

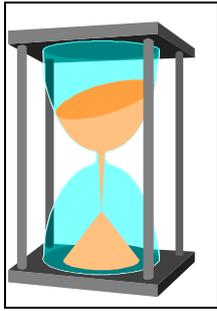


UPDATE - News from the LS User Group

Issue no. 14
June 1996

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This newsletter is designed to provide rapid dissemination of information on the ONS Longitudinal Study (LS) and a forum for the exchange of users' views and comments. It is produced by the LS User Support Programme at the Social Statistics Research Unit (SSRU) at City University. All comments and contributions for the newsletter should be sent to Rosemary Creaser, LS Support Programme, SSRU, City University, Northampton Square, London EC1V 0AR tel. 0171 477 8487 Email: rc@uk.ac.city.ssr.u. Contributions on IBM -formatted floppy disk are always welcome and should be sent, clearly documented (file name, wordprocessing package and version used) along with a hard copy of the text.



1 Diary

This section highlights forthcoming events of interest to LS Users.

If you are arranging an event and wish to publicise it in future issues of *Update* you should send details to Dina Maher, the LS Administrative Secretary at SSRU.

LS Workshop

SSRU hold regular 2-day workshops. These provide detailed information on the study and enable researchers to gain practical hands-on experience of accessing the data. They are also an ideal opportunity to meet members of the LS Support Team and to discuss the suitability of the LS for exploring specific research questions. The next LS Workshop will be held on 1st/2nd October. A programme and booking form are enclosed.

As part of the hands-on element of the workshop participants are able to specify a statistical analysis of their choice using a small sub-set of variables and a test data-set based on 1% of the LS data. The number of places is limited to ensure that participants get sufficient individual attention and hands-on experience. A non-refundable fee of £50 (or £20 for students) is charged to cover documentation, lunch, refreshments and administrative costs. Researchers who are planning to carry out analyses of LS data in the forthcoming year are advised to contact Dina Maher immediately on 0171 477 8486 to reserve a place. (EMAIL: dm@ssru.city.ac.uk)

One-day seminar on internal migration

On Thursday 3rd October SSRU will be holding a one-day seminar on internal migration in the Senate Suite, City University. The seminar will include an update on the migration data available in the LS. There will also be presentations on recent LS work exploring migration between metropolitan and non-metropolitan areas, the changing composition of rural populations and the relationship between migration and social or household change.

A non-refundable fee of £45 will be charged to cover administration, a buffet lunch, cheese and wine. A programme and booking form are enclosed. For further details please contact Dina Maher on 0171 477 8486.

LS User Group annual meeting on "Health Variations"

In February 1997 SSRU will be holding a meeting of the LS User Group at City University, the theme of which is "Health Variations". We hope to include presentations reflecting analyses of event data and the question on limiting long-term illness included in the 1991 Census. The programme for the meeting has not yet been finalised. If you are interested in presenting a paper based on recent LS work, please contact Rosemary Creeser at City University on 0171 477 8487 for further details.

2 *Update* readership survey, Rosemary Creeser

This article summarises the results of the readership survey we sent out with the last issue of *Update*. This exercise forms part of a review we are currently carrying out of the newsletters which are used to disseminate information on the LS. Readers were asked what they thought about the November 1995 issue of the newsletter and what they would like to see in future issues. We were also interested to learn whether

you may prefer to receive LS technical information in a different form - for example, by EMAIL or in an annual technical report.

Fifty-eight readers returned copies of the readership survey - a response rate of 19 per cent (58/314) . The two largest groups of those who responded were those working in the academic sector (65.5 per cent) and the health service (15.5 per cent). We also received a small number of responses from readers in central and local government and voluntary/professional associations. (In each of the three categories the proportions were under five per cent.)

The November 1995 issue of *Update*

Table 1 shows that each of the items in the November 1995 issue of *Update* had been read by more than half of those who took part in our survey. The items which attracted the largest readership were the diary section (67.2 per cent), the report on the one day LS conference on the enhancement of a complex dataset (65.5 per cent) and Catherine Hakim's article on "Opportunities and pitfalls of the 1981 Census labour market data".

