WHO guidance on management of TB in children and adolescents

Sabine Verkuijl, WHO Global Programme on Tuberculosis and Lung Health

KNCV webinar, 26 June 2025

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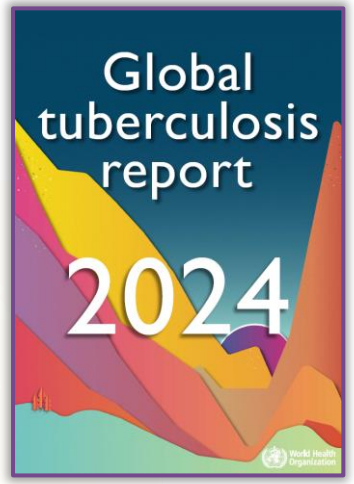
TB incidence and mortality in children and adolescents, 2023



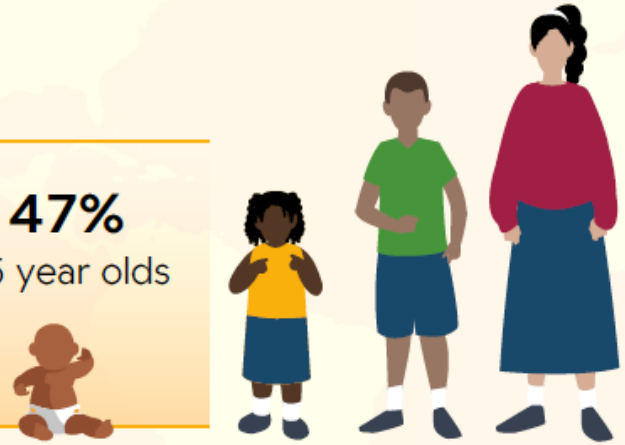
10.8 million
TB among all ages in 2023

1.25 million
TB deaths in 2023

1.25 million
children (0–14 years) developed TB in 2023 (12% of all TB)

191 000
TB deaths in 2023 (15% of all TB deaths)

47%
<5 year olds



727 000 adolescents
(10–19 year-olds) developed TB in 2012 (Snow et al, 2018)

Among deaths in HIV-negative children and young adolescents 0–14

73% were in children <5 years

96%
of deaths occurred in children who did not access TB treatment

(Dodd et al, 2017)

25 000
(14%) TB deaths in the 0–14 year age group were among children living with HIV

