

From the surgery to the surgeon: does deprivation influence consultation and operation rates?

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SUMMARY

Background. Concern about equity of access to health care has increased since the health care reforms implemented in the 1990s. Access to specialist health care is controlled by general practitioners; assessing and ensuring equity should therefore begin in general practice.

Aim. This study set out to determine whether there are socioeconomic differences in the relationship between expressed need for possible surgical intervention (consulting a general practitioner) and surgical provision.

Method. Information on the social class distribution of expressed need was obtained from the third national morbidity survey (1981–82) for 140 049 patients consulting a general practitioner. The conditions examined were: inguinal hernia, gallstones, tonsillitis, varicose veins, cataract and osteoarthritis. This expressed need was compared with the appropriate operation for all residents of North East Thames Regional Health Authority from January 1991 to July 1992 classified, according to area of residence, by the Townsend deprivation score.

Results. The relationship between expressed need and provision by deprivation was concordant for some conditions, but discordant for others. For cataract and tonsillitis, there was an inverse U pattern between increasing deprivation and both patient consultation and operation ratios. For varicose veins, deprivation was associated with higher patient consultation and operation ratios. For hernia, gallstones and osteoarthritis, consultations increased with deprivation, but operation ratios were either unrelated to deprivation scores (hernia and gallstones) or decreased by deprivation score (hip operations).

Conclusion. There are marked socioeconomic differences in consultation ratios for these common conditions which may not be matched by operation ratios. For discordant comparisons, people in the most deprived quartiles were generally least likely to receive surgery despite being most likely to consult a general practitioner with symptoms. If validated, these findings have important implications for general practice and service providers.

Keywords: surgery; consultation rates; inequalities in health; access to health; socioeconomic factors.

Introduction

REPEATED demonstrations of inequalities in health associated with socioeconomic deprivation have been stimuli for

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debate and research on how these inequalities occur, and how they can be addressed.^{1,2} While hospital care has little effect on the overall health status of a population,^{3,4} some interventions, such as surgery, can have a major impact on morbidity. General practitioners, as gatekeepers to specialist health care, are the link between the patient and the surgeon.

Studies from the United States of America, where economic considerations are paramount, suggest that health care provision has a direct association with social advantage,^{5,6} so that for an equal level of morbidity, fewer services are received by the socially disadvantaged.⁷ Such inequalities are often assumed not to occur within the 'free at the point of delivery' United Kingdom National Health Service. However, as financial constraints, and in particular, the need to explicitly ration health care services become an increasing reality,⁸ there are fears that some groups, such as those of lower socioeconomic status, may not receive the care that they need. The contracting process, informed by health care needs assessment, should now enable health authorities to address the issue of equity of provision. It is therefore timely to examine whether current health care is indeed being provided in an equitable fashion.

Few studies have attempted to correlate operation rates with levels of morbidity, and hence potential need, within the UK population. Indeed, it has been assumed that there is no socioeconomic gradient in the epidemiology of several conditions amenable to surgery.⁹ Much of the epidemiological information is based on hospital or clinic populations. These data are difficult to interpret as provision may either reflect the true prevalence by socioeconomic status, or a distorted pattern secondary to inequalities in health care provision. A mismatch between need and provision may either be due to a socioeconomic difference in how symptoms are perceived and acted upon by the patient, or how need, once expressed, is being met by health care systems. Disentangling explanations for inequalities in health care provision has important implications for policy interventions.

Population based data assessing need for surgical services are not routinely available. Ideally, epidemiological data on the true need for surgical interventions should be derived from special population based surveys,¹⁰ but these are time consuming and not feasible for most requirements. Further, a proportion of those identified as needing a particular intervention may not want it. For routine monitoring purposes, what is required is a measure of expressed need or demand, which is easily available and which has been assessed for a number of conditions. Although not ideal, the best routine data available which give an indication of expressed need are from the regular decennial national general practice morbidity surveys.¹¹ People who consult a general practitioner with a condition that is amenable to surgery generally do so with the expectation of receiving some form of intervention, although a proportion may not want or be suitable for surgery.

The aim of this study was to use routine data sources to compare operation rates and general practitioner consultation rates by an index of socioeconomic status to determine whether current health service delivery is at odds with the expressed need for that service.