General impressions

In general, those who took part in our survey were positive about the newsletter. (See table 2.) Between 60 and 80 per cent ranked a selection of newsletter items as "very interesting" or of "general interest" while from ten to twenty-five per cent indicated that they were only "slightly interesting". Those who found them of "no interest" whatsoever were definitely in the minority (between 0 and 9 per cent).

The writing style adopted by *Update*, the overall impression created by the newsletter, its appearance and readability all attracted favourable scores. Between 55 and 65 per cent of those surveyed ranked these particular attributes as "excellent" or "good". A slightly smaller proportion (26 to 40 per cent) rated them as "fair" while less than ten per cent gave the lowest ranking ('poor').

Responses to question four, in which participants were asked to indicate the phrase which best described the items in *Update* suggest that we have been successful in achieving the right balance. Over eighty per cent felt that the articles were "just right" - neither too long/short nor too technical/not technical enough. The quote below specifically mentions the relevance of the technical material included in the last issue of the newsletter.

"This is the first time that I have read *Update* properly and it is timely for me because I have just embarked on a two year project which will involve using SAS to manage, analyse and graph disease data. We are intending to utilise both SAS/GRAPH and SAS/GIS and to make use of 1981/1991 Census data so the technical articles in this issue were very relevant."

(University researcher)

Ideas and suggestions for future issues

In the second half of the survey respondents were asked what they would like to see in future issues of the newsletter and, in particular, how they would like to receive technical information on the LS.

The responses to question 5, summarised in table 3, show that more than forty per cent of those surveyed would like to continue receiving technical information on the LS in *Update*. Just under a fifth would like to receive this type of information in an annual technical report or by EMAIL while 16 per cent indicated that

they would like it to be sent by means of a combination of two or three. Two such readers justified their answers with the following comments,

"[I would choose *Update*] if I was using the LS, EMAIL because is quick for updating things and an annual report because it provides a record for all users, especially new ones."

"Having a hard copy is very useful where my colleagues may not have EMAIL or World Wide Web (WWW) access."

(Researchers in an independent research institute)

Of the readers we surveyed approximately seventy per cent indicated that they would like to see more LS research articles and items on other longitudinal studies in future issues of *Update*. Thirty six per cent requested more technical items while less than a fifth indicated that they would like to see profiles of LS researchers. Just under seven per cent indicated that they would like other items included in the newsletter such as abstracts of LS publications.

Summary details on *Update* readers

The survey also included a small number of questions designed to provide us with more information on your reading preferences. The responses to these questions are summarised in table 4.

Over fifty per cent of those who took part in the survey read *Update* at work. The proportions who read it while they are at home or while they are commuting are substantially less (16 and 7 per cent respectively). Just over a fifth read it at a combination of the three locations.

The majority of those we surveyed indicated that, after they have read their copy of *Update*, they either keep it (81 per cent) or circulate it among their colleagues (16 per cent). Very few (3 per cent) throw it away. Our results suggest that less than half of the copies of *Update* are read by two or more persons. More than 60 per cent of *Update* readers also receive the general purpose LS Newsletter, produced jointly by ONS and SSRU.

Changes following the readership survey

Although we were encouraged to learn that so many readers had positive things to say about *Update* we are keen to respond to some of the helpful, constructive comments made by those who took part in the survey. For example, several of you felt that the design and layout of *Update* needed improving. Unless you are a first time reader, you will have noticed we have made a number of changes, which improve the readability of the newsletter.

We will also endeavor to include the sorts of articles you mentioned that you would most like to see - such as those summarising recent LS research and items on other complimentary longitudinal data sources. For example, this issue reports preliminary findings from one of the LS research teams funded under the ESRC's 1991 Census Programme. (See section 5.) In addition, you can help by suggesting articles for future issues of the newsletter. Within limits, we are open to your suggestions.

