

TITLE

Traffic Density, Frequent Asthma Symptoms and Asthma-Related Emergency Room Visit or Hospitalization

THEME

Advance Environmental Public Health Science and Research

KEYWORDS

traffic density, epidemiology, frequent asthma symptoms, asthma-related emergency room visit or hospitalization, California, population-based survey

BACKGROUND

According to the 2001 California Health Interview Survey (CHIS 2001), 11.9% of Californians (3.9 million) have been diagnosed with asthma at some point in their lives. Vehicular exhaust is a major source of air pollution for many residents with asthma in the U.S. Few epidemiologic studies, however, have examined the relationship between traffic-related exposures and the frequency and severity of asthma symptoms.

OBJECTIVE(S)

We examined the relationship between residential daily vehicle traffic density and prevalence of: 1) daily or weekly asthma symptoms, or 2) an asthma-related emergency room visit or hospitalization.

METHOD(S)

The population studied included respondents to CHIS 2001 from Los Angeles and San Diego Counties who reported: 1) having a previous asthma diagnosis, and 2) a geocodable residential cross street intersection ($n = 1,788$). We mapped each respondent's reported residential cross-street intersection and identified the probable street segment of residence. We then estimated daily vehicle traffic density (TD) within 500 feet of the street segment using traffic-count data from the California Department of Transportation. We categorized TD into three categories: low ($<20,000$ daily vehicle miles per square mile (VMT/mi²)), medium (20,001–200,000 daily VMT/mi²), and high ($>200,000$ daily VMT/mi²). We used logistic regression to estimate the effects of residential daily TD on daily or weekly asthma symptoms during the 12 months prior to the date of interview and on asthma-related emergency room visits or hospitalization during this period.

RESULT(S)

Approximately 20% of respondents reported having daily or weekly symptoms during the 12 months preceding the interview date, while 8% reported an asthma-related emergency room visit or hospitalization during this period. Adjusting for age, gender, race/ethnicity, and poverty level, we observed an increase in both daily/weekly symptoms (odds ratio (OR): 1.72; 95% confidence interval (CI): 1.14, 2.60) and asthma-related emergency room visits or hospitalizations (OR: 3.21; 95% CI: 1.64, 6.26) associated with the highest category of residential daily TD.

DISCUSSION/RECOMMENDATION(S)

These findings suggest that residence near areas of high-traffic roadways may increase the frequency and severity of asthma symptoms. Findings from this study may serve as a model for linking traffic and health-effect data and contribute to the development of a comprehensive system of tracking exposures and health effects that may be related to environmental hazards. This project is funded by ATSDR/CDC.

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