

**Rebecca Jensen, MPH, MEM**

Project Manager, Environmental Health Section  
Chronic Disease Prevention and Control Research Center  
Baylor College of Medicine  
6560 Fannin, Suite 924  
Houston, TX 77030  
(713) 798-5381  
[rjensen@bcm.tmc.edu](mailto:rjensen@bcm.tmc.edu)  
[www.envirohealthhouston.org](http://www.envirohealthhouston.org)

**Winifred J. Hamilton, PhD, SM**

Director, Environmental Health Section  
Chronic Disease Prevention and Control Research Center  
Baylor College of Medicine  
6560 Fannin, Suite 924  
Houston, TX 77030  
(713) 798-1052  
[hamilton@bcm.tmc.edu](mailto:hamilton@bcm.tmc.edu)  
[www.envirohealthhouston.org](http://www.envirohealthhouston.org)

Air pollution from motor vehicles impacts the health of people living, working, driving, or going to school along major roadways. Studies published in a wide range of scientific journals document health effects for people living at various distances from roads with as few as 20,000 vehicles per day (about the amount of traffic on Kirby or a tenth of the traffic on a typical Houston freeway). The health effects appear strongest within 100 meters (about 1 football field) of major roads, but studies show effects up to 300 meters from major roads. Pollutant levels depend mainly upon traffic volume, and to a lesser extent, traffic jam percentage (Carr et al. 2002). In addition, levels of air pollution inside the cabin of a car are often 2-4 times greater than levels outside the car – especially in slow-moving traffic (SCAQMD 1989; Weinhold 2001). A brief summary of recent health effects literature is given below.

- Compared with children exposed to background levels of air pollution, children living near major roads had higher rates of asthma (Guo et al. 1999; Ising et al. 2003; Nicolai et al. 2003; Studnicka et al. 1997; Wong and Lai 2004; Zmirou et al. 2004), hospital admissions for asthma (Buckeridge et al. 2002; Lin et al. 2002), respiratory symptoms, including cough & wheeze (Brauer et al. 2002; Gehring et al. 2002; Janssen et al. 2003; Nicolai et al. 2003; Studnicka et al. 1997; Venn et al. 2001), reduced lung function (Brunekreef et al. 1997), and respiratory infections (Brauer et al. 2002; Buckeridge et al. 2002).
- Infants exposed to high levels of traffic exhaust had a greater risk of developing asthma during childhood (Zmirou et al. 2004).
- Mothers who lived close to heavy-traffic roadways during pregnancy were 10-20% more likely to have a preterm or low birth weight baby (Wilhelm and Ritz 2003).
- Dying from cardiopulmonary (heart and lung) disease was nearly two times more likely if an adult lived within 100 meters of a freeway or 50 meters of a major urban road (Hoek et al. 2002).
- Living near main roads was found to be associated with greater risk of dying from stroke (Maheswaran and Elliott 2003).
- Bus drivers in Denmark were found to be at increased risk of a number of cancers, including lung, larynx, kidney, bladder, skin, pharynx, rectum, and liver cancers (Soll-Johanning et al. 1998).
- Average traffic-related nitrogen dioxide exposure over 30 years was associated with a 20 percent increase in risk for lung cancer for people with the highest exposure (Nafstad et al. 2003; Nyberg et al. 2000).
- Elevated risk for persistent wheezing and chronic phlegm production was found among adults living within 50 meters of heavily trafficked roads in Massachusetts (Garshick et al. 2003).
- Rising obesity levels and impaired mental health with reduced social interactions are associated with car-dependent mobility and development patterns (Bell et al. 2002; Frumkin 2002; Giles-Corti et al. 2003).
- Noise, including the intermittent noise produced by road traffic during the night, can cause noise-induced sleep disturbances which affect sleep quality as well as mood and performance (Griefahn and Spreng 2004).

