



Setting the scene on:

Identifying and diagnosing children exposed to HIV and to TB

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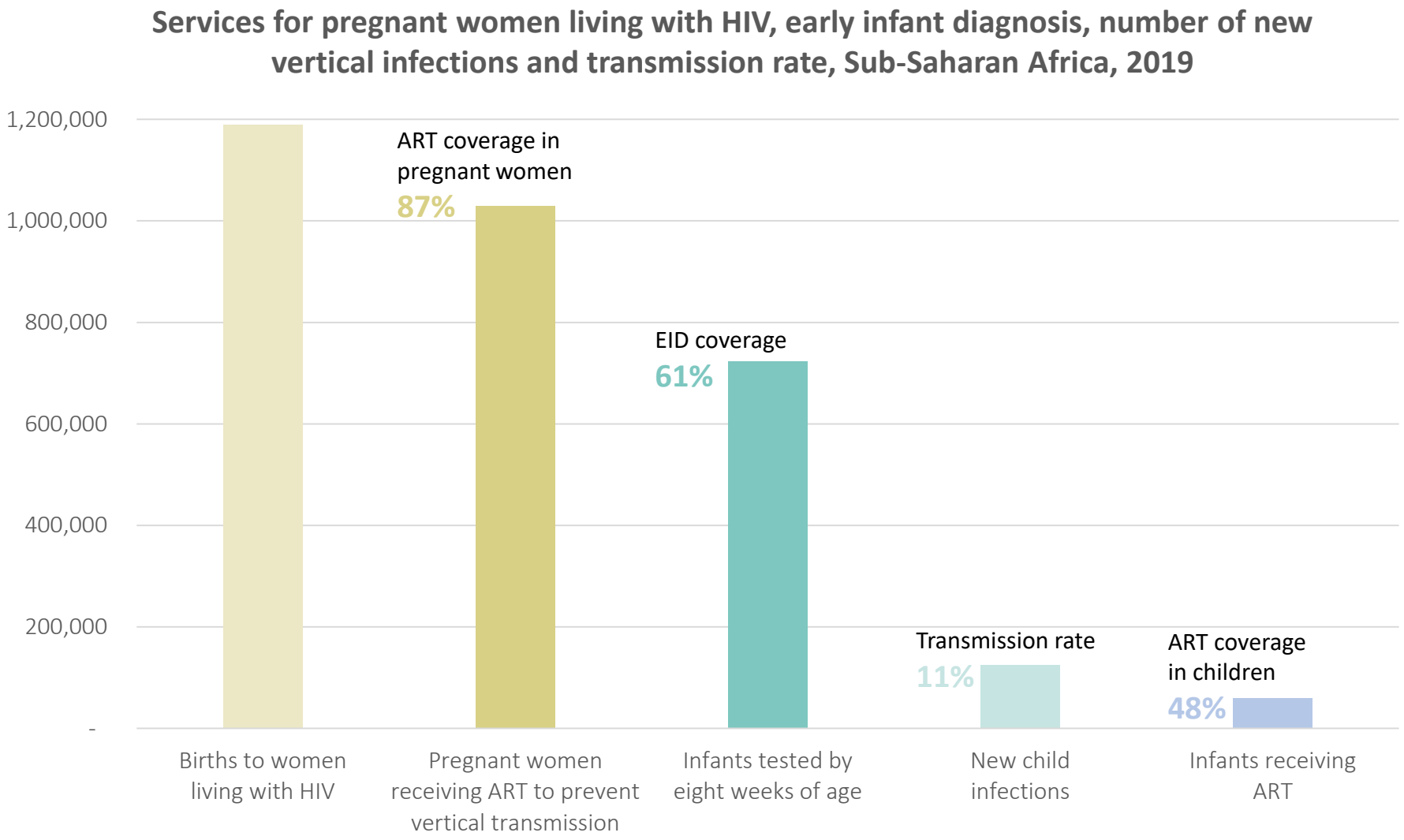
Challenges: Early Infant Diagnosis (EID) Cascade Gaps



