

Hidden lung impairment at tuberculosis diagnosis: a comprehensive physiological and imaging assessment

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Background



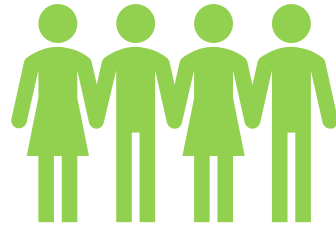
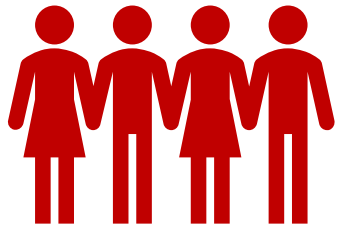
1. By 2020, 155 million TB survivors were alive globally
2. But, TB CURE $\neq$ End of disease, as $\approx 60\%$ of survivors have sequelae
3. PTLD is the 2nd commonest TB sequelae (18-87% of survivors)
4. Is associate with $\uparrow$ mortality (x3-6) and reduced quality of life
5. Despite growing research interest, notable gaps persist;
 - Reliance on spirometry
 - Underutilization of radiology
 - Frequently, studies enrol post TB
 - Lack of appropriate controls

PTLD-post TB Lung disease

(Bisson, Allwood et al.); (Taylor, Bastos et al. 2023) **1**

Study aim and methodology

Aim: To comprehensively characterise lung function and imaging in adults with drug-susceptible TB (cases) before treatment, compared with their household contacts.



- ≥ 18 yrs
- DS-TB
- Pre-treatment
- 1:1 HIV stratification

- ≥ 18 years
- No prior TB
- No CLD
- Household contacts
- Matched by HIV

Lung function testing

- Spirometry (pre/post bronchodilator)
- Body plethysmography
- Diffusion capacity of lungs for CO (Dlco)

Chest Imaging

- HRCT + chest X-ray

Six-minute walk test

Sputum Ultra and Culture

Demographics and clinical data

Results

Table 1: Sociodemographic and clinical characteristics. Data are median (IQR) or n/N (%)

