

# Tuberculosis prevention: An under prioritized YET critical intervention to reduce child tuberculosis morbidity and mortality

**Moorine Penninah Sekadde**  
**Childhood TB focal point, NTP Uganda**

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# Acknowledgement

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# Context

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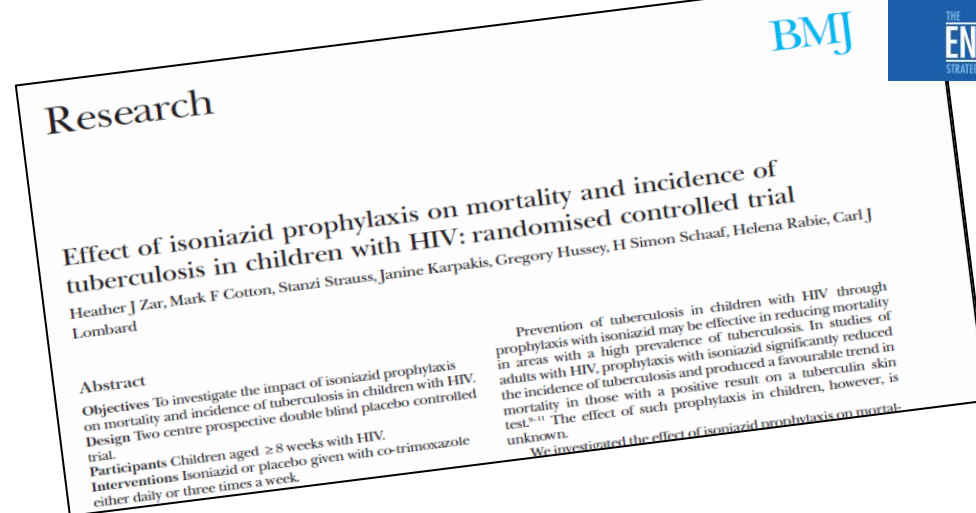
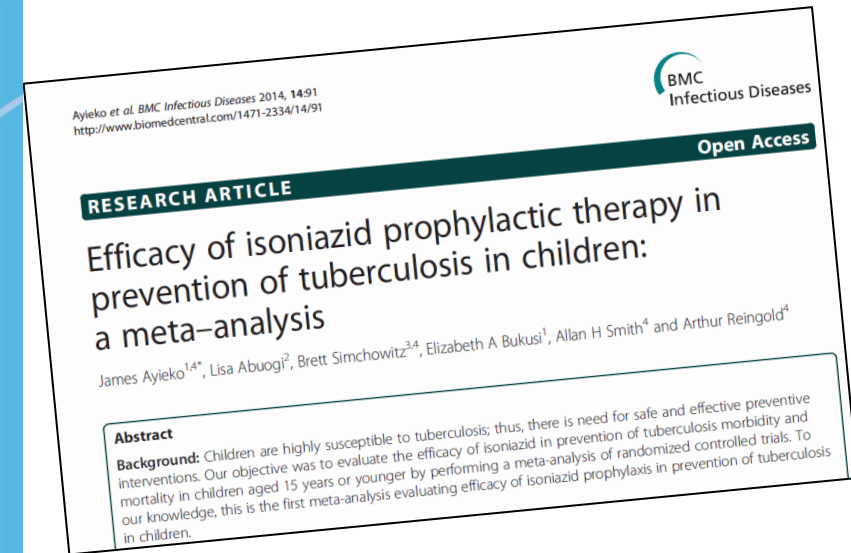
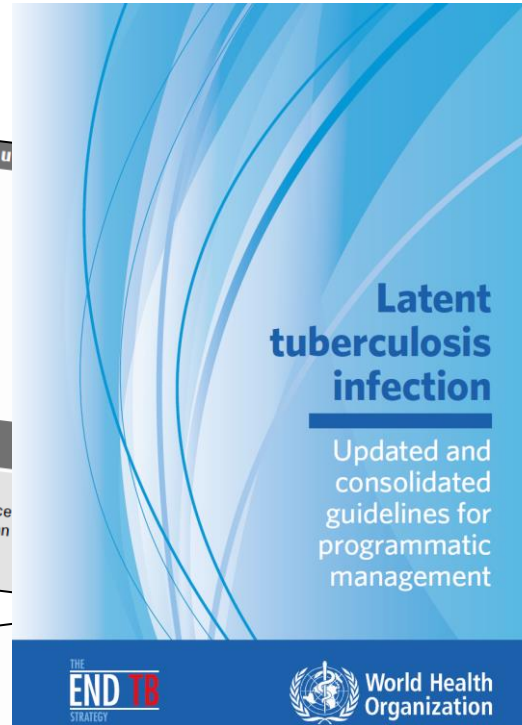
