Trends in socio-economic inequality in health care in the English NHS from 2001-7: analysis of national administrative data at small area level

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Abstract:
We examine small area variations and trends in the use of four high volume hospital procedures: hip replacement, heart revascularisation, senile cataract, and inpatient gastroscopy. For each procedure, anonymous inpatient hospital records covering all English NHS patients are used to count hospital utilisation by 32,482 English small areas for each year from 2001 to 2007. This is combined with small area data on deprivation and need, including population size and demographic structure, mortality, and estimates of disease prevalence attributed from GP practice data. Small area level negative binomial regression is used to allow for observable need variables. Small areas are split into four interval groups of deprivation based on the proportion of individuals living in households claiming low income benefits: 0-10%, 10-20%, 20-30% and 30% or over. More deprived areas have lower levels of hip replacement, but higher levels of the other three procedures. There appears to be no significant and systematic change in this pattern of utilisation differentials from 2001 to 2007 for any of our four tracer procedures. Socio-economic inequality in health care in the English NHS does not appear to have changed much from 2001 to 2007, despite major expenditure growth and reform.

Keywords: Access to Health Car, Health Care Economics and Organizations, Small Area Variations, Socioeconomic Factors,

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1. Introduction

The early and mid 2000s was a period of major expenditure growth and efficiency-oriented reform in the English NHS, which saw substantial falls in waiting times for hospital care. When Prime Minister Tony Blair was promoting his NHS reform programme in the early 2000s, he claimed that the resulting increase in capacity and choice would enhance equity for poorer patients (Blair 2003, Department of Health 2003); an argument subsequently elaborated by academic proponents of reform, who pointed to evidence of long-standing socio-economic inequalities in the use of specialist health care in the NHS prior to the reforms (Dixon & Le Grand, 2006; Dixon, Le Grand, Henderson, Murray, & Poteliakhoff, 2007). On the other hand, critics argued that the new emphasis on patient choice and provider diversity would undermine equity and lead to widening socio-economic health care inequalities (Appleby, Harrison, & Devlin, 2003), Tudor-Hart 2006). It is therefore of interest to find out what actually happened as a result of these reforms: did socio-economic health care inequality in the English NHS get better or worse?

Unfortunately, this question is not easy to address using household survey data of the kind that is usually employed in the literature on analysing health care equity (O'Donnell et al. 2008). Traditional indicators of health care utilisation in repeated national household surveys – such as the British Household Panel Survey or the Health Survey for England – are often rather general, such as whether or not the individual visited a hospital doctor in the past three months. This kind of indicator is rather broad-brush, and may not be able to pick up important changes in the use of high cost inpatient hospital treatments, as opposed to low cost outpatient hospital consultations, nor to pinpoint the specific areas of health care in which inequality change is most substantial. Some repeated national household surveys – in particular the biennial English Longitudinal

Survey of Health and Aging (ELSA) which has followed around 12,000 individuals aged over 50 since 2002 – do contain data on specific types of inpatient hospital utilisation, such as whether the individual has recently undergone a hip replacement. However, use of any specific inpatient procedures is relatively rare for individuals within the general population – only a fraction of the population will ever need any particular procedure, and they will not need it every year. For example, in 2007 the national rate of hip replacement for adults over 44 was 221 per 100,000 (see Table 1), and so we would only expect about 26 individuals in the ELSA survey to undergo a hip replacement each year. The total volume of utilisation of any particular hospital inpatient procedure in any particular year among a general survey population will therefore be small – tens or hundreds at most, even among a comparatively large survey population of tens of thousands – and so it will be hard reliably to identify statistically significant changes in socio-economic inequality in the use of those procedures over time.

We therefore turn to administrative data, from the national Hospital Episode Statistics (HES) database that contains anonymous hospital records on all English NHS inpatient activity during this period – i.e. data on millions rather than thousands of individuals. This enables us to examine trends in the use of specific hospital inpatient procedures. We focus on four tracer procedures as indicators of broader health care inequality trends – hip replacement, senile cataract, heart revascularisation, and inpatient gastroscopy. All of these are high volume procedures, with tens of thousands of procedures performed each year – or hundreds of thousands in the case of gastrosopy – thus potentially enabling us to detect statistically significant inequality trends over time. Hip replacement and senile cataract are both primary targets of health care reform, with initially high waiting times that fell substantially during the period. Examining heart revascularisation allows us to check whether inequality trends differ for

a more specialised form of care, not directly subject to the "patient choice" and "provider diversity" elements of reform. Finally, inpatient gastroscopy is examined in order to check whether inequality trends differ for a diagnostic procedure, as opposed to treatments.

