Association between prior tuberculosis infection and diabetes within an HIV-endemic rural South African population

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Background

- Tuberculosis (TB) may predispose individuals to the development of diabetes. [1,2,3]
- Such a relationship could have an outsized impact in high-prevalence tuberculosis settings.
- However, few studies have explored this relationship in populations heavily burdened by diabetes and TB.

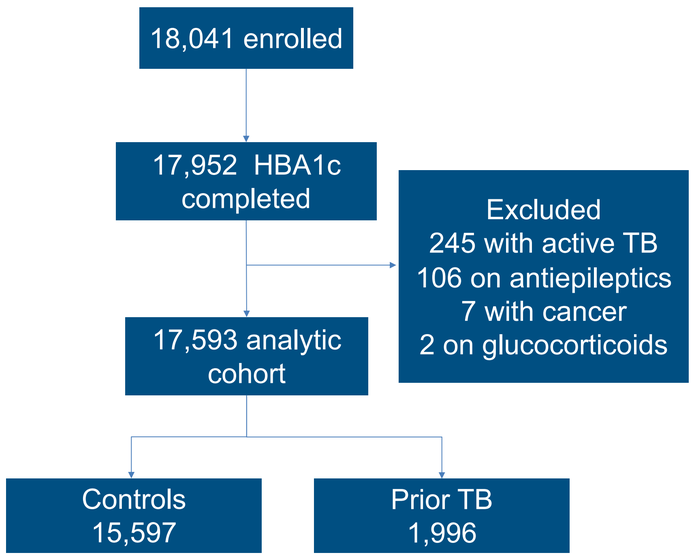
Objective

- To compare prevalence of glucose intolerance among individuals with and without prior TB
- Assess the interactions between Prior TB, HIV serostatus, and glucose intolerance

Methods

- Analysis of data from a community- based population cohort that enrolled adults (>15 years) in rural South Africa.
- **Primary outcome:** Glucose intolerance defined as HBA1c ≥ 6.5% or participants taking diabetic medications
- **Primary exposure:** Prior TB defined as self-reported history of TB treatment
- We fitted propensity score-matched logistic regression models to estimate relationships between glucose intolerance and prior TB
- Models stratified by sex, and adjusted for age, waist circumference, HIV, smoking, alcohol use, socioeconomic status

Figure 1. Analytic Cohort



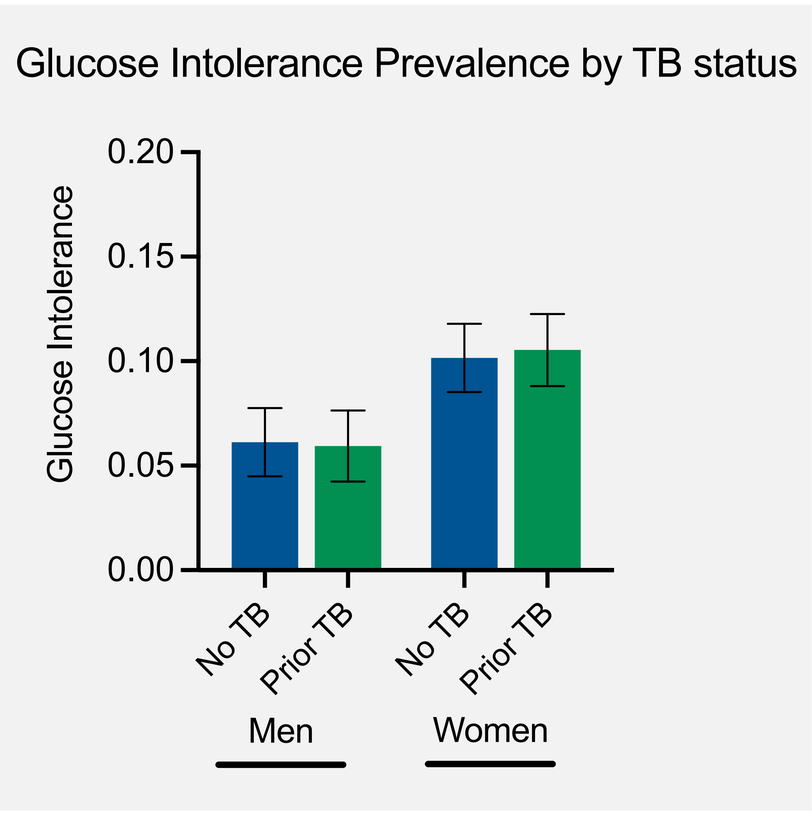
Results

Table 1. Baseline Characteristics

Characteristic	**Men** (n=5,607)		**Women** (n=11,986)	
	Prior TB	No Prior TB	Prior TB	No Prior TB
Age (years)	47 ± 14	35 ± 19	46 ± 15	42 ± 20
Waist Circumference (cm)	82 ± 11	80 ± 12	90 ± 16	91 ± 17
HBA1c ≥ 6.5 (%)	5.3	4.9	9.6	11.1
Living with HIV (%)	61	19	76	34
Past or active smoker (%)	38	20	3	1
Socio-economic score#	-0.04 ± 2.1	0.30± 2.10	0.04 ± 1.9	0.24 ± 2.0

