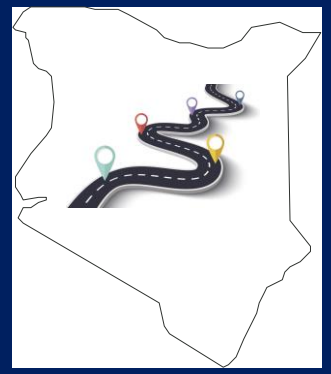
# Introducing the 4-month regimen for children and adolescents with non-severe TB in Kenya: implementation experiences

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Lorraine Mugambi-Nyaboga, CHS


REPUBLIC OF KENYA

MINISTRY OF HEALTH

Ministry of Health

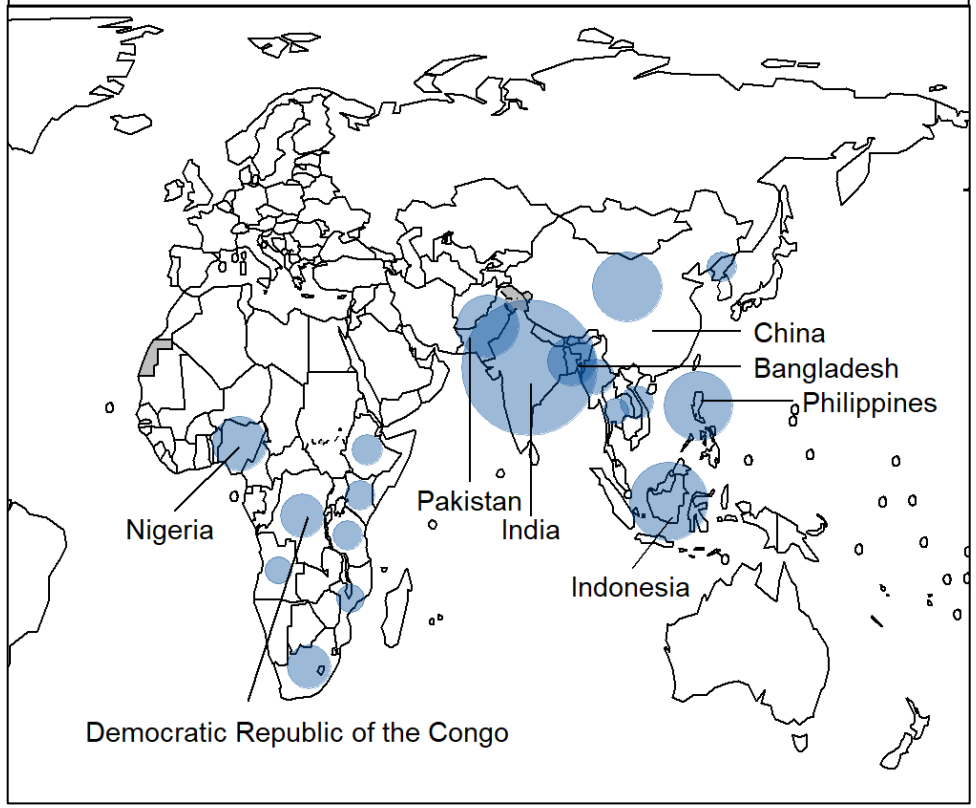
National Tuberculosis, Leprosy and Lung Disease Program


Annual meeting of the Child and Adolescent TB Working Group.

14th November 2023. Paris, France

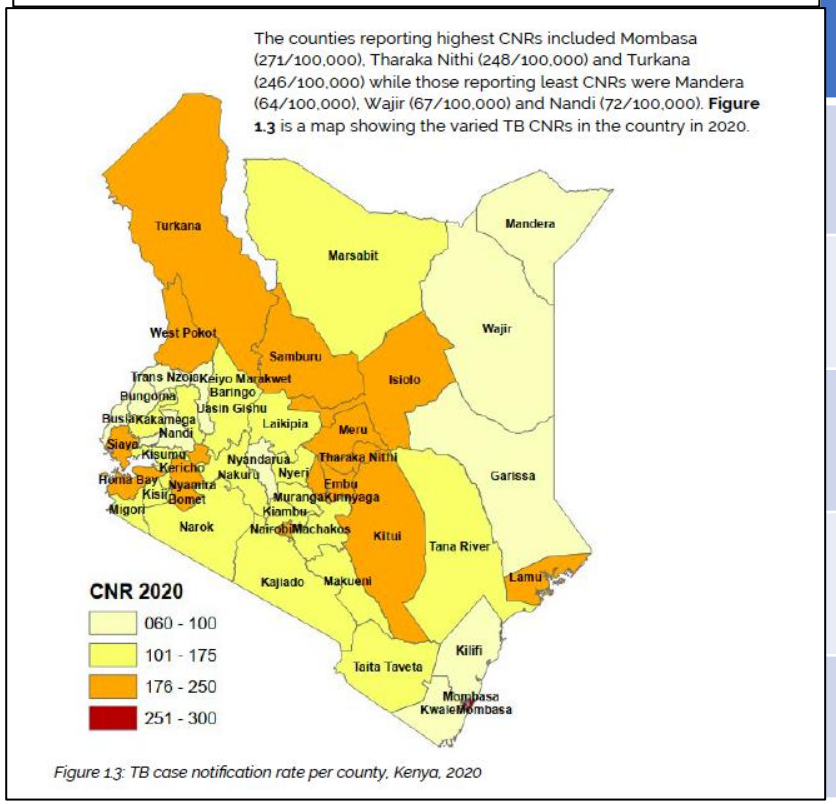
# This is Kenya – Demographics, TB burden

**Gobal TB Report 2022. No. of incident TB cases in top 30 countries globally.**




Among top 30 TB burden countries in the world
EIGHT ARE IN AFRICA, INCLUDING KENYA

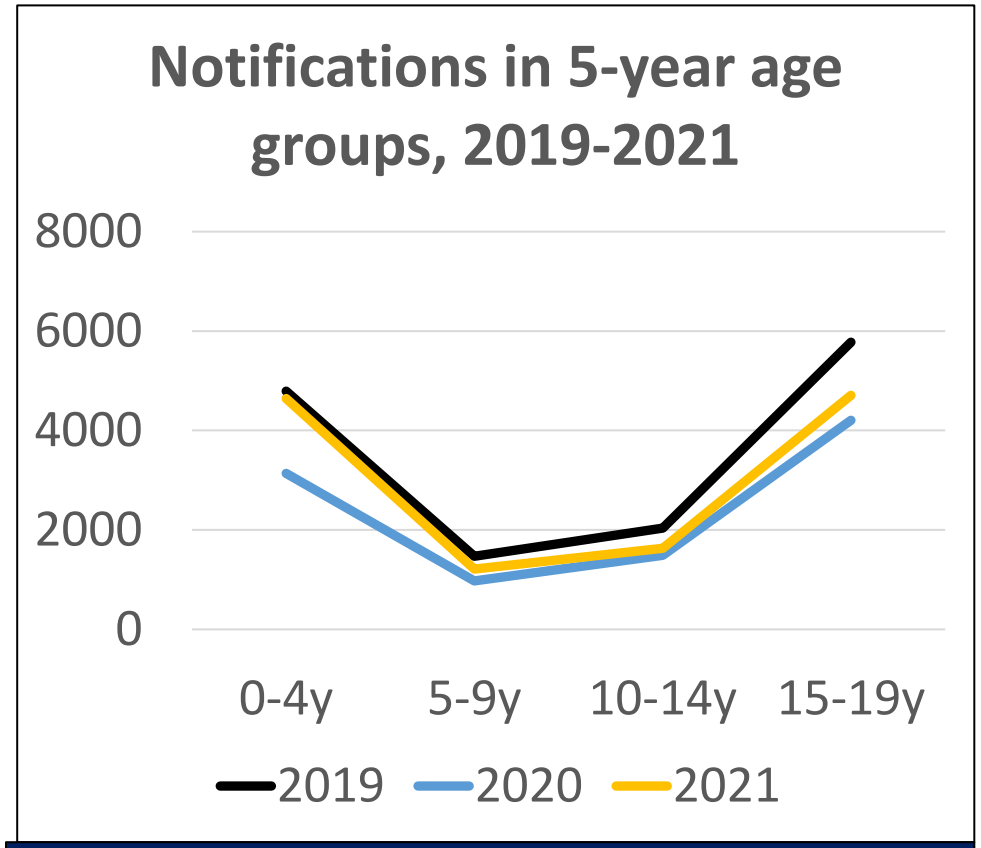
**Kenya TB case notification rate 2020.**
**251 (152-373) per 100,000**