By aggregating national hospital records to small area level, we can examine how far small area variations in the use of these specific hospital procedures are associated with deprivation, as was done in the pioneering cross sectional regional study by Chartuvedi and Ben Shlomo (1995) and in subsequent national studies (Cookson, Dusheiko, & Hardman, 2007). Our methodological contribution is to track these cross sectional associations forwards over time on a year-by-year basis, to examine trends in inequality over time.

Our analysis of year-by-year trends is more powerful than cross sectional analysis, which suffers from the serious drawback that measures of population need at small area level are inevitably rather crude. Hence in cross sectional small area analysis it is likely that observed differences in use of care between more and less deprived areas of the country partly reflect unobserved differences in population need. When examining changes in utilisation patterns over time, however, it is reasonable to assume that unobserved differences in population need between more and less deprived areas are unlikely to change much over a period of a few years. We provide some evidence for this later in the paper, showing similar trends in mortality from ischaemic heart disease and prevalence of coronary heart disease between more and less deprived areas. Hence a narrowing or widening of observed utilisation disparities between more and less deprived areas can reasonably be interpreted as an improvement or deterioration in socio-economic health care *equity* – i.e. a good or bad thing – rather than a differential trend in need.

The main advantage of our approach is that our analysis covers all patients in the English NHS, and so is highly representative of all sections of the community – including the most socio-economically deprived individuals, who are sometimes hard to include in sample surveys. The main limitations are (1) that we do not cover all important forms of health care – for instance, we do not cover cancer care because unobserved heterogeneity in diagnosis and staging make it hard to tell whether a higher procedure rate is "good" or "bad" – and (2) we only observe socio-economic inequality at the level of small areas – with mean population 1,500 – and not at the level of individuals. Despite these two limitations, we feel this analysis will be of interest to policy makers as the first national picture of trends in small area socio-economic inequality in the use of a range of different hospital procedures, all of which one might expect to be influenced – one way or another – by the major reforms that took place in the English NHS from 2001-7.

2. Methods

We examine inequality in the use of health care between groups of English small areas with varying degrees of income deprivation, and track these inequalities over time for seven financial years from 2001/2 to 2007/8. In each year we divide small areas into four interval groups of deprivation, in terms of the proportion of individuals on low income benefits: (1) 0-10%, (2) 10-20%, (3) 20%-30% and (4) 30% or above. This generates four unequally sized groups comprising about 57%, 22%, 12% and 9% of small areas respectively. The precise proportions vary slightly from year to year, with some small areas moving between deprivation groups due to changing economic circumstances over time. We examine other deprivation splits in sensitivity analysis, including deprivation quartiles generating four equally sized groups and deprivation

measures fixed in time so that small areas stay in the same deprivation group for the full seven year period.

We allow for observed small area need variables using small area level negative binomial regression, using the standard methodology for analysing health equity (O'Donnell et al. 2008). The standardising regression has small area utilisation count as the dependent variable, and includes income deprivation (the proportion of the population reliance on low income benefits) as well as need variables on the right hand side. Including deprivation in the standardising regression allows for correlation between need and deprivation, and helps to make a more appropriate adjustment for need that is less confounded by deprivation. Separate standardising regressions are run for each of our four procedures, selecting appropriate need variables in each case – see below.

The resulting model estimates are then used to compute need-predicted utilisation for each small area, using the need variables but setting deprivation to its mean value (O'Donnell et al. 2008). This is then used to calculate a standardised utilisation ratio for each small area in each year – the observed utilisation count divided by the need-predicted utilisation count. This variable is used to compute an adjusted utilisation rate per 100,000 for each small area in each year – the standardised utilisation ratio times the national mean utilisation rate per 100,000 for that year. These small area level variables are then aggregated across deprivation groups of small areas using population weighted means. Analogous methods are used to compute standardised mortality ratios and adjusted mortality rates for ischaemic heart disease by deprivation groups.

For hip replacement and senile cataract we rely exclusively on population size and age-sex structure as small area need variables. For heart revascularisation we also include the estimated small area prevalence of chronic heart or lung disease, and for gastroscopy we also include the estimated small area prevalence of obesity.

Finally, we also employ negative binomial regression to test whether inequality differentials between deprived and non-deprived groups change significantly from year to year, using 2001/2 as the baseline. These regressions use the same variables as the standardising regressions, except with the addition of year interactions with deprivation for each year from 2002/3 onwards. The main coefficient on deprivation shows baseline inequality in the year 2001/2. The coefficients on year interactions with deprivation from 2002/3 onwards then test whether inequality has changed significantly from baseline inequality.

