



Application number/Title: 25813 - Integrated paradigms to investigate the interplay between lifestyle behaviours, the social environment, and genetic risk in the development of cardio- metabolic disease and mental health.

Applicant PI: Professor Emmanuel Stamatakis

Applicant institution: University of Sydney

Collaborator: Professor Mark Hamer – Loughborough University; Professor Mitch Duncan

Keywords provided by the Applicant PI to describe the research project:

behaviours, cardiometabolic, cardiovascular, lifestyle, mortality, socioeconomic

Application Lay Summary:

Cardiometabolic conditions and mental health are closely related, and both types of outcomes are influenced by lifestyle behaviours such as physical activity, sleep, and diet as well as underlying genetic variation. Lifestyle behaviours, that are often interlinked and influenced by the social environment, may have synergistic effects on health in ways we do not completely understand. The main aim of the proposed project will be to understand the complex interactions and synergistic health effects of different lifestyle behaviours (physical activity, sleep, diet, alcohol, smoking) and to explore the role of the social environment as well as genetic variation, as moderators and confounders. The proposed project has a strong focus on health outcomes in relation to major chronic non-communicable disease. The generated information will have profound relevance to the majority of the population in the UK and worldwide by elucidating how different lifestyle behaviours interact to influence physical and mental health and disease, by informing public health and clinical guidance on combinations of lifestyle behaviours, and by informing policy through a better understanding of how social and physical environment interact with health behaviours. We will examine how clusters of lifestyle behaviours influence cardiovascular and metabolic risk factors, risk for death from any cause, and risk for development of cardiovascular disease, diabetes, and depression. We will examine how mental health and socioeconomic circumstances and certain aspects of the physical environments influence lifestyle behaviours and the way lifestyle behaviours influence health while both controlling for and exploring the influence of genetics

on these relationships. Full cohort $n=500,000$ for most research questions, $n=20,000$ for the longitudinal analyses involving the regression dilution bias sub-study and sub-sets for others research questions.