Coronary Heart Disease in the West of Berkshire:

A Health Equity Audit

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Date of report:	**2 February 2005**

Executive Summary

Mortality from coronary heart disease (CHD) is related to deprivation in the West of Berkshire. The responsiveness of CHD services to need and deprivation in the West of Berkshire is variable. Attendance at cardiology outpatient clinics and emergency admissions to hospital with CHD reflect higher levels of need in areas of deprivation. There has been a large increase in the provision of revascularisation recently, and groups with greater need receive higher levels of this intervention. Provision of preventive services for CHD (smoking cessation and prescription of statins) does not appear to reflect the increased need of patients from more deprived practices.

Introduction

There is a general tendency for health services to be used least by those who need them most – a phenomenon known as the inverse care law. This worsens the health of those already affected by poor health status, exacerbating existing health inequalities.

Primary care trusts have an important role in reducing inequalities in health, across all their functions in health improvement, primary care development and commissioning. In order to reduce health inequalities, they need to identify whether services are fairly distributed in relation to the health needs of different groups and areas and then take active steps to improve access for those with the greatest need. This depends on the availability of information on the extent of inequalities in the populations that PCTs serve and on progress towards reducing those inequalities.

This report aims to assist the PCTs in the West of Berkshire to understand what inequalities exist with regard to services for people with, or at increased risk of, coronary heart disease (CHD). CHD was chosen because it is a major health problem which is more common in socio-economically deprived people, it has been the subject of a national service framework which set targets for local services and there is existing local and regional analysis on which to build. The report is intended to help PCTs develop their policies and prepare for the Healthcare Commission's monitoring of their performance given that health equity audit is a performance indicator.

Approach

The report first considers the connection between socio-economic deprivation and mortality from CHD in the West of Berkshire. It then reviews whether various health services for people with, or at increased risk of, coronary heart disease are succeeding in targeting those whose need is greater by virtue of their deprivation. Recommendations are then made. A more detailed description of the methodology is in the appendix.

For the purposes of this audit, not all aspects of CHD services have been reviewed. This was because of the availability of data and the time and resources available. Similarly, the audit has focused mainly on socio-economic deprivation as an indicator of disadvantage.

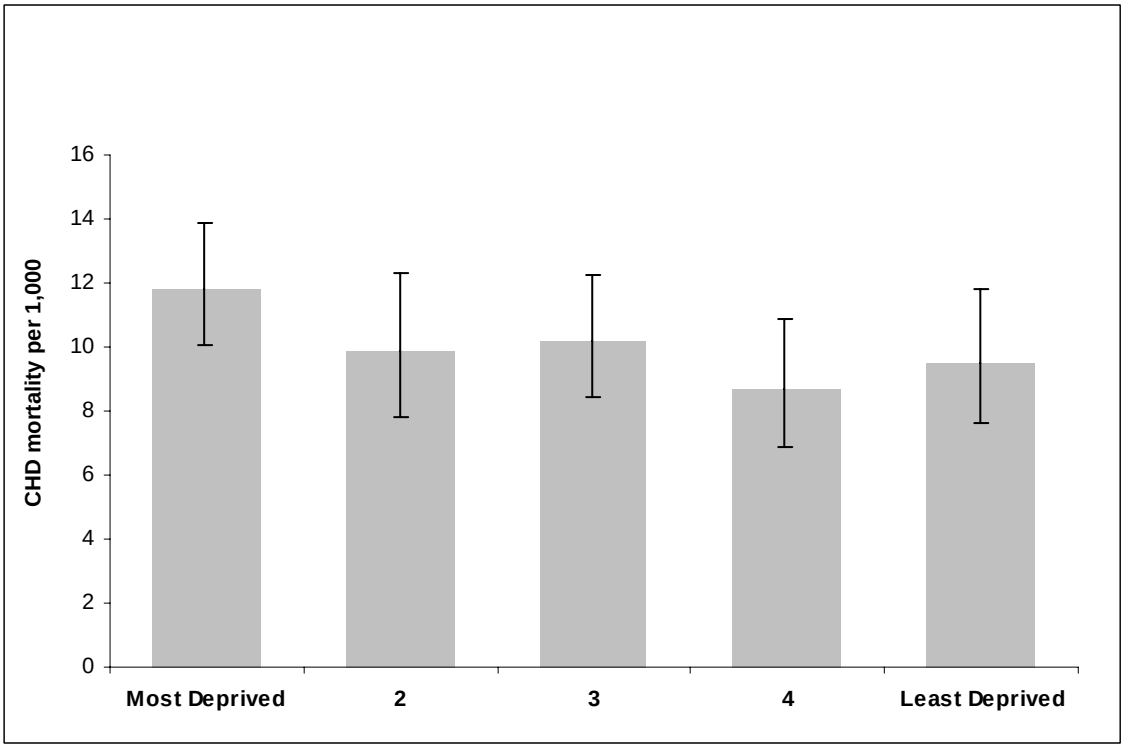
All the analyses are at a population level, at the level of a ward, a practice, a unitary authority or a PCT. They can therefore give us information about the utilisation of health care of groups of people with varying degrees of deprivation. Some of the analyses cover only the PCTs and unitary authorities in the West of Berkshire. However, in other cases the East of Berkshire is also included to provide a fuller picture.

Results

Mortality

Those who are socio-economically deprived are more likely to die from CHD than more affluent people. This general trend can be seen in the West of Berkshire (Figure 1) where, as expected, the most deprived wards have the highest CHD mortality, although relatively small numbers and the absence of substantial numbers of severely deprived residents prevent a marked and statistically significant trend being apparent. It is therefore appropriate to use ward of residence as a proxy for socio-economic status with regard to CHD risk.

Figure 1: Age-sex standardised mortality rates per 1000 for CHD by deprivation quintile of ward of residence, West of Berkshire, 2001-2003.



Vertical bars show 95% confidence intervals.

