Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma

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Context  Vehicle exhaust is a major source of ozone and other air pollutants. Although high ground-level ozone pollution is associated with transient increases in asthma morbidity, the impact of citywide transportation changes on air quality and childhood asthma has not been studied. The alternative transportation strategy implemented during the 1996 Summer Olympic Games in Atlanta, Ga, provided such an opportunity.

Objective  To describe traffic changes in Atlanta, Ga, during the 1996 Summer Olympic Games and concomitant changes in air quality and childhood asthma events.

Design  Ecological study comparing the 17 days of the Olympic Games (July 19–August 4, 1996) to a baseline period consisting of the 4 weeks before and 4 weeks after the Olympic Games.

Setting and Subjects  Children aged 1 to 16 years who resided in the 5 central counties of metropolitan Atlanta and whose data were captured in 1 of 4 databases.

Main Outcome Measures  Citywide acute care visits and hospitalizations for asthma (asthma events) and nonasthma events, concentrations of major air pollutants, meteorological variables, and traffic counts.

Results  During the Olympic Games, the number of asthma acute care events decreased 41.6% (4.23 vs 2.47 daily events) in the Georgia Medicaid claims file, 44.1% (1.36 vs 0.76 daily events) in a health maintenance organization database, 11.1% (4.77 vs 4.24 daily events) in 2 pediatric emergency departments, and 19.1% (2.04 vs 1.65 daily hospitalizations) in the Georgia Hospital Discharge Database. The number of nonasthma acute care events in the 4 databases changed –3.1%, +1.3%, -2.1%, and +1.0%, respectively. In multivariate regression analysis, only the reduction in asthma events recorded in the Medicaid database was significant (relative risk, 0.48; 95% confidence interval, 0.44-0.86). Peak daily ozone concentrations decreased 27.9%, from 81.3 ppb during the baseline period to 58.6 ppb during the Olympic Games (P<.001).
weekday morning traffic counts dropped 22.5% ($P<.001$). Traffic counts were significantly correlated with that day's peak ozone concentration (average $r = 0.36$ for all 4 roads examined). Meteorological conditions during the Olympic Games did not differ substantially from the baseline period.

**Conclusions**  Efforts to reduce downtown traffic congestion in Atlanta during the Olympic Games resulted in decreased traffic density, especially during the critical morning period. This was associated with a prolonged reduction in ozone pollution and significantly lower rates of childhood asthma events. These data provide support for efforts to reduce air pollution and improve health via reductions in motor vehicle traffic.

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**Author Contributions:** Dr Friedman was the study coordinator and principal investigator, and participated in the study concept and design, acquisition of data, analysis and interpretation of data, drafting and critical revision of the manuscript, and provided administrative, technical, or material support.

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