Evidence from the systematic review on models of care for child and adolescent TB

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PICO question 6

• Review the evidence for the impact of care models of interest on TB outcomes for children and adolescents (0-19 years old) in high-burden settings
  • A: Impact of decentralized care on diagnosis and treatment outcomes
  • B: Impact of decentralized care on prevention outcomes
  • C: Impact of integrated and family-centered care on diagnosis and treatment outcomes
  • D: Impact of integrated and family-centered care on prevention outcomes
Methods

• **Sources of studies**
  - Database searches (6 databases)
  - Manual review of 17 systematic and non-systematic reviews
  - Data requested from ongoing unpublished studies

• **Inclusion criteria**
  - Comparative studies where intervention was one of the care models of interest
  - Outcome available for an age group in the 0-19 range
  - Country with estimated 2019 TB incidence ≥100 per 100k or on WHO TB priority country list
Records identified via database searches (N=4486)

Records after duplicates removed (N=3265)

Abstracts screened (N=3265)

Excluded: outcome of interest not included or adults only (N=2878)

Full-text articles assessed for eligibility (N=516)

Excluded:
- Not a priority country (n=28)
- No outcomes of interest (n=37)
- No children/adolescents (n=34)
- Data not age-disaggregated (n=237)
- Care model not sufficiently described (n=14)
- Not care model of interest (n=25)
- Insufficient comparative data (n=135)
- Could not access article (n=6)

Comparative studies evaluating decentralized, integrated, or family-centered care models (N=25)

Included

Total identified studies (N=26)
Studies identified

• **26 studies with comparative outcomes identified**
  • From 12 countries in Africa, Asia, and the Americas
  • 7 randomized trials, 15 pre-post interventional studies, 4 cohort studies

<table>
<thead>
<tr>
<th>Type of outcomes</th>
<th>Decentralized care</th>
<th>Integrated care</th>
<th>Family-centered care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case notifications or diagnoses</td>
<td>16</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>TB disease treatment</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB preventive treatment (TPT) among contacts</td>
<td>3</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Heterogeneous interventions

- Training primary providers
- Screeners in primary care
- Decentralized Xpert
- Screening in home
- Sputum collection in home
- Other community screening
- Community treatment
- Screening in HIV
- Screening in MCH
- Screening in IMCI
- Screening in other clinic
- Co-located ART
- Social support
- Economic support
- Psychological support
- Community awareness
- Procurement support
- Provision of supplies
Decentralized interventions to improve diagnosis

- **Awareness of TB risk**
- **Contact with health system**
- **Screening**
- **Diagnostic evaluation**
- **Diagnosis**

**Activities in communities**

**Group 1:** Interventions that strengthen both services in primary care and community–facility linkages to improve the entire care cascade (N=9)

**Group 2:** Home-based screening targets only the beginning of the care cascade (N=6)

**Group 3:** Xpert decentralization affects only the last step of the cascade (N=1)

*Increased diagnoses*
### Population case notification rate ratio (0-14 years)

**Studies with both community and facility activities**

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Study design</th>
<th>Country</th>
<th>Intervention cases</th>
<th>Control cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talukder, 2012</td>
<td>Randomized</td>
<td>Bangladesh</td>
<td>175</td>
<td>130</td>
</tr>
<tr>
<td>Khan, 2012</td>
<td>Pre-post</td>
<td>Pakistan</td>
<td>205</td>
<td>28</td>
</tr>
<tr>
<td>Malik, 2018</td>
<td>Pre-post</td>
<td>Pakistan</td>
<td>1391</td>
<td>417</td>
</tr>
<tr>
<td>Zawedde-Muyanja, 2018</td>
<td>Pre-post</td>
<td>Uganda</td>
<td>647</td>
<td>271</td>
</tr>
<tr>
<td>Maha, 2019</td>
<td>Pre-post</td>
<td>Papua New Guinea</td>
<td>295</td>
<td>140</td>
</tr>
<tr>
<td>Islam, 2017</td>
<td>Pre-post</td>
<td>Bangladesh</td>
<td>231</td>
<td>65</td>
</tr>
<tr>
<td>Cap-TB, unpublished</td>
<td>Pre-post</td>
<td>10 countries</td>
<td>5865</td>
<td>2295</td>
</tr>
<tr>
<td>Oshi, 2016</td>
<td>Pre-post</td>
<td>Nigeria</td>
<td>1590</td>
<td>1210</td>
</tr>
<tr>
<td>Joshi, 2015</td>
<td>Pre-post</td>
<td>Nepal</td>
<td>360</td>
<td>113</td>
</tr>
</tbody>
</table>
## Decentralized interventions for TPT

<table>
<thead>
<tr>
<th>Summary of study findings</th>
<th>Author: effect estimate (95% CI)</th>
</tr>
</thead>
</table>
| TPT initiations increased in studies that both provided home-based screening for contacts and strengthened TPT services in primary-level health facilities | **Yassin**: 698 vs 0 TPT initiations  
**CaP-TB**: 8-fold increase in median monthly TPT initiations per site, p<0.001 |
| Home-based screening alone did not significantly increase TPT initiations; lack of access to x-ray was a barrier | **Zachariah**: RR 1.27 (0.76-2.12) |


## Impact of integrated care on diagnoses

<table>
<thead>
<tr>
<th>Summary of study findings</th>
<th>Author: effect estimate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stepped wedge trial from Ethiopia showed that TB screening in Integrated Maternal, Neonatal, and Child Illness clinics led to a small but significant increase in TB diagnoses</td>
<td>Ketema: 0.5 (0.2-0.7) additional diagnoses per IMNCI clinic per 4-month period</td>
</tr>
<tr>
<td>Pre-post study from Zambia showed that after co-located ART services were introduced into rural health centers, the number of patients 0-14 years old registered for TB treatment increased</td>
<td>Miyano: IRR 2.67 (1.05-6.76)</td>
</tr>
</tbody>
</table>
## Impact of family-centered care on TPT

<table>
<thead>
<tr>
<th>Summary of study findings</th>
<th>Author: effect estimate (95% CI)</th>
</tr>
</thead>
</table>
| Cluster-randomized trial from Peru showed that providing social support and conditional cash transfers to families affected by TB increased TPT initiation among contacts 0-19 years old | **Wingfield:**  
RR 1.70 (1.10–2.64) for TPT initiation |
| Pre-post study from Peru showed that providing social, psychological, and economic support to families affected by TB increased TPT initiation and completion among contacts 0-19 years old | **Rocha:**  
- RR 2.23 (2.11–2.36) for TPT initiation  
- RR 3.22 (2.90–3.57) for TPT completion |
Summary of findings

• Approaches that both strengthen services in primary-level facilities and strengthen linkage from community to health system improve TB diagnosis and TPT initiation

• Positive but limited evidence that integrating services can increase TB diagnoses

• Socioeconomic support for families affected by TB can improve TPT outcomes
Evidence gaps identified

• Heterogeneous, multifaceted interventions prevented assessment of impact of individual intervention components
• Lack of age-disaggregated data in a large number of studies that could have included children and adolescents
• Few studies assessed impact of care integration or family-centered care on child and adolescent outcomes
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