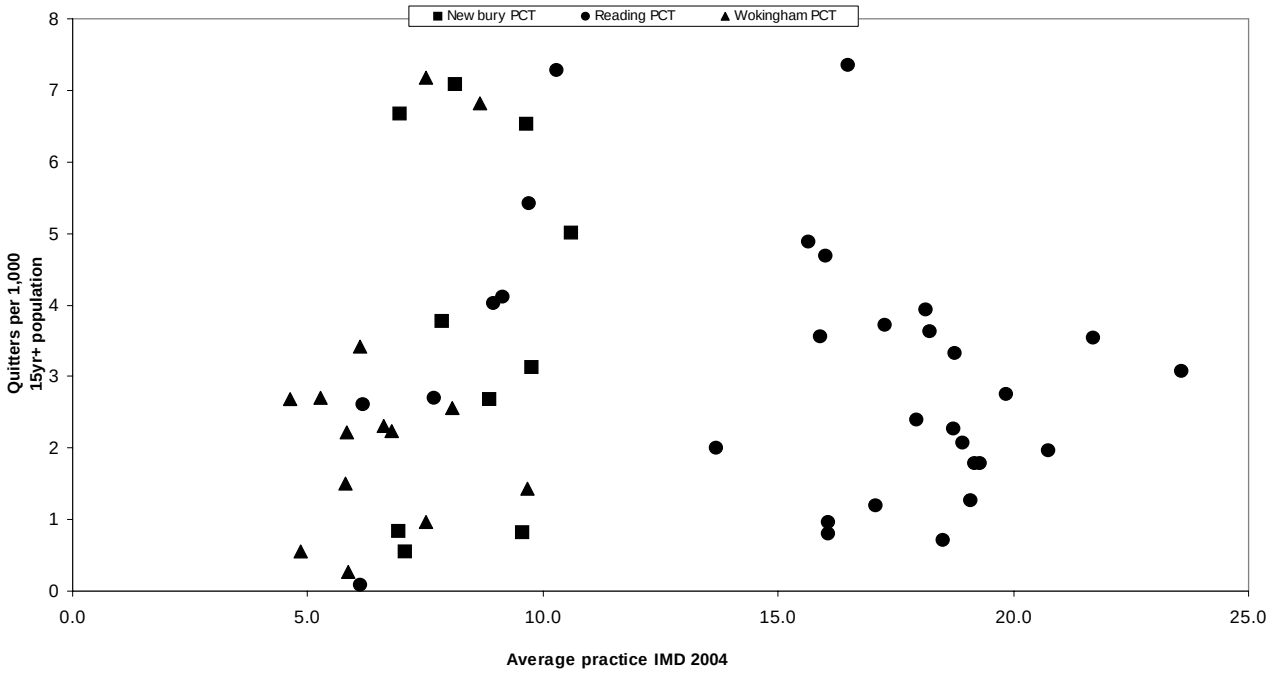
Smoking cessation

For a smoker, cessation is the most effective means of reducing CHD risk. Smoking is much more common among socio-economically deprived people and certain ethnic groups and is one of the main reasons for their high rates of CHD. Now that the NHS provides effective services to assist smokers to quit, it is important that these are easy for more socio-economically deprived smokers to use and that many of them are helped to stop smoking.

Figure 2 shows the proportion of the adults registered with each West of Berkshire practice who succeeded in quitting smoking while using an NHS smoking cessation service, analysed according to practice deprivation levels.
For all three PCTs, there is no indication that practices serving more deprived populations have higher quit rates.

There are a number of possible explanations for this: it could be because there are not greater numbers of smokers in deprived practice populations, because deprived smokers are more able than more affluent ones to give up without recourse to NHS services, because the services are not attracting deprived smokers, or because deprived smokers who attend are less likely to succeed in quitting. The first two explanations are not plausible. Analysis of data from Reading shows that the latter two are important: attendance rates are no higher from deprived practices than more affluent ones, while the proportion of smokers who quit appears lower in deprived practices.

Figure 2: Four-week quit rates per 1000 population aged over 15 years, by deprivation of practice, West of Berkshire, 2003/4.

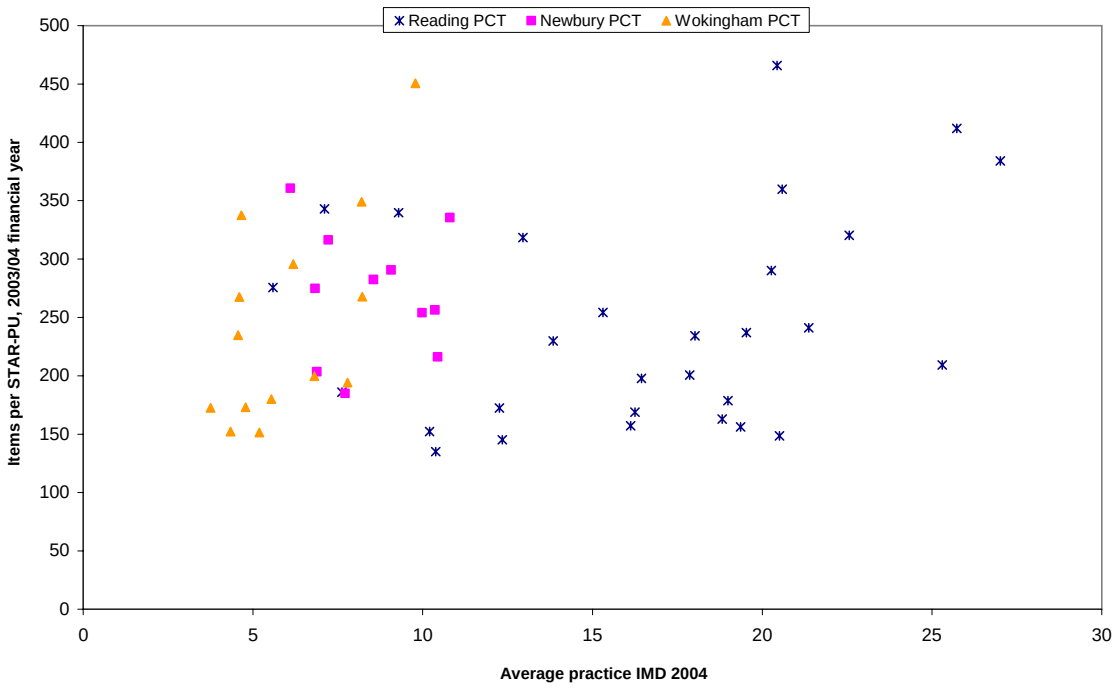


Primary care prescribing

Statins are drugs which reduce cholesterol levels in the blood. Their use is recommended in people with, or at high risk of, CHD.

