The impact of private sector provision on equitable utilisation of coronary revascularisation in London

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Abstract

Objective To investigate the impact of including private sector data on assessments of equity of coronary revascularisation provision using NHS data only.

Design Analyses of Hospital Episodes Statistics and private sector data by age, sex, and PCT of residence. For each PCT, the share of London's total population and revascularisations (all admissions, NHS-funded, and privately-funded admissions) were calculated. GINI coefficients were derived to provide an index of inequality across sub-populations, with parametric bootstrapping to estimate confidence intervals.

Setting London

Participants London residents undergoing coronary revascularisation April 2001 – December 2003.

Intervention Coronary artery bypass graft or angioplasty

Main outcome measures Directly-standardised revascularisation rates, GINI coefficients.

Results NHS-funded age-standardised revascularisation rates varied from 95.2 to 193.9 per 100,000 and privately funded procedures from 7.6 to 57.6. Although the age distribution did not vary by funding, the proportion of revascularisations among women that were privately funded (11.0%) was lower than among men (17.0%). Privately funded rates were highest in PCTs with the lowest death rates (p=0.053). NHS-funded admission rates were not related to deprivation nor age-standardised deaths rates from coronary heart disease. Privately-funded admission rates were lower in more deprived PCTs. NHS provision was significantly more egalitarian (Gini coefficient 0.12) than the private sector (0.35). Including all procedures was significantly less equal (0.13) than NHS funded care alone.

Conclusion Private provision exacerbates geographical inequalities. Those responsible for commissioning care for defined populations must have access to consistent data on provision of treatment wherever it takes place.

Word count: 243

Introduction

Primary care trusts (PCTs) in England are charged with commissioning healthcare on behalf of their resident populations. They are expected to ensure that care is provided equitably and in relation to need. However it has long been recognised that they have only an incomplete picture of the healthcare provided to their populations.[1] In addition to the care paid for by the National Health Service (NHS), a variable, but potentially substantial amount, is paid for privately (either by private insurers, including both for-profit and not-for-profit companies or by patients paying out of pocket). About 11.5% of the British population has private health insurance and this has remained steady over the past decade, with a small reduction in individual purchase of policies compensated for by an increase in employer-purchased schemes.[2] Consequently, comparisons of intervention rates, used in benchmarking, are potentially misleading.

Specifically, while it is well known that there are geographical inequalities in the provision of common procedures by the NHS,[3] it is less clear whether privately funded care smoothes out these inequalities, for example by reducing demand for NHS care, or whether it increases them, disproportionately benefiting areas that already have relatively good access to NHS care. If it does exacerbate inequalities, what is the magnitude of any effect? To our knowledge, these very basic questions, which are of increasing importance given the emergence of a mixed economy in the health system in England, have received no attention in the past decade, with earlier work addressing them only incidentally.[4] This study looks at the situation in 2001-2003, focusing on one category of intervention, coronary revascularisation.

Methods

All private hospitals in London (including both for-profit and not-for-profit hospitals) were identified and contacted to determine whether they carried out coronary revascularisation procedures. Following agreement on data-sharing protocols to safeguard confidentiality, all those undertaking revascularisation agreed to provide appropriate data on patients treated (whether funded privately

or by the NHS) to the London Health Observatory. Hospital Episode Statistics data were also obtained for NHS providers (again including patients paid for by the NHS or privately). A file was then generated containing all unique admissions to health care providers in London during the 2.75-year period from 1st April 2001 to 31st December 2003. Postcodes were used to allocate patients to their PCT of residence. Full details of the methods used to combine data sets have been described elsewhere.[5] In brief, an extensive process of data cleaning (in particular elimination of duplicates) and merging was developed to overcome the problems created by the use of different definitions and recording systems in the two data sets. These included the use of admissions (private sector) rather than Finished Consultant Episodes (NHS),[6] the number of procedure codes (one in private sector, four in NHS until 2001/02, 12 thereafter) and different reporting periods (financial year in NHS, calendar year in private sector). Revascularisation procedures were defined according to the OPCS-4 classification (K40-K46 – coronary artery bypass grafting; K49-K50 – percutaneous transluminal angioplasty, including stenting and both elective and acute procedures). An NHS episode was recorded as a revascularisation if one of these codes appeared in any position on the record.

Mid-year population estimates were obtained from the Office of National Statistics. A weighted average for the 2.75 years covered by the study was calculated for each PCT. Direct age-standardised rates of revascularisation admissions (calculated using the European Standard Population) and their confidence intervals were derived according to the formulae given by Armitage, Berry and Matthews.[7] The same source also provided a method for estimating the variance and hence confidence intervals for ratios of age-standardised rates. Deprivation levels in each PCT were assessed using the 2004 Index of Multiple Deprivation in which higher levels indicate greater deprivation.

