

MALNUTRITION IN DATA ANALYTICS

Neha Savale
SCOPE
Vellore Institute of
Technology
Chennai, India
neha.savale2021@vitstudent.ac.in

Raja Venkata Sai
SCOPE
Vellore Institute of
Technology
Chennai, India
rajavenkata.sai2021@vitstudent.ac.in

Praveen Joe I R
SCOPE
Vellore Institute of
Technology
Chennai, India
Praveen.joe@vit.ac.in

ABSTRACT:

This project aims to tackle malnutrition on a national scale by using data and technology to understand and address the problem. Malnutrition, which means not getting enough of the right kinds of food, is a big issue in many countries. It can cause health problems and make it hard for people, especially kids, to grow and learn. This project wants to help fix that. To do this, the project collects a lot of different kinds of information about food, health, and the environment. They look at things like how big people are, what they eat, and where they live. They also look at factors like income, education, and access to healthcare, which can affect how healthy someone is. They use this information to try and figure out why people might not have enough food or the right kinds of food. Using computers and math, they analyze all this information to find patterns and reasons for malnutrition. For example, they might see that malnutrition is more common in places where there's not enough money or where there's been a lot of bad weather. By understanding these patterns, they can try to predict where malnutrition might happen next and what can be done to prevent it. One important part of this project is talking to people in communities affected by malnutrition. They do surveys and interviews to learn about people's

traditions, beliefs, and challenges. This helps them understand what might be causing malnutrition in that community and what kind of help they need. Based on all this information, the project comes up with suggestions for policymakers and healthcare workers. They give ideas on things like improving access to nutritious food, providing better healthcare, and helping people learn about healthy eating. The goal is to give people the tools they need to make sure everyone has enough to eat and stays healthy. By focusing on proactive and sustainable strategies, this project hopes to make a real difference in the fight against malnutrition. They want to help make sure that no one goes hungry and that everyone has the chance to live a healthy life. Through collaboration and using data to guide decisions, they believe that they can make a positive impact on people's lives around the world.

KEYWORDS:

Forecasting, Malnutrition, Modeling, Prediction, Seasonality

INTRODUCTION:

Malnutrition is when people don't have enough food, and it can be a big problem all over the world. Sometimes, people, especially kids, are too skinny for their height, which can make them sick. To find

out if someone is too skinny, we measure things like how big their arms are and how much they weigh compared to their height. But fixing malnutrition isn't just about measuring it. It's also about understanding why it happens. Things like not having enough money, not having good food, and not having clean water can make malnutrition worse. To stop malnutrition, we need to do more than just give people food. We need to help them get things like money, education, and healthcare so they can stay healthy. It's important for different groups, like governments and charities, to work together to find ways to help people who don't have enough to eat. By measuring malnutrition and working together, we can make sure everyone has enough food to stay healthy. Malnutrition happens when people don't get enough of the right kinds of food, and it can cause problems like getting sick a lot or not growing properly. Kids are especially at risk because they need good food to grow strong. One way to tell if someone is malnourished is by looking at their weight compared to their height. If they're too thin for their height, it could mean they're not getting enough food. But malnutrition isn't just about not having enough to eat. It can also happen if people don't get the right nutrients, like vitamins and minerals, in their food. That's why it's important to eat a variety of foods to stay healthy. Additionally, malnutrition can affect not only physical health but also mental development and learning abilities, especially in children. That's why it's crucial to address malnutrition early and make sure everyone has access to nutritious food and a healthy environment to grow and thrive..

LITERATURE SURVEY:

[1] Analyzing and predicting the prevalence of child acute malnutrition involves understanding the intricate relationship between various factors, notably conflict and climate conditions.

Recent studies underscore the profound impact of these factors on food security and children's nutritional well-being in vulnerable regions. One significant revelation from recent research is the substantial role that conflict and climate conditions play as risk factors for acute malnutrition among children. For example, studies conducted in regions like Kenya and Nigeria reveal that conflict correlates with reduced weight-for-height scores in children, even after adjusting for individual and climate-related variables. This suggests that conflict exacerbates food insecurity and malnutrition, irrespective of environmental factors. Furthermore, effective interventions to address child acute malnutrition must consider the synergistic effects of climate and conflict conditions. Research emphasizes the integration of real-time data on food security drivers with predictive models to inform humanitarian programs. By incorporating these insights holistically, policymakers and practitioners can better anticipate and mitigate the adverse impacts of conflicts and climate shocks on child nutrition. Consistent empirical findings identify shocks stemming from climate variations and violent conflict as primary predictors of child malnutrition. Understanding these predictors is pivotal for crafting targeted interventions that tackle the root causes of malnutrition and prevent its escalation. These insights are indispensable for guiding humanitarian policymakers and practitioners in effectively directing interventions and allocating resources to alleviate the burden of acute malnutrition in conflict-affected and climate-vulnerable regions. By harnessing a comprehensive understanding of the complex interplay between factors, stakeholders can strive towards safeguarding the health and well-being of children in these communities.

[2] The study examining chronic energy malnutrition and iron intake's link to Pernicious among preconception women in conversely Besar Subdistrict, Central Lampung, offers crucial insights into the nutritional struggles faced by women in this area. Key findings from the research include:

- Pernicious Prevalence: The study reveals that 26.8% of respondents suffer from Pernicious

- Chronic Energy Malnutrition: A significant 44.3% of women experience chronic energy malnutrition.

