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

Paul G O'Mahony, Richard G Thomson, Helen Rodgers, Ruth Dobson, Oliver F W James

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 roll or a telephone listing" for epidemiological studies. 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

<table>
<thead>
<tr>
<th>Reported deceased</th>
<th>Address change</th>
<th>Name/alias of birth</th>
<th>Questionnaire set</th>
<th>Responders to questionnaire</th>
<th>Deceased</th>
<th>Not at registered address</th>
<th>Total reported deceased</th>
<th>Total address changes</th>
<th>Total change made</th>
</tr>
</thead>
</table>
| 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 (33.5) |
| 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) | 195 (10.0) | 195 | 160 | 2 (1.0) | 2 (1.0) | 7 (3.5) | 17 (7.5)* | 22 (12.0)* |
| Total (n=1000) | 10 (1.0) | 71 (7.1) | 988 (76.0) | 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) | 35 (16.5) |
| 85+ (n=200) | 8 (4.0) | 17 (8.5) | 2 (1.0) | 187 | 165 | 4 (2.0) | 13 (6.5) | 12 (6.0)* | 30 (15.0) | 44 (22.0) |
| Total (n=1000) | 16 (1.6) | 72 (7.2) | 976 (80.3) | 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) | 42 (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) | 1464 (73.5) | 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 χ² 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).
Accuracy of the FHSA register
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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.7
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 identifi-
cation of 69% of the total errors. In the
absence of this process, we would have sent
questionnaires to 26 (62% of all deaths) sub-
jects who had died and up to 102 (46% of all
dead address errors) who had major address errors.
This would have comprised 6.4% of the total
survey population. As we chose a point pre-
valence sample, some inaccuracies will occur
as an inevitable consequence of time lapses
between deaths and movements, and notifi-
cation 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.
We wish to acknowledge the former Northern Regional Health
Authority Research and Development Directorate who funded
this study. We also wish to thank Newcastle Family Health
Services Authority, the Northern Regional Information Systems
Department, and the staff of all the general practices who
participated in the study for their invaluable help with the
project.
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*J Epidemiol Community Health* 1997 51: 206-207
doi: 10.1136/jech.51.2.206

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