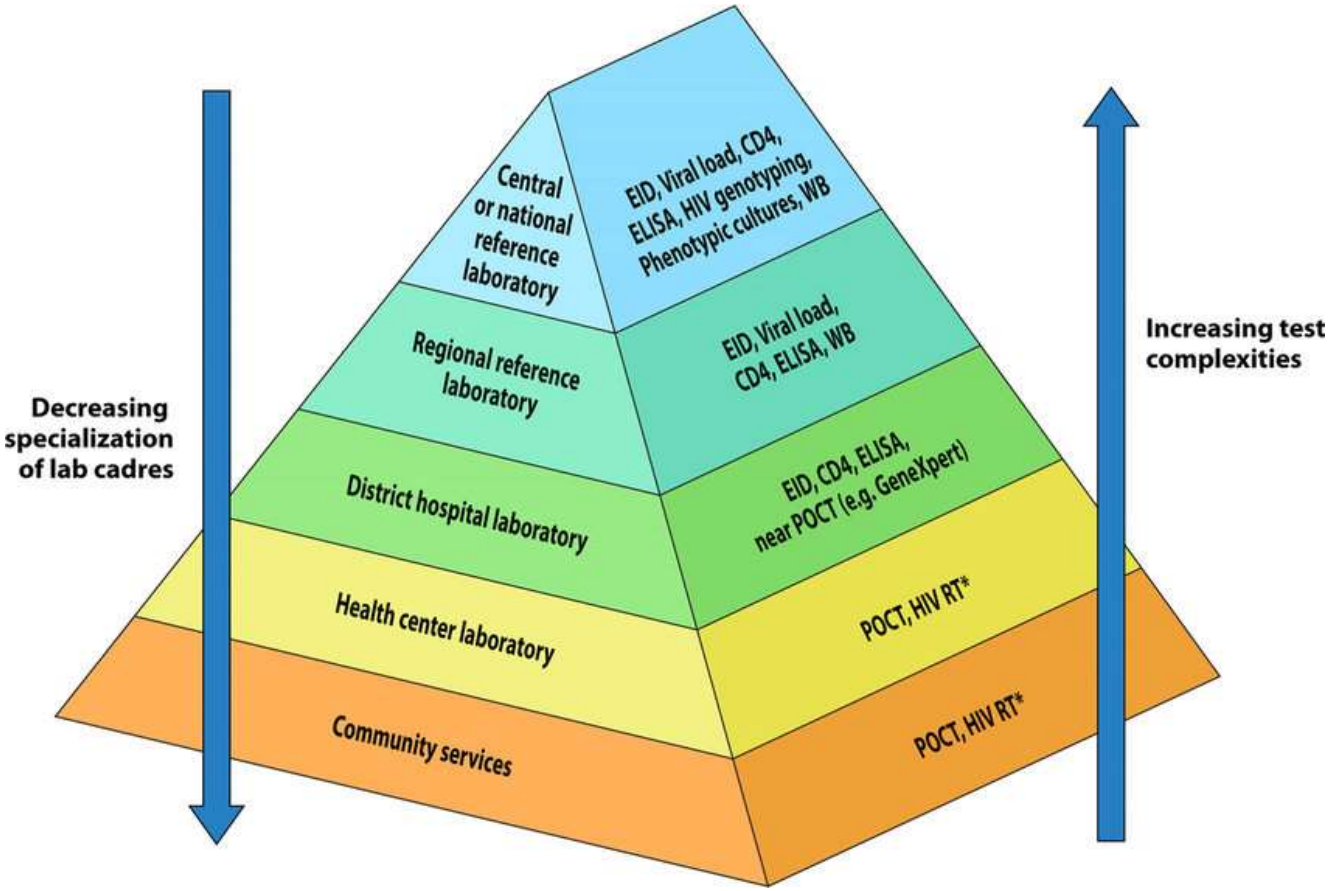
Challenge 1: Poor access to and delays in EID testing

