Poster presentations

Higher mortality in deprived areas: community or personal disadvantage?*  
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The measurement of community deprivation and the corollary of defining areas as "deprived" is a contentious subject but one that seems to be popular. By default the term "deprived" usually refers to social deprivation associated with poverty and unemployment, jobs with low earning potential, poor housing, etc. Commonly the degree of deprivation will be measured by some composite index, and indices developed by Townsend and also by Carstairs have been widely used and shown to be associated with mortality differentials in several cross sectional studies.

The straightforward explanation for raised mortality in deprived areas is that poor people live there! But there is also a popular suspicion that the surroundings reinforce the trend; that a deprived environment compounds the problem. Obvious candidates here are a perception that deprived areas have higher levels of pollution and lower levels of cleanliness in public places; poorer public services; higher crime rates etc. Also that an atmosphere of despair may lead to a propensity for health damaging behaviour, or even suicide.

This research investigates the association between mortality and residence in a deprived area, net of personal socioeconomic factors. The study uses the OPCS longitudinal study (LS), which is a 1% sample of the population of England and Wales, initiated at the time of the 1971 census and continuously updated thereafter. A range of small area statistics are available on the dataset from which deprivation indices for ward of residence can be calculated.

We calculated a Townsend like index for ward of residence. Our index was based on: the proportion of the labour force unemployed; proportion of households with no car access; proportion of households not owner occupied and, the proportion of employed men and women in social class IV or V.

We have modelled the risk of death, by use of a logistic regression model of risk across two time periods between 1984 and 1990, controlled for age and broad geographic zone. Using deprivation index as an explanatory variable in the mortality model confirms a clear association with mortality for both sexes separately. On entering measures of personal disadvantage into the model the association of deprivation with mortality was completely outweighed for all men, and for women resident in wards of above average deprivation. Measures known to be crude but powerful indicators of income, housing tenure and car access, were alone sufficient to outweigh the "deprivation effect" in most cases, adic demonstrable effect of ward of residence.

The evidence does not therefore confirm any social "miasma" whereby the shorter life expectancy of disadvantaged people is reduced further if living in close proximity to other disadvantaged people. Deprivation appears to be adequately assessed by personal or household circumstances which are themselves associated with income.

Our study deals with mortality only. We do not say that, in certain settings of severe deprivation, there is no ecological effect. It is quite possible that certain morbidities, psychological stress etc., and the resultant workload on health services, could be compounded by an ecological effect existing in highly deprived areas. We can only say that mortality rates do not appear to be disproportionately high. We do conclude that the rather cursory identification of "deprived areas" by census variables and boundaries is certainly not precise enough to detect such an effect systematically.

This study uses specific census based indicators to define levels of deprivation. The indicators of deprivation used could be considered rather narrow by comparison with the popular concept of depressed inner city communities, with concomitant crime, traffic pollution etc. However, it is census based indicators, along the lines of the index used here, that are being used increasingly in the planning of policies and the allocation of resources. With this developing popularity of deprivation indices for targeting health and social policy, caution should be exercised so as not to read too much into them.

Deprivation indices may be gainfully used to identify areas of relative concentration of disadvantage, in the absence of personal level data, or where the fact of geographic concentration is pertinent – for example, assessment of estate housing, estimation of GP workload. But disadvantaged people also live elsewhere and could be excluded in large numbers if interventions were planned purely on the basis of a local, census based, deprivation score. To gain maximum effectiveness health policy needs to target people as well as places.

Socioeconomic conditions in the Po Delta prospective study on chronic obstructive pulmonary disease and the possible respiratory effects of low levels of air pollution

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Study objectives – To analyse socioeconomic conditions in a general population sample enrolled in the Po Delta (near Venice, Italy) study on coronary obstructive pulmonary disease (COPD) and air pollution.

Design – This was a prospective epidemiological study. Two surveys were performed – before (1980-82) and after (1988-91) when a large, oil burning thermoelectric plant started operating. Sampling was a multistage family cluster design, stratified by socioeconomic status (SES) and age. Subjects were subdivided into three SES strata (low, medium, high) on the basis of two indices from the census data – crowding and percentage of those in higher job positions.

