EXHIBIT A

SELECTED ABSTRACTS since mid-2005 on traffic, air pollution, and public health

1. "Is it traffic type, volume, or distance? Wheezing in infants living near truck and bus traffic"

By Ryan PH, LeMasters G, Biagini J, Bernstein D, Grinshpun SA, Shukla R, Wilson K, Villareal M, Burkle J, Lockey J.

J Allergy Clin Immunol. 2005 Aug;116(2):279-84
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BACKGROUND: Previous studies of air pollution have not examined the association between exposure to varying types, distance, and amounts of traffic and wheezing in very young infants. OBJECTIVE: We sought to determine the relationship between types of traffic, traffic volume, and distance and wheezing among infants less than 1 year of age. METHODS: A geographic information system and a classification scheme were developed to categorize infants enrolled in the study as living near moving truck and bus traffic (highway >50 miles per hour, >1000 trucks daily, <400 m), stop-and-go truck and bus traffic (<50 miles per hour, <100 m), or unexposed and not residing near either. Symptom data were based on health questionnaires administered to parents when the infants were 6 months of age and monthly health diaries. RESULTS: Infants living very near (<100 m) stop-and-go bus and truck traffic had a significantly increased prevalence of wheezing (adjusted odds ratio, 2.50; 95% CI, 1.15-5.42) when compared with unexposed infants. The prevalence of wheezing among nonwhite infants was at least twice that of white infants, regardless of exposure. Infants living less than 400 m from a high volume of moving traffic, however, did not have an increased prevalence of wheezing. CONCLUSION: These results suggest that the distance from and type of traffic exposures are more significant risk factors than traffic volume for wheezing in early infancy.
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2 "Spatial Analysis of Air Pollution and Mortality in Los Angeles"

By Jerrett, Michael; Burnett, Richard T; Ma, Renjun; Pope, C Arden III ; Krewski, Daniel; Newbold, K Bruce; Thurston, George; Shi, Yuanli; Finkelstein, Norm; Calle, Eugenia E; Thun, Michael J.

Epidemiology. 16(6):727-736, November 2005.

Abstract:
Background: The assessment of air pollution exposure using only community average concentrations may lead to measurement error that lowers estimates of the health burden

attributable to poor air quality. To test this hypothesis, we modeled the association between air pollution and mortality using small-area exposure measures in Los Angeles, California.

Methods: Data on 22,905 subjects were extracted from the American Cancer Society cohort for the period 1982-2000 (5,856 deaths). Pollution exposures were interpolated from 23 fine particle (PM2.5) and 42 ozone (O3) fixed-site monitors. Proximity to expressways was tested as a measure of traffic pollution. We assessed associations in standard and spatial multilevel Cox regression models.

Results: After controlling for 44 individual covariates, all-cause mortality had a relative risk (RR) of 1.17 (95% confidence interval = 1.05-1.30) for an increase of 10 [mu]g/m3 PM2.5 and a RR of 1.11 (0.99-1.25) with maximal control for both individual and contextual confounders. The RRs for mortality resulting from ischemic heart disease and lung cancer deaths were elevated, in the range of 1.24-1.6, depending on the model used. These PM results were robust to adjustments for O3 and expressway exposure.

Conclusion: Our results suggest the chronic health effects associated with within-city gradients in exposure to PM2.5 may be even larger than previously reported across metropolitan areas. We observed effects nearly 3 times greater than in models relying on comparisons between communities. We also found specificity in cause of death, with PM2.5 associated more strongly with ischemic heart disease than with cardiopulmonary or all-cause mortality.
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3. "Traffic, Susceptibility, and Childhood Asthma"

By Rob McConnell,Kiros Berhane,Ling Yao, Michael Jerrett, Fred Lurmann, Frank Gilliland, Nino Künzli, Jim Gauderman, Ed Avol, Duncan Thomas, and John Peters

