

Bond University
Research Repository



Alzheimer's Disease: Identifying High Impact Variables Using Statistical Techniques

Ahmed, Tahera; Kumar, Kuldeep; Zhang, Ping

Licence:
CC BY-NC-ND

[Link to output in Bond University research repository.](#)

Recommended citation(APA):
Ahmed, T., Kumar, K., & Zhang, P. (2020). *Alzheimer's Disease: Identifying High Impact Variables Using Statistical Techniques*. 5. Abstract from International Online Conference in Applied Statistics 2020: Application of Statistics in Sciences, Social Sciences, Commerce, Humanities and Management , Mumbai, India.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

Alzheimer's Disease: Identifying High Impact Variables Using Statistical Techniques

Presenter: Tahera Ahmed, Higher Degree Research Student, Bond Business School, Bond University

1st Co-Author : Professor Kuldeep Kumar, Bond University

2nd Co-Author: Dr. Ping Zhang, Griffith University

BACKGROUND

Alzheimer's Disease (AD) is considered as the most common neurodegenerative disorder of the brain and is a major cause of disabilities in the later stages of life. It is also responsible for huge global costs. (1) Alzheimer's is usually diagnosed late and this makes the elderly population most vulnerable to it. Usually, the disease's deterioration process had already started by the time a positive detection of AD is made and substantial brain tissue damage had resulted in noticeable cognitive deficit and appearance of other symptoms. (2)

RESEARCH AIM

- Identifying risk factors that could make a positive diagnosis of the causes for contracting Alzheimer's in later life.
- Determining which variables have a larger effect on the elderly population and make them more likely to suffer from Alzheimer's.

METHOD:

For this research data was collected from the 2ADNI (Alzheimer's Disease Neuroimaging Initiative) Database with a 292 sample size aged between 55 to 91 years.

For understanding the impact of variables on Alzheimer's disease, Chi-square test, T-test, Logistic Regression, Neural Network, Decision Tree and Random Forest Model were used.

RESEARCH OUTPUT:

The study discovered some important common factors. It showed that LDELTOTAL score, MMSE score, CDR score, RAVLT tests, ADAS score, Presence of APOE4 Gene, Age and Weight on predictors were significant or found to be important variables from different statistical analysis.

KEYWORDS: Alzheimer's Disease, Elderly Population, Risk Factors, Statistical Techniques

REFERENCES:

1. Grassi, M., Perna, G., Caldirola, D., Schruers, K., Duara, R., & Loewenstein, D. A. (2018). A clinically-translatable machine learning algorithm for the prediction of Alzheimer's disease conversion in individuals with mild and pre mild cognitive impairment. *Journal of Alzheimer's Disease*, 61(4), 1555–1573.<https://doi.org/10.3233/JAD-170547>.
2. Belathur Suresh, M., Fischl, B., & Salat, D. H. (2018). Factors influencing accuracy of cortical thickness in the diagnosis of Alzheimer's dis/[10.1002/hbm.23922](https://doi.org/10.1002/hbm.23922).