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Horizontal inequities in Australia's mixed public/private health care system

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CHERE WORKING PAPER 2006/13

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Version: June 2006

Abstract

Recent OECD country comparative evidence suggests that Australia's mixed public-private health system does a good job in ensuring high and fairly equal access to doctor, hospital and dental care services. This paper provides some further analysis of the same data from the *Australian National Health Survey* for 2001 to see to what extent the general finding of horizontal equity remains when the full potential of the data is realized. We extend the common core cross-country comparative analysis by expanding the set of indicators used in the procedure of standardizing for health care need differences, by providing a separate analysis for the use for general practitioner and specialist care and by differentiating between admissions as public and private patients.

Overall, our analysis confirms that in 2001 Medicare largely did seem to be attaining its goal of an equitable distribution of health care access: Australians in need of care did get to see a doctor and to be admitted to a hospital. However, they were not equally likely to see the *same* doctor and to end up in the *same* hospital bed. As in other OECD countries, higher income Australians are more likely to consult a specialist, all else equal, while lower income patients were more likely to consult a general practitioner. The unequal distribution of private health insurance contributes to the phenomenon that the better-off and the less well-off do not receive the same mix of services. There is a risk that, as in some other OECD countries, the Medicare objective of equal access for equal need may be further compromised by the future expansion of the private sector in secondary care services. To the extent that such inequalities in use may translate in inequalities in health outcomes, they may be some reason for concern.

Acknowledgements

The authors are grateful to NHMRC for financial support to this work through a Program Grant (no. 254202), to the Australian Bureau of Statistics for access to the National Health Survey 2001 data. This paper was initiated while the first author was a Visiting Professor at CHERE, UTS, Sydney.

1. Introduction

Australia provides universal coverage through a publicly financed health scheme, known generally as Medicare. Free public hospital care and free or subsidized medical care should ensure that equitable access to health care, at least in terms of financial barriers, is achieved. Nonetheless, out-of-pocket spending on health care in Australia is higher than many similar OECD countries and has been growing rapidly (Australian Institute of Health and Welfare, 2005). Since 1996, government policy has encouraged the growth of the private sector with subsidies and tax incentives for private health insurance. There have been recent concerns over increasing patient payments, particularly for primary medical care, which have resulted in new strategies aimed at limiting exposure to out-of-pocket costs.

A recent five-country comparative study based on the 2001 Commonwealth Fund International Health Policy Survey compared inequities in access to medical care in Australia to those observed in Canada, New Zealand, United Kingdom, and United States. On the basis of a multivariate analysis of a cross-sectional 2001 random telephone survey of 1400 adults in each of these countries, they conclude that here were few significant access differences by income in Australia; yet, compared to UK, Australians were more likely to report out of pocket costs, and those with above-average income were more likely to have private supplemental insurance which protected them from cost-related access problems. However, this study uses respondents' own ratings about whether they are in high or low income and whether or not they experienced any access problems.

In the health economics literature, a fairly standard approach to the testing and measurement of income-related inequity in actual health care utilisation using health interview surveys has been developed (Wagstaff and van Doorslaer, 2000) and applied in a number of cross-country comparisons of income-related inequity (Van Doorslaer et al, 1992, 1993, 2000). An early study using similar methods was done for Australia (Lairson et al, 1995) using the 1989-90 National Health Survey. They find mixed results but this is largely due to their separate use of various morbidity variables as health care need indicators. Recently, Australia was included for the first time in a similar comparison involving 21 OECD countries and using a more appropriate and uniform methodology (Van Doorslaer et al, 2004, 2006). The Australian results show a slight pro-poor inequality in both the probability of hospital visit and no inequality in the probability of doctor visits over the last twelve months. While this suggests that the Australian system performs well against the equitable access criterion, this conclusion has to be treated cautiously. Data availability (from the Australian 2001 *National Health Survey*) allowed only a limited number of comparisons with other OCED countries. For example, the 2001 NHS asked for recall of whether there had been a GP or specialist doctor visit in the last two weeks, how many such visits and the time since the last consultation with either type of doctor. For hospital admissions data was collected on number of admissions in the last twelve months and the number of nights and patient type at the most recent admission. A finding for other OECD countries was that while the majority had either pro-poor or non-significant levels of inequality in the overall number of doctor visits in the last twelve months, the distribution of general practitioner visit was generally pro-poor while the

distribution of specialist visits was generally pro-rich. The 2001 NHS did allow this comparison over the twelve month recall frame.

The aim of this paper is to explore further the issue of income-related use of health care in Australia. In particular, we examine inequality in hospital use split by patient status, public or private, and the distribution of GP and specialist use over the 2 week timeframe. We also undertake a decomposition of the inequality measure for GP and specialist visits to shed light on how different factors contribute to the inequalities in access to care. The horizontal version of the equity principle is interpreted to require that people in equal need of care are treated equally, irrespective of characteristics such as income, place of residence, race, etc. It is this principle of horizontal equity that the present study uses as the yardstick for its assessment of the Australian situation.

