



Tuberculosis related health impairment at end of treatment assessed using the St. George's Respiratory Questionnaire: uMkhanyakude District, South Africa

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Background:

Post-TB Lung Disease

- Post-TB lung disease (PTLD) is an important and increasingly recognised global consequence of TB
- Defined as: *‘Evidence of chronic respiratory abnormality, with or without symptoms, attributable at least in part to previous tuberculosis.’*
- Can include range of pathophysiological changes to lung tissue, body composition and immune functioning as a result of tuberculosis and treatment course
- Impairment beyond lung alone: significant effects possible on effort tolerance, respiratory and non-respiratory functioning, social and mental wellbeing that persist long after ending treatment
- **Estimated to affect approximately 60% of all people cured of tuberculosis**
- Longitudinal TB surveillance is the ideal mechanism to monitor long term health outcomes in these groups

Background:

Asymptomatic Tuberculosis

- Increasing recognition of the wide range of presentations of active TB disease in clinical care across a continuum from completely asymptomatic to classical symptomatic presentation
- Substantial burden largely undetected within community setting – due to reliance on clinical presentation and screening programs
- **Estimated to account for 50-60% of prevalent TB cases in endemic countries**
 - Potential driver of TB transmission as well as TB treatment resistance patterns
 - Significant impact of delays to treatment initiation and progression of disease
- Considerable effort needed to identify TB cases and initiate TB treatment in this group if “End TB” Strategy to be achieved.

Knowledge gap:

Little is known of the long-term sequelae and consequences of TB within the asymptomatic population after treatment.

Research Aim

To explore the association between reported symptoms at start of TB treatment and health impairment at end of TB treatment

AHRI TB Surveillance Platform: Umkhanyakude District, KZN

Prospective cohort study of individuals with TB starting or receiving treatment in Umkhanyakude

Aim: To provide insights into the epidemiological burden of TB and drivers of *M. tuberculosis* transmission in a rural population in South Africa.

Procedures:

- Enrols all individuals with active TB at 12 PHC's & 1 district hospital within AHRI HDSS area.
- 7 year duration 2024 until 2030
- Over 750 participants enrolled to date

Baseline interview and file review: demographic data, sputum samples – culture, Xpert & sensitivity testing

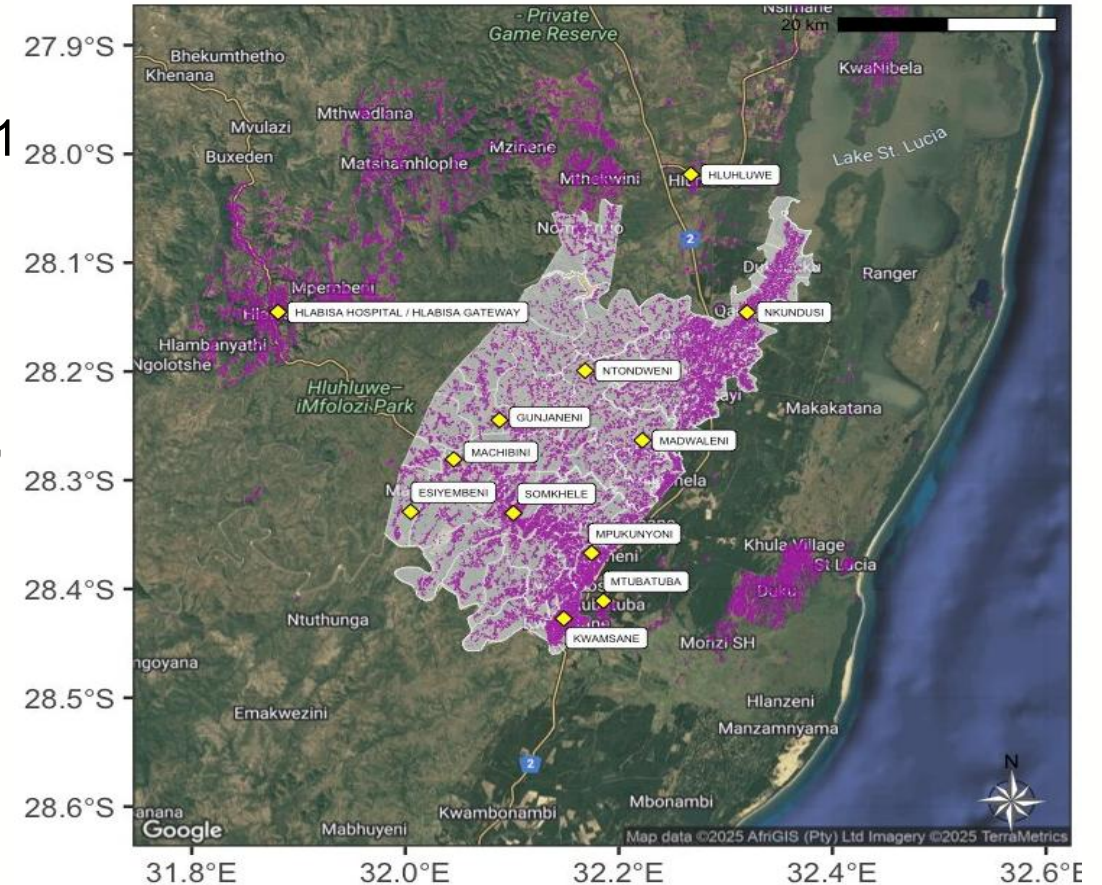
5-month follow up interview & end-of-treatment file review.