Challenge 2: Delays or no return of test results

Challenge 3: Poor initiation of HIV-positive infants on treatment

Source: UNAIDS epidemiological estimates, 2020 (https://aidsinfo.unaids.org); Global AIDS Monitoring, 2020

Challenges: Diagnostic networks



Present Diagnostic Networks

- Over capacity
- Costly
- Poor access
- Low clinical impact
- Lack of synergy between testing programs
- Frequent breakdowns
- Inconsistent quality
- Limited monitoring and evaluation (M&E) and real time tracking
- Low key performance indicators (KPIs)

Source: Pyramid: Parekh BS et al. 2019.
Current Dx network challenges: Alemnji G et al. 2020 JAIDS Suppl

Solutions: Recent Technological Advances (POC EID)

Technological advances, such as point-of-care (POC) EID technologies, are one of the key solutions and can improve the identification and diagnosis of children exposed to HIV, given that they are: affordable, accessible, and well integrated within the network

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- **MORE results** are returned to caregivers
- **FASTER turnaround** time for return of results
- **MORE** HIV-infected infants are being initiated **on ART**
- **FASTER ART initiation** of HIV-infected infants
- **POC EID testing is cost-effective**, can be scaled-up, can improve adherence to testing algorithm, and where the cost/result retuned <30 days is cheaper than conventional

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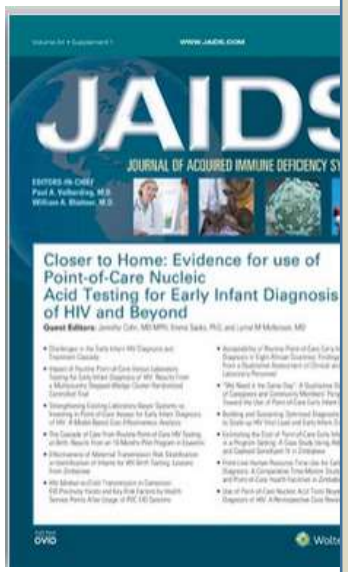

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Yet, total costs of ownership are still too high

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Solutions: Strategic Implementation

- Testing policies—complimentary use of POC and laboratory tests
- Integrated/multi-disease testing
- Optimized and connected lab networks is critical
- Improved logistics systems
- Task shifting
- Different placement models and testing strategies
- Increase case finding in various entry points (inpatient, nutrition, OPD)
- Community mobilization, education, and outreach

