

# TB Prevention, Diagnosis and Treatment

**Accelerating advocacy on  
TB/HIV**

**15th July, Vienna**

# Diagnosis

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- Microscopy of specially stained sputum is the main test for diagnosing TB (1-2 days)
- TB bacilli seen in the sputum sample using a microscope (smear positive or AFB +)
- Detects only  $\frac{1}{2}$  of all TB and  $\frac{1}{3}$ rd of HIV related TB
- PLHIV higher proportion of
  - sputum negative pulmonary TB
  - extrapulmonary TB

# Diagnosis

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- X-ray also has a role for diagnosing TB if smear –ve
- Role of culture: (takes 3 - 4 wks)
- EPTB may require tissue samples/culture
- Diagnostic process will differ depending on the setting (rural/urban/laboratory capacity/availability of X-Ray/culture)

# How is TB diagnosed?

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- Bacteriological confirmation
  - Sputum smear microscopy
  - Culture
- Non-bacteriological
  - Symptom screen
  - TST or Mantoux or PPD
  - Chest X-ray
  - Diagnostic algorithm

# Challenges of non-bacteriologic tests

- Non-specific to TB
  - fever is not exclusive to TB
- Immune suppression can confuse results
  - TST may not react in someone who is immune suppressed
- Require training of health care provider
  - reading chest xrays requires specific training
- Often misses EPTB

# Challenges of bacteriological tests

- Smear microscopy detects only  $\frac{1}{2}$  of all TB and  $\frac{1}{3}$ rd of HIV-related TB
- Smear microscopy is focused on pulmonary TB
- Solid culture can take up to 4-6 weeks for results
- Liquid culture requires a high level of biosafety and training

# Tuberculosis Case definition

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**TB case** - A patient in whom tuberculosis has been confirmed by bacteriology or **diagnosed by a clinician**.

**Smear positive pulmonary TB case** - A patient with one or more positive sputum smear examinations (direct smear microscopy) AFB+.

**Smear negative pulmonary TB case** – A patient with two sputum smear examinations negative for AFB; X ray suggests TB, unresponsive to a course of broad-spectrum antibiotics (except in a patient with strong clinical evidence of HIV infection); **and a decision by a clinician to treat with anti tuberculosis chemotherapy**; or positive culture but negative AFB sputum examinations.

**Extrapulmonary TB case** - one culture-positive specimen, or histological or strong clinical evidence. **Followed by decision by a clinician to treat with a full course of anti-tuberculosis chemotherapy**

# Diagnosis

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- Early detection and treatment is the priority, especially for people living with HIV
- Anybody with symptoms suggestive of TB should be investigated.
- Close contacts of TB patients should also be checked by health staff
- Active versus passive case finding



# Treatment

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## **The Aims of anti-TB Treatment**

- a. To cure the patient of TB
- b. To prevent death from active TB or its late effects
- c. To prevent TB relapse or recurrent disease
- d. To prevent the development of drug resistance
- e. To decrease TB transmission to others.

# Treatment

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- TB is treatable and curable, even in people living with HIV
- First line TB drugs
  - Rifampicin (R)
  - Isoniazid (H)
  - Ethambutol (E)
  - Pyrazinamide (Z)

# Gaps in first-line treatment

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- High pill burden
- Long duration of treatment
- Side effects
- Drug stock outs
- Interactions with ARVs
- Little to no pediatric data

# TB treatment terms

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- What is drug-susceptible (or drug sensitive) TB?
- What is drug-resistant TB?
  - Mono-resistant
  - Poly-resistant
  - Multi-drug resistant
  - Extensively-drug resistant

# TB treatment terms

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- What is drug-susceptible (or drug sensitive) TB? TB that is susceptible to all TB drugs
- What is drug-resistant TB?
  - Mono-resistant is resistant to 1 TB drug
  - Poly-resistant is resistant to at least 2 of any of the TB drugs
  - Multi-drug resistant is resistant to isoniazid and rifampin
  - Extensively-drug resistant is resistant to isoniazid and rifampin AND any fluoroquinolone AND any 2nd line injectable

# Drug Resistant TB

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## Caused by:

Poor quality medication

Inadequate or erratic treatment

Transmission from one person  
to another

# Multi-Drug Resistant TB

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Difficult to diagnose

- Time for culture
- Special laboratories

Treat with second-line drugs

MDR TB treatment takes 3-4 times longer and costs 100 times more

More side effects and drug interaction esp with ART

# Extensively drug resistant TB - XDR TB

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- MDR-TB that is also resistant to 2/3 most powerful second line TB drugs
- Difficult to diagnose
  - Time for culture
  - Special laboratories
- About 10% of MDR TB is XDR
- High fatality rate in people living with HIV
- Present in every region of the world



# Gaps in treatment for DR-TB

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- Unclear how best to treat poly-drug resistant TB
- DST is not readily available in most high burden settings that need it most
- Lack of treatment options
- Poor cure rates
- Isolation and quarantine vs. community-based care

# Challenges to treating TB/HIV

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- Rifampin-based regimens
- Immune Reconstitution Inflammatory Syndrome (IRIS)
- Co-trimoxazole prophylaxis therapy (CPT)
- When do start ART?