Inclusion:

- All individuals with active TB initiating treatment
- Facilities within HDSS or HDSS residents

Exclusion:

- Hospitalized patients (until stable)



Yellow diamonds: health facilities. Pink dots: population distribution

End-of-treatment Health Impairment Data Analysis Methods:

- Population:
 - Analysis within AHRI TB Surveillance Platform – Umkhanyakude District, KwaZulu-Natal
- Study Data:
 - Baseline interview: At treatment initiation. To identify demographic characteristics, previous TB history, exposures and baseline symptom status.
 - 5-month end of treatment interview: Correlating to final treatment collection. St. George's Respiratory Questionnaire (SGRQ) is conducted.
- Inclusion Criteria
 - All consenting individuals enrolled in AHRI TB Surveillance
 - Above the age of 15 years at treatment initiation
 - Initiated on TB treatment since January 2025 – April 2026
- Exclusion Criteria:
 - Not yet completed 5-month interview at time of analysis
 - Patient death, loss-to-follow-up

St. George's Respiratory Questionnaire (SGRQ):

- Validated 50 item questionnaire for use in chronic lung disease and Tuberculosis to assess for impairment in health related quality of life
- Normative reference ranges calculated for healthy population group
- Includes overall measure – as well as composite: symptom, activity and functional impact scores
- **Higher score correlates to higher level of impairment in wellbeing**

Asymptomatic Definition

- For the purpose of this analysis we have defined asymptomatic individuals as any individuals identified with Tuberculosis who were asymptomatic for ANY symptom at baseline interview
- Includes WHO-4 Symptom Screen (W4SS) as well as other reported symptoms

Methods continued:

- Symptoms status at baseline assessment compared against “Health impairment” at end-of-treatment as measured by the St George’s Respiratory Questionnaire (SGRQ) scoring system.
 - Comparison between those who reported any symptoms vs those who reported none
- **Univariable** and **Multivariable** analyses conducted
 - Multivariable Linear Regression Model:
 - SGRQ total and component scores assessed **within PLWHIV**
 - Adjusted for age, prior TB disease, any baseline symptoms, significant smoking history and sex