2. The Australian health care system and equity

Medicare covers basic hospital, medical services and pharmaceuticals. Private health insurance is limited to covering private hospital treatment (in a public or private hospital) and some ancillary services, including dentistry. Concession card holders, largely those in receipt of the aged pension or other social security payments, are entitled to a lower co-payment under the Pharmaceutical Benefits Scheme. While there has been an expectation that concession card holders would be bulk billed, there has been no explicit incentive to do so in the period under consideration.

All Australians are entitled to be treated free of charge as public patients in public hospitals. Private treatment is subsidized through the reimbursement of some in-hospital medical costs. Since 1996 there has been increasing government emphasis on private financing of health care, with a series of incentives designed to increase private cover. These include the 30% subsidy on private insurance premiums introduced in 1999 and lifetime community rating, introduced in 2000, which mandated an age-related premium loading for new entrants aged over 30 years at entry to private health insurance (Hall and Savage 2005). Overall private health insurance coverage rose from 31% to 45%. The extent to which private patients in both public and private hospitals face out-of-pocket costs depends on their insurance policy and agreements between insurers and providers. Private insurance offers the choice of doctor (public patients are treated by doctors paid by the hospital); and lower waiting times particularly for elective surgery.

Out of hospital medical services are for the most part provided by private medical practitioners on a fee for service basis. The patient is reimbursed by Medicare according to a fee schedule set by government (at 85% of schedule fees during this period). However, if the provider bills government directly (known in Australia as bulk billing), the Medicare reimbursement must be accepted as full payment, and the patient faces no out of pocket cost. Thus the basic structure for hospital admissions and medical services has been established so that most Australians can use essential health care without financial barriers.

Although the government, in effect, sets a floor price for medical services, medical practitioners are free to set their own fees. Any fee above the bulk billing reimbursement

rate must be met by the patient as an out-of-pocket payment and cannot be covered by private health insurance. Bulk billing rates overall have increased over time, from under 50% of all items in 1984/5 to around 70% in 2001; and are higher in general practice, around 75% in 2001 : (DoHA statistics). Bulk billing varies by provider specialty, whether a city or rural location, and socio-economic characteristics of the area of residence. As a result, whether or not a patient faces an out-of-pocket cost for a medical service depends on provider behaviour.

3. Methods and data

The degree of inequality in use of health care can be measured using the concept of a *concentration curve* as shown in Figure 11,2. It plots the cumulative distribution of use as a function of the cumulative distribution of the population ranked by income. A distribution is equal if the cumulative distribution coincides with the diagonal. If the curve lies above (below) the diagonal this indicates that use is more concentrated among the poor (rich). A concentration index (CI) measures the degree of inequality in use. When it is positive, it indicates pro-rich inequality, and when it is negative, it indicates pro-poor inequality.

We would expect overall health care use to be pro-poor because lower income groups generally have poorer health status and therefore higher need. A more appropriate measure of inequality would adjust use for differences in need. In this paper we estimate the degree of inequality in need-standardized use.

Figure 1: A (stylized) concentration curve of medical care use

The method we use to describe and measure the degree of horizontal inequity in health care delivery is conceptually identical to the one used in Wagstaff and Van Doorslaer (2000a), Van Doorslaer *et al.* (2000) , Van Doorslaer, Koolman and Puffer (2002) and Van Doorslaer, Masseria et al (2004). This compares the observed distribution of medical care by income with the distribution of need. In order to statistically adjust needs for groups or individuals, the average relationship between need and use estimated for the population as a whole is used as the "norm" of what treatment is needed. We investigate the extent to which there are any systematic deviations from this norm by income level. The approach is to model health care use employing OLS regression techniques.

Health care utilisation data such as physician visits are known to have skewed distributions with typically a large majority of survey respondents reporting zero or very few visits and only a very small proportion reporting frequent use. Because these features cause violations of the standard OLS model, various specifications of non-linear, two-part models have been proposed in the literature, distinguishing between the probability of positive usage and the amount of usage conditional on use in the reference period (see Jones, 2000, for a review). While these models have certain advantages over OLS specifications, their intrinsic non-linearity makes the (linear) decomposition method described above impossible. In order to restore the mechanics of the decomposition, one has to revert to a re-linearization of the models using approximations (see Van Doorslaer,

Koolman and Jones, 2003, for an example). However, Van Doorslaer *et al.* (2000) and Van Doorslaer, Masseria et al (2004) have shown that the measurement of horizontal inequality is not sensitive to the specification. We are confident that our results are not conditional on the choice of the linear standardization model.

3. 1 Measurement of inequity

This study describes distributions of actual and need-adjusted use of health care by income quintile, each representing 20% of the total population ranked by household equivalent income from poorest to richest. "Need-expected" health care use is computed by regressing medical care use, y_i, (*e.g.* doctor visits or hospital nights) on a set of explanatory variables.

$$[1] \qquad y_i = \alpha + \beta \ln inc_i + \sum_k \gamma_k x_{k,i} + \sum_p \delta_p z_{p,i} + \varepsilon_i$$

We distinguish between three types of explanatory variables: the (logarithm of) the household income of individual i ($\ln inc_i$), a set of k need indicator variables (x_k) including demographic and morbidity variables, and p non-need variables (z_p). α, β, γ_k and δ_p are parameters and ε_i is an error term.