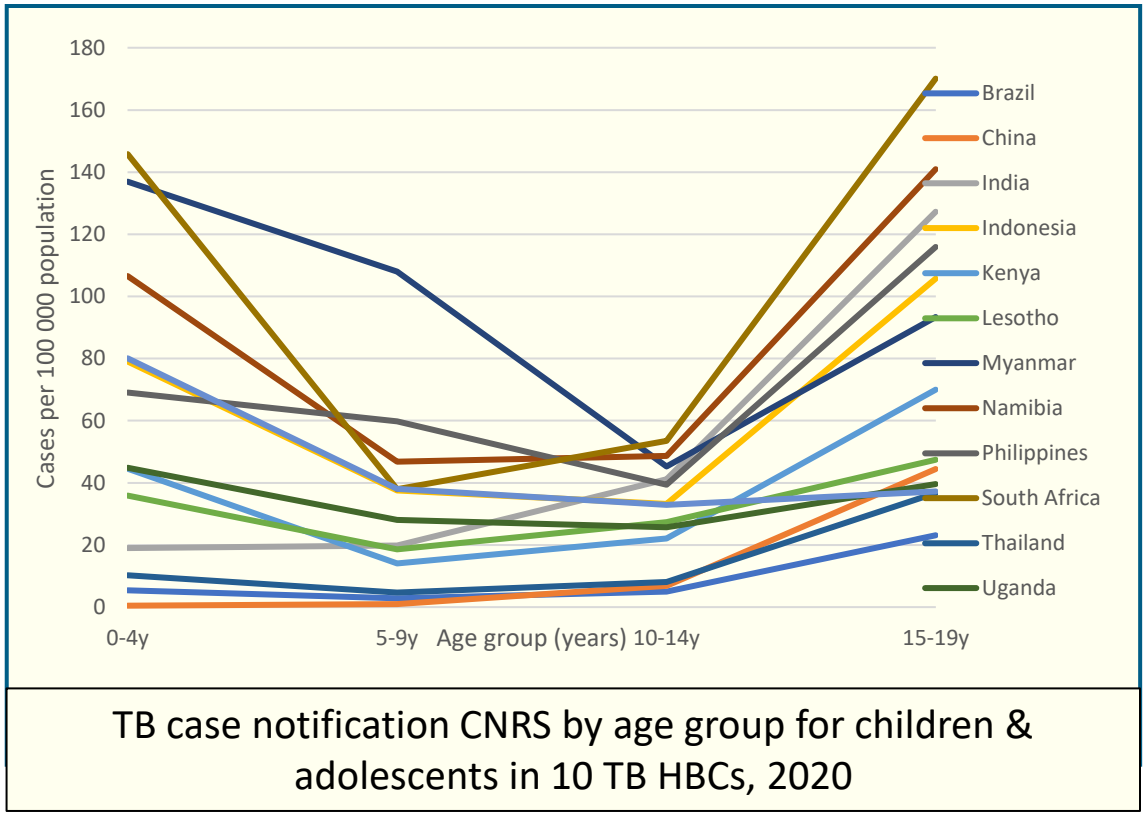

High level of TB in most counties in Kenya

| Demographic Characteristic | Detail |
|---|---|
| Population | 54 million |
| Median Age | 19 years |
| Life Expectancy | 63 years |
| Fertility rate | 3.2 live births per woman |
| Under 5 mortality rate | 36 per 1000 |