Method

Six relatively common conditions, where surgical intervention is readily available and affords marked symptomatic relief, were chosen for investigation. These were: varicose veins, inguinal hernia, gallstones, cataract, tonsillitis and arthritis of the hip.

The third national general practice morbidity survey (1981–82) was used to provide an indication of the expressed need for surgical interventions for these six conditions.¹¹ In this survey, a subsample of 140 049 individuals who were registered with 25 practices in England and Wales were matched to their 1981 census records. Only the first consultation for each of these conditions was included for analysis. Royal College of General Practitioners' codes¹² for these conditions were as follows: varicose veins (202), inguinal hernia (249), infection of gall bladder and gallstones (261), cataract (147), both acute and chronic infections of the tonsils (213 and/or 218) and osteoarthritis (361) (there was no specific code for arthritis of the hip).¹³ Social class for each individual was assigned according to the Registrar General's classification of occupations.¹⁴ Men and single women aged 16 years and over were classified according to their own occupation, while married or cohabiting women were classified according to their partner's occupation. For children, social class was based on the occupation of parent or head of household.¹³

Age standardized patient consultation ratios were calculated by social class for each sex. The standard population was all those who were registered with a general practitioner in the study, including all those who could not be allocated to a social class category. By standardizing for age, standardized patient consultation ratios allow the comparison of different socioeconomic subgroups with the effect of age removed. Age groups appropriate to the condition in question were chosen. The expected number of patient consultations was calculated for each population subgroup by applying the age specific consultation rates for the total population to the corresponding person years at risk in the same subgroup.¹³ The ratios of observed to expected consultations for the appropriate subgroups were then multiplied by 100. Social classes were grouped as follows to provide more stable estimates: social class 1 and 2, 3N (non-manual), 3M (manual), and 4 and 5. To examine whether the social class patterns for consultation differed by geographical area, the standardized patient consultation ratios were calculated for only those general practitioners in south east England.

Hospital episode statistics data were supplied for all North East Thames Regional Health Authority residents from the integrated district regional information system (IDRIS) for the period January 1991 to July 1992, inclusive. Data on private operations were not available as these are not included in routine health service statistics. Office of Population Censuses and Surveys operation codes for the surgical conditions examined were as follows: varicose veins (L85–L87), inguinal hernia (T19–T20), cholecystectomy (J18), cataract (C71–C75), tonsillectomy (F34) and hip operations (W37–W39 and W46–W48). Day case surgery was included. Male and female age-specific rates of operations for the total population of north east Thames were applied to deprivation quartiles (see below) to calculate expected numbers of operations. The ratio of observed to expected operations for each quartile was then multiplied by 100.

Ten-year age groups were generally used in the analyses of consultations and operations. The age limits for inclusion by condition were as follows: varicose veins, above 24 years and below 85 years; hernia, above 24 years; gallstones, above 24 years and below 85 years; cataract, above 34 years; tonsillitis, below 45 years; and osteoarthritis, above 44 years.

Data on socioeconomic variables for wards in the north east Thames region were obtained from the 1981 census (small area statistics package, SASPAC) to derive Townsend deprivation

scores.¹⁵ This score is calculated from census data and includes the proportion of unemployed economically active men and women, car ownership by household, overcrowding and housing tenure. A composite score is produced by standardizing and summing all four components. An increasing positive score indicates relative deprivation. Each ward was allocated a deprivation score; for a few wards it was necessary to allocate deprivation scores by using the frozen postcode file, as boundary changes had occurred since the last census. The median number of operations per ward was relatively small. To improve the stability of the estimates of operation rates, wards were ranked by their deprivation score and divided into quartiles. Quartile one denotes the most affluent 25% of wards. Data for men and women were combined, as the patterns of consultations and operations by socioeconomic status were similar.

A value of greater than 100 for either consultation or operation ratios indicates a higher than expected level of expressed need (consultation) or provision (operation).

A chi square test for heterogeneity was calculated to compare the patterns for the operation and general practitioner consultation ratios.

Results

Table 1 shows the number of consultations and operations for each condition. The number of operations was generally large, although for some conditions, for example hernias among women, the number of consultations was small.

The results can be broadly divided into two groups; those conditions where the socioeconomic pattern in operations was matched by the pattern in general practitioner consultations (concordant), and those where there was a mismatch (discordant).

The proportions of patients consulting or having operations

Table 1. Number of people consulting for and having an operation for each condition, by sex.

