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Comparing the Hospital Experience of Differing Social Groups and Local Authority Residents in East Kent in 1999/2000

An interpretation of major findings from the East Kent Inequalities in Hospital Use Study

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CONTENTS

LIST OF FIGURES

INTRODUCTION

In recent years the Health Authority has conducted a range of investigations around health inequalities in the resident population of East Kent. Recent public health reports have featured the main findings of these investigations (1,2,3). In 2001 the Inequalities Committee, which has guided much of the work, commissioned the Centre for Health Service Studies to conduct a study which focused on inequalities in the use of secondary health care (hospital) services (4).

The purpose of this study has been to look for

(a) demonstrable links between any unusual rates of hospital inpatient use, and indicators of socio-economic status, and

(b) ***demonstrable links between any unusual rates of hospital inpatient use, and indicators of geographic dispersion by residence across East Kent***.

Understanding how such inequalities relate to care access should inform primary and secondary care planning and development.

The work was done by investigating variations in the use of specific acute hospital inpatient services through analysis of *'hospital episode statistics'*(5) for the period 1999/2000. The report described detailed analyses of episodes of acute hospital use for 11 inpatient diagnoses, 21 elective procedures and 20 cancers. Much of the variation discovered was not statistically significant or did not differ to that expected. Some of the variation could be accounted for by explanations unrelated to access. In some cases however significant variation from the mean was discovered in association with deprivation, *(by comparative analysis of hospital experience of subgroups according to DETR Index(6))*, and or in association with geographic location of residence, *(by comparative analysis of subgroups according to local authority of residence(7))*.

This paper highlights those findings where an association with deprivation or residential location has been demonstrated by an unusually high or low rate of hospital use, for a specific medical condition or procedure. The fact that an association is demonstrated does not definitively indicate unequal access or opportunities for care. However the findings do 'flag up' instances where unequal access could be operating and are therefore worthy of further investigation. In some instances specific issues for further investigation are proposed.

EXECUTIVE SUMMARY

THE MAIN UNUSUAL FINDINGS ARE SUMMARISED

This paper presents Acute Hospital Inpatient episodes as 'Indicators of Health Service Use' by the population. The population of East Kent Health Authority has been divided into socio-economic groups and their specific hospital experiences have been compared with each other. Similarly the population has also been divided into geographic localities and specific hospital experiences of these groups compared with each other. In some cases the rate for a particular indicator has been found to lie significantly outside the range expected for the average. These have been looked at in detail. In each case, the evidence supporting possible reasons for the anomaly are considered and inferences are made. They are inferences only and will frequently require further supporting evidence to get closer to the underlying cause. The findings have been grouped according to the types of indicator they represent.

INDICATORS OF NEED

Acute Myocardial Infarction. There appears to be unmet need in the prevention of acute myocardial infarction for the most socio-economic deprived population in the East Kent.

Head Injury in Young Persons. The findings suggest that acute care needs for head injury in young persons are probably being addressed appropriately.

Acute Upper Respiratory Infections. The rates of Hospital Episodes of Acute Upper Respiratory Infections varied significantly between local authorities. This may simply reflect underlying morbidity, it could also possibly be related to the organisation of Primary Care. Avenues for further investigation are suggested.

PRIMARY CARE PREVENTABLE ADMISSION INDICATORS

Heart Failure (emergency inpatients). Higher than average rates of emergency hospital episodes for heart failure were seen in deprived groups, in part reflecting the underlying incidence of heart disease. However, wide variation in the way cardiac failure is managed is frequently seen making it a potential candidate for shared guidelines (along with the appropriate implementation strategy). Further avenues of investigation are put forward.

Angina Pectoris. The most deprived population group of East Kent residents has the highest rate of angina pectoris This is likely to be a reflection of the co-relation between deprivation and lifestyle associated illness. Actions for follow up are proposed.