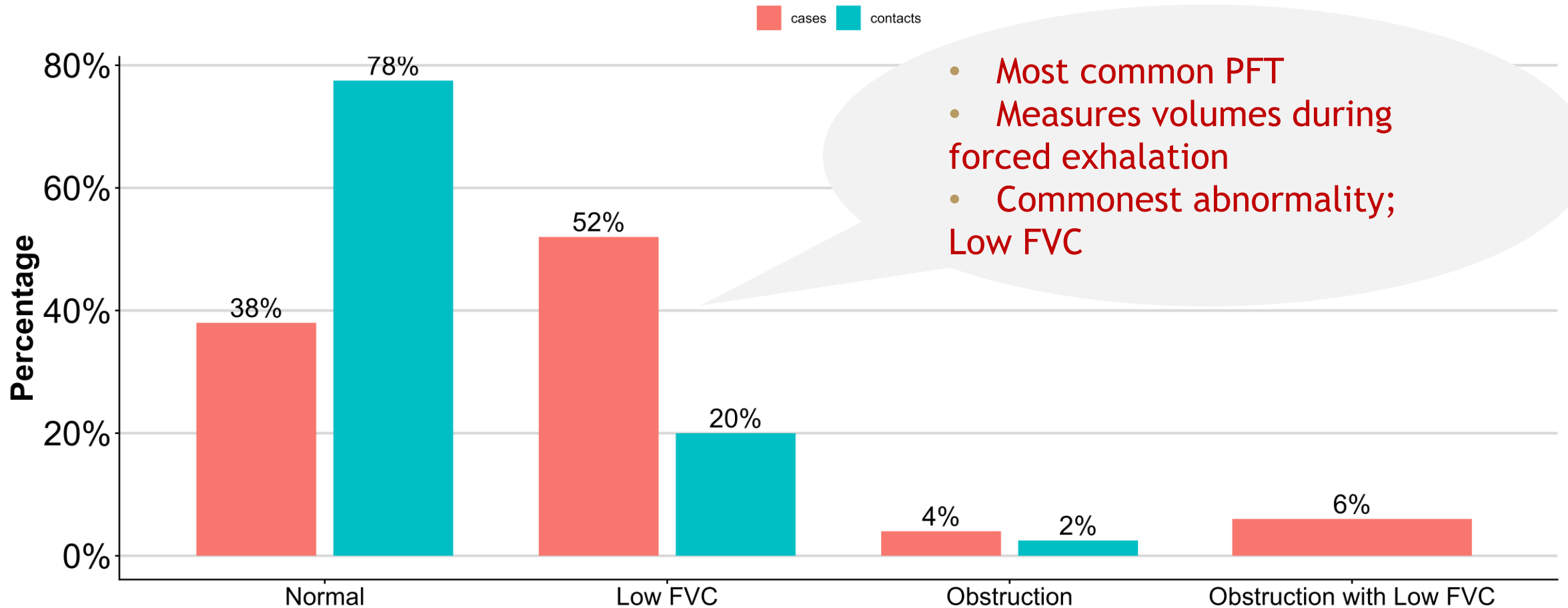
Characteristics	Overall n = 94	TB positive n = 50	Household contacts n = 44	p-value
Female	55 (60)	23 (46)	32 (76)	0.003
Age, years	29.00 (23.50, 38.00)	34.00 (26.00, 40.00)	27.00 (23.00, 31.00)	0.011
BMI	22.95 (20.30, 28.50)	21.80 (19.10, 24.90)	26.70 (22.30, 33.20)	<0.001
MUAC	26.00 (24.00, 31.00)	26.00 (23.75, 29.25)	27.00 (24.00, 34.00)	0.212
HIV positive	37 (40)	24 (48)	13 (31)	0.097
TBscoreII	2.00 (1.00, 2.00)	2.00 (1.00, 2.00)	-	
Previous TB	11 (12)	11 (22)	-	
Current or previous smoker	39 (41)	21 (42)	16 (41)	0.273
Fagerstrom nicotine dependence score	0.00 (0.00, 3.00)	0.00 (0.00, 2.00)	3.00 (2.00, 4.00)	<0.001
Alcohol Use Disorders Identification Test score	0.00 (0.00, 4.00)	0.00 (0.00, 3.00)	2.00 (0.00, 6.00)	0.202
Monthly income	3,200 (600, 5,000)	3,000 (750, 5,000)	3,500 (480, 5,000)	0.921

