models were fitted to small-area level data and aggregated to four age bands (0–14 years; 15–29 yrs; 30–49 years and 0–49 years) and by gender with the logarithm of the "at risk" population as an offset.

Results The study analysed 2566 cases of osteosarcoma and 1650 cases of Ewing sarcoma. After adjustment for age and gender there was a statistically significant negative association for the incidence of osteosarcoma with area-level Townsend deprivation score (RR for one unit increase in level of deprivation 0.975; 95% CI 0.963 to to 0.986). For Ewing sarcoma, after adjustment for age and gender, there was a statistically significant negative association for incidence with population density (RR for an increase of one person per hectare 0.981; 95% CI 0.972 to to 0.989) and also with non-car ownership (RR for an increase of one percent in non-car ownership 0.996; 95% CI 0.993 to to 1.000).

Conclusion Higher deprivation appears to have a protective effect on the incidence of osteosarcoma. Higher incidence of Ewing sarcoma was associated with living in less densely populated areas and greater levels of car ownership, both of which are characteristic of rural areas. This study contributes to the growing body of evidence linking risk of Ewing sarcoma to some aspect of agriculture and suggests further study of environmental exposures or land use may be informative.

004 FLUORIDE AND BONE CANCER: IS THERE A LINK? SMALL-AREA ANALYSES OF PRIMARY BONE CANCER IN 0–49-YEAR-OLDS IN GREAT BRITAIN, 1980–2005

doi:10.1136/jech.2010.120956.4

[1]K Blakey, [2]R G Feltbower, [2]R C Parslow, [1]P W James, [1]B Gómez Pozo, [3]C Stiller, [3]T J Vincent, [4]P Norman, [2]P A McKinney, [3]M F Murphy, [5]A W Craft, [1]R J Q McNally. *[1]Institute of Health and Society, Newcastle University, Newcastle-upon- Tyne, UK; [2]Paediatric Epidemiology Group, University of Leeds, Leeds, UK; [3]Childhood Cancer Research Group, Department of Paediatrics, University of Oxford, Oxford, UK; [4]School of Geography, University of Leeds, Leeds, UK; [5]Northern Institute of Cancer Research, Newcastle University, Newcastle-upon- Tyne, UK*

Objective To analyse the putative association between incidence of primary bone cancer diagnosed in 0–49 year olds in Great Britain (GB) in 1980–2005 and fluoride in drinking water. The analyses focussed on osteosarcoma and Ewing sarcoma.

Design The study accessed multiple data sources including population census, digital boundary, postcode directory and fluoride monitoring at water supply zone level data. Incidence data from all 10 regional cancer registries were accessed and analysed by census ward. Residential postcode was used as a proxy for population distribution and the basis for making all census data compatible with 2001 census geography. Postcode distributions were also used to link water supply zones to census wards for England and Wales and postcode sectors for Scotland and enabled a fluoride level to be assigned to each census small-area in GB.

Setting GB.

Participants Data from patients (0 to 49 years) diagnosed with a primary bone cancer between 1980 and 2005 and registered with one of the 10 regional cancer registries in GB.

Main outcome measure Negative binomial regression was used to examine the relationship between incidence rates and census small-area fluoride levels. These models were fitted to census small-area data aggregated into four age bands (0–14; 15–29; 30–49 and 0–49 years) and by gender with the logarithm of the "at risk" population as an offset.

Results There were a total of 2566 osteosarcoma cases aged 0–49 years; 817 aged 0–14 years; 1315 aged 15–29 years and 434 aged 30–49 years. For Ewing sarcoma there were a total of 1650 cases aged 0–49 years; 659 aged 0–14 years; 800 aged 15–29 years and 191 aged 30–49 years. After adjustment for age and gender, no statistically significant association was found between osteosarcoma or Ewing sarcoma and fluoride levels in drinking water. For example, for osteosarcoma the RR for 1 ppm increase in fluoride level 0.993; 95% CI 0.843 to to 1.171 and for Ewing sarcoma RR 0.860; 95% CI 0.696 to to 1.064.

Conclusion This is the first time the relationship between fluoride and bone cancer has been studied across the whole of GB at census ward level. No statistically significant associations between Ewing sarcoma or osteosarcoma and fluoride in drinking water were found.

Coronary heart disease

005 TRENDS IN CORONARY HEART DISEASE MORTALITY IN ENGLAND BY SOCIO-ECONOMIC CIRCUMSTANCES, 1982–2006

doi:10.1136/jech.2010.120956.5

[1]M Bajekal, [1]S Scholes, [2]M O'Flaherty, [1]R Raine, [3]P Norman, [2]S Capewell. *[1]University College London, London, UK; [2]University of Liverpool, Liverpool, UK; [3]University of Leeds, Leeds, UK*

Objective Understanding the scale of social inequalities in coronary heart disease (CHD) mortality and differential trends in these by age, gender and social position is crucial for assessing the impact on health inequalities of concomitant changes in risk factors, health-care, legislation and policy on health inequities.

Previous analyses of trends in Scotland suggest that falling CHD mortality rates may have recently begun to level in younger age-groups. Furthermore, the flattening of mortality rates was confined to the most socially deprived groups. Given the uncertainty attached to the estimates, the authors advised caution and suggested confirmatory research of these potentially important findings.

We therefore update previous analyses by examining socio-economic trends over a longer time-span, 1982–2006, and for England (to overcome the previous technical limitation of small counts).

Setting and methods Small areas (c.1500 people) in England were aggregated into equal quintiles by ascending scores on a composite index of multiple deprivation (with quintile 5 the most deprived group). CHD deaths and populations from 1981 to 2007 for each quintile group were used to calculate three-year moving averages of overall (age-standardised) and age-specific mortality rates for each social group, separately by gender for those aged 35 and over.

Trends by quintiles were analysed using joinpoint regression modelling to calculate annual percentage change estimates and to identify turning points in each series.

Results Social gradients in mortality were large and persistent. The rates of decline in age-standardised CHD mortality were socially patterned with the steepest fall in the most affluent quintile. Thus, while absolute inequalities narrowed over the period, relative inequalities increased slightly. For similar age and deprivation groups, rates fell faster for men than women. From 2000, mortality rates levelled off in the most affluent groups (q1 and q2) for women aged 45–54. For men aged 35–44, rates of fall were significantly lower in the most recent period compared to the early 1990s for all except q3, but are still either higher or at the same level as in the late 1980s.

Conclusions Comparisons across and within countries provide valuable insights into potential drivers of inequality for CHD—a leading cause of death in the UK, and worldwide. The differing results for England and Scotland are intriguing. These differences may be real or may reflect data artefact arising due to higher levels of selective health migration in deprived areas and uncertainties in accurately estimating the population structure.