Use of the WHO Treatment Decision Algorithms in Sierra Leone

Annual Meeting of the Child and Adolescent TB Working Group
Tuesday 14 November 2023
Background

• Population: 8.3 million
• The country is divided into four administrative regions: North, East, Southern and Western Area provinces
• These regions are subdivided into 16 districts, (two new – Falaba & Kerene)
• PHUs: 1284 (MOHS)
• Number of DOTS: 187 (14.6%)
• Sierra Leone has >1,500 health facilities, 1,284 PHUs, 186 DOTS centers (14%), 1 NRL, and 3 MDR-TB treatment facilities
• Gene Xpert sites: 14 Health Facilities
• MDR-TB Management Centers: 3
• National TB Reference lab: 1
Background

• Sierra Leone is one of the 30 High TB burden countries in the world
• Estimated TB cases: 25,000 (Notified: 19,400 (2022))
• Incidence: 286/100K population
• Estimated deaths: 2,500
• Drug resistant TB cases: 370 (1.5%)
• HIV positive TB incidence: 3,300 (15.8% of the estimated TB cases)
• Estimated number of Children with TB (0 – 14 years): 2,400, 9.6% (Notified: 8 %) of the total TB cases, in 2022
Trend of TB Incidence Rate and Notification Rate
New & Relapse Cases, 2013-2022

- Est incidence rate
- Notification rate, new & relapse (per 100,000 pop)
Trend of TB mortality Rate, 2000-2021

[Graph showing the trend of TB mortality rate from 2000 to 2021 with data points for different categories: Est. mortality_All TB cases per 100k, Est. mortality_HIV Negative per 100k, Est. mortality_TB_HIV per 100k]
Trend of new and relapse pulmonary TB cases by Bacteriological confirmation 2013-2022
Trend of % child TB cases new and relapse, 2016-2022
# TB Treatment Outcome by Districts

All forms TB cases Notified in 2022

<table>
<thead>
<tr>
<th>Year</th>
<th>District</th>
<th>Treatment Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>Bo</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>Bombali</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>Bonthe</td>
<td>97%</td>
</tr>
<tr>
<td></td>
<td>Falaba</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Kailahun</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Kambia</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>Kenema</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>Kerene</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Koinadugu</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Kono</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Moyamba</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>Port Loko</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>Pujehun</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Tonkolili</td>
<td>97%</td>
</tr>
<tr>
<td></td>
<td>Western Area R.</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Western Area U.</td>
<td>82%</td>
</tr>
</tbody>
</table>

**TB Treatment outcome**:
- **Death rate**
- **Failure rate**
- **LTFU rate**
- **Not evaluated rate**
- **Treatment Success**
Diagnostic Treatment Algorithms

• Several drafts of the National Tb Guideline made since 2018 with different Treatment Decision Algorithms
• Different Districts attempt to increase case finding by developing different Algorithms
• This has greatly improved Child and Adolescent TB Case Finding in some Districts
% Child TB cases New and Relapse by Districts 2021-2022
2018/2019 Algorithm

Presumptive TB Cases:
Collect one sputum sample* for TB testing

Gene Xpert testing performed on sample

- MTB detected
  - Treat with First Line
- MTB detected and RR
  - Treat with 2nd line or refer
- Invalid/Error/No result
  - Repeat Gene Xpert test

Unable to perform gene Xpert

MTB Not Detected

- Re-evaluate the patient clinically
- Perform chest x ray
- Perform urine LF-Lam??
- Consider alternative diagnosis;
- Refer, if seriously sick, or HIV positive and TB dx remains in doubt

AFB Negative

Perform sputum microscopy

AFB positive

- Treat for TB
- Collect Sample and send for GeneXpert testing?

* Samples for gene xpert testing include stool, urine, gastric aspirates, naopharangeal aspirate in children, and other body fluids for adults.