4. Data

To measure small area hospital utilisation we use anonymous hospital records from the national Hospital Episode Statistics database, which covers all patients treated in the English NHS. For each of our four procedures, records are extracted for each financial year from 2001/2 to 2007/8 and aggregated to small area level. The small area used is the Lower Super Output Area (LSOA). There are 32,482 LSOAs in England with a mean population of about 1,500 individuals and a minimum of 1,000.

Our first procedure is elective admissions involving primary total prosthetic replacement of the hip joint. These are identified under OPCS-4 codes W37.1, W38.1 and W39.1 as reported under the main operation. These OPCS-4 codes represent the three main variants of this procedure –

"using cement", "not using cement", and "not elsewhere classified". We exclude patients coming for revisions or conversions of previous hip operations. We also exclude other types of hip replacement operation such as hybrid prosthetic replacements, resurfacings, and prosthetic replacement of the neck of femur. We include in the analysis patients aged 45 and over only since they represent the vast majority of people in need of an elective hip replacement. Focusing on this section of the population limits the heterogeneity of in the need for such a procedure.

Our second procedure is elective revascularisation, which consists of percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG). Patients receiving an elective revascularization procedure were identified using OPCS-4 codes K40-K46, K49-50 and K75 reported under the main operation. We include patients aged 45 and over only that represent the vast majority of people in need of such a procedure.

Elective senile cataract is the third procedure in our basket. Patients aged 45 and over were included and identified by OPCS-4 codes C71, C72, C74, C75 reported in their main operation and ICD-10 codes H25 and R69 in their primary diagnosis[1].

The fourth procedure examined is elective gastroscopy. We include patients aged 18 and over identified by OPCS-4 code G45 reported in their primary procedure.

[1] Senile cataract is identified using ICD-10 code H25 and OPCS-4 codes. R69 defines unknown and unspecified causes of morbidities and is reported by independent sector organizations in the vast majority of cases. R69 code is then included in order to identify patients treated by independent sector organizations that otherwise would have been excluded. Cataract and hip replacement procedures are supplied by independent sector organizations with significant volumes.

Small area income deprivation is measured at LSOA level using the time-varying income deprivation domain of the English Economic Deprivation Index (EDI) 2008. The EDI 2008 income domain score indicates the proportion of the LSOA population aged from 0 to 60 who are living in households receiving one of two out-of-work means-tested benefits: Income Support (IS) or income-based Job Seekers Allowance (JSA-IB). The index is based on mid-year population estimates from the Office of National Statistics (ONS) and benefit claims data from the Department of Work and Pensions (Department of Communities and Local Government 2008). The index covers each year from 1999 to 2005, and for years 2006 and 2007 we use the 2005 value. In sensitivity analysis, we also use two time-fixed indices from the Index of Multiple Deprivation 2004, both of which measure small area deprivation in the population census year of 2001 – the income deprivation index, covering all ages, and the income deprivation affecting older people index, covering people over retirement age.

For each year, data on estimated small area population size and age-sex structure is obtained from the ONS mid-year population estimates. Annual data on mortality from ischaemic heart disease at small area level is also obtained from the ONS, broken down by age and sex. Data on disease prevalence at GP practice level are obtained from the Quality and Outcomes Framework (QOF). These data are then attributed to small area level using the Attribution Dataset of patient registration addresses within GP practices. The attribution process assumes that prevalence for a particular small area is a weighted sum of the prevalence in each GP practice serving that small area, with weights proportional to the number of small area residents registered with each GP practice.

Three small area disease prevalence variables are constructed in this way (1) proportion adults 18 and over with coronary heart disease, (2) proportion of adults 18 and over with chronic heart or lung disease, including coronary heart disease, stroke or transient ischaemic attack, hypertension, diabetes, asthma, and coronary obstructive pulmonary disease, and (3) proportion of adults 18 and over who are obese.

These prevalence data are based on the proportion of people 18 and over who are registered to GP practice lists. Data on coronary heart disease are available from 2004/5 to 2007/8, data on obesity are available in 2006/7 and 2007/8, and data on chronic heart and lung disease are only available from 2007/8, since they related to a smoking cessation quality indicator only introduced in the 2006 revision of the QOF. All three prevalence variables are based on practice level QOF data from the Quality Management and Analysis System (QMAS). Both the QOF data and practice to small area attribution data were obtained from the NHS Information Centre.

