



## National Vehicle Emissions Policies and Practices and Declining US Carbon Monoxide-Related Mortality

Mott JA, Wolfe MI, Alverson CJ, Macdonald SC, Bailey CR, Ball LB, Moorman JE, Somers JH, Mannino DM, Redd SC.

**CONTEXT:** Carbon monoxide (CO) has been reported to contribute to more than 2000 poisoning deaths per year in the United States.

**OBJECTIVES:** To evaluate the influence of national vehicle emissions policies and practices on CO-related mortality and to describe 31 years (1968-1998) of CO-related deaths in the United States.

**DESIGN AND SETTING:** Longitudinal trend analysis using computerized death data from the Centers for Disease Control and Prevention, US Census Bureau population data, and annual CO emissions estimates for light-duty vehicles provided by the US Environmental Protection Agency.

**MAIN OUTCOME MEASURE:** All deaths in the US for which non-fire-related CO poisoning was an underlying or contributing condition, classified by intent and mechanism of death. Negative binomial regression was used to incorporate every year of data into estimated percentage changes in CO emissions and mortality rates over time.

**RESULTS:** During 1968-1998, CO-related mortality rates in the United States declined from 20.2 deaths to 8.8 deaths per 1 million person-years (an estimated decline of 57.8%; 95% confidence interval [CI], -62.4% to -52.6%). Following the introduction of the catalytic converter to automobiles in 1975, CO emissions from automobiles decreased by an estimated 76.3% of 1975 levels (95% CI, -82.0% to -70.4%) and unintentional motor vehicle-related CO death rates declined from 4.0 to 0.9 deaths per 1 million person-years (an estimated decline of 81.3%; 95% CI, -84.8% to -77.0%). Rates of motor vehicle-related CO suicides declined from 10.0 to 4.9 deaths per 1 million person-years (an estimated decline of 43.3%; 95% CI, -57.5% to -24.3%). During 1975-1996, an annual decrease of 10 g/mile of estimated CO emissions from automobiles was associated with a 21.3% decrease (95% CI, -24.2% to -18.4%) in the annual unintentional motor vehicle-related CO death rate and a 5.9% decrease (95% CI, -10.0% to -1.8%) in the annual rate of motor vehicle-related CO suicides.

**CONCLUSIONS:** If rates of unintentional CO-related deaths had remained at pre-1975 levels, an estimated additional 11 700 motor vehicle-related CO poisoning deaths might have occurred by 1998. This decline in death rates appears to be a public health benefit associated with the enforcement of standards set by the 1970 Clean Air Act.

Full article (fee required): <http://jama.ama-assn.org/cgi/content/full/288/8/988>