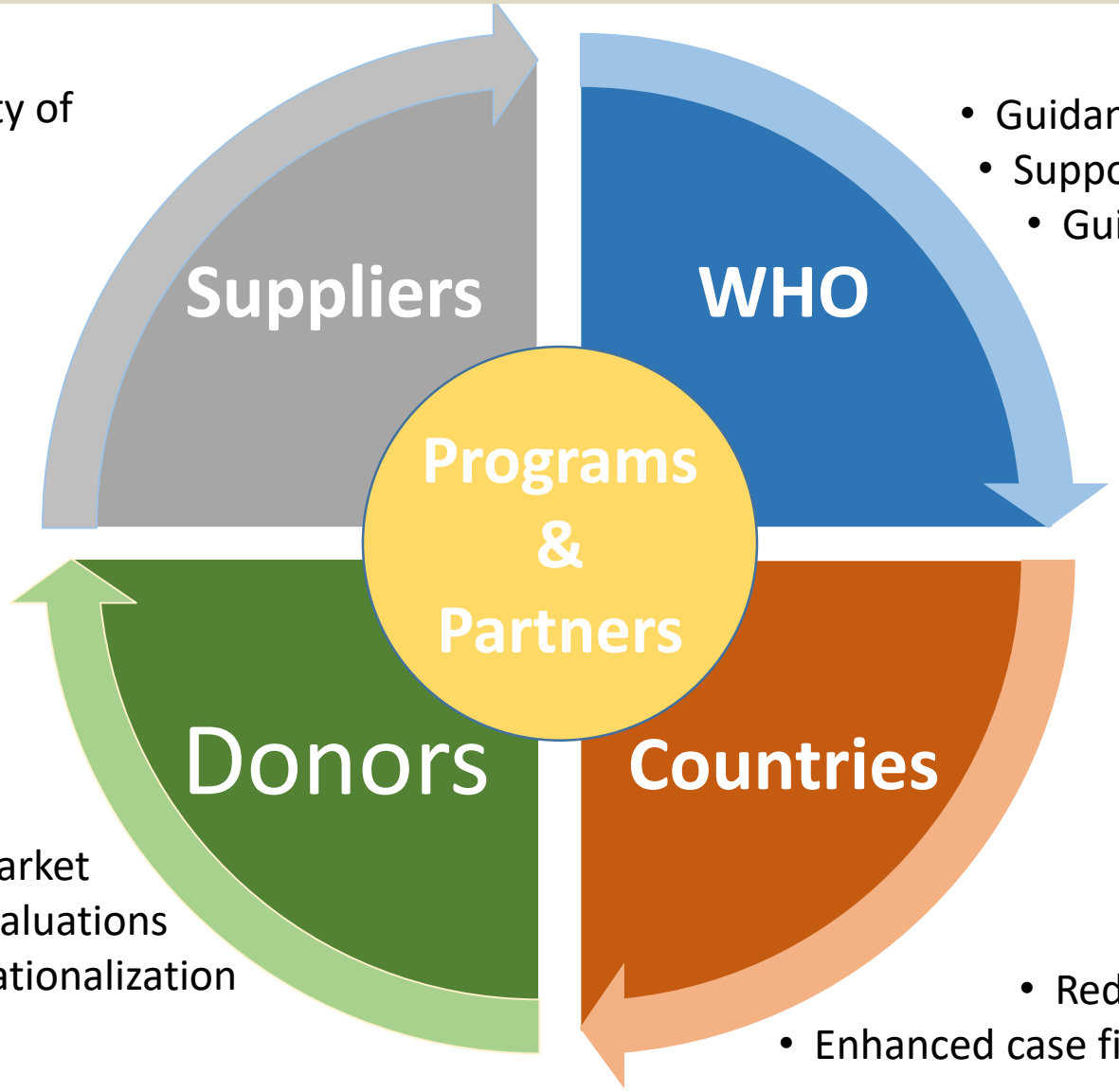
Solutions: Strategic Implementation

The need to scale-up and optimize such adapted models and interventions is critical

- Increase case finding in various entry points (inpatient, nutrition, OPD)
- Community mobilization, education, and outreach

Solutions: Leadership & Coordinated efforts

- Ensure uninterrupted availability of quality-assured products
- Consistent transparent all-in pricing, including service-level agreements
- Stay in market



- Guidance on post-market surveillance
- Support national regulatory agencies
- Guidance for multi-disease testing
- Develop collaborative PQ Dx

- Support competitive, healthy market
- Refrain funding for repetitive evaluations
- Support procurement and operationalization of national strategic plans

- Leadership and governance
- Adapted national strategies
- Integrated efficient systems
- Transparent forecasts
- Streamline regulatory
- Post-market surveillance
- Reduce repetitive field evaluations
- Enhanced case finding and evidence generation

Solutions: Leadership & Coordinated efforts

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- Guidance on post-market surveillance
- Support national regulatory agencies

Sustained funding, comitted leadership, and coordinated efforts are vital

- Support competitive, healthy market
- Refrain funding for repetitive evaluations
- Support procurement and operationalization of national strategic plans

