A data-driven approach to estimate putative pulmonary TB among adolescents living with HIV/AIDS: use of self-reported TB symptoms.

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BACKGROUND

Tuberculosis is the most common cause of death globally, especially in the era of HIV/AIDS. South Africa has a long history of high tuberculosis burden, and about 25,000 TB-related deaths were recorded in 2015 (WHO 2017). The country houses one of the highest global TB burdens, with 28% of the world's cases of HIV-TB co-infection. However, few studies have measured TB prevalence in non-clinical settings in low- and middle-income countries, particularly among adolescents living with HIV (ALHIV). Despite progress made, burden of undetected TB is high, most effective TB diagnostic tools (sputum, Gen-Expert) are expensive and not accessible to resource-constrained populations. Moreover, accurate estimates for rates of TB infection remain unknown, particularly for high risk populations such as ALHIV.

DATA (MZANTSI WAKHO STUDY)

At baseline, 1527 adolescents were enrolled and 1454 were successfully re-interviewed at follow-up (94% retention rate) and were included in this analysis. The sample was predominantly female (57.6 %) and HIV positive (N=1060, 72.4%) with median age 15. According to self-reports, 71.8% of the adolescent's sample, had been tested for TB in the past year and were aware of the results. 28 % of those tested reported having TB in the past year (either treated or not).
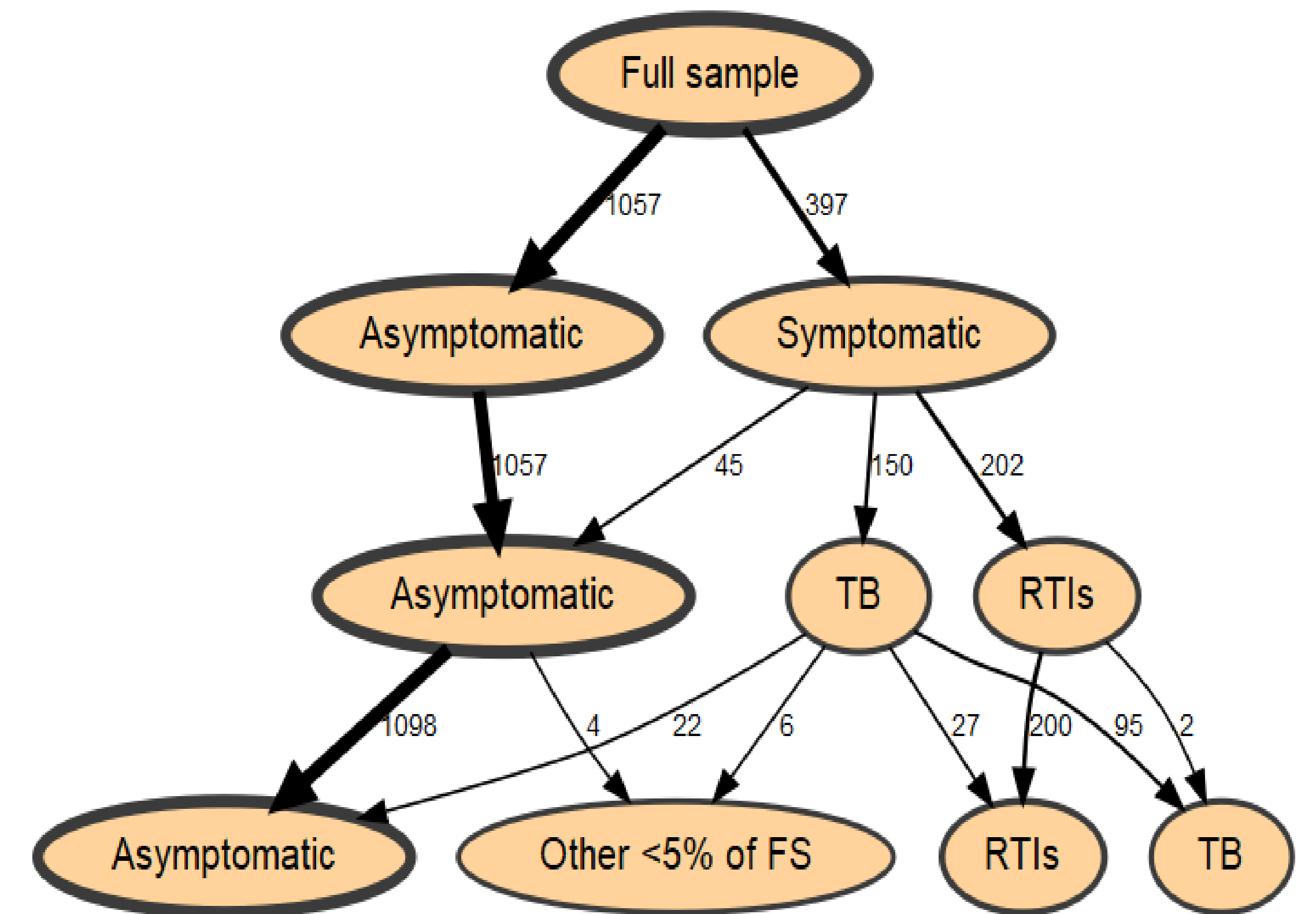
OBJECTIVE

✓ To estimate and assess rates of PTB infection among adolescents in a resource-constrained setting in South Africa.