Pneumonia (Emergency admission). High rates of emergency hospital episodes for Pneumonia are seen among the most deprived. Pneumonia frequently complicates prior respiratory infection, a proportion of the acute hospital morbidity load may be preventable, through primary care. Further avenues of investigation are put forward.

Asthma (Emergency Admission) There are significant differences between places of residence. This could suggest variable impacts of primary care in different locations, or alternatively, low access to all types of care for some locations. Further analysis is proposed.

Diabetic ketoacidosis and coma

Much higher than average rates of hospital episodes for Diabetic ketoacidosis and coma are seen among the most deprived. This could be a strong indication of difficulties in diabetes management lack of early intervention in this group. Further analysis is proposed.

Accidental Injuries The most deprived group show the highest rate of accidental injuries. The severely deprived therefore may represent a target group for more focused accident and injury prevention strategies.

INDICATORS OF ACCESS

Chronic Ischaemic Heart Disease (Elective Admission)

The Chronic Disease picture is almost (but not exactly) the reverse of the acute symptomatic picture. The local authority group with the highest of all rate for episodes of acute angina shows the lowest rates for elective episodes for Chronic Ischaemic Heart Disease, and vice versa. This could possibly indicate lower access to appropriate investigation for some groups and may suggest significant geographic disparities in access in East Kent for people with Ischaemic Heart Disease.

Hip and Knee Joint Replacements Lower than average rates are seen among the most deprived (the highest 10% deprivation score) group of East Kent residents. Geographic variations are also seen. Further analysis is proposed.

Primary repair of inguinal hernia. Significantly high rates are seen in the most deprived possibly reflecting morbidity in a group known to have a higher prevalence of lifestyle risk factors for this condition such as smoking, lack of exercise and obesity.

Cataract Replacement. The rates show a gradient which appears to correlate with deprivation which probably reflects underlying morbidity and appears to demonstrate appropriate access. Some residential groups appear to more the subject of throughput variations than others. This may effect their waiting times.

Revascularisation Associated Investigations and Procedures are treated collectively:

Angiography High rates of angiography in the most deprived probably reflects the increased burden of cardiovascular morbidity. Deprivation does not appear to be a barrier to access, but variations elsewhere demonstrate that access could be inhibited on geographic grounds.

Percutaneous transluminal coronary angioplasty shows no significant variation across the deprivation groups for elective, or elective plus emergency, episodes.

However, Canterbury shows significantly lower than average rates of all PTCAs. adding further evidence to the suggest significant geographic disparities in access in East Kent for people with Ischaemic Heart Disease.

Coronary Artery By-pass Graft episodes showed no significant differences across deprivation groups further suggesting that there are no major barriers to access on grounds of deprivation. However, when the data are examined according to geographic location there is further evidence supporting the suggestion that location of residence may be a barrier to access for investigation and management of Ischaemic Heart Disease.

All revascularisations (elective and emergency inpatients) combined. The evidence demonstrated above is further borne out

INDICATORS OF APPROPRIATE UPTAKE

Stroke. It appears again for Stroke that the bulk of the serious morbidity burden is born by the more deprived half of the population. This tends to suggest that the incidence of the vascular disease is a major determinant of rates as they stand. Comparative analysis of the use of alternative types of care for stroke and for its preventability is suggested.

Biopsy of Cervix Uteri. Certain geographic rates looked quite abnormal, however investigation of this finding has revealed that there is a specific coding anomaly underlying and resulting in what is in reality a data classification artifact.

The purpose of highlighting these unexpected findings, be they high or low rates for procedures or conditions according to deprivation or place of residence, is to focus attention on their existence. The interpretations which follow will rarely if ever be the final word on a particular issue but will it is hoped provoke interest and further investigation on what initially appear to be disparities in opportunity to avail of services between equally deserving members of the population.

USING HOSPITAL DATA TO DEMONSTRATE AND INTERPRET VARIATIONS IN RATES OF CARE.