Finally, until significantly more of our readers have access to EMAIL and the World Wide Web (WWW) we have decided to continue distributing *Update*, including the technical articles which form part of it, in its current (paper) form. However, readers who do have WWW access may download issues 8 to 14 of the

newsletter via anonymous FTP (File Transfer Protocol). We include step-by-step instructions on how you may do this on pages 13 to 15.

Table 1: Responses to questions on the November 1995 issue of <i>Update</i>			
Q1: Which items did you read ?	Yes	No	
	%	%	N
Diary	67.2	17.2	49
Report on 1-day LS conference	65.5	15.5	47
Opportunities and pitfalls of the 1981 Census labour market data	60.3	22.4	48
The LS and Travel-to-work-areas	56.9	22.4	46
Technical issues	53.4	29.3	48
Funding for the LS Support Programme	50.0	29.3	46

Table 2: General impressions on <i>Update</i>					
Q2: Ranking of selected items	Very interesting	General interest	Slightly interesting	No interest	
	%	%	%	%	N
Research articles	56.9	24.1	10.3	3.4	55
Technical issues	31.0	29.3	25.9	6.9	54
Reports	27.6	51.7	12.1	--	53
Diary	24.1	41.4	19.0	8.6	54
Q3: Ranking of <i>Update</i> on the following attributes	Excellent	Good	Fair	Poor	
	%	%	%	%	N
Overall impression	20.7	41.4	32.8	3.4	57
Writing style	15.5	41.4	36.2	5.2	57
Appearance	15.5	48.3	25.9	8.6	57
Readability	12.1	43.1	39.7	3.4	57

Q4: Indicate the phrases which best describe the items in <i>Update</i>	Just right	Too long	Too short	
	%	%	%	N
	82.8	5.2	5.2	54
	Just right	Too technical	Not technical enough	
	%	%	%	N
	81.0	5.2	3.4	52

Table 3: Ideas and suggestions for future issues of <i>Update</i>					
Q5: How would you like to receive LS technical information ?	Update	Annual technical report	Email	A combination of two/three	
	%	%	%	%	N
	41.4	19.0	17.2	15.5	54
Q10: What would you like to see in <i>Update</i> ?	Yes	No			
	%	%	N		
More LS research articles	72.4	10.3	48		
Items on other longitudinal studies	69.0	8.6	45		
More technical items	36.2	25.9	36		
Researcher profiles	17.2	43.1	35		
Other	6.9	---	4		

Table 4: Summary details on <i>Update</i> readers					
Q6: Where do you read <i>Update</i> ?	At work	Home	Commuting	Combination of all three	
	%	%	%	%	N
	53.4	15.5	6.9	20.6	56
Q7: What do you do with <i>Update</i> after you have read it ?	Keep it	Circulate it	Bin it	N	

	81.0	15.5	3.4	58
Q8: In addition to you, how many people generally read your copy of <i>Update</i> ?	None	One	Two or more	N
	56.9	27.6	15.5	58
Q9: Do you also receive the general purpose LS newsletter ?	Yes	No		
	%	%	N	
	63.8	31.0	55	

3 Technical issues

3.1 The 1991 ward cluster classification

The new ONS ward cluster classification for 1991 (CLUSTW9) has now been added to the LS database and is available for analysis. The classification was derived from a sub-set of the 1991 Census Small Area Statistics data which were analysed using a cluster technique. This produced 43 clusters which may be aggregated to form 14 groups (see table 5). The items used in this analysis are indicated in table 6.

The 1991 clusters are different from those produced in 1981. Not only are they based on a different set of variables, but the country itself has changed, necessitating a different set of clusters to describe it. Further information on the derivation of CLUSTW9 may be found in Wallace M, Charlton J and Denham C (1995) "The new OPCS area classifications", *Population Trends*, 79, pp 15-30.

