ABSTRAK

PENGEMBANGAN DAN PENERAPAN MODEL DETEKSI DINI FAKTOR RISIKO TUBERKULOSIS BERBASIS *HOST* DAN *ENVIRONMENT*

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Tuberkulosis (TB) masih menjadi masalah kesehatan masyarakat yang signifikan di Indonesia, termasuk di Kabupaten Lampung Tengah. Penelitian ini bertujuan untuk mengembangkan dan menerapkan model deteksi dini faktor risiko TB berbasis *host* dan *environment*. Penelitian ini dilakukan dalam dua tahap, menggunakan desain *case–control* dengan pendekatan kuantitatif. Sampel terdiri dari 278 responden, dengan perbandingan 1:1 antara kelompok kasus (139 penderita TB paru) dan kelompok kontrol (139 bukan penderita TB).Analisis data dilakukan secara univariat, bivariat, dan multivariat menggunakan regresi logistik. Tahap pengembangan dan penerapan model menggunakan metode *Expert System Development Life Cycle* (ESDLC), dengan mesin inferensi *Forward Chaining dan Certainty Factor.*

Hasil analisis multivariat menunjukkan faktor yang berhubungan secara signifikan dengan kejadian TB adalah riwayat kontak dengan penderita TB, status gizi, ventilasi udara, dan kebiasaan merokok. Berdasarkan hasil tersebut, dikembangkan model sistem deteksi dini TB dengan mengintegrasikan nilai OR ke dalam basis pengetahuan sistem pakar. Hasil pengujian kelayakan dan penerimaan pengguna menunjukkan skor 546 dari 625 (87%), artinya aplikasi masuk kategori sangat layak. Kesimpulannya, faktor risiko kejadian TB meliputi riwayat kontak, status gizi, ventilasi udara, dan kebiasaan merokok. Model sistem pakar valid dan layak diimplementasikan dan dapat menjadi dasar penguatan surveilans TB serta mendukung kebijakan nasional pengendalian tuberkulosis.

Kata kunci: *Environment*, ESDLC, faktor risiko, *Host,* Model deteksi dini, Tuberkulosis

ABSTRACT

DEVELOPMENT AND IMPLEMENTATION OF A HOST- AND ENVIRONMENT-BASED EARLY DETECTION MODEL FOR TUBERCULOSIS RISK FACTORS

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Tuberculosis (TB) remains a significant public health problem in Indonesia, including Central Lampung Regency. This study aimed to develop and implement an early detection model for TB risk factors based on host and environmental determinants. The research was conducted in two stages using a quantitative case–control design. The sample consisted of 278 respondents, with a 1:1 ratio between the case group (139 patients with pulmonary TB) and the control group (139 individuals without TB). Data were analyzed using univariate, bivariate, and multivariate analyses through logistic regression. The model development and implementation stages employed the Expert System Development Life Cycle (ESDLC) method, utilizing Forward Chaining and Certainty Factor as the inference mechanisms.

The results of the multivariate analysis indicated that a history of contact with TB patients, nutritional status, household ventilation, and smoking habits were significantly associated with TB incidence. Based on these findings, an early TB detection system model was developed by integrating Odds Ratio (OR) values into the knowledge base of the expert system. The results of feasibility and user acceptance testing yielded a score of 546 out of 625 (87%), indicating that the application was classified as highly feasible. In conclusion, the risk factors associated with TB incidence include a history of contact with TB patients, nutritional status, household ventilation, and smoking habits. The expert system model was found to be valid and feasible for implementation and may serve as a foundation for strengthening TB surveillance and supporting national tuberculosis control policies.

Keywords: Environment, ESDLC, Early Detection Model, Host, Risk Factors, Tuberculosis