

infants who did not wheeze, 86% of infants who wheezed did not go on to develop asthma at age 8. Among infants who wheezed, markers of atopy and severity of wheeze were risk factors for asthma at school age, findings that are consistent with previous studies.

**REVIEWER COMMENTS.** Although infants who wheeze are at increased risk of asthma at age 8 compared with those without wheeze, overall, only 14% of those with infant wheeze went on to have asthma at school age, highlighting that recurrent wheeze is a poor predictor of asthma at school age. Better predictors of asthma are needed not only to provide better asthma anticipatory guidance to parents but also to be able to target appropriate populations for the development of primary prevention approaches.

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### **Association of Improved Air Quality With Lung Development in Children**

Gauderman WJ, Urman R, Avol E, et al. *N Engl J Med*. 2015;372:905–913

**PURPOSE OF THE STUDY.** To determine the effects of decreased air pollution in Southern California over 3 separate calendar periods from 1994 to 1998, 1997 to 2001, and 2007 to 2011.

**STUDY POPULATION.** Children 11 to 15 years of age living in Southern California communities.

**METHODS.** There were 2120 children enrolled in 12 Southern California communities, and analysis was done from 5 communities where consistent results were obtained in all 3 cohorts. Linear regression models were used to examine the relationship between declining pollution levels over time and lung function development from 11 to 15 years of age.

**RESULTS.** Over the 13 years, improvement in 4-year growth in both forced expiratory volume in 1 second and forced vital capacity were associated with concurrent decline in levels of nitrogen dioxide and a particulate matter of aerodynamic size <2.5 microns and also for particles <10 microns. The portion of children with low forced expiratory volume in 1 second (<80% predicted) at 15 years of age declined significantly from 7.9% to 6.3% and then 3.6% across the three periods. There was no difference in females or males and in patients with or without asthma.

**CONCLUSIONS.** Long-term improvement in air quality was associated statistically and clinically with significant positive effect on lung function and lung growth in children.

**REVIEWER COMMENTS.** These data are a major public health statement of the salutary benefits for our efforts to improve

air quality. A higher level of lung function in early adulthood decreases the effect of chronic respiratory conditions and also decreases premature death of all causations.

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### **The Influence of Childhood Traffic-Related Air Pollution Exposure on Asthma, Allergy and Sensitization: A Systematic Review and a Meta-analysis of Birth Cohort Studies**

Bowatte G, Lodge C, Lowe AJ, et al. *Allergy*. 2015;70(3):245–256

**PURPOSE OF THE STUDY.** To summarize the literature on the effect of childhood exposure to traffic-related air pollution (TRAP) on the development of asthma and allergies.

**STUDY POPULATION.** Birth cohort studies that examined the association between TRAP exposure in early childhood and development of respiratory or allergic outcomes.

**METHODS.** Medline, Embase, and ISI Web of Science databases were searched using key words related to TRAP and respiratory or allergic outcomes and data were extracted using a standardized form. Only English-language studies were considered. Meta-analysis was done to analyze the association between exposures to various components of traffic, including PM<sub>2.5</sub>, NO<sub>2</sub>, and “black carbon” and the outcomes of asthma incidence and allergic sensitization separately. Analyses were further stratified by the age at which asthma incidence was measured.

**RESULTS.** Nineteen articles describing 11 birth cohorts fit the inclusion criteria. Increased exposure to NO<sub>2</sub>, PM<sub>2.5</sub>, and black carbon showed significant associations with increased asthma incidence, especially at younger ages, but there was substantial variability between studies, particularly for the studies of NO<sub>2</sub> and PM<sub>2.5</sub>. Increased exposure to NO<sub>2</sub> and PM<sub>2.5</sub> was also associated with increased risk of sensitization to outdoor, but not indoor, aero-allergens, again with substantial variability between studies. Meta-analysis of the association between TRAP and hay fever, eczema, or wheeze could not be performed.

**CONCLUSIONS.** Increased exposure to TRAP was found to be associated with increased risk of incident asthma and allergic disease, but substantial heterogeneity was found between studies. The authors call for more large, long-term studies investigating the effects of age of exposure on these outcomes and looking at long-term outcomes.

**REVIEWER COMMENTS.** Traffic-related air pollution is a known risk factor for asthma and allergic diseases, and this study

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