Surveying older people from minority ethnic groups: an evaluation of a primary care sampling method for UK African-Caribbean elders

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ABSTRACT *There are substantial logistical difficulties in conducting community surveys of minority ethnic group populations. Primary care lists have been identified as an important potential resource but the representativeness of samples derived through this method has received little evaluation. In a community survey of psychiatric morbidity, African-Caribbean people aged 55–75 were identified by practice staff from registration lists for seven primary care teams in south London. The sensitivity of the process was evaluated by contacting a random sample of people whose ethnicity was not known. Participants aged 65–75 ($n = 174$) were also compared to a similarly aged group sampled through household enumeration ($n = 34$) with respect to demographic factors, risk factors for vascular disease, depression and cognitive function. For those with correct addresses, the identified group was estimated to include 72% of the potentially eligible population. Only 8% of contacted people were found not to be eligible in terms of ethnicity. Compared to the household enumeration sample, the primary care sample had marginally higher socio-economic status but was similar with respect to all other measured characteristics. Primary care list sampling with staff-assigned ethnicity therefore appeared highly specific, reasonably sensitive, and did not seem to introduce substantial bias for this population.*

Key words: African-Caribbean; hypertension; diabetes; depression; cognitive impairment

Introduction

Rapid demographic ageing is an important issue for African-Caribbean people in the UK, as for other migrant groups. The mental health needs of older members of these communities, in particular, have received relatively little research (Rait et al., 1996). Epidemiological surveys with representative, community samples represent a vital source of evidence (Chaturvedi and McKeigue, 1994). However there are important difficulties with sampling older people from minority ethnic groups in any epidemiological research. A 'gold standard' approach would involve identifying a sample through comprehensive household enumeration. However this is a potentially lengthy and costly process because older people from most minority groups are considerably dispersed even within areas of highest density. Primary care registration lists have been highlighted as an alternative sampling frame for community surveys in

the UK (Chaturvedi and McKeigue, 1994) because, even in deprived areas, rates of registration for minority ethnic groups are high (Johnson et al., 1983; Richards et al., 1996). However in urban settings where populations are highly mobile, high proportions of addresses on these lists may be incorrect. Mobility may be influenced by physical and/or mental health factors, resulting in sampling bias. Furthermore, identifying members of particular ethnic groups from the lists themselves may be difficult. Unlike some cultural or religious groups, the family name cannot be used to differentiate Caribbean-born from indigenous elders. Assignment of ethnicity by practice staff is an alternative procedure, which has been used in previous community studies (Chaturvedi et al., 1993). However people who are well known to their practice will be more likely to be identified, a process that, again, is potentially influenced by health status and a source of bias.

Practice list sampling is therefore potentially useful for conducting community-based research. However the level and direction of sampling bias have received no formal investigation to date. Between 1997 and 1998, a survey was carried out in a primary-care-derived sample of African-Caribbean people aged 55–75 to investigate the relationship between risk factors for cerebrovascular disease and cognitive function (Stewart et al., 2001a; Stewart et al., 2001b). In a previous pilot study another sample of African-Caribbean people aged 65 and over had been recruited from a register obtained by household enumeration (Richards et al., 2000). The objective of the analysis presented here was to compare health and demographic characteristics of people aged 65–75 from the two studies in order to investigate the representativeness of the primary care sample and identify factors that might have influenced the sampling process.

Methods

The primary care sample

The sampling frame consisted of registration lists for seven primary care teams in south London (predominantly within the borough of Lambeth). Lists of people aged 55–75 were generated by computer. These were perused by practice staff and those believed to be African-Caribbean were identified. A letter was sent out by practices informing potential participants of the study and allowing refusal. Attempts at telephone or doorstep contact were then made by research staff, including at least two evening visits if contact could not be established at other times. All participants gave written, informed consent. Inclusion criteria for the study were that the person had been born in, and had at least one parent who was born in, a Caribbean nation. The sensitivity of this procedure was investigated within one practice by attempting to contact a random sample of people whose ethnicity was not known to practice staff.

The household enumeration sample

A register of African-Caribbean and white residents aged 65 and older was obtained by household enumeration in a defined geographic area (Bellenden electoral ward, Southwark borough) in south London. All African-Caribbean residents and a random age- and sex-matched sample of white participants were invited to participate in a further interview. All participants gave written informed consent. Characteristics of the

African-Caribbean and white groups have been compared in a previous publication (Richards et al., 2000). Only the African-Caribbean group was considered in this analysis.

Comparing the samples

Both African-Caribbean samples were restricted to participants aged between 65 and 75. The following self-reported measures were obtained in both samples and were compared: age, sex, years of formal education, occupation (manual or non-manual), previous stroke, hypertension, diabetes, and previous/current smoking. The 10-item Geriatric Depression Scale was completed by participants in both samples and depression was defined as a score of 4 or greater on this instrument (D'Ath et al., 1994). Identical versions of the Mini-Mental State Examination were also administered (Folstein et al., 1975).

