - Research to develop new diagnostics, drugs and vaccines
High-quality DOTS expansion and enhancement

1. Political commitment with increased and sustained financing
   Legislation, planning, human resources, management, training

2. Case detection through quality-assured bacteriology
   Strengthening TB laboratories, drug resistance surveillance

3. Standardized treatment with supervision and patient support
   TB treatment and programme management guidelines, International Standards of TB Care (ISTC), PPM, Practical Approach to Lung Health (PAL), community-patient involvement

4. An effective drug supply and management system
   Availability of TB drugs, TB drug management, Global Drug Facility (GDF), Green Light Committee (GLC)

5. Monitoring & evaluation system and impact measurement
   TB recording and reporting systems, Global TB Control Report, data and country profiles, TB planning and budgeting tool, WHO epidemiology and surveillance online training
Essential criteria before implementing TB programme in emergencies?

1. Data from population indicate TB is an important health problem
2. Acute phase of emergency is over
3. Stability of population envisaged for at least 6 months (ideally 12-15)
4. Basic needs met
5. Essential health care services and drugs for common illnesses available.
6. Basic health services accessible so that TB suspects can be identified, investigated and referred if necessary
Situation analysis

1. Demographic composition of emergency-affected population
2. Estimated annual TB incidence
3. Political commitment
4. National TB control policies and DOTS coverage
5. Expertise among NTP and NGO in implementing TB pgms
6. Health facilities and primary health care services available
7. Type and location of laboratory facilities
8. Channels of drug procurement - customs regulations, duties
9. Storage facilities for drugs
10. Human resources available to dedicate to TB programme
Local TB control protocol (i)

1. Coordination mechanism and lead agency
2. Memorandum of understanding with all partners concerned
3. Coverage of the local population in the TB control programme
4. Clear steps in management of patient with suspected TB
5. Diagnostic algorithms
6. Identification of diagnostic facilities (laboratories suitable for smear examination including quality control)
7. TB treatment categories and drug regimens
Local TB control protocol (ii)

8. Referral of seriously ill patients to local hospitals
9. Procurement and management of drug stocks and reagents
10. Procedures for follow up of cases
11. Recording and reporting system
12. Patient evaluation and outcome definition
13. Programme evaluation (case-finding, early conversion result, cohort analysis at 12 months)
14. Contingency plans for insecurity, unexpected movements, repatriation, transfers.
Special considerations for TB control in emergencies

- TB in children and in feeding centres
- TB and HIV/AIDS (clinical & programme management implications)
- BCG vaccination
- Sputum negative TB in adults
- Chemoprophylaxis (breastfed infants of sputum-positive mothers)
- Sputum culture and other diagnostic tests