In the NHS, every time a person is treated as a hospital inpatient, a form is completed and a standard set of data is collected. The information gathered includes the patients age, sex, residential and social characteristics along with time spent in hospital and waiting beforehand, as well as diagnoses, treatments and follow up. These data collections are, in theory, uniform up and down the country. This means that data reflecting the hospital experience of the whole population or any particular sub groups, over any period, can be examined.

A word on rates

When we want to compare the occurrence of something in a group of people, with the experience of another group, we need to compare apples with apples. To do this we need a fixed period of time, e.g. one year, and we need to examine the specific occurrence rates found for every 'so many' residents in each group, (eg the rate per 100,00 residents of each population). This is because the groups are not going to be exactly the same size so that a direct comparison of occurrences of cases would be meaningless. Furthermore, as the age distributions are not likely to be exactly the same either, we use another mathematical adjustment which gives us an *'age standardised rate'*. This allows meaningful comparison of groups with different age structures.

A commonly examined group is a 'Health Authority Population'. This is because the health authorities have responsibility for strategies aimed at improving the health of their residents.

USING POPULATION SUBDIVISIONS FOR MAKING COMPARISONS

If we look at the annual rate of, say, hip replacements for the catchment population of the Health Authority it provides us with a 'health authority average rate', but actually it tells us very little in isolation. It is only useful when we compare rates for other populations with this average. In this paper, for each indicator we have looked at each sub population of East Kent Health Authority and compared the rate with the Health Authority average. We have also, where relevant, compared sub population rates with each other.

Two separate (but related) sets of sub population were used.
(i) The first set are ***geographic groups*** and are based on individual patients' post codes. We have grouped the populations into each of the local authorities within the East Kent Health Authority catchment, thereby giving ***Six Local Authority Sub Populations***. These are Ashford, Canterbury, Dover, Shepway, Swale, and Thanet.
(ii)The second set are ***socio-demographic groups***. We have used a special census-based indicator of deprivation applied to electoral wards. Using individual patients' post codes, the population is first broken down as far as *electoral ward groups.* These are then regrouped according to an Index of Deprivation (*).This regrouping provided socio-economic groups The first represents the population of East Kent which falls into the highest 10% deprivation score, and so on for each 10% up to the least deprived scores (the most well off). As there are fewer people in the less deprived groups, those in the top thirty percent deprivation scores have been lumped into one group. This results in eight groups in all.

(* developed nationally by the Department of the Environment, Transport and the Regions known as the Index of Multiple Deprivation – IMD 2000).

USING CLINICAL INDICATORS

Although never providing a complete picture, there are features of the health of the population and, in particular, the use of health services by that population, which are reflected in acute hospital inpatient data. This paper looks at the hospital inpatient experience of the residents of East Kent during the period from April 1999 to March 2000.

In this report a 'basket' of clinical conditions and therapeutic procedures are used as a broad set of clinical indicators. Interpretation based on background research is used to classify the indicators in groups. (See Appendix 1 for further detail on indicator use).
The groups of indicators are considered to be potential reflections of the following:

Response To Need (e.g. Acute heart attack admitted as an emergency),
Service Accessibility (e.g. Hip Replacements),
Possible Under Use (e.g. Heart by-pass grafts),
Possible Over Use (e.g. Grommets in 'glue-ear'),
Possibly Preventable Admission (e.g. Diabetic emergency).

FINDINGS

INDICATORS OF NEED

Acute Myocardial Infarction (emergency inpatients)
The most deprived population group of East Kent residents has the highest rate of acute myocardial infarction episodes(167.25per 100,000). Significantly higher than average rates are seen. (The rate ratios are not enormous being c.40% higher than average.)This is likely to be a reflection of the co-relation between deprivation and lifestyle associated illness. Higher rates of tobacco, inactivity and obesity related disorders, are not uncommon in deprived populations.