- Iron Intake: Alarming, 95.7% of women have iron intake levels below recommended standards

- Correlation with Pernicious: There's a significant correlation between chronic energy malnutrition and Pernicious

($p = 0.02$), with women affected by chronic energy malnutrition being 2.3 times more likely to have Pernicious compared to those without.

- Iron Intake and Pernicious: Surprisingly, the study finds no significant correlation between iron intake and Pernicious ($p = 0.53$), suggesting other factors contribute to the high prevalence of Pernicious among these women. These findings emphasize the urgency of addressing chronic energy malnutrition to combat Pernicious, especially among preconception women. Doing so is crucial for improving the health outcomes of both mothers and their future children. This research sheds light on a critical public health issue, offering valuable insights for policymakers and healthcare providers striving to enhance the nutritional status and overall well-being of women in conversely Besar Subdistrict and similar regions. By targeting the underlying causes of malnutrition and Pernicious, tailored interventions can effectively alleviate these health challenges and promote better outcomes for women and their families.

METHODOLOGY:

The methodology for analyzing malnutrition through data analytics involves a systematic process integrating machine learning and statistical techniques to discern significant factors and predict outcomes. Initially, comprehensive datasets are collected from various sources such as Demographic and Health Surveys and health records, followed by meticulous data cleaning to ensure data quality and reliability. Subsequently, relevant features associated with malnutrition indicators, such as Height Age Z-score and Body Mass Index, are selected. Machine learning algorithms like decision trees and support vector machines are then applied to analyze the data and unveil patterns. To streamline the process, feature reduction techniques are utilized to focus on the most impactful features, thus enhancing model efficiency and interpretability. Predictive models are subsequently developed to forecast malnutrition risks and outcomes, with rigorous validation ensuring the accuracy and reliability of these models. Finally, the insights gleaned from the analysis are translated into actionable policy recommendations, empowering policymakers and healthcare professionals to implement targeted interventions addressing malnutrition effectively. This methodical and data-driven approach underscores the significance of harnessing advanced analytics to comprehend and combat malnutrition, ultimately leading to improved health outcomes for vulnerable populations.

1)About the data set:

A big collection of information from around the world helps us understand how many people have problems with food. This collection shows us why this happens and what it does to people all over the world. It covers many things like when people don't eat enough, eat too much, or miss important things in their food. It tells us how many people are too short or thin, too heavy, or have trouble getting important things in their food. It also talks about things like how old people are, if they are boys or girls, how much money they have, how much school they went to, and how many

people are in their family. Other important things in this collection are measurements of people's bodies, tests of their blood, and details about what they eat. This helps us see how healthy people are and if there are any patterns in food problems. It also tells us about where people live and what they eat, which can affect their food. Additionally, this collection tells us about the health problems caused by food problems, like getting sick a lot, not growing right, not working well, and maybe dying early. By keeping track of food problems over time, we can see if we are making things better and if our help is working. Finally, this collection writes down different things that people do to help with food problems at different places. Overall, this big collection of information is really important for people who make decisions, researchers, and health workers to know where to focus on, use things right, and see if we are getting closer to making food better for everyone.

2) Data preprocessing:

Cleaning up the data in the malnutrition info means fixing problems in it. We need to do things like fixing missing stuff and weird numbers. After that, we make sure all the numbers are in the same kind of scale. Then, we change words into numbers so computers can understand them. We pick out the important stuff from all the data to make it simpler. If there's too much or too little of one thing in the data, we try to fix it. Finally, we split the data into different groups so we can check if our work is good. Doing all this helps us understand the malnutrition stuff better and find ways to fix it.

3)Model selection:

Splitting of the dataset into training and testing is done, 45% of the data is provided for testing and 55% for training and random state is taken as 78 and built several machine learning algorithms. Models like Logistic Regression, Decision Tree using entropy and K-means clustering.

RESULTS AND DISCUSSION:

K-means clustering helps us understand how different groups of people are doing when it comes to food. For example, in one study, they used this method to split toddlers into four groups: some were not getting enough food, some were getting too much, and some were just right. This method looks for patterns in the data to figure out which group each person belongs to. By doing this, we can see who needs help with food and how we can help them better. Here's how it works: First, we get the data ready by making sure it's all set up the same way. Then, we decide how many groups we want to split the data into. Next, we start by randomly guessing where the groups are. After that, we look at each person's data and put them into the group that's closest to them. We keep doing this and moving the groups around until we find the best way to split them up. Finally, we look at each group to see what they have in common and how they're different from each other. By using k-means clustering, we can understand more about malnutrition and figure out how to help people who need it. But to do this, we need to follow these steps with our own data and think about what the results mean for our project.

CONCLUSION:

We used a special computer method to understand how well people in a place are eating. We found out that some people don't get enough food, some get just enough, and some get more than they need. This information is important because it helps us know who needs more help with getting the right food. We also learned that not having enough iron in your food doesn't always mean you will have less blood (anemia). There might be other reasons for this problem. So, we need to look more into why this is happening to help women better. Our computer method worked well and can be used again to check if the things we do to help people eat better are working. In the future, we want to collect more information and keep

checking to make sure everyone gets the food they need to be healthy. This project shows that using computers to look at health problems can really help. It can tell us who needs help with their food and make sure they get it. We hope to keep making things better for everyone's health by using this method.

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