# So how do we prevent TB infection and disease?

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- **Primary prevention** aims to block infection
- **Secondary prevention** aims to block progression of an infection to active disease.

# Preventing primary infection

- Infection control strategies:

# How could you prevent TB infection?

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1. Involve patients & community in advocacy campaigns
2. Infection control plan
3. Safe sputum collection
4. Cough etiquette and cough hygiene
5. Triage TB suspects to fast tract or separation
6. Rapid TB diagnosis and treatment
7. Improve room air ventilation
8. Protect health care workers
9. Capacity building
10. Monitor infection control practices.

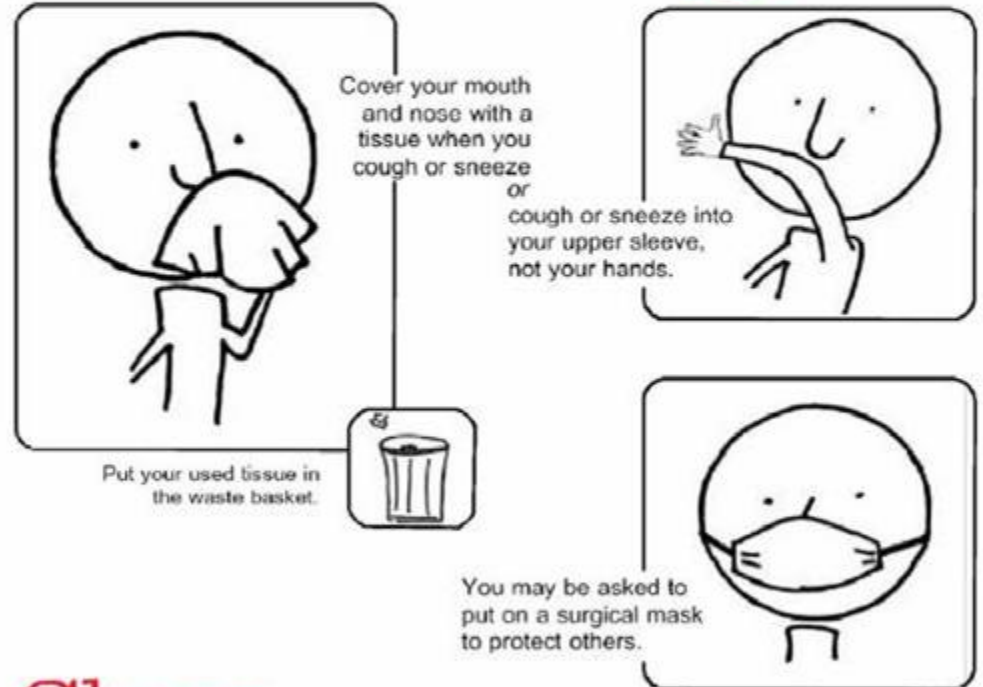
Stop the spread of germs that make you and others sick!

# Our Clinic is STOPPING TB

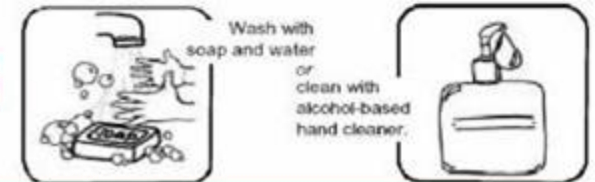


- We have a clinic staff member who is responsible for TB prevention and control.
- We ask patients about symptoms of TB, especially chronic cough.
- Patients who are coughing maybe asked to:
  - Wait outside or in a special room.
  - Cough into a sputum cup which is sent to the laboratory. Lab results on the sputum will be ready in 1-2 days.
  - Cover their cough with tissues or cough into their sleeve.
  - Wear a mask.
- We may keep windows open, even in cold weather.
- Our health workers may wear a mask when talking to you.
- We screen all health workers for TB.
- We encourage health workers and patients to know their HIV status.
- We make sure TB patients get full treatment for TB.
- People with HIV infection get HIV care and treatment.

# Cover your Cough



# Clean your Hands after coughing or sneezing.





# TB Infection control in HIV care



“Excuse me, does anyone have a cough?”

# Prevention of Tuberculosis

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1. Early diagnosis and prompt effective treatment of infectious cases
2. Good infection control
3. Isoniazid preventive therapy
4. Other factors better housing, nutrition, alcohol reduction....



# How can we prevent TB disease?

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- Bacillus Calmette-Guerin (or BCG) vaccine
- Isoniazid preventive therapy (IPT)
- Antiretroviral therapy (ART) for people with HIV

# What is current TB vaccine?

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- The Bacille Calmette-Guérin (BCG) is the ONLY successful TB vaccine
- Was introduced in 1921
- BCG is the world's most widely administered vaccine.
- Only prevents serious TB disease in children (TBM and miliary TB)
- WHO estimates that it save the lives of over 40,000 children per year.

# Isoniazid Preventive Therapy

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- Isoniazid treatment for 6 months given to people with HIV can reduce by 40-60%
- The effect is more pronounced in people with a positive Tuberculin test.
- Screening for TB is needed first to exclude active disease.

# How can ART help to prevent TB disease?

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- ART helps to restore immune function
- ART can greatly reduce the risk of TB in a person living with HIV.
- But risk still elevated to about 2x that in a person without HIV.