10197 - DOES EXPOSURE TO POLLUTION VARY BY SOCIAL CLASS ? - RESULTS OF A PRELIMINARY ANALYSIS

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Objectives

Most point source analyses of the health effects of airborne pollution adjust for socio-economic position where feasible, because there is overwhelming evidence of a relationship between health and socio-economic position and this might confound the relationship between pollution exposure and health status. However, if less advantaged people's health is worse, in part as a direct consequence of pollution exposure, then adjustment for socio-economic position might attenuate the real relationship between exposure and health. This study aims to test whether exposure to pollution varies by socio-economic position.

Methods

In 1994 a population health survey was conducted amongst adults living in the West Glamorgan area of south Wales, UK. The study contained demographic and health status measures, including the social class scale widely used in the UK. The sample size was 1,358 and the response rate 81%. In part of the area a widespread study of NO_2 exposure using diffusion tubes has been carried out and NO_2 isopleths plotted on a Geographical Information System. Postcode centroids were used to provide an estimated grid reference for respondents in the survey. We overlayed the NO_2 map with the positions of the 171 respondents in the survey who lived within 2500m of an air quality management area. Forty diffusion tubes were used across the area. In addition, the direct linear distance between the location of a respondent and the nearest A or B class road was measured. Respondents were grouped into three social groups, group 1 containing those from social classes 1 and 2, 2 from social classes 3M and 3NM, and 3 from social classes 4 and 5. Statistical analysis included non-parametric analysis of variance and ranked correlation. Mean values are quoted to aid interpretation.

Results

There were 34, 85, and 52 people in the three social groups. NO_2 levels varied from 24-54 $\mu g/m^3$ and distances from roads from 10-1200m. Mean NO_2 levels in the three groups were 48.23, 44.7, and 46.5 $\mu g/m^3$ respectively (p=0.34). Mean distances to a road were 256, 398, and 356 metres respectively (p=0.02). Limiting the analysis to those less than 300 metres from roads yielded a modest correlation coefficient between ranked NO_2 and distance from roads (rho=-0.24,p=0.01).

Conclusions

In this pilot study socio-economic position was not associated with differential exposure to pollution. We plan to extend the study to include a much larger sample and to use grid reference of address rather than postcode centroid to refine the geo-location of the sample and reduce measurement error. Distance to regulated industries will also be included. Further work is required to define socio-economic variation in pollution exposure and its application to other areas.

10872 - Proximity of California public schools to busy roads

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Residential proximity to busy roadways has been associated with adverse health outcomes. Since children spend so much of their time at school, school location may be an important determinant of exposure to traffic-related pollutants. There are over 8,000 public schools in California, but to date no one has assessed the spatial distribution of schools in relation to busy roads and freeways. The goal of this study was to examine the number and demographic profile of public schools in California by proximity to major roadways. We obtained statewide information on public schools from the California Department of Education 2000 database and selected all active public schools grades K – 12, excluding alternative and special education. Using a Geographic Information System (GIS) we were able to geocode 7,460 of 7,515 eligible schools based on school address. We determined distances to nearby roads and average annual daily traffic counts using a statewide road network from the California Department of Transportation and a GIS. The Department of Transportation does not collect traffic flow data on minor residential and rural streets. For each school, we calculated exposure to nearby traffic as the maximum daily traffic count for all road segments with traffic flow data within 150 meters of the school. High exposure to nearby traffic was defined as 50,000 or more vehicles per day on any road segment within 150 meters of the school; medium exposure was 25,000 to 49,999 vehicles; low exposure was less than 25,000 vehicles within 150 meters; and very low exposure was defined as all street segments with traffic flow data more than 150 meters from the school. Statewide, 173 schools (2.3%) with a total enrollment of 150,323 had high exposure to nearby traffic, 536 (7.2%) had medium exposure, 4484 (60.1%) had low exposure, and 2267 (30.4%) had very low exposure. The median percentage of children on CalWorks (aid for families and welfare-to-work program) increased steadily from 8.9% in schools with very low exposure to 15.5% in schools with high exposure. Similarly, the median percentage of children enrolled in free or reduced meal programs increased from 40.7% in the group with very low exposure to 60.5% in the highest exposure group. Race/ethnicity was also related to traffic exposure. The percentage of non-white students was highest at the schools near roads with the highest traffic counts (84%) and lowest in the schools with very low exposure (54.8%). The percentage of Hispanic children at the schools with high traffic exposure was twice as high as that at schools with very low exposure. In summary, a substantial number of children in California attend schools that are close to major roads with very high traffic counts, and a disproportionate number of those students are economically disadvantaged and minority. Future exposure monitoring and health studies should target children from those highly exposed schools.