# TB in children and adolescents in Kenya
# Highest hit age groups: children <5yr, older teenagers 15-19



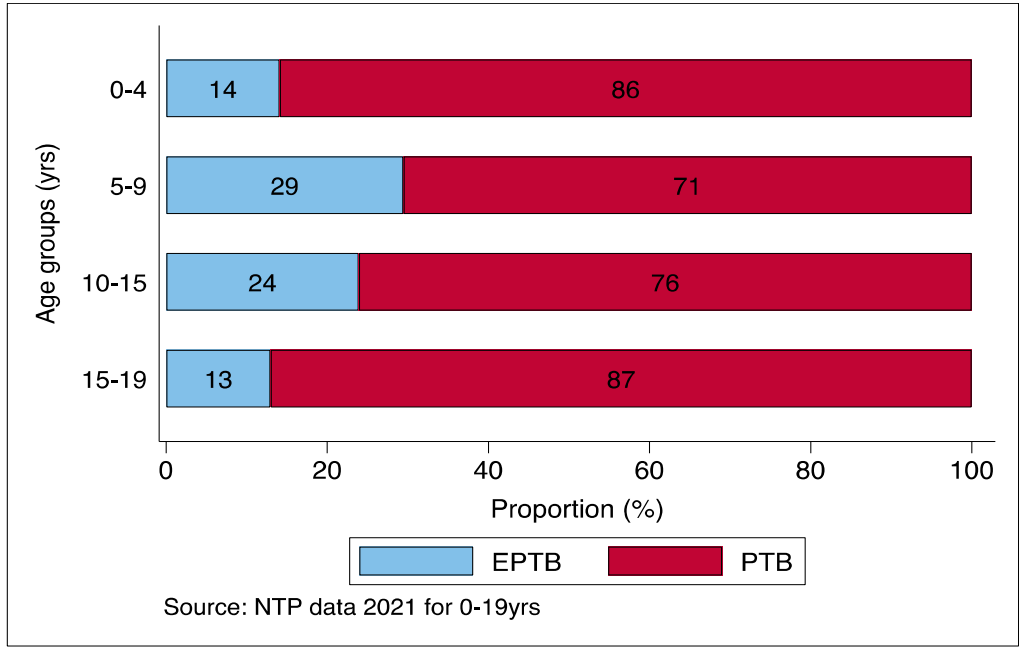

***In Kenya, highest no cases 0-5yr and 15-19yr old***

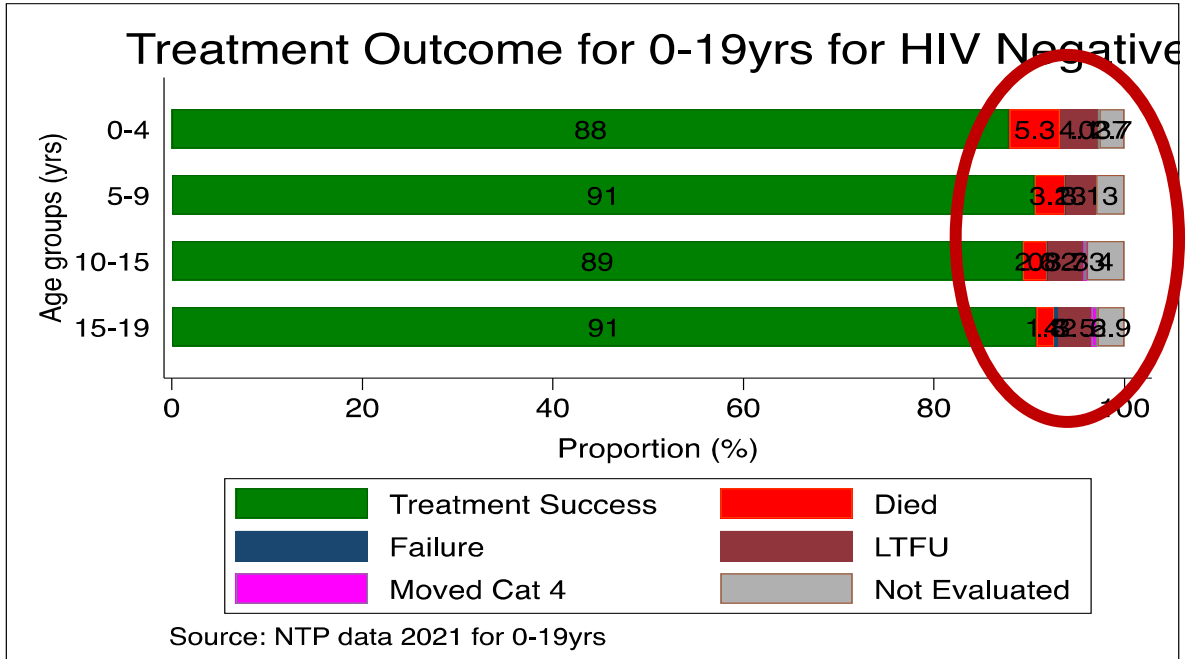


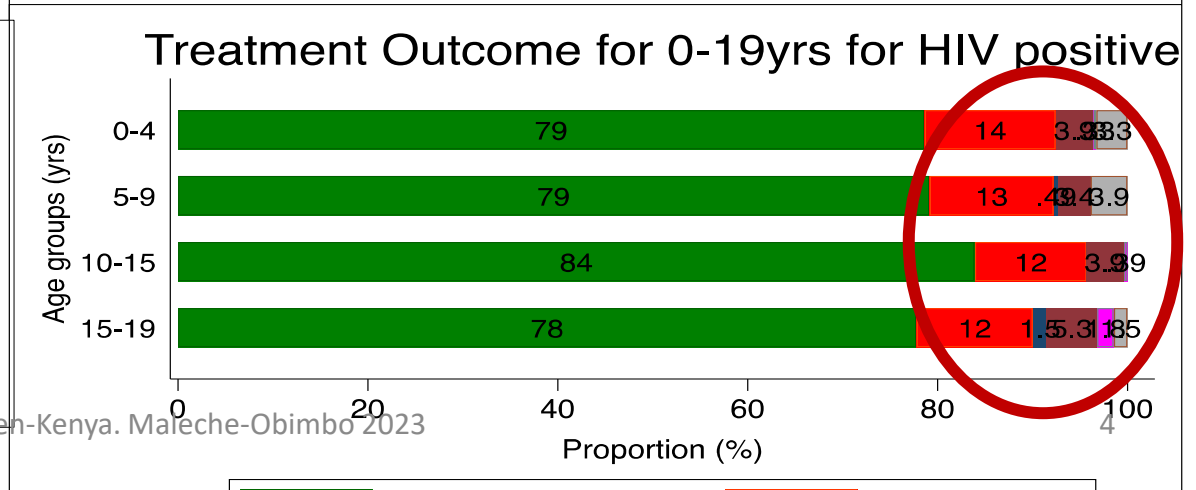

TB case notification CNRS by age group for children & adolescents in 10 TB HBCs, 2020

***10 high burden TB countries globally: highest no cases: U5yr and older teens***

# Type of TB, Treatment Outcomes: 0 – 19 years, Kenya 2021




**Pulmonary TB:** 71% to 87%

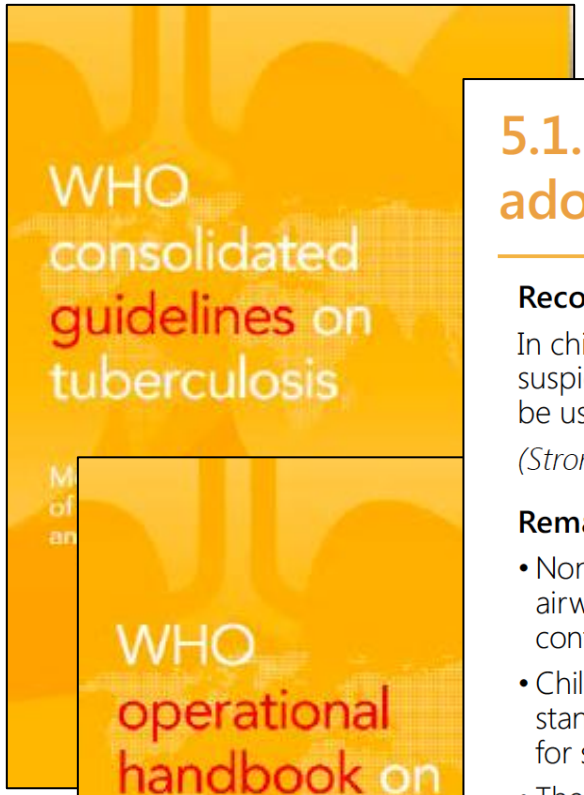
**Treatment success <15 yrs**

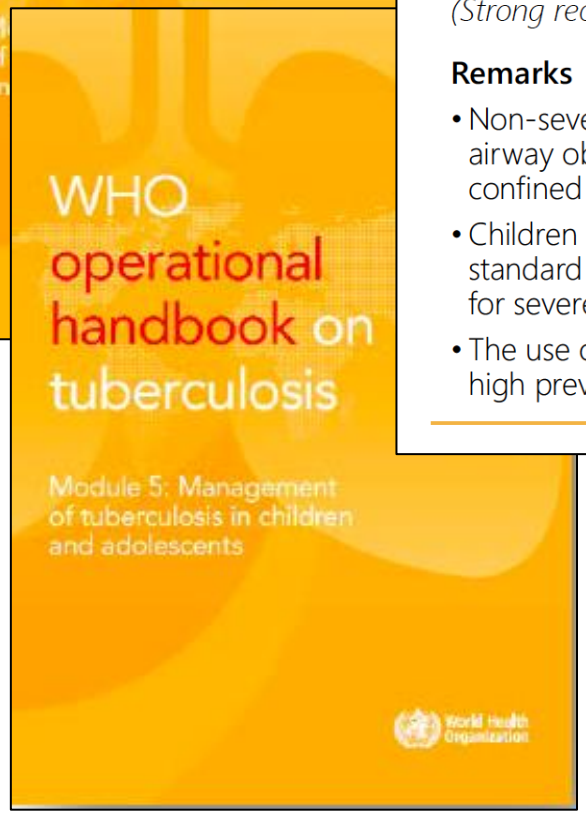
All: 87.5%. HIV+: 80.9%

**Death HIV neg**: 1.4 (15yr+) to 5.3% (U5s)

**Death HIV pos:** 12.1 (15y+) to 14.0% (U5s)

# Updated Guidelines on Management of TB in Children & Adolescents: *W.H.O. 2022*




## 5.1. Treatment shortening in children and adolescents with non-severe TB

**Recommendation:**

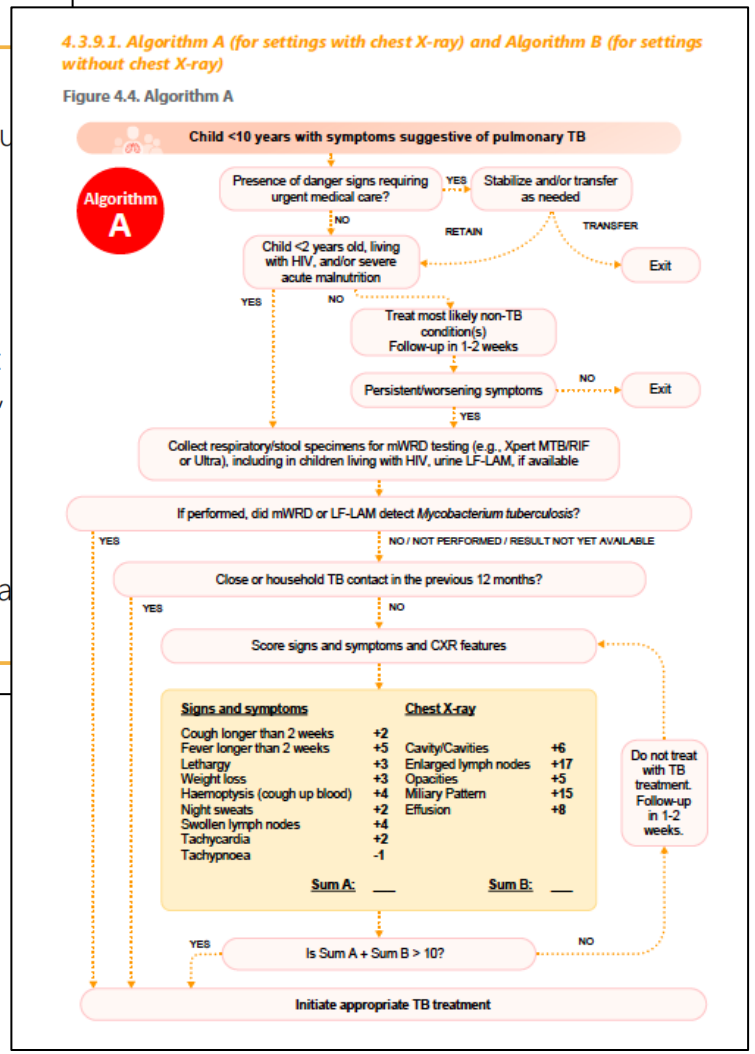
In children and adolescents between 3 months and 16 years of age with non-severe TB (without suspicion or evidence of MDR/RR-TB), a 4-month treatment regimen (2HRZ(E)/2HR) should be used.