Equation 1 is used to generate need-predicted values of use, $\hat{y}_i^X$, *i.e.* the expected use of medical care of individual i on the basis of his/her need characteristics. It indicates the amount of medical care s/he would received if s/he had been treated as others with the same need characteristics (e.g. age), on average. Combining estimates of the coefficients in Equation (1) with *actual* values of the x_k variables and *sample mean* values of the $\ln inc_i$ and z_p variables, we can obtain the need-predicted, or "x-expected" values of utilisation, $\hat{y}_i^X$ as:

$$[2] \qquad \hat{y}_i^X = \hat{\alpha} + \hat{\beta} \ln inc^m + \sum_k \hat{\gamma}_k x_{k,i} + \sum_p \hat{\delta}_p z_p^m$$

Estimates of the (indirectly) need-standardized utilisation, $\hat{y}_i^{IS}$, are then obtained as the difference between actual and x-expected utilisation, plus the sample mean $\left(y^m\right)$

$$[3] \qquad \hat{y}_i^{IS} = y_i - \hat{y}_i^X + y^m$$

The quintile means of these indirectly standardized values provide our need-standardized distributions of medical care. They are interpreted as the expected distributions *if need were equally distributed across quintiles*.

Quintile distributions are difficult to compare across types of care. It is therefore useful to summarize the degree of inequality observed using a *concentration index* which can be computed using a simple covariance formula, as shown below for weighted data:

$$[4] \qquad C = \frac{2}{y^m} \sum_{i=1}^{n} w_i \left(y_i - y^m\right)\left(R_i - R^m\right) = \frac{2}{\mu} \operatorname{cov}_w(y_i, R_i)$$

where y^m is the weighted sample mean of y, cov_w denotes the weighted covariance and R_i is the (representatively positioned) relative fractional rank of the ith individual, defined as :

$$[5] \qquad R_i = \tfrac{1}{n}\sum_{j=1}^{i-1} w_j + \tfrac{1}{2} w_i$$

where w_i denotes the sampling weight of the ith individual and the sum of w_i equals the sample size (n).

Testing for differences between concentration indices requires confidence intervals. Robust estimates for C and its standard error can be obtained by running the following convenient (weighted least squares) regression of (transformed) y on relative rank:

$$[6] \qquad \frac{2\sigma_R^2}{y^m} y_i = \alpha_1 + \beta_1 R_i + \varepsilon_{1,i},$$

where σ_R^2 is the variance of R_i and $\hat{\beta}_1$ is equal to C, and the estimated standard error of $\hat{\beta}_1$ provides the estimated standard error of C.

The concentration index of the actual medical care use measures the degree of inequality and the concentration index of the need-standardized use (which is our horizontal inequity index HI) measures the degree of needs-adjusted inequality. It is worth emphasizing that coinciding concentration curves for need and actual use provide a sufficient but not a necessary condition for horizontal equity. Even with crossing curves, one could have zero inequity if, for example, inequity favoring the poor in one part of the distribution exactly offsets inequity favoring the rich in another.

3. 2 Use of decomposition to explain inequality

It is possible to estimate the "contributions" of the various determinants and their relative importance. Using the regression coefficients γ_k, (partial) elasticities of medical care use with respect to each determinant k can then be defined as:

$$[7] \qquad \eta_k = \gamma_k x_k^m / y^m$$

where y^m is the (population weighted mean) of y and x_k^m is the (population weighted) mean of x_k. These elasticities denote the percentage change in y result from a percentage change in x_k.

It has been shown (Wagstaff, Van Doorslaer and Watanabe, 2003) that the total concentration index can then be written as:

$$[8] \qquad C = \eta_r C_{\ln inc} + \sum_k \eta_k C_{x,k} + \sum_p \eta_p C_{z,p} + GC_\varepsilon$$

where the first term denotes the partial contribution of income inequality, the second the (partial) contribution of the need variables, and the third the (partial) contribution of the other variables. The last term is the generalized concentration index of the error term ε. In other words, estimated inequality in predicted medical care use is a weighted sum of the inequality in each of its determinants, with the weights equal to the medical care use

elasticities. The decomposition also makes clear how each determinant k's separate contribution to total income-related inequality in health care demand can be decomposed into two meaningful parts: i) its impact on use, as measured by the use elasticity (η_k), and ii) its degree of unequal distribution across income, as measured by the (income) concentration index (C_k). This decomposition method allows us to separate the contributions of the various determinants, and also to identify the importance of each of these two components within each factor's total contribution.

