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Summary of research

Key words: Sun, mortality, cancer, cardiovascular, skin

The prevalence of hypertension correlates with latitude, with BP rising with distance from the equator. Vitamin D is made in sun exposed skin, and serum levels correlate inversely with hypertension and ischaemic heart disease (IHD) prevalence. However, oral vitamin D supplements have no effect on BP or IHD. We hypothesise that sunlight has beneficial effects on cardiovascular disease and overall mortality, independently of vitamin D. We have demonstrated large stores of nitrogen oxides in the skin, released to the circulation on UVA irradiation of the skin, with a fall in BP.

Although sunlight exposure is risk factor for skin cancer there is no evidence that it causes a rise in all-cause mortality. Epidemiological data suggest it may cause a reduction in deaths from hypertension related diseases, in particular cardiovascular and cerebrovascular disease. As deaths from these are almost 100 times more frequent than from skin cancer, the benefits of sunlight may exceed the risks. The UK Biobank dataset includes questions on sun exposure and latitude of residence and allow a prospective study on overall risk-benefit ratio of sunlight exposure. This meets the aspirations of the UK Biobank to improve prevention and treatment of disease, in particular cardiovascular and stroke.

We will seek access to the full dataset, looking at data on sunlight exposure and variables known to affect cardiovascular disease and stroke. Our primary outcome measure will be all-cause mortality and

we will derive an odds-ratio for the effect of sunlight on this. We will also look for rates of skin cancer. We will correct for confounding factors that may link with different sun exposure patterns. We require access to data only (i.e. no samples) for the full cohort, with data on vitamin D serum levels when available.