*(Strong recommendation, moderate certainty of evidence)*

**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 six-month treatment regimen (2HRZE/4HR), or recommended treatment regimens for severe forms of extrapulmonary TB.
- The use of ethambutol in the first two months of treatment is recommended in settings with a high prevalence of HIV,[26] or of isoniazid resistance.[27]

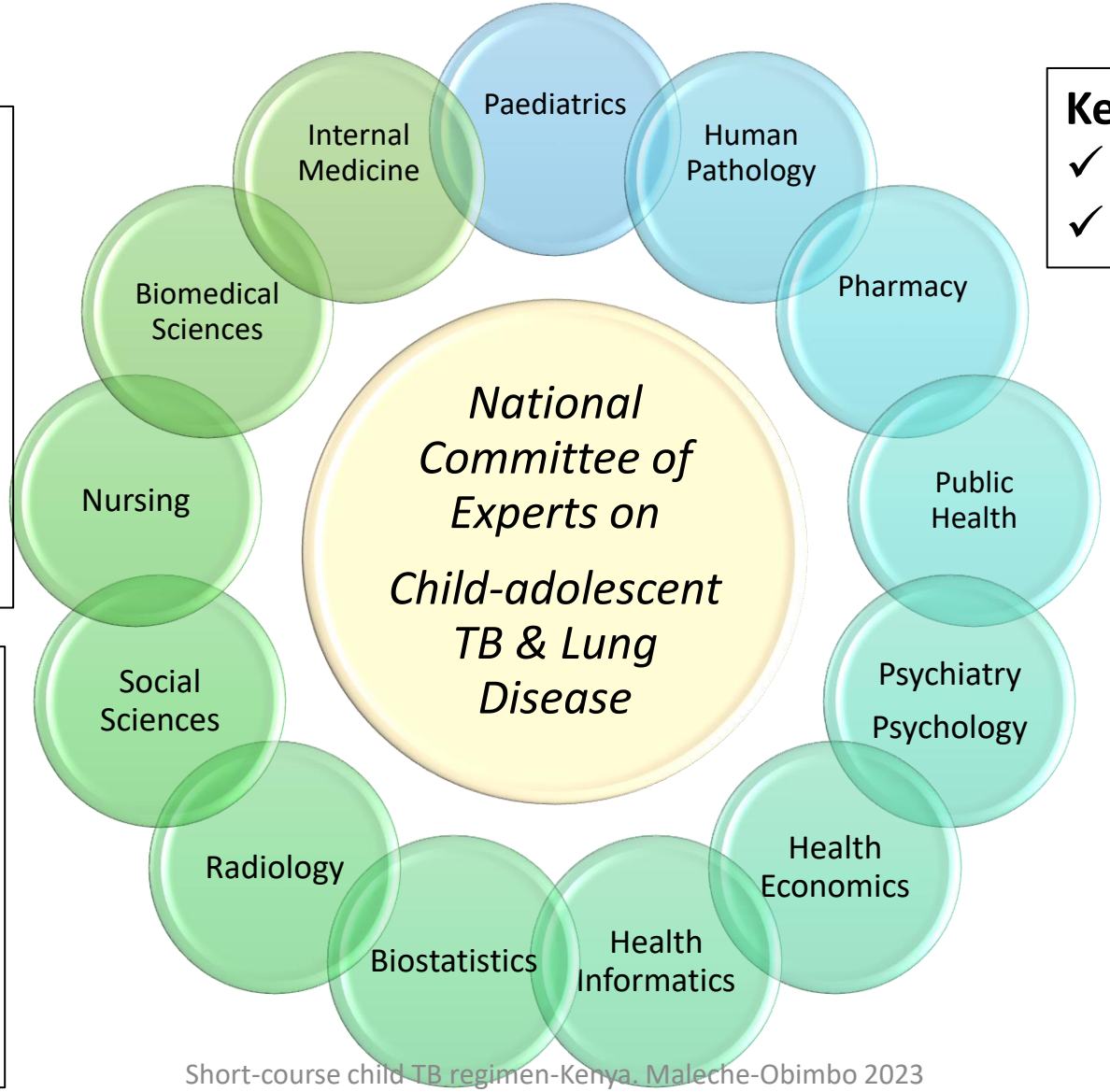
**https://www.who.int/health-topics/tuberculosis**



# *Kenya National Committee of Experts (CoE) on Child-adolescent TB & Lung Disease: Driver of Adaptation*

**National TB / Lung Program**
- ✓ Head NTLP
- ✓ Paed focal person (Dr)
- ✓ Commodity
- ✓ Laboratory
- ✓ M & E
- ✓ Logistics

**Academia - Universities**
- ✓ Paediatric Pulmonologist,
- ✓ Implementation Scientist
- ✓ Infectious Dx specialists




**Kenya Ministry of Health**
- ✓ National AIDS Program
- ✓ Division of Child/Adol Health

**Kenya Medical Research Institute**
- ✓ Researchers in Child TB (Paed IS)

**Development Partners**
- ✓ CHS-TB ARC (CHS)
- ✓ Global Fund
- ✓ WHO – TB focal person

# Overview of the steps taken in review new WHO guidelines, and adaptation for Kenya paediatric guidelines

## Step 1

**Child-adolescent TB Committee of Experts (COE)**

*July to August 2022*

Virtual & Face-to-face meetings

Familiarisation and Discussion of the WHO 2022 recommendations

## Step 2

**Data Synthesis & Guideline adaptation**

**Experts & Implementers**

**3-day on-site workshop**

*Sept 2022 (3-days)*

Reviewed evidence for new guidelines

Analysed Local National Data

Examined local relevant guidelines

**Adapted Kenya guideline**

## Step 3

**Sensitised wider stakeholders new algorithms & short-course TB treatment for children**

**Half day meeting (on-site + virtual) Oct 2022**

Presentation of the algorithm and proposed short-course TB treatment regimen to wider audience of stakeholders

- County representatives TB, TB-HIV
- Other MoH units – child health
- Faith based & Private Health Providers
- TB/lung Experts
- Patient communities, CSOs
- Professional associations
- Private Health Providers
- Other partners

# Data Synthesis & Guideline adaptation
# Experts & Implementers
## 3-day on-site workshop


**Paediatricians from CoE, Academia**
Prof Maleche-Obimbo *(Pulmonologist)*
Dr Jacquie Oliwa *(Implememtation scientist)*


- Reviewed evidence for new guidelines
- Analysed Local National Data
- Examined local relevant guidelines
- **Adapted Kenya paediatric TB guidelines**

# WHO guide: How to decide which child gets 4 vs 6 mth TB regimen:

**Box 5.3 Eligibility criteria for the 4-month regimen (2HRZ(E)/2HR) in children and adolescents aged between 3 months and 16 years with non-severe pulmonary or peripheral lymph node TB in various settings**