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Abstract
Results from studies of traffic and childhood asthma have been inconsistent, but there has been little systematic evaluation of susceptible subgroups. In this study, we examined the relationship of local traffic-related exposure and asthma and wheeze in southern California school children (5-7 years of age). Lifetime history of doctor-diagnosed asthma and prevalent asthma and wheeze were evaluated by questionnaire. Parental history of asthma and child's history of allergic symptoms, sex, and early-life exposure (residence at the same home since 2 years of age) were examined as susceptibility factors. Residential exposure was assessed by proximity to a major road and by modeling exposure to local traffic-related pollutants. Residence within 75 m of a major road was associated with an increased risk of lifetime asthma [odds ratio (OR) = 1.29; 95% confidence interval (CI), 1.01-1.86], prevalent asthma (OR = 1.50; 95% CI, 1.16-1.95) , and wheeze (OR = 1.40 ; 95% CI, 1.09-1.78) . Susceptibility increased in long-term residents with no

parental history of asthma for lifetime asthma (OR = 1.85; 95% CI, 1.11-3.09), prevalent asthma (OR = 2.46; 95% CI, 0.48-4.09), and recent wheeze (OR = 2.74; 95% CI, 1.71-4.39). The higher risk of asthma near a major road decreased to background rates at 150-200 m from the road. In children with a parental history of asthma and in children moving to the residence after 2 years of age, there was no increased risk associated with exposure. Effect of residential proximity to roadways was also larger in girls. A similar pattern of effects was observed with traffic-modeled exposure. These results indicate that residence near a major road is associated with asthma. The reason for larger effects in those with no parental history of asthma merits further investigation.
Key words: air pollution, asthma, child, epidemiology, traffic.

Concluding paragraph of article

We conclude that living in a residence with more nearby traffic increases the risk of childhood asthma. Children with no parental history of asthma who had long-term residential exposure (or early-life exposure) constituted a susceptible population, and the risk was larger for girls than for boys. Because a substantial number of southern California children live near a major road, this exposure is potentially an important public health problem that could be remediable by transportation and residential development policy and by more effective control of vehicular emissions. Among those long-term residents with no parental history of asthma who lived within 75 m of a major road, 59% of asthma was attributable to residential proximity to the road. Further investigation is warranted to understand why the absence of parental asthma history increased susceptibility to traffic-related exposure.
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4. "Traffic-Related Air Pollution and Otitis Media"

By Michael Brauer, Ulrike Gehring, Bert Brunekreef, Johan de Jongste, Jorrit Gerritsen, Maroeska Rovers, Heinz-Erich Wichmann, Alet Wijga, and Joachim Heinrich

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Abstract

Background. Otitis media is one of the most common infections in young children. Although exposure to environmental tobacco smoke is a known risk factor associated with otitis media, little information is available regarding the potential association with air pollution.

Objective. We set out to study the relationship between exposure to traffic-related air pollution and otitis media in two birth cohorts.

Methods. Individual estimates of outdoor concentrations of traffic-related air pollutants—nitrogen dioxide, fine particles [particulate matter with aerodynamic diameters ≤ 2.5 μm (PM2.5)], and elemental carbon—were calculated for home addresses of approximately 3,700 and 650 infants from birth cohort studies in the Netherlands and Germany, respectively. Air pollution exposure was analyzed in relation to physician diagnosis of otitis media in the first 2 years of life.

Results. Odds ratios (adjusted for known major risk factors) for otitis media indicated positive associations with traffic-related air pollutants. An increase in 3 μg/m3 PM2.5, 0.5 μg/m3 elemental carbon, and 10 μg/m3 NO2 was associated with odds ratios of 1.13 (95% confidence interval, 1.00–1.27), 1.10 (1.00–1.22), and 1.14 (1.03–1.27) in the Netherlands and 1.24 (0.84–1.83), 1.10 (0.86–1.41), and 1.14 (0.87–1.49) in Germany, respectively.

Conclusions. These findings indicate an association between exposure to traffic-related air pollutants and the incidence of otitis media. Given the ubiquitous nature of air pollution exposure and the importance of otitis media to children's health, these findings have significant public health implications.
Keywords: air pollution, cohort studies, infant, otitis media, vehicle emissions
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5. "Effect of exposure to traffic on lung development from 10 to 18 years of age: a cohort study"

By W James Gauderman, Hita Vora, Rob McConnell, Kiros Berhane, Frank Gilliland, Duncan Thomas, Fred Lurmann, Edward Avol, Nino Kunzli, Michael Jerrett, John Peters

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Summary
Background: Whether local exposure to major roadways adversely affects lung-function growth during the period of rapid lung development that takes place between 10 and 18 years of age is unknown.This study investigated the association between residential exposure to traffic and 8-year lung-function growth.
Methods: In this prospective study,3677 children (mean age 10 years [SD 0 ·44]) participated from 12 southern California communities that represent a wide range in regional air quality.Children were followed up for 8 years, with yearly lung-function measurements recorded. For each child, we identified several indicators of residential exposure to traffic from large roads. Regression analysis was used to establish whether 8-year growth in lung function was associated with local traffic exposure,and whether local traffc effects were independent of regional air quality.