In Newbury, Wokingham and Reading, there is substantial variation between practices in prescribing rates for statins, after adjustment for differences in their age structures (Figure 3). There is, however, no clear trend towards statins being more frequently prescribed by practices serving more deprived populations. This suggests that there are deprived people in those practices who would benefit from statins but are not yet receiving them. Statins are available over-the-counter, but it is unlikely this explains the findings, not least because this only came into effect after the period covered by this analysis.

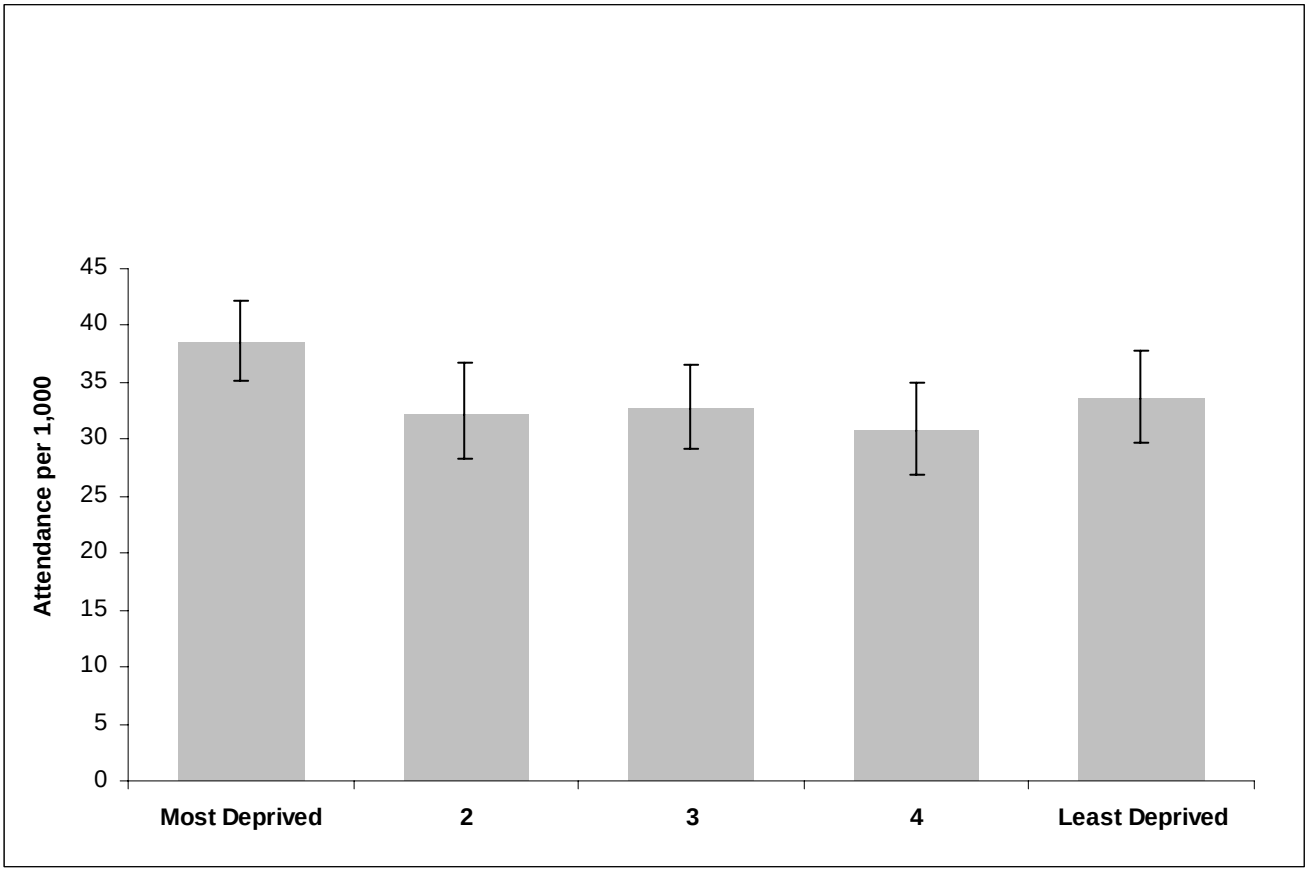
Figure 3: Statin items per STAR-PU, by deprivation of practice, West of Berkshire PCTs, 2003/4.



Cardiology outpatient attendances

Attendance at a cardiology clinic is the gateway to further investigation and treatment for many patients with CHD. Figure 4 shows that attendance rates are highest among residents of the most deprived wards, although there is no clear trend across the quintiles.

Figure 4: Age-sex standardised first cardiology outpatient attendance rate by deprivation quintile, West of Berkshire, 2001-2003.



Vertical bars show 95% confidence intervals.

Emergency hospital admissions

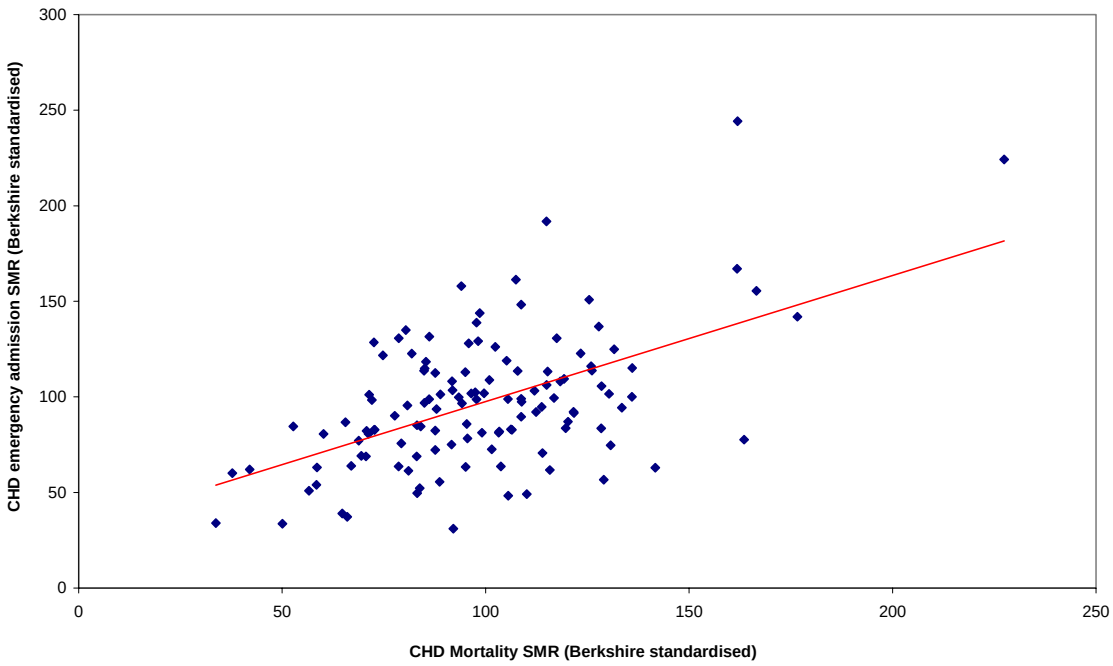
Populations with a higher mortality from CHD also have a higher incidence of the disease and are therefore likely to need more frequent admissions to hospital with CHD-related diagnoses, for both emergency and elective care.