4. Results

Table 1 shows descriptive statistics for key variables by year, focusing on crude (unadjusted) utilisation rates per 100,000. Figure 1 shows adjusted utilisation rates and confidence intervals, after allowing for observable need variables, in the following order: (1) hip replacement, (2) senile cataract, (3) gastroscopy and (4) heart revascularisation. The left panel compares adjusted utilisation in 2001/2 and 2007/8 for our four interval groups of deprivation, with bars showing 95% confidence intervals. Deprivation is increasing as we move rightwards on the horizontal axis. More deprived groups have lower adjusted utilisation of hip replacement but higher adjusted utilisation of the other three procedures. The right panel tracks these utilisation

differentials between the four deprivation groups for each year from 2001/2 to 2007/8, with 95% confidence intervals. In each case, the four lines move roughly in parallel over time. There therefore appears to be no systematic pattern of increasing or reducing inequality over time for any of the four procedures.

Table 2 shows results of the regression test whether any of the observed changes in relative utilisation between deprived and non-deprived communities since 2001/2 are statistically significant. For all four procedures, the coefficients on interaction terms are mostly small and non-significant. Significant interactions are observed in one or two cases – for instance, hip replacement shows significantly larger inequality in 2002/3 and in 2007/8 compared with 2001/2. However, these anomalies in two particular years do not reflect any systematic pattern of widening or narrowing inequality over time. (Furthermore, our preliminary regressions have not adjusted for clustering within small areas over time – this will reduce significance levels).

Finally, Figure 2 shows trends in mortality from ischaemic heart disease from 2001/2 to 2007/8, with the adjusted mortality rate per 100,000 in the top panel and the standardised mortality ratio in the bottom panel. The bars show 95% confidence intervals. Mortality clearly increases with deprivation. The adjusted mortality rate declines each year for each deprivation group, roughly in parallel. The standardised mortality ratios in the bottom panel are horizontal over time, showing that the rate of decline is the same in all four deprivation groups.

5. Discussion

5.1 Cross sectional associations

In cross section, our small area level analysis of administrative data clearly fails to allow adequately for unobserved aspects of need. In general, deprived communities tend to have more need for health care than less deprived communities, since they suffer from more ill-health – as illustrated by figure 2. It is important to allow for such differences in need when examining inequality in health care between deprived and less deprived communities. Cross sectional small area analysis is limited in its ability to do this, because small area need variables are crude and highly correlated with deprivation. Hence cross sectional analysis is unable to adjust for important unobserved aspects of need which are correlated with deprivation.

In the cases of senile cataract, gastroscopy and heart revascularization, both crude and adjusted utilisation are higher in more deprived communities. However, it seems likely that deprived areas have lower adjusted utilisation because individuals living in those areas generally have healthier cardiovascular systems and hence have lower need for heart revascularisation, rather than because the NHS systematically favours deprived communities. In the case of hip replacement, by contrast, both crude utilisation and adjusted utilisation are lower in more deprived areas. In this case, the direction of the relationship is more plausible: there is some evidence from detailed individual level survey data that low income and in particular less well educated individuals are less likely to receive a needed hip replacement operation (Propper, Eachus, Chan, Pearson, & Smith, 2005, Milner et al. 2004). However, the magnitude of the cross sectional relationship is highly questionable: our crude adjustment for age and sex alone is

highly unlikely to capture all aspects of need for hip replacement, and may either under-estimate or over-estimate relative need in deprived communities.

5.2 Choice of small area need variables

Our choice of small area need variables for cross sectional analysis is not essential, as our key focus is on the time trends. However, we did perform sensitivity analysis using alternative need variables, especially in relation to heart revascularisation. We examined (1) the estimated prevalence of ischaemic heart disease, (2) the rate of emergency admissions for cardiovascular disease, and (3) the standardised mortality ratio from ischaemic heart disease. None of these variables performs substantially better than the prevalence of chronic heart or lung disease: whatever variable is used, adjusted utilisation remains lower in the least deprived group. Furthermore, variable (2) may reflect aspects of supply rather than need – for instance, the rate of emergency admissions may partly be driven by the quality of local primary care and the configuration of local emergency services. Finally, variable (3) may suffer from a problem of "reverse causation": a higher rate of elective heart revascularisation may cause lower mortality from ischaemic heart disease. To that extent, lower mortality from ischaemic heart disease might reflect not reflect lower need but rather higher need and appropriately higher utilisation.

5.3 Time trends and the assumption of parallel trends in need

Our time series trends yield more useful information than the cross sectional analysis. When looking at time series trends, it is reasonable to assume that any trends in unobserved need do not systematically vary between more and less deprived groups. Need for heart revascularisation and other procedures might grow faster (or slower) in deprived groups than non-deprived groups over a period of decades. However, relative need is unlikely to change much over a few years.

