

High air pollution increases risk of repeated heart attacks by over 40 percent

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Air pollution, a serious danger to the environment, is also a major health risk, associated with respiratory infections, lung cancer and heart disease. Now a Tel Aviv University researcher has concluded that not only does air pollution impact cardiac events such as heart attack and stroke, but it also causes repeated episodes over the long term.

Cardiac patients living in high pollution areas were found to be over 40 percent more likely to have a second [heart attack](#) when compared to patients living in low pollution areas, according to Dr. Yariv Gerber of TAU's School of Public Health at the Sackler Faculty of Medicine. "We know that like [smoking cigarettes](#), pollution itself provokes the inflammatory system. If you are talking about long-term exposure and an inflammatory system that is irritated chronically, pollution may well be involved in the progression of atrial sclerosis that manifests in [cardiac events](#)," explains Dr. Gerber.

Done in collaboration with Prof. Yaacov Drory and funded by the Environmental and Health Fund in Jerusalem, the research was presented at the San Diego Epidemiological Meeting of the [American Heart Association](#) in March and the Annual Meeting of the Israeli Heart Society in April.

Risking recurrence

Air pollution has previously been acknowledged as a factor in [heart](#)

[attack risk](#), as well as other health risks. The goal of this study, says Dr. Gerber, was to quantify that association and determine the long-term effects of air pollution on [myocardial infarction](#) (MI) patients. Their study followed 1,120 first-time MI patients who had been admitted to one of eight hospitals in central Israel between 1992 and 1993, all of whom were under the age of 65 at the time of admittance. The patients were followed up until 2011, a period of 19 years.

Air quality was measured at 21 monitoring stations in areas where the patients lived, and analyzed by a group of researchers at the Technion in Haifa. After adjusting for other factors such as socio-economic status and disease severity, the researchers identified an association between pollution and negative clinical outcomes, including mortality and recurrent vascular events such as heart attack, stroke and heart failure.

Compared to patients who lived in areas with the lowest recorded levels of pollution, those in the most polluted environment were 43 percent more likely to have a second heart attack or suffer congestive heart failure and 46 percent more likely to suffer a stroke. The study also found that patients exposed to air pollution were 35 percent more likely to die in the almost 20 year period following their first heart attack than those who were exposed to lower levels of pollution.

According to Dr. Gerber, the true impact of air pollution might be even stronger than this study shows. "Our method of assessing exposure does have limitations. Because we are using data from monitoring stations, it's a crude estimate of exposure, which most likely leads to an underestimation of the association," he warns. He estimates that air pollution could have double the negative impact with more precise measurement.

Identifying vulnerable groups

The results of the study not only indicate a health benefit for a public policy that curtails air pollution caused by industrial emissions and second hand smoke, but also call for heightened awareness by clinicians. Doctors should be making their patients aware of the risks of remaining in high pollution areas, suggesting that they work to limit their exposure, Dr. Gerber suggests.

Another purpose of this study was to begin identifying populations that are vulnerable to MI and re-occurring MI. Establishing the connection between [air pollution](#) and long-term risk for [patients](#) with cardiovascular diseases was an important step towards that goal.

Provided by Tel Aviv University

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