Berkshire-wide ward level analysis: Figure 5 shows that wards in Berkshire with higher CHD mortality also have higher rates of emergency admission for CHD diagnoses. This is shown graphically by a trend line within the figure.

Berkshire-wide unitary authority level analysis: Figure 6 shows that unitary authorities in Berkshire with higher CHD mortality also have higher rates of emergency admission for CHD.

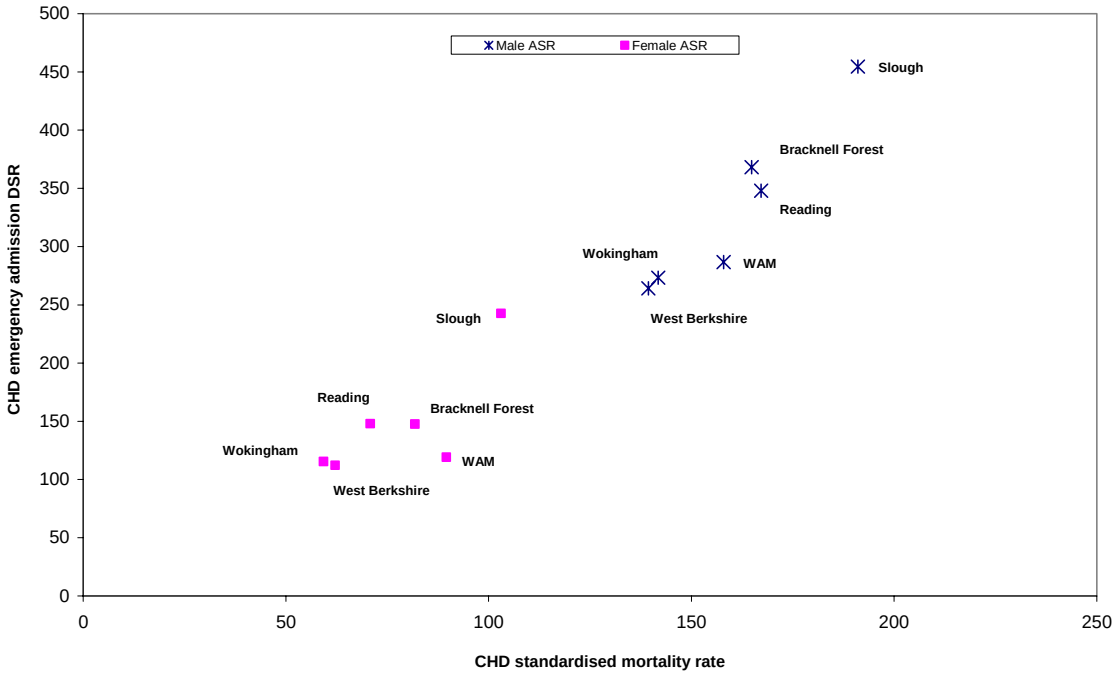
Both of these analyses suggest that there is no inverse care law operating in the delivery of emergency hospital care.

Figure 5: Standardised mortality ratios and standardised emergency admission ratios, CHD, Berkshire wards, 2001-2003.



Both mortality and admissions are standardised to the Berkshire population.

Figure 6: Age-standardised CHD emergency admission rate and CHD mortality rate, both per 100,000, Berkshire unitary authorities, 2001-2003.

