Socioeconomic deprivation, coronary heart disease prevalence and quality of care: a practice-level analysis in Rotherham using data from the new UK general practitioner Quality and Outcomes Framework

Mark Strong, Ravi Maheswaran and John Radford

Abstract

Background The provision of coronary heart disease (CHD) health care has been shown to be inequitable, with those most in need having the least access to high-quality care. The new UK general practitioner (GP) Quality and Outcomes Framework (QOF) contract offers substantial financial rewards to general practices that combine maximal CHD case finding with high-quality CHD care.

Objective To examine whether GP practice-level CHD prevalence and the measures of quality of care derived from the new QOF data are associated with area-level socioeconomic deprivation.

Methods An ecological study of 38 GP practices contracting with Rotherham Primary Care Trust, United Kingdom, was carried out. We calculated Spearman rank correlation coefficients for practice-level age–sex-standardized QOF CHD prevalence against area deprivation score and for 11 QOF CHD indicator achievements against area deprivation score.

Results Practice-level CHD prevalence showed a positive correlation with deprivation ($r=0.64$, $p<0.001$), as did one of the 11 quality-of-care indicators (recording of smoking status, $r=0.34$, $p=0.04$). The remaining 10 quality-of-care indicators showed no significant correlation with deprivation.

Conclusion Practice-level CHD prevalence is associated with deprivation, but we found no evidence of socioeconomic inequality in CHD care. This finding is in contrast to that from previous studies and the widely reported inverse care law.

Keywords: coronary disease, primary health care, quality of health care, socioeconomic factors

Introduction

The prevalence of coronary heart disease (CHD) in England is positively associated with deprivation, with those at greatest socioeconomic disadvantage experiencing the greatest disease burden. Moreover, many studies have shown that those who experience the worst deprivation have the least access to high-quality CHD care.

The Quality and Outcomes Framework (QOF), introduced as part of the new UK general practitioners’ (GP) contract in 2004, offers substantial financial rewards to those practices that combine maximal CHD case finding with high-quality CHD care. There are 11 quality-of-care indicators for CHD within the QOF, worth (in 2004–2005) up to £7362 for a practice with national average CHD prevalence and with the national average number of patients (5891). Higher-than-average prevalence or a larger-than-average list size results in greater payment.

To claim payment, a practice reports the number of patients on the list who have CHD along with the proportion of these patients whose care meets a defined standard for each of the 11 quality-of-care indicators. The indicators measure both clinical process (e.g. the percentage of CHD patients whose blood pressure is recorded) and outcome (e.g. the percentage of CHD patients whose blood pressure is 150/90 mmHg or less) and are based on the current best evidence.
Methods

For each of the Rotherham practices, we calculated a mean index of multiple deprivation (IMD) score using the revised 2004 Super Output Area level IMD scores published by the Office of the Deputy Prime Minister, weighted for the proportion of patients living in each Super Output Area. A total of 248,811 (99 per cent) of all Rotherham registered patients were assignable to a Super Output Area.

To calculate a measure of prevalence for each practice, we used the number of patients on the QOF CHD register. This was indirectly standardized for age and sex, using the 2003 Health Survey for England CHD rates as the external standard. We calculated Spearman rank correlation coefficients for the standardized CHD prevalence against practice deprivation and for the 11 CHD quality-of-care indicator achievements against practice deprivation.

Results

Rotherham has 39 GP practices, 38 of which took part in the national QOF. A total of 250,979 patients were registered to these 38 practices. The 39th practice is a small specialized practice which cares for less than 0.5 per cent of the total Rotherham registered population. The total number of patients on the 38 QOF CHD registers was 12,920, giving a crude prevalence of 5.1 per cent. This compares with a national crude prevalence of 3.6 per cent and is in line with previous data showing higher-than-average CHD prevalence in this region.

Practice-level CHD prevalence showed a positive correlation with deprivation ($r=0.64$, $p<0.001$), as did one of the 11 quality-of-care indicators, the percentage of a practice’s CHD patients whose notes record smoking status ($r=0.34$, $p=0.004$). The remaining 10 quality-of-care indicators showed no significant correlation with deprivation (Table 1).

Discussion

Our analysis of the 2004–2005 QOF data suggests that the inequity in CHD care we would expect to see among Rotherham practices may not exist. Those practices in the most deprived areas, although having a higher CHD prevalence, do not appear to provide a lower quality of CHD care. Indeed the one quality-of-care indicator that did correlate with deprivation, has a record of influenza immunization in the preceding 1 September to 31 March

Table 1 Correlations between prevalence and deprivation and between quality of care and deprivation