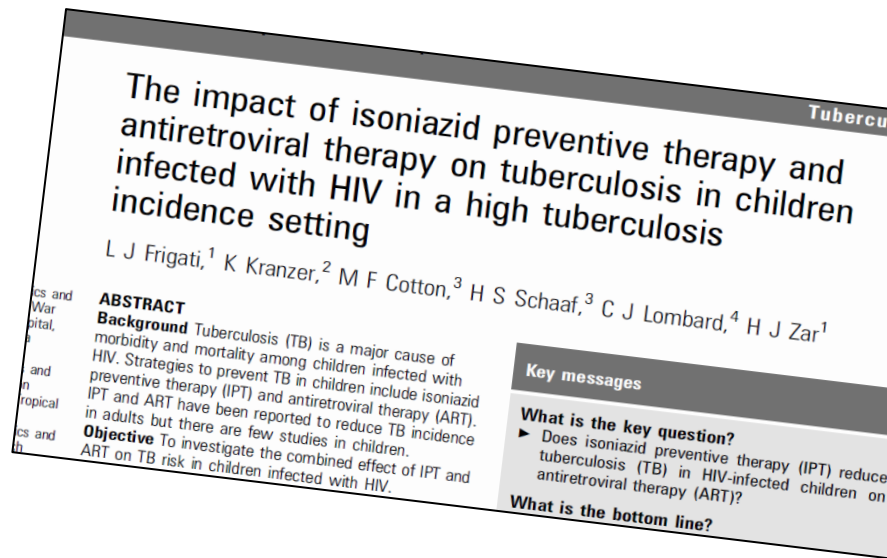
- Underestimation of the burden of TB disease among children due to poor diagnostics and non-specific presentations.
- Only 45% of the global estimated 1M children with TB were notified in 2017
- Majority are at risk of preventable TB related complications and death.
- Only 23% of the global estimated 1.3 M eligible under five contacts were initiated on TB preventive therapy in 2017
- Urgent need to strengthen LTBI treatment among eligible childhood TB contacts