Table 5 : The composition of the 1991 Ward Cluster Classification

Group 1	Suburbia
16 Leafier Suburbs	639,512
1 Classic Commuters	3,781,937
Group 2	Rural Areas
2 Agricultural Heartland	456,955
41 More Accessible Rural	838,049
12 Remoter Coastal & Rural	435,684
Group 3	Rural Areas with Mixed Economies
5 Most Agricultural	1,149,619
17 Industrial Margins	1,249,665
36 Edge of Town	1,762,942
Group 4	Industrial & Manufacturing Towns
34 Small, Expanding Towns	1,129,548
15 Mostly Scottish - Pub Sec Housing	1,165,040
37 Coalfields	1,237,100
6 "Better Off"	1,731,187
4 Traditional Manufacturing	1,412,302
Group 5	Middling England
7 Small or Rural Scottish Deprived	1,135,303
20 Poorer Wards in Nice Areas	1,779,949
43 Expanding Towns	1,238,472
11 Blue Collar Manufacturing /Wmids	1,956,709
40 Welsh Coalfields	1,429,383

Table 5 : The composition of the 1991 Ward Cluster Classification (continued)

Group 6	Prosperous Wards	
8 Maturer Populations		1,007,830
39 Prosperous English Villages		1,078,745
30 Concentrations of Prosperity		894,192
Group 7	Purpose Built, Inner City Estates	
9 Mainly Scotland		769,623
24 Mainly London		964,322
Group 8	Established Owner-Occupiers	
28 More Metro Mature		4,310,678
13 Country Fringes		2,392,350
Group 9	Armed Forces Bases	
14 Armed Forces Bases		412,343
Group 10	Metropolitan Professionals	
18 Qualified Professionals		1,562,361
26 Young Singles		530,403
Group 11	Deprived City Areas	
10 Innerish London		913,232
25 Outerish London		1,129,009
Group 12	Lower Status Owner Occupiers	
38 Declining Resorts		754,899
32 Non-Metropolitan Industrial England		1,289,017
29 Smaller Industrial Towns		1,236,899
27 Textile Towns Terraces		459,113
21 Miners Terraces		328,598
Group 13	Mature Populations	
22 Remoter Retirement Areas		889,885
35 More Struggling Pensioners		866,859
3 Better Off Pensioners		1,577,303
42 Very Elderly in Coastal Towns		704,030
Group 14	Deprived Industrial Areas	
33 Heavy Industry		1,119,431
23 Merseyside and Similar		1,197,434
31 Textile Cities Inner Areas		629,382

Note: This classification is also available at DHA and county district levels.

Table 6: Variables used in the production of the Ward Cluster Code

Percentage of Residents who are:

- Aged 0-4
- Aged 5-14
- Aged 25-44
- Aged 45-64
- Aged over 65
- Identified as Black
- Identified as Asian

- Number of People per household

Percentage of households which consist of:

- young single persons
- 4+ children

Percentage of people in households which are:

- owner occupiers
- renting from their local authority
- renting privately
- without central heating

Percentage of dwellings which are:

- terraced
- purpose built flats

- Dwellings with 7+ rooms (%)

- Number of rooms per person

Percentage of residents who:

- moved in the last year
- have an Higher Educational qualification
- are in Social class 1 or 2
- are in Social class IIN
- are in Social class 4 or 5

Percentage of households which have:

- 2 earners and no children
- 2+ cars

- Dependents with a lone carer (%)

- Children with single adult (%)

- People in households without a car (%)

- Proportion of people in employment who go to work on public transport

- Limiting long term illness standardised rate

- Percentage of women working

Table 6: Variables used in the production of the Ward Cluster Code (continued)

- The Unemployment Rate
- Percentage of Residents who are Students

Proportion of people in employment who are:

- in agriculture
- in mining
- in manufacturing
- in finance and services

3.2 The LS World Wide Web page

SSRU now have a World Wide Web (WWW) site which includes details of the ONS Longitudinal Study, the 1958 and 1970 birth cohort studies and the MSc in Social Research Methods. The SSRU page may be accessed by pointing your "web browsers" (the software used to navigate the World Wide Web) at this address:

<http://ssru.city.ac.uk/>

Alternatively, to link up with the LS site choose:

<http://ssru.city.ac.uk/Ls/lshomepage.html>

The LS site provides summary information on the study, forthcoming events, a list of ongoing projects and publications based on the LS. To obtain further information on any of these just "click" on the relevant highlighted area eg [Introduction to the LS](#).

