Need and demand for primary health care: a comparative survey approach

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Abstract

Objective—To develop general practice profiles of needs and demand for primary health care.

Design—Postal survey of a stratified random sample of 3478 people registered with five general practices. Data from a single practice were compared with data from the remaining four to identify areas of comparative need.

Setting—Five general practices in Lothian.

Main outcome measures—Differences between the single practice and the comparison practices in terms of social and economic circumstances, limiting long term illness, specific ongoing conditions, minor illness or symptoms, psychosocial problems, discussion of lifestyle, associated use of services.

Results—Respondents from the single practice reported higher rates than those in the four comparison practices of ongoing mental health and respiratory problems and use of antidepressants, tranquillisers, or sleeping tablets. Although rates of limiting long term illness and other specific ongoing conditions were comparable, the rates of minor illness or symptoms and psychosocial difficulties were higher in the single practice. Respondents from the single practice were more likely to consult frequently, to have contacted the practice out of normal working hours, and to have discussed psychosocial difficulties with a general practitioner. For any specific ongoing condition or "minor" illness, respondents from the single practice were no more likely to consult.

Conclusions—A comparative survey approach is a useful method of developing an understanding of patterns of need and demand among general practice populations. It has the potential to inform planning within individual general practices and the process of commissioning among general practices within a given area.

Introduction

Understanding patterns of illness and distress and of service use and provision among general practice populations is crucial to three areas of development within primary health care. Firstly, a variety of purchasing and commissioning models aim to promote local sensitivity in service development.¹ Many of the developing models use general practices as the basis for planning and development.^{2,3}

Secondly, within primary care the balance between individual and population based approaches to care provision is changing.^{4,6} The concept of community oriented primary care is receiving increasing attention.⁷⁻⁹ This model emphasises developing strategies of care in line with the needs and demands of practice populations.⁹

Thirdly, there is the issue of resource allocation. The use of capitation based formulas in primary care is

firmly on the agenda. It has been argued that complex methods derived from routinely available data amount to "weighting in the dark," and that locally sensitive research is necessary to highlight the issues which general mechanisms obscure.¹⁰ Moreover, the application of such formulas has been criticised for separating resource allocation from strategy development.

There is a clear need for practice based data on needs and demands for care. Several methodological problems beset current approaches. A popular and expedient approach is to ask professionals to act as proxy informers of patients' needs.¹¹ General practitioners have this role in many of the emerging commissioning models.^{3,12} There are drawbacks to this approach.

Not all people who are ill or experiencing distress or disability use services, and the extent of this need may not be known by providers.¹³ Having an understanding of the needs of individuals is not the same as understanding the needs of populations,¹⁴ and most health professionals have experience only in the former. The perceptions of professionals often do not match those of patients either in kind or degree. It is often patients' perceptions which are the key to understanding patterns of service use.¹⁵ Finally, if information about needs is to be used to inform decisions about resource allocation then this should be independent of the practitioners who may receive the resources.

The use of routine data is attractive because of its availability. It also has drawbacks. Data on health service use inevitably depends on the supply of services.^{16,17} Data on social conditions are conceptually independent of service use, but their relevance to planning health services has been questioned on both theoretical and practical grounds.^{10,18} A major practical difficulty is that data are often aggregated and apply to areas which are not necessarily coterminous with those used in planning.¹⁹ Much routine morbidity information is based on diagnostic categories which are of limited relevance to primary care provision. Around half of patients visiting a general practitioner never receive a specific medical diagnosis.^{20,21}

A survey of the practice population offers the opportunity to overcome the limitations of routine data and the use of proxy informers. This paper presents results from a survey of illness, distress, and service use carried out in five general practices in Lothian. The survey was done as part of a larger study looking at the development of general practice based health needs assessment.

