

## ABSTRAK

**Latar Belakang:** Angka kematian ibu (AKI) masih menjadi tantangan serius di Indonesia dengan peningkatan jumlah kematian ibu hamil yang signifikan dalam beberapa tahun terakhir. Salah satu penyebabnya adalah keterlambatan dalam mendeteksi risiko kehamilan. Kartu Skor Poedji Rochjati (KSPR) digunakan sebagai metode skrining risiko kehamilan, tetapi pencatatan manual yang masih digunakan berpotensi menimbulkan kesalahan dan keterbatasan analisis. Oleh karena itu, diperlukan solusi digital berbasis teknologi yang mampu meningkatkan efisiensi dan akurasi deteksi dini risiko kehamilan.

**Tujuan:** Mmbuat dan mengevaluasi model klasifikasi tingkat risiko kehamilan menggunakan algoritma *Decision Tree* berdasarkan KSPR

**Metode:** Penelitian ini merupakan studi deskriptif kuantitatif menggunakan pendekatan *cross-sectional*. Data yang digunakan adalah *Maternal Health and High-Risk Pregnancy Dataset* dari IEEE Dataport yang telah dilabeli ulang sesuai KSPR. Model dikembangkan menggunakan algoritma *Decision Tree* dan dioptimalkan dengan metode SMOTE. Evaluasi dilakukan berdasarkan akurasi, *precision*, *recall*, *F1-score*, dan *confusion matrix*.

**Hasil:** Penerapan metode SMOTE berhasil memperbaiki distribusi kelas dan meningkatkan kemampuan model dalam mengenali kelas risiko tinggi.

**Kesimpulan:** Model *Decision Tree* yang dioptimalkan dengan SMOTE mencapai *F1-score Weighted Average* sebesar 0,79 dengan *recall* 100% untuk kelas Kehamilan Risiko Sangat Tinggi (KRST). Variabel posisi janin merupakan faktor paling dominan dalam klasifikasi.

**Kata Kunci:** klasifikasi, *Decision Tree*, KSPR, kehamilan risiko tinggi, CDSS, machine learning

## ABSTRACT

**Background:** The maternal mortality rate (MMR) remains a significant challenge in Indonesia, with a notable increase in maternal deaths in recent years. A key contributing factor is the delay in detecting pregnancy risks. The Poedji Rochjati Score Card (KSPR) is a standard screening method, but its continued manual application is prone to errors and analytical limitations. This necessitates a digital, technology-based solution to improve the efficiency and accuracy of early high-risk pregnancy detection.

**Objective:** This study aims to make and evaluate a classification model for pregnancy risk levels based on the KSPR using a Decision Tree algorithm.

**Methods:** This quantitative descriptive study employed a cross-sectional design. Data were sourced from the Maternal Health and High-Risk Pregnancy Dataset on IEEE Dataport, which were re-labeled according to KSPR categories. A Decision Tree model was developed and subsequently optimized using the Synthetic Minority Over-sampling Technique (SMOTE) to address class imbalance. The model's performance was evaluated using accuracy, precision, recall, F1-score, and a confusion matrix.

**Results:** The application of SMOTE successfully balanced the class distribution, significantly enhancing the model's ability to identify high-risk classes.

**Conclusion:** The SMOTE-optimized Decision Tree model achieved a weighted average F1-score of 0.79. Critically, it attained 100% recall for the Very High-Risk Pregnancy (KRST) class, indicating its effectiveness in identifying the most severe cases. Fetal position was identified as the most dominant factor in the classification model.

**Keywords:** classification, Decision Tree, KSPR, high-risk pregnancy, CDSS, machine learning