3.3 Data and variables used

We use data from the 2001 Australian National Health Survey which is conducted using a representative sample of the non-institutionalized residential population. In this study we focus on the adult sample (>18). Measurement of health care utilisation is based on a combination of various survey questions. The probability of reporting at least one visit to any doctor, (either a general practitioner or a medical specialist) in the last 12 months was derived from answers to the question "When was the last time you visited a doctor?". The actual number of visits to a general practitioner or a medical specialist was recorded only for the 2 weeks preceding the interview. We also use the probability of having been admitted to a hospital in the last 12 months, and we separately investigate admissions as a public or as a private patient.

The measurement of health as a proxy for care need was based on four types of questions. First, respondents' rating of their general health status based on five categories ('excellent', 'very good', 'good', 'fair', and 'poor'). Second, data indicating whether a respondent's health status got somewhat worse, or much worse, over the last year was used to create a dummy variable for deterioration in health. Third, for the analysis of hospital use, dummy variables were included for health care conditions that were constructed from detailed data on long term conditions. Finally, nine age and gender dummies were included to reflect the fact that the meaning of the above health indicators tends to differ by age and sex.

This is a more extensive set of explanatory variables than the one used in Van Doorslaer, Masseria *et al* (2004). It is well known that the inclusion of additional health information in the need standardization procedure tends to result in less pro-poor results (see Van Doorslaer, Wagstaff and Rutten, 1993). This appears to be because the poor suffer from health problems more frequently and their health problems tend to be more severe. Less extensive use of health information in the need standardization process, because of the selection of a common core set of indicators for cross-country comparisons, may lead to an overestimation of pro-poor patterns. We therefore expect less pro-poor findings in this study.

Household income per equivalent adult was only available for income decile groups. Our income measure was defined as the logarithm of the mean household weekly equivalent income for the decile in which the individual's household was located (ranging from $110 for the bottom decile to $1420 for the top decile).

Other explanatory variables used in the analysis included education and employment status, as these factors may affect an individual's general propensity to consume health care, but cannot often directly be influenced by health policy makers. A dummy variable

for whether the respondent usually speaks English at home was included as an indicator of non-financial access to health care, and dummies for location in major city or inner region to capture differences in geographical access to doctor and hospital services.

Health insurance coverage was measured by two variables: whether the person has private health insurance coverage, and whether the person has a health care concession card.

4. Results

We present quintile distributions and concentration indices for all types of care and for both unadjusted (actual) distributions and for need-adjusted (standardized) probabilities of use. Next, we investigate the contributions of various determinants of health care use using the decomposition results.

4.1 Quintile distributions and indices

The level of health care use in Australia is quite high compared to most other OECD countries; 87% of the population has seen a doctor in the last year (28% even in the last two weeks) and over 14% have been admitted to a hospital within the previous year. But such comparisons of admission rates may be contaminated by uncertainties regarding the appropriate labeling of day admissions as proper admissions or outpatient visits (Van Doorslaer, Masseria et al, 2004).

Table 1 presents probabilities and concentration indices for all subcategories of doctor and hospital use. For all types of use except private hospital admissions, lower income groups are more intensive users, as can be seen from the negative gradients by quintile and the (significantly) negative concentration indices of actual use. This is not an unfamiliar pattern in countries with universal coverage systems and reflects the fact that the need for care tends to be inversely related to income (cf. Van Doorslaer *et al*, 2004). But the degree clearly varies by type of visit and by type of admission, as is illustrated graphically in Figures 2 and 3. Figure 2 shows that the quintile distributions of GP visits are more concentrated among the lower income groups than the visits to medical specialists. And similarly, figure 3 demonstrates that the distributions of hospital admissions as public or private patient differ dramatically by income: the probability of being admitted as a public patient is three times higher than that of being admitted as a private patient in the bottom quintile. The reverse s true at the high end: in the top income quintile the private admission probability is twice the public admission probability.

The results for needs-standardized use are also shown in Table 1. The pattern is more mixed. The annual probability of seeing a doctor is fairly equally distributed. It is highest in the top quintile but the differences are very small and the non-significant concentration index suggests an equitable distribution. All other indices are significantly different from zero, suggesting either inequity favoring the poor (if negative) or inequity favouring the rich (if positive). GP visit probability in the last two weeks is pro-poor while specialist visit probability is pro-rich. The combined doctor visit probability in the last two weeks is

also pro-poor but this is not surprising as GP visits constitute the great bulk of two week visits.

Table 1: Fractions of users, by quintile, by type of care, (NHS 2001)

Figure 2: GP and specialist visit probabilities in the last two weeks by doctor type by quintile of equivalent income (NHS 2001)

Figure 3: Public and private admission probabilities in the last 12 months by quintile of equivalent income (NHS 2001)

A similar pattern is observed when we examine hospital admission probabilities. The overall picture is one of a very pro-poor distribution, which remains slightly pro-poor even after standardization for need, but this obscures two very different patterns underlying admission as either a public or as a private patient. It is, of course, not possible to estimate the need for a public or a private admission separately from these data, only the general need for a hospital admission, which is why no need standardized distributions are presented separately for public and private patient admissions.