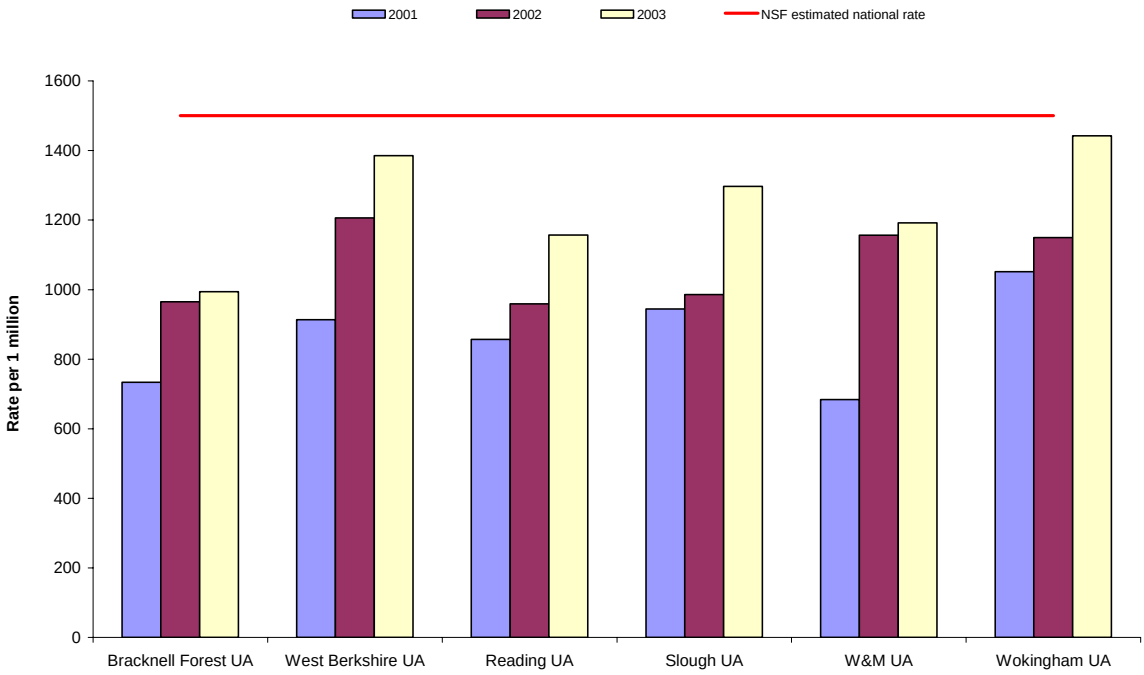


Revascularisation

Berkshire-level analyses

Figure 7 shows revascularisation rates by unitary authority, after adjustment for the underlying rate of CHD to enable direct comparison between unitary authorities. There was an increase of 44% in the number of revascularisations carried out on Berkshire residents in the three years from 2001. All PCTs contributed to this increase. However, no unitary authority in Berkshire had a rate of revascularisation that met the national target of 1500 revascularisations per million population per year set out in the national service framework published in 2000.

Figure 7: Annual revascularisation rates per million adjusted for CHD SMR, Berkshire unitary authorities, 2001, 2002 and 2003.



Berkshire unitary authorities (and, hence, PCTs) with higher mortality from CHD show higher rates of revascularisation (Figure 8). The trend is more evident among men, with the results for women being less clear, partly because of smaller numbers.

Figure 8: Age-standardised rates of revascularisation and of mortality from CHD per 100,000 by gender, Berkshire unitary authorities, 2001-2003.

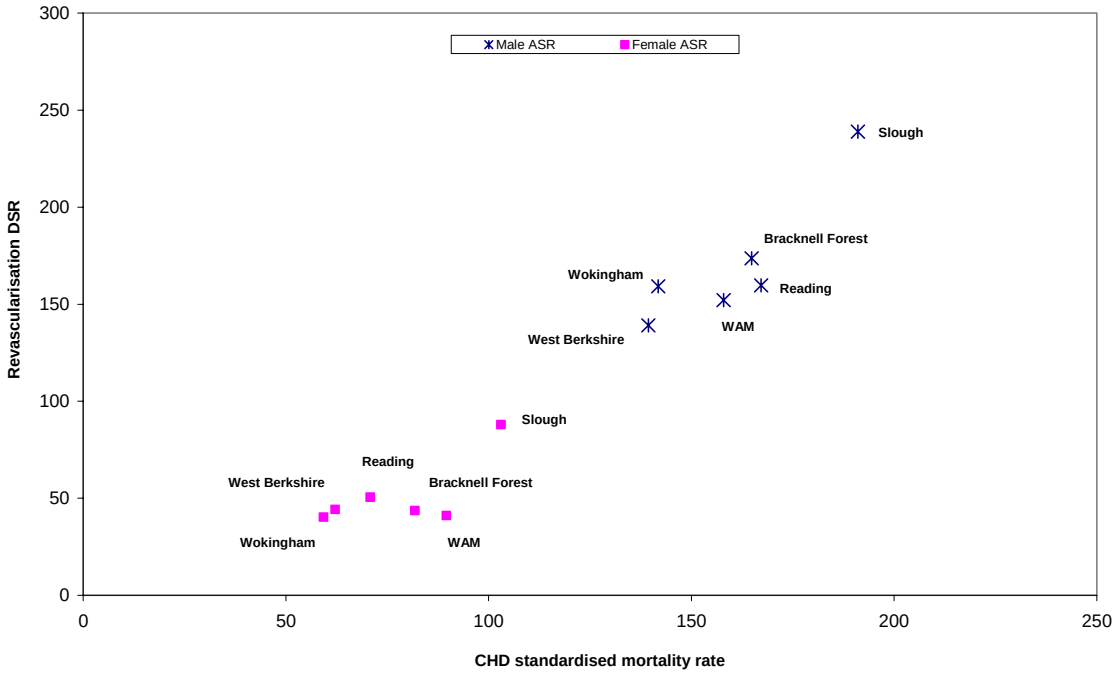
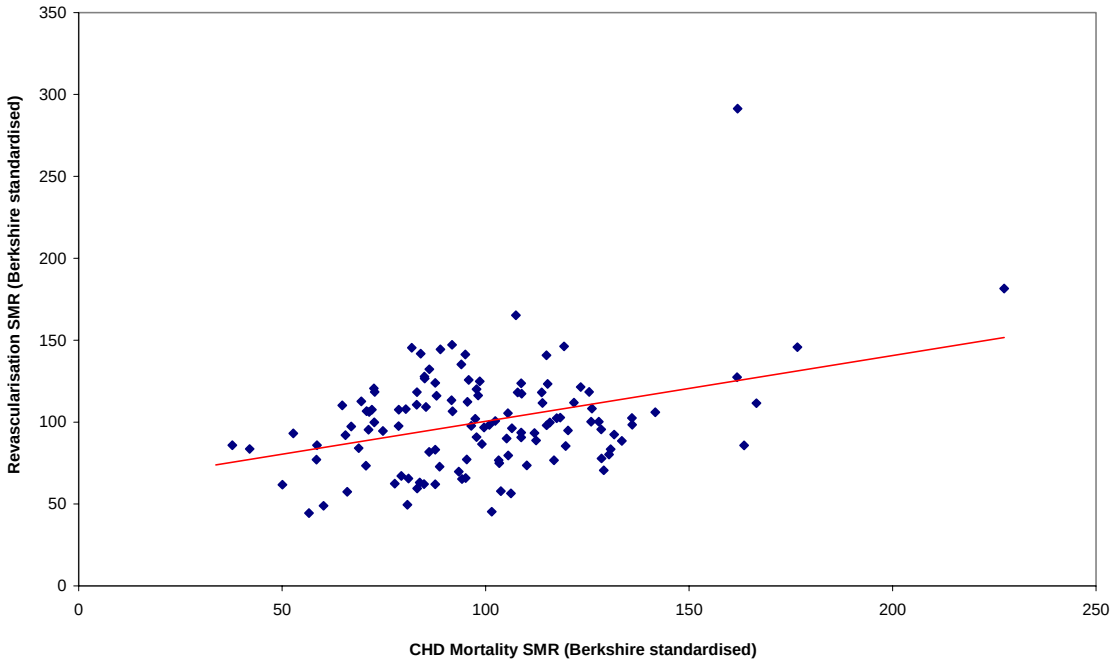


Figure 9 shows revascularisations and mortality from CHD for each ward in Berkshire, after adjustment for differences in age structure. Wards with higher mortality appear to have slightly higher revascularisation rates; however, the slight upward trend line shown in the figure is exaggerated by the 2 outlying wards in the top right of the figure. When the outliers are removed, this trend is no longer apparent.

