Systematic screening for TB disease

Updated WHO recommendations and operational guidance for people living with HIV

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IAS Webinar -- 15 June 2021
Update to the WHO tuberculosis screening guidelines

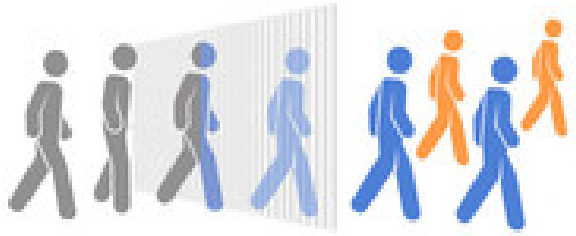
World Health Organization

Systematic screening for TB disease

"The systematic identification of people at risk for TB disease, in a pre-determined target group, by assessing symptoms and using tests, examinations, or other procedures that can be applied rapidly."

Key features:

- Should be done *systematically* in a selected population
- Should be done using a highly sensitive tool to distinguish people with a higher probability of TB
- Should be followed with a diagnostic evaluation using a test with high accuracy to confirm a diagnosis
- Should follow ethical principles specific to screening



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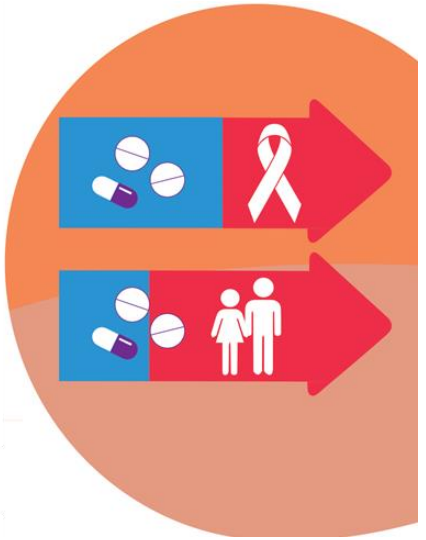
Role of TB screening for people with HIV

- **Large burden of disease and mortality due to TB** among people living with HIV
  - People living with HIV are more vulnerable to TB and to rapid progression from infection to disease and to death
  - TB is a primary cause of AIDS-related death among people with HIV

- **Large TB detection gap** among people living with HIV
  - An estimated 44% of people living with HIV-associated TB are not diagnosed

- Therefore **early detection and treatment are essential** to reducing mortality among people living with HIV

- **Screening for TB disease is an essential first step** prior to initiating TB preventive treatment (TPT) as well as providing other care, including the package of care for people with advanced HIV disease



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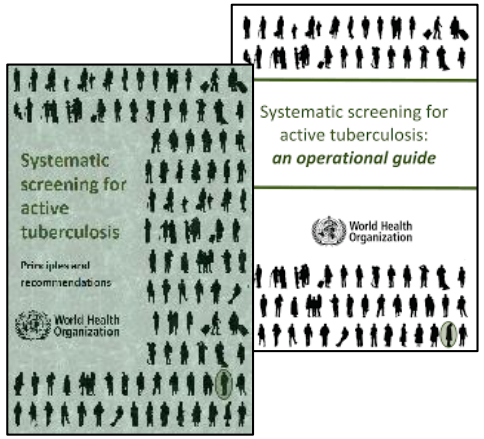
TB screening guidelines – Updated 2021