For each PCT, the share of London's total population and revascularisations (by funding category: all admissions, NHS funded admissions, and privately funded admissions) were calculated and a series of Lorenz distributions were constructed. From these, GINI coefficients were derived using Brown's method,[8]

which provides an index of inequality across sub-populations rather than individuals. It is equivalent to the standard method if each member of each subpopulation is assigned its sub-population mean value. In this case the data are the size of each PCT's population (X) and the numbers of operations in each case (Y).

Parametric bootstrapping was used to estimate confidence intervals for the index. For each of the 31 PCTs, a value was sampled from a distribution with mean equal to the PCT's observed operation rate. If the observed number of operations in a PCT was less than 40, a Binomial distribution was assumed; otherwise the Normal approximation was used. A Gini coefficient was then calculated from the 31 sampled operation rates. This procedure was replicated 5,000 times to produce a distribution of Gini coefficients, and the confidence interval was given by the 2.5^{th} and 97.5^{th} percentiles of this distribution.

Results

During the study period, 28,405 revascularisations were recorded as being undertaken on London residents. 25,005 took place in NHS hospitals (a further 262 records were duplicates and 15 contained inadequate data on funding, gender or age), of which 23,912 (84.2% of all the revascularisations) were NHS funded and 1,093 (3.8%) were privately funded. 3,400 took place in private hospitals (a further 6 had no patient identifier and 71 did not list the funding source), of which 86 (0.3%) were NHS funded and 3,314 (11.7%) were privately funded.

The age-standardised revascularisation rate per 100,000 population funded by the NHS was 131.9 (range 95.2 - 193.9). The corresponding figure for privately funded procedures was 24.2 (range 7.6 - 57.6). Overall, there was no significant difference in the age distribution of those funded by the NHS and private sector. However, the proportion of revascularisations among women that were privately funded was lower than among men (11.0% (95% CI 10.3-11.8) vs 17.0% (95% CI 16.5-17.5)).

Revascularisation rates funded by the NHS did not correlate with a proxy measure of need, age-standardised deaths rates from coronary heart disease. Privately funded rates tended to be highest in PCTs with the lowest death rates, although the association did not quite reach significance (p=0.053). There was no significant association between deprivation and NHS-funded admission rates but privately-funded admission rates were lower in more deprived PCTs (Figure).

Table 1 describes the degree of inequality of provision of procedures funded in the two sectors. NHS provision is significantly more egalitarian than the private sector. The Gini coefficient for private provision (0.35) is almost identical to the value for income inequality in the United Kingdom (0.36).[9] The addition of privately funded to NHS funded care produced a distribution that was significantly less equal than NHS funded care alone.

Discussion

This study confirms the importance of private funding of health care in London. More than one in every eight revascularisations was privately funded, with 12% taking place in private hospitals. Consequently, any analysis of provision based only on NHS data will be seriously misleading.

Before considering the implications, one methodological constraint requires comment. Ideally, utilisation would be related to a precise measure of need that would capture ability to benefit. This is a perennial problem for epidemiological studies as, ultimately, the decision as to whether an individual is likely to benefit can only be resolved by detailed clinical (and in this case, angiographic) assessment. As a consequence, studies relating utilisation to need almost invariably employ proxy measures. Some authors have used admission rates for acute myocardial infarction 10 but we rejected this option because it is not clearly superior to our chosen option of cardiovascular mortality while suffering from potential additional limitations due to potential systematic differences in the threshold for admission, exemplified by research comparing the impact of incorporating troponin levels into the diagnostic process.11 Cardiovascular mortality is now well-established 3,12,13 as a proxy measure of need for

revascularisation but it must be recognised that, while the best option available, it is not ideal, especially bearing in mind that most revascularisations are undertaken for symptom control rather than, primarily, as a means of reducing mortality. It would not, however, be justifiable simply to ignore differences in the existence of need when studying patterns of utilisation.

Several findings have relevance for policy. The level of NHS-funded care, at 131.9 revascularisations per 100,000, was below the figure of 150 per 100,000 recommended in the National Service Framework for Coronary Heart Disease. However the total revascularisation rate - 156.1 - exceeded it, although of course this overlooks the extent of inequality in access to care.