Figure 9: CHD standardised mortality ratio and standardised activity ratio for revascularisation, Berkshire wards, 2001-2003.

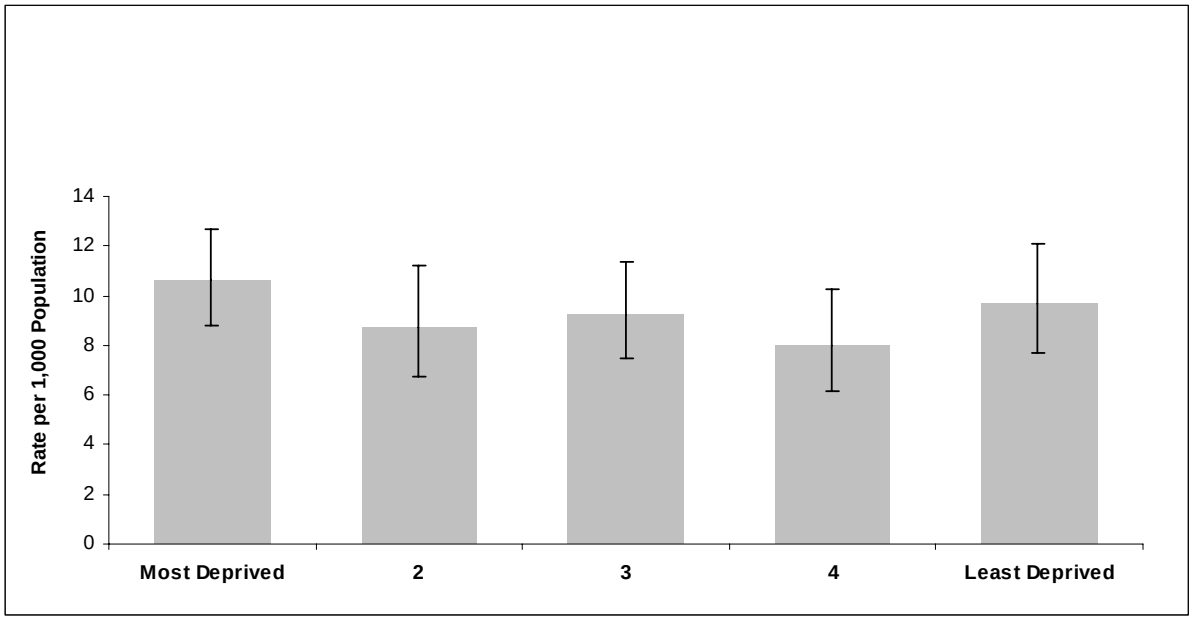


Both mortality and admissions are standardised to the Berkshire population.

West of Berkshire analyses

In the West of Berkshire, residents of the most deprived wards have the highest revascularisation rates (Figure 10), indicating at least partial success in meeting their higher level of need. Although the most deprived have the highest revascularisation rates, these are not significantly different from the less deprived groups.

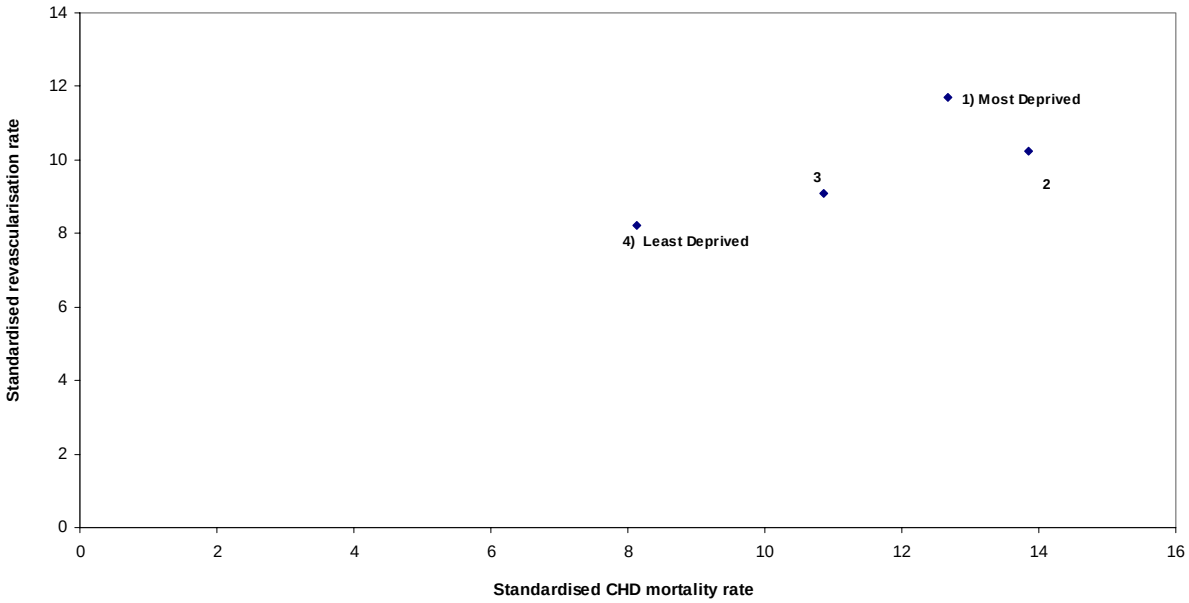
Figure 10: Age-sex standardised revascularisation rates by deprivation quintile, West of Berkshire, 2001-2003.



Vertical bars show 95% confidence intervals.