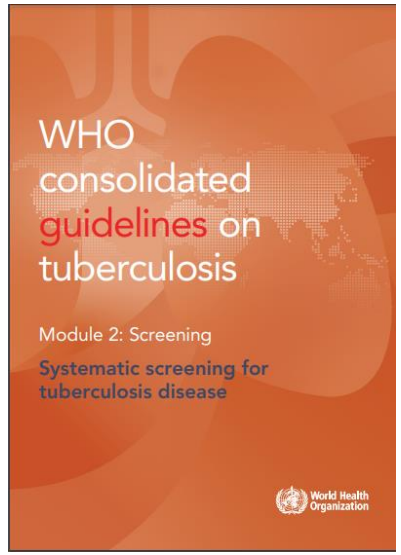


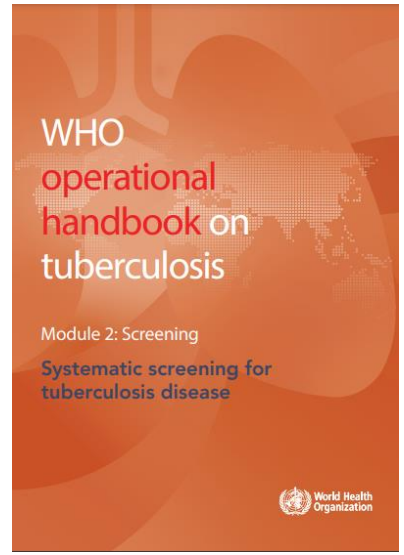
Goals of update:

- Consolidate and update recommendations to bring them in line with most recent evidence,
- Evaluate novel screening tools and technologies
- Provide implementation guidance, including algorithms, for screening specific risk groups

New guidelines and operational guide:

- Released for World TB Day, March 2021
- Available at: https://www.who.int/activities/screening-for-tb





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Recommendations

Populations to be screened

Systematic screening for TB disease is *strongly recommended among*:

- **Household and close contacts of people with TB**
- **People living with HIV**
- **Miners exposed to silica dust**
- **Prisoners**

For these populations:

- ✓ Screening should always be conducted
- ✓ Question is how – what tools and algorithms, implementation model, frequency
- ✓ TPT should be provided when appropriate
- ✓ Monitoring and evaluation should be conducted to assess outcomes of screening and continually inform questions of implementation

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Recommendations

Populations to be screened

Systematic screening for TB disease is *conditionally recommended among*:

- **People with risk factors for TB seeking healthcare, in settings with ≥0.1% TB prevalence**
  - Malnourishment, diabetes, chronic lung disease, history of previous TB, and others
- **People with untreated fibrotic lesions on chest x-ray**
- **Populations with structural risk factors for TB and limited access to health care**
  - Urban poor, homeless, refugees, migrants, other vulnerable or marginalized groups
- **General population in settings with ≥0.5% TB prevalence**

For these populations, consideration should be given to:

- ✓ Weighing the benefits and risks of screening
- ✓ Considering opportunity costs for other TB and health interventions
- ✓ Prioritizing risk groups that represent the greatest burden or have the greatest vulnerability in a particular setting

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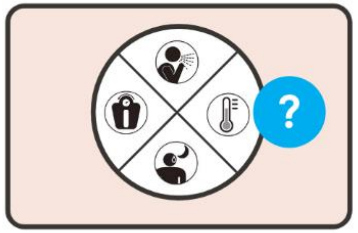
Recommendations

Tools for screening people living with HIV

The following tools are recommended for screening people living with HIV
(for adults and adolescents 10 years and older)

- **WHO-recommended 4 symptom screen**
  - **Cough**
  - **Fever**
  - **Night sweats**
  - **Weight loss**



Population	Sensitivity (%)	Specificity (%)
All people living with HIV	83	38
Inpatients	96	11
Outpatients on ART	53	70
Outpatients not on ART	84	37
≤ 200 CD4 cells/μL[a]	86	30
Pregnant women living with HIV	61	58

- Recommended since 2011 for screening all PLHIV at every healthcare visit
- Remains the most feasible screening test
- Has limited accuracy in some subgroups, hampering implementation

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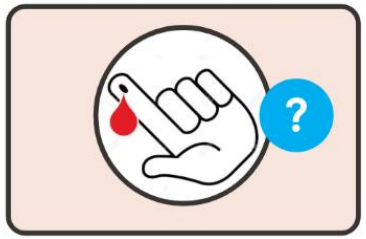
Recommendations

Tools for screening people living with HIV

The following tools are recommended for screening people living with HIV
(for adults and adolescents 10 years and older)

- **C-Reactive Protein**



Population	Cut-off > 5 mg/L		Cut-off > 10 mg/L	
	Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)
All people living with HIV	90	50	83	65
Inpatients	98	12	97	21
Outpatients on ART	40	80	20	90
Outpatients not on ART	89	54	82	67
≤ 200 CD4 cells/μL[a]	93	40	90	54
Pregnant women living with HIV	70	41	70	54

