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Sociodemographic variables for general practices: use of census data

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Measures of the social, ethnic, and demographic characteristics of general practice populations are essential both for planning health services and for research. Such measures can be derived by combining census data for electoral wards with postcoded data from a family health services authority's age-sex register.¹ Because electoral wards have large populations (typically 5000-15 000 people), the patients registered with individual general practices will rarely be representative of a ward, and this will reduce the accuracy of census derived variables. Enumeration districts, however, have smaller populations (typically 200-600 people). We (a) derived estimates of age structure of practice populations based on enumeration districts and electoral wards and compared them with those obtained from the authority's age-sex registry and (b) compared the predictive power of variables derived from enumeration districts and electoral wards in explaining the variation in breast cancer screening rates among these practices.

Patients, methods, and results

The family health services authority provided a database containing the age, general practice, and postcode of all 601 330 patients living in Merton, Sutton, and Wandsworth and registered with 131 general practices. An enumeration district was assigned to each postcode by means of a table.² Of the 11 572 postcodes on the age-sex register, 166 could not be assigned to an enumeration district because they were not listed in the table. The 1149 patients living at these postcodes were excluded from the calculation of the census derived variables, as were the 1543 people

living in importing and special enumeration districts (importing enumeration districts contain census data on people living in other enumeration districts, and census data for most special enumeration districts are suppressed). When postcodes lay in only one enumeration district (81.7% (9460) of postcodes) the value of the relevant census variable for the enumeration district was taken as the value for the postcode. When postcodes lay in more than one enumeration district (16.8% (1946) of postcodes) a weighted average of census data for the enumeration districts was taken as the value for the postcode, with the weights being the number of households in each part postcode unit.² For each census variable we assigned a value to each patient based on their postcode. For each general practice we then calculated the average of these assigned values for the registered patients. Apart from the need to use the table, the method is similar to that described previously for electoral wards.¹

The correlations between the observed and expected age structure of the 131 practices were higher in each age group when enumeration district data were used to calculate the expected age variables (table); in all but one case the improvements were significant. The interquartile ranges of the differences between the observed and expected age structure of the practices were also smaller when enumeration district data were used to calculate the expected values (table).

To compare the predictive power of variables derived from enumeration districts and electoral wards we performed regression analysis of breast cancer screening rates on the eight Jarman variables and the census derived estimates of list inflation. Variables derived from enumeration districts gave a significantly

Agreement between age distribution in authority's age-sex register and distributions derived from census data for electoral wards and enumeration districts for 131 general practices in Merton, Sutton, and Wandsworth

Age group (years)	Absolute agreement†					
	Linear agreement*		Median difference		Size of interquartile range	
	Enumeration districts	Electoral wards	Enumeration districts	Electoral wards	Enumeration districts	Electoral wards
0-4	0.49	0.34‡	-0.9	-0.8	1.9	2.1
5-14	0.74	0.66‡	0.0	0.1	2.0	2.3
15-24	0.42	0.39	-1.9	-1.9	2.4	2.2
25-34	0.74	0.67‡	1.1	1.2	4.6	4.8
35-44	0.44	0.33‡	0.7	0.7	2.0	2.0
45-54	0.55	0.46‡	1.2	1.1	1.9	1.9
55-64	0.45	0.36‡	0.0	0.0	1.9	2.1
65-74	0.63	0.58‡	-0.1	-0.1	1.8	2.2
75-84	0.59	0.50‡	-0.3	-0.4	1.9	2.1
≥85	0.55	0.44‡	0.2	0.1	0.9	0.9

*Correlation coefficient.

†Observed percentage of practice patients minus expected percentage from census data.

‡Difference significant at P=0.05 by method of Hotelling.¹

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better fit than those from electoral wards ($P=0.002$ by the method of Royston and Thompson⁴), explaining 58% compared with 53% of the variation in screening rates between practices.

