

MOBILITY PREDICTS INCIDENT TB INFECTION IN CHILDREN AND ADULTS IN RURAL UGANDA

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Background

- In sub-Saharan Africa, a significant portion of the large latent TB reservoir is established outside of the home.
- Data on TB risk among mobile children and adults who travel outside of the community for work or school is limited, and may be critical to targeting TB prevention efforts.

Objectives

In an ongoing longitudinal cohort of TST negative children and adults in rural communities Eastern Uganda we sought to:

- Describe the characteristics of children with incident TB infection, as defined by TST conversion at 1-year follow up.
- Assess the association between mobility and incident TB

Methods

Study Population and Study Design

- This study population is comprised of a tuberculin skin test (TST) negative cohort of children and adults (≥5 years of age) residing in 4 rural communities in Eastern Uganda. All households are participating in a longitudinal household survey nested in the SEARCH test and treat trial (NCT:01864603). Households were randomly sampled, and enriched for those with an HIV-infected adult.
- Participants were included in the TST negative cohort if their baseline TST induration was 0mm. Baseline TSTs were placed October 2015- January 2017.
- Follow-up TSTs were placed one year from baseline.
- All TSTs were placed in the home, and up to 3 home visits were made.

Study Definitions

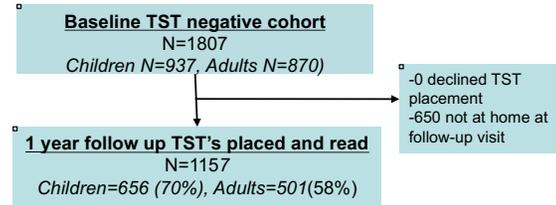
- Incident TB infection** = newly positive TST at 1-year follow-up (positive TST was defined as induration ≥10mm for HIV uninfected persons or induration ≥5mm for HIV infected persons). All participants had a baseline TST of 0mm.
- Mobile**= living outside of the community for more than 1 month in the last year, such as to attend boarding school or work.

Analytic Methods

- We used multivariate logistic regression to assess the association between mobility and incident TB infection. Adjusted models included variables with unadjusted odds with a p-value≤0.01, and HIV status and living with an HIV-infected adult were included a-priori.

Results

Study Flow Diagram



Characteristics of Children and Adults with Incident TB Infection

- 13% of children and adults met our definition of incident TB

Demographics of TST Negative Cohort at 1-year of Follow Up N=1157

Female	57%
Age (years)	
6-14	57%
15-24	17%
≥25	26%
Mobile	5%
BCG scar or record of vaccination	93%
HIV-infected*	11%
Household TB contact in the last year	1%

*Sample enriched for those with HIV-infected adults in the household

Characteristics of Participants with Incident TB Infection N=150

Female	61%
Age (years)	
6-14	49%
15-24	13%
≥25	38%
Mobile	9%
BCG scar or record of vaccination	93%
HIV-infected*	11%
Household TB contact in the last year	4%

Results 2

Association Between Mobility and Incident TB Infection

Predictors of Incident TB Infection in Children and Adults	OR (95% CI) ¹	aOR (95% CI) ¹
Mobile ²	1.9* (0.9-4.08)	2.3** (1.1-5.2)
Age (year)	1.0*** (1.0-1.0)	1.0* (1.0-1.0)
Female	1.2 (0.9-1.7)	
Household TB Contact	4.2* (1.0-18.3)	2.4 (0.6-9.2)
HIV-infected	1.2 (0.6-2.7)	0.8 (0.4-1.7)
Lowest Wealth Tertile	0.9 (0.6-1.5)	

¹Confidence intervals were calculated using robust standard errors and adjusted for clustering by household.

²Mobile is defined as living outside of the community for more than 1 month.

¹p<1.0
^{**}p<0.5
^{***}p<0.01

Conclusions

- In a cohort of rural Ugandan children and adults, where population based treatment of HIV is ongoing, mobility was a predictor of increased risk of incident TB infection.
- TB exposure outside of the community, such as in boarding schools or travel for work, may drive a portion of TB infections in rural communities.
- Casual TB contacts within rural communities and undiagnosed household contacts may explain the incident infections not associated with a known household contacts or mobility.

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