2 Presumptive TB is defined by having symptom & signs consistent with TB; mainly Persistent cough of two or more weeks (or cough of any duration if HIV positive), fever for 2 weeks or more with or without night sweats, weight loss or failure to thrive, and a History of TB Contact among children
Approach to TB diagnosis in HIV- Uninfected Child

TB is suspected on basis of typical and persistent symptoms

Sputum smear/ Xpert negative

- Positive contact history
- Physical signs and symptoms suggestive of TB

If only one or none of the features are present

- IF CHILD SICK, FURTHER INVESTIGATION & APPROPRIATE MANAGEMENT
- IF CHILD WELL, REVIEW AFTER 2-4 WEEKS

Sputum smear/ Xpert positive

Make a diagnosis of TB if two or more of these features are

TREAT FOR TB
Approach to TB diagnosis in HIV-Infected Child

TB is suspected on basis of typical and persistent symptoms

Sputum smear/ Xpert negative

Consider contact history

Sputum smear/ Xpert positive

Contact is smear/ Xpert negative or not done

Physical signs & symptoms, and CXR suggest other diagnosis, manage accordingly

Physical signs & symptoms and CXR suggestive of PTB diagnosis

TREAT FOR TB
TB SPEED Treatment Decision Algorithm used in Bo and Port Loko Districts
HIV Negative Children
TB SPEED Treatment Decision Algorithm used in Bo and Port Loko Districts
HIV Infected Children

Sick children <15 yo. seeking care at triage/OPD (PHC or DH)

- Systematic TB symptoms screen
  - Persistent cough for 2 weeks or more
  - Persistent fever for 2 weeks or more
  - Documented weight loss
  - History of TB contact with any duration of cough

  Pos
  Neg

  Routine clinical assessment

  Presumptive TB

  Informed consent and assent if >7 yo

  NTP standard TB assessment

  NPA + stool/sputum collection

  Clinical evaluation for TB
  - TB symptoms
  - Contact history
  - Clinical TB signs

  DM
  - Chest X-ray

  PHC
  - No clearly defined clinical criteria
  - Ultra Results

  Pos
  Neg

  ≥1 criteria

  Discharge (cohort FU)

  Persistent symptoms after ATB treatment
  - TB symptoms
  - Contact history

  PHC
  - Chest X-ray

  DH

  Neg

  Pos

  ≥1 criteria

  Day 0 visit

  Criterion 1: One of these TB Symptoms
  - Persistent non-cursory cough for 2 weeks or more
  - Persistent fever for 2 weeks or more
  - Documented weight loss
  - History of TB contact with any duration of cough

  Criterion 2: Positive history of contact with a PTB case
  - Bacteriologically confirmed by microscopy or Xpert or culture

  Criterion 3: Clinical Features suggestive of TB
  - Severe malnutrition or documented failure to thrive
  - Enlarged lymph nodes around the neck or the arm pt (TB adenitis)
  - Acute pneumonia not responding to a complete course of appropriate broad spectrum antibiotics.
  - Recurrent pneumonias (defined as at least 2 episodes of pneumonia in a year with at least 1 month of clinical recovery between episodes)
  - Persistent wheeze not responding to bronchodilators (usually asymmetrical)
  - Presence of a swelling on the back bone (Gibbus)
  - Signs of meningitis in child with symptoms suggestive of TB

  Day 7 visit

  Criterion 4: CXR findings suggestive of PTB
  - Enlarged lymph nodes
  - Alveolar opacity of the lung tissue
  - Airways compression
  - Miliary
  - Cavitation
  - Pleural or pericardial effusion
Kono District

1. Contact tracing using CHWs
2. Chest Xray with Artificial intelligence for all child contacts.
3. Use of Screening Tool
4. Use of Stool and nasopharyngeal aspirate for diagnosis of TB
5. Training HCWs at PHU level on how to screen children for TB
6. Giving TPT to all eligible children using shorter regimens.
7. Actively screening all children admitted at the hospital for TB.
8. Screening children in Under 5 units for TB actively
9. Designing an algorithm and training PHU staff on screening and diagnosing TB in children
Kono Treatment Decision Algorithm

Patient reviewed

Consider other disease(s) → No tuberculosis

TB screening (using tool) → No tuberculosis

TB diagnosis decision

Could be TB?