**TABLE 5.1**

**TB preventive treatment for people living with HIV and children under 5 years of age who were household contacts of a bacteriologically confirmed pulmonary TB case, high TB or TB/HIV burden countries, 2017**

	TREATMENT PEOPLE LIVING WITH HIV NEWLY ENROLLED IN CARE	PEOPLE LIVING WITH HIV NEWLY ENROLLED IN CARE STARTED ON TB PREVENTIVE		ESTIMATED NUMBER OF CHILD CONTACTS UNDER 5 YEARS OF AGE ELIGIBLE FOR TB PREVENTIVE TREATMENT <sup>a</sup>		CHILDREN UNDER 5 YEARS OF AGE STARTED ON TB PREVENTIVE TREATMENT		
		NUMBER	COVERAGE (%)	BEST ESTIMATE	UNCERTAINTY INTERVAL	NUMBER	COVERAGE <sup>b</sup> (%)	
							BEST ESTIMATE	UNCERTAINTY INTERVAL
Angola	22 137	2 842	13	24 800	(22 600–27 000)			
Bangladesh				54 400	(49 500–59 200)	11 394	21	(19–23)
Botswana				781	(711–850)	556	**	
Brazil				2 860	(1 850–3 860)			
Cambodia	3 582	754	21	5 540	(5 040–6 030)	2 410	44	(40–48)
Cameroon				10 300	(9 400–11 200)	89	0.86	(0.79–0.95)
Central African Republic	8 180	0	0	3 500	(3 190–3 810)			
Chad				4 520	(4 110–4 920)			
China				10 400	(6 710–14 000)			
Congo	1 380	272	*	2 410	(2 190–2 620)	98	4.1	(3.7–4.5)
DPR Korea				9 450	(8 610–10 300)	11 984	**	
DR Congo				84 400	(76 900–92 000)	13 045	15	(14–17)
Eswatini	23 271	232	1.0	1 200	(1 090–1 300)	89	7.4	(6.8–8.2)
Ethiopia	39 126	17 801	45	27 500	(25 100–30 000)	2 964	11	(9.9–12)
Ghana				3 710	(3 380–4 040)			
Guinea-Bissau				2 060	(1 880–2 250)	394	19	(18–21)
India	173 174	18 162	10	344 000	(314 000–375 000)	38 745	11	(10–12)
Indonesia	49 215	7 681	16	71 500	(65 200–77 900)	6 080	**	
Kenya	155 377	136 495	*	24 900	(22 700–27 100)	6 521	26	(24–29)
Lesotho				1 760	(1 610–1 920)			
Liberia				2 300	(2 100–2 510)	133	5.8	(5.3–6.3)
Malawi	168 972			4 530	(4 130–4 940)	3 068	**	
Mozambique	1 480 908	170 022	*	21 000	(19 100–22 800)	26 087	>100	
Myanmar	37 402	6 531	17	15 900	(14 500–17 300)	337	2.1	(1.9–2.3)
Namibia	21 213	3 143	15	3 150	(2 860–3 430)	1 069	34	(31–37)
Nigeria	232 822	91 873	39	52 500	(47 800–57 200)	10 258	**	
Pakistan				107 000	(97 100–116 000)			
Papua New Guinea	3 788	590	16	2 430	(2 210–2 640)			
Philippines	6 755	3 817	57	55 200	(50 200–60 100)	6 473	**	
Russian Federation	16 868	16 368	97	1 690	(1 100–2 290)	10 096	**	
Sierra Leone	23 693	5 323	22	7 690	(7 010–8 380)			
South Africa	710 083	375 650	53	40 800	(37 200–44 500)	32 104	79	(72–86)
Thailand				5 510	(5 020–6 000)	278	5.0	(4.6–5.5)
Uganda				20 700	(18 900–22 500)	1 734	8.4	(7.7–9.2)
UR Tanzania				21 000	(19 100–22 800)	7 303	35	(32–38)
VietNam	14 509	4 552	31	15 600	(14 200–17 000)	4 128	26	(24–29)
Zambia	234 586	42 961	18	10 600	(9 670–11 600)	404	3.8	(3.5–4.2)
Zimbabwe	164 963	17 618	**	7 610	(6 930–8 290)	1 789	24	(22–26)

# More than enough evidence to support TB preventive Therapy !!!



## Impact of isoniazid preventive therapy on mortality among children less than 5 years old following exposure to tuberculosis at home in Guinea-Bissau: a prospective cohort study

Victor Francisco Gomes,<sup>1,2</sup> Andreas Andersen,<sup>1,2</sup> Grethe Lemvik,<sup>1,3</sup> Christian Wejse,<sup>1,3</sup> Ines Oliveira,<sup>1,2</sup> Fina J Vieira,<sup>4</sup> Luis José Carlos,<sup>5</sup> Cesaltina da Silva Vieira,<sup>4</sup> Peter Aaby,<sup>1,2</sup> Per Gustafson<sup>6</sup>

# Effect of household TB contact management

## Potential effect of household contact management on childhood tuberculosis: a mathematical modelling study

Peter J Dodd, Courtney M Yuen, Mercedes C Becerra, Paul Revill, Helen E Jenkins, James A Seddon

### Summary

**Background** Tuberculosis is recognised as a major cause of morbidity and mortality in children, with most cases in children going undiagnosed and resulting in poor outcomes. Household contact management, which aims to identify children with active tuberculosis and to provide preventive therapy for those with HIV or those younger than 5 years, has long been recommended but has very poor coverage globally. New guidelines include widespread provision of preventive therapy to children with a positive tuberculin skin test (TST) who are older than 5 years.

**Methods** In this mathematical modelling study, we provide the first global and national estimates of the impact of moving from zero to full coverage of household contact management (with and without preventive therapy for TST-positive children older than 5 years). We assembled data on tuberculosis notifications, household structure, household contact co-prevalence of tuberculosis disease and infection, the efficacy of preventive therapy, and the natural history of childhood tuberculosis. We used a model to estimate households visited, children screened, and treatment courses given for active and latent tuberculosis. We calculated the numbers of tuberculosis cases, deaths, and life-years lost because of tuberculosis for each intervention scenario and country.

**Findings** We estimated that full implementation of household contact management would prevent 159 500 (75% uncertainty interval [UI] 147 000–170 900) cases of tuberculosis and 108 400 (75% UI 98 800–116 700) deaths in children younger than 15 years (representing the loss of 7 305 000 [75% UI 6 663 000–7 874 000] life-years). We estimated that preventing one child death from tuberculosis would require visiting 48 households, screening 77 children, giving 48 preventive therapy courses, and giving two tuberculosis treatments versus no household contact management.