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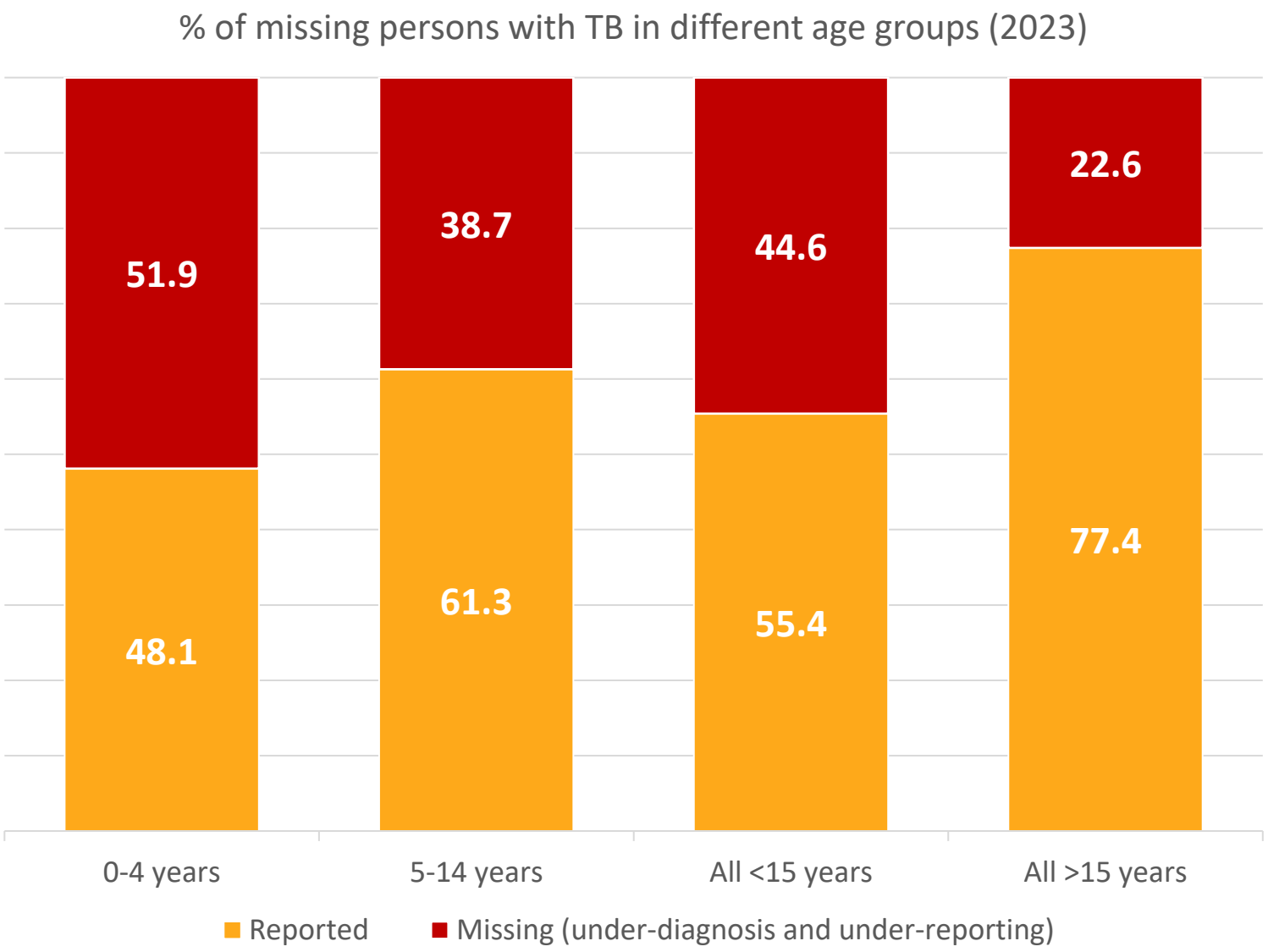
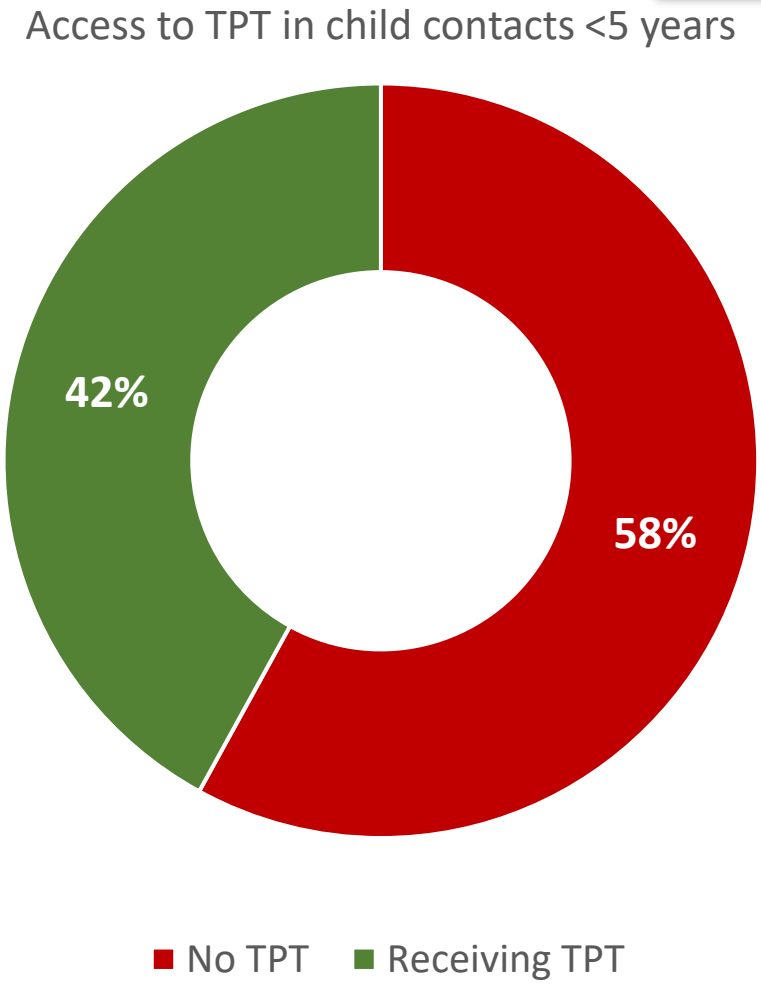
Main gaps based on available data (global)