Setting – Participants completed an interviewer administered CNR standardised questionnaire on respiratory symptoms and risk factors for COPD, and performed lung function tests.

Participants – Altogether 2136 subjects took part – 589 males, 1147 females (low: 19%; medium: 29%; high: 52%).

Results – In a previous paper we evaluated the reliability between SES based on sampling stratification and socioeconomic conditions derived from the individual questionnaire information collected in the first survey such as house characteristics, job, and education. In the second survey, socioeconomic conditions had improved –
for example the percentage of subjects without hearing in the house fell by 18% – but there were still significant differences in the SES sampling strata (15.8% in the low, 8.9% in the medium and 6.7% in the high). Prevalence of respiratory symptoms (which increased in the second in respect of the first survey) were higher in both male and female smokers in the low stratum compared with the high. Furthermore, they were associated with education level and job position, particularly when considering cough and phlegm in males. It is also noteworthy that in non-smokers the reported diagnosis of asthma was higher in the low SES group. Lung function decline, adjusted for age and smoking, was higher in the low stratum (according to sampling definition), but was not clearly related to the questionnaire’s socioeconomic variables.

Conclusions – Our results indicate a relationship between socioeconomic conditions and respiratory health. The exact meaning of this association needs to be further clarified: in particular, how the different SES indices interact and what kind of susceptibility to lung disease they represent. Statistical issues, related to changing socioeconomic conditions in prospective studies on environmental effects, must also be investigated.

Deprivation and mortality in Yorkshire: changes from 1981–91

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Study objective – The relationship between deprivation and mortality is well known. We examined this relationship in the Yorkshire Regional Health Authority for the years 1981–83 and 1990–92.

Design – This was an ecological study, based on electoral wards, using routine mortality statistics for 1981–83 and 1990–92. Deaths were allocated to wards using postcodes. Census data came from the 1981 and 1991 small areas statistics.

Setting – The Yorkshire Regional Health Authority, which is the counties of West Yorkshire, North Yorkshire and Humberside.

Measurements and main results – Three deprivation scores were calculated, those of Townsend, Carstairs, and Jarman. Their relationship to mortality was analysed using Poisson regression. Results were similar for each score. There was a significant fall in mortality between 1980–83 and 1990–92 (rate ratio = 0.80, 95% confidence interval (CI) = 0.68–0.95). Using the Townsend score the rate ratio for a change of 1SD in the deprivation score in 1981–83 was 1.076 (95% CI 1.005, 1.088), but by 1990–92 this had increased to 1.100 (95% CI 1.090, 1.110), suggesting a stronger effect of deprivation on mortality.

Conclusions – There is a strong relationship between deprivation and mortality. This relationship was stronger in 1990–92 than in 1981–83, suggesting that the gap between poorer and poorer areas, and by implication, richer and poorer people has widened further over the last decade. There is no evidence that the choice of an indicator of deprivation makes any difference to these conclusions. However, when ranks of deprivation are considered, as is the case when various government grants are dispensed, there can be considerable variation between the three scores.

Deprivation related differentials in mortality and hospital admission ratios

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Introduction – Many diseases are known to show a socioeconomic gradient in mortality and morbidity. A central aim of the NHS is to ensure that groups with the greatest health need receive the most health care and there is thus an interest in examining the utilisation of services by socioeconomic group. Routinely collected data on hospital admissions are readily available, although their quality is often questionable. There may be systematic differences between hospitals in disease coding and the data are episode-based and not person-based. Nevertheless, the near complete postcoding of admission data enables analysis at the small area level.

We have compared mortality and hospital admission ratios at ward level in the London district of Ealing, Hammersmith and Hounslow, which has a population of 650,000, areas of high deprivation, and substantial minority ethnic communities.

Methods – Standardised mortality ratios (SMR) for the three year period 1990–92 were calculated at ward level using England and Wales rates; standardised admission ratios (SAR) were computed using 1993/94 data and internally standardised using overall district rates. Deprivation indices (underprivileged area score and Carstairs index) were derived from the 1991 census. Comparisons at ward level were made between SMRs, SARs, and deprivation indices for ischaemic heart disease, lung cancer, and breast cancer.