Cases were more men, older, with lower BMI

Result cont'd

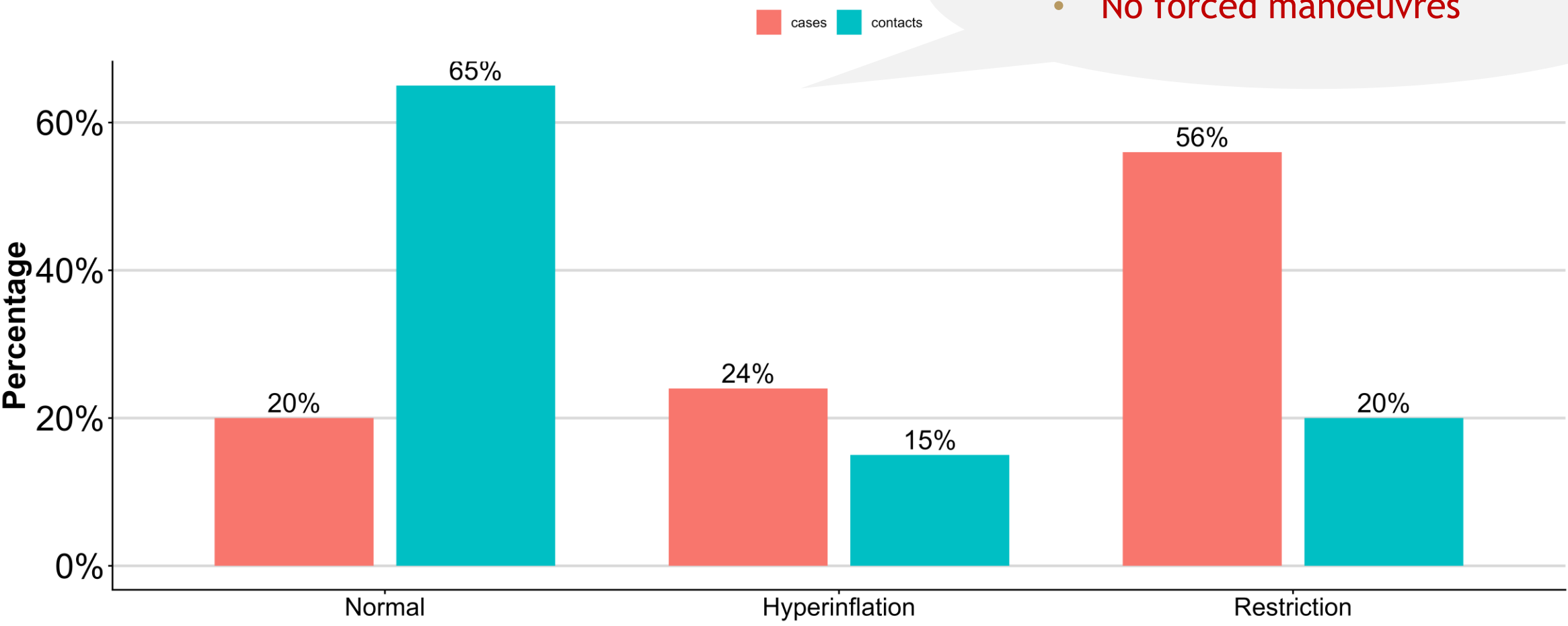
Figures showing lung function outcomes for cases and contact by modality