Individual general practices rarely have the opportunity to compare the needs and demands of their population with those of other populations, either locally or nationally. We present data for one practice in comparison to four others and thereby identify areas of comparative need.²²

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Methods

PARTICIPATING PRACTICES AND SURVEY SAMPLE

Five general practices within Lothian were chosen so that the age, sex, and deprivation profile of the overall sample would be similar to that of Lothian as a

TABLE I—Response rates by age and sex for practice A and comparison practices. Values are percentage (number) of questionnaires giving age and sex

	Men		Women	
	Practice A	Comparison practices	Practice A	Comparison practices
16-44	34.7 (149)	48.2 (548)	43.0 (203)	63.0 (800)
45-64	48.8 (63)	70.9 (447)	63.8 (99)	64.7 (439)
65-74	80.7 (21)	78.4 (145)	67.4 (31)	76.3 (164)
≥ 75	66.7 (6)	74.1 (60)	67.6 (23)	67.7 (103)

TABLE II—Characteristics of respondents from practice A and comparison practices. Values are percentages (95% confidence interval); numbers of respondents are given in parentheses

	Practice A	Comparison practices	P value
Age (mean)	39.1 (37.8 to 40.4) (n=599)	43.7 (43.1 to 44.3) (n=3003)	<0.0001*
Women	53.1 (49.1 to 57.1) (322/605)	54.8 (53.0 to 56.6) (1663/3032)	>0.05
Living with children under 16	39.9 (36.0 to 43.8) (248/620)	32.5 (30.8 to 34.2) (996/3066)	<0.001
Single adult with child(ren) under 16	8.1 (5.9 to 10.2) (50/620)	3.8 (3.1 to 4.5) (117/3066)	<0.0001
Owning own home	46.7 (42.7 to 50.7) (281/603)	68.4 (66.7 to 70.1) (2008/2973)	<0.0001
Owning a car	46.8 (42.8 to 50.8) (283/604)	68.1 (66.4 to 69.8) (2017/2963)	<0.0001
Aged under 65 and not working	33.6 (29.9 to 37.3) (208/620)	21.1 (19.7 to 22.5) (648/3066)	<0.0001
Receiving (or partner receiving) income support	31.6 (27.9 to 35.3) (190/601)	14.4 (13.1 to 15.7) (426/2952)	<0.0001
Moved house in the past year	17.5 (14.5 to 20.5) (106/606)	9.1 (8.1 to 10.1) (271/2987)	<0.0001

* χ^2 Test; other P values obtained with χ^2 test.

TABLE III—Reported limiting long term illness and specific conditions, and associated use of services in practice A and comparison practices. Values are percentages (95% confidence intervals); numbers of respondents are given in parentheses

	Practice A	Comparison practices
Limiting long term illness, health problem, or handicap:		
16-44 years	9.3 (6.5 to 12.1) (39/426)	6.2 (5.1 to 7.3)* (107/1721)
45-64 years	29.2 (21.2 to 37.2) (36/123)	21.2 (18.5 to 23.9)* (184/868)
≥ 65 years	39.7 (26.5 to 53.1) (20/51)	35.8 (31.2 to 40.4) (148/414)
All	16.0 (13.1 to 18.9) (99/620)	14.8 (13.5 to 16.1) (453/3066)
Specific conditions:		
Asthma	8.8 (6.6 to 11.0) (54/620)	6.5 (5.6 to 7.4)* (200/3063)
Diabetes	1.3 (0.4 to 2.2) (8/620)	1.8 (1.3 to 2.3) (56/3062)
Chronic bronchitis	4.9 (3.2 to 6.6) (30/620)	2.2 (1.7 to 2.7)*** (68/3066)
Epilepsy	1.2 (0.3 to 2.1) (7/620)	0.9 (0.6 to 1.2) (26/3066)
Painful joints or arthritis	21.0 (17.8 to 24.2) (130/620)	20.9 (19.4 to 22.3) (640/3066)
Back trouble or sciatica	19.0 (15.9 to 22.1) (118/620)	18.0 (16.6 to 19.4) (552/3066)
High blood pressure	6.9 (4.9 to 8.9) (43/620)	7.4 (6.5 to 8.3) (226/3066)
Anxiety or depression or bad nerves	22.3 (19.0 to 25.6) (138/620)	13.4 (12.2 to 14.6)*** (410/3066)
Persistent foot trouble	4.1 (2.5 to 5.7) (25/620)	4.6 (3.9 to 5.3) (140/3066)
Difficulty seeing even with glasses	4.9 (3.2 to 6.6) (30/620)	4.7 (3.9 to 5.4) (143/3066)
Difficulty hearing with hearing aid	2.8 (1.5 to 4.1) (17/620)	3.6 (2.9 to 4.3) (109/3066)
Stomach problems	10.8 (8.4 to 13.2) (67/620)	11.4 (10.3 to 12.5) (351/3066)
Heart problems or angina	5.5 (3.7 to 7.3) (34/620)	4.9 (4.1 to 5.7) (150/3066)
Kidney or bladder trouble	5.7 (3.9 to 7.5) (36/620)	6.1 (5.3 to 6.9) (186/3066)
Mean number of specific conditions (n=14) reported	1.2 (1.1 to 1.3) (620)	1.06 (1.01 to 1.11)*† (3066)

