# Serial testing for Tuberculosis infection in a cohort of Indian nursing students: QFT Conversions & reversions

DJ Christopher, Prince James, Peter Daley, Lois Armstrong, Beulah Premkumar, Joy Sarojini Michael, Alice Zwerling, Madhukar Pai

Christian Medical College, Vellore, India  & McGill University, Montreal, Canada

## AIMS AND OBJECTIVES

1. To evaluate rates of conversions and reversions of QuantiFERON-TB Gold In-Tube (QFT-GIT) in nursing students at a tertiary care hospital in South India upon annual screening for LTBI.

2. To evaluate risk factors associated with new LTBI infections in Indian nursing students.

## MATERIAL AND METHODS

- Nursing students from 5 programs were approached for consent to participate in a cohort study.

- In addition to history, clinical log books provided detailed information on potential exposure to TB prior to baseline, and during the subsequent years.

- All consenting students were tested with TST and QFT at baseline in year 2008.

- In year 2009, QFT was repeated for all students, but TST was done only for those who were TST negative in year 2008.

## RESULTS

### Table 1. Characteristics of included participants

| Study Population Characteristics | N(%) |
|---|---|
| Provided consent | 261 |
| Age (mean) | 20.12 yrs (Range: 17-40 yrs) |
| Female | 243 (93%) |
| BCG scar visible | 193 (74%) |
| Mean time in health care (months) | 21 (1-277) |

### Annual risk of LTBI measured by QFT,    ARTI= 11%

| QFT Converters: (n=22) |
|---|
| **Baseline Discordant (TST+/QFT-):** |
| 10/22 were TST positive in 2008 (baseline testing), and therefore TST was not  repeated in 2009 |
| **Baseline Concordant Negatives (TST-/QFT-):** |
| 12/22 were TST negative in 2008, 2/12 converted both TST and QFT, and 10/12 became discordant TST-/QFT+ |

### Table 2. QFT Conversions & Reversions upon annual screening of Indian nursing students

| QFT: 2008 | QFT: 2009 |
|---|---|
| Negative n=207 (79.3%) | Stable Negatives n=185/207 (89%) |
| | Converters n=22/207 (11%) |
| Positive n=53 (20.3%) | Stable Positives n=40/53 (75.5%) |
| | Reverters n=13/53 (24.5%) |
| Indeterminate n=1 | Negative n=1 |

### Table 3. Multivariate Logistic Regression analysis

| Variable | Association with QFT Conversion (OR & 95%CI) |
|---|---|
| Direct contact with active TB patients | 1.07 (0.92-1.24) |
| Days spent tending to active TB patients | 1.04 (0.96-1.13) |

## KEY FINDINGS

- Using the QFT test, we estimated a baseline LTBI prevalence of 20.3%

- ARTI: 11% is much higher annual risk for infection than historically documented with TST~5%

- QFT conversions (11%) & reversions (24.5%) were frequent upon serial testing

- Infection control should be implemented to reduce nosocomial transmission to nursing students