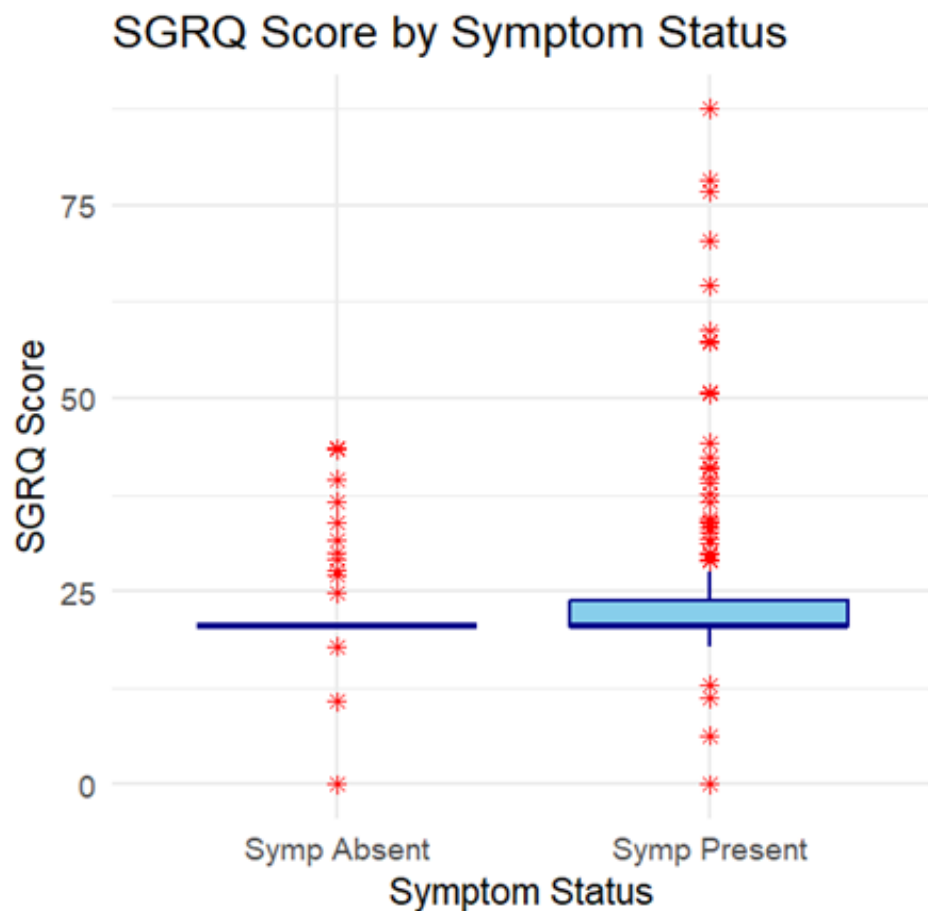
Results

Baseline Characteristics of those Completing SGRQ in those above 15 years age

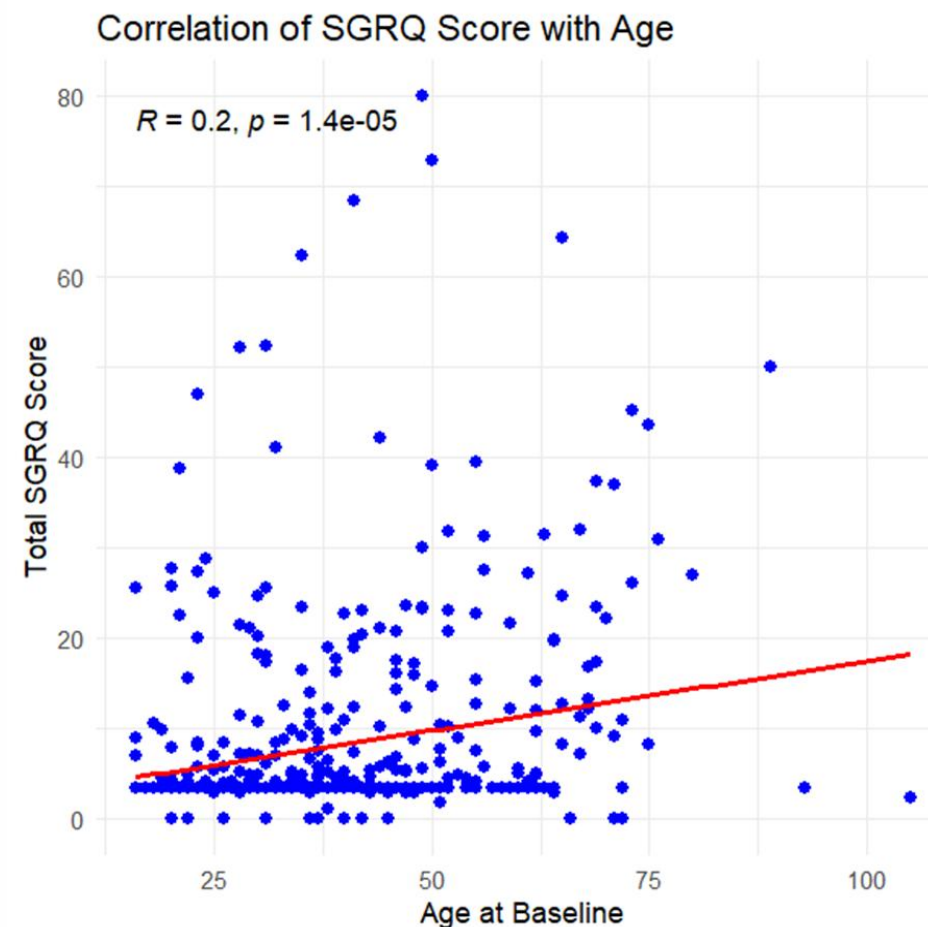
Characteristic	Overall n = 474	Any Symptoms Present n = 382 (80.6%)	Asymptomatic at Baseline n = 92 (19.4%)
Age			
Median (IQR)	39 (30-49)	40 (31-50)	39 (29-46)
Sex			
Female	240	174 (72.5%)	66 (27.5%)
Male	234	208 (88.9%)	26 (11.1%)
HIV Status			
PLWH	366	283 (77.3%)	83 (22.7%)
HIV Negative Group	108	99 (91.7%)	9 (8.3%)

- **90% of asymptomatic individuals are PLWH**
- **Higher asymptomatic proportion amongst female participants**
- **Higher asymptomatic proportion among PLWH**

Results of Univariable Analysis



Total SGRQ Score



Total SGRQ Score vs Age

Overall, median SGRQ at month 5 = 20.4 vs. 6 in healthy reference population

No difference in mean SGRQ between symptomatic people (24.4) vs. asymptomatic (22.9) on T-test

Weakly positive correlation between increase age and SGRQ score: Correlation Coefficient = 0.26 ($P < 0.01$)

Multivariate Analysis Results

Effect	Estimate	Standard Error	T-value	P-Value
Intercept	-27.1099	15.6441	-1.733	0.09
Age at Visit	0.16	0.14	1.106	0.27
Drug Resistant TB Status	14.44	9.07	1.592	0.12
Previous TB History	7.15	3.29	2.172	0.03 *
Any Symptoms Present at Baseline	4.00	6.13	0.653	0.52
Smoking History	1.05	3.40	0.309	0.76
Sex at birth	7.54	5.77	1.307	0.20
Residual standard error: 12.39 on 72 degrees of freedom, Multiple R-squared: 0.134, Adjusted R-squared: 0.06188. F-statistic: 1.858 on 6 and 72 DF, P <0.01.				

Results:

- Previous TB Associated with 7.15 point increase in total SGRQ score (P <0.05)
- No association found with SGRQ score and baseline symptom status

Conclusions:

- Persistent health impairment found after treatment completion in both groups
- **No evidence of difference** in health impairment between people who do / do not report symptoms at baseline
- Underlines importance of finding people with asymptomatic TB
 - **Special attention needed to include asymptomatic and male patients into TB testing programs, where missed by TUTT**
- Need for studies to calculate normative reference ranges for SGRQ in SA population
- Further analyses of Mental Health Impairment across groups through PHQ9 data

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Thank you!
Questions?

