

## 1. Introduction

Stunting, or growth retardation, is caused by a lack of adequate nutrition over a long period and is often accompanied by illness [1]. One of the significant causes is malnutrition in children. Almost half of the deaths of children in developing countries are directly or indirectly related to malnutrition [2]. Malnutrition has been proven to be one of the significant problems that are now or concurrently responsible for more than half of all deaths worldwide, particularly among children under the age of five [3].

In 2019, about 21.3% of children under the age of five were estimated to experience stunting worldwide [4]. According to WHO, there are 144 million children under five years old who suffer from stunting. Globally, 2.6 million children die each year due to malnutrition [5]. A lack of supervision and attention from parents to their children is one of the reasons for the occurrence of stunting in children under age. Therefore, research is needed to predict the likelihood of stunting and hopefully prevent stunting in toddlers.

Furthermore, developing accurate and reliable prediction models to identify toddlers at high risk of stunting is also essential to this research. Using data related to stunting status, this research can create a predictive tool that can provide valuable information about the likelihood of stunting in each individual.

A similar research on the use of Machine Learning in the problem of stunting in East Java in 2023 has been conducted by M. Syauqi Haris, Mochammad Anshori, and Ahsanun Naseh Khudori. They used two machine learning methods: random forest (RF) and multilinear regression (MLR). They found that the Multi Linear Regression model provides the best prediction accuracy for stunting in children in East Javaprovince [6].

Other research on stunting in toddlers has also been shown in the city of East Aceh in 2022 by Eva Darnila, Maryana, Khalid Mawardi, Marzuki Sinambela, and Iwan Pahendra. The results of their research show that the machine learning classification algorithm considered by Random Forest can effectively predict stunting status in the East Aceh administrative area [2].

An alternative perspective reveals another example of a deep learning approach to predicting malnutrition status in Bangladesh by Md Mehrab Shahriar, Mirza Shaheen Iqbal, Samrat Mitra, and Amit Kumar Das. This study demonstrates the ANN's superior accuracy in classifying wasting, underweight, and stunting conditions, showcasing its potential as a scientific tool for policymakers and clinicians dealing with child malnutrition in developing nations [7].

While the examples drawn from diverse studies offer valuable insights into the classification of stunting using machine learning, There are more things to explore and develop. Certain studies have utilized only a single machine learning model, limiting the opportunity for robust model comparisons. Additionally, some research needs a thorough Exploratory Data Analysis (EDA), a pivotal step in understanding and visualizing data patterns. Considering these factors, This study aims to contribute to existing knowledge by using two machine learning models to classify stunting. Moreover, the study endeavors to address the challenge of imbalanced data, a prevalent issue in stunting classification, further enhancing the model's ability to make accurate predictions under such conditions. Through this comprehensive approach, the study aspires to fill gaps in the current literature and advance the methodologies employed in stunting classification research.

Using an accurate prediction model to help identify toddlers at risk of stunting so that timely interventions can be made. Using the Random Forest and Logistic Regression methods, predictions can be made by considering various risk factors for stunting, such as nutritional status, environment, and socioeconomic factors. In addition, the predicted data can also be used to determine more effective and targeted stunting prevention policies and programs[8].