

**760. The Diversity of *Mycobacterium tuberculosis* in India Is Underestimated and Underreported**

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**Background.** The seven lineages of *Mycobacterium tuberculosis* differ in virulence, transmissibility, drug resistance, and immune responses. We reviewed spoligotype data published from India to determine the distribution and diversity of TB lineages in India.

**Methods.** Spoligotype patterns were extracted from studies published from India and compared against the SpolSimilarity database to determine Spoligotype International Type (SIT) number, sub-lineage and lineage. Minimum spanning trees (MSTs) were created with Phyloviz.

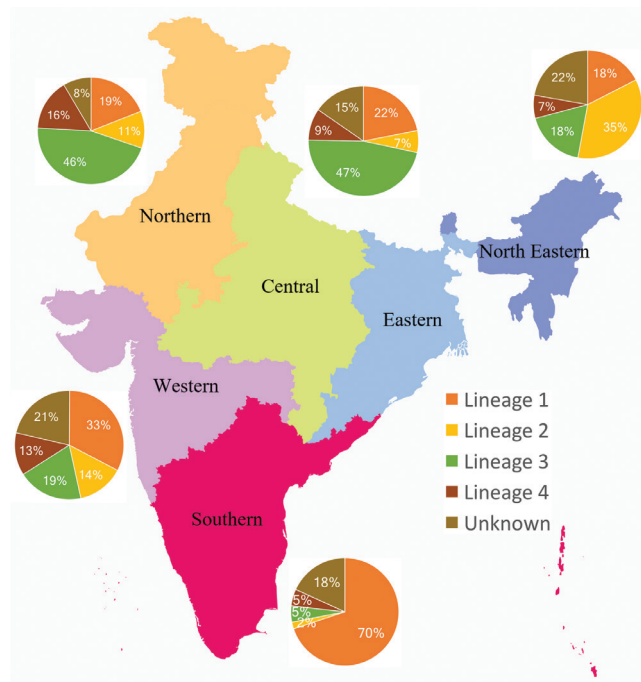
**Results.** Thirty-four studies list 1,473 spoligotypes containing 8,242 isolates (Table 1), with 6,733 isolates belonging to 472 SITs. Of the remaining 1,001 patterns (1,509 isolates), 351 patterns (491 isolates) match orphans, while 650 patterns (1,018 isolates) are unreported; these 1,509 isolates could potentially form 532 new SITs and 469 orphans. The most common SITs are SIT11 (Lineage 1; 1,218 isolates, 14.78%), SIT26 (Lineage 3; 982, 11.91%) and SIT1 (Lineage 2; 618, 7.5%). Figure 1 demonstrates regional differences in lineage distribution. Figure 2 is an MST of all isolates by lineage ("not assigned" are known SITs with no lineage and "unknowns" are previously unreported patterns). Figure 3 is an MST by superfamily, "others" referring to patterns with no known superfamily.

**Conclusion.** Lineages 1 and 3 dominate in India, in contrast to lineages 2 and 4 prevalent worldwide. The 1,473 SITs reflect the significant diversity of *M. tuberculosis* in India; the 1,001 orphan and previously unreported patterns suggest this diversity is underestimated. Understanding *M. tuberculosis* diversity is necessary for clinical and public health interventions to control India's TB epidemic.

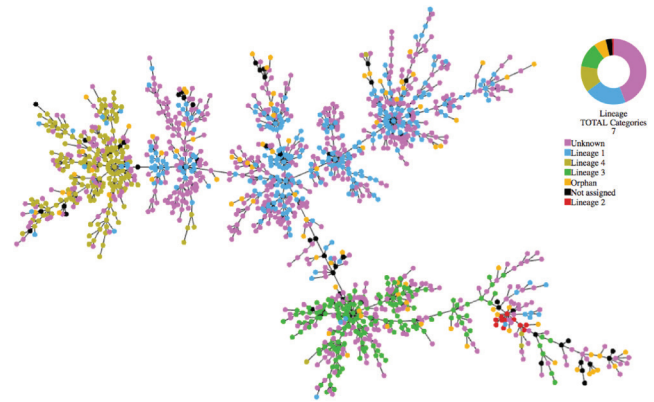
**Table 1.**

Lineage	Superfamily	Number of SITs	Number of Isolates	Percentage (%)
Lineage 1	EAI	234	3,214	39.00
	Manu	70	481	5.84
	Total	304	3,695	44.83
Lineage 2	Beijing	11	655	7.95
Lineage 3	CAS	182	1,865	22.63
Lineage 4	H	26	89	1.08
	LAM	20	55	0.67
	S	5	13	0.16
	T	111	476	5.78
	Ural	11	37	0.45
	X	17	56	0.68
	Total	190	726	8.81
	Unknown	Unknown	786	1,301
<b>Total</b>		<b>1,473</b>	<b>8,242</b>	<b>100.00</b>