Findings: Children who lived within 500 m of a freeway (motorway)had substantial deficits in 8-year growth of forced expiratory volume in 1 s (FEV1,–81 mL,p=0 ·01 [95%CI –143 to –18])and maximum midexpiratory . ow rate (MMEF, –127 mL/s,p=0 ·03 [–243 to –11),compared with children who lived at least 1500 m from a freeway.Joint models showed that both local exposure to freeways and regional air pollution had detrimental,and independent,effects on lung-function growth.Pronounced deficits in attained lung function at age 18 years were recorded for those living within 500 m of a freeway,with mean percent-predicted 97 ·0%for FEV1 (p=0 ·013,relative to >1500 m [95%CIv94 ·6 –99 ·4])and 93 ·4%for MMEF (p=0 ·006 [95%CI 89 ·1 – 97 ·7]).
Interpretation: Local exposure to traffic on a freeway has adverse effects on children's lung development,which are independent of regional air quality,and which could result in important deficits in attained lung function in later life.
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6. Effects of Subchronic and Chronic Exposure to Ambient Air Pollutants on Infant Bronchiolitis

By Catherine Karr, Thomas Lumley, Astrid Schreuder, Robert Davis, Timothy Larson, Beate Ritz and Joel Kaufman

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Abstract

Ambient air pollutant exposure has been linked to childhood respiratory disease, but infants have received little study. The authors tested the hypotheses that subchronic and chronic exposure to fine particulate matter (particulate matter ≤2.5 μm in aerodynamic diameter (PM2.5)), nitrogen dioxide, carbon monoxide, and ozone increases risk of severe infant bronchiolitis requiring hospitalization. Study subjects were derived from linked birth–hospital-discharge records of infants born in 1995–2000 in the South Coast Air Basin of California. Cases with a hospital discharge for bronchiolitis in infancy were matched to 10 age- and gestational-age-matched controls. Exposures in the month prior to hospitalization (subchronic) and mean lifetime exposure (chronic) referenced to the case diagnosis date were assessed on the basis of data derived from the California Air Resources Board. In conditional logistic regression, only subchronic and chronic PM2.5 exposures were associated with increased risk of bronchiolitis

hospitalization after adjustment for confounders (per 10-µg/m3 increase, adjusted odds ratio = 1.09 (95% confidence interval: 1.04, 1.14) for both). Ozone was associated with reduced risk in the single-pollutant model, but this relation did not persist in multipollutant models including PM2.5. These unique US data suggest that infant bronchiolitis may be added to the list of adverse effects of PM2.5 exposure.
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7. Associations of Fine and Ultrafine Particulate Air Pollution With Stroke Mortality in an Area of Low Air Pollution Levels

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Stroke. 2007;38:918.

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Background and Purpose— Daily variation in outdoor concentrations of inhalable particles (PM10 <10 µm in diameter) has been associated with fatal and nonfatal stroke. Toxicological and epidemiological studies suggest that smaller, combustion-related particles are especially harmful. We therefore evaluated the effects of several particle measures including, for the first time to our knowledge, ultrafine particles (<0.1 µm) on stroke.

Methods— Levels of particulate and gaseous air pollution were measured in 1998 to 2004 at central outdoor monitoring sites in Helsinki. Associations between daily levels of air pollutants and deaths caused by stroke among persons aged 65 years or older were evaluated in warm and cold seasons using Poisson regression.

Results— There was a total of 1304 and 1961 deaths from stroke in warm and cold seasons, respectively. During the warm season, there were positive associations of stroke mortality with current- and previous-day levels of fine particles (<2.5 µm, PM2.5) (6.9%; 95% CI, 0.8% to 13.8%; and 7.4%; 95% CI, 1.3% to 13.8% for an interquartile increase in PM2.5) and previous-day levels of ultrafine particles (8.5%; 95% CI, –1.2% to 19.1%) and carbon monoxide (8.3; 95% CI, 0.6 to 16.6). Associations for fine particles were mostly independent of other pollutants. There were no associations in the cold season.

Conclusions— Our results suggest that especially PM2.5, but also ultrafine particles and carbon monoxide, are associated with increased risk of fatal stroke, but only during the warm season. The effect of season might be attributable to seasonal differences in exposure or air pollution mixture.
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