A recent study shows that dramatic changes in income can increase (or decrease) the incidence of cardiovascular disease. And no, it's not about gaining or losing health insurance. Could there be something other than $$$ at play? Let's find out.

The researchers made use of a longitudinal survey, the Atherosclerosis Risk in Communities (ARIC) involving four regions in the Midwest and Eastern US. Participants were seen every three years, and the usual risk factors and demographics collected. The roughly 9000 individuals comprising the study had no evidence of cardiovascular disease at their initial evaluation or during the next six-year interval; none were retired, and there were no incomplete data sets. Self-reported total family income was obtained at entry and year six, allowing individuals to be stratified into three groups; those with income that had dropped by 50% or more, those with incomes rising by 50% or more, and those with stable incomes. [1]

The outcome of interest was the incidence of a cardiovascular event (heart attack, heart failure, or stroke) or death attributed to coronary artery disease. 900 participants experienced an income drop of 50% of more, falling to $14,655 (for a family of two the poverty level is officially $16,900); 70% remained relatively unchanged, and for 20%, their income rose to $53,347. It was not an apple to apple comparison. When compared with participants with stable income (acting as the
control or reference group), those with diminishing income were older, less educated, more frequently female. They were less likely to have health insurance, more likely to smoke, more sedentary, with a higher BMI, hypertension, and diabetes – they had more CVD risk factors. Those participants with rising income, again compared to the individuals with stable incomes, were younger, more likely to smoke but less likely to drink – they had far fewer risk factors.

- Smoking and drinking both decreased when incomes rose or dropped.
- For those whose income declined, so did their BMI.
- For those whose income declined, the adjusted [2] risk of cardiovascular disease rose by 17% in 17 years of follow up
- For those whose income increased, the adjusted risk was reduced by 14% in 17 years of follow up
- White participants had a higher risk than blacks
- Women fared better than men

It is difficult to see a single clear path from income loss to health outcomes. The one that comes to mind most readily is the loss of health insurance, but that was not a factor in this group. Income loss can affect our lifestyle, including diet and other habits. But again, in those experiencing income loss, there was less smoking and drinking, and the BMI fell, although the BMI by itself is a poor measure of nutritional intake. Income loss can also result in both stress and depression.

The limitations of the study make definitive statements difficult. Sensitivity analysis of lower-income rising and falling demonstrated a trend towards their conclusions but was not statistically significant. More importantly, it is difficult to parse out reverse causality where illness predated income loss. Finally, the time frame of the study was short and may not have adequately accounted for income variation. So specific conclusions require the addition of a few grains of salt.

But having said that, consider the high-level view. Consider that income was a proxy for some other unmeasured variables. I would offer up stress as an ideal candidate. Stress makes everything worse and is a challenging variable to measure. You can obtain self-reported qualitative stress measures, but there is no biomarker or vital sign to use to quantify our level of stress. But consider for yourself how stressful it would be to fall from a median income of 34%, which might be viewed as the working poor or lower end of the middle class into poverty.

The authors suggest that physicians be more aware of their patient’s incomes, but I suspect that that is impractical at a variety of levels. It might serve us better to spend a few moments in looking for sources of stress when we take a social history from our patients. But that is old school, and I don’t think the electronic health records have a box to record that information even if we did continue to ask.

[1] A 25% reduction or increase was also characterized and used in the sensitivity analysis.
[2] Adjustment included age, gender, race, household size, employment status, education, health insurance, CVD risk factors, lipid profile, and medications.

Source: Longitudinal Associations Between Income Changes and Incident Cardiovascular Disease