4 LS Publications

Economic activity and mortality of the 1981 Census cohort in the ONS Longitudinal Study

Ann Bethune¹, *Population Trends*, No. 83, Spring 1996

This article summarises the mortality (1981-89) of those of working ages at the 1981 Census by their economic activity, as recorded at census. This is an extension of previous analyses of deaths to men between 1981 and 1983² and includes women for the first time. The mortality of men in employment or seeking work in the 1980s is also compared with those in the 1970s.

Figure 2 shows that those in employment had the lowest mortality at working ages. Both men and women in every other category had higher than average mortality - a standardised mortality ratio (SMR) in excess of 100. A comparison of male deaths by ten year age groups showed that this persisted at every age.

Deaths among women under 60 were disaggregated into younger and older working ages (16-44 and 45-59 years respectively). In both groups employed women had the lowest mortality. There was also a 14 per cent mortality excess among those aged 45 to 59 who were looking after the home.

The difference in mortality between employed men and those seeking work, at both younger and older working ages, was consistent for the 1971 and 1981 Census cohorts. Employed men had lower SMRs than all men of the same age at each census, and unemployed men had higher SMRs.

At a time of high unemployment one would expect greater numbers of fit and healthy people to be out of work than at a time of low unemployment. Compared with all men in the 1971 cohort, the analysis showed excesses of mortality among those seeking work, of 76 and 27 per cent. (The age groups included those aged 15/16-44 and 45-64 years respectively.) The corresponding excesses for men seeking work in 1981 compared with all men in the 1981 cohort, were 53 and 23 per cent.

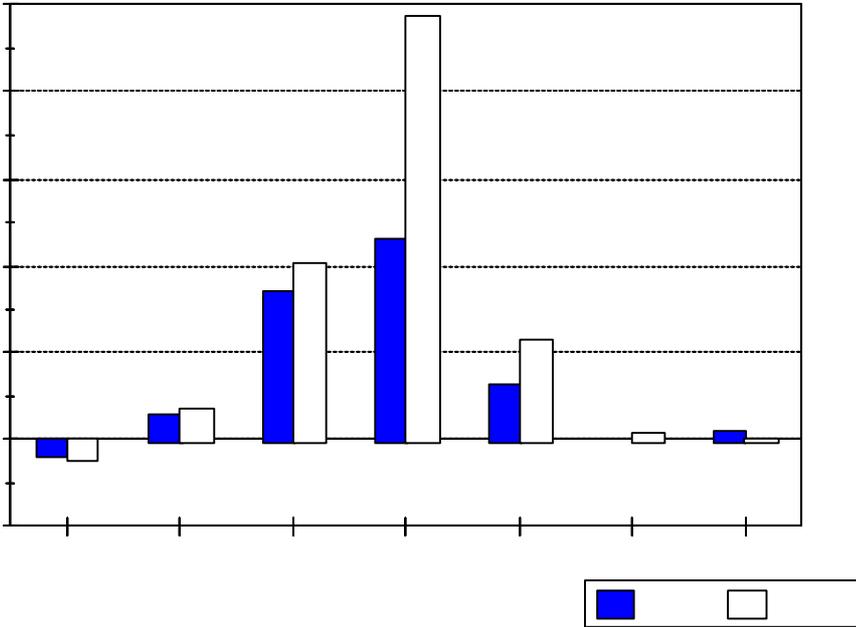
The same pattern for all cause mortality was found for each of the four main causes of death - all malignant neoplasms, circulatory diseases, respiratory diseases and injuries and poisonings. In both cohorts, compared to those of similar ages, employed men had lower mortality for every cause, while for those seeking work mortality was higher.

Unemployment is unevenly distributed among the social classes and largely concentrated in the less skilled groups. The proportions unemployed in each social class at the 1981 Census were virtually double those in 1971. There was a clear mortality gradient by social class, both for all men of working age and those seeking work. However, within each social class the SMRs were higher for unemployed men. The raised mortality of the unemployed was not therefore simply due to their social class background. When the SMRs were standardised to take account of the social class distribution of the unemployed this explained some, but not all, of the excess mortality.