Statistical analysis

The two samples were compared initially using univariate analyses. Because of small cell numbers for some comparisons, 95% confidence intervals for all univariate odds ratios were calculated according to an 'exact' method (Mehta et al., 1985), using EPI-6 software. STATA (version 6) software was used for all other analyses. Age, years of education and MMSE score were compared as continuous variables. Because of their skewed distribution, MMSE scores were transformed by subtracting each score from 31 and taking the natural logarithm. Back-transformation was carried out to compare geometric means. Differences between the samples were then further analysed using multivariate procedures. For these, each characteristic was treated as the dependent variable and logistic or linear regression was carried out as appropriate. The first set of analyses was carried out with the sample group as the sole independent variable. A second set of analyses was then carried out including age, sex, education and occupation in each model (where they were not dependent variables).

Results

The primary care sample

From the registration lists of seven primary care practices, 747 names and addresses of African-Caribbean people aged 55–75 were identified by practice staff. Of these, a reply could not be obtained by researchers for

41 (5%), and 156 (21%) had died, moved away or were not known at the given address. A further 63 (8%) did not fulfil inclusion criteria regarding ethnicity (being mostly of African or south Asian origin). Of the remaining 487 potentially eligible people, 197 (40%) declined to participate or had substantial missing data, leaving 290 participants. For comparison with the household enumeration sample, this group was restricted to 173 who were aged 65–75.

The sampling process was further evaluated in one practice with a total of 1,031 registered patients aged 55–75. Of these, 127 had been identified as potential participants and 504 were believed not to be African-Caribbean. Ethnic group was unknown for 400. Sixty names were selected at random from this unknown group and similar attempts were made to contact these people. An answer was obtained for 56 (93%) addresses. The named person was not known at or had moved away from 32 addresses (53%). Of the remaining 24, six were African-Caribbean (10% of the total). Of the practice-identified group, address and ethnicity were correct for 104. From the random sample, it was estimated that the 'unknown ethnicity' group might contain a further 40 potentially eligible people. For those with correct addresses, the sensitivity of the practice-derived list was therefore 72%. This assumes that all people in the 'not African-Caribbean' group were correctly assigned. If 8% were misclassified (as for those believed to be African-Caribbean), the sensitivity would fall to 61%.

The household enumeration sample

Eighty African-Caribbean residents aged 65 or over were identified through household enumeration (Richards et al., 2000). Forty-five of these (56%) agreed to an interview. For comparison with the primary care sample, this group was restricted to 34 who were aged 75 or below.

Comparing characteristics between the samples

Characteristics of the two samples are summarized and compared in Table 1. A higher proportion of participants from the primary care sample had worked in non-manual occupations. However the two samples were very similar with respect to health conditions of interest, depression and cognitive function. Similarities were, if anything, more pronounced after adjustment for differences in socio-demographic factors.

Discussion

Primary care registration lists represent a potentially important sampling frame for community surveys of minority ethnic groups in the UK and other settings, offering considerable logistic advantages over household enumeration. However there are important potential sources of bias that have received relatively little investigation. Although registration rates have been found to be high even in inner London (Bone, 1984), and uptake of services is similar between ethnic groups (Johnson et al., 1983) the problem of incorrect addresses has been highlighted (Chaturvedi and

Table 1. Comparing the two samples with respect to characteristics of interest

Characteristic	Household enumeration sample (n = 34)	Primary care list sample (n = 173)	Mean difference/odds ratio (95% CI)	
			Unadjusted	Adjusted [†]
Mean (SD) age	68.8 (2.7)	69.4 (3.3)	+0.56 (−0.62, +1.74)	+0.48 (−0.75, +1.71)
Sex (% female)	44.1	55.5	1.58 (0.71–3.57)	1.16 (0.53–2.55)
Mean (SD) education (yrs)	8.6 (2.2)	9.3 (2.6)	+0.65 (−0.32, +1.63)	+0.41 (−0.56, +1.38)
Manual occupation (%)	87.9	71.1	0.34 (0.08–1.04)	0.36 (0.12–1.12)
Stroke (%)	8.8	8.1	0.91 (0.23–5.23)	1.05 (0.89–1.24)
Hypertension (%)	61.8	64.2	1.11 (0.47–2.51)	0.94 (0.86–1.04)
Diabetes (%)	32.4	32.4	1.00 (0.43–2.44)	1.00 (0.90–1.10)
Previous/current smoking (%)	45.5	52.6	1.33 (0.59–3.04)	1.07 (0.96–1.18)
Depression (%)	16.1	18.7	1.20 (0.41–4.30)	1.08 (0.96–1.21)
Mean* MMSE score	24.4	24.8	+0.41 (−1.36, +1.78)	−0.06 (−1.90, +1.38)

* Geometric mean.