*P<0.05; ***P<0.001.

† χ^2 Test; other P values determined by χ^2 test.

whole. An overview of the participating practices is given in the appendix.

Questionnaires and reply paid envelopes were posted to 6328 patients (mean 1265.6 per practice) with a covering letter signed by a partner. The samples from each practice were stratified by sex and age (16 to 44, 45 to 64, 65 to 74, and 75 years or over). A reminder was posted after three weeks. A random sample of non-respondents were followed up by telephone or by visit.

QUESTIONNAIRE

The questionnaire included demographic details and socioeconomic circumstances; presence of limiting long term illness, health problem, or handicap; presence of each of 14 ongoing health problems and associated consultations; presence of each of 11 "minor" symptoms or signs in the past six months and associated consultations; presence of each of 10 common psychosocial difficulties in the past six months, associated consultations, and whether respondent had felt unsure about where to get help; frequency of contact with general practitioner or nurse in the past six months; use of medications; whether any of seven aspects of lifestyle had been discussed with a general practitioner or nurse in the past six months.

DATA ANALYSIS

Data from one practice (labelled A) were compared with data from the other four practices (B to E). To take account of the differential response rates in each age-sex stratum (table I) the data from each practice were weighted so that the age-sex distribution of the sample matched that of the practice(s).

Results

RESPONSE RATES

The overall response rate for practice A was 46% compared with 64% for the four other practices. The follow up of 52.9% (241) of non-respondents from practice A showed that in 53.5% (129) cases questionnaires had been sent to an invalid address; 3.3% (8) could not complete the questionnaire because of ill health; and 0.4% (1) could not complete the questionnaire because of language difficulties. Corresponding figures for the follow up of 51.3% (799) non-respondents from practices B-E were 21.9% (175); 1.3% (10), and 0.3% (3).

DEMOGRAPHIC AND SOCIOECONOMIC PROFILE

Table II shows characteristics of respondents from practice A and from the comparison practices. There was no difference in the sex distribution. Respondents from practice A were significantly younger and more likely to have children under the age of 16, to be the single adult in a household with children, and to have moved within the past year. Respondents from practice A were significantly worse off on all socioeconomic measures.

LIMITING LONG TERM ILLNESS AND ONGOING CONDITIONS

In younger age groups, respondents from practice A were significantly more likely to report having a limiting long term illness, although overall there was no significant difference (table III). Respondents from practice A were significantly more likely to report having asthma, chronic bronchitis, and anxiety, depression, or bad nerves and to report having more of the conditions but no more likely to report having any of 11 other ongoing conditions (table III).

Respondents from practice A who reported that they had asthma were significantly more likely to report that they had consulted about this (82% (52) v 66% (186);

TABLE IV—Reported minor illness and associated contact with general practice in six months before questionnaire. Values are percentages (95% confidence intervals); numbers of respondents are given in parentheses