4.2 Decomposition of specialist visits and public/private admissions

A factor contributes to inequality in use if it is both distributed unequally by income and has an effect on the probability of using health care. The mechanics of the decomposition method are illustrated in Table 2 for the probability of a specialist visit. The table presents the mean, concentration index and regression coefficient for each explanatory variable in the model. These are translated into an inequality contribution using equation (7) in section 3.2. The CI for actual specialist visits (-0.050) corresponds to that presented in Table 1. The HI is derived as the CI minus the sum of the contributions of all the need indicators. It can be seen that virtually all the contributions of need proxies (especially self-assessed health and chronic conditions) are negative because morbidity is more concentrated among the lower income groups and increases the likelihood of using specialist services.

More interesting are the contributions of the non-need determinants, i.e. the factors affecting the difference between the actual distribution and the one expected on the basis of need indicators alone. It can be seen that the contribution of the (partial) effect of income itself is much smaller than that of, for instance, not having paid employment. Because private insurance is associated both with higher income and higher use of specialist visits, it has a strong positive contribution to the observed pro-rich distribution. Interestingly, for the opposite reasons, i.e. lower income associated with lower use, ceteris paribus, the concession card also contributes positively to specialist use inequality. These findings should be interpreted with caution. Obviously, private insurance and concession card status may be endogenous and it is likely that selection into these states is at least partially responsible for their contributions.

Table 2: Decomposition analysis of income-related inequality in specialist visit probability

The results of the decomposition exercise for all types of care are presented graphically in Figure 4, which shows the contributions to the measured degree of inequity after subtracting the need contributions following equation (8)). The most influential factors are the insurance and employment status variables. Concession cards contribute substantially to the observed pro-poor distribution of the GP and all doctor visit probability. In all cases, private insurance shows a positive contribution to income-related inequity, but only for the probability of a specialist visit or a hospital admission, this contribution is substantial. Less obvious is the role played by employment status, which reduces inequity in specialist use and makes hospital admission pro-poor. To some extent, this may be because, all else equal, not being in paid employment may be an indicator of need for care. If, for instance, most of the contribution is due to disability status, then in fact the contribution may be largely need-driven. If this were true, and employment status could be seen as a proxy for care need, then inclusion of its contribution among the need factors - and its deduction from overall inequity, would make specialist even more pro-rich and would turn hospital admissions from pro-poor into pro-rich inequity.

Figure. 4: Decomposition of inequity into determinant contributions

5. Conclusion

Overall, based on our analysis of the NHS 2001 data, we can conclude that Medicare largely does appear to be attaining its goal of an equitable distribution of health care access: Australians in need for care do get to see a doctor and to be admitted to a hospital. However, they are not equally likely to see the *same* doctor and to end up in the *same* hospital bed. As in other OECD countries, while lower income Australians are more likely to consult a general practitioner, those on higher incomes are more likely to go on to consult a specialist, all else equal. Those on higher incomes are also more likely to be admitted into hospital as a private than as a public patient. The unequal distribution of private insurance by income further stimulates the phenomenon that the better-off and the less well-off do not receive the same mix of services. While the partial effect of private insurance identified in this paper cannot be interpreted as causal because it is at least partially endogenous, European evidence suggests that controlling for endogeneity does not necessarily reduce the specialist utilisation effect of (supplementary) private insurance. Indeed, using employer-provided cover as an instrument, Jones *et al* (2006) find that there is positive (rather than adverse) selection into such coverage and that correction for this selection effect even increases the utilisation effect. So the estimated contribution of private insurance need not necessarily be an upper bound.

Similarly, the chances of being admitted as a public or private patient are very unequally distributed and very much related to the unequal distribution of private insurance and medical cards by income. Whether or not the observed unequal care mix by income is

undesirable probably depends on the extent to which it translates into unequal health outcomes. Evidence from other countries suggests that unequal access to specialist care services may result in unequal outcomes for cardiac patients (e.g. Alter et al 2004, 2006 for Ontario), but such evidence is currently lacking for Australia.

Our study was somewhat constrained by the limitations of the NHS 2001 survey data. As is true for all surveys, all information - on both income, health and use - is self-reported and therefore may to some degree be subject to inaccurate recall, or misreporting. In addition, and because of the typical infrequency of health care utilisation, the very short recall period of two weeks makes it less than ideal for a more detailed analysis of its appropriateness. And finally, it is unclear to what extent the hospital admission data used here excludes some same-day admissions, which is not unimportant because they constitute around half of all hospital admissions in Australia. Most of these limitations could be overcome if administrative health care data such Medicare records could be linked with measures of socioeconomic status such as income from taxation records. This is something we believe deserves serious consideration in future research.