- A general marker for inflammation, can be performed as a point-of-care test in some settings
- Has similar sensitivity and similar or improved specificity to W4SS in all subgroups of PLHIV, depending on cut-off
- **Represents an improvement in accuracy (particularly specificity) over the W4SS for people living with HIV not on ART**

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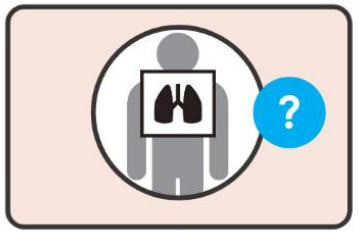
Recommendations

Tools for screening people living with HIV

The following tools are recommended for screening people living with HIV
(for adults and adolescents 10 years and older)

- **Chest X-ray**



Population	Sensitivity (%)	Specificity (%)
All people living with HIV	93	20
Inpatients	90	7
Outpatients on ART	85	33
Outpatients not on ART	94	19
≤ 200 CD4 cells/μL[a]	94	14
Pregnant women living with HIV	75	56

- CXR used alongside W4SS increases sensitivity of screening, to help detect TB and rule out prior to TPT
- CXR and W4SS combined (parallel screen) provides improved sensitivity and similar specificity to W4SS alone for all subgroups of PLHIV
- **Most sensitive screening strategy for PLHIV on ART**

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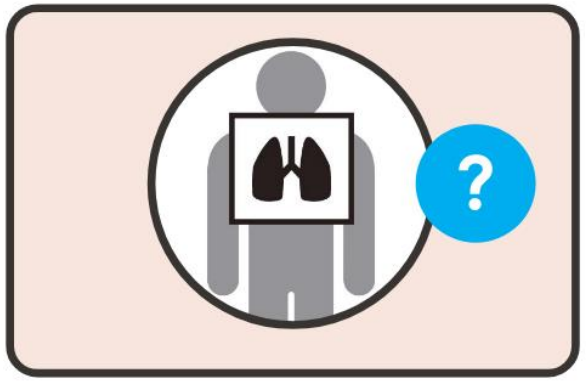
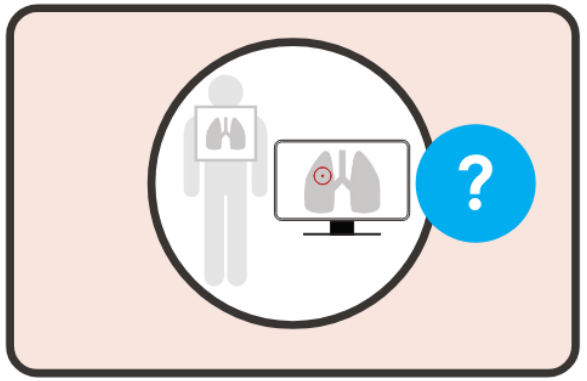
Recommendations

Tools for screening people living with HIV

Computer-aided detection (CAD) for automated interpretation of chest X-ray is now recommended as an alternative to human interpretation for TB screening and triage for all adults aged 15 years and older

– INCLUDING people living with HIV





Landscape of CAD software - https://www.ai4hlth.org/
CAD for TB detection - https://tdr.who.int/activities/calibrating-computer-aided-detection-for-tb

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Recommendations

Tools for screening people living with HIV

The following tools are recommended for screening people living with HIV
(for adults and adolescents 10 years and older)

- **Molecular WHO-recommended rapid diagnostic tests**

Population	Sensitivity (%)	Specificity (%)
All people living with HIV	69	98
Inpatients	77	93
Outpatients on ART	54	99
Outpatients not on ART	72	98
≤ 200 CD4 cells/μL[a]	76	97
Pregnant women living with HIV	55	99

- **Strongly recommended** for medical inpatients with HIV in high-burden settings (medical wards with a TB prevalence of ≥ 10%) as a "screen and treat" strategy, no need for further diagnostic testing
- **Conditionally recommended** for all other people living with HIV

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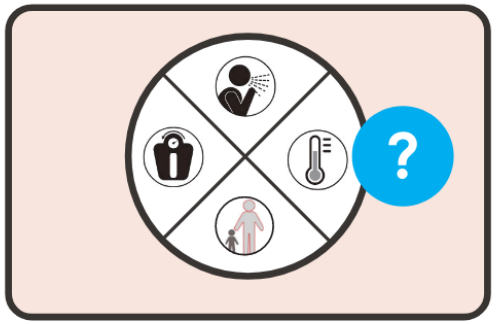
Recommendations