	No. of people consulting ^a		No. of people having operations ^b	
	Men	Women	Men	Women
<i>Varicose veins</i>				
Numerator	265	608	1314	2979
Denominator	34 289	34 085	1 130 588	1 237 310
<i>Hernia</i>				
Numerator	313	22	5713	529
Denominator	36 138	35 604	1 140 078	1 271 301
<i>Gallstones</i>				
Numerator	66	153	671	1596
Denominator	34 289	34 085	1 130 588	1 237 310
<i>Cataract</i>				
Numerator	72	99	3779	6246
Denominator	27 888	26 866	864 766	994 922
<i>Tonsillitis</i>				
Numerator	1823	2199	3760	4896
Denominator	34 621	34 734	1 178 661	1 160 231
<i>Osteoarthritis (hip replacement)</i>				
Numerator	796	1248	1152	3118
Denominator	20 221	19 264	625 605	755 350

^aFor all those with 1981 census linked data from the third national morbidity survey. ^bFor all residents in North East Thames Regional Health Authority in 1991–92.

who could not be assigned a social class grouping either because occupation was not stated or was inadequately described, by consultation grouping, is as follows: varicose veins 6.4%, hernia 8.4%, gallstones 4.3%, cataract 15.1%, tonsillitis 4.0% and osteoarthritis 9.2%.

For varicose veins, general practitioner consultation and operation ratios were higher with increasing deprivation (Figure 1a). An approximate inverted U shape was observed for patient consultations and operations for cataract (Figure 1b) and tonsillitis (Figure 1c). The chi square test of heterogeneity showed no difference in consultation and operation rates for varicose veins and cataract, but suggested that there was a difference between the pattern of consultations and operations for tonsillitis ($\chi^2 = 8.3$, 3 degrees of freedom, $P < 0.05$).

For hernia, gallstones and osteoarthritis, there was a marked difference between general practitioner consulting patterns and operation rates (Figure 1d-f). For these conditions, there was an increase in consultations with lower social class. However, there was no corresponding trend in operations for either hernia or gallstones. This finding from visual inspection is supported by the chi square heterogeneity statistic for hernia ($\chi^2 = 8.7$, 3df, $P < 0.05$), but not for gallstones. Even more strikingly, the trend for hip operations was in the opposite direction to patient consultations for osteoarthritis. General practitioner consultations for osteoarthritis were higher in the lower social classes, while hip operations were more commonly performed on those living in areas of relative affluence ($\chi^2 = 71.4$, 3df, $P < 0.001$).

One third of all patients in this study were on the lists of the general practitioners based in the south east of England. The patterns of consultation by social class for this subgroup did not differ to any marked degree from the total sample.

Discussion

Provision of health care should be primarily determined by need. This study has shown that for some conditions, while general practitioner consultations increase with social deprivation, operation rates do not appear to show the same pattern. Others in the UK have shown that there are socioeconomic differences in general practitioner consultation rates,¹⁶ and differences in operation rates,¹⁷ but have not related the two.

From these data, barriers to surgery appeared to occur after patients recognized their symptoms and sought help. This finding was not seen for all conditions, but appeared true of hernia, cholecystectomy and hip operations. Statistical tests comparing patterns of consultation with operations supported the visual comparison of these conditions except for tonsillitis and gallstones. While the pattern for tonsillitis appeared concordant, the number of people consulting for tonsillitis and receiving operations was large, and hence slight differences in the two patterns were statistically significant. Conversely, the number of subjects consulting for gallbladder problems was relatively small, and the study therefore lacked the power to demonstrate a statistical difference between consultation and operation ratios.

Studies from the USA show that higher socioeconomic status, variously measured as level of health insurance, income or education, is associated with higher operation rates.^{18,19} These findings have been interpreted as a consequence of the financial incentives inherent in USA health care. A comparison of the variables determining operation rates in North America and the UK showed that while provision of surgical manpower was directly related to operation rates in North America, this relationship was much weaker in the UK.²⁰ In addition to supplier related factors, demand related variables, such as knowledge and the ability to articulate need may also contribute to these variations. Medical professionals are shown to have higher operation rates even when

compared with other professional groups.²¹ The association between knowledge and service use is further supported by the observation that disadvantaged groups are less likely to know about and therefore attend breast and cervical screening services.^{19,22}

