

ABSTRACT

Measles is a highly contagious infectious disease; therefore, early identification of measles suspects is crucial to mitigate the rise in cases, particularly in regions with limited laboratory diagnostic facilities. This study aims to implement and evaluate the performance of the Learning Vector Quantization (LVQ) algorithm in recognizing patterns of measles suspects based on clinical symptoms and immunization records. The dataset comprises 326 measles suspect records from Tasikmalaya City (2024–2025), consisting of symptom features fever, rash, cough, runny nose, and red eyes as well as MCV1 and MCV2 immunization status. The research methodology involved data cleaning, outlier handling, normalization using RobustScaler, stratified data splitting, LVQ model training, and parameter optimization via grid search with 5-fold cross-validation. The results indicate that immunization features contributed the most to the learning process, whereas certain clinical symptoms, such as fever and rash, had no significant effect due to a lack of data variation. The best model was achieved in the scenario excluding demographic features (age), yielding a recall of 0.7500, an accuracy of 0.8902, a measles class precision of 1.00, and a weighted F1-score of 0.8873. These findings demonstrate that the LVQ algorithm is effective as an initial approach for recognizing measles suspect patterns and has the potential to be developed as a clinical decision support system.

Keywords: *Clinical Symptoms, Grid Search, Learning Vector Quantization, Measles, Pattern Recognition*

ABSTRAK

Campak merupakan salah satu penyakit menular dengan tingkat penyebaran tinggi, sehingga identifikasi dini terhadap suspek campak menjadi krusial untuk menekan peningkatan kasus, terutama di wilayah yang memiliki keterbatasan fasilitas diagnostik laboratorium. Penelitian ini bertujuan untuk menerapkan dan mengevaluasi kinerja Algoritma *Learning Vector Quantization* (LVQ) dalam pengenalan pola suspek campak berdasarkan gejala klinis dan informasi imunisasi. Dataset yang digunakan mencakup 326 data suspek campak Kota Tasikmalaya tahun 2024–2025 yang terdiri dari fitur gejala demam, ruam, batuk, pilek, mata merah, serta status imunisasi MCV1 dan MCV2. Tahapan penelitian meliputi pembersihan data, penanganan *outlier*, normalisasi menggunakan *RobustScaler*, pembagian data secara *stratified*, pelatihan model LVQ, serta optimasi parameter melalui *grid search* dengan evaluasi *5-fold cross-validation*. Hasil penelitian menunjukkan bahwa fitur imunisasi memiliki kontribusi terbesar dalam proses pembelajaran, sedangkan beberapa gejala klinis seperti demam dan ruam tidak berpengaruh akibat kurangnya variasi data. Model terbaik diperoleh pada skenario tanpa fitur demografi (umur) dengan nilai *recall* sebesar 0.7500, akurasi 0.8902, *precision* 1.00, serta *weighted f1-score* sebesar 0.8873. Temuan ini menunjukkan bahwa Algoritma LVQ efektif digunakan sebagai pendekatan awal dalam pengenalan pola suspek campak dan berpotensi dikembangkan sebagai sistem pendukung keputusan di bidang kesehatan.

Kata kunci: Campak, *Grid Search*, Gejala Klinis, *Learning Vector Quantization*, Pengenalan Pola,