The finding that NHS provision was unrelated to need is consistent with many other studies but the finding that privately funded utilisation of revascularisation was highest in areas with the lowest need (as judged by death rates) has not been shown before; while it is intuitive that this should be the case, it is important to confirm that it occurs and to assess the degree of association.

This study confirms that private provision exacerbates geographical inequalities. The negative association, at PCT level, between deprivation and private utilisation is consistent with evidence that 41% of those in the highest income decile have private coverage compared with less that 4% in the lowest decile.14 This study also shows that women, who are known to be disadvantaged in obtaining treatment for cardiovascular disease in the NHS, also have relatively less access to private provision. This is consistent with data on enrolment, which shows that men are about three times as likely to have individually purchased private insurance and about twice as likely to have corporately purchased cover.15

It should, however, be noted that the share of revascularisations funded privately (15.5%) was lower than the percentage of the population in London with private medical insurance (18%),15 although of course this does not take account of the expected lower need in those with coverage.

The clear implication of this study is that analyses limited to NHS data substantially underestimate the extent of inequity in access to revascularisation and, although not the subject of this study, the same is almost certainly true for all elective surgery.

The NHS Information Technology strategy should, if it can overcome the many problems that have arisen so far, facilitate the provision of high quality data from NHS facilities. However, there may be difficulties with NHS funded care provided elsewhere, as illustrated by the problems that NHS commissioners have faced in obtaining accurate data in an appropriate format from the new independent treatment centres.16 However, this is just the start and it is clear that, if they are to discharge their responsibility to assess the health needs of their resident populations and whether these are being met, NHS commissioners must access to consistent data on provision of treatment wherever it takes place.

Our experience confirms that the private sector is willing to share data with the NHS, subject to suitable safeguards. However, combining the data for this study involved considerable effort, requiring detailed scrutiny of many individual records. This is clearly not appropriate for routine use.

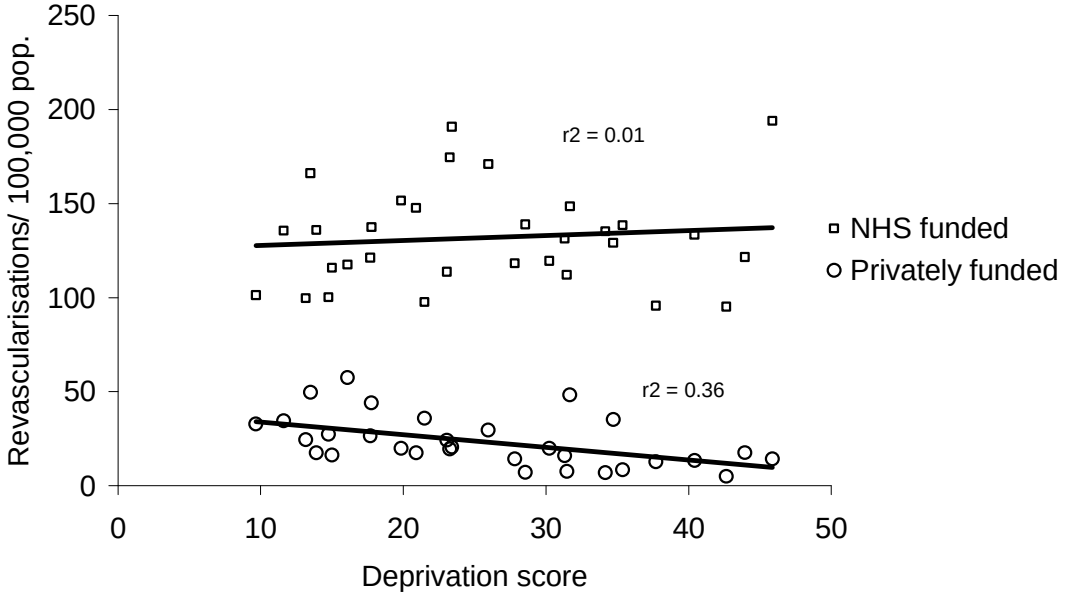
The Department of Health in England has adopted an explicit policy of pursuing greater diversity of health care provision, exerting pressure on health care commissioners to purchase care from the private sector and establishing extremely favourable conditions for new market entrants. These measures have not, however, been accompanied by the necessary consideration of how this more liberalised market might be managed. These developments have coincided with a massive investment in the NHS Information Technology Strategy that seeks to create a single NHS system that fails to take account of this increasing diversity of provision. The NHS information technology programme faces enough technical and financial difficulties so it would be unreasonable to ask for it to be revisited to incorporate private providers, even if this would be the logical consequence of this diversity.

