

# Diabetes and Tuberculosis Comorbidity in the Democratic Republic of Congo: prevalence, correlates, and programmatic implications

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## BACKGROUND

Diabetes increases the risk of pulmonary tuberculosis (TB) and negatively impacts the treatment and prognosis of TB patients. The global rise of diabetes, especially in high-prevalence TB countries like the Democratic Republic of Congo (DRC), poses a threat to TB elimination efforts in those countries and globally. Local, accurate estimates of TB and diabetes comorbidity in high TB burden countries are crucial to supporting locally-tailored recommendations and TB elimination efforts.

This study aimed to:

- Estimate the prevalence of TB and diabetes comorbidity
- Explore the correlates of TB and diabetes comorbidities

## METHOD

Between March and April 2024, we conducted a cross-sectional survey with TB patients enrolled in the USAID/SANRU *Sasa Ivi TB Elimination Program* (SIEP). The surveys were conducted in four of the six provinces supported by the SIEP in the DRC: Kasai oriental, Lomami, Tanganyika, and Sud Kivu.

Eligibility criteria:

- Adults aged at least 18 years.
- Diagnosed with pulmonary TB by either a positive microscopy (Ziehl) or a molecular diagnosis (XPert) at a SIEP-supported facility within 6 months before the survey.

## METHODS (CNTD)

Eligible participants were recruited in TB healthcare facilities and the community, and trained data collectors used a questionnaire programmed on smartphones to collect data. We conducted descriptive analysis to estimate the prevalence of diabetes among TB patients and multivariable analysis to determine the correlates of TB and diabetes comorbidity. All statistical tests were conducted with a two-sided alpha=0.05.