[†] Included in regression model with age, sex, duration of education and occupation.

McKeigue, 1994). Furthermore, the means of identifying people from a particular ethnic group may give rise to further bias. Ethnic group has begun to be routinely recorded in records for secondary care and some primary care services in the UK – most often using self-assigned categories similar to those in the 1991 UK census. This information was not available for any of the primary care practices at the time of this survey and staff-assigned ethnicity was therefore used as an alternative method for identifying the population of interest.

The sensitivity and specificity of the sampling process were investigated, although were limited by the large proportion of registered people with incorrect recorded addresses. The specificity of the procedure was high because few people who were identified as 'African-Caribbean' by practice staff were born outside the Caribbean. The majority of incorrectly identified people were born in African or south Asian nations. In retrospect, we believe that a high proportion of these could have been excluded through their family name, although this procedure was not formally evaluated. The sensitivity of ethnic group assignment was investigated by contacting a random sample of people from one practice whose ethnicity was not known to staff. Through this procedure we calculated that, within the group with correct addresses, staff had identified approximately three-quarters of potentially eligible people. However potentially eligible people comprised only 10% of the unknown ethnicity group and further sampling of this group was not feasible within time and funding constraints. It was also not possible to repeat this evaluation for other practice lists and investigate between-practice variation in the sensitivity of ethnic group assignment. Neither was it possible to investigate the accuracy of the 'not African-Caribbean' category assigned by practice staff. An alternative estimate, assuming similar rates of misclassification in the two definite groups, was 61%. However we believe that this is likely to be excessively conservative because a large part of the total group misclassified as African-Caribbean arose from another practice that had applied very broad criteria and included south Asian and African people in the target sample. Of the group whose ethnicity was not known but whose contact details were correct, the proportion who were African-Caribbean (25%) was consistent with 1991 census data for that locality (Storkey, 1994). Information on staff ethnicity was unfortunately not collected. If staff-

assignment of ethnicity is to be used in future research, further evaluation could helpfully address these limitations – in particular investigating variation in the accuracy of ethnicity-assignment between practices and practice-level correlates of accuracy.

The principal objective for the larger survey was to investigate the association between risk factors for cerebrovascular disease and cognitive impairment in older people from the Caribbean (Stewart et al., 2001a). A particular concern was that the method of sampling might have given rise to an unrepresentative and biased sample. In particular, people with physical health problems might be better known to practice staff, more likely to have an updated address on practice records and therefore over-represented in the sample. It was less certain whether this process would be influenced by cognitive impairment or depression and, if so, in which directions. A comparison was therefore made with a household enumeration sample of African-Caribbean people within an identical age range and from a comparable area of south London. The precision of the comparison is limited by the size of the smaller sample. However, contrary to expectations, we found no evidence to suggest that the sampling procedure was substantially influenced by the presence or absence of health conditions of interest, nor were there any marked differences between samples in depression or cognitive function. Norms for a series of other cognitive tests have been reported for the two samples and were also found to be comparable (Stewart et al., 2001c). This does not, of course, exclude sampling bias. However the confidence intervals do not suggest that this is substantial. The most marked difference between the two samples was in previous occupation, and adjustment for this largely accounted for apparent differences in other factors. A relatively crude binary measure of occupational status was used in this analysis. Further attenuation of other differences would be likely if a more sensitive indicator of socio-economic status had been applied. A limitation is that the sampling areas for the two surveys, although comprising similar districts of south London, did not overlap. It cannot therefore be concluded whether the observed difference was explained by the different sampling procedures or by geographic variation. It also cannot be concluded absolutely that similarities in other respects were not explained by a combination of sampling and geographic factors, although we feel that this is unlikely.

Participation rates were relatively low for both surveys. Non-participation has been found to be associated with worse physical health and with cognitive impairment in other settings (Launer et al., 1994). This may therefore be a more important source of bias than the sampling procedure. Participation rates have been similarly low in other community studies of older UK African-Caribbean populations (Chaturvedi et al., 1993; Rait et al., 2000). This does not appear to be explained by the urban milieu alone, because higher participation rates have been achieved in surveys of older white populations in deprived urban settings (Prince et al., 1998). Close liaison with local primary care teams and flexible interviewing times were all employed to try to enhance participation rates in the primary care sample. Research staff were of varied ethnic origin but this was not found to influence participation. A large majority of those who declined to participate did so with a speedy and firm decision and our impression is that they would not have been influenced by alternative means of approach. The primary care list study improved on the household enumeration pilot to a small extent with respect to participation rates and may therefore conceivably give rise to a more representative sample. The assessment of public health needs of older minority populations depends to a large extent on high quality epidemiological data. Low survey participation rates potentially reduce the representativeness of community samples and the quality of the data. Reasons for this and measures that may be taken to improve participation therefore require further investigation.

