Accuracy of the family health services authority register in Newcastle upon Tyne, UK as a sampling frame for population studies

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Family health services authority (FHSA) registers (now incorporated within unitary authorities) include details of patients registered with general practitioners (GPs). A recent review concluded that they are a, "viable alternative sampling frame to the electoral rolls or a telephone listing" for epidemiological studies.¹ The studies in the review excluded subjects aged over 70 years, among whom mortality and migration rates are high. Inadequacies of population registers will have a number of implications, including compromised response rates to surveys using them as a sampling frame. We report the accuracy of the register specifically for middle aged and elderly subjects.

Methods

An age and sex stratified random sample of 2000 subjects was obtained from the Newcastle FHSA register in August 1993. Two hundred subjects were chosen for each 10 year age/sex group (45-54, 55-64, 65-74, 75-84, and 85 plus years) by random number generation. Relatively greater proportions of elderly subjects were sampled because there was relatively little previous data on FHSA accuracy in the elderly and to ensure adequate numbers for study and

analysis. Each general practice was sent a list of patients selected and was asked to notify us of deaths, changes of address, and other errors. Postal questionnaires asking about a history of stroke were sent to those not thus excluded, followed by two reminders. All changes of address made by recipients, questionnaires and reminders returned by the Post Office, and phone calls received concerning deaths or changes of address were recorded.

Results

The prior notification process identified 26 (1.3%) deaths and one duplicate entry (table 1). GPs asked for exclusion of nine others. Questionnaires were sent to 1964 subjects. From these, 16 deaths were reported, 72 people returned uncompleted questionnaires, and a further 68 were identified as "not at address". Information is not available about the accuracy of registered details for only 145 non-responders. Inaccuracies due to deaths and total errors were significantly more common among those aged 75 years and over than the younger subjects. Our sample was age and sex stratified with higher weighting to the older age groups. The overall rate of inaccuracy (age and sex

Table 1 Age and sex distribution of inaccuracies in the family health services authority register for a random sample of 2000 subjects aged 45 years and over

	Reported deceased by general practices No (%)	Address change made by general practices No (%)	Name/date of birth changes made by general practices No (%)	Questionnaire set No	Responders to questionnaire No	Deceased† No (%)	Not at registered address‡ No (%)	Total reported deceased No (%)	Total address changes No (%)	Total change made No (%)
Females										
45-54 (n=200)	0 (0.0)	11 (5.5)	2 (1.0)	200	176	0 (0.0)	2 (1.0)	0 (0.0)	13 (6.5)	15 (7.5)
55-64 (n=200)	2 (1.0)	6 (3.0)	5 (2.5)	197	179	2 (1.0)	2 (1.0)	4 (2.0)	8 (4.0)	17 (13.5)
65-74 (n=200)	1 (0.5)	21 (10.5)	2 (1.0)	199	172	1 (0.5)	3 (1.5)	2 (1.0)	24 (12.0)	28 (14.0)
75-84 (n=200)	2 (1.0)	16 (8.0)	3 (1.5)	197	173	0 (0.0)	5 (2.5)	2 (1.0)	21 (11.5)*	26 (13.0)*
85+ (n=200)	5 (2.5)	17 (8.5)	9 (4.5)	195	160	2 (1.0)	8 (4.0)	7 (3.5)	25 (12.5)*	41 (20.5)*
Total (n=1000)	10 (1.0)	71 (7.1)	21 (2.1)	988	860	5 (0.5)	20 (2.0)	15 (1.5)	91 (9.1)	127 (12.7)
Males										
45-54 (n=200)	0 (0.0)	12 (6.0)	3 (1.5)	200	148	1 (0.5)	20 (10.0)	1 (0.5)	32 (16.0)	36 (18.0)
55-64 (n=200)	2 (1.0)	15 (7.5)	5 (2.5)	198	173	0 (0.0)	9 (4.5)	2 (1.0)	24 (12.0)	31 (15.5)
65-74 (n=200)	2 (1.0)	13 (6.5)	5 (2.5)	198	167	4 (2.0)	10 (5.0)	6 (3.0)	23 (11.5)	34 (17.0)
75-84 (n=200)	4 (2.0)	15 (7.5)	5 (2.5)	195	160	2 (1.0)	7 (3.5)	6 (3.0)*	22 (11.0)	33 (16.5)
85+ (n=200)	8 (4.0)	17 (8.5)	2 (1.0)	185	145	4 (2.0)	13 (6.5)	12 (6.0)*	30 (15.0)	44 (22.0)
Total (n=1000)	16 (1.6)	72 (7.2)	20 (2.0)	976	803	11 (1.1)	59 (5.9)	27 (2.7)	131 (13.1)	178 (17.8)
Male and female										
45-54 (n=400)	0 (0.0)	23 (5.8)	5 (1.3)	400	324	1 (0.3)	22 (5.5)	1 (0.3)	45 (11.3)	51 (12.8)
55-64 (n=400)	4 (1.0)	21 (5.3)	10 (2.5)	395	352	2 (0.5)	11 (2.8)	6 (1.5)	32 (8.0)	48 (12.0)
65-74 (n=400)	3 (0.8)	34 (8.5)	7 (1.8)	397	339	5 (1.3)	13 (3.3)	8 (2.0)	47 (11.8)	62 (15.5)
75-84 (n=400)	6 (1.5)	31 (7.8)	8 (2.0)	392	343	2 (0.5)	12 (3.0)	8 (2.0)*	43 (10.8)	59 (14.8)*
85+ (n=400)	13 (3.3)	34 (8.5)	11 (2.8)	380	305	6 (1.5)	21 (5.3)	19 (4.8)*	55 (13.8)	85 (21.3)*
Total (n=2000)	26 (1.3)	143 (7.2)	41 (2.1)	1964	1663	16 (0.8)	79 (4.0)	42 (2.1)	222 (11.1)	305 (15.3)