± standard deviation
socioeconomic score ranges from -7.0 to +7.0

Figure 2: Glucose Intolerance by Prior TB Status



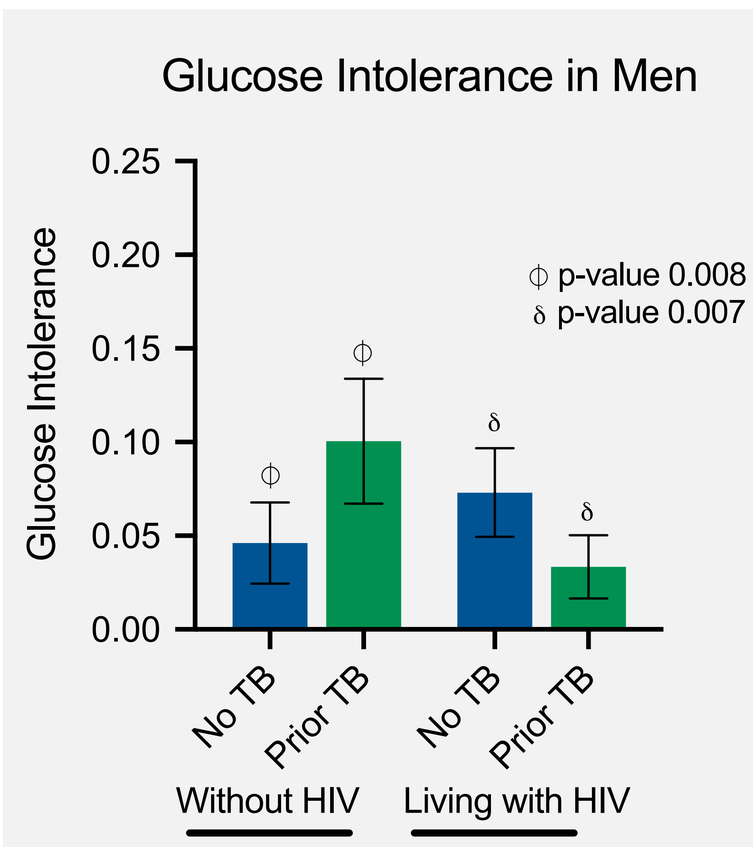


Figure 3: Prior TB and HIV Interactions in Men

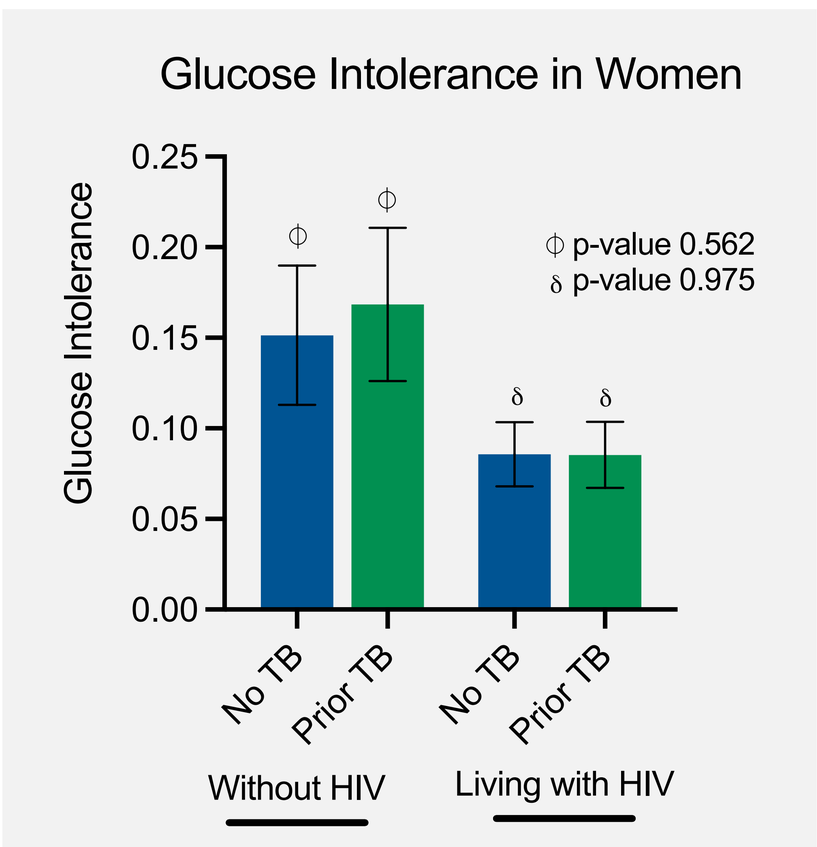


Figure 4: Prior TB and HIV Interactions in Women

Conclusions

- At a population level, prior TB infection was not associated with prevalent glucose intolerance in an HIV-endemic, rural South African population.
- However, we found a significant qualitative interaction between prior TB and HIV status. Among men without HIV, those with prior TB have greater odds of glucose intolerance compared to men without prior TB.
- Longitudinal studies are needed to establish a causal effect and underlying mechanisms that relate to resolved TB, HIV, and diabetes.

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