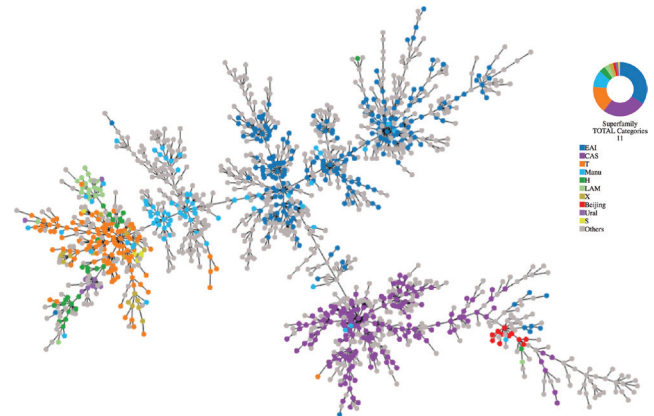
**Figure 1.**



**Figure 2.**



**Figure 3.**



**Disclosures.** All authors: No reported disclosures.

**761. Age-Related Incidence of TB Infection Supporting Efficacy of BCG Vaccination**

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**Background.** *Mycobacterium tuberculosis* (MTB) is a major, and potentially preventable, cause of morbidity and mortality worldwide. Bacillus Calmette-Guerin (BCG) remains the only licensed vaccine for TB, and while efficacy has been demonstrated in some populations, many uncertainties remain. Three BCG vaccination policies were implemented across bordering geographical regions in the South West of Ireland from 1972; neonatal vaccination (vaccinated region-a), vaccination of children aged 10–12 years (vaccinated region-b) and no vaccination (unvaccinated region-c). The aim of this study was to investigate the impact of BCG vaccination on incidence of MTB during the study period.

**Methods.** Surveillance data were used to identify all *M. tuberculosis* complex (MTC) isolates from 2003 to 2016. Residential addresses for each case were geocoded using the Google Maps API. Case locations were spatially linked to 2011 census population data and to Local Health Offices (LHO) BCG coverage data for study regions a-c. The 13-year incidence of TB was calculated assuming a steady-state population. Using SatScan (v9.4.4), spatial clusters were identified at the small area level with the spatial scan statistic based on the discrete Poisson probability distribution.

**Results.** Of 638 MTC infections identified (621 MTB, 16 *M. bovis*, 1 *M. africanum*), 510 occurred in study regions a-c (median age 42 years (4 months–94 years), 65% male and 66% Irish born). The incidence of MTB was higher in the unvaccinated population, region-c 132/100,000 (95% CI 116–150) vs. vaccinated region-a 56/100,000 (95% CI 45–69) and region-b 44/100,000 (95% CI 29–63). A single high-risk cluster of 138 cases within a population of 46,000 was identified in unvaccinated region-c (relative risk 4.94 (95% CI 4–6)). The year-on-year incidence rates in the 20- to 35-year-old age range suggested a decreasing risk consistent with a beneficial impact of vaccination policies.

**Conclusion.** Prevention and treatment of TB remains a significant challenge worldwide. Our study demonstrates significant differences in incidence of MTC

infection in demographically similar populations based on BCG immunization policy and thus further supports efficacy of BCG for prevention of tuberculosis infection.

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### 762. Sex Differences in the Epidemiology of Tuberculosis in Tunisia

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**Background.** According to WHO, many more men than women are diagnosed with tuberculosis (TB) and die from it globally. In light of this fact, examining the gender differences among patients with TB is important to institute effective prevention, coverage and treatment. We aim to study sex differences in the epidemiology and clinical specificities of TB.

**Methods.** We conducted a retrospective study of patients with TB, of all ages between January 1995 and December 2016. Data were collected from the regional register of tuberculosis implanted at the anti tuberculosis center ATC of Sfax, Southern Sfax.

**Results.** We recorded 2,771 new cases of TB. Sex ratio was 1.2. Pulmonary Tuberculosis (PT) represented 40.5% of all cases of TB ( $n = 1,121$ ) and was 2.5 times more frequent in men than women (50.3% vs. 28.7%;  $P < 0.001$ ). The sex ratio for extra-pulmonary tuberculosis (EPT) was 0.83. Lymph node and abdominal TB were significantly more frequent in women with respectively 52.5% (vs. 37.4%;  $P < 0.001$ ) and 12.6% (vs. 9.1%;  $P = 0.025$ ). Pleural and urogenital TB were significantly more common in men (20.3% vs. 8.9%;  $P < 0.001$  and 13.4% vs. 9.8%;  $P = 0.023$  respectively). We did not find any gender differences in other EPT forms. Between 1995 and 2016, overall TB ( $P = 0.001$ ;  $\rho = 0.64$ ), EPT ( $P = 0.02$ ;  $\rho = 0.63$ ) and PT ( $P = 0.03$ ;  $\rho = 0.46$ ) cases were increasingly notified in women while they were stable in men. Death rates were significantly more important in men (3.5 vs. 2.1;  $P = 0.02$ ). Women experienced recovery more frequently (89.2% vs. 86.7%;  $P = 0.04$ ) and duration of treatment was significantly higher in women (9 months vs. 8 months;  $P < 0.001$ ).

**Conclusion.** Our study highlighted sex differences of TB in the region of Sfax with a higher burden and morbidity in men. National TB programs should actively focus in these results with more routine diagnostic and screening.