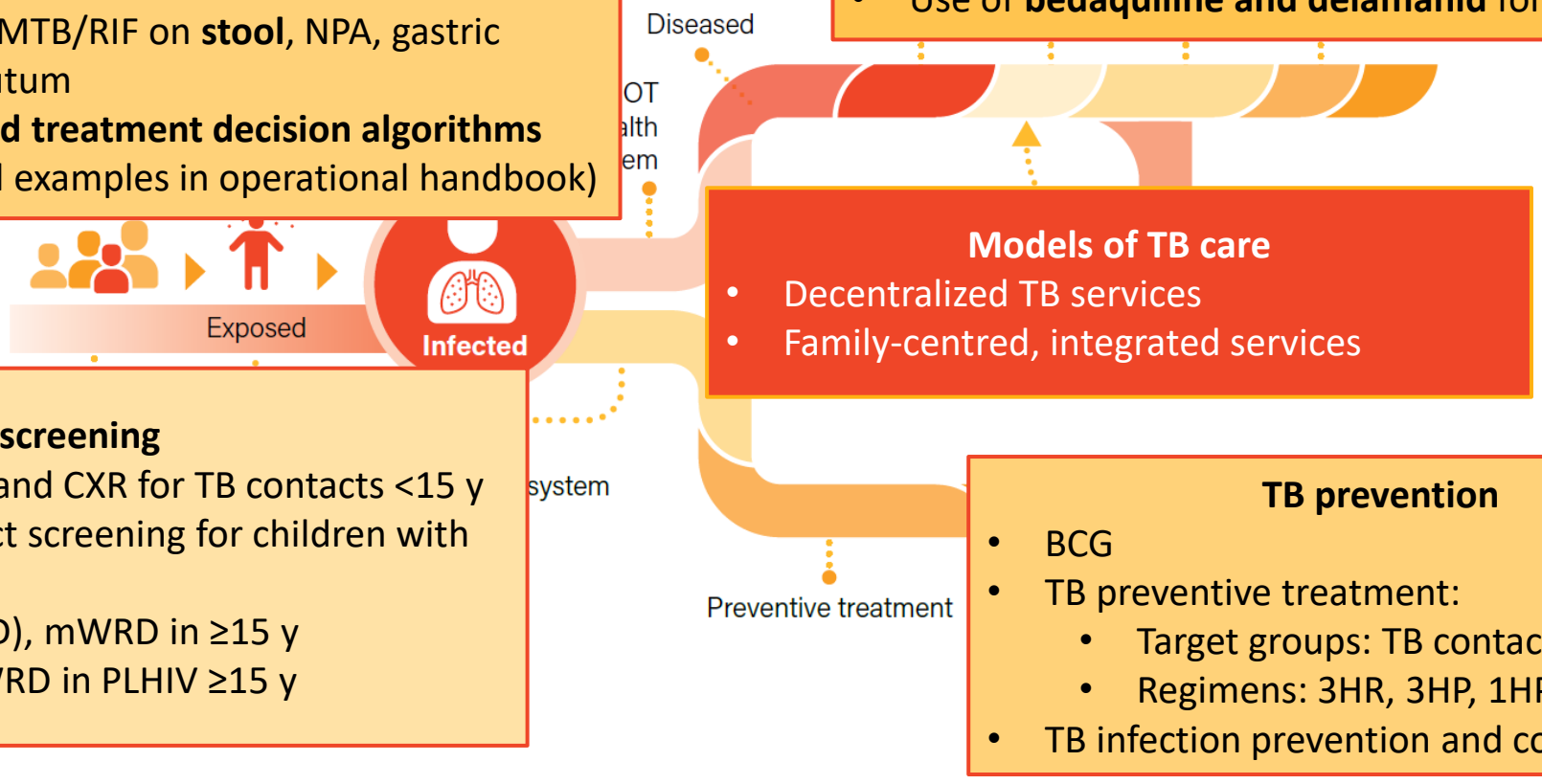
WHO policy guidance

TB treatment

- 4-month regimen (2HRZ(E)/2HR) for **non-severe TB** (3 months – 16 years) – eligibility criteria detailed in operational handbook
- Alternative regimens for **TB meningitis**: 6HRZEto and 2HRZ(E)/10HR
- Use of **bedaquiline and delamanid** for all ages (MDR/RR-TB)

TB diagnostic approaches

- Use of rapid diagnostic tests, including concurrent testing
- Xpert Ultra and MTB/RIF on **stool**, NPA, gastric aspirate and sputum
- Use of **integrated treatment decision algorithms** (evidence-based examples in operational handbook)



Models of TB care

- Decentralized TB services
- Family-centred, integrated services

TB screening

- Symptom screening and CXR for TB contacts <15 y
- Symptom and contact screening for children with HIV < 10 y
- Use of CXR (with CAD), mWRD in ≥15 y
- Use of CXR, CRP, mWRD in PLHIV ≥15 y

TB prevention

- BCG
- TB preventive treatment:
  - Target groups: TB contacts, CALHIV
  - Regimens: 3HR, 3HP, 1HP, 6-9H
- TB infection prevention and control

Guidelines: https://www.who.int/publications/i/item/9789240046764
Handbook: https://www.who.int/publications/i/item/9789240046832
WHO TB Knowledge Sharing Platform: https://extranet.who.int/tbknowledge

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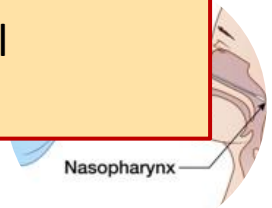
WHO guidance on diagnostic approaches

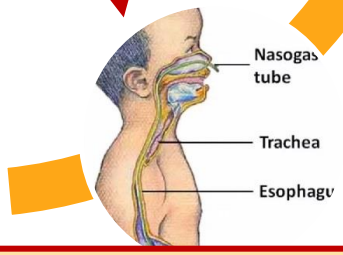
stool

(induced) sputum

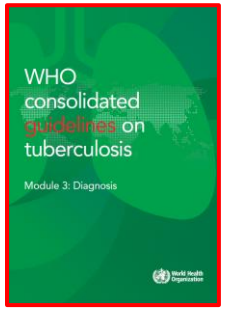
Updated diagnostics guidance (2025):
Parallel testing:
Respiratory specimen + stool
(+ LF-LAM if HIV pos)