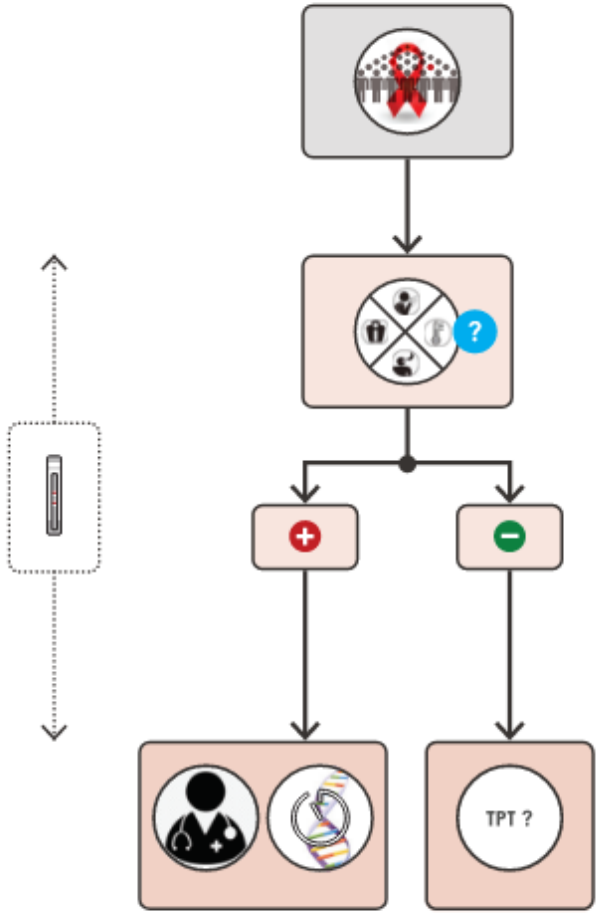
Tools for screening children living with HIV

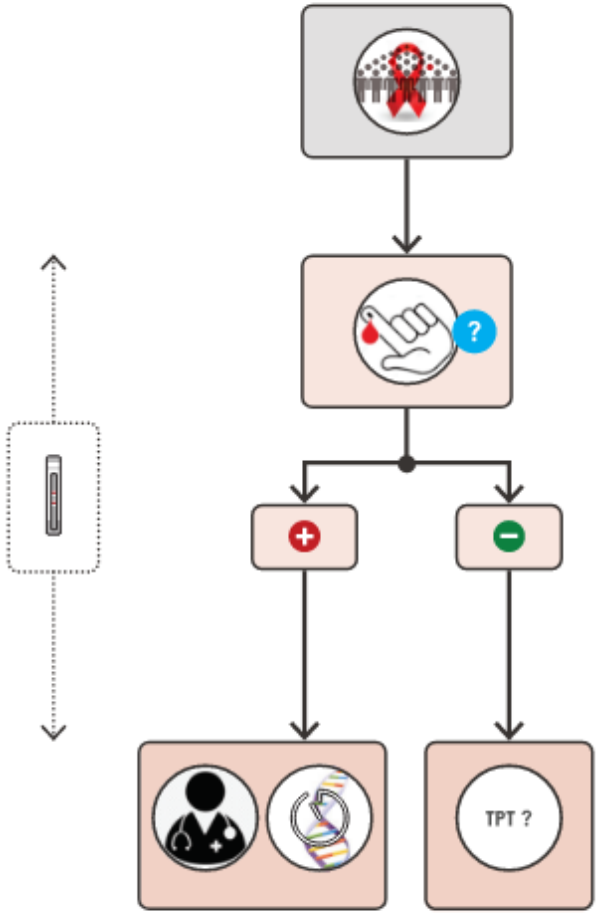
- **Two groups of children in whom TB screening is strongly recommended**
  - Child contacts of TB patients
  - Children living with HIV

