Classifying Stunting Status in Toddlers Using K-Nearest Neighbor and Logistic Regression Analysis

Publisher: IEEE

Alvin Tolopan Armando Sibuea ; Putu Harry Gunawan ; Indwiarti **All Authors**

Abstract:
Stunting is a critical child growth disorder, characterized by a height below the norm for one's age group. Despite a notable decrease in stunting prevalence in Indonesia... **View more**

Metadata

Abstract:
Stunting is a critical child growth disorder, characterized by a height below the norm for one's age group. Despite a notable decrease in stunting prevalence in Indonesia from 37% in 2014 to 21.6% in 2022, achieving the targeted reduction to 14% by 2024 remains imperative. This study contributes to this national health goal by developing a robust predictive model for stunting in toddlers using machine learning. The research employs two models, K-Nearest Neighbors (KNN) and Logistic Regression. The dataset used for this research shows a big gap of data imbalance, for the majority of its data is significantly higher than the minority. Both of the chosen method is focusing on mitigating data imbalance through oversampling and undersampling techniques. The KNN model is particularly suited for this study due to its effectiveness in handling the complex, non-linear patterns often found in multifaceted health data like stunting indicators. It consistently demonstrated high accuracy, averaging 0.980, and reaching 0.987 for F1-Score. Logistic Regression, chosen for its ability to provide clear interpretability, especially useful in understanding the impact of various health indicators, also performed well with an average accuracy of 0.877 and an F1-Score of 0.894. This study highlights the significance of machine learning in addressing child stunting, providing effective tools for prediction. The combination of KNN's ability to handle complex data and Logistic Regression's interpretability, along with data balancing, contributes to the goal of reducing stunting prevalence. In summary, this research tackles child stunting, a pressing issue in Indonesia. By leveraging machine learning techniques, it develops predictive models to aid in stunting prevention. KNN excels in capturing complex patterns, while Logistic Regression offers interpretability. These models offer promise in reaching the vital goal of reducing stunting to 14% by 2024.

Published in: 2024 International Conference on Data Science and Its Applications (ICoDSA)

Date of Conference: 10-11 July 2024

DOI: 10.1109/ICoDSA62899.2024.10652063

Date Added to IEEE *Xplore*: 05 September 2024

Publisher: IEEE

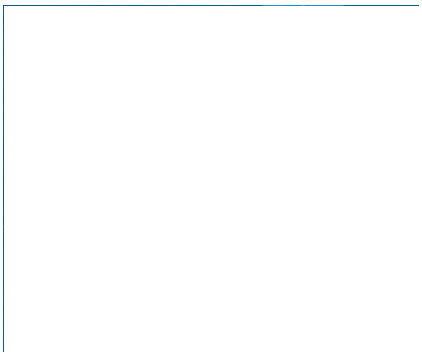
ISBN Information:

Conference Location: Kuta, Bali, Indonesia

Contents

Stunting is still considered to be one of the most well-known and significant child health disorder in Indonesia. Stunting is a condition where a child's height appears to be shorter than their peers [1]. Stunting affects child's physical and cognitive development as well as impacting future productivity of the child [2], [3]. According to Indonesian Health Ministry data, there are approximately one-third of nine million children in Indonesia experienced stunting in 2018, with a prevalence of 30.8%, which is a slight increase from the previous year's prevalence of 29.6% [4], [5]. In 2020, Indonesia still ranked 115th out of 151 on stunting prevalence category. Despite being on the lower ranks, Indonesia is still classified as a country with the most stunting prevalence according to JME, UNICEF, and World Bank [6]. While this increase might not seem significant, the government still keeps a close monitor on the issue at hand.

Back to Results



More Like This

Improved Accuracy for Identifying At-Risk Students at Different Percentage of Course Length using Logistic Regression Compared with Random Forest Predictive Model

2022 5th International Conference on Contemporary Computing and Informatics (IC3I)

Published: 2022

Understanding APT detection using Machine learning algorithms: Is superior accuracy a thing?

2024 IEEE International Conference on Electro Information Technology (eIT)

Published: 2024

Show More