Results – There was wide variation in ward level ratios for mortality and hospital admission. Hospital admissions showed greater variability than mortality. Ischaemic heart disease and all cause mortality showed strong and statistically significant positive correlations with deprivation; lung cancer and breast cancer showed only small socioeconomic gradients. SMRs for ischaemic heart disease and lung cancer showed a similar pattern to mortality, but SARs for breast cancer were much lower in the more deprived wards.

Conclusions – Despite their limitations, hospital admission data indicate socioeconomic differentials in utilisation of services. For ischaemic heart disease and lung cancer hospital admission ratios and SMRs have similar relationships with deprivation. The SARs for breast cancer were lower in more deprived areas, even though mortality ratios showed little socioeconomic gradient.

Cancer survival and deprivation in Scotland

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Study objective – To investigate the relationship between cancer survival and deprivation.


Design and methods – Postcode sector level deprivation scores were assigned to linked cancer registrations, hospital inpatient episodes, and mortality records for individual patients. Five deprivation categories were created ranging from the "least" to "most" deprived. Observed survival to 10 years after diagnosis was calculated for each deprivation category and compared by means of the log rank test statistic (LR). For a subset of cancers, selected coexisting conditions and mortality due to causes other than cancer were identified from the linked patient records.

Main results – Statistically significant differences in survival were observed between deprivation categories for a number of cancers including breast, cervix, large bowel, lung, ovary, and bladder. For breast cancer, survival at five years after diagnosis was 9% higher for women resident in the least compared with the most deprived areas (LR = 8.9, p < 0.001). A 7% survival advantage for patients with cervical cancer resident in the least deprived areas was evident at one year after diagnosis and persisted throughout the follow up period (LR = 24, 4df, p < 0.001).

Conclusions – A number of common cancers, higher survival was observed for patients resident in areas classified as least, compared with most, deprived. Several factors may influence these results including the prevalence of comorbidity, competing causes of death, patterns of referral to specialist oncology centres, availability of diagnostic tools, and treatment. Routinely collected health data are currently being used to investigate further the role and interplay of these factors in Scotland.
gradient of increasing incidence with deprivation for tumours of the stomach, larynx, and lung. Cancers of the breast, uterus, ovary, prostate, and testis were more common in the least deprived sections of the population. There was no evidence of consistent trends in the incidence of lymphatic and haematological tumours with deprivation.

Conclusions — Associations between incidence and deprivation were found for several cancers. These are likely to reflect different patterns of exposure to common carcinogens and differences in lifestyle across the social classes. Ecological analyses, where the characteristics of a geographical area are ascribed to all the resident population, have weaknesses. However, in the absence of accurate, individual based measures of deprivation or socioeconomic status, such small area classifications are valuable in describing, and explaining, patterns of cancer incidence in Scotland.

Whose deprivation?
ROY A CARR-HILL1, TREVOR A SHELDON1, COLIN THUNHURST. (Centre for Health Economics, University of York, Nuffield Institute for Health, University of Leeds) Since the Black report there has been a resurgence of interest in the relationship between social and material conditions and health status. An apparently “natural” consequence has been the development of indicators of deprivation, for use in resource allocation. While not disputing the value of examining correlations between a sociodemographic variable and health (or housing, etc), this paper questions their use without due thought in the formulation of social policy and the allocation of resources.

Part of the problem is cavalier use of out of date data and lack of consideration over the use of statistical date reduction procedures and this is illustrated: but the bulk of the paper is concerned with exploring the more fundamental ideological and political issues involved.

Thus, deprivation is obviously multidimensional; an index over simplifies reality. Arguments over deprivation and poverty are depoliticised by being taken away from the people affected. Documenting associations reifies “deprivation”; it does not further understanding.

We conclude by drawing a parallel between the deprivation fixation and the medical deficit model and by drawing up some guidelines for the appropriate use of sociodemographic data in these analyses. Researchers should use methods that are appropriate in the context, make their conceptualisations ideologically explicit, avoid composing, balance the qualitative and quantitative, and solicit participation. To preserve its “radical” edge, the “new public health” cannot simply adopt traditional methods of enquiry.