In this analysis routinely available data have been used, and it is important to consider possible limitations and biases. The measure of 'expressed need' was based on data from the 1981 national morbidity survey. The participating practices throughout England and Wales are not typical of all general practitioners. Patient profiles do however appear similar to the general population.¹¹ Further, general practitioners who participate in the national morbidity survey are usually younger, and have more qualifications than those who do not, and may differ in their response to the needs of more deprived patients.¹¹

The study set out to determine whether current provision matched expressed need, and hence recent hospital data for operation rates were used. However, consultation rates were only available for a period a decade earlier. It is not yet possible to know whether there have been any temporal changes in social class patterns for consultation. But the true incidences for these conditions by socioeconomic status would not change in the short period. Thus, the temporal gap between consultation and operation data would only be problematic if subjects of lower socioeconomic status presented more frequently in 1981 than in 1991, and this seems unlikely.

More deprived groups accept a greater degree of ill health as normal, and are therefore less likely to consult a general practitioner.²³ This suggests that the observed consultation rates for the more deprived groups are an underestimate and a more accurate measure of need would increase the observed disparities between rates of consultation and operation. There is a suggestion that people in lower socioeconomic groups consult later than people of higher social groups in the natural history of their disease, and are therefore more likely to require surgical than conservative intervention.^{16,24} This too would increase the observed disparities.

The data on operations used were based on routine hospital statistics. Private operations were therefore not included, as these data are not routinely available. In 1981, the proportion of total surgery performed privately varied from 11% for cholecystectomy, to 26% for total hip replacement.²⁵ These proportions are likely to have increased in the last few years, but private operations are more commonly performed on people of higher socioeconomic status.¹⁷ The inclusion of private operation data would therefore disproportionately increase operation rates for the higher socioeconomic groups. The mismatch in the discordant results found here would be increased; the other patterns would be less concordant.

Because no information was collected on individual socioeconomic status for the operation data, individuals were classified by an area deprivation score for their ward of residence. The results may also be distorted by the 'ecological fallacy' whereby recipients of operations in the more affluent areas may actually be of lower socioeconomic status. It is not possible to address this criticism without obtaining individual data from case notes. An ecological measure is of value as demonstrated by the strong associations between area and individual classification for mortality,^{15,26,27} and between area and morbidity for both chronic²⁷ and infectious diseases.²⁸ Ecological measures have been usefully applied to predicting general practitioner consultations,^{29,30} and to psychiatric³¹ and hospital admissions.²⁶ Further, an individual based study in one general practice confirmed that while people in deprived groups reported more serious illness than controls in more affluent areas, consultant referral rates were equal in the two groups.³²