- Integrated efficient systems
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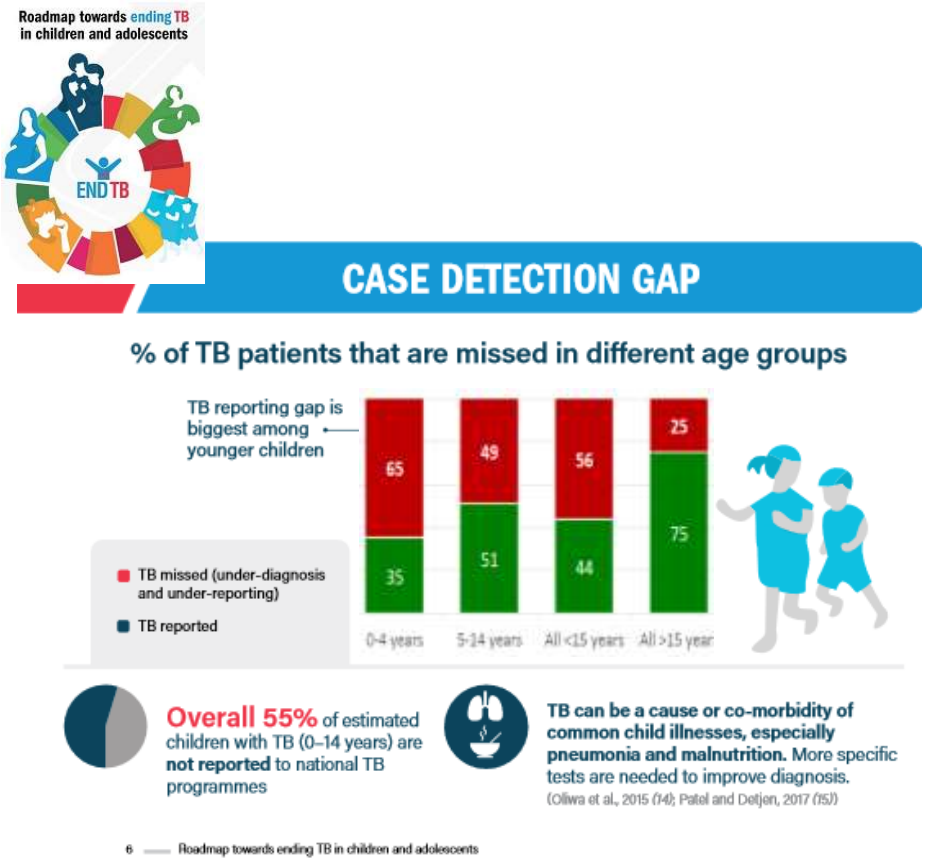
Challenges in Identification and Diagnosis of TB in Children



- Persistent gaps (prevention and detection)
- Difficulty collecting respiratory specimen
- Paucibacillary, thus more difficult to diagnose—various forms of TB including EPTB,
- Infrastructure, including for sample collection procedure
- Sign and symptoms screening not specific to TB
- Limited and inconsistent quality of pediatric-specific approaches and pediatric TB notification data
- Low political will, little translation into actions
- Insufficient funding (programmatic and for commodities)

Solutions: Recent Technological Advances

Recent technological advances have shown to be able to improve access to TB diagnosis in children:

Better sensitivity

- The pooled sensitivity in diagnosing pTB in symptomatic children (against microbial.std) is 72.8% for the Xpert MTB/RIF ***Ultra*** assay compared to Xpert MTB/RIF (64.6%)

Alternative specimen types

- Less invasive: Stool, nasopharyngeal aspirate for Xpert (Ultra) and urine for LF-LAM in CLHIV

New biomarker and assay types

- LF urinary LAM assay: Alere Determine TB LAM Ag, FujiLAM
- More to come soon..TB Host Response, Xpert MTB/XDR

More options in molecular diagnosis endorsed by WHO

- RT-PCR assays: TrueNat (Chip-based), Xpert Ultra (Cartridge-based),
- Line-probe assays: GenoType MTBDR*plus*, Genoscholar NTM+MDRTB II, GenoType MTBDR*sl*
- *Loop-mediated isothermal amplification: TB-LAMP*

Solutions: Recent Technological Advances

Recent technological advances have shown to be able to improve access to TB diagnosis in children:

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- Lin… MTBDR*sl*
- *Loop-mediated isothermal amplification: TB-LAMP*

Despite improvements, current tools have sub-optimal performance in children— a good pediatric test is still missing.