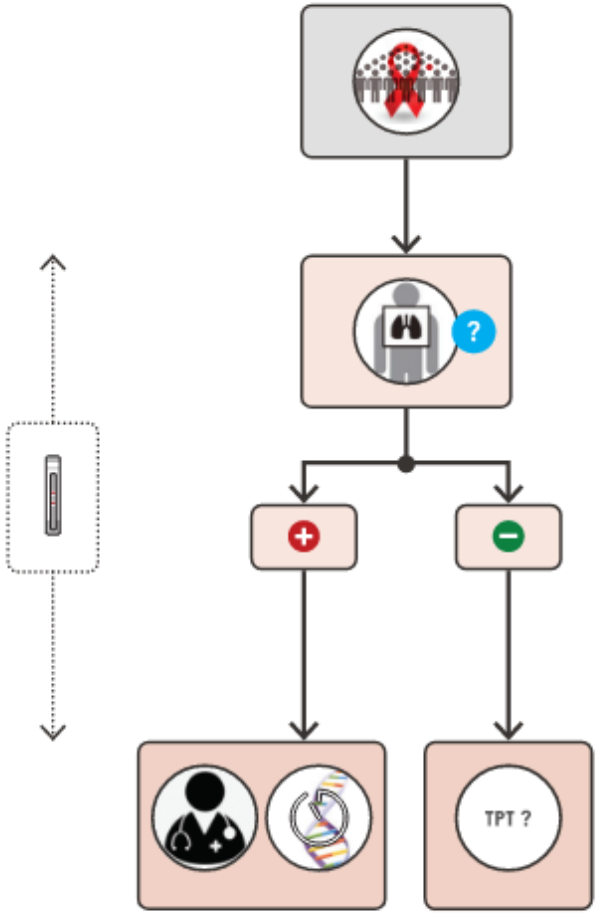
- **Tools strongly recommended for screening children living with HIV** (up to 10 years)
  - Symptom screening (cough, fever, weight loss)
  - And/or contact with TB patient



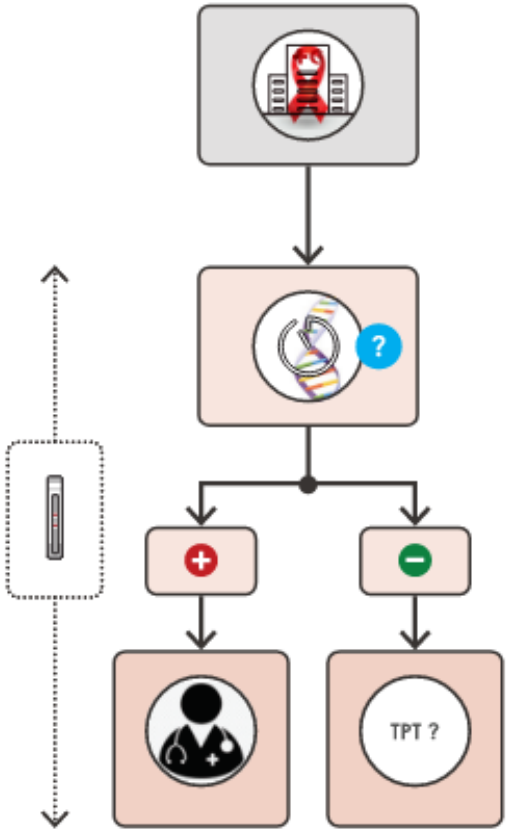
Adults and adolescents living with HIV
Single screening algorithms – W4SS, CRP, CXR