Figure 2 and Table 3 offer some support for this assumption. Figure 2 shows that annual rates of mortality from ischaemic heart disease from 2001-7 decline at the same rate in all four of our deprivation groups. Table 3 shows that trends in prevalence of ischaemic heart disease run approximately parallel between our four interval deprivation groups from 2004-7. Hence if utilisation differentials between deprivation groups systematically widen or narrow over time, it is reasonable to assume that this reflects a genuine widening or narrowing of socio-economic inequality – rather than a widening or narrowing of relative need.

5.4 Conclusions

Our cross sectional analysis does not enable us to quantify the level of socio-economic inequality in the NHS, or even reliably to conclude whether any significant inequality exists. However, our time series analysis does enable us to tell whether any pre-existing inequality was getting better or worse, under the reasonable assumption of parallel trends in need between more and less deprived groups. We find no significant and systematic pattern of change in small area socio-economic inequality in the use of care from 2001/2 to 2007/8 for hip replacement, senile cataract, heart revascularisation or gastroscopy. This suggests there was not much change in socio-economic health care inequality in the NHS from 2001/2 to 2007/8, despite substantial investment and reform.

Table 1: Descriptive statistics for key variables by year

	2001	2002	2003	2004	2005	2006	2007
Hip replacement rate per 100,000							
All	178.08	194.93	211.83	209.49	210.59	204.94	221.31
Deprived (EDI > 20%)	157.31	170.68	179.2	172.94	177.64	164.57	187.06
Non deprived	182.56	199.87	218.31	216.09	216.2	211.76	227.05
Senile cataract rate per 100,000							
All	470.51	523.2	597.21	644.55	559.25	517.79	499.87
Deprived (EDI > 20%)	584.24	631.65	720.12	743.49	615.68	581.8	568.83
Non deprived	446.02	501.11	572.8	626.67	549.65	506.99	488.33
Gastroscopy rate per 100,000							
All	1799.31	1768.61	1684.22	1569.72	1601.3	1720.38	1797.24
Deprived (EDI > 20%)	2407.76	2334.27	2219.74	2024.76	2082.65	2313.7	2417.48
Non deprived	1668.23	1653.42	1577.91	1487.49	1519.43	1620.26	1693.43
Revascularisation rate per 100,000							
All	159.17	173.96	186.17	206.25	201.72	202.59	199.24
Deprived (EDI > 20%)	177.73	195.98	208.93	229.19	228.17	226.93	221.84
Non deprived	155.17	169.48	181.65	202.1	197.22	198.49	195.46
Economic Deprivation Index (EDI) income domain (mean)	12.2%	11.9%	11.8%	11.3%	11.0%	11.0%	11.0%
Proportion of LSOA in deprivation groups							
EDI Income domain = 0-10%	0.568	0.578	0.582	0.596	0.602	0.602	0.602
EDI Inocme domain = 10%-20%	0.223	0.220	0.218	0.216	0.218	0.218	0.218
EDI Income domain = 20%-30%	0.118	0.117	0.116	0.114	0.113	0.113	0.113
EDI Income domain >30%	0.091	0.085	0.084	0.074	0.067	0.067	0.067
Need variables (LSOA mean values)							
Population over 45	602	608	613	619	625	633	641
Prevalence of chronic diseases	21.25%	21.25%	21.25%	21.25%	21.25%	21.25%	21.25%
Prevalence of chronic heart diseases	3.60%	3.60%	3.60%	3.60%	3.59%	3.57%	3.54%
Prevalence of obesity	7.41%	7.41%	7.41%	7.41%	7.41%	7.41%	7.65%
stnd mortality ratio ischemic heart disease	1.009	1.007	1.005	0.998	0.994	0.995	0.997

Table 2: Year-by-year inequality differences compared with baseline inequality in 2001/2 (standardised utilisation rate ratios between deprived and non-deprived areas)