## References

- Bell AC, Ge K, Popkin BM. 2002. The road to obesity or the path to prevention: motorized transportation and obesity in China. *Obes Res* 10(4):277-283.
- Brauer M, Hoek G, Van Vliet P, Meliefste K, Fischer PH, Wijga A, et al. 2002. Air pollution from traffic and the development of respiratory infections and asthmatic and allergic symptoms in children. *Am J Respir Crit Care Med* 166(8):1092-1098.
- Brunekreef B, Janssen NA, de Hartog J, Harssema H, Knape M, van Vliet P. 1997. Air pollution from truck traffic and lung function in children living near motorways. *Epidemiology* 8(3):298-303.
- Buckeridge DL, Glazier R, Harvey BJ, Escobar M, Amrhein C, Frank J. 2002. Effect of motor vehicle emissions on respiratory health in an urban area. *Environ Health Perspect* 110(3):293-300.
- Carr D, von Ehrenstein O, Weiland S, Wagner C, Wellie O, Nicolai T, et al. 2002. Modeling annual benzene, toluene, NO<sub>2</sub>, and soot concentrations on the basis of road traffic characteristics. *Environ Res* 90(2):111-118.
- Frumkin H. 2002. Urban sprawl and public health. *Public Health Rep* 117(3):201-217.
- Garshick E, Laden F, Hart JE, Caron A. 2003. Residence near a major road and respiratory symptoms in U.S. Veterans. *Epidemiology* 14(6):728-736.
- Gehring U, Cyrus J, Sedlmeir G, Brunekreef B, Bellander T, Fischer P, et al. 2002. Traffic-related air pollution and respiratory health during the first 2 yrs of life. *Eur Respir J* 19(4):690-698.
- Giles-Corti B, Macintyre S, Clarkson JP, Pikora T, Donovan RJ. 2003. Environmental and lifestyle factors associated with overweight and obesity in Perth, Australia. *Am J Health Promot* 18(1):93-102.
- Griefahn B, Spreng M. 2004. Disturbed sleep patterns and limitation of noise. *Noise Health* 6(22):27-33.
- Guo YL, Lin YC, Sung FC, Huang SL, Ko YC, Lai JS, et al. 1999. Climate, traffic-related air pollutants, and asthma prevalence in middle-school children in Taiwan. *Environ Health Perspect* 107(12):1001-1006.
- Hoek G, Brunekreef B, Goldbohm S, Fischer P, van den Brandt PA. 2002. Association between mortality and indicators of traffic-related air pollution in the Netherlands: A cohort study. *Lancet* 360(9341):1203-1209.
- Ising H, Lange-Asschenfeldt H, Lieber GF, Weinhold H, Eilts M. 2003. Respiratory and dermatological diseases in children with long-term exposure to road traffic emissions. *Noise Health* 5(19):41-50.
- Janssen NA, Brunekreef B, van Vliet P, Aarts F, Meliefste K, Harssema H, et al. 2003. The relationship between air pollution from heavy traffic and allergic sensitization, bronchial hyperresponsiveness, and respiratory symptoms in Dutch schoolchildren. *Environ Health Perspect* 111(12):1512-1518.
- Lin M, Chen Y, Burnett RT, Villeneuve PJ, Krewski D. 2002. The influence of ambient coarse particulate matter on asthma hospitalization in children: Case-crossover and time-series analyses. *Environ Health Perspect* 110(6):575-581.
- Maheswaran R, Elliott P. 2003. Stroke mortality associated with living near main roads in England and Wales: A geographical study. *Stroke* 34(12):2776-2780.
- Nafstad P, Haheim LL, Oftedal B, Gram F, Holme I, Hjermann I, et al. 2003. Lung cancer and air pollution: a 27 year follow up of 16 209 Norwegian men. *Thorax* 58(12):1071-1076.
- Nicolai T, Carr D, Weiland SK, Duhme H, von Ehrenstein O, Wagner C, et al. 2003. Urban traffic and pollutant exposure related to respiratory outcomes and atopy in a large sample of children. *Eur Respir J* 21(6):956-963.
- Nyberg F, Gustavsson P, Jarup L, Bellander T, Berglund N, Jakobsson R, et al. 2000. Urban air pollution and lung cancer in Stockholm. *Epidemiology* 11(5):487-495.
- SCAQMD. 1989. In-vehicle Air Toxics Characterization Study in the South Coast Air Basin: South Coast Air Quality Management District.
- Soll-Johanning H, Bach E, Olsen JH, Tuchsien F. 1998. Cancer incidence in urban bus drivers and tramway employees: A retrospective cohort study. *Occup Environ Med* 55(9):594-598.
- Studnicka M, Hackl E, Pischinger J, Fangmeyer C, Haschke N, Kuhr J, et al. 1997. Traffic-related NO<sub>2</sub> and the prevalence of asthma and respiratory symptoms in seven year olds. *Eur Respir J* 10(10):2275-2278.
- Venn AJ, Lewis SA, Cooper M, Hubbard R, Britton J. 2001. Living near a main road and the risk of wheezing illness in children. *Am J Respir Crit Care Med* 164(12):2177-2180.
- Weinhold B. 2001. Don't breathe and drive? Pollutants lurk inside vehicles. *Environ Health Perspect* 109(9):A422-427.
- Wilhelm M, Ritz B. 2003. Residential proximity to traffic and adverse birth outcomes in Los Angeles county, California, 1994-1996. *Environ Health Perspect* 111(2):207-216.
- Wong GW, Lai CK. 2004. Outdoor air pollution and asthma. *Curr Opin Pulm Med* 10(1):62-66.
- Zmirou D, Gauvin S, Pin I, Momas I, Sahraoui F, Just J, et al. 2004. Traffic related air pollution and incidence of childhood asthma: Results of the Vesta case-control study. *J Epidemiol Community Health* 58(1):18-23.