	Had condition		Saw GP or nurse	
	Practice A (n=620)	Comparison practices (n=3066)	Practice A	Comparison practices
Bad cold or flu	53.3 (49.4 to 57.2) (331)	46.6 (44.8 to 48.4)** (1429)	37.4 (32.1 to 42.7) (119/318)	33.2 (30.7 to 35.7) (918/1373)
Feeling tired	48.5 (44.6 to 52.4) (301)	43.9 (42.1 to 45.7)* (1345)	25.8 (20.6 to 30.9) (72/277)	24.7 (22.3 to 27.1) (311/1255)
Constipation	10.3 (7.9 to 12.7) (64)	11.1 (9.9 to 12.2) (340)	38.9 (26.7 to 51.1) (24/61)	40.7 (35.3 to 46.1) (131/322)
Diarrhoea or vomiting	14.2 (11.5 to 16.9) (88)	13.4 (12.2 to 14.6) (411)	37.3 (26.9 to 47.7) (31/83)	35.1 (30.3 to 39.9) (135/384)
Cough	17.2 (14.2 to 20.2) (106)	13.1 (11.9 to 14.3)** (403)	39.8 (30.2 to 49.4) (39/99)	43.3 (38.3 to 48.3) (162/375)
Sore throat	30.0 (26.4 to 33.6) (186)	26.2 (24.6 to 27.8)* (804)	37.1 (29.9 to 44.3) (65/175)	32.0 (28.7 to 35.3) (242/758)
Skin problems	21.7 (18.5 to 24.9) (135)	17.0 (15.7 to 18.3)** (521)	68.3 (60.1 to 76.5) (86/125)	64.3 (30.9 to 77.7) (317/494)
Headache	35.6 (31.8 to 39.4) (221)	31.4 (29.8 to 33.0)* (963)	31.2 (24.9 to 37.5) (65/208)	25.4 (22.5 to 28.3) (225/886)
No appetite or off food	15.8 (12.9 to 18.7) (98)	7.3 (6.4 to 8.2)*** (225)	28.7 (19.5 to 37.9) (26/92)	34.1 (27.5 to 40.7) (68/198)
Difficulty sleeping	32.0 (28.3 to 35.7) (198)	25.1 (23.6 to 26.6)*** (769)	34.4 (27.6 to 41.2) (64/187)	32.9 (29.4 to 36.4) (233/709)
Fever or high temperature	10.7 (8.3 to 13.1) (66)	5.2 (4.4 to 5.9)*** (160)	48.4 (35.9 to 60.9) (30/61)	47.1 (39.1 to 55.1) (70/149)
Accident	6.3 (4.4 to 8.2) (39)	7.3 (6.4 to 8.2) (223)	81.6 (68.7 to 94.4) (29/35)	74.5 (68.6 to 80.4) (157/210)
Mean number conditions (n=12; per patient)	2.9 (2.7 to 3.1)	2.40 (2.25 to 2.55)***		

*P<0.05; **P<0.01; ***P<0.001; χ^2 test.

TABLE V—Reported psychosocial problems over six months and use of services. Values are percentages (95% confidence intervals); numbers of respondents are given in parentheses

	Practice A (n=620)	Comparison practices (n=3066)	P value (χ^2 test)
Reporting problems with:			
Money	31.6 (27.9 to 35.3) (196)	22.2 (20.7 to 23.7) (680)	<0.0001
Husband, wife, or partner	23.9 (20.5 to 27.3) (148)	15.9 (14.6 to 17.2) (486)	<0.001
Children	16.9 (13.9 to 19.8) (105)	11.3 (10.2 to 12.4) (348)	<0.0001
Work	16.5 (13.6 to 19.4) (102)	17.4 (16.0 to 18.7) (532)	>0.05
Other members of family	16.2 (13.3 to 18.9) (100)	11.7 (10.6 to 12.8) (359)	<0.001
Unemployment	16.1 (13.2 to 18.9) (100)	7.9 (6.9 to 8.9) (243)	<0.0001
Housing	11.2 (8.7 to 13.7) (70)	3.8 (3.1 to 4.5) (116)	<0.0001
Social activities	8.5 (6.3 to 10.7) (53)	4.3 (3.6 to 5.0) (130)	<0.0001
Death of someone close	8.3 (6.1 to 10.5) (51)	6.6 (5.7 to 7.5) (203)	>0.05
Violence or the threat of violence	7.9 (5.8 to 10.0) (49)	2.5 (1.9 to 3.1) (76)	<0.0001
Mean number of problems reported	1.6 (1.6 to 1.7)	1.0 (0.94 to 1.14)	<0.0001
% Of those reporting any problem who:			
Spoke to GP about problems	19.8 (15.8 to 23.8) (76/384)	15.6 (13.8 to 17.6) (242/1550)	<0.05
Felt unsure about where to get help	28.3 (23.7 to 32.9) (104/369)	18.9 (36.9 to 20.9) (279/1472)	<0.0001

P<0.05). There were no other significant differences in reported contact for specific conditions.

