Adverse Childhood Experiences for Predicting Chronic Health Conditions

Danner Affadzi

Introduction

- Adverse Childhood Experiences (ACEs) count traumatic childhood experiences
- Studies correlate high ACE scores with chronic health conditions
- Incorporating ACE scores in medical care can improve healthcare and patient outcomes

Problem Statement

- Can a machine learning model use childhood trauma assessments to predict diabetes and high blood pressure in adults, and can this tool be used for preventative care?
- Evaluated based on accuracy and F1-score
- Sensitivity needs to be above 90% in order for it to be considered useful

Methodology

- Data Acquisition
- Data Cleaning and Preprocessing
- Model Selection
- Model Training and Evaluation

Findings

- Models: Logistic Regression, Gradient Boosting, and Neural Network
- All were capable of 90% sensitivity with parameters
- The models are not useful for their intended use

Limitations and Downfalls

- Data Size
- Refinement of Target Variable
- Data Collection Protocol

Next Steps

- Data Enhancement
- Refine Target Variable
- Refine Feature Engineering
- Address Class Imbalance
- Other Models

A step in the right direction!

Resources

1. Association of adverse childhood experiences with diabetes in adulthood (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7959232/#:~:text=Over%20the%20years%2C%20studies%20have,2%20diabetes%20later%20in%20life.)
2. Adverse Childhood Experiences and Blood Pressure Trajectories from Childhood to Young Adulthood (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4430378/)
3. What is Trauma-Informed Care? (https://www.traumainformedcare.chcs.org/what-is-trauma-informed-care/)