# Predicting Stunting in Toddlers Using KNN and Naïve Bayes Methods



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**Abstract:**
Stunting poses a significant health challenge in Indonesia, with a prevalence rate reaching 21.6% in 2022, exceeding the WHO's tolerance limit for stunting. This study ai... **View more**

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**Abstract:**
Stunting poses a significant health challenge in Indonesia, with a prevalence rate reaching 21.6% in 2022, exceeding the WHO's tolerance limit for stunting. This study aims to identify stunting in toddlers using the K-Nearest Neighbor (KNN) and Naive Bayes (NB) algorithms. The KNN method is chosen for its effectiveness in utilizing the similarity between the attributes of new data and the training dataset, while Naive Bayes is selected for its probabilistic approach, addressing attributes related to stunting in toddlers. The dataset, obtained from the Bojongsoang Community Health Centre, underwent preprocessing to address initial imbalances such as converting the age format to month and removing an irrelevant column like address details. The attributes used in this study include age-in-months, height, weight, Z-Score Weight-for-Age, Z-Score Height-for-Age, and Z-Score Weight-for-Height. This research uses an SMOTE algorithm for handling imbalance data. In the SMOTE algorithm, imbalanced data can be managed by using undersampling and oversampling techniques. The research reveals a significant improvement in both KNN and NB models after applying the oversampling technique. Particularly, the KNN model demonstrates superior performance, increasing the F1-Score from 67.20% to 95.62%, with an accuracy of 95.67%. The Naive Bayes model also experiences enhancement, raising the F1-Score from 71.22% to 95.62%, with an accuracy of 94%. This study contributes to effective stunting classification methods. Leveraging direct measurements of height and weight, the research aids in stunting identification and proposes methods, including oversampling, to enhance classification accuracy KNN and Naive Bayes.

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## Contents



Stunting remains a critical issue affecting the growth and development of toddlers, posing significant challenges to their health and well-being. Defined as a condition where children under five years of age experience impaired growth and development due to chronic malnutrition, stunting continues to be a major concern in Indonesia [1]. Data from the Indonesian Nutritional Status Survey (SSGI) conducted by the Ministry of Health in 2022 indicates that the prevalence of stunting in Indonesia is still at 21.6% [2]. However, this figure still exceeds the maximum tolerance limit set by the World Health Organization (WHO), which establishes that the maximum tolerance for stunting is 20% of the total number of toddlers [3]. Factors contributing to this concerning statistic are multifaceted, including inadequate nutrition, limited access to sufficient food, poverty, unsatisfactory environmental sanitation, and inadequate healthcare accessibility [4].





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