Application number/Title: 34684 Multimorbidity and dementia: an observational cohort study using the UK Biobank.

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Keywords provided by the Applicant PI to describe the research project:
dementia, mediators, moderators, multimorbidity, risk

Application Lay Summary:

Background/scientific rationale: People with dementia, on average, have an additional 4.6 chronic conditions, many of which may start before the onset of dementia. The co-occurrence of multiple chronic diseases/conditions in one person is termed "multimorbidity". Emerging evidence suggests that multimorbidity is associated with poorer cognitive health in older age, but whether multimorbidity increases the risk of developing dementia is yet to be established. Currently there is a lack of large scale, population based, rigorous longitudinal studies investigating the impact of multimorbidity on the risk of developing dementia.

Aims: We aim to investigate if co-occurrence of multiple chronic diseases/conditions in older age increases the risk of developing dementia. We also want to understand which combinations of chronic conditions is more or less harmful in terms of developing dementia. Furthermore, we will explore if/how other factors, including socio-economic, lifestyle, environmental and genetic factors, influence the link between multimorbidity and dementia. For example, whether the effect of multimorbidity on dementia risk is higher (or lower) in people living in the most deprived areas compared with the most affluent.

Project duration and plan of investigation: We propose this study to be a rolling three-year project from the date of data access. We will set-up a (retrospective) observational cohort study based on the UK Biobank's dementia free participants at baseline (time of recruitment). Subsequent incidence of dementia will be identified from the linkage to the National Health Service (NHS)
records. Multimorbidity will also be measured from the linked NHS records. Socio-demographic, lifestyle, and environmental factors will be selected from the baseline variables. Inflammatory markers will be measured from the UK Biobank’s biomarkers data (if/when available). Relevant genetic factors will be selected from the SNP genotype data. Appropriate statistical methods, such as Cox regression, joint models and relevant causal mediation analysis will be employed for testing the hypotheses of interest.

Public health impact: The study will generate valuable information on patterns and prevalence of multimorbidity in dementia patients, and will potentially identify new modifiable causes (modifiable diseases and lifestyle factors) of dementia. Many chronic diseases (e.g., diabetes, depression, arthritis hearing impairment) are modifiable. Knowing if a specific combination of modifiable chronic conditions increases the risk of dementia, can potentially help with primary prevention, delaying onset and personalised management and organisation of dementia care. Main output of our research will be publications in peer-reviewed journals, conference posters/presentations in dementia and related conferences.