

## People living in polluted areas have less 'good' cholesterol which helps protect the heart, study finds

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Ian Johnston, Independent Science Correspondent - 14th April 2017

**Air pollution could increase the chance of having a heart attack by lowering levels of 'good' cholesterol in the bloodstream**, according to new research.

A study of more than 6,500 people in the US aged 45 to 84 found exposure to black carbon – a marker of traffic-related pollution – was “significantly associated” with reduced amounts of HDL cholesterol.

Higher amounts of fine particles known as PM2.5, which are produced by burning fossil fuels, were also linked to less HDL, which has a protective effect.

The research adds to a growing body of evidence that air pollution, much of it invisible, causes serious health problems.

The British Heart Foundation described it as a “silent killer” responsible for a “myriad of changes in the body”, such as increased blood pressure.

A paper about the study in the journal *Arteriosclerosis, Thrombosis, and Vascular Biology* said: “We found that higher concentrations of PM2.5 over a three-month time period was associated with lower HDL-P, and higher annual concentrations of black carbon were associated with lower HDL-C.

“Lower HDL particle numbers have been associated with ... cardiovascular events in previous studies, and lower HDL-C is a traditional risk factor for cardiovascular disease.”

The paper said the negative effects on good cholesterol were lower but “comparable” to the kind of positive changes seen when people give up smoking.

It added: **“The association between air pollution and HDL was stronger in women, although the association in men was still negative.”**

The study essentially shows a correlation between air pollution and cholesterol, **but not actual causation**. Sometimes correlations occur when the link is indirect.

For example, the mortality risk of someone who watches television for hours every day is higher than average. But it's the sedentary lifestyle, not the TV itself, which is killing them.

Professor Sir Nilesh Samani, medical director of the British Heart Foundation, said it was clear that air pollution was harmful.

“There is an urgent need to fund more research that looks in to the dangerous effects of air pollution on the cardiovascular system,” he said.

“This silent killer is related to 40,000 deaths in the UK each year, with eight in 10 caused by a heart attack or stroke.”

He said the new study itself might not actually be evidence of a direct link between air pollution and heart disease.

“This is *an interesting study* showing an association between higher air pollution and lower levels of HDL-cholesterol, often called ‘good cholesterol’,” Professor Samani said.

“*The effects are small* and recent studies have questioned whether lower levels of HDL-cholesterol cause heart disease.

“Furthermore, air pollution causes a myriad of changes in the body – for example it also increases blood pressure – and therefore it is difficult to know how much contribution, if any, the observed difference in HDL-cholesterol makes to the risk associated with air pollution. This ***means it is still too early to say how these findings might fit in to the wider picture.***”

“But the underlying message is the same: air pollution poses a serious risk to heart health.”