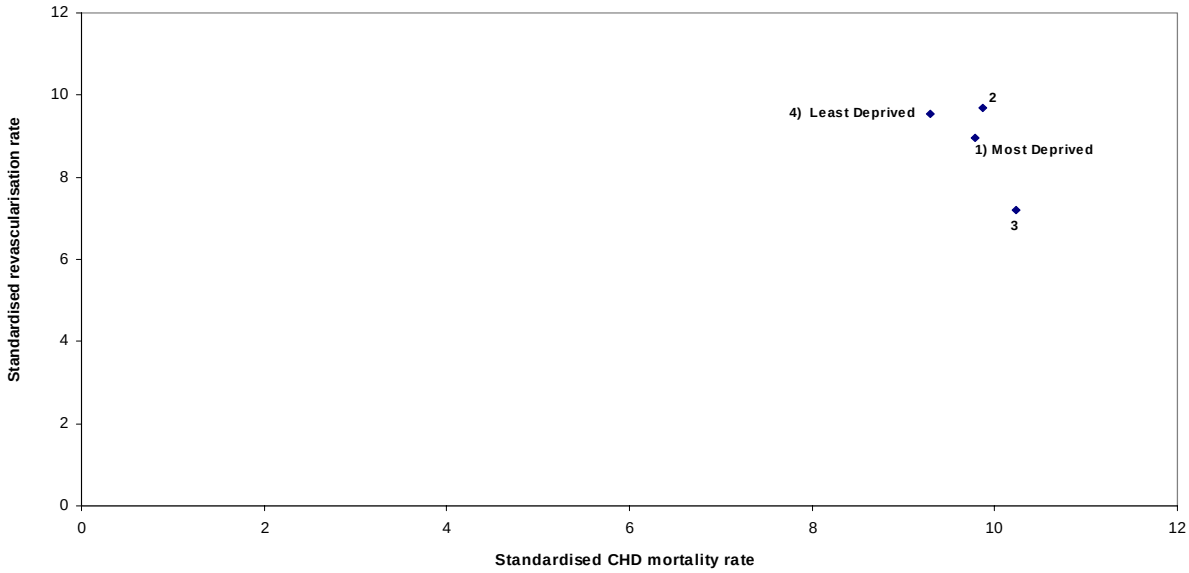
Unitary authority-specific analyses
In Reading, there is a clear trend for residents of the most deprived wards to have the highest rates of revascularisation (Figure 11).

Figure 11: Age-standardised rates of revascularisation and of mortality from CHD per 10,000 by deprivation quartile, Reading UA, 2001-2003.



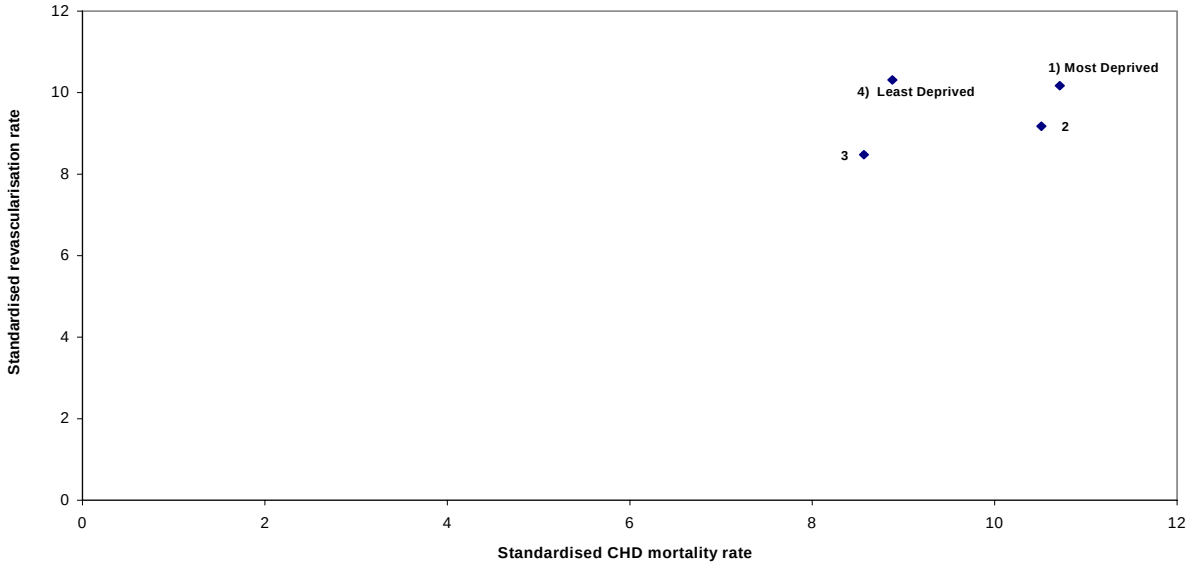
In West Berkshire, the differences in CHD mortality between the quartiles of wards grouped by deprivation are very small (Figure 12), hence one would expect little difference between revascularisation rates. No clear trend is shown.

Figure 12: Age-standardised rates of revascularisation and of mortality from CHD per 10,000 by deprivation quartile, West Berkshire UA, 2001-2003.



Wokingham shows a similar pattern to West Berkshire, with only small differences in mortality between the quartiles (Figure 13). The revascularisation rate in the most deprived quartile is very close to being the highest.

Figure 13: Age-standardised rates of revascularisation and of mortality from CHD per 10,000 by deprivation quartile, Wokingham UA, 2001-2003.



Conclusions

The responsiveness of CHD services to need in the West of Berkshire is inconsistent. Some hospital-based services show higher levels of activity for deprived populations: in particular, revascularisation rates are highest in groups with greatest need. However, preventative services such as smoking cessation and statin prescribing do not appear to be focused sufficiently on deprived groups and are therefore unlikely to reduce inequalities in the impact of CHD. Other important services such as cardiac rehabilitation cannot yet provide data suitable for health equity audit.

The first step in reducing health inequalities is to ensure that those with the highest level of need have the highest level of access to services, so that health services do not exacerbate existing inequity in health outcomes. This has been achieved for some but not all services. The second step is to ensure that service utilisation is increased for those with the highest level of need so that service utilisation properly reflects increased need and, therefore, that services actively reduce inequalities. It is not clear from this analysis whether this is yet achieved.

Recommendations

1. Stop smoking services should take steps to improve smoking cessation rates amongst people from socio-economically deprived groups. By identifying deprived wards with lower uptake of cessation services and lower proportions of successful quitters, and then improving their impact when working with deprived smokers, the services can actively reduce the high incidence of CHD in deprived groups.