## Highlights

- Full implementation of household contact management in children < 15 years would prevent:-
- ✓ 159 500 case (75% UI 147 000–170 900) cases of TB
- ✓ 108 400 (75% UI 98 800–116 700) deaths due to TB



# Examples of Implementing TB preventive Therapy under routine national TB programs

## A. Evaluations of current programmatic practice

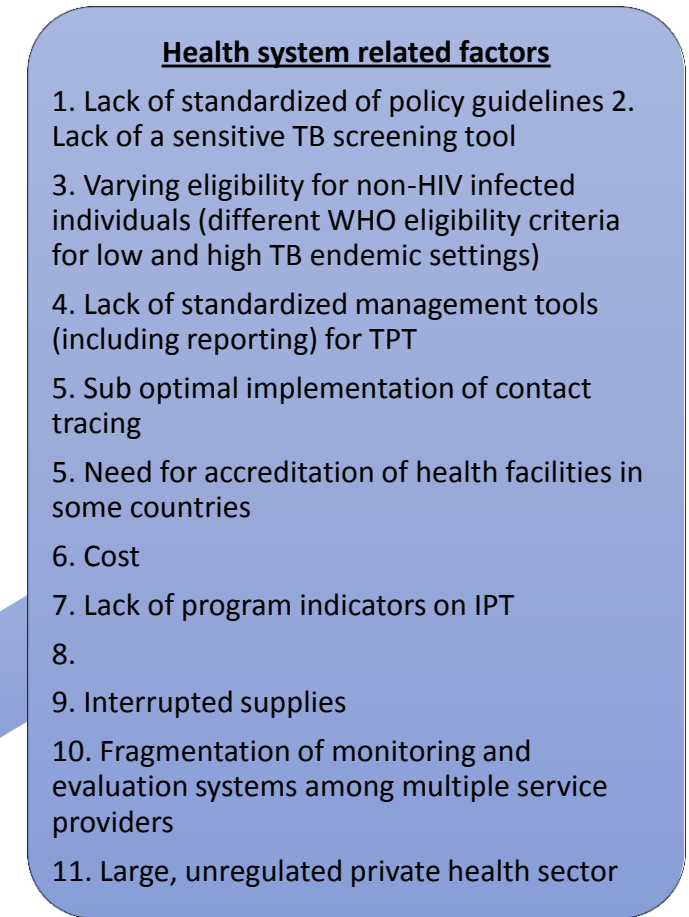
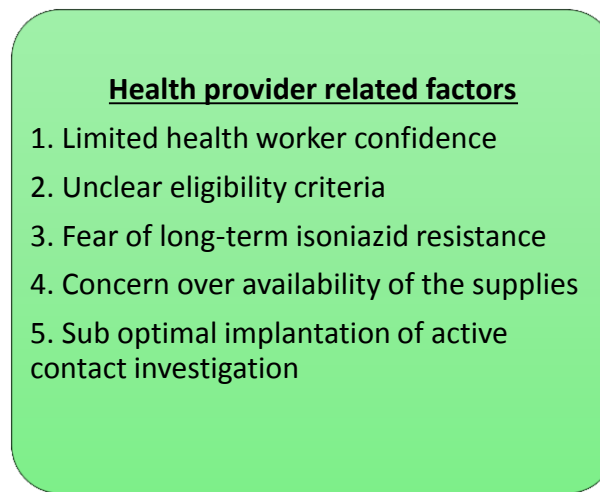
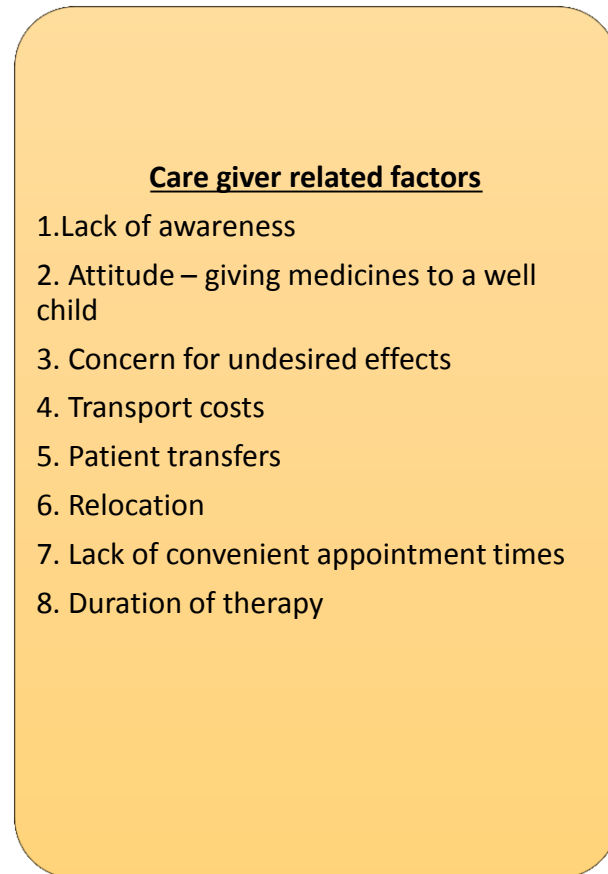
Study	Setting	Study population	Methods	Findings
Osman, 2013	14 primary health care facilities in Cape Town	< 5 year old household contacts	Retrospective review of electronic data records	<ul style="list-style-type: none"> <li>• 33.3% of 1179 records of infectious adult TB cases had no documentation of contacts</li> <li>• Of the 525 contacts aged &lt;5 years who were documented, less than half were screened for TB</li> <li>• 141 (27%) contacts initiated IPT</li> <li>• Only 18 (13%) completed IPT</li> </ul>
Van Wyk, 2011	Primary community clinics in Cape Town	< 5 year old household contacts	Record review of routinely collected program data	<ul style="list-style-type: none"> <li>• 46% (310) of the TB case clinical charts did not have contacts documented</li> <li>• 4 of the 149 under five contacts were screened</li> <li>• Only 1% (2) were initiated on IPT</li> <li>• 2 of the 56 under five contacts of non-infectious cases were screened and 1 was started on IPT contrary to recommendations</li> </ul>
Claessens, 2002	44 districts hospitals in Malawi	< 5 year old household contacts	Cross sectional study by the Malawi NTP	<ul style="list-style-type: none"> <li>• Only 21% of 659 smear positive patients had been informed about the need to screen their children for TB</li> <li>• Only 9% of the 365 children were screened for TB</li> <li>• 22 (6%) of children received IPT</li> </ul>