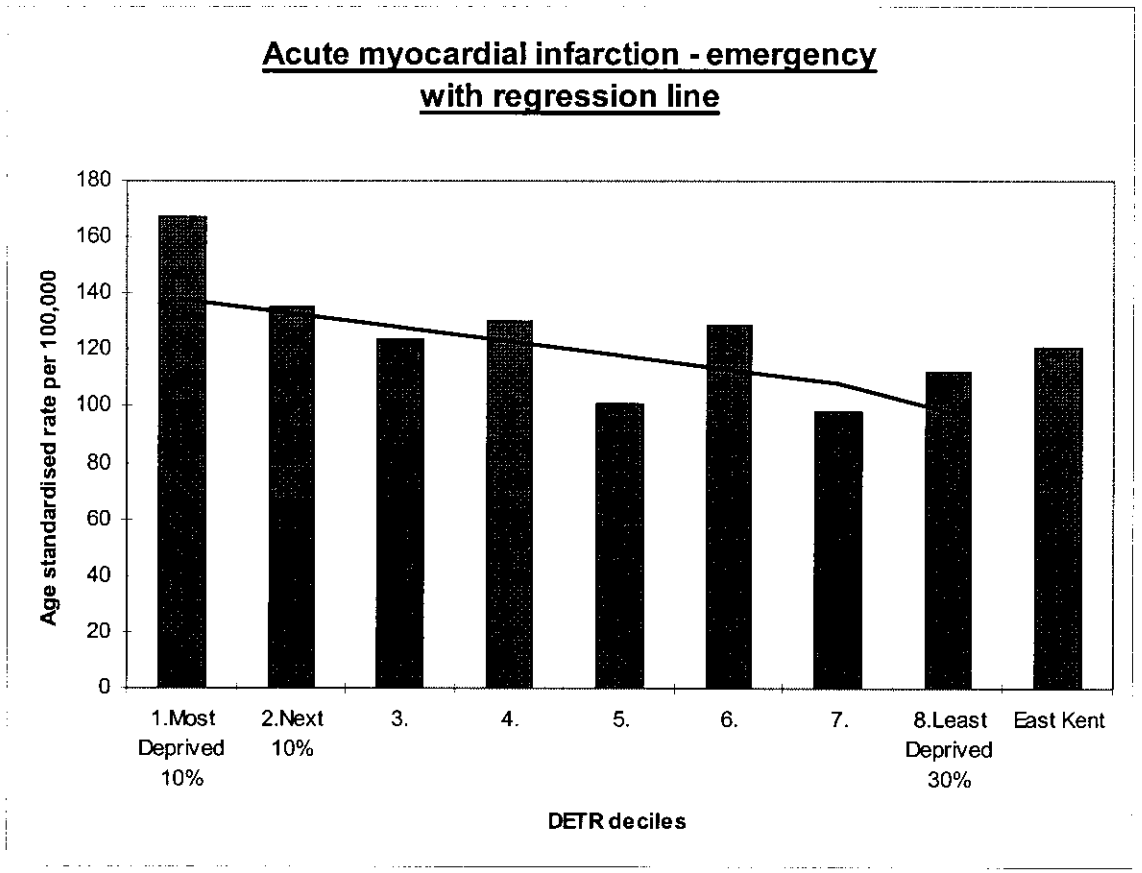

Figure 1. Myocardial Infarction Rates (emergency inpatients), by IMD 2000 group, with regression line, for East Kent 1999/2000.

Coronary Heart Disease Standardised Mortality Rate

When the Standardised Mortality Rate for Coronary Heart Disease in these groups is examined, we see that, although there is an upward gradient from the least to the most deprived, the rate for the most deprived group is not significantly different from that for the East Kent population, nor indeed from the least deprived group. When looked across place of residence there is no significant variation particular to any single local authority.