¹ Ann Bethune is a Research Officer working on LS health related research at ONS, London.

² Moser K A, Goldblatt P O, Fox A J and Jones D R (1987) "Unemployment and mortality: comparison of the 1971 and 1981 Longitudinal Study census samples", *British Medical Journal*, Vol 294, pp 86-90

1. Employed
2. Seeking work
3. Temporarily sick
4. Permanently sick/disabled
5. Retired
6. Looking after home/family
7. Other inactive



5 LS research article

Investigating deprivation using the ONS Longitudinal Study

Andy Sloggett, Centre for Population Studies, London School of Hygiene and Tropical Medicine and Heather Joshi, SSRU, City University

Background

The project we have been working on, funded by the ESRC, is concerned with issues about socio-economic deprivation, its health consequences, and the role of indicators of deprivation in small geographical areas.

Areas of deprivation, as defined by the use of census variables, are often thought the best proxy for the location of poverty and associated health need. Furthermore, they are identifiable relatively cheaply on a nationwide basis, and therefore seem to be suitable for impartial allocation of resources. Indicators are used by both central and local government in various formulae including the Department of Health's RAWP calculation and Jarman's Underprivileged Area Scores (UPA). (The latter is used to allocate extra payments to GPs in deprived areas.) Classification of deprived areas has also been used in a variety of epidemiological studies (for example Eames et al 1993, and a recent Supplement to the *Journal of Epidemiology and Community Health*).

It is rare to have data on health differentials in which community and individual factors can be used in combination. Some of the data sources which allow this include the Health and Lifestyle Survey (Blaxter 1990, Duncan et al 1993, Humphreys and Carr-Hill, 1991) and, more recently, the 1991 SARs (Samples of Anonymised Records) (Gould and Jones, 1996, Shouls et al, 1996). However, neither of these have the combination of nationwide aggregate data to ward level and individual-level data that are found in the ONS Longitudinal Study (LS). The aim of our project was to explore the longitudinal dimension of the individual data in the LS, such that risk factors can be observed before the outcome, and in sequence themselves.

Our work started with a study of mortality between 1983 and 1989 as a function of an area deprivation score and individual characteristics in 1981 (Sloggett and Joshi, 1994). The latter proved to be more robust predictors of mortality than ward deprivation and the findings contributed to an ongoing debate about the relative importance of people and place - composition and context - in the spatial clustering of poverty and poor health. Our method focused on the individual level factors on which spatial aggregates are based and ecological correlations of measured variables. We do not deny that there are contextual effects but illustrate the difficulty in attributing them to indicators based on socio-economic data aggregated at a geographic level (ward).

Objectives

Does material deprivation, at least in the way it may be detected in the census, imply further disadvantage and diminished life chances? Do summaries of the social profile of small areas indicate places where life chances are particularly poor? Are there features of "deprived" communities exacerbating disadvantages and strengthening the case for targeting resources on places rather than persons? How far do the same people occupy deprived states and deprived localities over time? Are the adverse consequences of deprivation deepened for those who experience deprivation repeatedly?

To address these questions we adopted a parsimonious definition of area deprivation, a short list of personal or household circumstances, recorded for the whole electoral ward in which the LS member was living. "Deprivation" was defined using four census variables - low social class, unemployment, car access, and home ownership. Deprivation of a ward was assessed by a "Townsend/Carstairs like" index of the same four components but as aggregate measures from the Small Area Statistics which are available in

the LS for each of the three censuses (Townsend et al, 1989, Morris and Carstairs, 1991). A North/South indicator was also used, to distinguish those living in Northern England and Wales from those living in Southern England.

Initially, our strategy was to determine the relation between area and individual deprivation in 1981 and disadvantageous outcomes recorded in the LS. We started with mortality and moved on to other outcomes recorded in vital registration, such as low birthweight, stillbirth, teenage and unpartnered motherhood, and responses to the 1991 Census question on limiting long-term illness (LLTI), as well as the chance of recording one of the four individual-level deprivations.

