

Latent Tuberculosis Infection Among Healthcare Workers In A Newly Established Malaysian Hospital: Prevalence And Risk Factors**Kamariah Abdul Jalil^{1,2*}, Mohd Salami Ibrahim¹, Norhidayah Badya¹, Salwani Ismail¹, Nor Iza A. Rahman¹, Chew Chieng Yeo¹, Sumaiyah Adzahar^{1,2}, Syamihah Mardhiah A. Razak^{1,2}, Adibah Daud^{1,2}**¹Department of Pathology and Medical Laboratory, Faculty of Medicine, Universiti Sultan Zainal Abidin, Kuala Terengganu, Terengganu²Department of Pathology and Medical Laboratory, Hospital Sultan Zainal Abidin, Kuala Terengganu, Terengganu*Corresponding author: kamariahjalil@unisza.edu.my**Background**

Latent tuberculosis infection (LTBI) is a significant occupational health concern among healthcare workers (HCWs), particularly in tuberculosis (TB)-endemic regions like Malaysia. Despite rising TB notification rates among HCWs, systematic LTBI screening and national guidelines remain lacking.

Objective

This study aimed to determine the prevalence and associated risk factors of LTBI among HCWs at Hospital Sultan Zainal Abidin (HoSZA), a newly established tertiary care facility in Terengganu, Malaysia.

Methods

A cross-sectional study was conducted from October 2023 to August 2024 involving 150 HCWs with a minimum of four years of clinical experience. LTBI was diagnosed using the T-SPOT.TB interferon-gamma release assay (IGRA). Linear discriminant analysis (LDA) with forward stepwise selection was used to identify significant predictors. Model validation included ROC analysis and leave-one-out cross-validation (LOOCV).

Results

The prevalence of LTBI was 16% (95% CI: 10.1–21.9). Significant predictors included longer duration of healthcare service, positive Mantoux test, non-smoking status, and profession (medical laboratory technician and science officer). Table 1 shows the results of multivariate analyses. The final LDA model achieved 60.7% accuracy upon cross-validation, with an ROC AUC of 0.692, indicating moderate discriminatory power.

Table 1. LDA Multivariate Variable Selection

No.	Variables	Variable IN/OUT	Status	Partial R ²	F	Pr > F	Wilks' Lambda	Pr < Lambda
1	Mantoux done - positive	Mantoux done - positive	IN	0.037	5.714	0.018	0.963	0.018
2	Mantoux done - positive / Never smoke	Never smoke	IN	0.031	4.626	0.033	0.933	0.006
3	Duration of work in health sector / Mantoux done - positive / Never smoke	Duration of work in health sector	IN	0.032	4.750	0.031	0.904	0.002

4	Duration of work in health sector / MLT / Mantoux done - positive / Never smoke	MLT	IN	0.027	3.970	0.048	0.880	0.001
5	Duration of work in health sector / MLT / SO / Mantoux done - positive / Never smoke	SO	IN	0.028	4.143	0.044	0.855	0.000

Conclusion

This is the first Malaysian study to apply IGRA-based screening and multivariate analysis to assess LTBI risk among HCWs. The findings underscore the need for targeted, evidence-informed LTBI screening strategies, especially for HCWs with prolonged clinical exposure. These results support integrating IGRA testing into occupational health protocols to prevent TB transmission in healthcare settings.

Keywords: Latent Tuberculosis Infection (LTBI), healthcare workers, T-SPOT.TB, IGRA, occupational health

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