Solutions: Strategic Implementation

- **Multi-pronged targeted programmatic approach**
  - Household Contact Investigation, TB screening at multiple entry points, systematic screening at triage/waiting room, access to improved technology -Ultra, various specimen types **can improved the pediatric case detection rate by 1.4 fold and bacteriological confirmation by 1.6 fold[10,11,12]**
  - Need to build HCWs capacity to manage pediatric TB through training programs developped specifically on pediatric TB

- **2020 WHO consolidated guidance on TB diagnosis recommends[13]:**
  - **use of urine LF-LAM assay (in conjuncture with other tests) for symptomatic and/or most vulnerable PLHIV, including children**, and strong linkage to AHD care package
  - **Xpert MTB/RIF (and Ultra*) recommended as initial test for a variety of specimen:**
    - Sputum*, nasopharyngeal aspirate*, gastric aspirate, or stool as the initial test for pTB,
    - CSF* as the initial test for TB meningitis
    - Lymph node aspirate*, lymph node biopsy*, pleural fluid, peritoneal fluid, pericardial fluid, synovial fluid or urine for EPTB
    - For RIF resistance for EPTB*

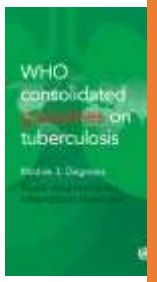
[10] *Lemaire J et al. 2020*
[11] *Kakayeva S et al. 2020*
[12] *Lemaire J et al. 2020*

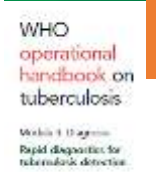
[13] *WHO consolidated guidelines on tuberculosis. Module 3: diagnosis - rapid diagnostics for tuberculosis detection.*

Solutions: Strategic Implementation

- **Multi-pronged targeted programmatic approach**
  - Household Contact Investigation, TB screening at multiple entry points, systematic screening at triage/waiting room, access to improved technology -Ultra, various

Yet, pediatric-specific multi-pronged interventions and timely adoption of global guidance falls behind, too often due to insufficient resources.





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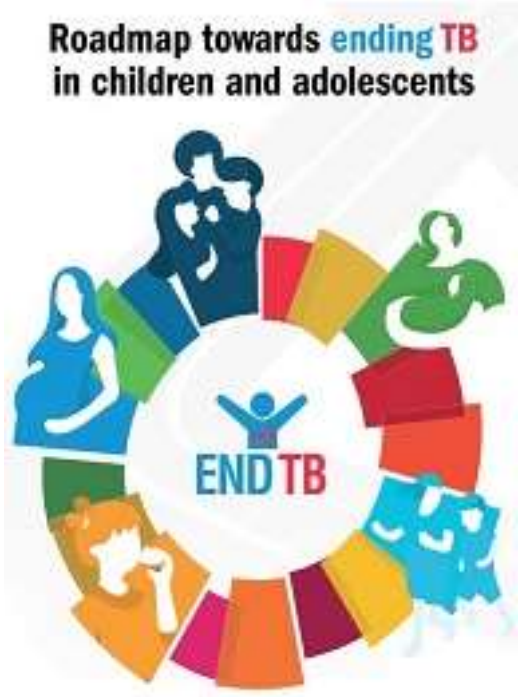
Solutions: Coordinated efforts



Solutions: Coordinated efforts

Prioritizing, targeting, and committing funding, as well as political leadership, towads pediatric TB health interventions must not be delayed further.

Thank you!

“Sometimes in life there is that moment when it's possible to make a change for the better. This is one of those moments.”

-Elizabeth Glaser