	Gastroscopy		Hip replacement		Cataract		Revascularization	
	IRR	P>z	IRR	P>z	IRR	P>z	IRR	P>z
f_20_34_p	0.999	0.000						
f_35_44_p	1.000	0.005						
f_45_54_p	4.015	0.000	1.710	0.116	0.049	0.000		
f_55_64_p	2.327	0.000	11.860	0.000	0.053	0.000		
f_65_74_p	122.519	0.000	39.626	0.000	0.153	0.000		
f_75_84_p	46.429	0.000	145.703	0.000	1.586	0.309		
f_85plus_p	0.150	0.000	1.635	0.218	0.086	0.000		
m_35_44_p	1.000	0.000						
m_45_54_p	2.102	0.000	2.435	0.008	0.013	0.000		
m_55_64_p	0.442	0.000	27.373	0.000	0.010	0.000		
m_65_74_p	0.719	0.043	21.875	0.000	0.549	0.177		
m_75_84_p	0.332	0.000	10.762	0.000	0.493	0.132		
obesity_q2	1.080	0.000						
obesity_q3	1.116	0.000						
obesity_q4	1.143	0.000						
obesity_q5	1.111	0.000						
pcd_q2	1.010	0.020					0.986	0.037
pcd_q3	1.085	0.000					1.009	0.208
pcd_q4	1.132	0.000					1.054	0.000
pcd_q5	0.998	0.711					1.140	0.000
ediinc_100	1.013	0.000	0.992	0.000	1.011	0.000	1.006	0.000
y2002_edi	0.890	0.006	1.259	0.005	0.978	0.804	1.103	0.197
y2003_edi	0.892	0.011	1.149	0.082	1.023	0.802	1.042	0.584
y2004_edi	0.750	0.000	1.124	0.156	0.962	0.672	1.112	0.156
y2005_edi	0.842	0.000	1.199	0.029	0.776	0.007	1.130	0.108
y2006_edi	1.040	0.357	1.094	0.288	0.955	0.628	1.139	0.090
y2007_edi	1.027	0.516	1.462	0.000	1.030	0.755	1.075	0.356
y2002	1.009	0.192	1.045	0.000	1.116	0.000	0.988	0.319
y2003	0.965	0.000	1.132	0.000	1.272	0.000	0.993	0.593
y2004	0.929	0.000	1.116	0.000	1.396	0.000	0.991	0.465
y2005	0.949	0.000	1.124	0.000	1.257	0.000	0.992	0.522
y2006	1.006	0.356	1.116	0.000	1.155	0.000	0.993	0.549
y2007	1.062	0.000	1.187	0.000	1.108	0.000	0.998	0.899
smr_ihd_q2							1.021	0.003
smr_ihd_q3							1.032	0.000
smr_ihd_q4							1.018	0.011
smr_ihd_q5							1.035	0.000
pop18	(exposure)							
pop45			(exposure)		(exposure)		(exposure)	

Table 3: Trends in prevalence of coronary heart disease 2004-7

(Based on QOF data attributed to small area level; data collection began in 2004)

		2004	2005	2006	2007
(1) EDI Income domain 0-10%	Mean (%)	3.62	3.62	3.61	3.58
	Ratio to (1)	1.00	1.00	1.00	1.00
(2) EDI Income domain 10%-20%	Mean (%)	3.60	3.56	3.54	3.50
	Ratio to (1)	0.99	0.98	0.98	0.98
(3) EDI Income domain 20%-30%	Mean (%)	3.51	3.48	3.45	3.41
	Ratio to (1)	0.97	0.96	0.96	0.95
(4) EDI Income domain 30%	Mean (%)	3.56	3.51	3.49	3.45
	Ratio to (1)	0.98	0.97	0.97	0.96

Figure 1: Inequality trends (standardised utilisation rates by deprivation group)