* Statistically significant difference ($p < 0.005$) for errors in those aged <75 years when compared to those aged 75 years and over, using χ^2 analysis.

† Subjects reported deceased after posting the screening questionnaire.

‡ Notifications of address inaccuracies made after posting the screening questionnaire (68 non-responders and 11 responders).

adjusted) for the over 45s was 17.0% for men and 12.5% for women. The rates of address inaccuracies were 13.1% and 8.5% respectively. Errors due to deaths were 1.7% and 1.2% respectively.

Discussion

Uncertainty exists over whether FHSA registers are reliable sampling frames for population studies. In 1981, despite a high level of address inaccuracy (17.1%), the register had a lower population inflation rate than practice medical record envelopes or practice age-sex registers.² Practice medical envelopes proved to be the most accurate address source. More recently, it was stated that the register was too inaccurate for sampling older age groups in an inner city population.³

As elderly subjects have higher morbidity, an accurate sampling frame is important for epidemiological studies and needs assessment. Our results confirm that the elderly age groups have a large proportion of errors in the register. However, the percentage of address errors in those aged 85 years and over (13.8%) is considerably less than reported from a London borough, where 65% of this age group were untraceable at their registered address.³ Their 3.5% error rate due to deaths was similar to our study (4.8%). No other studies provide sufficient detail to allow direct comparison, although in one study more than 25% of women aged 50–64 years were not at their registered

address, compared to just 5% of our 45–64 year olds.⁴

Our prior notification process allowed identification of 69% of the total errors. In the absence of this process, we would have sent questionnaires to 26 (62% of all deaths) subjects who had died and up to 102 (46% of all address errors) who had major address errors. This would have comprised 6.4% of the total survey population. As we chose a point prevalence sample, some inaccuracies will occur as an inevitable consequence of time lapses between deaths and movements, and notification to and correction of the register.

We feel that the accuracy of FHSA registers is apparently improving. This means that, in the absence of more reliable sources, they are a suitable sampling frame for middle aged and elderly age groups for use in large community postal surveys.

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