Spirometry



Plethysmography

- Measures total lung capacity
- No forced manoeuvres



Result cont'd

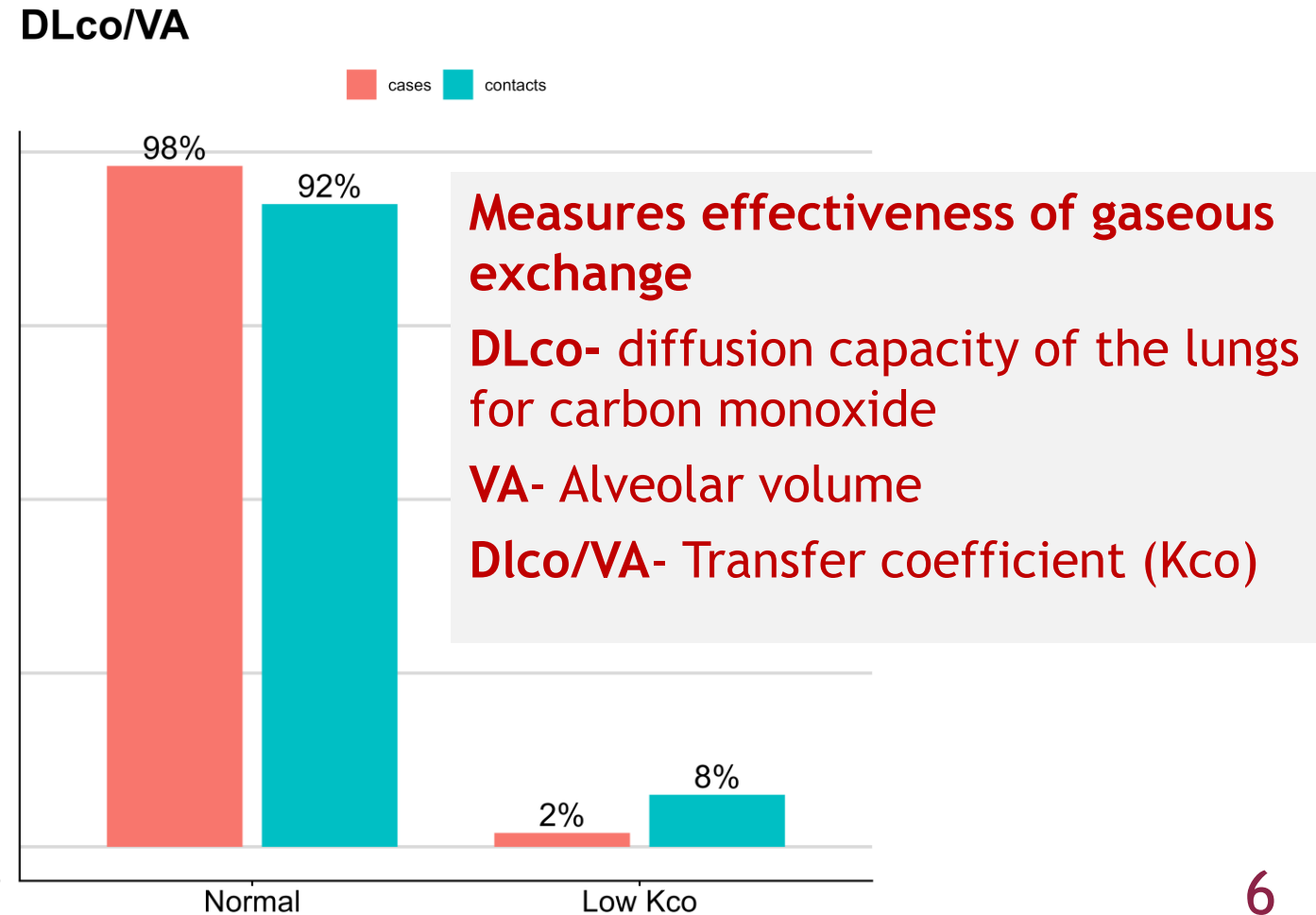
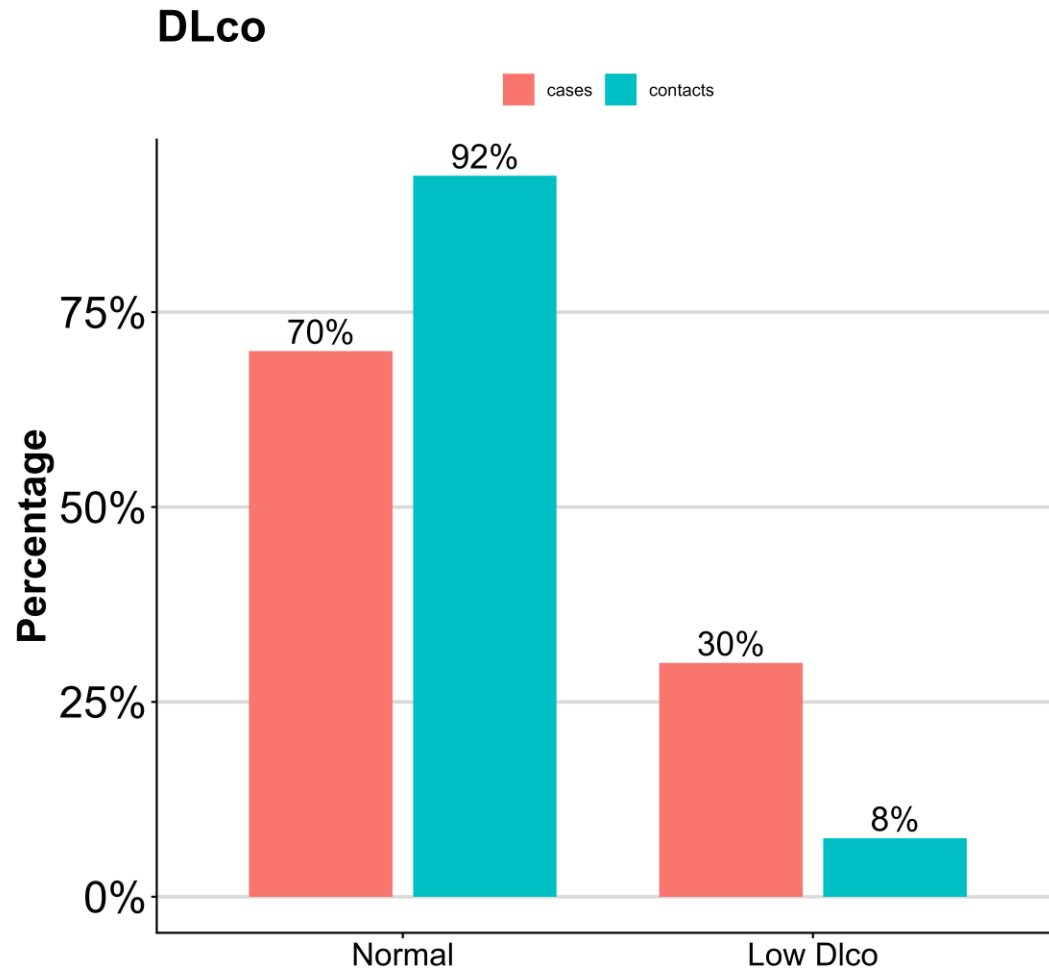