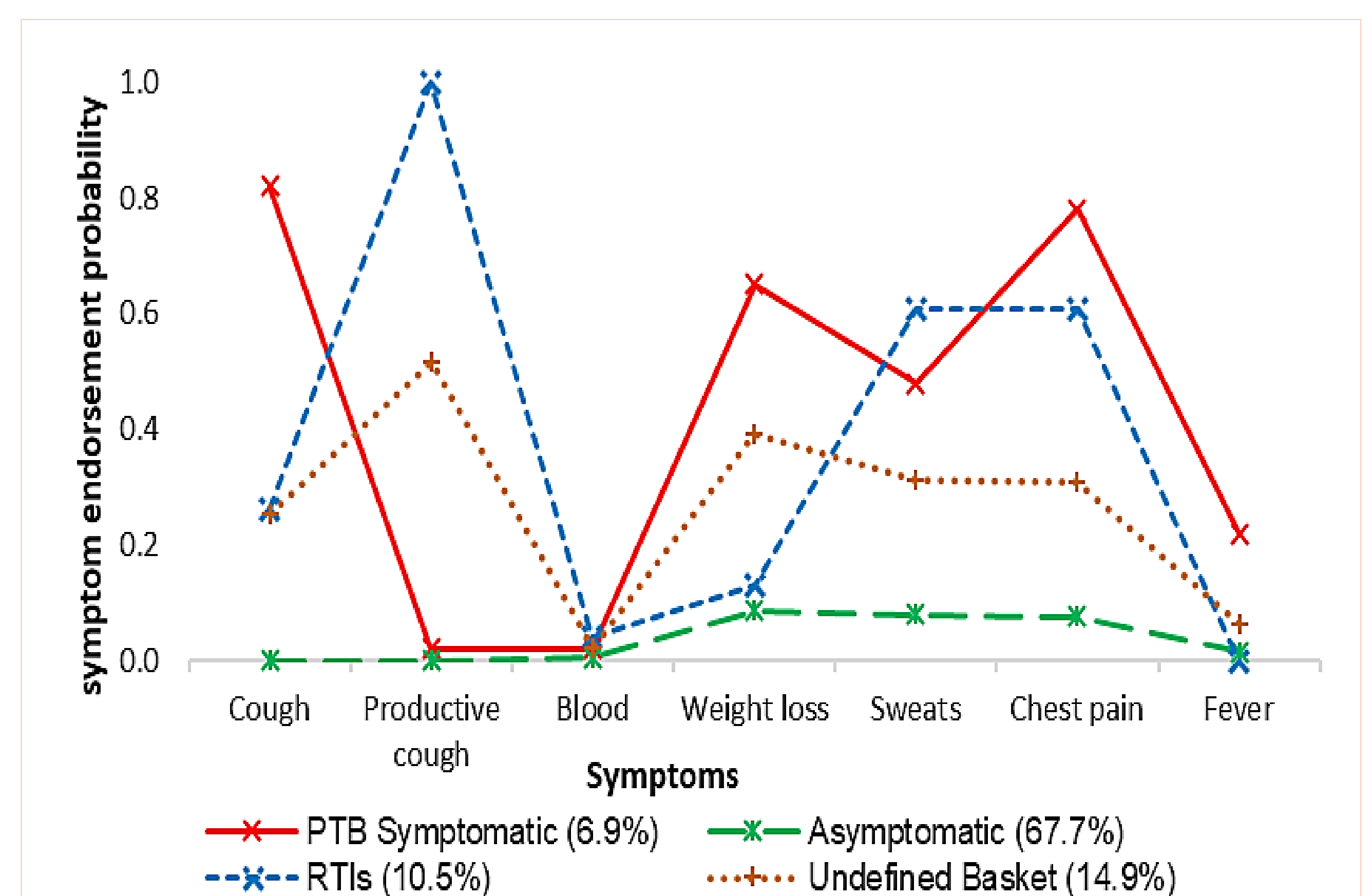|			
Self-reported TB	n=761	213 (TB+)	28%
TB diagnosis in patient medical records	n=711	47 (TB+)	6.6%

ANALYSES

Classifications over a sequence of 2, 3, and 4 latent class models

RESULTS

Using Latent Class Analysis (LCA), we estimated that 6.9% of the adolescents were symptomatic of pulmonary TB, characterized mainly by chronic non-productive cough, chest pain, weight loss, and night sweats. Unexpectedly, further examination of symptom profiles uncovered a higher proportion of adolescents (10.5%) who were symptomatic of other respiratory tract infections characterized mainly by highly productive cough, chest pain, and night sweats. Cumulatively combining these symptoms for identifying TB increased PPVs to 67.6% for adolescents living with HIV. Combining productive cough and night sweats for HIV- adolescents or a productive cough and chest pain for HIV+ adolescents had high PPVs (83.7%).

CONCLUSIONS

✓ Our analysis suggests high rates of PTB, and RTIs among adolescents living with HIV in a community-traced study from South Africa.
✓ PTB, and more surprisingly RTIs can be detected with reasonable accuracy using a simple symptom-based approach.
✓ Additional research to understand provider use of symptom-based screening to prioritise TB and RTI diagnosis is needed, so that adolescents at highest risk of mortality can access timely and correct treatment.

Methodological contribution

✓ Latent Class Analysis (LCA) used to compute full sample reliable TB outcome using self-reported symptoms and offers prospects for more effective TB/RTIs differentiation, especially in resource-poor settings

Caring for ALHIV

✓ High rates of pulmonary TB and RTIs – driven by HIV, especially RTIs.

FIGURE 1: PROFILES OF ADOLESCENTS TB SYMPTOM EXPERIENCES