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## **Particulate air pollution and hospital admissions for cardiac diseases in potentially sensitive subgroups.**

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### **Source**

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### **Abstract**

#### **BACKGROUND:**

Although numerous studies have provided evidence of an association between ambient air pollution and acute cardiac morbidity, little is known regarding susceptibility factors.

#### **METHODS:**

We conducted a time-stratified case-crossover study in 9 Italian cities between 2001 and 2005 to estimate the short-term association between airborne particles with aerodynamic diameter  $<10\ \mu\text{m}$  (PM<sub>10</sub>) and cardiac hospital admissions, and to identify susceptible groups. We estimated associations between daily PM<sub>10</sub> and all cardiac diseases, acute coronary syndrome, arrhythmias and conduction disorders, and heart failure for 167,895 hospitalized subjects  $\geq 65$  years of age. Effect modification was assessed for age, sex, and a priori-defined hospital diagnoses (mainly cardiovascular and respiratory conditions) from the previous 2 years as susceptibility factors.

#### **RESULTS:**

The increased risk of cardiac admissions was 1.0% (95% confidence interval [CI] = 0.7% to 1.4%) per 10  $\mu\text{g}/\text{m}^3$  PM<sub>10</sub> at lag 0. The effect was slightly higher for heart failure (lag 0, 1.4% [0.7% to 2.0%]) and acute coronary syndrome (lag 0-1, 1.1% [0.4% to 1.9%]) than for arrhythmias (lag 0, 1.0% [0.2% to 1.8%]). Women were at higher risk of heart failure (2.0% [1.2% to 2.8%]; test for interaction,  $P = 0.022$ ), whereas men were at higher risk of arrhythmias (1.9% [0.8% to 3.0%]; test for interaction,  $P = 0.020$ ). Subjects aged 75-84 years were at higher risk of admissions for coronary events (2.6% [1.5% to 3.8%]; test for interaction,  $P = 0.001$ ). None of the identified chronic conditions was a clear marker of susceptibility.

#### **CONCLUSIONS:**

An important effect of PM<sub>10</sub> on hospitalizations for cardiac diseases was found in Italian cities. Sex and older age were susceptibility factors.