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Tables

Table 1: Fractions of users, by quintile, by type of care, (NHS 2001)

	Quintile							
	1	**2**	**3**	**4**	**5**	**Total**	**Conc/HI Index**	**t-stat**
Probability of a visit to:								
Actual use								
Any doctor, in 12months	0.895	0.880	0.833	0.830	0.832	0.854	**-0.0164**	-6.97
a GP, in 2 weeks	0.339	0.304	0.216	0.193	0.179	0.245	**-0.1411**	-14.45
a specialist, in 2 weeks	0.079	0.068	0.057	0.055	0.065	0.065	**-0.0505**	-2.37
Any doctor, in 2 weeks	0.373	0.335	0.242	0.222	0.217	0.277	**-0.1233**	-13.7
Need standardized use								
Any doctor, in 12months	0.852	0.850	0.847	0.853	0.864	0.854	0.0029	1.29
a GP, in 2 weeks	0.281	0.268	0.235	0.224	0.220	0.245	**-0.0535**	-5.73
a specialist, 2 weeks	0.057	0.059	0.063	0.065	0.078	0.065	**0.0634**	3.03
Any doctor, in 2 weeks	0.309	0.297	0.262	0.255	0.260	0.276	**-0.0394**	-4.6
Admission probability to:								
Actual use								
Any Hospital, in 12 months	0.176	0.173	0.136	0.109	0.108	0.139	**-0.1205**	-8.73
Public Admit., in 12 months	0.130	0.115	0.070	0.046	0.038	0.079	**-0.2632**	-13.82
Priv Admit., in 12 months	0.046	0.058	0.066	0.063	0.070	0.061	**0.0650**	3.04
Need standardized use								
Any Hospital, 12 months	0.145	0.156	0.140	0.122	0.135	0.139	**-0.0329**	-2.47

Note: A positive/negative CI indicates a pro-rich/pro-poor distribution. Index in bold typeface indicates statistical significantly different from zero at 99% confidence level.

Table 2: Decomposition analysis of income-related inequality in specialist visit probability

Variable	Mean	Conc Index	Regression coefficient	t-value	Contrib to Conc Ind	Summed contrib
(At least one) specialist visit (actual)	0.065	-0.050				-0.050
(At least one) specialist visit (pred)	0.065	-0.114				-0.056
Horizontal Inequity Index						**0.0633**
Log (hh income)	6.054	0.067	0.002	0.51	0.014	0.014
Self-assessed health very good	0.325	0.110	0.005	0.98	0.003	
Self-assessed health good	0.309	-0.034	0.015	2.5	-0.002	
Self-assessed health fair	0.139	-0.217	0.050	5.17	-0.023	
Self-assessed health poor	0.050	-0.427	0.095	5.02	-0.031	-0.054
Health worse than a year ago	0.113	-0.110	0.046	4.65	-0.009	
Health much worse than a year ago	0.020	-0.236	0.138	4.51	-0.010	-0.019
Male 34-49	0.160	0.181	-0.005	-0.76	-0.002	
Male 50-64	0.115	0.070	-0.005	-0.53	-0.001	
Male 65-74	0.049	-0.384	0.015	0.94	-0.004	
Male 75+	0.032	-0.414	0.009	0.46	-0.002	-0.009
Female15-34	0.146	0.074	0.045	3.79	0.008	
Female 34-49	0.159	0.066	0.011	1.33	0.002	
Female 50-64	0.108	-0.047	0.016	1.4	-0.001	
Female 65-74	0.050	-0.425	0.009	0.54	-0.003	
Female 75+	0.041	-0.487	-0.028	-1.65	0.009	
Fem 20-35 with child(ren)	0.090	-0.076	-0.011	-0.8	0.001	0.015
Other Infectious Diseases	0.010	-0.054	0.057	1.87	-0.001	
Other Neoplasms	0.003	-0.009	-0.014	-0.35	0.000	
Diabetes with no Complications	0.035	-0.276	0.040	2.2	-0.006	
Type I Diabetes Mellitus	0.006	-0.215	0.086	1.85	-0.002	
Other endocrine Disorders	0.087	-0.158	-0.004	-0.37	0.001	
Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders	0.036	-0.211	-0.005	-0.32	0.001	
Other Gastrointestinal Disorders	0.074	-0.097	-0.005	-0.5	0.001	
Rheumatoid Arthritis	0.032	-0.299	0.024	1.38	-0.004	
Osteoporosis	0.030	-0.236	0.046	2.37	-0.005	
Other Musculoskeletal Disorders	0.404	-0.082	0.004	0.71	-0.002	
Disorders of Immunity	0.003	0.030	0.106	1.41	0.000	
Iron Deficiency and Anemias	0.016	-0.069	0.005	0.27	0.000	
Drug/Alcohol Abuse	0.008	-0.122	-0.004	-0.14	0.000	
Personality Disorders	0.048	-0.169	0.028	1.88	-0.003	
Depression	0.007	-0.227	-0.035	-1.16	0.001	
Anxiety Disorders	0.051	-0.121	0.001	0.08	0.000	
Other Psychiatric Disorders	0.034	-0.261	0.029	1.65	-0.004	
Other Developmental Disability	0.001	-0.049	-0.040	-0.97	0.000	
Seizure Disorders and Convulsions	0.007	-0.216	0.060	1.43	-0.001	
Mononeuropathy/Injuries	0.076	0.007	0.005	0.53	0.000	
Hypertensive Heart Disease	0.142	-0.227	0.006	0.66	-0.003	
Other Heart Disease	0.001	-0.218	-0.097	-3.44	0.000	
Cerebrovascular Disease	0.028	-0.407	0.009	0.5	-0.002	
Vascular Disease	0.015	-0.373	-0.011	-0.51	0.001	
Other Circulatory Disease	0.040	-0.162	-0.003	-0.19	0.000	