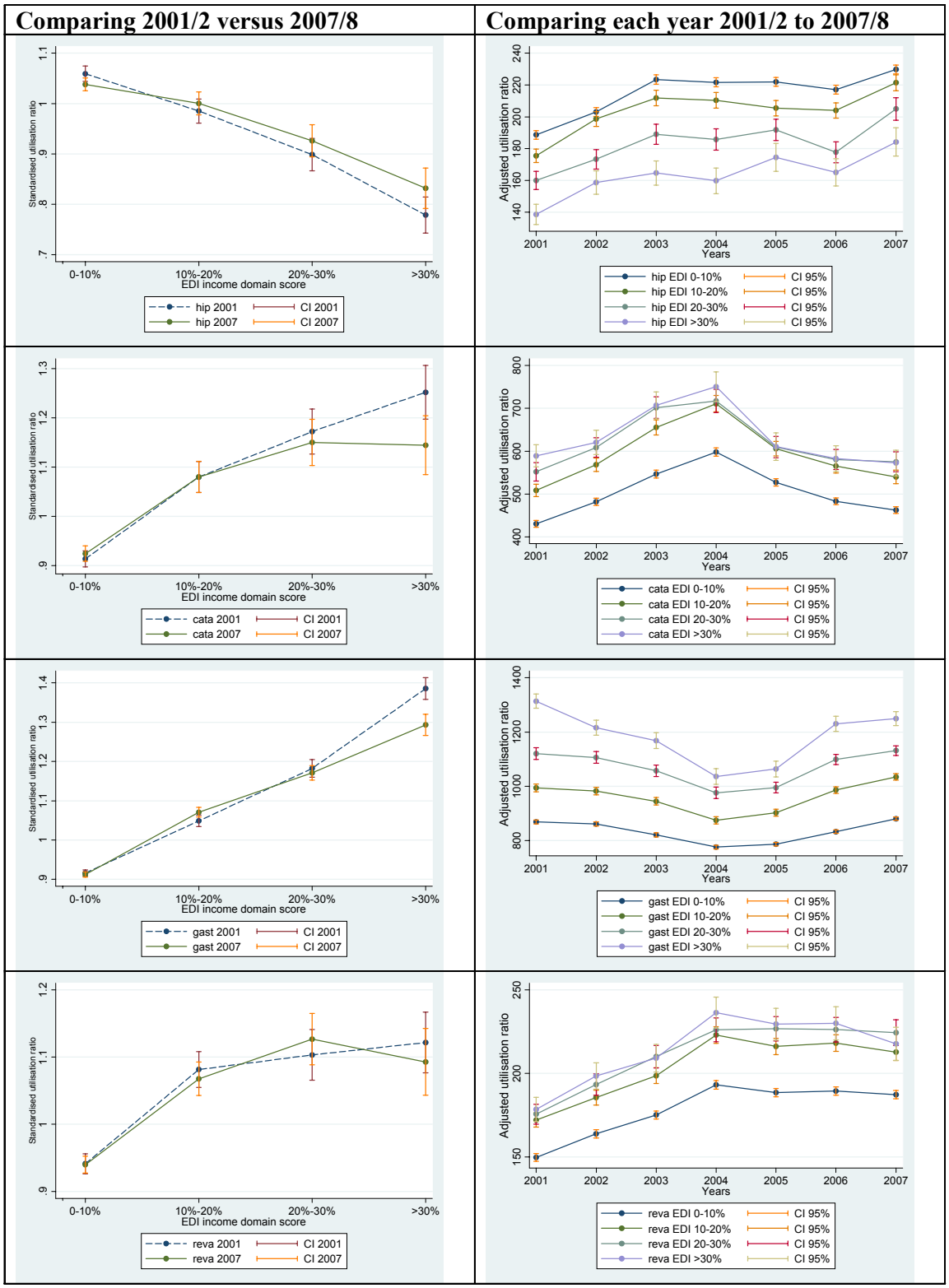
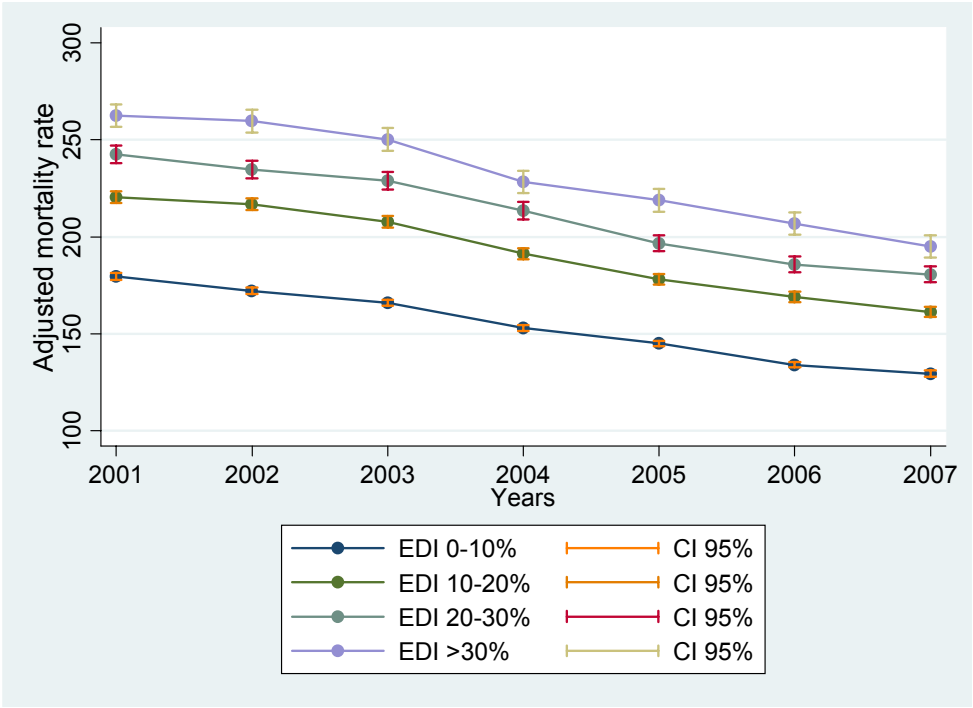
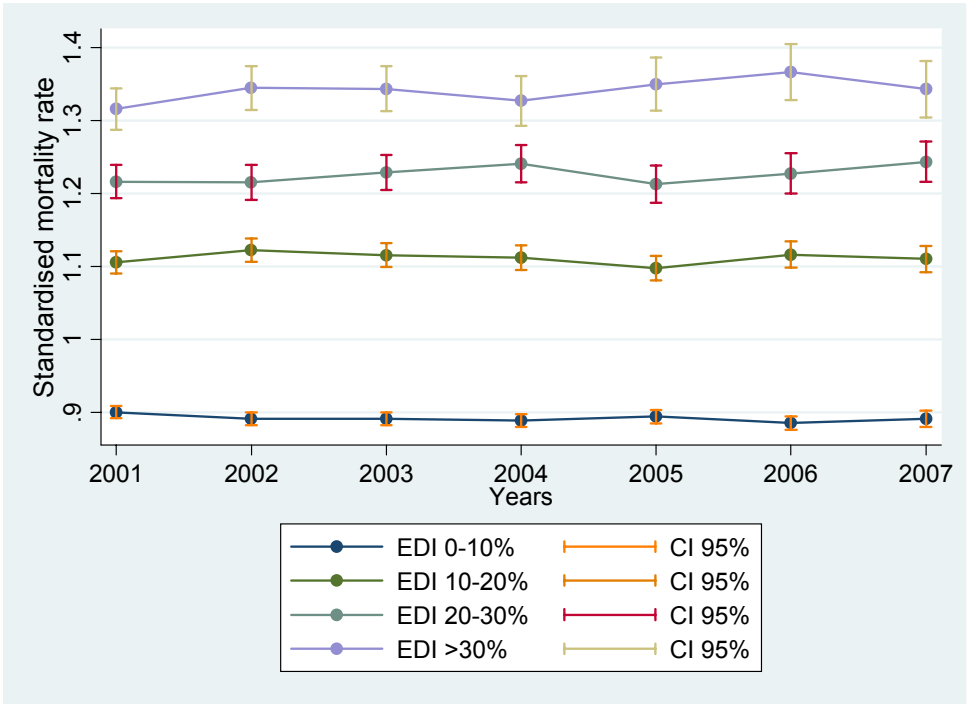


