EVALUATING THE ACCURACY OF STANDARD F TB-FERON FIA FOR TB INFECTION DIAGNOSISIN VIETNAM

964

Han Thi Nguyen[1,2], Luan Nguyen Quang Vo[2,4], Andrew James Codlin[2,4], Rachel Forse[2,4], Tom Wingfield[3], Kristi Sidney Annerstedt[4], Emily Lai-Ho MacLean[5], Jacob Creswell[6], Beatrice Kirubi[6], Hoa Binh Nguyen[7], Luong Van Dinh[7], Ha Thu Doan[7] and Lina Davies Forsman[1], for the TBI Testing Team

Division of Infectious Diseases, Department of Medicine, Karolinska Institute, Stockholm, Sweden[1], Friends for International TB Relief, Ha Noi, Viet Nam[2], Centre for Tuberculosis Research, Departments of Clinical Sciences and International Public Health, Liverpool School of Tropical Medicine, Liverpool, United Kingdom[3], WHO Collaborating Centre on Tuberculosis and Social Medicine, Department of Global Public Health, Karolinska Institutet, Stockholm, Sweden[4], NHMRC Clinical Trials Centre, Faculty of Medicine and Health, The University of Sydney, Sydney, NSW, Australia[5], Stop TB Partnership, Geneva, Switzerland[6], National Lung Hospital; Hanoi, Vietnam[7].

BACKGROUND

- **Vietnam National Guideline requirement:** TB infection testing is mandatory before TB preventive therapy (TPT) for people without HIV.
- **Interferon Gamma Release Assays (IGRAs) limitations**: Requires advanced laboratories, limiting accessibility.
- **The Standard F TB-Feron fluorescent immunoassay (TB-Feron) advantages:** simplified IGRA and no specialized laboratory staff.

METHODS

- **Study design:** Cross-sectional diagnostic accuracy study (June–August 2024).
- **Study population:**
  1) People with bacteriologically-confirmed (Bac)(+) pulmonary TB.
  2) Household contacts (HHCs) of people with TB.
  3) Individuals with recent negative IGRA and no prior TB exposure.
- **Baseline procedures:** Clinical assessment and blood sampling for TB-Feron and QFT-Plus assays (QFT-Plus as reference standard).
- **Primary endpoints:** TB-Feron sensitivity and specificity.
- **Secondary endpoints:** Inter-test agreement and intra-test reproducibility.



TB-Feron has ***high sensitivity***, but ***suboptimal specificity*** and ***moderate agreement*** with QFT Plus for diagnosing TB infection

RESULTS

- We included 345 participants in the analysis, after excluding four with indeterminate TB-Feron and/or QFT-Plus results and two from Group 3 with positive QFT-Plus results.
  - Group 1 (Bac(+), n=95): Sensitivity: 88.4% (95% CI: 80.2–94.1).
  - Group 2 (HHCs, n=200): Sensitivity: 89.2% (79.8–95.2), specificity: 75.4% (66.9–82.6).
  - Group 3 (no TB exposure, n=50): Specificity: 70.0% (55.4–82.1).
  - Overall performance: Sensitivity (Groups 1 & 2): 90.2% (84.5–94.3); specificity (Groups 2 & 3): 73.9% (66.7–80.2).
- Concordance with QFT-Plus: 81% (Cohen's κ = 0.6167; p<0.001).
- No systematic differences were observed between the 30 TB-Feron tests performed by two different laboratory staff (Bland Altman plot, p=0.206).

	Sensitivity (95% CI)	Specificity (95% CI)	Agreement	Cohen's Kappa (k)	p-values
Group 1	88.4% (80.2%-94.1%)	Not applicable	87%	0.2674	0.004
Group 2	89.2% (79.8%-95.2%)	75.4% (66.9%-82.6%)	81%	0.6069	<0.001
Group 3	Not applicable	70.0% (55.4%-82.1%)	69%	0.0459	0.274
Overall	90.2% (84.5%- 94.3%)	73.9% (66.7%- 80.2%)	81%	0.6167	<0.001

CONCLUSIONS

- TB-Feron has high sensitivity, yet moderate specificity and moderate agreement with QFT Plus for diagnosing TB infection compared to a QFT-Plus.
- Limitation: The reference standard used in the study (QFT-Plus assay) also has suboptimal sensitivity but is currently the best available test for the diagnosis of TB infection and is recommended by the WHO.
- Future studies should assess the assay's diagnostic performance in key populations and analyze its cost-effectiveness to determine its potential as a near-point-of-care tool for guiding TPT.

AUTHOR CONTACT

Emails:
han.nguyen@tbhelp.org
han.nguyen.2@ki.se
Websites:
www.tbhelp.org
www.ki.se

ACKNOWLEDGEMENTS

- **Approval:** Ethical approval was granted by the Vietnam National Lung Hospital Institutional Review Board (65/23/CN-HDDD-BVPTU) and the Swedish Ethical Review Authority (Dnr 2023-04271-01).
- **Funding:** The Stop TB Partnership's TB REACH initiative