In children and adolescents who have undergone bacteriological testing and CXR, a 4-month treatment regimen should be started in children and adolescents meeting all of the following three criteria:

- CXR findings consistent with non-severe TB (CXR should ideally be done at baseline, but it can be performed at any point during the treatment course):
  - intrathoracic lymph node TB without significant airway obstruction; or
  - PTB confined to one lobe with no cavities and no miliary pattern; or
  - uncomplicated pleural effusion (without pneumothorax or empyema);
- TB that is negative, trace, very low or low using Xpert MTB/RIF or Ultra, or sputum smear-negative (if Xpert MTB/RIF or Ultra not available);
- the child or adolescent has mild TB symptoms that do not require hospitalization. [a]

## Microbiologic tests

*Ability to classify as…*

- "Paucibacillary" Xpert or ultra (trace, very low, low)
- or bacteriologic negative by sputum smear or xpert

## INVESTIGATIONS TO DECIDE (WHO 2022)

## Chest x-ray

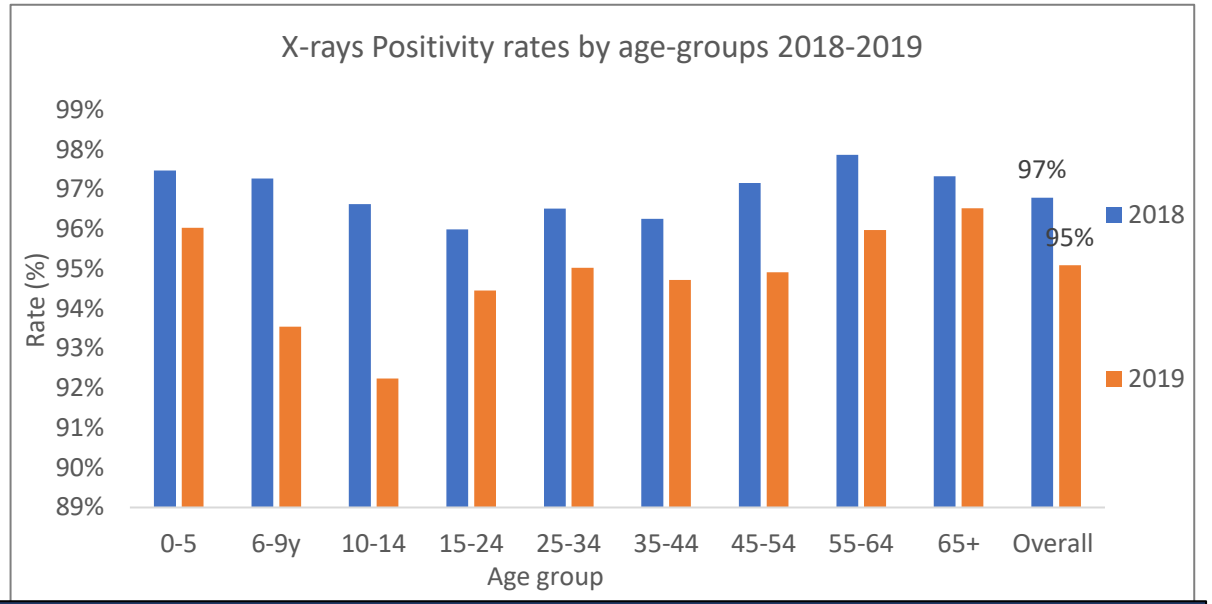
*Ability to identify the following pathology in the child's CXR….*

- Intrathoracic LN no airway compression
- Pleural effusion "uncomplicated",
- No of lobes with pathology – one
- Rule out miliary pattern
- Be sure no cavitation

REPUBLIC OF KENYA

MINISTRY OF HEALTH

# How useful was CXR for TB diagnosis in Children & Adolescents in Kenya? Kenya 2019 CXR Data




| Age group | Total Patients 2019 | X-rays Done 2019 | X-ray Uptake (%) | Positivity rate (%) |
|---|---|---|---|---|
| **0-5** | 5118 | 3380 | **66%** | **96%** |
| **5-9** | 1141 | 589 | **52%** | **94%** |
| **10-14** | 2057 | 851 | **41%** | **92%** |
| **15-24** | 15056 | 4039 | 27% | 94% |
| **25-34** | 21945 | 6329 | 29% | 95% |
| **35-44** | 18479 | 6058 | 33% | 95% |
| **45-54** | 10842 | 3953 | 36% | 95% |
| **55-64** | 5645 | 2309 | 41% | 96% |
| **65+** | 5537 | 2735 | 49% | 97% |
| **Overall** | **85820** | **30243** | **35%** | **95%** |

What % of children with presumed TB got CXR?

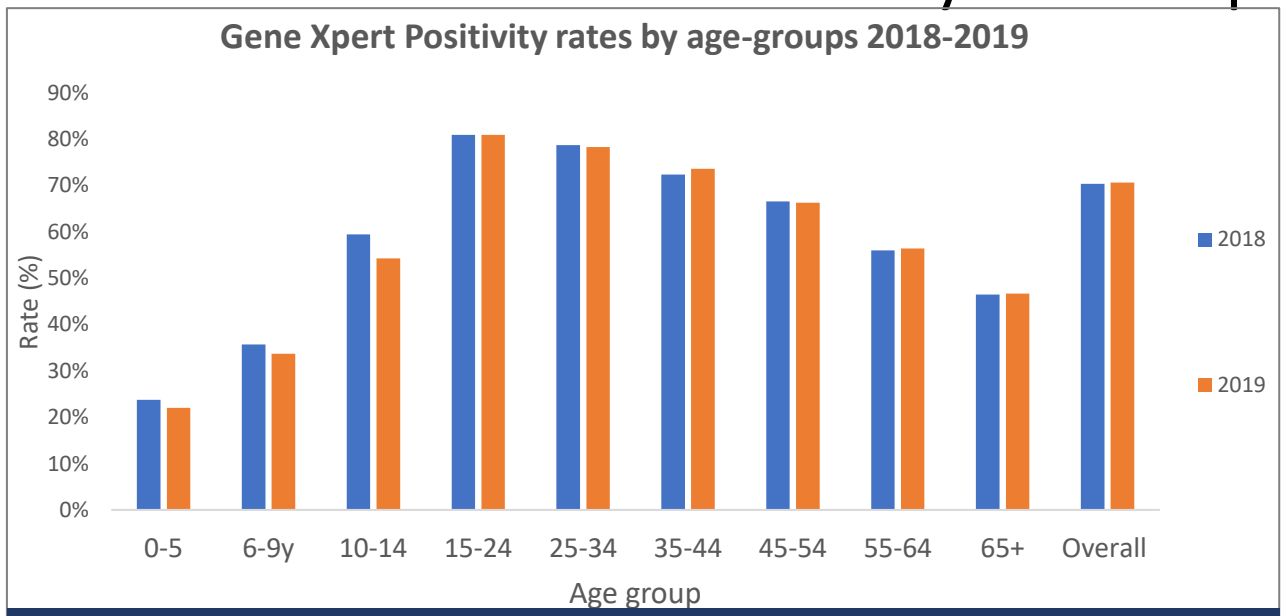
<5 yrs: 66%

5 – 9 yrs: 52%

10 – 14 yrs: 41%

***Half to one-third of children & adolescents <15 yr with presumed TB DID NOT HAVE CXR ACCESS. This may delay TB treatment decision***