"MINOR" ILLNESS AND SYMPTOMS

Rates of reporting all symptoms except constipation, diarrhoea, or vomiting and having had an accident were significantly higher among respondents from practice A; the mean number of symptoms per person was also significantly higher. Of the respondents who reported having had an illness or symptom, respondents from practice A were no more likely to report that they had consulted with it (table IV).

PSYCHOSOCIAL DIFFICULTIES

Rates of reporting all psychosocial problems except with work and the death of someone close were significantly higher among respondents from practice A. The mean number of psychosocial problems reported by respondents from practice A was also significantly higher (table V). Of respondents who

reported having had any of the 10 psychosocial problems, respondents from practice A were significantly more likely to report that they had spoken to a general practitioner about the problem and that they had felt unsure about where to get help.

CONTACT WITH THE PRACTICE AND USE OF MEDICATIONS

Respondents from practice A were significantly more likely to have seen or spoken to a general practitioner or nurse at the practice three or more times and to have had any contact with the practice out of normal working hours (table VI). They were significantly more likely to report having taken tranquilisers, antidepressants, or sleeping tablets. Rates of reporting getting medicines on regular prescription, having got a prescription in the past six months, and having taken any medicines bought from a chemist were not significantly different from those in the other practices.

DISCUSSION OF LIFESTYLE

Respondents from practice A who had seen or spoken to a general practitioner or nurse were significantly more likely to report having discussed ways of coping with stress (11.6% (427) v 7.1% (1939); P<0.01). There were no significant differences in reported discussion of the other aspects of lifestyle.

Respondents from practice A were significantly more likely to smoke (43.7% (620) v 32.1% (3066), P<0.0000). If they had seen or spoken to a general practitioner or nurse at the practice they were more likely to have discussed smoking (25.3% (208) v 19.8% (662); P<0.05) and less likely to report that this was helpful (39.7% (47) v 64.2% (123); P<0.01).

Discussion

Defining need is complex.^{13 22 23} This paper is based on an interpretation of need as comparative disadvantage.²² We have focused on one practice, combining data from four other practices as a single comparison group. Any of the five practices could have been selected as a focus to illustrate the comparative survey approach. This approach does not take account of needs which may be common among all practices. However, a comparative approach is directly related to the principle of equity²² and is therefore particularly valuable in the context of local resource distribution.

The overall response rate for the five practices was adequate for a postal survey. Although the response rate for practice A was substantially lower, data from the survey and the follow up of non-responders suggests that the main reason for this was greater housing mobility among people registered at that practice. The focus on practice A raises issues about need and demand for primary care in inner city areas of high social deprivation, as shown in this specific population, and these issues in turn illustrate tensions between national primary care policy and local sensitivity.

IMPLICATIONS FOR PRACTICE A

There have been concerns about excess demands placed on primary health services for "minor" illness in areas of social deprivation.²⁴ This study shows that the excess of "minor" illness in patients presenting to practice A is a result of excess morbidity and not of greater propensity to consult.

Among respondents from practice A there was excess reporting of chronic mental health problems and reported use of psychotropic medication. Respondents from practice A were more likely to report that they had spoken to a general practitioner about psychosocial difficulties and stress management. They

TABLE VI—Reported contact with general practice and use of medication. Values are percentages (95% confidence intervals); numbers of respondents are given in parentheses