Table 2. CT scan results for cases, stratified by HIV status. Data is median (IQR) or n(n/N%)

	Overall, n = 50	Negative, n = 26	Positive, n = 24	p-value
CT scan Abnormalities	45 (100)	25 (100)	20 (100)	
Cavities	34 (76)	22 (88)	12 (60)	0.041
Consolidation	30 (67)	17 (68)	13 (65)	0.832
Pulmonary nodules	43 (96)	25 (100)	18 (90)	0.192
Pleural effusion	3 (6.7)	1 (4.0)	2 (10)	0.577
Fibrotic changes	9 (20)	4 (16)	5 (25)	0.482
CT semiquantitative score	10.00 (7.00, 15.00)	12.50 (9.00, 15.00)	9.50 (2.00, 13.50)	0.038

- **Commonest abnormality-pulmonary nodules**
- **HIV-negative had ↑ burden-of-disease scores and cavitary lesions**

Conclusion and Take-Home Messages

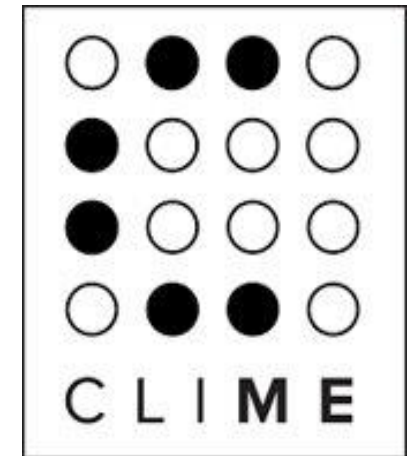
Conclusions

1. Pulmonary impairment is already present at TB diagnosis and is heterogenous
2. Predominantly; Restriction
3. Spirometry missed > 2/3 of TB-pulmonary impairments
4. High burden of impairments among TB contacts reveals hidden respiratory morbidity
5. PLHIV + TB-positive had better lung function and imaging
6. Discordance between imaging, physiological, and functional measures

Clinical implication: Early multimodal pulmonary assessment may improve risk stratification and PTLD risk prediction

Future direction: longitudinal follow-up to define trajectories and recovery pattern in TB

Acknowledgments



Medicine and Health Sciences
EyeNzululwazi ngezoNyango neMpilo
Geneeskunde en Gesondheidswetenskappe