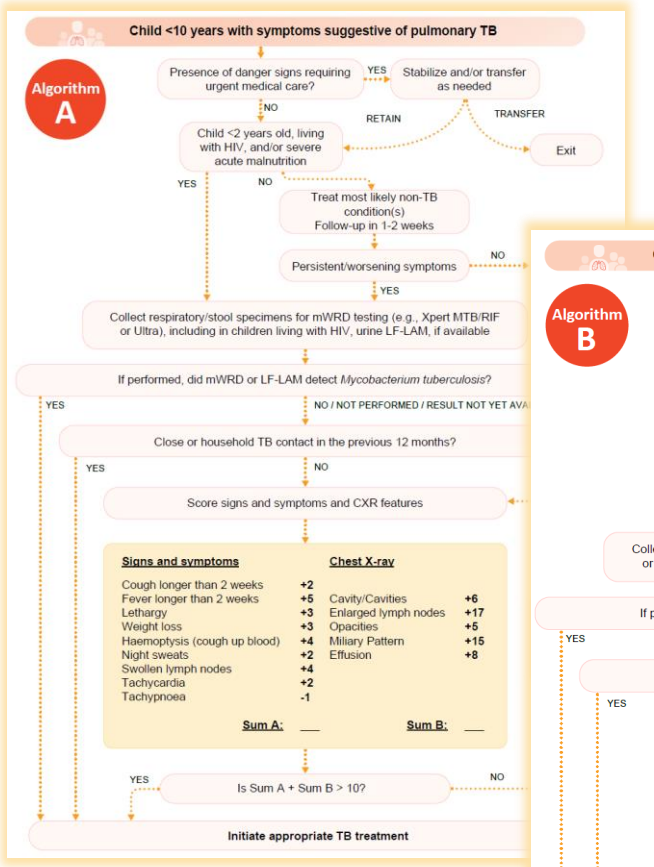


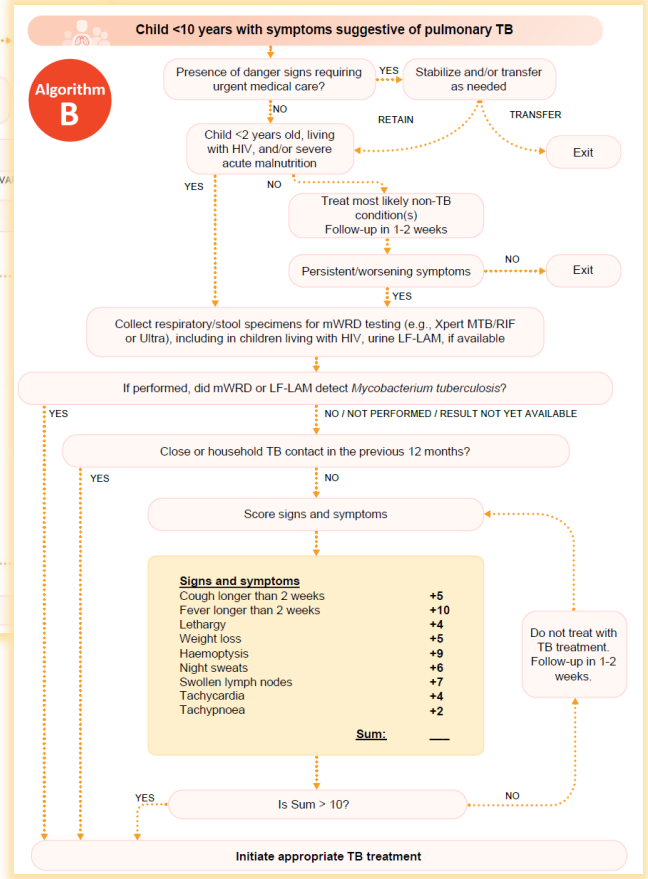
NPA

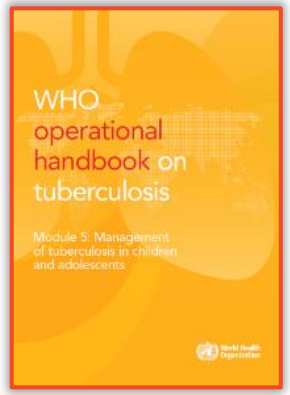


gastric aspirate









Interim recommendation on **TDAs in general** with **evidence-based example TDAs** in the Module 5 Operational Handbook

Diagnostics guidelines: https://www.who.int/publications/i/item/9789240107984
Diagnostics handbook: to be released soon

TDR For research on diseases of poverty
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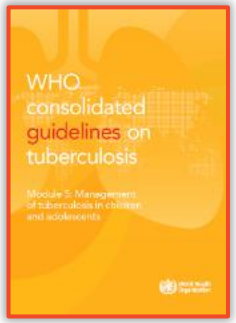
Integrated treatment decision algorithms



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

Child <2 years old, living with HIV, and/or severe acute malnutrition

RETAIN

TRANSFER → Exit

YES

NO → Treat most likely non-TB condition(s) Follow-up in 1-2 weeks

Persistent/worsening symptoms

NO → Exit

YES

Collect respiratory/stool specimens for mWRD testing (e.g., Xpert MTB/RIF or Ultra), including in children living with HIV, urine LF-LAM, if available

If performed, did mWRD or LF-LAM detect *Mycobacterium tuberculosis*?

