Analysis of Repeated Cross-Sectional Surveys, of Pre-school Respiratory Symptoms and Traffic-Related Air Pollution

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Introduction

Traffic-related air pollution is associated with respiratory morbidity in school age children. However, there is very little information on the effects of this pollution on younger children, the age at which problems start and whether problems in early childhood persist in later life.

Aim

To determine if estimates of PM_{10} exposure at the home address are associated with respiratory symptoms in young children and whether this association changes as the children get older.

Method

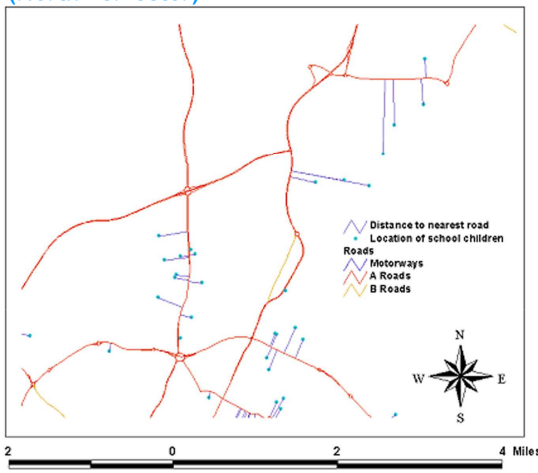
A prospective cohort of 4400 one to five year olds living in Leicester in 1998.

Parents were sent questionnaires in 1998 (children aged one to five), 2001 (children aged four to eight) and again in 2003 (children aged six to ten).

The questionnaire asked about respiratory symptoms (wheeze, cough etc.) and relevant confounders.

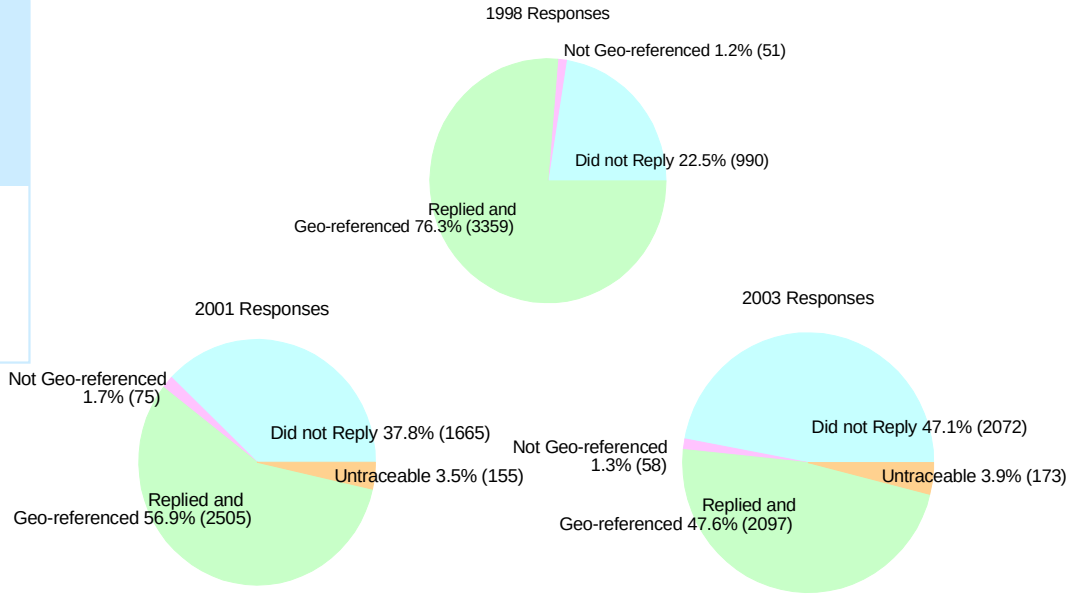
The distance from each child's full home address to a major road (DHR) was calculated using the Ordnance Survey Address-point software. (Figure 1)

Figure 1: Distance to nearest main road (North Leicester)



Results

- In all three studies cough without a cold has a significant positive association with DHR.
- Nasal symptoms were also associated with DHR in all surveys.
- While Cough at night is associated with DHR in all surveys this association is only significant in 2001.
- Wheeze is also associated with DHR in all surveys, this is only significant in 2001 but the confidence limits for the O.R.s are non-overlapping for wheeze.



Association between distance to a major road (per 100m) and chronic respiratory symptoms during the past 12 months – Tables 1 and 2

Table 1	Odds ratio (95% CI)		
Symptoms Children Aged:	**1998 (N=3410)** 1-5 yrs	**2001 (N=2580)** 4-8 years	**2003 (N=2153)** 6-10 yrs
Cough without cold	**1.032 (1.013, 1.052)**	**1.029 (1.009, 1.049)**	**1.029 (1.007, 1.050)**
Cough at Night[1]	**1.018 (1.001, 1.035)**	**1.018 (1.000, 1.036)**	1.017 (0.997, 1.037)
Nasal symptoms[1]	**1.018 (1.002, 1.035)**	**1.027 (1.009, 1.044)**	**1.037 (1.017, 1.057)**
Wheeze[1]	1.005 (0.988, 1.023)	1.023 (0.999, 1.048)	1.008 (0.983,1.034)

[1] Questionnaire asked for symptoms in the last 12 months

Table 2	Adjusted odds ratio (95% CI)		
Symptoms Children Aged:	**1998 (N=3410)** 1-5 yrs	**2001 (N=2580)** 4-8 years	**2003 (N=2153)** 6-10 yrs
Cough without cold[2]	**1.022(1.041,1.002)**	**1.033(1.010, 1.057)**	**1.032(1.007, 1.057)**
Cough at Night[1,2]	1.012(0.995,1.029)	**1.022(1.002,1.043)**	1.016(0.994, 1.039)
Nasal symptoms[1,2]	1.015(0.998,1.031)	**1.033(1.013, 1.053)**	**1.046(1.022, 1.070)**
Wheeze[1,2]	1.005(0.987,1.022)	**1.045(1.015, 1.077)**	1.016(0.988, 1.047)

[1] Questionnaire asked for symptoms in the last 12 months
[2] Adjusted for age, sex, mothers asthma, coal heating, smoking in the home and parents education

Discussion

- Cough without a cold has a consistent significant association with DHR, the relationship between DHR and the other symptoms is less clear.
- The strongest relationships were in 2001 suggesting this could be the most sensitive age-group.

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