# How useful was Xpert for TB diagnosis in Children & Adolescents in Kenya? Kenya 2019 Xpert Data



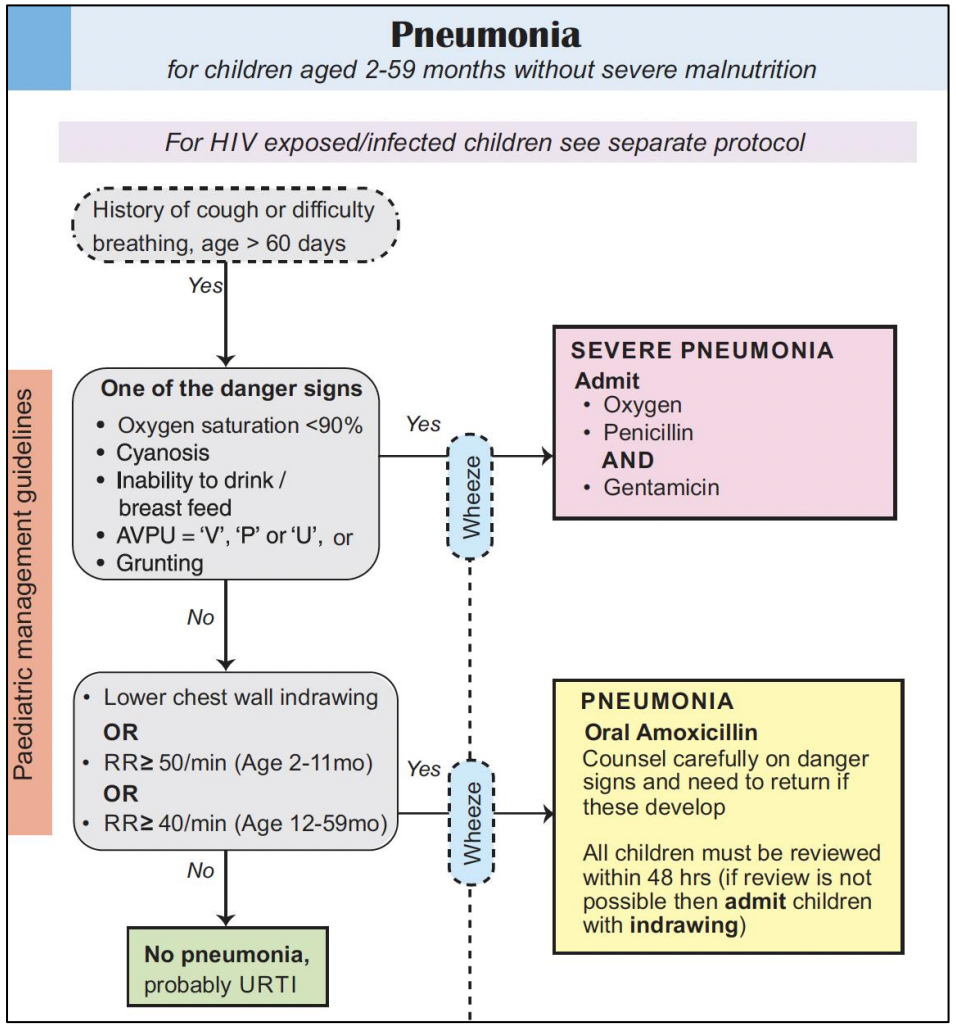

What % of children with presumed TB got an Xpert test?

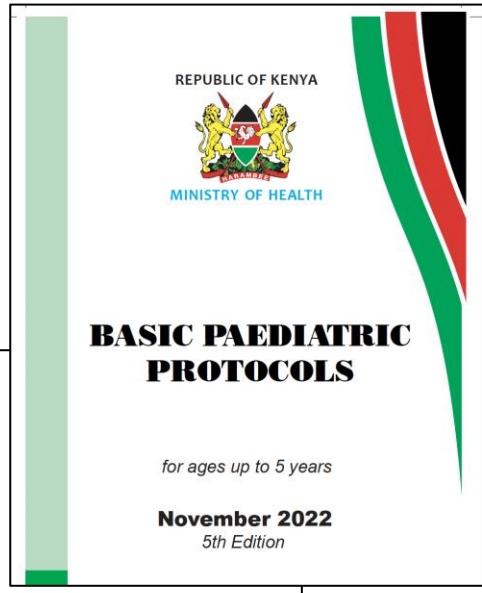
| | |
|---|---|
| <5 yrs: | 22% |
| 5 – 9 yrs: | 42% |
| 10 – 14 yrs: | 55% |

| Age group | Total Patients 2019 | Xperts Done 2019 | Xpert Uptake (%) | Positivity rate (%) |
|---|---|---|---|---|
| **0-5** | 5118 | 1103 | **22%** | **22%** |
| **5-9** | 1141 | 481 | **42%** | **34%** |
| **10-14** | 2057 | 1126 | **55%** | **54%** |
| **15-24** | 15056 | 9770 | 65% | 81% |
| **25-34** | 21945 | 14658 | 67% | 78% |
| **35-44** | 18479 | 12380 | 67% | 74% |
| **45-54** | 10842 | 7007 | 65% | 66% |
| **55-64** | 5645 | 3529 | 63% | 56% |
| **65+** | 5537 | 3389 | 61% | 47% |
| **Total** | **85820** | **53443** | **62%** | **71%** |

***50 to 80% of children & adolescents <15 yr with presumed TB NOT ABLE TO GET SPECIMEN TO XPERT LAB. MTB DETECTION LOW (14% BC overall).***
***TB treatment decision based on clinical +/- CXR for majority***

# Classifying severe respiratory disease in child Kenya MoH paediatric protocols – IMCI/ETAT




**Severe respiratory disease:**

- Cyanosis, SPO2 <90%
- Chest wall indrawing
- Grunting, increased work of breathing

**Other danger signs indicating severe illness:**

- Unable to drink/breastfeed
- Drowsy/reduced consciousness (AVPU <A)
- Signs of shock

# Kenya 2023: Proposed treatment regimens for children 10 years and below

**** All children 11 years and above will require the 6 month regimen***

| | Eligibility for 4 month regimen | Eligibility for 6 month regimen | Eligible 12 month regimen |
|---|---|---|---|
| **Type of TB** | Non-severe Pulmonary TB<br>Peripheral LN TB | Severe Pulmonary TB<br>Extra Pulmonary TB *(excluding TB meningitis, Osteoarticular and peripheral LN TB)* | TB Meningitis<br>Osteo-articular TB |
| **Indicators of severity** | Stable enough to be managed as an outpatient | All hospitalised patients | Any setting |
| | No danger signs | A sick child at diagnosis with any danger sign<br><br>**Respiratory danger signs:** In respiratory distress (oxygen saturation <90%, cyanosis, grunting, chest in-drawing) | |
| **Immune status** | Is HIV negative, not severely malnourished, not immune suppressed | Infants < 1yr (immature immune system),<br>HIV positive, severe malnutrition,<br>any immunosuppressed child | |
| **Bacteriologic status** *(where available)* | Bacteriologically negative OR<br>Clinically diagnosed TB | Bacteriologically confirmed<br>Drug-susceptible TB | |
| **Treatment regimen** | **4 month regimen: 2HRZE/2HR** | **6 month regimen: 2HRZE/4HR** | **12 month regimen 2HRZE/10HR** |

- ***If the child has known contact with a person with drug-resistant TB, this table does not apply….***
- ***Start the child on treatment as per the Drug-Resistant TB guidelines***

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# Implementation Steps: Short-course TB regimens for children (& revised clinical diagnostic algorithm)

| **Addendum to TB guidelines**<br>**Revise tools, training material**<br>**Commodity planning** | **Endorsement by TB Interagency Coordinating Committee** | **Sensitisation & Dissemination**<br>**Professional Societies via Conferences, Webinars** | **Piloting new algorithm**<br>**Training HCWs**<br>**Launch & Roll-Out Country-wide** |
|---|---|---|---|
| *Workshops*<br>*Q4 2022 to Q2 2023* | *Meeting*<br>*Nov 2022* | *Conferences, webinars*<br>*Q4 2022 to Q4 2023* | *Piloting Q4 2022 to Q2 2023*<br>*Launch & Roll out Q4 2023* |
| Incorporate input from the COE/stakeholder forum to the algorithm and regimen proposals<br><br>Draft an addendum to the current guidelines<br><br>Review reporting tools<br>Develop training material for sensitisation and dissemination<br><br>Commodity planning | Endorsement by the TB ICC<br><br>Adoption of the guideline addendum & revised tools | Respiratory Society of Kenya - November 2022 (400)<br><br>Pan-African Thoracic Society - June 2023 (500)<br><br>Paediatric Association Congress – April 2022 (500)<br><br>Infectious Disease Society Conference – October 2023 (600)<br>**TOTAL: 2000 pax** | Pilot diagnostic algorithm selected counties Q4 2022 – Q2 2023<br><br>Lessons used to fine-tune tools.<br>CoE final review Q3 2023<br><br>Trainer of trainers, cascade to health teams country-wide<br><br>Official launch, nationwide awareness Nov 2023<br><br>**Roll out of the shorter regimen December 2023** |

