Machine Learning for Prediction of Cognitive Health in Adults Using Sociodemographic, Neighbourhood Environmental, and Lifestyle Factors 3 6000HEALTH ADDIVISIONED 3 6000 HEALTH ADDIVISIONED



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Introduction

- Sociodemographics, physical and social features of the neighbourhood environment, and lifestyle behaviours can shape the trajectory of cognitive health in older adults.
- ❖ However, there is a gap in our understanding of the models and factors that are suitable for predicting specific domains of cognitive function in middle-aged and older adults.
- This study aimed to address this gap by comparing the performance of different machine learning models using sociodemographic, neighbourhood environmental, and lifestyle factors to predict processing speed and memory.

Explains 43% Processing Speed *Both sociodemographic and lifestyle factors were good predictors of processing speed. Lifestyle Behaviours Socio-economic Status AUC = 0.78 AUC = 0.84 Cognitive function

❖Both sociodemographic and lifestyle factors were good predictors of high and low cognitive function classes

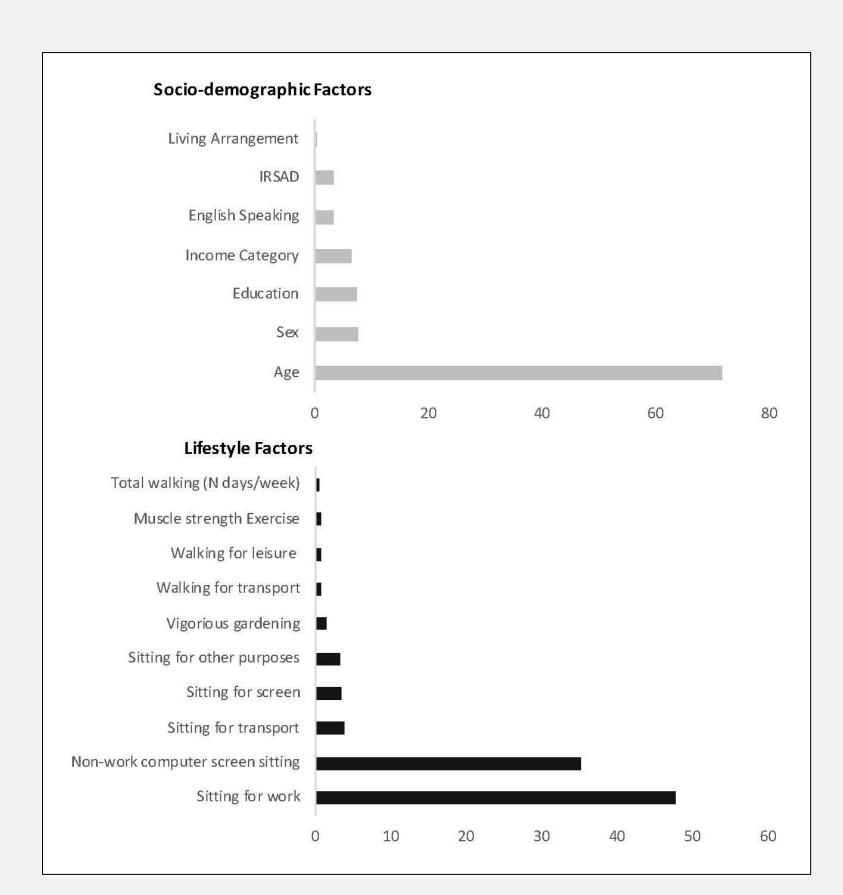


Figure: Relative influence of variables on the prediction of high and low cognitive function classes.



❖Data for this study are from the third wave of the Australian Diabetes, Obesity and Lifestyle study collected in 2011–2012 (AusDiab3).



Model Inputs



Machine learning models

Used to predict cognitive function in mid-age and older adults.

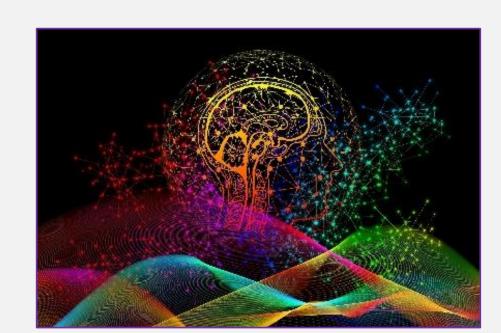


Cognitive function
Processing speed and verbal working

memory

Cognitive function was assessed using:

- ❖Continuous cognitive measures a score on a cognitive test
- ❖Categorical cognitive measures membership of participants to a specific cognitive profile, which was identified using a distinct latent class analysis



Conclusions

- Sociodemographic factors were the strongest predictors, with age being the most important characteristic.
- Lifestyle factors, including sedentary behaviour and physical activity, also significantly predicted cognitive function classes and processing speed.
- Neighbourhood environmental characteristics appeared to be less important in machine learning

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