The NHS and the private sector already collaborate in many areas and recent legislation has placed both within the same inspection system, ensuring common standards in areas such as patient safety. It should not be an unsurmountable problem to extend this collaboration to ensure that data collected by all providers are compatible and, subject to suitable safeguards, can be used by those charged with assessing the population's health needs.

Table 1 Gini coefficients for provision of coronary revascularisation among residents of London Primary Care Trusts

	Actual Gini	Mean bootstrapped Gini	95% confidence intervals
NHS	0.115	0.117	0.109-0.124
Private only	0.354	0.356	0.341-0.371
NHS + private	0.130	0.131	0.125-0.138

Figure 1 Association between revascularisation rates and deprivation in London Primary Care Trusts



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Competing interest: MM is a member of BUPA's Medical Advisory Panel and chair of the LHO's Expert Advisory Council

Ethical approval: Release of data was approved by the relevant authorities in each private sector provider. All Public Health Observatories have been granted access to Hospital Episode Statistics by the Patient Information Advisory Group. The LHO's use of the data was carried out in accordance with the Information Centre's 'HES Protocol' documentation.

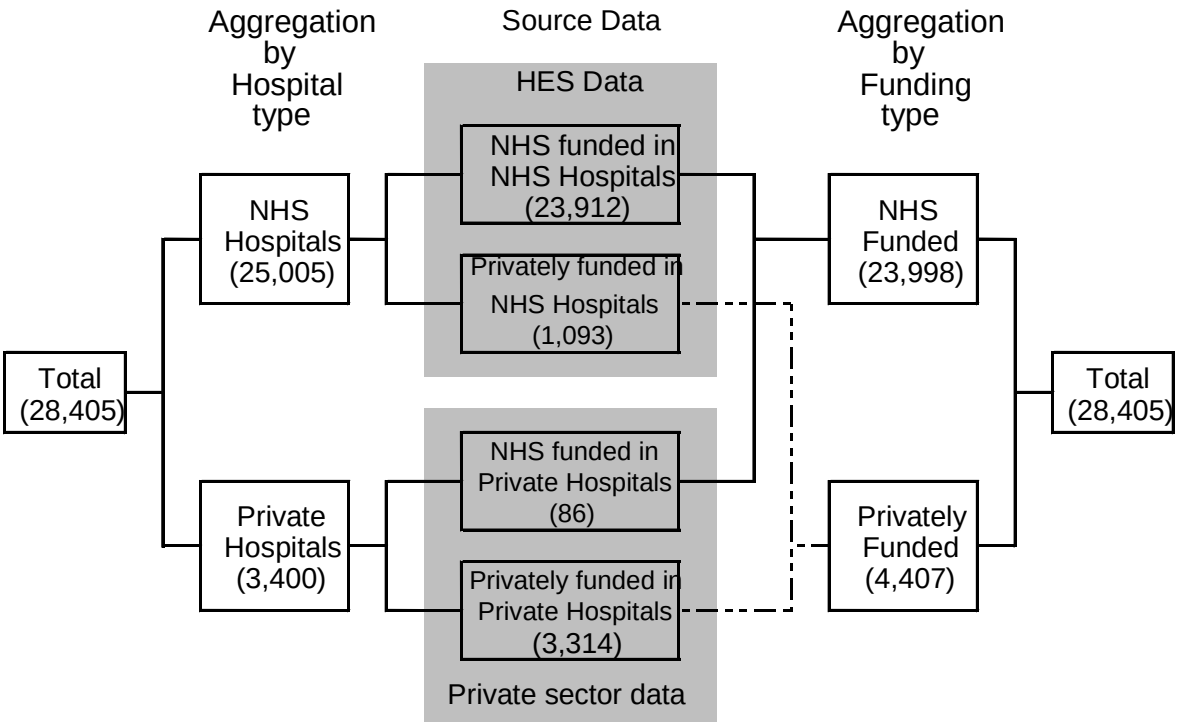
Contributions: JM had the initial idea, persuaded the private providers to release their data to the LHO, and interpreted the results. EK prepared the data and conducted the analyses. JF supervised the analyses. NM negotiated with the

private providers, wrote data confidentiality and transfer protocols, and obtained the private providers' datasets. MM commented on the analyses and drafted the paper. CS undertook additional analyses on the Gini coefficients. All authors commented on the draft manuscript and approved the final version. JM is guarantor.

Notes to editor:

1. Depending on space, the information in para 1 of results might alternatively presented as a figure. We believe that this would be clearer but understand constraints of space. See below.

2. The age-standardised rates in each PCT could be reproduced in a map if space permits.



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