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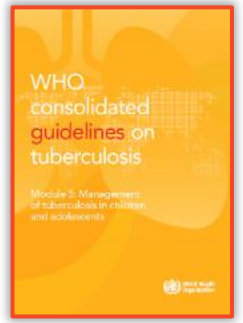
Integrated treatment decision algorithms



Algorithm A

If performed, did mWRD or LF-LAM detect *Mycobacterium tuberculosis*?

YES

NO / NOT PERFORMED / RESULT NOT YET AVAILABLE

Close or household TB contact in the previous 12 months?

YES

NO

Score signs and symptoms and CXR features

Signs and symptoms		Chest X-ray	
Cough longer than 2 weeks	+2		
Fever longer than 2 weeks	+5	Cavity/Cavities	+6
Lethargy	+3	Enlarged lymph nodes	+17
Weight loss	+3	Opacities	+5
Haemoptysis (cough up blood)	+4	Miliary Pattern	+15
Night sweats	+2	Effusion	+8
Swollen lymph nodes	+4		
Tachycardia	+2		
Tachypnoea	-1		

Sum A: ___ **Sum B:** ___

Is Sum A + Sum B > 10?

YES

NO

Initiate appropriate TB treatment

Scoring part:

Sensitivity: 85%

Specificity:

Algorithm A: 37%

Algorithm B: 30%

Additional steps added to improve performance

Algorithms internally validated, external validation ongoing

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External validation of treatment decision algorithms

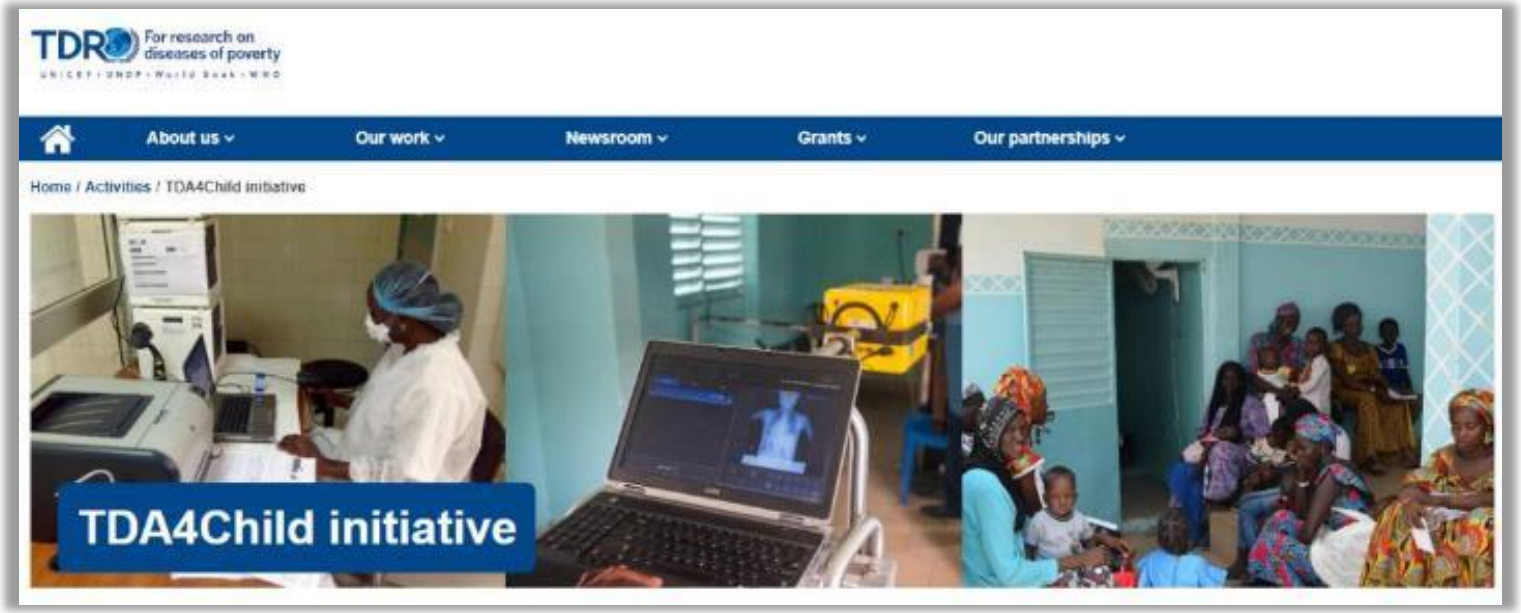

Image: TDR/E. Papot

Aims of TDA4Child:

- To contribute to the **external validation of the TDAs**
- **Harmonisation of research efforts** from NTPs and research groups
- To **guide national TB strategies**
- To **inform global policy guidance**

https://tdr.who.int/activities/TDA4Child-initiative

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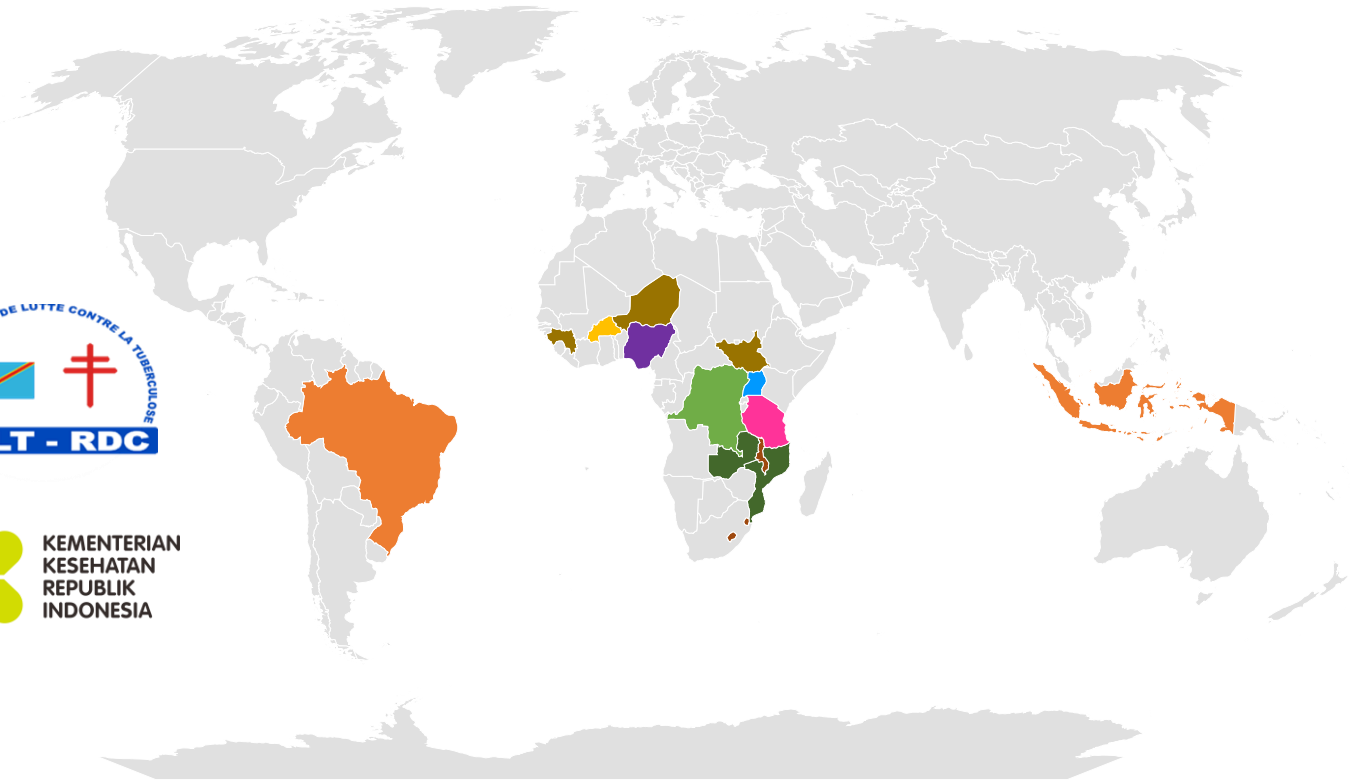
TDA studies as of June 2025

Estimated/expected cohort size: ~20,000



- Local partners
- TDA4Child
- TDA4Child, EDCPT
- TB GAPs
- MSF
- Decide TB
- TDA4Child, MSF
- EDCPT, EGPAF, TB GAPs
- EDCPT, EGPAF, TB GAPs, MSF

Shorter treatment duration in children with non-severe TB

In children and adolescents between 3 months and 16 years of age with non-severe TB (without suspicion or evidence of MDR/RR-TB), a 4-month treatment regimen (2HRZ(E)/2HR) should be used.

*(**Strong** recommendation, moderate certainty of evidence)*

SHINE: Shorter Treatment for Minimal Tuberculosis in Children

Remarks:

- ***Non-severe TB*** *is defined as: Peripheral lymph node TB; intrathoracic lymph node TB without airway obstruction; uncomplicated TB pleural effusion or paucibacillary, non-cavitary disease, confined to one lobe of the lungs, and without a miliary pattern*
- *Children and adolescents who* ***do not meet the criteria for non-severe TB*** *should receive the standard 6-month treatment regimen (2HRZE/4HR), or recommended treatment regimens for severe forms of EPTB*
- *The use of* ***ethambutol*** *in the first 2 months of treatment is recommended in settings with a high prevalence of HIV, or of isoniazid resistance*

Standard first-line medicines; continuation phase reduced to 2 months

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Assessing eligibility for the 4-month regimen

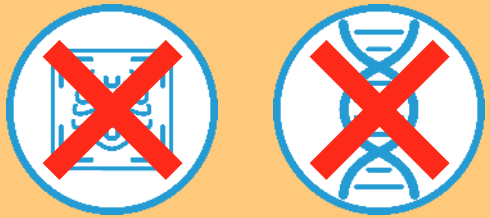
Main considerations:
Access to CXR and bacteriological testing, clinical assessment

3m-16y

- Based on CXR features
- Xpert MTB/RIF or Ultra neg, trace or (very) low
- Mild symptoms not requiring hospitalization

3m-16y

- Xpert MTB/RIF or Ultra neg, trace or (very) low (PTB) or isolated peripheral lymph node TB
- Mild symptoms not requiring hospitalization



<10y

- Isolated peripheral lymph node TB
- Mild symptoms not requiring hospitalization

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Eligibility for the 4-month regimen for non-severe TB

Main considerations: Access to CXR and bacteriological testing, clinical assessment.