Chronic Obstructive Pulmonary Dis.	0.010	-0.417	-0.047	-1.84	0.003	
Asthma	0.106	-0.026	0.001	0.11	0.000	
Other Lung Disorders	0.032	-0.185	-0.002	-0.11	0.000	
Glaucoma	0.013	-0.257	0.048	1.65	-0.002	
Cataract	0.029	-0.362	0.038	1.86	-0.006	
Other Eye Disorders	0.654	-0.031	0.010	1.69	-0.003	
Hearing Loss	0.141	-0.141	0.013	1.73	-0.004	
Other Ear, Nose, Throat Disorders	0.281	0.033	-0.003	-0.59	0.000	
Urinary Obstruction and Retention	0.026	-0.144	0.003	0.15	0.000	
Incontinence	0.012	-0.320	0.025	0.88	-0.001	
Other Urinary Tract Disorders	0.019	-0.019	0.017	0.87	0.000	
Other Dermatological Disorders	0.034	0.006	-0.015	-1.27	0.000	
Major Symptoms, Abnormalities	0.004	-0.237	0.122	1.87	-0.002	
Minor Symptoms, Signs, Findings	0.103	-0.072	0.020	2.22	-0.002	-0.047
Education: year 9 to 11 completed	0.385	-0.012	0.004	0.58	0.000	
Education: Year 12 or more completed	0.380	0.220	0.009	1.25	0.012	0.012
Self-employed	0.100	0.066	0.007	0.99	0.001	
Unemployed	0.034	-0.613	-0.019	-1.9	0.006	
Out of labor force	0.344	-0.401	0.019	2.35	-0.041	-0.034
Main language spoken not English	0.150	-0.139	-0.017	-2.46	0.005	0.005
Resident of major city	0.667	0.048	0.025	4.18	0.012	
Resident of inner region	0.213	-0.098	0.017	2.47	-0.006	0.007
Private insurance	0.516	0.207	0.024	4.54	0.039	0.039
Concession card	0.356	-0.507	-0.005	-0.71	0.015	0.015

Figures

Figure 1: Concentration index of medical care use

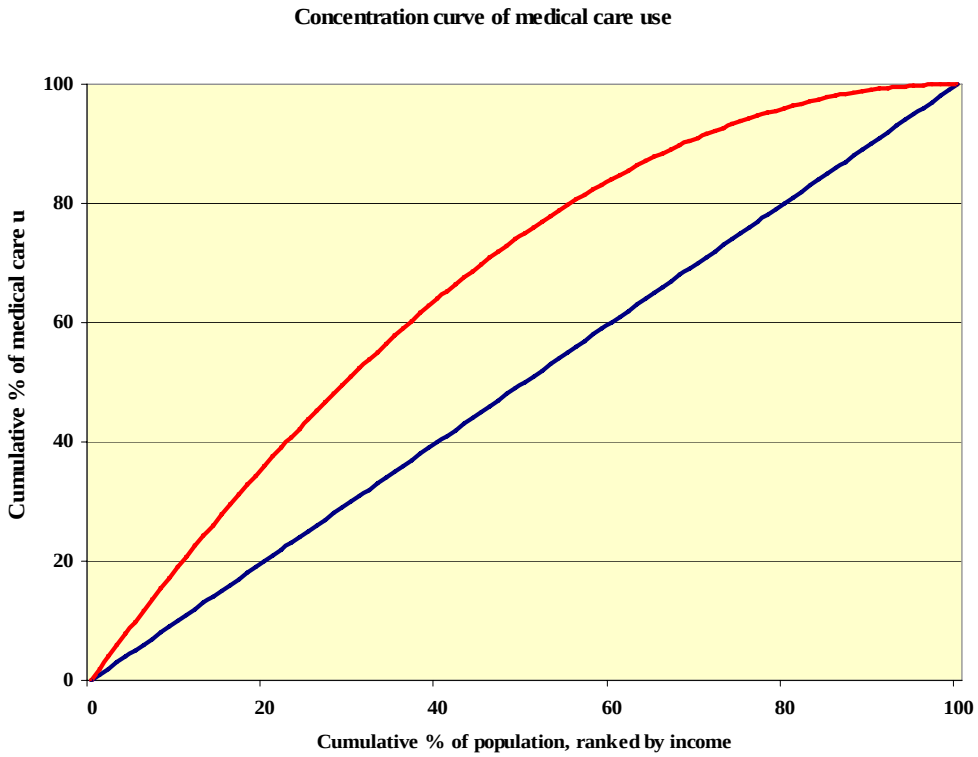

Figure 2: GP and specialist visit probabilities in the last two weeks by doctor type by quintile of equivalent income (NHS 2001)

