

Development and validation of a dementia risk prediction model in patients with depression: a prospective cohort study using competing risk analysis

Maha Alshahrani^{1,2,3,4}, Mario Siervo^{1,3}, Zhongyang Guan^{1,3}, and Blossom CM Stephan³

¹ Curtin School of Population Health, Curtin University, Perth, WA 6102, Australia, ² Research Centre of Advanced Materials, King Khalid University, Abha, Saudi Arabia, ³ Dementia Centre of Excellence, Curtin enAble Institute, Curtin University, Perth 6102, Australia, ⁴ Saudi Arabian Cultural Mission, Canberra, Australia

Background

- Depression is a key risk factor for dementia.
- However, there are currently no validated models for predicting who with depression is at the highest risk of dementia.
- Precise risk classification may enable timely intervention and prevention.

Objective

- To develop and externally validate a model for predicting risk of dementia, specifically in individuals with a history of depression, using data from the 10/66 Study for validation.

Methods

- The model (DEP-DEM) was developed using data from the UK Biobank Study in dementia-free individuals with a history of depression at baseline (n = 31,064).
- Predictor selection used nested cross-validation with LASSO-Cox regression.
- Dementia risk at 5, 10, and 15 years was estimated using Fine-Gray competing risk regression models.
- External validation using data from the 10/66 Study.

Results

- 650 incident dementia cases during a mean follow-up of 9.8 (SD=2.4) years.
- Six routinely available predictors were retained: age, sex, living alone, multimorbidity cardiovascular diseases, diabetes, and COPD.
- Excellent discrimination:
5 years C-statistic: 0.91
10 years: 0.87
15 years 0.86
- Outperformed age-only models
- External validation in the 10/66 cohort demonstrated moderate discrimination (5-year C-statistic = 0.66) with a significant spread in risk scores, supporting generalisability.

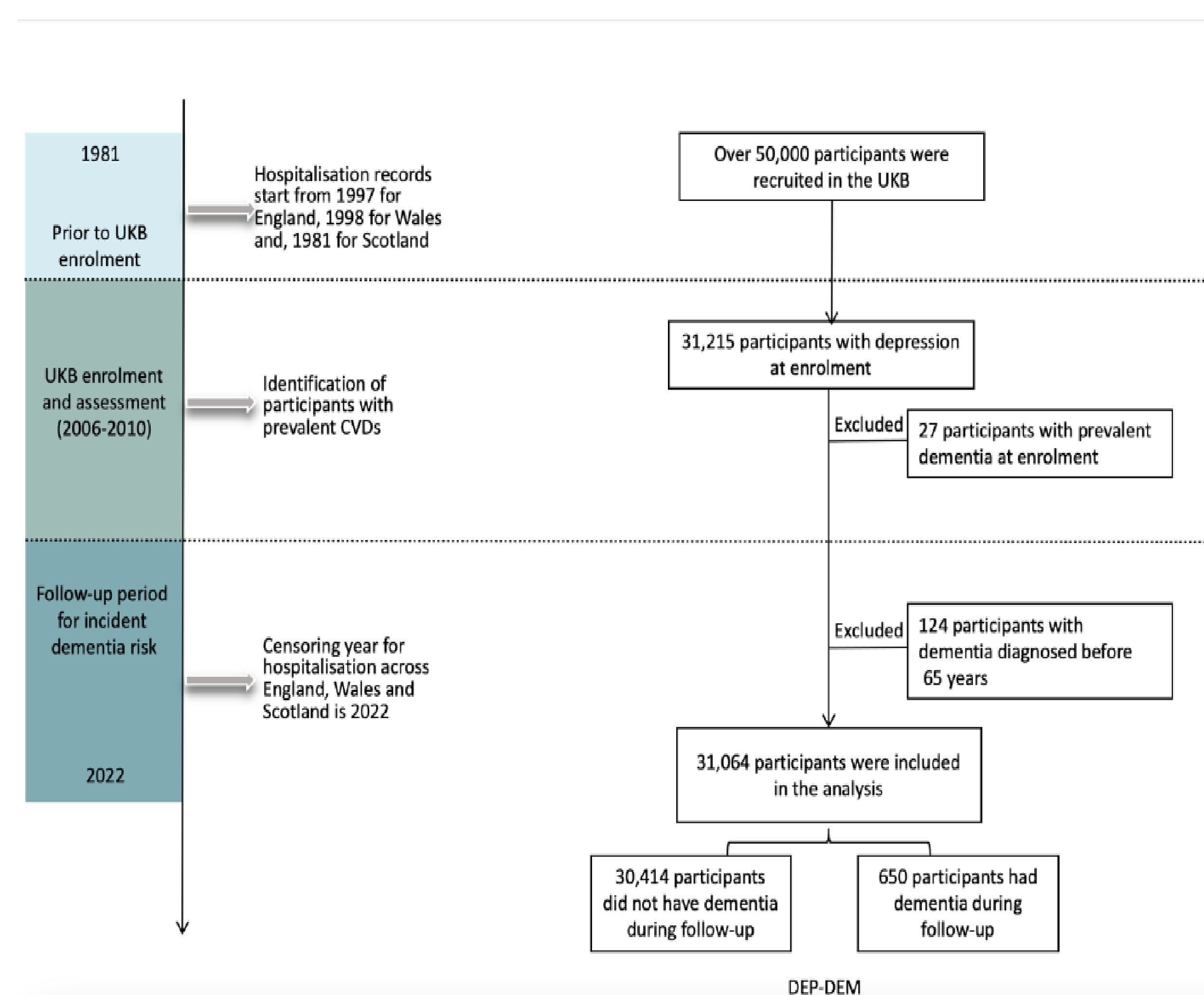
Conclusion

- DEP-DEM provides an interpretable and well-calibrated approach for estimating dementia risk in individuals with depression.
- The model supports risk stratification and may facilitate targeted prevention strategies.

Acknowledgements

- This work was funded by Saudi Arabian Cultural Mission.

Contact



Maha Alshahrani

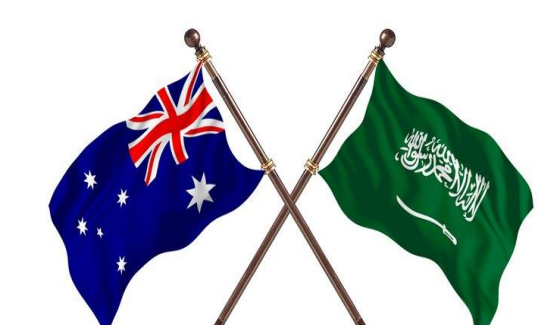
Curtin University

m.alshahrani12@postgrad.curtin.edu.au

+61 466 679833



الملقية الثقافية السعودية في أستراليا
Saudi Arabian Cultural Mission



Monday-1074