Mild symptoms:

- no danger signs, no asymmetrical and persistent wheezing, no signs of EPTB (other than lymph node TB)
- no severe acute malnutrition, respiratory distress, high fever, severe pallor, restlessness, irritability or lethargy

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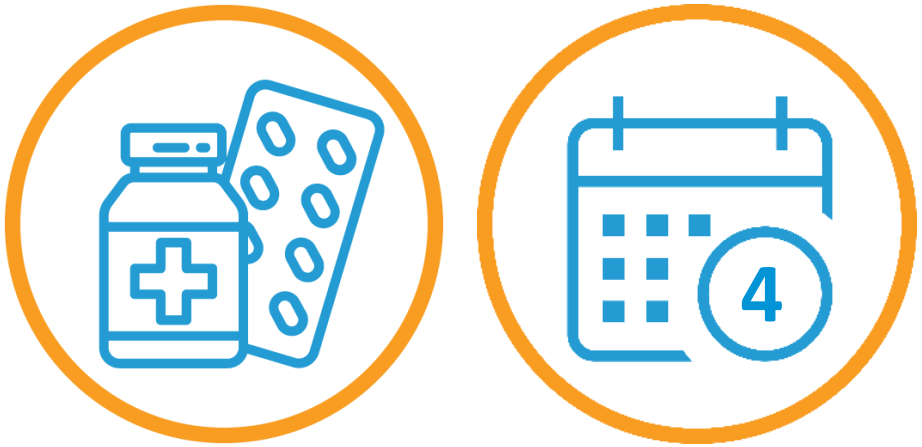
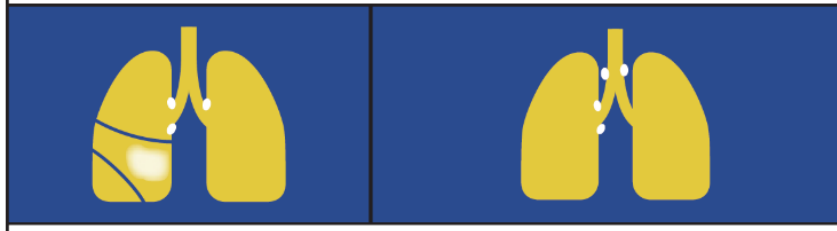
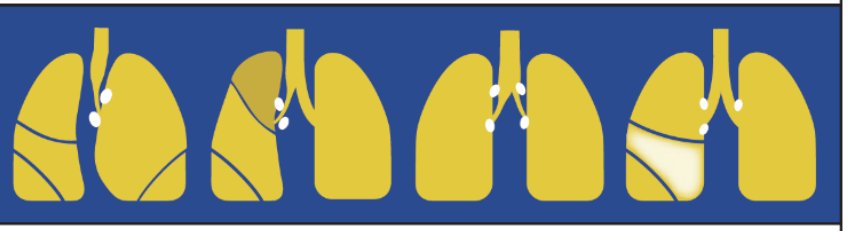
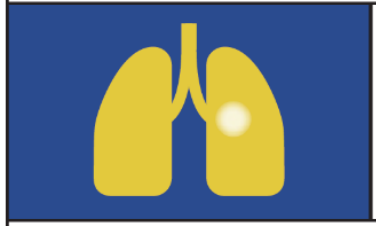
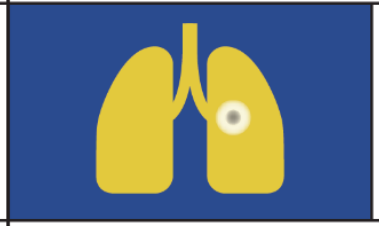
Follow up after starting the 4-month regimen without CXR

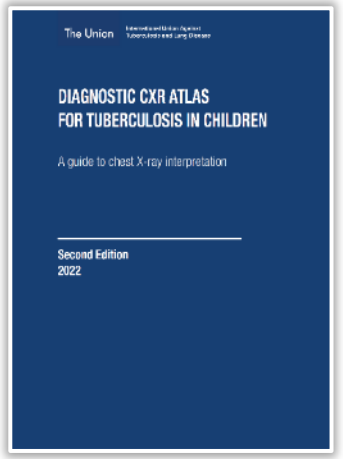


Children and adolescents started on 4-month regimen without CXR:

- follow up monthly
- symptoms expected to have resolved within 1 month
- expected to be well at 4 months (including nutritional status)
- continue treatment for 6 months if no response clinically after 4 months; evaluate for DR-TB, non-TB-related disease and poor treatment adherence

Assessing severity: CXR

Non-Severe	Severe
Uncomplicated lymph node disease	Complicated lymph node disease
	
Primary (Ghon) focus	Primary (Ghon) focus with cavitation
	
Simple pleural effusion	Complicated pleural effusion
	



Diagnostic CXR atlas for paediatric pulmonary tuberculosis: a guide to chest X-ray interpretation to diagnose paediatric tuberculosis, second edition.
https://theunion.org/technical-publications/diagnostic-cxr-atlas-for-tuberculosis-in-children
With image library

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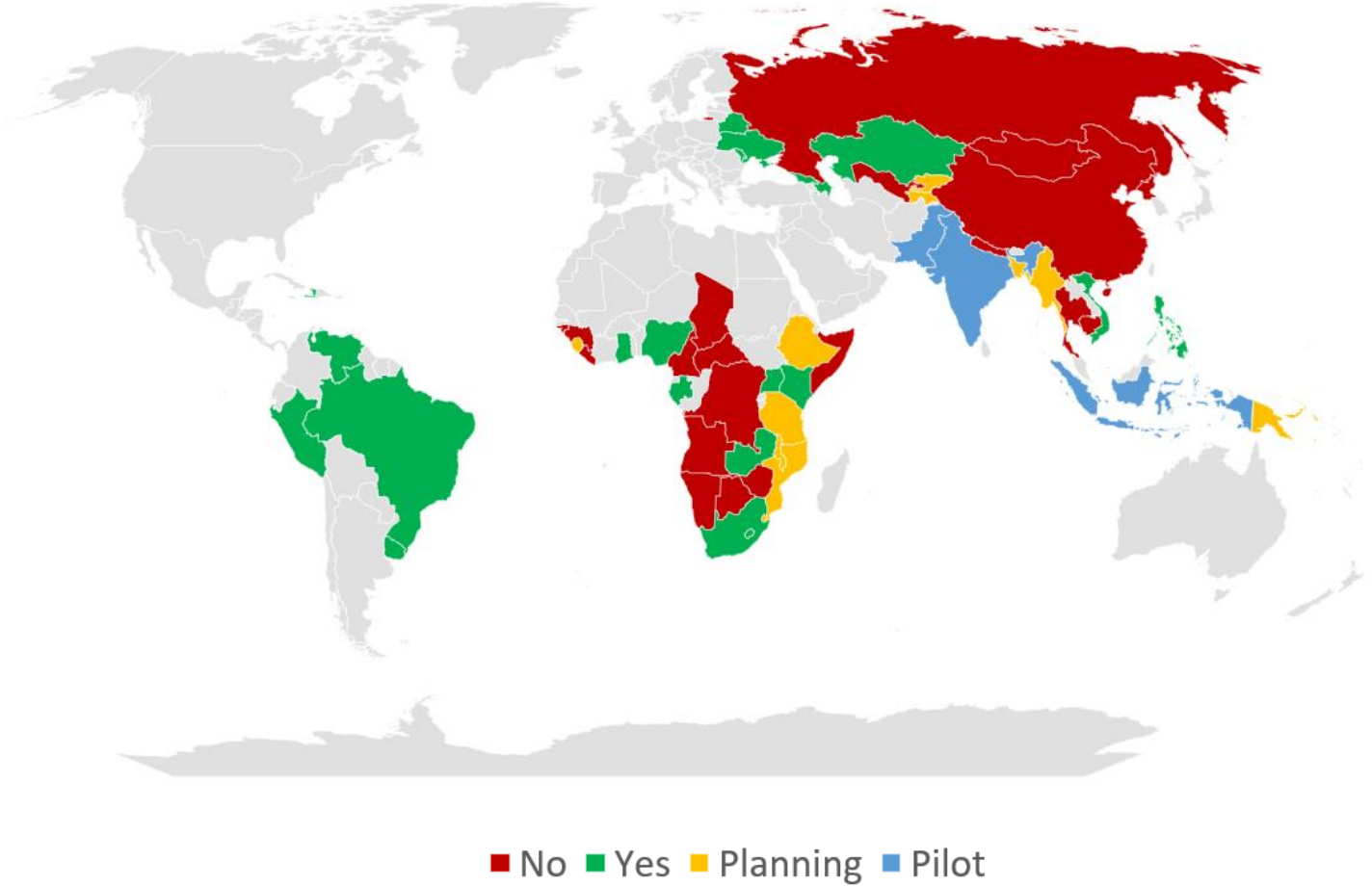
Implementation research on short regimen for non-severe TB

- Limited implementation up to 2024*
- Many countries consulting widely to determine practical guidance on how to assess eligibility/severity in programmatic settings
- TDR/GTB developing an implementation research package
  - Evaluation of the adoption, fidelity, feasibility, acceptability, efficiency and cost impact of the four-month regimen for non-severe DS-TB in children and adolescents 3 months - 16 years



** Information may not be fully up to date!*



Acknowledgements

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Thank you for your attention!

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