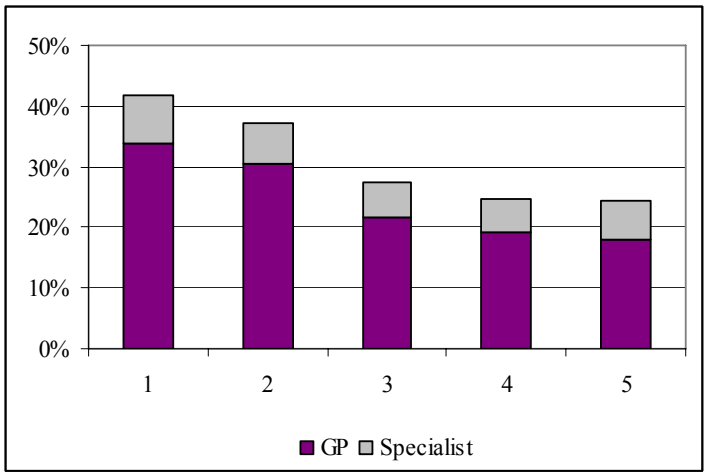

Figure 3: Public and private admission probabilities in the last 12 months by quintile of equivalent income (NHS 2001)

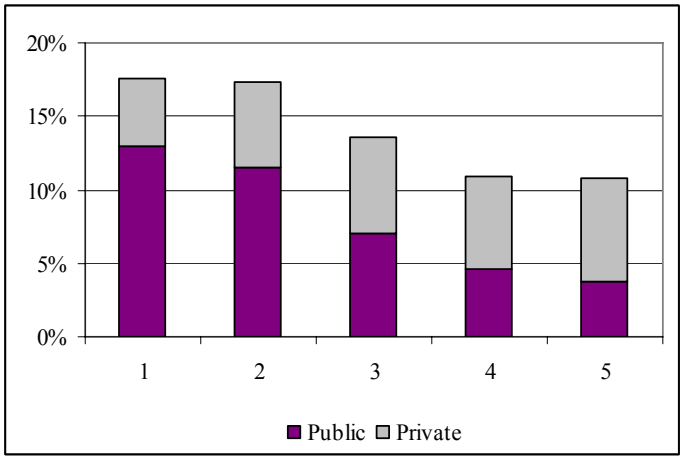
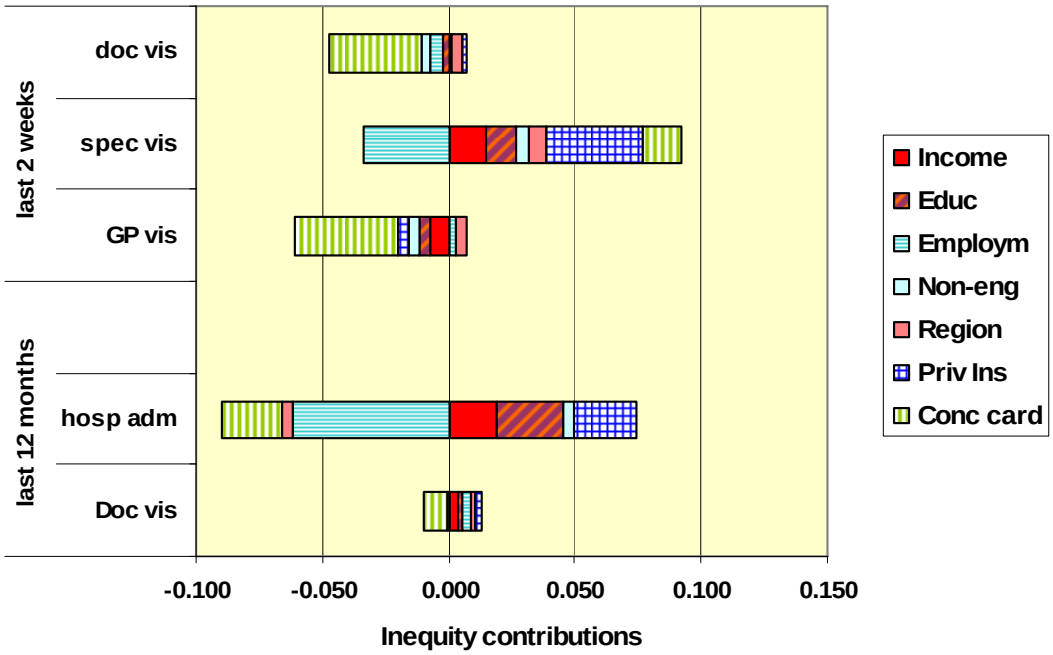
Figure. 4: Decomposition of inequity into determinant contributions