# Examples of Implementing TB preventive Therapy under routine national TB programs

## B. Successful Programmatic Interventions

Study	Setting	Study population	Methods	Findings
Adjobimey, (2016)	Benin NTP Clinics	< 5 year old household contacts of smear positive TB	Integrating the contact management program under the NTP  Patients were asked to bring their under-five contacts to TB treatment visits and a phone call or home visit for missed appointments was made	<ul style="list-style-type: none"> <li>• 496 under 5 year old household contacts were initiated on 6 months IPT with an initiation rate of= 99.6%;</li> <li>• The IPT completion rate was 86.1% with adherence based on clinic attendance</li> </ul>
Van Soelen, 2013	Urban clinic setting in Cape Town	< 5 year old household contacts	Introduction of an IPT register in the clinic	<ul style="list-style-type: none"> <li>• More child contacts per adult case were identified (0.7 (54 children) vs. 0.3 (24 children)) as compared to pre-register</li> <li>• An increase in the number of children started on IPT (54 vs. 4) was observed</li> <li>• 37% of those who started, completed therapy compared to no information during pre-register period</li> </ul>





# Opportunities for Improving TB contact Management

## Service delivery

*TB Contact investigation*  
*Child survival programs (IMCI, ICCM)*  
*Monitoring and evaluation tools*

## Health work force

*Effective training and mentorship strategies*

## Information

*Guidelines*  
*Monitoring and evaluation tools*  
*Community engagement (ENGAGE-TB)*  
*E-HMIS*

## Medical products, vaccines, and technologies

*Shorter TB preventive regimen*  
*Child friendly formulations*  
*Rapid TB diagnostics – Xpert*  
*E-Health Information System*

## Financing

*Country specific budgets*  
*Bilateral and Multilateral agencies*  
*Global Fund*  
*(Medicines, Diagnostics, Catastrophic costs)*

## Leadership and Governance

*Country specific multisector plans*  
*Child and Adolescent TB Road map 2018*  
*END Strategy*  
*Commitment from the UN HLM*

**HEALTH SYSTEM FRAMEWORK: BUILDING BLOCKS**

**UNTIL NO CHILD DIES OF TB !!!!!**