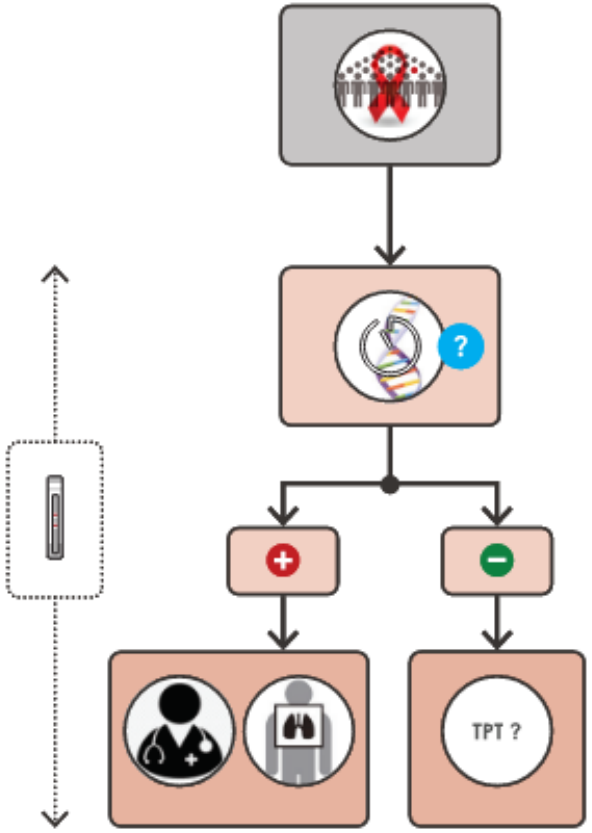




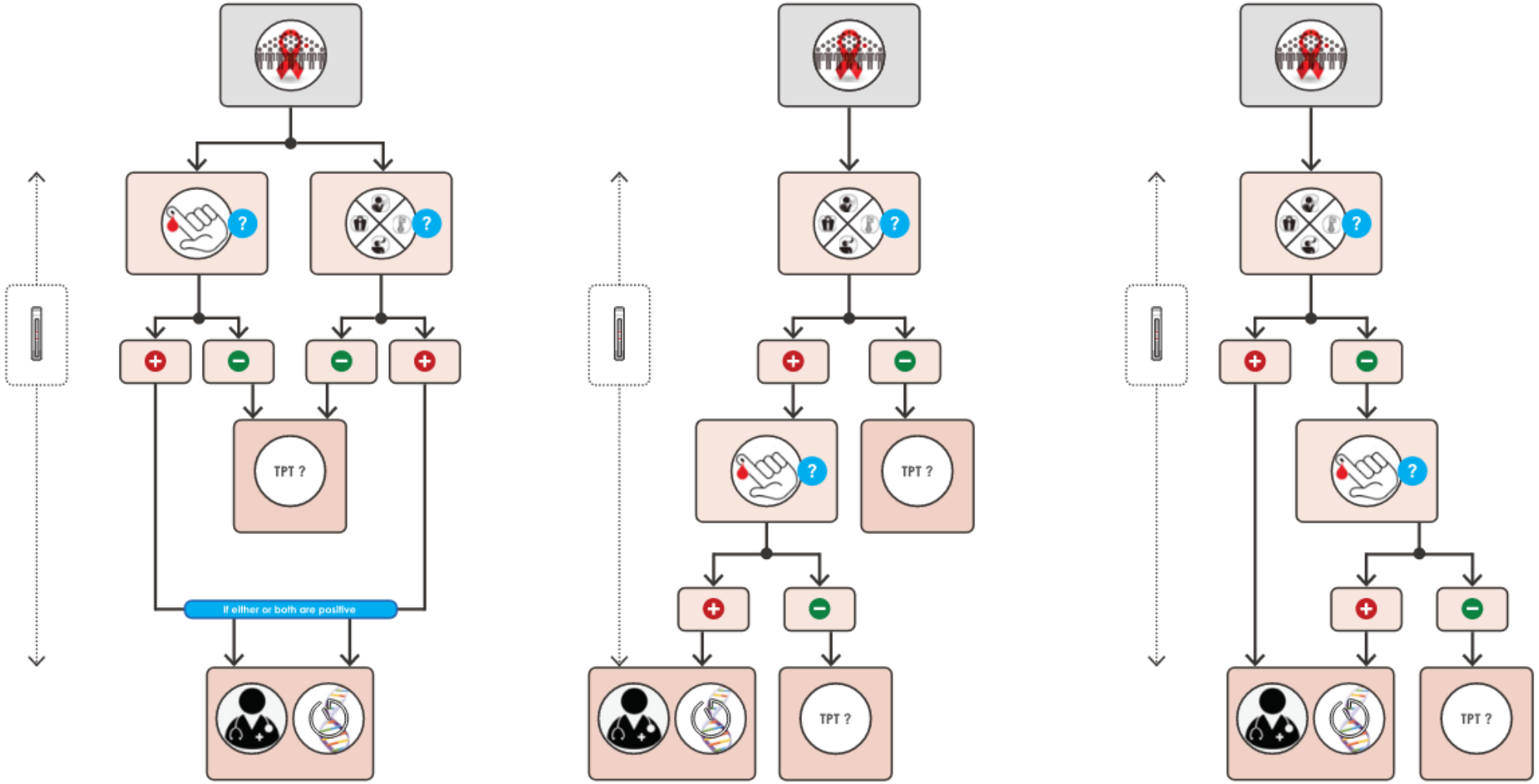


Adults and adolescents living with HIV
Single screening algorithms - mWRDs

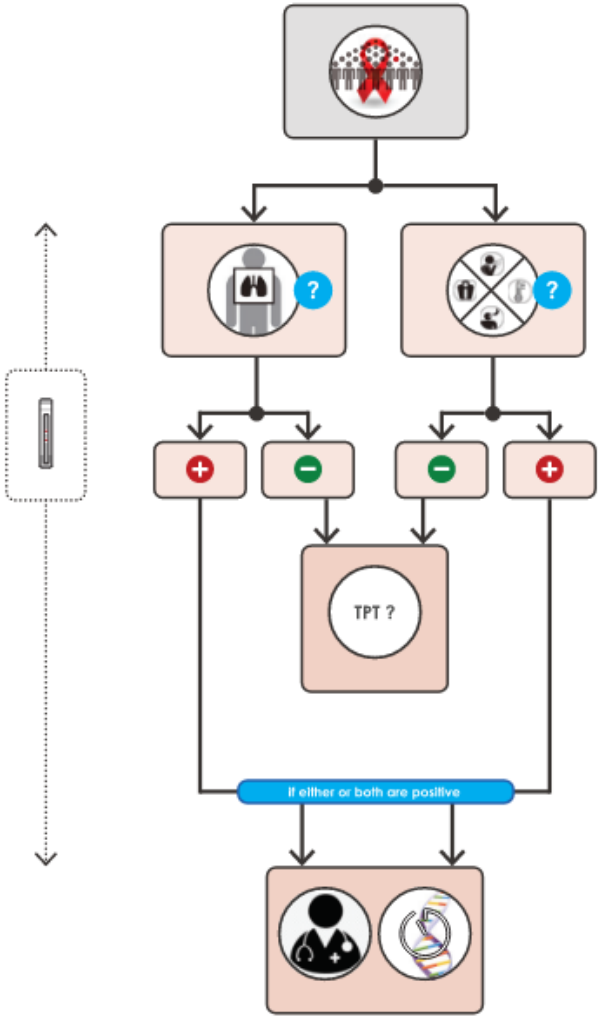


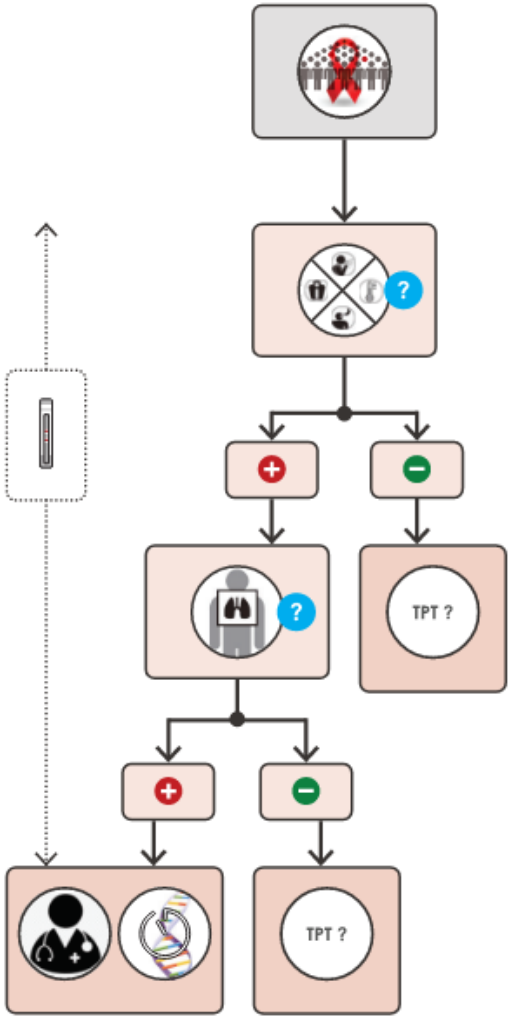


