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Lifestyle index for mortality prediction using multiple ageing cohorts in the USA, UK and Europe

Jing Liao[1,2], Graciela Muniz-Terrera[3], Shaun Scholes[3], Yuantao Hao[1,2] and Yu-ming Chen[1]
[1]Sun Yat-sen University, China
[2]University of Edinburgh, Scotland
[3]University College London, London

Current mortality prediction indexes are mainly based on functional morbidity and comorbidity, with limited information for risk prevention. This study aimed to develop and validate a modifiable lifestyle-based mortality predication index for older adults. Data from 51,688 participants (56% women) aged ≥50 years in 2002 Health and Retirement Study, 2002 English Longitudinal Study of Ageing and 2004 Survey of Health Ageing and Retirement in Europe were used to estimate coefficients of the index with cohort-stratified Cox regression. Models were validated across studies and compared to the Lee index (having comorbid and morbidity predictors). Over an average of 11-year follow-up, 10,240 participants died. The lifestyle index includes smoking, drinking, exercising, sleep quality, BMI, sex and age; showing adequate model performance in internal validation (C-statistic 0.79; D-statistic 1.94; calibration-slope 1.13) and in all combinations of internal-external cross-validation. It outperformed Lee index (e.g. differences in C-statistic=0.01, D-statistic=0.17, P<0.001) consistently across health status. The lifestyle index stratified participants into varying mortality risk groups, with those in the top quintile having 13.5% excess absolute mortality risk over 10 years than those in the bottom 50th centile. Our lifestyle index with easy-assessable behavioral factors and improved generalizability may maximize its usability for personalized risk management.

chenyum@mail.sysu.edu.cn

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