

# A COHORT STUDY OF TRAFFIC-RELATED AIR POLLUTION AND CARDIOVASCULAR MORTALITY AMONG ADULTS IN THREE CANADIAN CITIES

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**Background:** Several longitudinal studies have demonstrated associations between air pollution and cardiovascular mortality, but few studies have assessed intra-urban variation in traffic-related pollution or evaluated health effects at lower levels of pollution that are typically seen in Canadian cities. The purpose of this study was to determine whether an association exists between traffic-related air pollution and cause-specific cardiovascular mortality among adults living in Ontario, Canada.

**Methods:** This population-based cohort study used as a sampling frame the Federal income tax database which captures 95% of Canadians. More than 660,000 adults who were 35 years of age and older and lived in 10 cities in Ontario between 1982 and 1986 were randomly selected from income tax database and were followed up through 2004. Mortality from cardiovascular and cerebrovascular disease were ascertained for all subjects over the period of 1982-2004 using the Canadian Mortality Database. We report herein an analysis of a sub-cohort who, at the time of entry, lived in either Toronto, Hamilton, and Windsor, Ontario ( $n=205,430$ ), for whom we were able to make use of concentrations of  $\text{NO}_2$  estimated from land use regression models. Adjusted Cox models included known individual risk factors and ecological covariables, and we conducted sensitivity analyses using indirect methods to adjust for smoking.

**Results:** For each increase of 5ppb of  $\text{NO}_2$ , the adjusted rate ratios ( $\text{RR}_{5\text{ppb}}$ ) were 1.08 (95%CI: 1.04-1.11) for all cardiovascular mortality and 1.09 (95%CI: 1.04-1.14) for ischemic heart disease. Further indirect adjustment for smoking reduced the effect estimates, but the positive associations remained: all cardiovascular mortality, 1.04 (95%CI: 1.00-1.09) and ischemic heart disease, 1.05 (95%CI: 1.00-1.11). We did not find any effect for cerebrovascular disease ( $\text{RR}_{5\text{ppb}}=0.96$ ; 95%CI: 0.89-1.03).

**Conclusion:** Our findings support the hypothesis that long-term exposure to traffic-related air pollution increases the risk of cardiovascular disease and in particular, from ischemic heart disease.