

Principal Investigator

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Summary of research

Cardiovascular, Mortality, Sun exposure, Vitamin D

Application Lay Summary:

1a: Recently low levels of sun exposure and low levels of vitamin D have been associated with increased risk of CVD and mortality. This evidence is based on people living in a restricting area (i.e. city), leaving uncertain potential variations due to participants' demographics (i.e. age, ethnicity), location or seasonality. In this study we will test the hypothesis that the association between sun exposure and vitamin D with CVD and mortality will vary by subgroups, location, and season. Secondly, we will investigate a potential dose-response relationship between vitamin D levels and hours of sun-exposure with vascular risk factors.

1b: The planned analyses will provide new understanding about a potential role of sun exposure and vitamin D in cardiovascular disease and mortality risk across different population subgroups and geographical areas. These findings will help identify potentially new preventative measures against CVDs and associated risk factors. The use of vitamin D and vascular biomarkers (i.e. blood pressure, cholesterol, CRP, cerebral blood flow/heart MRI) will highlight potential mechanisms through which sun exposure may impact on CVD, and mortality risk. The findings will facilitate enhanced risk prediction modelling and identify potential therapeutic targets for vascular disease patients.

1c: In the full UK Biobank cohort, baseline data on sun exposure and vitamin D will be used to assess their prevalence and relationship with subsequent risk of stroke, CHD, and mortality in subgroups defined by their age, gender, and ethnicity. Baseline chronic illness and lifestyle factors (i.e. smoking, drinking, depression, chronic illness, social class, education, housing) will be used as covariates. Additionally, the relationships between sun exposure and vitamin D with stroke, CHD, and mortality and vascular biomarkers (i.e. blood pressure, cholesterol, CRP) will be estimated to explore potential mechanisms through which sun exposure influences stroke and CHD risk.

1d: The analyses of sun exposure with stroke, CHD, and mortality events will be conducted on the full cohort, except those with established stroke and CHD at baseline. The relationships between measured vitamin D with stroke, CHD, and mortality will be conducted on the full cohort. The relationships between measured vitamin D and sun exposure with vascular biomarkers will be conducted on the full UK Biobank participants. The derived fields for the imaging data would be used.