Title: Engineering Data-Driven Predictive Ensemble Models for the Early Detection of Alzheimer's Disease

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Abstract

Objectives: To develop and validate a predictive model for Alzheimer's Disease (AD) risk using census data and various health metrics.

Methods: Data from the Behavioral Risk Factor Surveillance System (BRFSS) and U.S. Census were integrated, with predictive modeling performed using machine learning techniques, specifically ensemble models like the Random Forest Classifier.

Results: The model identified key risk factors, including oral health, dietary habits, and mental distress, with an overall high accuracy in predicting AD risk.

Discussion: The model's implications for early intervention and personalized healthcare strategies are discussed.

Conclusion: This predictive model offers significant potential for enhancing early detection and management of AD.

Key Messages

- **What is already known on this topic**: Alzheimer's Disease has a complex etiology with various contributing factors.
- **What this study adds**: This study integrates multiple health metrics into a predictive model, offering nuanced insights into AD risk.
- **How this study might affect research, practice, or policy**: The findings could inform targeted public health interventions and personalized healthcare approaches.