<table>
<thead>
<tr>
<th>Correlation with deprivation</th>
<th>Spearman correlation coefficient</th>
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<tbody>
<tr>
<td>CHD prevalence</td>
<td>0.59†</td>
</tr>
<tr>
<td>Quality-of-care indicators</td>
<td></td>
</tr>
<tr>
<td>% patients with newly diagnosed angina (diagnosed after 1 April 2003) who are referred for exercise testing and/or specialist assessment</td>
<td>0.02‡</td>
</tr>
<tr>
<td>% patients with CHD whose notes record smoking status in the past 15 months, except those who have never smoked where smoking status need be recorded only once since diagnosis</td>
<td>0.34*</td>
</tr>
<tr>
<td>% patients with CHD who smoke, whose notes contain a record that smoking cessation advice or referral to a specialist service, where available, has been offered within the last 15 months</td>
<td>0.19†</td>
</tr>
<tr>
<td>% patients with CHD whose notes have a record of blood pressure in the previous 15 months</td>
<td>0.14†</td>
</tr>
<tr>
<td>% patients with CHD in whom the last blood pressure reading (measured in the last 15 months) is 150/90 mmHg or less</td>
<td>0.26†</td>
</tr>
<tr>
<td>% patients with CHD whose notes have a record of total cholesterol in the previous 15 months</td>
<td>0.09‡</td>
</tr>
<tr>
<td>% patients with CHD whose last measured total cholesterol (measured in last 15 months) is 5 mmol/l or less</td>
<td>–0.07‡</td>
</tr>
<tr>
<td>% patients with CHD with a record in the last 15 months that aspirin, an alternative anti-platelet therapy, or an anti-coagulant is being taken (unless a contraindication or side effects are recorded)</td>
<td>–0.04‡</td>
</tr>
<tr>
<td>% patients with CHD who are currently treated with a beta-blocker (unless a contraindication or side effects are recorded)</td>
<td>0.13†</td>
</tr>
<tr>
<td>% patients with a history of myocardial infarction (diagnosed after 1 April 2003) who are currently treated with an ACE inhibitor or angiotensin II antagonist</td>
<td>0.10†</td>
</tr>
<tr>
<td>% patients with CHD who have a record of influenza immunization in the preceding 1 September to 31 March</td>
<td>0.17†</td>
</tr>
</tbody>
</table>

ACE, angiotensin-converting enzyme; CHD, coronary heart disease.

*Significant at 0.05 level.
†Significant at 0.001 level.
‡Not significant.
the percentage of a practice’s CHD patients whose notes record smoking status, showed a positive association, possibly suggesting better care in more deprived areas.

Tudor Hart’s inverse care law, ‘the availability of good medical care tends to vary inversely with the need for it in the population served’, predicts that those patients in the most deprived areas with the highest CHD disease burden will have the poorest access to high-quality CHD care. This law has been demonstrated in numerous studies of CHD care at an individual, general practice and PCO level, but not here. The QOF provides a new window on the quality of CHD care delivered at general practice level, and it is reassuring that, in this analysis at least, we have found no evidence of systematic inequity.

There are several potential limitations to our study. The QOF uses recorded activity as a proxy for quality of care, and this has many pitfalls. The completeness and accuracy of the CHD disease register relies on adequate case finding, followed by the correct clinical coding of these cases, and only these cases, as having CHD. The validity of the data that are automatically collected to support the achievement against the 11 QOF indicators likewise relies on accurate clinical coding. Despite working alongside practices to improve clinical coding, we do not have a measure of the completeness or accuracy of the data set. A widespread audit across a representative sample of practice clinical systems would be required to verify the data, something that we have not done, but that PCOs may decide to pursue.

The degree to which the 11 QOF CHD process and outcome measures are adequate proxies for quality of care is also an important question. It has been suggested that clinical process measures are best suited to determining health care quality because they relate to what is within the organization’s control, unlike many structural measures, and they largely avoid the case-mix bias associated with outcome measures. Of the 11 CHD indicators within QOF, nine are measures of clinical process, two are measures of outcome and none are measures of structure. The types of indicators chosen therefore do seem reasonable.

Related to this is the much broader question of what is quality. A full exploration of this is outside the scope of this discussion, but the delivery of health gain (i.e. reduction in morbidity and mortality) is clearly a key component of high-quality health care. The interventions and outcomes included in the QOF have been chosen because there is published evidence linking them to important health gains, and this again supports the notion that they are reasonable measures of quality.

This study was conducted at a GP practice level, and as with all such ecological studies we are assuming that the association observed at this area level reflects the same association at the individual level. This may not be true, a problem known as the ecological fallacy. An individual patient-level analysis would be required to understand associations at the individual level, but this is not possible using the anonymized aggregated data reported by practices for the QOF.

The results of this analysis of the QOF data are reassuring, but we cannot conclude that the new contract is responsible for the lack of socioeconomic inequality seen. The data we used in this study were not available to us before the new GP QOF contract was implemented, and this, along with the absence of a control group, prevents an analysis capable of testing the hypothesis that the QOF contract has decreased socioeconomic inequalities.

Moreover, although we have not seen statistically significant inequalities in care within our primary care trust, this may be due to a lack of power. Inequalities may well be seen in a practice-level analysis across a region or nationally, something that has now become possible with the open publication of all QOF data.

The UK government recognizes the importance of tackling health inequalities, and all National Health Service (NHS) organizations are required to demonstrate that they are working towards this end. These results have been important for the Rotherham health community, which is working hard to abolish health inequalities. Further studies are required to examine the validity of the QOF data set, the association between QOF achievement and socioeconomic deprivation at a regional and national level, and the effects of the new contract on equity over time.

Contributors
M.S. conceived the study, analysed the data and wrote the first draft. R.M. provided epidemiological advice. All three authors revised the manuscript. J.R. is the guarantor.

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None needed.

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Competing interests
All authors declare that they have no competing interests.

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