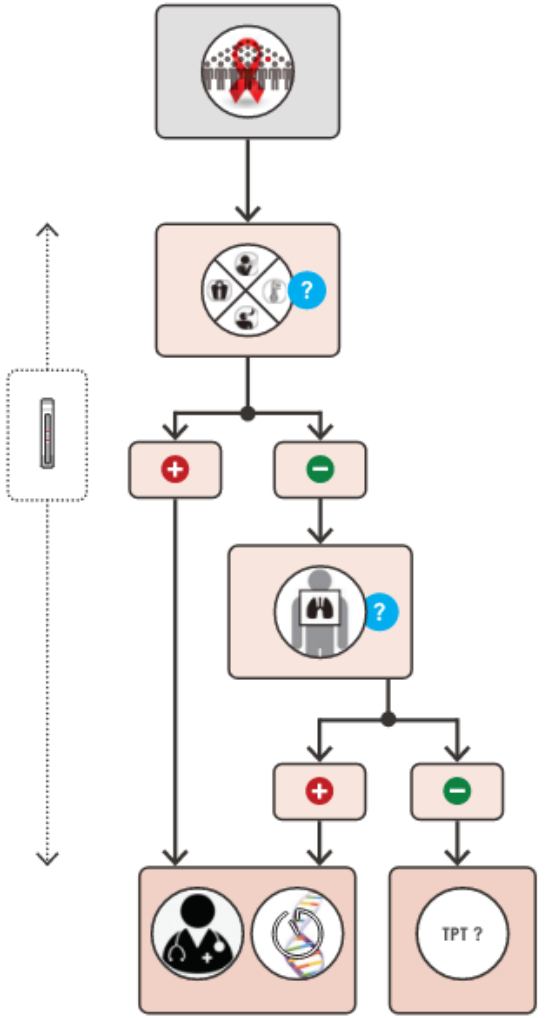
Adults and adolescents living with HIV
Algorithms with W4SS and CRP



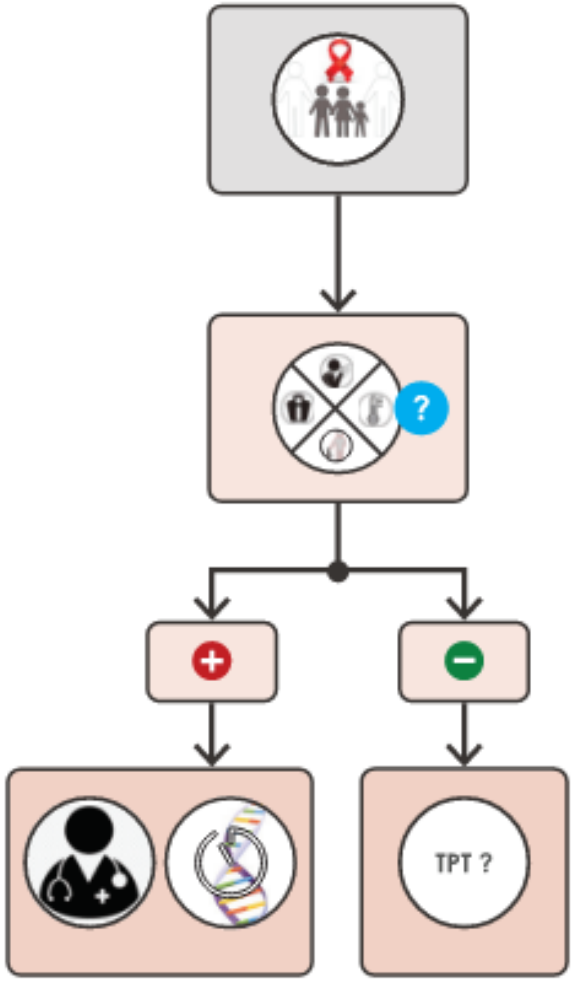
Adults and adolescents living with HIV
Algorithms with W4SS and CXR







Children living with HIV < 10 years
Screening with symptoms



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THANK YOU!

THE CLOCK IS TICKING

It's time to END TB

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