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SEX DIFFERENCES IN RATES OF TUBERCULOSIS IN PEOPLE WITH HIV IN RIO DE JANEIRO, BRAZIL

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BACKGROUND

- Rates of tuberculosis (TB) are markedly different in adolescent and adult men and women.
- 2:1 ratio of TB cases in men vs. women globally.
- Differences have been presumed to primarily reflect social and behavioral factors.
- Recent studies suggest genetic, immunologic, and hormonal factors influence human responses to TB.
- Population-level data on sex differences in TB for people living with HIV (PLWH) are limited.
- Aim: To determine whether sex differences in TB are present in PLWH in Brazil.

METHODS

- **Study design:** Retrospective cohort study
- **Inclusion criteria:** Living with HIV in Rio de Janeiro city from 2010-2016
- **Data sources and linkage:**
  - Four national disease surveillance and monitoring databases (SINAN, SICLOM, SISCEL, SIM)
  - Data on HIV and TB notifications, CD4 counts and viral loads for public sector patients, ART, deaths
  - Probabilistic linkage based on patient's name, mother's name, date of birth (OpenRecLink)
- **Follow-up:** Jan 1, 2010 (prevalent HIV) or entry into HIV care (incident HIV) to TB diagnosis, death, or administrative censoring on Dec 31, 2017
- **Primary outcome:** TB diagnosis
- **Statistical analyses:**
  - Incidence rates (IR) per 100 person-years (pys)
  - Incidence rate ratios (IRR) to compare TB IRs of males to females
  - Assessed IRs and IRRs among 1) all prevalent and incident HIV patients from 2010-2016 and 2) incident HIV patients from 2010-2016
  - Stratified by ART status and baseline CD4 count

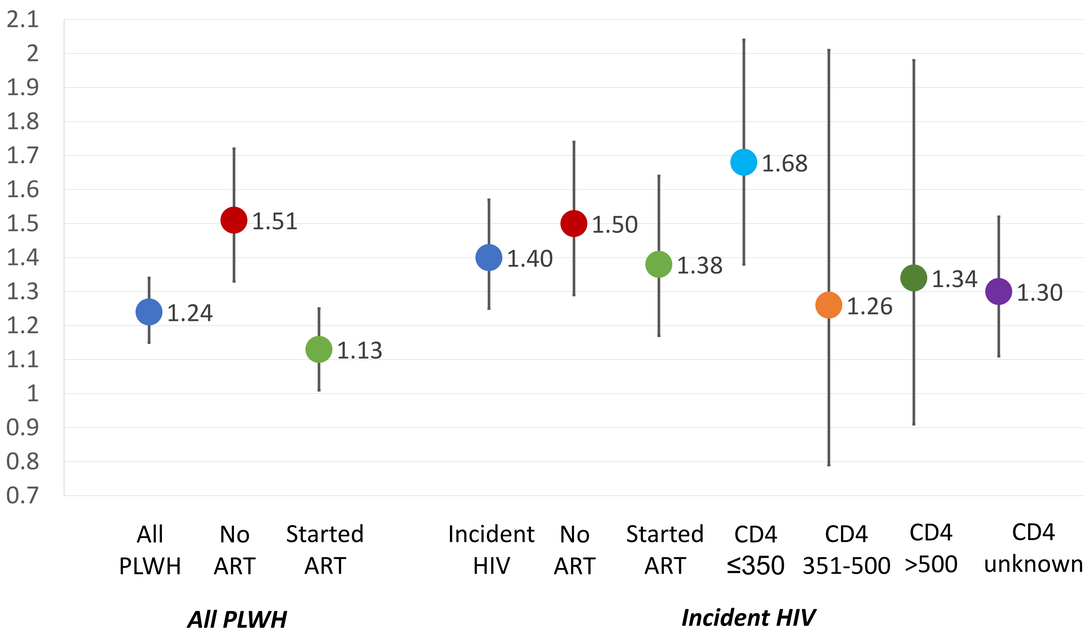
RESULTS

- Median age was similar between men and women (p=0.85)
- Women were more likely to be Black, brown, or Indigenous (p<0.001) and had lower educational attainment (p<0.001) than men

TB incidence was *higher* among men than women with HIV in a TB endemic area.

Biologic sex differences may *decrease* risk of TB in women with HIV compared to men.

Figure 1. TB incidence rate ratios and 95% CI, male vs. female



RESULTS

Table 1. TB IR per 100 pys and 95% CI, all PLWH

	Total N=54,957	Male N=35,880	Female N=19,077
All PLWH	0.97 (0.95-1.01)	1.04 (1.00-1.09)	0.84 (0.78-0.90)
No ART	1.63 (1.54-1.73)	1.88 (1.75-2.01)	1.24 (1.12-1.38)
Initiated ART	0.77 (0.73-0.80)	0.80 (0.76-0.85)	0.71 (0.65-0.77)

Table 2. TB IR per 100 pys and 95% CI, incident HIV

	Total N=30,485	Male N=20,958	Female N=9,527
Incident HIV	1.34 (1.28-1.41)	1.49 (1.40-1.57)	1.06 (0.96-1.17)
No ART	2.19 (2.05-2.34)	2.47 (2.29-2.67)	1.65 (1.45-1.88)
Initiated ART	0.91 (0.85-0.98)	1.00 (0.92-1.09)	0.72 (0.62-0.84)
CD4 ≤350	2.92 (2.68-3.18)	3.42 (3.10-3.77)	2.03 (1.72-2.41)
CD4 351-500	0.92 (0.74-1.15)	1.00 (0.76-1.31)	0.79 (0.54-1.17)
CD4 >500	0.69 (0.57-0.83)	0.77 (0.61-0.96)	0.57 (0.42-0.79)
CD4 unknown	1.15 (1.07-1.23)	1.23 (1.14-1.33)	0.95 (0.83-1.08)

CONCLUSIONS

- TB incidence was higher among men than women with HIV in a TB endemic area.
- Differences were present, despite similar age and CD4 counts among men and women, and greater socioeconomic risks in women.
- Biologic sex differences in host responses to infection may decrease risk of TB in women with HIV.

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