# A Call to ACTION!

## It's time to WIN THE BATTLE and END TB in children and adolescents!!

Courtesy of NTLP. FAQs child TB. www.chskenya.org

# Acknowledgements & Appreciation


***To the guidelines adaptation team***

***Special appreciation***

*Kenya NTLP team*

- Dr Jacqueline Kisia
- Dr Immaculate Kathure
- Ms Druscilla Nyaboke (M&E)

*CHS TB-ARC*

Dr Lorraine Mugambi-Nyaboga

Dr Irungu Karuga

*University of Nairobi/KEMRI*

Dr Jacqueline Oliwa


- Courtesy of NTLP. FAQs child TB. www.chskenya.org

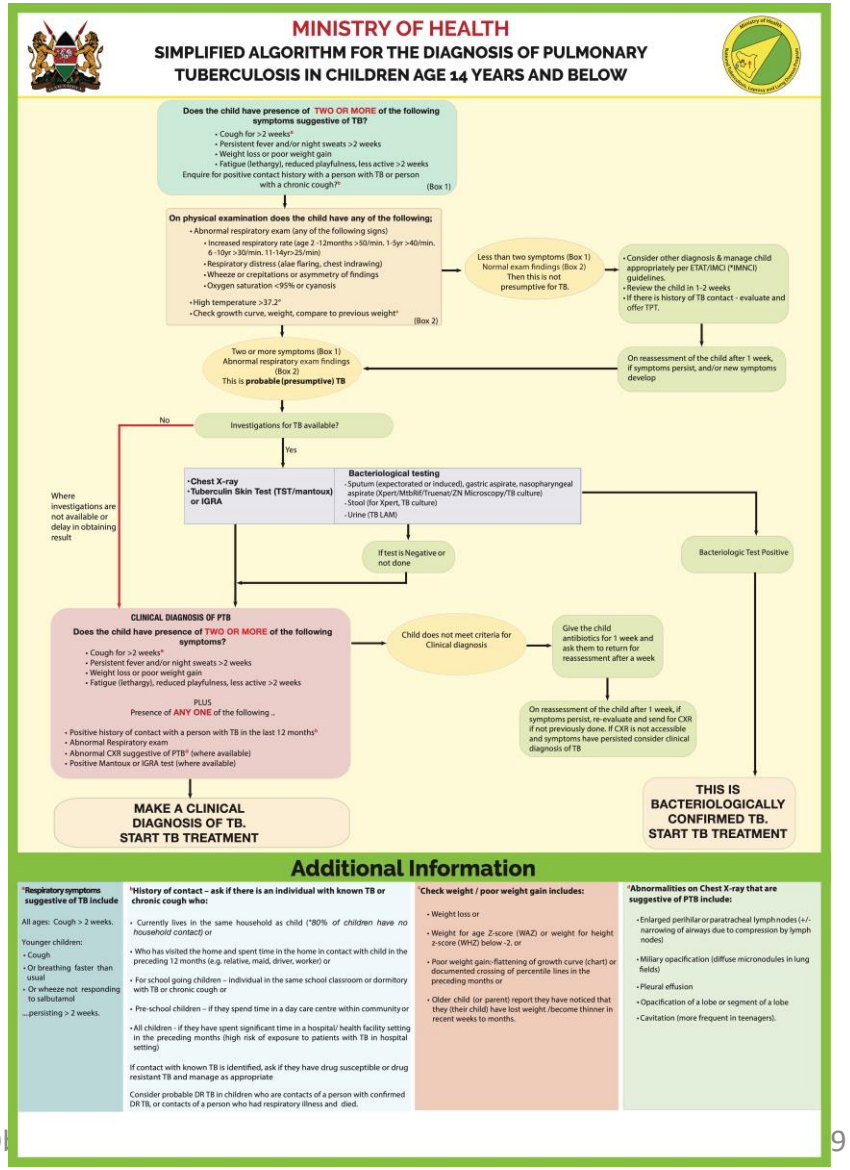
*Thank you! Asanteni! Merci! Gracias! Obrigado!*

# SUPPLEMENTAL SLIDES

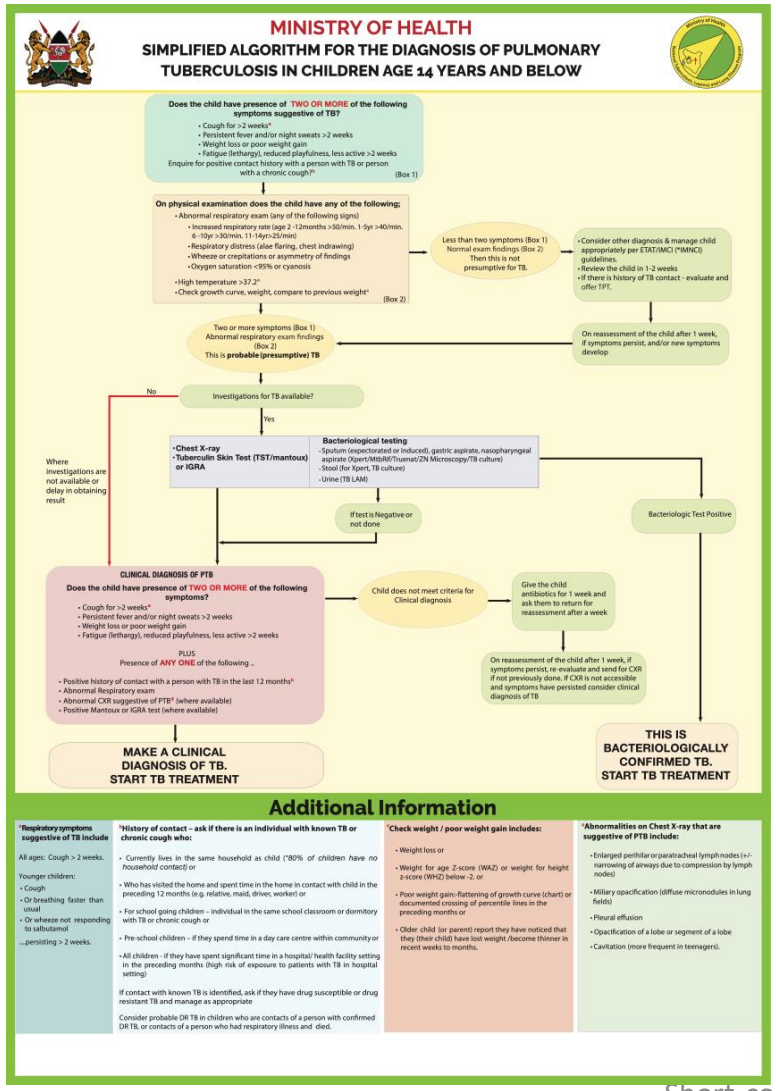
# Kenya child TB diagnostic algorithm 2022

***Kenya decision***

- Strengthen existing diagnostic approaches.
- Empower Health Care Workers to make clinical diagnosis in children, and make TB treatment decision
- Recognise that TB progresses faster and is more severe in children



# Kenya simpilified algorithm for diagnosis of PTB in children <15yr



MINISTRY OF HEALTH

SIMPLIFIED ALGORITHM FOR THE DIAGNOSIS OF PULMONARY TUBERCULOSIS IN CHILDREN AGE 14 YEARS AND BELOW

Does the child have presence of TWO OR MORE of the following symptoms suggestive of TB?
- Cough for >2 weeks[a]
- Persistent fever and/or night sweats >2 weeks
- Weight loss or poor weight gain
- Fatigue (lethargy), reduced playfulness, less active >2 weeks

Enquire for positive contact history with a person with TB or person with a chronic cough?[b] (Box 1)

On physical examination does the child have any of the following;
- Abnormal respiratory exam (any of the following signs)
  - Increased respiratory rate (age 2 -12months >50/min. 1-5yr >40/min. 6 -10yr >30/min. 11-14yr>25/min)
  - Respiratory distress (alae flaring, chest indrawing)
  - Wheeze or crepitations or asymmetry of findings
  - Oxygen saturation <95% or cyanosis
- High temperature >37.2°
- Check growth curve, weight, compare to previous weight[c]

(Box 2)

Less than two symptoms (Box 1) Normal exam findings (Box 2) Then this is not presumptive for TB.