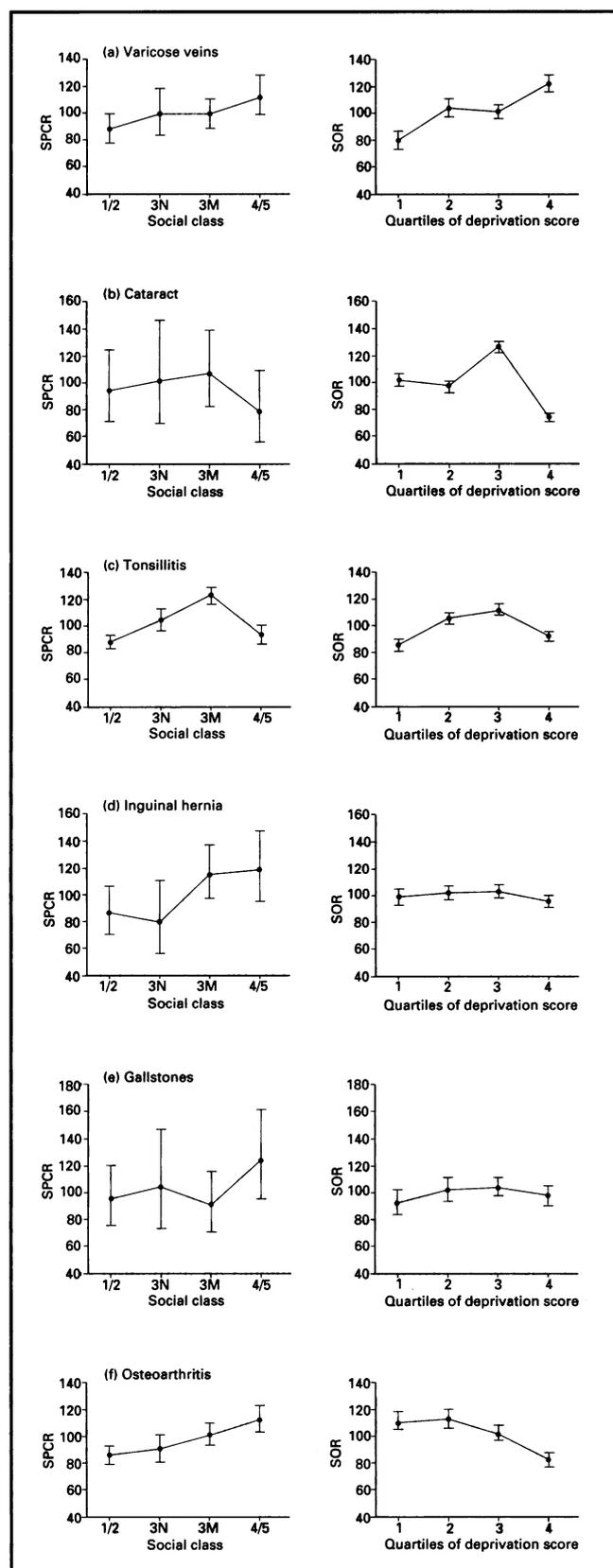


Figure 1. Standardized patient consultation ratios (SPCR) and standardized operation ratios (SOR) by deprivation (a value of greater than 100 indicates a higher than expected level of expressed need or provision). The bars indicate 95% confidence intervals.

The results presented here suggest that at least some of the influences resulting in poorer access to surgical intervention for disadvantaged people may act after presentation to the health care system. There are two main reasons why an operation may not be performed after presentation to a general practitioner. People from lower social groups may have a higher prevalence of co-morbid conditions, which may be contraindications to surgery. This may explain why for some of the six conditions studied relationships were concordant, and for others discordant. Of these six conditions, people with either tonsillitis or varicose veins are relatively young and therefore least likely to have other co-morbid conditions. The explanation of a concordant pattern for cataract may be due to the very low general practitioner consultation rates in the lower socioeconomic groups as people in these groups may be more tolerant of deteriorating eyesight. Candidates for hernia, cholecystectomy and hip operations are generally older and more likely to have other co-morbid conditions which make surgery less advisable.

A further explanation is that barriers to care are service related. Tudor Hart proposed the inverse care law, which states that poorer quality primary care was to be found in more deprived areas, where the need was greatest.³³ This is supported by Cartwright and Anderson, who showed that general practitioners of working class patients were more likely to have large lists, less likely to have a postgraduate qualification, and more likely to use a deputizing service.³⁴ They also found that people from lower social classes were less likely to have been a hospital inpatient in the last 12 months. In an analysis of data from the general household survey, the ratio of hospital referral to measures of ill health was highest in the higher social classes.³⁵ Further, in the 1970–71 general practice morbidity survey, while general practitioner consultation rates for all conditions did not differ by social class, referral rates for a specialist opinion were highest for the higher social classes.³⁶ Interestingly, this trend was not seen in the 1980–81 survey.¹³ However, an analysis grouping all conditions ignores social class variations between conditions, and these grouped analyses may therefore be misleading.

In conclusion, these findings suggest that there is a mismatch between expressed need and provision for some conditions amenable to surgery, at least in the north east Thames region. The reasons for this should be investigated further. A relatively simple method for examining whether the provision of hospital services is matched by need as assessed by general practitioner consultation has been demonstrated. It is possible that the findings may be unique to north east Thames, and different patterns may occur in other parts of the UK, especially if important barriers to care are service related. Like other ecological analyses, these findings are intended to highlight potential areas of interest, which will require further detailed studies for validation. These should obtain data on individual socioeconomic status as well as the presence of other co-morbid conditions that may affect the likelihood of receiving a surgical intervention. Other regions could repeat these analyses to assess their own situation, and results could act as a baseline to monitor, and hopefully influence, temporal trends. Unless we explicitly compare need with provision by socioeconomic status, as well as sex³⁷ and ethnicity,³⁸ we will not know to what degree the NHS provides a comprehensive and equitable health care system.

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