

# Air Pollutants as a Cause of Middle Ear Infections

Institute of Epidemiology

A study published by GSF epidemiologists together with Dutch colleagues identifies for the first time an association between the occurrence of middle ear infection or inflammation (otitis media) in children and traffic related air pollutants.

It has been known for a long time, that environmental factors such as exposure to environmental tobacco smoke play a role in the development of middle ear infections in infants and young children. In two prospective studies, data from 4150 Dutch children and 670 Munich children were collected from the time of pregnancy onwards starting in 1997-1999. The individual burden of traffic-related ambient air pollutants resulting from each child's local environment was modelled on the basis of spatial

measurements of ambient air pollutants, including fine particles and nitrogen dioxide, and data of the Geographic Information System (GIS) such as distance to major roads, traffic volume and population density. Information about the occurrence of middle ear infections in the first two years of life was collected by questioning parents. Possible risk factors like socio-economic status of the parents, parental allergies, and exposure to environmental tobacco smoke were taken into account. Both the Dutch and the German study group showed a clear correlation between the occurrence of disease and the exposure to the traffic-related air pollutants: fine particles and nitrogen dioxide. The scientists suspect that the same mechanisms of action are responsible for the association



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between air pollutants and otitis media as are assumed for passive smoking and otitis media.

In view of the fact that traffic-related air pollutants are a constant source of exposure, and that middle ear infections are among the most common acute infections in infants and have a variety of late effects on health, these results have far-reaching implications for the risk assessment of exposure to fine particles.

## Literature:

- Brauer, M. et al.: Environ. Health Persp. 114, 1414-1418 (2006)

**Life time prevalence:** 75% in children below 3 years; most common infections in childhood and a common reason for a doctor consultation; main reason for antibiotic course in early childhood; increasing trend of incidence

**Complications:** Hearing loss, language development, and life quality are limited.

**Risk factors:** Exposure to environmental tobacco smoke, ambient air pollutants as risk factors are rarely investigated yet.

Bacterial (60%) or viral (40%) infections of the middle ear, inflammatory swelling of the mucosa, infection route via nose and throat area.