	Practice A	Comparison practices
Saw or spoke to GP or nurse ≥ 3 times in past 6 months	38.8 (34.9 to 42.6) (239/617)	29.3 (27.7 to 30.9)*** (890/3038)
Saw or spoke to GP or nurse out of normal working hours (1800-0800) in past 6 months	17.1 (14.1 to 20.1) (106/620)	13.6 (12.4 to 14.8)* (417/3066)
Get medicines regularly on prescription	36.5 (32.7 to 40.3) (224/612)	38.6 (36.9 to 40.3) (1158/2999)
Got medicines on prescription in past 6 months	50.7 (46.7 to 54.7) (299/589)	47.3 (45.5 to 49.1) (1366/2890)
Took antidepressants, tranquillisers, or sleeping tablets in past 6 months	12.7 (10.0 to 15.4) (74/585)	9.0 (7.9 to 10.0)** (256/2860)
Took over the counter medicines in past 6 months	44.9 (40.9 to 48.9) (270/601)	45.6 (43.8 to 47.4) (1314/2881)

*P<0.05; **P<0.01; ***P<0.001; χ^2 test.

were also more likely to report that they had felt unsure about where to get help about psychosocial problems, although health professionals working in the area identified several voluntary agencies, community groups, and welfare rights agencies that could also provide support and advice.

A clear implication of these findings is the importance of a local strategy for mental health, to try to prevent and to manage the high levels of ongoing mental health problems and psychosocial distress. The strategy should attempt to increase awareness of different sources of help and advice within the community and to encourage their use.

Rates of smoking and respiratory illness were significantly higher among respondents from practice A, and discussion of smoking with nurses and general practitioners was less likely to be reported as helpful. Health professionals at practice A felt that current approaches to smoking prevention within primary care amounted to "victim blaming" and that it was important to recognise that smoking was often an important coping strategy for people living with the stress of multiple social problems. This was a possible explanation of why patients would be less likely to find discussions with health professionals helpful and was a source of concern about investing more resources in this specific area of work.

NATIONAL POLICY VERSUS LOCAL SENSITIVITY

These findings also illustrate the limitations of a national system of remuneration that offers incentive payments for selected areas of care and health promotion.^{25 26} Following changes to the system of payments for health promotion, the practice with large declared need and demand for support for psychosocial problems goes unrewarded for its work in stress management while being encouraged to undertake narrowly defined work on smoking prevention. By encouraging a focus on particular areas of care, national policy may lead to a relative neglect of greater need in areas not linked to financial incentives.²⁶

Although practice A receives deprivation payments,

the method for allocation has been shown to be practically and conceptually flawed.^{10 18} Moreover, the allocation is not strategically linked to morbidity and care provision.

Given the younger age profile of respondents for practice A, lower rates of reporting of long standing illness, ongoing conditions, and medications would be expected. The finding that rates are comparable or higher suggests a health disadvantage for respondents from practice A and reinforces the view that capitation payments based on age and sex are inadequate.

The limitations of national strategies to address local health needs and of routine data to inform strategy development and resource allocation are becoming increasingly apparent.^{2 10 18 27} Given these limitations, responsibility for addressing relative disadvantage among different practice populations may have to be taken more locally.^{27 28} Many of the emerging locality commissioning models offer the opportunity to do so.³ It is crucial that the development of skills in local decision making and planning is underpinned by more adequate and relevant information.

This study has shown the feasibility of a survey to collect information about need and demand in general practice populations on the basis of patients' perceptions of their problems, which are independent of use of services. Surveys may better inform the development of a strategy within a specific practice population and help to close the gap between resource allocation and resource management.

Surveys are unlikely to replace the use of resource allocation formulas, although they could inform the conceptual development of the formula and the routine data on which a formula may be based.^{2 10} It is within the context of local commissioning that the surveys are most worthy of further attention. A comparative perspective is essential if local policy makers are to be encouraged to grasp the nettle of resource redistribution.

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Appendix

Overview of participating practices

	Area	No of general practitioners	List size	% Of patients for whom the practice receives deprivation payment
Practice A	Inner city	3	3 780	36.0
Practice B	Inner city	4	6 231	14.0
Practice C	Urban	8	12 571	0.7
Practice D	Semirural	4	6 231	1.6
Practice E	Semirural	8	12 666	9.2

Key messages

- Understanding patterns of need and demand in general practice populations is crucial to policy development
- Patient surveys overcome important limitations of assessments of need based on the views of health professionals or routine data
- Surveys can inform planning and development within specific practice populations
- A comparative perspective is essential in the context of locality commissioning and resource redistribution

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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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