Try other management

Symptoms and signs resolve

Yes

No

Patient sent for radiology investigations

Radio investigations (X-ray, USS) are done

Further history, exam, with radiology results

Investigation results are available

Link to TB clinic

TB registration and treatment
Bombali District

New Diagnostic Tools
• Stool GeneXpert for presumptive children (3-5% positivity)
• TB LAM in HIV cohort (20-30% positivity)
• Genexpert for all TB presumptive cases (20% test positivity)
• Sputum induction for children

New Implementation
• WHO Peds algorithm with Xray and without Xray implemented in health care facilities
• Proactive contact tracing of close contacts
• Screening of all children in Paediatric and Nutrition Wards
• Screening of children in 12 DOTs sites Community Health Centres (CHC)
• CHW referring cases to CHC
Ola During Children’s Hospital: WAU

• Using both NG Aspirate and Stool Specimen in younger children
• Sputum for older children
• Using the new WHO Treatment Decision Algorithm for Children
Treatment decision algorithms and operational guidance

Figure A5.1. Algorithm A (for settings with chest X-ray) and Algorithm B (for settings without chest X-ray)

**Algorithm A**

Child <10 years with symptoms suggestive of pulmonary TB

- Presence of danger signs requiring urgent medical care?
  - YES: Stabilize and/or transfer as needed
  - NO: RETAIN

- Child <2 years old, living with HIV, and/or severe acute malnutrition?
  - YES: Treat most likely non-TB condition(s)
    - Follow-up in 1-2 weeks
  - NO: Persistent/worsening symptoms?
    - YES: Collected respiratory/abscess specimens for mWRD testing (e.g., Xpert MTB/RIF or Ultra), including in children living with HIV, urine LF-ATM, if available
    - NO: Exit

- If performed, did mWRD or LF-ATM detect Mycobacterium tuberculosis?
  - YES: Close or household TB contact in the previous 12 months?
    - YES: Score signs and symptoms and CXR features
      - Signs and symptoms
        - Cough longer than 2 weeks
        - Fever longer than 2 weeks
        - Leukopenia
        - Weight loss
        - Haemoptysis (cough up blood)
        - Hepatomegaly
        - Splenomegaly
        - Tachypnoea
        - Tachycardia
      - Chest X-ray
        - Cavity/Cavities
        - Enlarged lymph nodes
        - Miliary Pattern
        - Effusion
      - Sum A: ___  Sum B: ___
      - Is Sum A + Sum B > 10?
        - YES: Initiate appropriate TB treatment
        - NO: Exit
      - If Sum A + Sum B ≤ 10?
        - DO NOT TREAT with TB treatment, follow-up in 1-2 weeks.

- NO: NOT PERFORMED / RESULT NOT YET AVAILABLE

NO: Scores at 1-2 months

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Next Steps

• Child and adolescent TB are part of the general TB and DR-TB guidelines
• The National Guideline for management of tuberculosis in Sierra Leone was revised in June 2022 and again this year and is at its final stage of editing.
• This guideline includes the management of tuberculosis in children & adolescents and has the recent WHO Treatment Decision Algorithm for Children included
• National Guidelines for the Management of Drug-resistant Tuberculosis in Sierra Leone which also includes management of DR-TB in children and adolescents, is also in its final Draft stage
• Printing and dissemination of the new guidelines and monitoring Tools is in process
• A comprehensive training program for 102 healthcare workers which aligned with WHO guidelines and covered various aspects of childhood TB diagnosis and management was conducted across the country.
Thank you

Merci

Obrigado