Implementation of the Random Forest Algorithm for Classification of Bacteria that Cause Acute Respiratory Infections (ARI)*(Implementasi Algoritma *Random Forest* untuk Klasifikasi Bakteri penyebab Infeksi Saluran Pernapasan Akut(ISPA))*

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ABSTRACT

Acute Respiratory Infections (ARI) are a group of diseases that affect the respiratory tract, including the nose, throat, bronchi and lungs, and can be caused by various types of bacteria. This disease can cause symptoms such as fever, cough, runny nose, sore throat and shortness of breath. Prevention and control of ISPA is a top priority in the health sector, especially in areas such as Situbondo Regency, East Java, which is experiencing an increase in pneumonia cases in toddlers. In 2022, the number of pneumonia cases treated will reach 1,758 cases, namely 91.2% of the 1,927 estimated cases. However, there are Community Health Centers whose achievements are far below the target, namely Kapongan Community Health Center (11.7%), Suboh (51%), Sumbermalang (61.9%) and Mangaran (63.6%). This research aims to develop a classification system for bacteria that cause ISPA for early detection using the Random Forest algorithm, compared to the previous method, namely Naïve Bayes, which produces an accuracy of 97.368%. The Random Forest algorithm was chosen because of its superiority in handling overfitting and producing a more stable and accurate model. In the training stage, this method shows high accuracy up to 88.75% using 11 decision trees. Due to differences in preprocessing and differences in image data, there is an additional bacteria, namely "Neiseria gonorroea" in the author's research. A system that can identify the type of bacteria that causes ISPA uses Random Forest with 5 shape feature extraction parameters, namely number of objects, area, circumference, average eccentricity, and average metric of 5 types of bacteria.

Keywords*: Bacteria, Acute Respiratory Infection, Random Forest.*