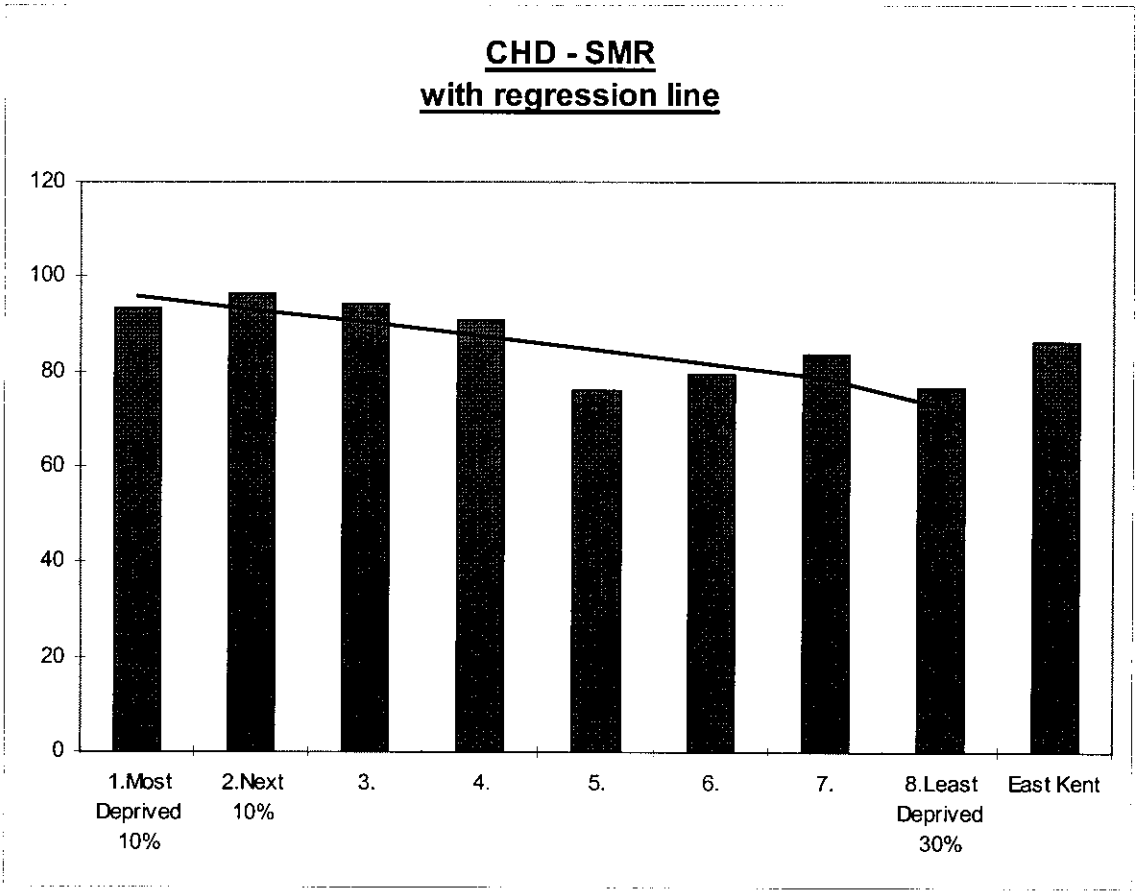

Figure 2. CHD Standardized Mortality Ratios, by IMD 2000 group, with regression line for East Kent 1999/2000.

