

# PUBLIC HEALTH IMPORTANCE OF AIR POLLUTION AS TRIGGER OF MYOCARDIAL INFARCTION: A COMPARATIVE RISK ASSESSMENT

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**Background and Aims:** Acute myocardial infarction is triggered by various factors, such as physical exertion, stressful events, heavy meals, or increases in air pollution. However, the importance and relevance of each trigger are uncertain. We compared triggers of myocardial infarction at an individual and population level.

**Methods:** We searched PubMed and the Web of Science citation databases to identify studies of triggers of non-fatal myocardial infarction to calculate population attributable fractions (PAF). When feasible, we did a meta-regression analysis for studies of the same trigger.

**Results:** Of the epidemiologic studies reviewed, 36 provided sufficient details to be considered. In the studied populations, the exposure prevalence for triggers in the relevant control time window ranged from 0.04% for cocaine use to 100% for air pollution. The reported odds ratios (OR) ranged from 1.05 to 23.7. Ranking triggers from the highest to the lowest OR resulted in the following order: use of cocaine, heavy meal, smoking of marijuana, negative emotions, physical exertion, positive emotions, anger, sexual activity, traffic exposure, respiratory infections, coffee consumption, air pollution (based on a difference of 30 µg/m<sup>3</sup> in particulate matter with a diameter <10 µm [PM<sub>10</sub>]). Taking into account the OR and the prevalences of exposure, the highest PAF was estimated for traffic exposure (7.4%), followed by physical exertion (6.2%), alcohol (5.0%), coffee (5.0%), a difference of 30 µg/m<sup>3</sup> in PM<sub>10</sub> (4.8%), negative emotions (3.9%), anger (3.1%), heavy meal (2.7%), positive emotions (2.4%), sexual activity (2.2%), cocaine use (0.9%), marijuana smoking (0.8%) and respiratory infections (0.6%).

**Conclusions:** In view of both the magnitude of the risk and the prevalence in the population, air pollution is an important trigger of myocardial infarction, it is of similar magnitude (PAF 5–7%) as other well accepted triggers such as physical exertion, alcohol, and coffee. Our work shows that ever-present small risks might have considerable public health relevance.