Results: Mortality

Our earlier work on mortality (Sloggett and Joshi, 1994) asked whether an "area" effect of the sort documented in a study of Alameda County, California (Haan et al, 1987), could be deduced by a simple indicator constructed from nationally available census data when individual circumstances were also controlled. We did not deduce such an effect. The index of census variables seemed to be doing no more than reflecting social composition. The mortality of non-deprived male inhabitants of deprived areas appeared to be no worse than their social equals in other areas, while the effect for women was small and questionable.

However, this study confirmed the strength of individual level associations. For men, living in one of the worse fifth of wards was associated with a decrease in "expected life" of just under three years. When the differentials are calculated on an individual basis, the contrast in life expectation is even more striking. For example, a man living in owner-occupied housing with access to a car is expected to live nearly five years longer than one without either, irrespective of the area in which he is living.

We concluded that census based indicators should be used with caution in resource allocation. One consideration is that many vulnerable individuals live outside the areas where deprivation is concentrated. We calculated that 45% of deprived individuals (unemployed or low skilled, and a tenant with no car) were living in the "worst" wards (20% of the population). A simple indicator may not be sufficiently sensitive to local conditions to identify problem areas reliably. However, indicators of deprived social composition are still indicators of deprived social composition even if they are no more than that. They indicate where vulnerable people are concentrated, and this of itself is a *prima facie* source of health need.

Adverse Life Events

The objective here was to see if our findings for mortality applied to other types of "disadvantageous" outcome. These include, (for women) stillbirth, a low birthweight, teenage or sole registered birth, as well as self-reported limiting long-term illness (LLTI) for each sex. Associations with social deprivation were estimated before and after allowing for levels of personal deprivation, and the interactions between individual and area deprivation were tested.

A variety of adverse or "inauspicious" life events are associated with residence in a "deprived" area. Teenage and sole registered births show a particularly strong association along with the prevalence of limiting long-term illness. (Each of these shows a stronger association with living in 'deprived' area than we saw for mortality.) Without adjusting for personal circumstances all outcomes, except risk of stillbirth, show a clear, significant, and approximately linear association with social deprivation of ward of residence in 1981. Associations are much stronger for outcomes where a greater "social" component can be construed (teenage birth or sole registered births) than for outcomes which are probably more "biologically" determined (mortality, stillbirth, low birthweight). When adjustment is made for personal disadvantage the associations with local area deprivation are reduced, especially for those living in the more deprived areas. This broadly confirms the mortality findings. There are indications that individual

deprivation leads not only to the shortening of lives, but to the inter-generational transmission of social and economic disadvantage through early childbearing.

These associations appear to be largely because residence in “deprived” areas is associated with personal disadvantage, which is more damaging to these types of events than area of residence. In general, indicators of individual deprivation were not as successful in accounting for differences among less deprived wards. This suggests that a complete account of health inequalities needs information on affluence, (and urbanisation) as well as deprivation.

Indicators of deprivation in longitudinal perspective

We started by describing the experience, by individuals, of the four conditions used to identify deprived areas. Cross-tabulation revealed that the rate of reporting either unemployment or permanent sickness in the cohort aged 16-49 in 1971 was generally quite low over the three censuses between 1971 and 1991 - never as high as 10 per cent. In contrast, the proportion who were in social class 4 or 5, without access to a car, or living in rented accommodation, were each in excess of 13 per cent. (Those who were tenants in 1971 were, at 48 per cent, the largest group). Relatively few experienced multiple deprivation, the number with three or more deprived states at census were between 8 and 4 per cent of the total.

Looking at the cohort's experience of single and combined states across three censuses, a fair amount of turnover was observed. Those in a state at any one time were not consistently in the same state at all censuses, but the experience of the state at **any** census extends beyond those people identified by a cross section. Among those in the three most prevalent deprived states in 1971, approximately one third remained in the same state at both subsequent censuses, a third omitted to record the state at either subsequent census and a third experienced just one repeat. For those in deprived states in 1991, the chances of having been deprived on at least one of the previous censuses are generally higher (except again for unemployment).