2. Practices serving deprived populations should increase statin prescribing, targeting harder-to-reach people who may be deprived and have a greater need for statins. By identifying deprived people with CHD and at high risk because of risk factors such as diabetes, practices can reduce the subsequent impact of CHD in these groups.

3. National revascularisation targets should be adjusted locally to reflect each PCT population's level of need.

4. PCTs should ensure that data collection methods enable more comprehensive health equity audit analyses to be undertaken, including other CHD prevention/treatment services and other dimensions of inequality. These include:

   i. establishing a database for Wokingham and Newbury stop smoking services, similar to that held by Reading PCT, which enables collation of postcode-specific data on service contacts and quit rates;
   ii. implementation of plans by the cardiac rehabilitation service to collect computerised postcode-specific data;
   iii. exploring potential for inclusion of data on heart failure services in health equity audits;
   iv. improving completeness of ethnic minority recording;
   v. using primary care quality outcomes framework data to enable assessment of inequalities in relation to access to primary care interventions aimed at preventing/reducing risk of CHD.

4. A further analysis should be carried out to assess whether the increased uptake of hospital services by more deprived people is commensurate with their needs.

Appendix: Methodology for CHD equity profile, 2004: admissions and mortality data

The approach used in this CHD equity profile builds on the work led by Don Sinclair, on behalf of the Berkshire Public Health network, during 2003/04.

Data extraction

Morbidity

All morbidity data for hospital admissions and outpatient attendances were extracted from the Berkshire commissioning information system. It was decided to use 3 calendar years of data, from 2001 to 2003, for all hospital episodes. This time period was used to ensure that the latest complete data was used and that yearly fluctuations with small numbers were reduced. Outpatient attendances were extracted for 2003 only, as the numbers were larger than hospital admissions. Only first attendances were used to show initial contact by patients rather than total contact with cardiology consultants.

All hospital admissions data are first finished consultant episodes (FFCE's). This is taken as the first episode only in an inpatient stay in hospital. FFCE's ensure that only admissions due to the cause are included, rather than the complete number of episodes of care resulting from one admission. All hospital admissions were selected using the primary diagnosis only.

All revascularisation and angiography procedures are extracted from finished consultant episodes (FCE's). These are all episodes of care resulting from one admission. FCE's were used to ensure that all procedures were identified in the complete hospital stay of a patient. Primary and secondary procedure codes were used for selection.

Mortality

Mortality data was extracted from the Berkshire annual districts deaths database. 3 calendar years of data, from 2001 to 2003, was used to match the morbidity data and also reduce fluctuation in small numbers. Data was selected using ICD10 codes from the registered underlying cause of death.

Diagnosis Codes

ICD10 codes I20 to I25 were used for selecting both mortality and morbidity data.

OPCS4 codes were used for selecting all revascularisation procedures from the hospital episodes:

Condition	OPCS4 Code
Coronary Artery Bypass Graft (CABG)	K40-K46
Percutaneous Transluminal Coronary Angioplasty (PTCA)	K49-K50
Angiography	K63, K65

Data manipulation

Direct age standardisation

The European standard population was used as the standard population in the directly standardised rates that were produced for this report. Two slightly different standardisation methods were used for the different levels of data presentation. For data at Unitary Authority level, information has been age standardised for both males and females separately, using the standard 5-year European population age-groups. For data both at ward and deprivation quartiles, information has been age standardised for all persons using a condensed age range of the European population. This second method was used in order to minimise the effect of the small numbers on the standardisation process.

Standardised Morbidity/Mortality/Activity Ratios

Standardised ratios were produced for ward-based presentation of revascularisation, CHD mortality, CHD emergency admissions and Cardiology outpatients. They were used for these Ward based measures, as numbers were too small to carry out a direct standardisation.

Revascularisation trend weighting

Revascularisation (CABG and PTCA) annual crude rates were shown for years 2001, 2002 and 2003 for each of the unitary authorities. No standardisation process was undertaken for this trend data for the following reasons:

- The numbers of revascularisations are relatively small in number, possibly skewing the standardisation results
- The trend information was compared to the minimum crude rate expectation outlined in the CHD NSF.

Deprivation

The deprivation measure used in the report is based on the index of multiple deprivation score for England (IMD), produced in 2004. This measure was used due to the better correlation that the IMD 2004 score had with CHD mortality compared to two other readily available deprivation measures: the Carstairs index and the Census measure of household deprivation (Census table UV67).

The IMD 2004 score is a combined measure of seven specific independent ‘domains’ of deprivation that has been exponentially transformed. The bigger the IMD 2004 score for an area, the more deprived that area. However, because of the exponential distribution, it is not possible to say, for example, that an area with a score of 40 is twice as deprived as an one with a score of 20. In order to make comparisons between areas the scores of the IMD are ranked to show the differences.

For this document, ward level deprivation scores have been ranked:

- Within Berkshire
- Within each Unitary Authority

Each authority area (and Berkshire as a whole) has been broken up into quartiles, based on the ward ranking within its Unitary Authority. Quartiles have been used instead of quintiles in order to compare between the authority areas, due to the fact that Slough has too smaller a number of wards for quintiles to be a meaningful aggregation of wards.

Practice deprivation

The Thames Valley Primary Care Agency (TVPCA) provided a download from the primary care Exeter database. This download gave the postcodes of all patients registered with Berkshire practices, broken down by practice.

Each postcode within the practice was assigned a matching geographical unit of Lower Super Output area (SOA), which is a standard administrative geographical unit smaller than the electoral ward level. Standard lookup tables provided by the Office for National Statistics were used to accomplish the lookup procedure. The SOA forms the lowest unit at which the recent England indices of multiple deprivation (IMD 2004) are measured. Each SOA in England has an IMD score, which can be aggregated into larger geographical units, such as local authorities.

Each of the SOA's IMD scores were then averaged within each practice. The averaging process was simple and unweighted, as no underlying denominator population could be used. The end product of the averaging gave an IMD score for each Berkshire practice.

Population Weighting

The revascularisation trend charts use weighted populations in order to give a proxy for need to the number of revascularisations. The populations have been weighted using CHD mortality SMR's using England and Wales as a standard rate. These weightings allow the populations to be adjusted within Berkshire to take account of higher or lower CHD mortality. The weighting ratios used to adjust population (or 'normalisation' factors) are only ratios against the Berkshire total, so do not take into account the variation in revascularisations nationally, or regionally.