Figure 2: Trends in mortality from ischaemic heart disease 2001-7 by four income deprivation groups (all ages)

Adjusted mortality rate per 100,000



Standardised mortality ratio



References

Appleby, J., Harrison, A., & Devlin, N. (2003). *What is the real cost of more patient choice?* London: Kings Fund.

Blair T (2003). We must not waste this precious period of power. Speech given at South Camden Community College, 23 January 2003.

Chaturvedi N, Ben-Shlomo B. From the surgery to the surgeon: does deprivation influence consultation and operation rates? British Journal of General Practice 1995; 45:127–131.

Cookson, R., Dusheiko, M., & Hardman, G. (2007). Socioeconomic inequality in small area use of elective total hip replacement in the English National Health Service in 1991 and 2001. J Health Serv Res Policy, 12 Suppl 1, S1-10-17.

Department of Communities and Local Government (2009). Tracking Neighbourhoods: The Economic Deprivation Index 2008. HMSO, London.

Department of Health (2003). Building on the Best Choice, Responsiveness and Equity in the NHS. London, HSMO.

Dixon, A., & Le Grand, J. (2006). Is greater patient choice consistent with equity? The case of the English NHS. *J Health Serv Res Policy, 11*(3), 162-166.

Dixon, A., Le Grand, J., Henderson, J., Murray, R., & Poteliakhoff, E. (2007). Is the British National Health Service equitable? The evidence on socioeconomic differences in utilization. *J Health Serv Res Policy, 12*(2), 104-109.

O'Donnell, O, van Doorslaer, E, Wagstaff, A and Lindelow, M. (2008). Analyzing Health Equity Using Household Survey Data. World Bank Books.

Milner PC, Payne JN, Stanfield RC, Lewis PA, Jennison C, Saul C. Inequalities in accessing hip joint replacement for people in need. Eur J Public Health 2004;14:58–62

Propper, C., Eachus, J., Chan, P., Pearson, N., & Smith, G. D. (2005). Access to health care resources in the UK: the case of care for arthritis. Health Econ, 14(4), 391-406.

Tudor-Hart, J. (2006) The political economy of health care: a clinical perspective. Policy Press.