Comment

Census derived variables for general practices have many potential uses—for example, they could be used to set targets for cervical cancer screening according to the populations that practices serve. We have shown that postcoded data in family health services authority age-sex registers can be used with census data to produce such variables for general practices. Despite the inaccuracies associated with small area census data,⁵ variables derived from enumeration districts were more accurate than those derived from electoral wards in measuring the age structure of practice populations and explaining the variation in breast cancer screening rates. Census derived variables could also be produced for schools and hospitals, allowing

league tables comparing their performance to be adjusted for the social make up of their catchment populations.

We thank Dr David Martin, lecturer in geography at the University of Southampton, and Dr Patrick Royston, reader in medical statistics, Royal Postgraduate Medical School, for their help. We also thank the University of Manchester Computer Centre for providing access to census data and to the postcode enumeration district table, and the South West London breast screening service for permission to use its data.

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Nutrition guidelines

The following guidelines indicate how papers submitted to the *BMJ* should describe the methods by which the diet of a group of people was assessed.

Sample characteristics

As with any epidemiological study the sample and control population must be adequately described, and the reasons for believing them to be representative of the whole population. In nutritional surveys it is usually relevant to know the age, sex, weight, and height of the subjects, and the season of the year in which measurements were made, since all these factors may affect dietary intake.

Methods used in assessing the diet

(a) Questionnaire

If a questionnaire was used in assessing the diet a copy of the questionnaire must be submitted with the paper.

(b) Definition of assessment methods

Listed below are preferred terms for describing methods for assessing dietary intake and their precise meaning:

Diet recall: The respondent is asked to recall the actual food and drink consumed on specified days, usually the immediate past 24 hours (24 hour recall) but sometimes for longer periods.

Diet history: The respondent is questioned about "typical" or "usual" food intake in a one to two hour interview. The aim is to construct a typical seven days' eating pattern. The interview may discuss each meal and inter-meal period in turn or each day of the week in turn. Questions are usually openended, although a fully structured interview may be used. The diet history may be preceded by a 24 hour recall and/or supplemented with a check list of foods usually consumed.

Food frequency (and amount) questionnaire: The respondent is presented with a list of foods and is required to say how often each is eaten in broad terms such as x times per day/per week/per month, etc. Foods listed are usually chosen for the specific purposes of a study and may not assess total diet. The questionnaire may be administered by the interviewer or completed by the respondent. Assessment of the quantities of food consumed on each eating occasion/day may also be included.

Menu record: Record obtained without quantifying the portions. It may be subsequently analysed in terms of

frequencies of consumption, or the investigator may assign "average" weights to portions. Because the respondent does not indicate quantity, there can be no attempt to identify the true weight of individual portions.

Estimated record: A record with portions described in household measures (cups, spoons, etc) with or without the aid of diagrams or photographs. This method aims to estimate the actual quantity eaten.

Weighed record: Record with weights of portions as served and the plate waste. (Weighed records are rarely fully weighed; estimated portions are usual for food eaten away from home.)

(c) Assessment of food portion sizes

Average portions: Investigator assigns "average" portion weights derived from previous studies or experience. "Small," "medium," or "large" may also be used to indicate portion size in relation to the "average."

Household measures: Respondent describes portions in terms of household measures—for example, cups, spoons, etc. "Standard" weights are assigned to the descriptions.

Photographic measures: Respondent is shown photographs of portions of known weight and asked how their own portion relates to the pictured portions.

Food models/replicas: Respondent is shown three dimensional models representing foods and asked how their own portion relates to the models. Models may be realistic replica foods or a variety of neutral shapes and sizes.

Weighed: The subject weighs and records each food item as it is consumed.

(d) Food composition analysis

How/by whom were the records checked and coded for analysis?

Which database was used for analyses?

How were foods dealt with which were not on the database?

These guidelines were taken from a document prepared by the United Kingdom Nutritional Epidemiology Group. They are published in full in *British Journal of Nutrition* 1993;69(3):935-40 and *Metabolism* 1993;22:258-9. Further details may be obtained from Dr Michael Nelson, lecturer in nutrition, Department of Nutrition and Dietetics, King's College London, Campden Hill Road, London W8 7AH.