- Consider other diagnosis & manage child appropriately per ETAT/IMCI (*IMNCI) guidelines.
- Review the child in 1-2 weeks
- If there is history of TB contact - evaluate and offer TPT.

On reassessment of the child after 1 week, if symptoms persist, and/or new symptoms develop

Two or more symptoms (Box 1) Abnormal respiratory exam findings (Box 2) This is **probable (presumptive) TB**

No

Investigations for TB available?

Yes

Where investigations are not available or delay in obtaining result

- Chest X-ray
- Tuberculin Skin Test (TST/mantoux) or IGRA

Bacteriological testing
- Sputum (expectorated or induced), gastric aspirate, nasopharyngeal aspirate (Xpert/MtbRif/Truenat/ZN Microscopy/TB culture)
- Stool (for Xpert, TB culture)
- Urine (TB LAM)

If test is Negative or not done

Bacteriologic Test Positive

CLINICAL DIAGNOSIS OF PTB

Does the child have presence of TWO OR MORE of the following symptoms?
- Cough for >2 weeks*
- Persistent fever and/or night sweats >2 weeks
- Weight loss or poor weight gain
- Fatigue (lethargy), reduced playfulness, less active >2 weeks

PLUS

Presence of ANY ONE of the following ..
- Positive history of contact with a person with TB in the last 12 months[b]
- Abnormal Respiratory exam
- Abnormal CXR suggestive of PTB[d] (where available)
- Positive Mantoux or IGRA test (where available)

Child does not meet criteria for Clinical diagnosis

Give the child antibiotics for 1 week and ask them to return for reassessment after a week

On reassessment of the child after 1 week, if symptoms persist, re-evaluate and send for CXR if not previously done. If CXR is not accessible and symptoms have persisted consider clinical diagnosis of TB

MAKE A CLINICAL DIAGNOSIS OF TB. START TB TREATMENT

THIS IS BACTERIOLOGICALLY CONFIRMED TB. START TB TREATMENT

**Additional Information**

[a]Respiratory symptoms suggestive of TB include

All ages: Cough > 2 weeks.

Younger children:
- Cough
- Or breathing faster than usual
- Or wheeze not responding to salbutamol

...persisting > 2 weeks.

[b]History of contact – ask if there is an individual with known TB or chronic cough who:
- Currently lives in the same household as child (*80% of children have no household contact*) or
- Who has visited the home and spent time in the home in contact with child in the preceding 12 months (e.g. relative, maid, driver, worker) or
- For school going children – individual in the same school classroom or dormitory with TB or chronic cough or
- Pre-school children – if they spend time in a day care centre within community or
- All children - if they have spent significant time in a hospital/ health facility setting in the preceding months (high risk of exposure to patients with TB in hospital setting)

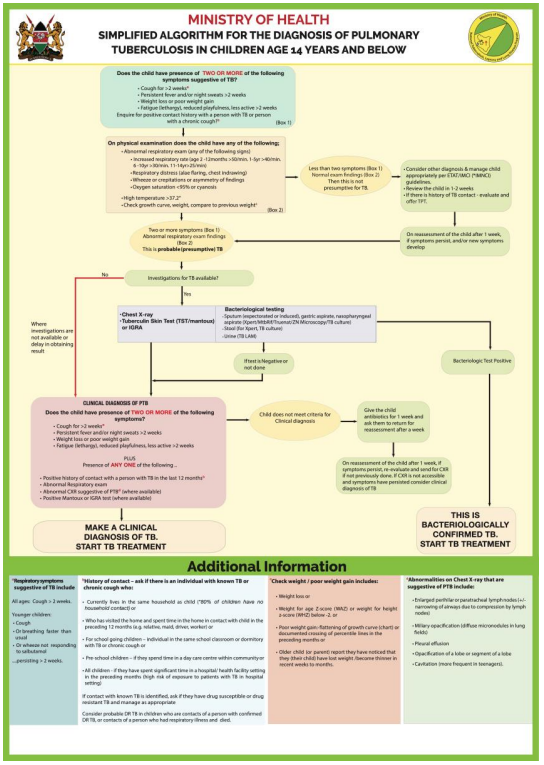
If contact with known TB is identified, ask if they have drug susceptible or drug resistant TB and manage as appropriate

Consider probable DR TB in children who are contacts of a person with confirmed DR TB, or contacts of a person who had respiratory illness and died.

[c]Check weight / poor weight gain includes:
- Weight loss or
- Weight for age Z-score (WAZ) or weight for height z-score (WHZ) below -2, or
- Poor weight gain: flattening of growth curve (chart) or documented crossing of percentile lines in the preceding months or
- Older child (or parent) report they have noticed that they (their child) have lost weight /become thinner in recent weeks to months.

[d]Abnormalities on Chest X-ray that are suggestive of PTB include:
- Enlarged perihilar or paratracheal lymph nodes (+/- narrowing of airways due to compression by lymph nodes)
- Miliary opacification (diffuse micronodules in lung fields)
- Pleural effusion
- Opacification of a lobe or segment of a lobe
- Cavitation (more frequent in teenagers).

# Kenya Simplified diagnostic algorithm for Pulmonary TB in children <15 yr

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Yes

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**Bacteriological testing**

- Sputum (expectorated or induced), gastric aspirate, nasopharyngeal aspirate (Xpert/MtbRif/Truenat/ZN Microscopy/TB culture)
- Stool (for Xpert, TB culture)
- Urine (TB LAM)

If test is Negative or not done

Bacteriologic Test Positive

**CLINICAL DIAGNOSIS OF PTB**

**Does the child have presence of TWO OR MORE of the following symptoms?**

- Cough for >2 weeks[a]
- Persistent fever and/or night sweats >2 weeks
- Weight loss or poor weight gain
- Fatigue (lethargy), reduced playfulness, less active >2 weeks

PLUS
Presence of **ANY ONE** of the following ..

- Positive history of contact with a person with TB in the last 12 months[b]
- Abnormal Respiratory exam
- Abnormal CXR suggestive of PTB[d] (where available)
- Positive Mantoux or IGRA test (where available)

Child does not meet criteria for Clinical diagnosis

Give the child antibiotics for 1 week and ask them to return for reassessment after a week

On reassessment of the child after 1 week, if symptoms persist, re-evaluate and send for CXR if not previously done. If CXR is not accessible and symptoms have persisted consider clinical diagnosis of TB

**MAKE A CLINICAL DIAGNOSIS OF TB. START TB TREATMENT**

**THIS IS BACTERIOLOGICALLY CONFIRMED TB. START TB TREATMENT**

# Simplified Algorithm for the Diagnosis of Pulmonary TB in Children Age <= 14 years. Kenya 2023

***Presence of TWO or more of the following symptoms…***

- Cough > 2weeks (or wheeze, fast breathing, DIB)
- Weight loss or poor weight gain
- Persistent fever and/or night sweats > 2 weeks
- Fatigue, reduced playfulness, less active > 2 weeks

***PLUS***

***Presence of any ONE of the following….***

- Positive contact history with person with Tb or chronic cough in past 12 months
- Abnormal Respiratory exam (tachypnoea, wheeze/creps, resp distress, SPO2 <95%)
- CXR suggestive of PTB (where available)
- Positive Mantoux or IGRA test (where available)

***MAKE A CLINICAL DIAGNOSIS OF PTB, START TB TREATMENT***