

Contact Tracing and Active Case Finding: Underused Tools to Reduce the Burden of TB in Children

**Regional TB Symposium
Dushanbe, Tajikistan 2013**

Dr Clara van Gulik
Paediatric TB and HIV advisor
Médecins Sans Frontières

TB Case Finding Strategies



- **Passive case finding**
 - Patient initiated, self presentation because of symptoms
- **Enhanced case finding**
 - Patient initiated but following a provider/program initiated information campaign
- **Active/Intensified case finding**
 - Program/provider initiated
 - Attempt to identify most cases of a disease in a specific time period, geographic location or at risk group

ACF: What Strategy for Children?



Where?

- Schools/Nurseries
- Paediatric TB services
- Maternal and Child Health services
 - OPD/ANC
 - Paediatric hospital wards
 - Nutrition programs
- Households

How?

- Symptom screening
- Mobile X-ray
- Microscopy
- Culture
- Molecular diagnostics
- Role of TST/IGRA
- TB Paediatricians

Whom?

All children < 5 yrs with contact with (P)TB
All HIV infected children > 1yr

MSF Paediatric clinic



ACF: To Screen or To Diagnose?



Screening

- Should be simple
 - Can be complex
- High sensitivity
- Detect those without active TB and start preventive treatment

Diagnosis

- Can be complex
 - Should be simple
- High specificity
- Early diagnosis means earlier treatment
 - Better outcomes
 - Reduces transmission

Source: WHO

Screening is simple, Politics is not



ACF: Is it cost-effective?



WHO PRO/STOP TB: Modelling analyses of 6 strategies suggests:

- Only cost-effective if TB prevalence among the target population is high
- Extensive diagnostic methods only for very high-risk groups, such as TB contacts, prisoners or PLHIV
- TB symptom screening always applicable but diagnostic yield is very limited

Target prioritization and strategy selection for active case-finding of pulmonary tuberculosis: a tool to support country-level project planning

N Nishikiori, C Van Weezenbeek, BMC Public Health Feb 2013

IPT can reduce development of TB by up to 90% in patients with primary infection

Reinforcing Contact Tracing



Purpose:

- Identify contacts of all ages with undiagnosed TB
- Provide preventive therapy

Symptom based clinical screening is sufficient

- Cough, fever, weight loss/failure to thrive
- Allows implementation at PHC/MCH/community level
- Home visits allow additional family IEC

WHO prioritised high risk groups:

- **Children < 5yrs of age**
- **People living with HIV infection**
- **Index case is M/XDR TB, Sm+ PTB, HIV + or child < 5yrs**

Evidence of higher TB/LTBI risk in Contacts



- Meta-analysis of 203 studies; > 1m contacts

Contact investigation for tuberculosis: systematic review and meta-analysis, Fox et al, European Respiratory Journal, 41, 2013

	Low & Middle Income (95) % prevalence		High Income (108) % prevalence	
	TB	LTBI	TB	LTBI
Age group				
< 5	10	35.5	4.7	16.3
5 - 14	8.4	53.1	2.9	18.4
All contacts	3.1	45	1.9	28
HIV+	22	54	25	11.4

Incidence greatest in 1st year of exposure

Do MDR TB close contacts get MDR?



Study	Country	# of contacts	# of MDR case/# with TB, with DST
Kritski et al,1996	Brazil	218	62% (8/13)
Schaaf et al., 2000	S. Africa	149	83% (5/6)
Texeira et al., 2001	Brazil	133	83% (5/6)
Schaaf et al., 2002	S. Africa	119	75% (3/4)
Bayona et al., 2003	Peru	945	84% (35/42)
Becerra et al., 2011	Peru	4503	90% (129/142)
Johnston et al., 2012	Canada	89	0% (0/5)

Do MDR TB close contacts get MDR?



Исследование	Страна	Число контактов	# случаев МЛУ/# больны ТВ, с ЛЧТ
Kritski et al, 1996	Бразилия	218	62% (8/13)
Schaaf et al., 2000	ЮАР	149	83% (5/6)
Teixeira et al., 2001	Бразилия	133	83% (5/6)
Schaaf et al., 2002	ЮАР	119	75% (3/4)
Bayona et al., 2003	Перу	945	84% (35/42)
Becerra et al., 2011	Перу	4503	90% (129/142)
Johnston et al., 2012	Канада	89	0% (0/5)

Child contacts of MDR TB, Peru (1996 – 2003)



Method: Retrospective cohort

- HH contacts to MDR TB index cases
- TB prevalence at start of index case treatment
- TB incidence over 4 yrs

Results: 1299 child contacts

- 67 treated for TB, **7 of 8 had MDR**
- Disease rate **30x** > children gen population
- Incidence rate in **1st year 5 – 10x** > later yrs

Conclusion: Similar to 2 SA cohorts

- Contact investigation, prompt referral and Tx of paediatric HH contacts of MDR TB patients essential regardless of age

Age	Prevalence (per 100.000)
< 1 yr	0
1 – 2 yr	2513
3 – 4 yr	565
5 – 10 yr	2000
11 – 14 yr	1994
All children	1771
Adults > 15	2257

Tuberculosis in Children Exposed at Home to Multidrug Resistant Tuberculosis, M Becerra et al, The Paediatric Infectious Disease Journal, Feb 2013

Child contacts of MDR TB, Armenia (June 2012 – ongoing)



Method: Prospective cohort study

- Prevalence of TB infection/disease at start of index case treatment
- Incidence of TB infection/disease in subsequent 2 yrs
- Sample size: 150 contacts
- Screening:
 - Clinical history and examination
 - TST and QFT-IT
 - Chest X-ray
 - (Sputum/GA if Sx/signs on CXR)
 - (HIV)
- 3- monthly follow up



Child contacts of MDR TB, Armenia (June 2012 – ongoing)

Preliminary Results

- 55 child contacts
- Infected: 35 (64%)
- Non infected: 19 (35%)
 - Eight re-assessed at 3M: 2 became infected
- Disease suspected (based on CXR): 1

Differing Risk Factors?

- Slow/reluctance to recruitment
- BCG and EPI coverage
- Nutritional status
- Climate/environment
- HH conditions
- Context

Role Model: Kazakhstan



- Strong govt commitment
 - Prevent TB in children
 - Treat and care for TB in children
- Majority of children diagnosed through ACF in PHC setting
- Contact investigations in HH conducted routinely
- Extensive and developed infrastructure of paediatric TB services focusing on ACF and screening of contacts

- 74% reduction in TB case notification in children (1999 – 2011)
- 3x increase in MDR TB in children, 5x increase in adolescents

Source: WHO Child TB Roadmap 2013

Concluding Points



- Contact screening is an important but under used ACF strategy that is effective for children of all ages
- Contact tracing needs to be accompanied with a well implemented and functioning preventive activity
- To scale up case finding in children:
 - Strengthen and expand paediatric TB care to all HC settings
 - Integrate or collaborate with existing maternal, neonatal and child health (MNCH) services
- Still many research gaps