Identifikasi keterkaitan variabel dan prediksi hasil pengobatan penyakit tuberkulosis berdasarkan struktur dynamic bayesian networks = Identification of variable relation and prediction of the tuberculosis treatment outcome based on dbn structure

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Abstrak

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Indonesia menempati peringkat ke-4 di dunia sebagai negara dengan kasus tuberkulosis terbanyak, setelah India, China, dan Afrika Selatan (WHO,2012). Upaya yang dilakukan untuk mengendalikan kasus tuberkulosis adalah menerapkan strategi pengobatan Direct Observed Treatment Shortcourse (DOTS) dalam waktu 6-9 bulan. Membangun sebuah model agar dapat memprediksi hasil pengobatan tuberkulosis sangat dibutuhkan untuk membantu para tenaga medis untuk mensupervisi setiap pasien berdasarkan kondisinya dan status resikonya. Penelitian ini menggunakan metode dynamic bayesian networks. Metode dynamic bayesian networks juga digunakan untuk mengidentifikasi independensi variabel pada penyakit tuberkulosis. Dalam penelitian software CaMML versi 1.4.1 digunakan untuk membangun struktur graf dynamic bayesian networks dan package Netica J-API yang berbasis Java untuk memvisualisasikan serta evaluasi graf. Evaluasi dilakukan dengan mengukur nilai akurasi dengan membentuk matriks konfusi dan menghitung logarithma loss.Tingkat akurasi struktur graf dalam memprediksi hasil pengobatan tuberkulosis sebesar 76,47% pada eksperimen 1 dan 100% pada eksperimen 2. Hal ini menunjukkan bahwa struktur graf yang terbangun dapat digunakan untuk model dalam mengidentifikasi keterkaitan variabel dalam data pengobatan TB. Selain itu, identifikasi hubungan variabel hasil pengobatan tuberkulosis dengan variabel data yang lain bersifat dependen atau indepeden dapat dilakukan melalui struktur dynamic bayesian networks dengan menggunakan algoritma d-separation.;

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ABSTRACT

Indonesia ranks 4th in the world as the country with the most cases of tuberculosis, after India, China, and South Africa (WHO, 2012). Efforts to control tuberculosis cases are implemented by the Direct Observed Treatment Shortcourse (DOTS) treatment strategy within 6-9 months. Building a model that can predict the outcome of tuberculosis treatment is needed to help the medical staff to supervise each patient based on the condition and status of the risk. This research use dynamic Bayesian networks method. Dynamic bayesian networks method is also used to identify independency of the variables on tuberculosis treatment data. In this research, CaMML version 1.4.1 software is used to construct the graph of dynamic bayesian networks and Java based Netica-J API package is used to visualize and evaluate the graph. For evaluation, this research measure the value of accuracy obtained from a confusion matrix and calculate the logarithmic loss. In the first experiment, accuracy prediction of graph structure is 76,47% and in the second experiment the accuracy prediction is 100%. The result can be used as the model to identify the independency of variables in tuberculosis treatment data. In addition, identification of the relationship between tuberculosis treatment outcome variable and other variables are dependent or independent can be known using d-separation algorithm., Indonesia ranks 4th in the world as the country with the most cases of tuberculosis, after India,

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