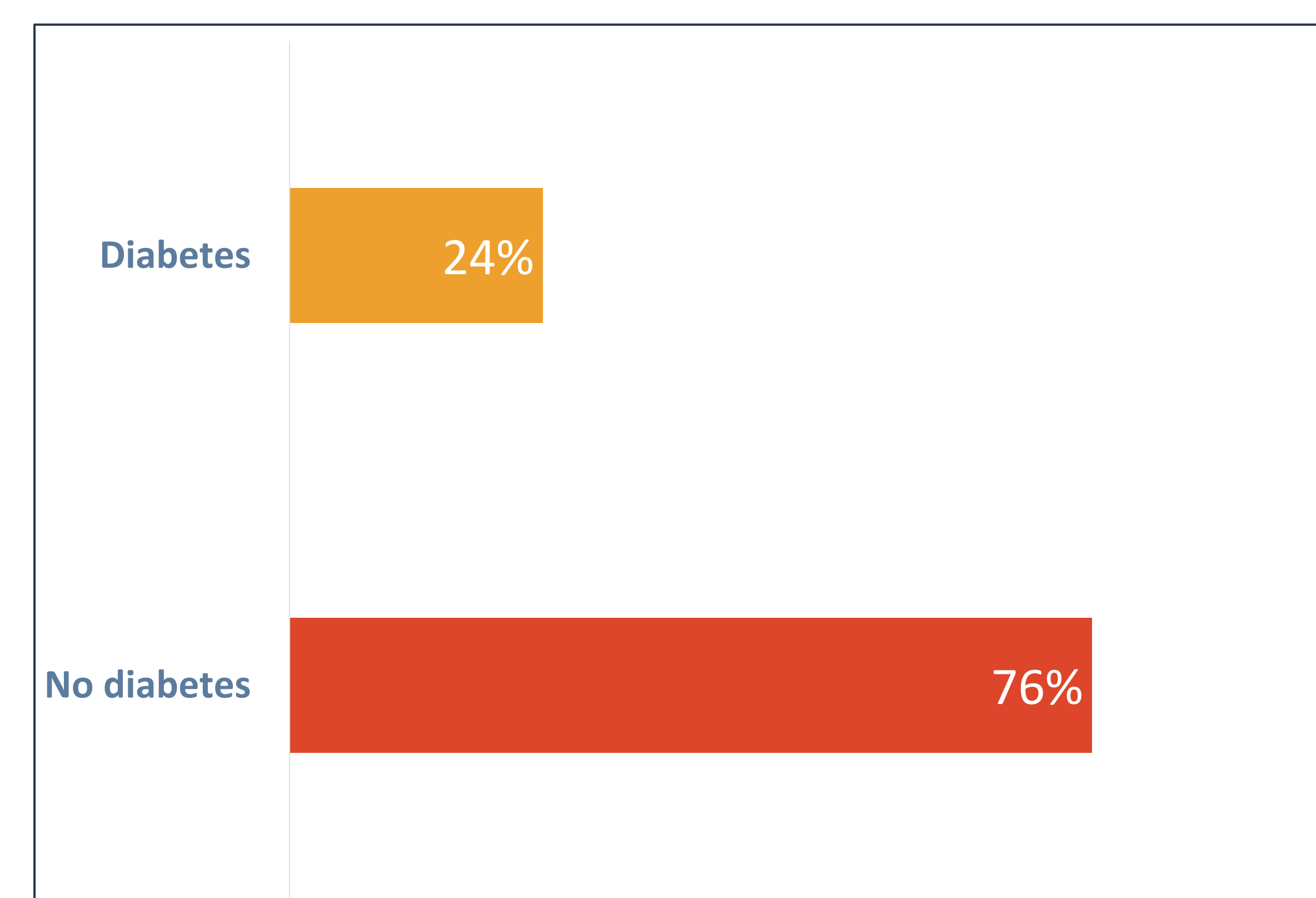
## RESULTS

We recruited 449 TB patients. Most patients were men (59.0%), married (68.6%), had a primary level of education or less (50.1%), and residents of rural areas (70.7%). The prevalence of diabetes comorbidity among TB patients was 24% [95% CI: 19.1 – 28.1]. Compared to participants 18 – 29 years old, the odds of diabetes were four times higher in those aged 30 – 39 years old [ORa=3.7, 95% CI: 3.0 – 4.5] and 40 – 49 years old [ORa=4.0, 95% CI: 3.1 – 5.1]; and twelve times higher among those aged 50 years old or more [ORa=12.9, 95% CI: 10.5 – 15.5, p<.01]. Diabetes was significantly less likely in TB patients living in households with less than 5 people vs. households with more than 5 people; households with a TB contact vs. households without TB contact, HIV-positive patients, and patients with previous TB infection vs. those without a previous TB infection.

TABLE 1. Factors associated with TB and diabetes comorbidity in multivariable logistic regression

Variables	Odds ratio	95% CI
<b>Age group</b>		
18 – 29	ref	ref
30 – 39	3.7	3 – 4.5
40 – 49	4.0	3.1 – 5.1
50+	12.9	10.5 – 15.9
<b>Person per household</b>		
5 persons or less	ref	ref
5 – 9 persons	0.7	0.6 – 0.9
9+ persons	0.3	0.3 – 0.4
<b>Family member with TB</b>		
No	ref	ref
Yes	0.3	0.3 – 0.4
<b>HIV status</b>		
HIV negative	ref	ref
HIV positive	0.6	0.4 – 0.9
<b>Previous TB infection</b>		
No	ref	ref
Yes	0.3	0.2 – 0.3

FIGURE 1. Prevalence of diabetes among TB patients registered in a facility supported by the SIEP in four provinces of the DRC.



## CONCLUSIONS

Nearly one in four TB patients also have diabetes in the DRC. Diabetes comorbidity seems to be driven by age, with the odds of having the comorbidity increasing as age increases. Some personal and clinical factors seem to exert a protective effect against diabetes among TB patients, specifically living with large number of people in the household, having a family member with TB, being HIV positive, and a history of previous TB infection.

## RECOMMENDATIONS

Screening for diabetes, particularly in higher risks groups of TB patients, is essential to inform the adequate and adapted care and treatment of patients with TB, which in turn could improve treatment success and patients' prognosis, and ultimately accelerate the country's TB elimination efforts.

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