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### 763. Risk Factors for Homeless Status and Mortality Among Homeless TB Cases in Texas, 2010-2017

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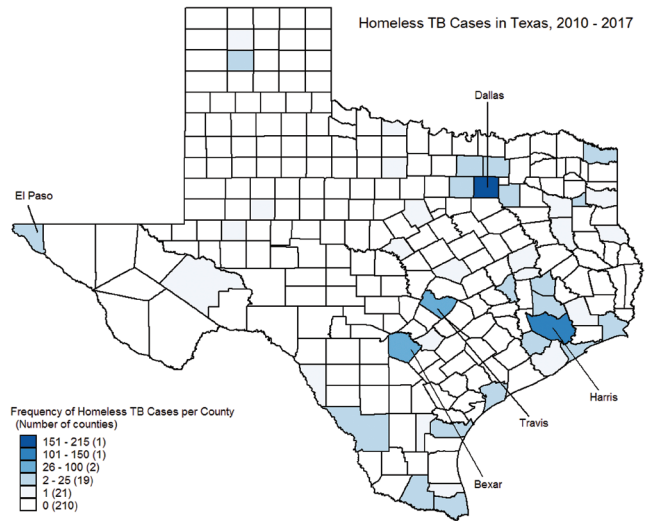
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**Background.** A disproportionate amount of tuberculosis (TB) cases and mortality occur among people experiencing homelessness in the United States. Our objective was to identify risk factors for mortality among reported homeless TB cases in Texas, a state with an increased TB prevalence in the United States.

**Methods.** Using data from the Centers for Disease Control and Prevention TB Genotyping Information Management System (TB GIMS), we evaluated the demographic, laboratory and clinical characteristics of people identified as being homeless in the year preceding TB diagnosis in Texas from January 1, 2010 to December 31, 2017. TB cases with missing or unknown homeless status were removed from the analysis. Multivariate logistic regression was used to analyze and evaluate risk factors associated with homeless status and mortality among homeless TB cases.

**Results.** Of the 10,103 newly diagnosed TB cases over the 8-year period, 543 (5.4%) were reported as being homeless in the year preceding TB diagnosis. In 412 homeless TB patients with a reported outcome as "died" or "completed," 57 (13.8%) died during treatment and 355 (86.2%) completed therapy. Age >45, male, black ethnicity, foreign-born, urban living, excessive alcohol consumption, IDU, long-term care facility resident, diabetes, previous TB, and pulmonary TB were associated with homeless TB cases. Being homeless and having TB increased the risk of mortality compared with having TB alone (OR 2.26,  $P < 0.01$ ). Age >45 years, positive HIV status, cavitory and military radiographic findings, no or unknown culture conversion and TB case confirmation by a positive culture/NAA/smear compared with clinical case definition/provider diagnosis were independent risk factors for mortality among homeless TB cases in Texas.

**Conclusion.** Being homeless increased the risk of TB mortality by nearly 130% compared with being housed prior to TB diagnosis. Our findings indicate that homelessness may be being diagnosed and treated in more advanced TB diseased homeless individuals who probably have poorer health due to the stresses of poverty, comorbidities, and lack of access to healthcare, leading to higher mortality. Additionally, testing and treatment for HIV among those reporting homelessness may reduce mortality among this high-risk group.



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### 764. Impact of Diabetes Mellitus on the Presentation and Response to Treatment of Adults With Pulmonary Tuberculosis in Qatar

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**Background.** Persons with diabetes mellitus (DM) have a 3-fold increased risk of TB. Vitamin D deficiency also is associated with a 4-fold increase in risk of progression of TB from latent TB infection to active TB. Qatar is an oil rich country with high prevalence of diabetes, obesity, and vitamin D deficiency. We aimed to evaluate the effect of diabetes mellitus on manifestations and response to treatment in adults with DM and TB.

**Methods.** Retrospective national hospital-based study of adult from January 2007 to December 2011, comparing TB-infected patients with and without DM.

**Results.** Of 134 adults with DM and TB, 62 (47%) became culture negative after 8 weeks of anti-TB treatment compared with 84 (72%) patients without DM. Patients with DM had more frequent lower lobe disease (28% vs. 17%,  $P = 0.03$ ). Week 8 sputum culture conversion did not differ between patients by the degree of dysglycemia at time of diagnosis and onset of anti-TB treatment (70% vs. 46%,  $P = 0.09$ ).

**Conclusion.** Diabetes mellitus was associated with delayed sputum culture conversion at two month and atypical radiological findings in adults with pulmonary TB in Qatar. Glycemic control had no effect on week-8 sputum culture conversion.

**Disclosures.** All authors: No reported disclosures.

### 765. Tuberculosis and Diabetes Mellitus Among Prison Inmates in Peru: Results of a National Survey, 2016

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**Background.** Diabetes mellitus (DM) increases the risk of tuberculosis disease (TB) and is associated with poor TB treatment outcomes in the general population. We examined the relationship between TB and DM in prison inmates in Peru.

**Methods.** We analyzed data from a cross-sectional, national survey of adult prison inmates in Peru conducted in 2016. The survey collected sociodemographic