

Research Fellowship Scheme

F1 - Income Inequality and Cardiovascular Health in China

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Introduction and Project Objectives: Whether absolute income (income per se) or relative income (social comparisons of income) at the household or neighbourhood level affects cardiovascular disease (CVD) risk in China is understudied. Relative income have been hypothesized to affect health via material and/or psychosocial stress pathways. However, it remains unclear whether stress biomarkers, such as cortisol, are on the pathway from income to CVD risk. This project aimed to examine the associations of absolute and relative household and neighbourhood income with CVD risk, and the mediating role of cortisol, in Hong Kong Chinese, and to assess whether cortisol, a major stress hormone, plays a potential causal role in CVD and its risk factors in Westerners and Hong Kong Chinese.

Methods: Complementary designs with an observational study and two Mendelian randomization (MR) studies were used. Based on Hong Kong's FAMILY Cohort, 17,607 adults (recruited from 2009 to 2014) were included for the observational study to examine the associations of income with CVD risk, and 1,562 adults (attended clinical follow-up started in 2016) were used to assess the mediating role of cortisol and for the MR study in Hong Kong Chinese. Publicly available genome-wide association studies (GWAS) with large sample size and extensive genotyping for cortisol and CVD and its risk factors were included for the MR study in Westerners.

Results: In the observational analysis in Hong Kong Chinese, relative household income deprivation was associated with higher systolic blood pressure but lower body mass index, whereas it was unrelated to self-reported CVD and diabetes. Neighbourhood income inequality was generally unrelated to CVD risk, nor was absolute income. Cortisol did not clearly mediate the association of relative household income deprivation with systolic blood pressure. Using the MR analysis, genetically predicted cortisol was unrelated to ischemic heart disease, ischemic stroke, diabetes or other CVD risk factors in Westerners, nor CVD risk in Hong Kong Chinese.

Conclusion and/or Discussion: Relative household income deprivation was not consistently associated with cardiovascular health in Hong Kong Chinese adults, nor was neighbourhood income inequality or absolute income. Relevance of relative and absolute income to cardiovascular health may be context specific. Cortisol unlikely plays a role in cardiovascular risk, casting doubts on the cortisol-related pathway to CVD. Better understanding of complex psychosocial mechanisms and alternative mediating pathways would inform more effective preventive strategies to close the income gap in cardiovascular health in China.

Research Fellowship Number: 02160107