

# Socioeconomic status and gender are associated with differences in cholesterol levels

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A long-term lifestyle study reports differences between the sexes when it comes to fat profiles associated with socioeconomic status. Research in the open access journal *BMC Public Health* breaks down factors associated with social class and finds surprising inequalities between men and women.

The researchers found that [men](#) in social classes (based on occupation) with manual jobs had lower [cholesterol levels](#) than their counterparts in non-manual social classes. In contrast, [women](#)'s LDL-cholesterol levels were more closely tied to their educational level than men.

The study highlights the [health inequalities](#) that exist between the social classes, and the researchers believe that future interventions should focus on men and women separately and explore the reasons for these differences, in order to promote better health.

Researchers from University of Cambridge performed a cross-sectional study as part of the European Prospective into Cancer involving 22451 participants aged 39-79 years old from the from Norfolk cohort in the UK. Each participant indicated what their alcohol consumption was and their BMI was calculated. Participants completed a survey that measured socioeconomic status using three factors: social class, education level, and the level of deprivation in the area they lived. This is the first time that socioeconomic status has been looked at assessing these three

factors independently. Blood samples were also taken to determine the following lipid levels: total cholesterol, HDL-cholesterol, triglycerides, and LDL-cholesterol.

Kay-Tee Khaw, lead researcher, says: "There is a well-recognised social gradient in cardiovascular disease. We were interested in trying to understand reasons for the observed socioeconomic inequalities in health. However, there are different measures of socioeconomic status including occupational class, educational status and residential deprivation, which may relate differently to different domains of health."

Overall, women were found to have higher total cholesterol levels than men. In men, socioeconomic status was not initially associated with total cholesterol level, but after taking age into account, , men in manual social classes were found to have slightly lower total cholesterol than those in non-manual jobs. Women with a lower education level were found to have higher total cholesterol compared to others.

When the team looked at HDL-cholesterol levels – the 'good' cholesterol – they found that women had [higher levels](#) than men. Men with more education and from higher occupational classes were found to have higher levels of HDL-cholesterols, but this was not linked to the deprivation in their area. However, when the results are adjusted for alcohol consumption – which is higher in the non-manual occupation group – this association lost statistical significance.

For LDL-cholesterol – the 'bad' cholesterol – again women were found to have higher levels than men. Women without educational qualifications beyond the age of 15 had significantly higher LDL-cholesterol than those who did even when accounting for BMI and alcohol use. Occupational class and level of deprivation were not linked to LDL-cholesterol in women. No association was found between the

three socioeconomic indices and LDL-cholesterol levels in men.

In the breakdown of the [socioeconomic status](#) factors, the researchers did not expect to see such differences in lipid [levels](#) in occupational social class of the women, especially as their social class was based on her partner's occupational social class. They had expected this to be similar for men and women. They speculate that this may be because men in manual social classes may have more physical activity and no differences in body mass index compared to those in non-manual social classes, whereas women in manual social classes (defined by their partners' occupation) may not have high physical activity and had higher mean [body mass index](#) compared to those in non-manual social classes. To address this limitation the team conducted a separate analysis based on the women's own occupation and found similar results.

Kay-Tee Khaw says: "We observed sex differences in the lipid patterns according to social class and education. The association of some adverse lipid parameters with [social class](#) and in particular, educational status in women was much stronger than for men. If we wish to reduce health inequalities we need to understand the reason for these health inequalities. Future studies need to look at men and women separately and explore the reasons for these sex differences."

**More information:** Distribution of lipid parameters according to different socio-economic indicators- The EPIC-Norfolk prospective population study, Shamarina Shohaimi, Matthijs S Boekholdt, Robert Luben, Nicholas Wareham and Kay-Tee Khaw, *BMC Public Health* 2014, 14:782. [www.biomedcentral.com/1471-2458/14/782](http://www.biomedcentral.com/1471-2458/14/782)

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