Methods of sampling are an important issue for research in minority ethnic groups at any age because it is often not feasible to enumerate an entire catchment area population in order to identify a small subgroup. This is even more pertinent for target samples with a restricted age range. Balanced against logistical issues is the need to avoid sampling bias and to increase generalizability. 'First generation' migrants from some groups can be reliably identified by their family name. In a UK context this includes some south Asian groups such as Gujarati Indians. This becomes steadily more problematic for future generations because of intermarriage. For African-Caribbean groups, family names cannot be categorized in this way and other methods are required such as the one presented here. For UK research in older age groups, an

important issue is that people of African origin, who might be mis-classified as African-Caribbean, are currently a relatively young population and present in relatively few numbers in geographic areas of interest. As these populations age, future research will have to establish the extent to which these groups can be distinguished, either by practice staff or by family name. The comprehensive UK primary care system was an advantage in carrying out this sampling method. Research in other settings is therefore also required to establish whether similar sampling methods can be applied using other agencies with wide local knowledge to ascertain ethnicity and migration status.

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References

- Bone M. Registration with General Medical Practitioners in Inner London: a Survey Carried Out on behalf of the Department of Health and Social Security. London: HMSO, 1984.
- Chaturvedi N, McKeigue PM, Marmot MG. Resting and ambulatory blood pressure differences in Afro-Caribbeans and Europeans. *Hypertension* 1993; 22: 90–6.
- Chaturvedi N, McKeigue PM. Methods for epidemiological surveys of ethnic minority groups. *J Epidemiol Comm Health* 1994; 48: 107–11.
- D'Ath P, Katona P, Mullan E, Evans S, Katona C. Screening, detection and management of depression in elderly primary care attenders. I: The acceptability and performance of the 15-item Geriatric Depression Scale (GDS15) and the development of short versions. *Fam Pract* 1994; 11: 260–6.
- Folstein M, Folstein S, McHugh P. 'Mini-Mental State', a practical method for grading the cognitive state of patients for the clinician. *J Psychiatric Res* 1975; 12: 189–98.
- Johnson MRD, Cross M, Cardew SA. Inner-city residents, ethnic minorities and primary health care. *Postgrad Med J* 1983; 59: 664–7.
- Launer LJ, Wind AW, Deeg DJH. Nonresponse pattern and bias in a community-based cross-sectional study of cognitive functioning among the elderly. *Am J Epidemiol* 1994; 139: 803–12.

- Mehta CR, Patel NR, Gray R. Computing an exact confidence interval for the common odds ratio in several 2×2 contingency tables. *J Am Stat Assoc* 1985; 80: 969–73.
- Prince MJ, Harwood RH, Thomas A, Mann AH. A prospective population-based cohort study of the effects of disablement and social milieu on the onset and maintenance of late-life depression. The Gospel Oak Project VII. *Psychol Med* 1998; 28: 337–50.
- Rait G, Morley M, Burns A, Baldwin R, Chew-Graham C, St Leger AS. Screening for cognitive impairment in older African-Caribbeans. *Psychol Med* 2000; 30: 957–63.
- Rait G, Burns A, Chew C. Age, ethnicity, and mental illness: a triple whammy. *BMJ* 1996; 313: 1347–8.
- Richards M, Brayne C, Forde C, Abas M, Levy R. Surveying African Caribbean elders in the community: implications for research on health and health service use. *Int J Geriatr Psychiatry* 1996; 11: 41–5.
- Richards M, Brayne C, Denning T, Abas M, Carter J, Price M, Jones C, Levy R. Cognitive function in UK community-dwelling African Caribbean and white elders: a pilot study. *Int J Geriatr Psychiatry* 2000; 15: 621–30.
- Stewart R, Richards M, Brayne C, Mann A. Vascular risk and cognitive impairment in an older, British, African-Caribbean population. *J Am Geriatr Soc* 2001a; 49: 263–9.
- Stewart R, Prince M, Richards M, Brayne C, Mann A. Stroke, vascular risk factors and depression. A cross sectional study in a UK Caribbean-born population. *Br J Psychiatry* 2001b; 178: 23–8.
- Stewart R, Richards M, Brayne C, Mann A. Cognitive function in UK community-dwelling African Caribbean elders: normative data for a test battery. *Int J Geriatr Psychiatry* 2001c; 16: 518–27.
- Storkey M. *London's Ethnic Minorities*. London: London Research Centre, 1994.

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