Though there is some movement between these states, there is more than random correlation between them over time. Just as people move in and out of deprived areas, they move in and out of deprived states. The association between different deprivation indicators at the individual level is also significant, showing positive although quite low correlation. These individual level correlations are smaller than those reported (Green 1994) for more or less the same variables at the ward level. Here, then, we do find an ecological fallacy. Deprivation is more highly correlated at ward and local authority district level than it is with those of working ages studied here. Multiple deprivation in individuals will tend to be overstated by multiple deprivation in wards. We defined multiple deprivation as recording three out of four states at any one census. On the basis of this only 14 per cent of males and 11 per cent of females experienced multiple deprivation at any of the three censuses. A very small minority (1.3 and 0.5 per cent respectively) experienced this degree of multiple deprivation at all three censuses.

We took particular interest in self-reported limiting long-term illness in 1991. In age-adjusted models there is a positive association between the levels of illness reported in 1991 and the deprivation indicators (personal and areal) for the two previous censuses. This association is stronger for those indicators measured at the individual level and where the 1981 measures are used. Unemployment in 1981 is especially predictive and has the effect of doubling the odds of illness for both males and females, even after information about previous unemployment has been taken into account. Age effects increase the likelihood of poor health for those passing through their fifties and sixties in the 1980s. A change of address between 1971 and 1981 seems to be a particularly important factor in predicting LLTI among women.

Individuals who had changed addresses between 1971 and 1981 were investigated further. They were mostly under thirty at the start of the period, and had usually not experienced much change in area deprivation score. Moving home between 1971 and 1981 was associated with adverse outcomes in 1991

for older people. We think that this is largely because of its associations with other adverse circumstances. For younger people migration is more often an escape route from deprived areas and deprived circumstances.

We draw the conclusion that deprivation at local or personal level has long-term consequences, which is intensified if the deprived state is repeated. This may have an effect twenty years later even for those who experience improvements in their situation.

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References

- Blaxter M (1990) *Health and Lifestyles*, London: Tavistock/ Routledge
- Duncan C, Jones K and Moon G (1993) "Do places matter ? A multilevel analysis of regional variations in health-related behaviour in Britain", *Social Science and Medicine*, **37: 6**, pp 725-733
- Eames M, Ben-Shlomo Y, Marmot M (1993) "Social deprivation and premature mortality: regional comparison across England", *British Medical Journal*, **307**, pp 1097-1102
- Gould M and Jones K (forthcoming 1996) "Analysing perceived limiting long term illness using UK Census Microdata", *Social Science and Medicine* (in press)
- Green A (1994) *The Geography of Poverty and Wealth*, Institute of Employment Research, Coventry: University of Warwick
- Haan M, Kaplan G and Camacho T (1987) "Poverty and health: prospective evidence from the Alameda County study", *American Journal of Epidemiology*, **125**, pp 989-998
- Humphreys K, Carr-Hill R (1991) "Area Variations in Health Outcomes: Artefact or Ecology", *International Journal of Epidemiology*, **20**, pp 251-258
- Journal of Epidemiology and Community Health*, December 1995 Supplement, "Use of deprivation indices in small area health studies of environment and health"
- Morris R, Carstairs V (1991) "Which deprivation ? A comparison of selected deprivation indexes", *Journal of Public Health Medicine*, **13**, pp 318-326
- Shouls S, Congdon P, Curtis S and Green M (forthcoming 1996) "Modelling inequality in reported long-term illness in the UK: combining individual and area characteristics", *Journal of Epidemiology and Community Health* (in press)
- Sloggett A, Joshi H (1994) "Higher mortality in deprived areas: community or personal disadvantage ?", *British Medical Journal*, **309**, pp 1471-1474
- Townsend P, Phillimore P, Beattie A (1989) *Health and Deprivation*, London: Routledge

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