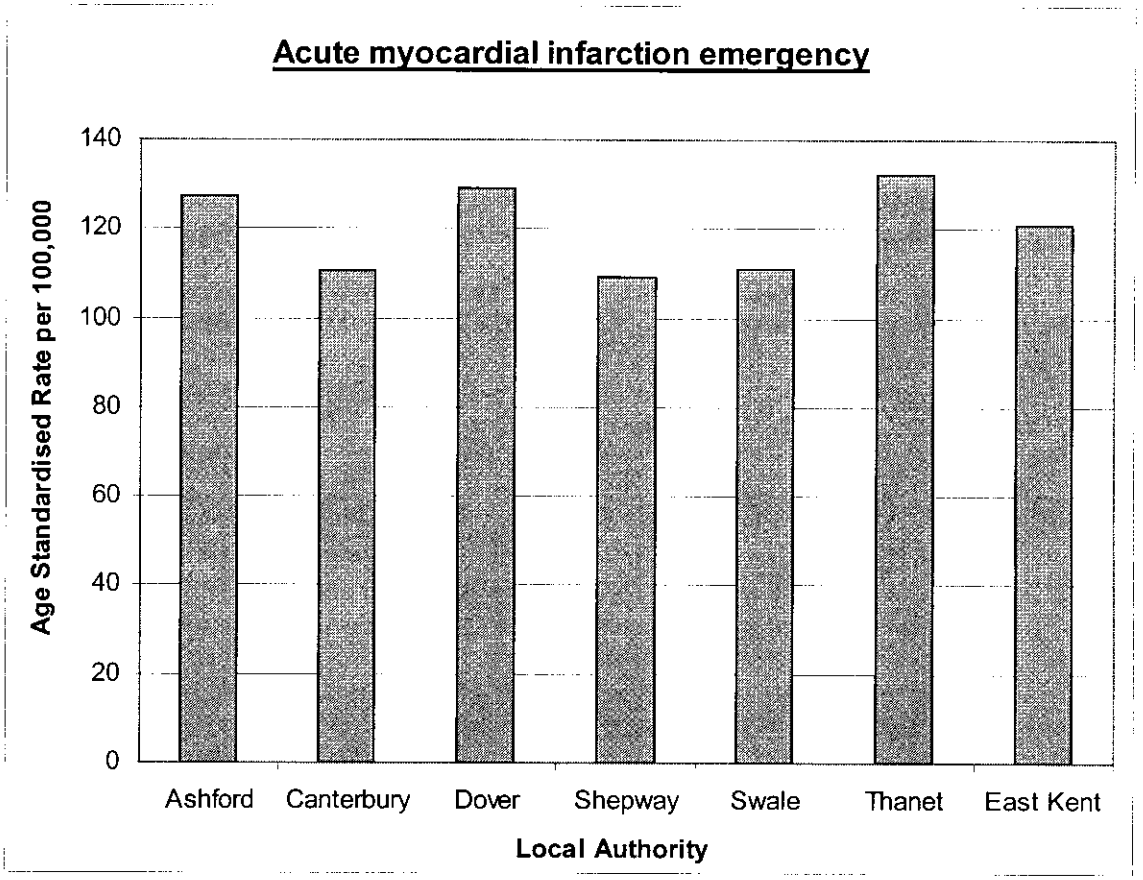

Figure 3. Myocardial Infarction Rates (emergency inpatients), by Local Authority of residence group, with regression line, for East Kent 1999/2000.

There appears to be unmet need in the prevention of acute myocardial infarction for this group in particular. Further investigation is desirable and this could include analysing:
Comparative prescribing rates for Ischaemic heart disease medications,
Comparative specialist referral rates for Coronary Heart Disease (CHD)
Comparative investigation and re-vascularisation rates for CHD (see elsewhere in this report)
Out of hospital coronary death rates, (incl A&E)
Comparative rates for acute myocardial infarction with inclusion of private sector data.

Fracture of the Skull, intracranial injury and late effects, age 0-24 (emergency inpatients) - None of the deprivation groups show age standardised rates which differ significantly from the East Kent rate There is nothing, therefore, to suggest that needs are not being met for any particular group. Comparisons across local authorities showed significantly higher than expected and lower than expected rates at Canterbury and Ashford respectively. With the total number of cases at 72 all together, the result may be due to small numbers, or it may possibly reflect the Road Traffic Accident burden, with Canterbury being the largest urban population in Kent. It is not, however, appropriate to draw any substantial inference from these figures.

The acute care needs for these head injury conditions in the young are probably being addressed appropriately.

Acute Upper Respiratory infections multiple / unspecified

None of the deprivation groups show age standardised rates which differ significantly from the East Kent rate There is nothing, therefore, to suggest that needs are not being met for any particular group. However, comparisons across local authorities show some statistically significant differences with the highest rates at Canterbury and the lowest at Ashford. Both of these are significantly different than the East Kent rate.

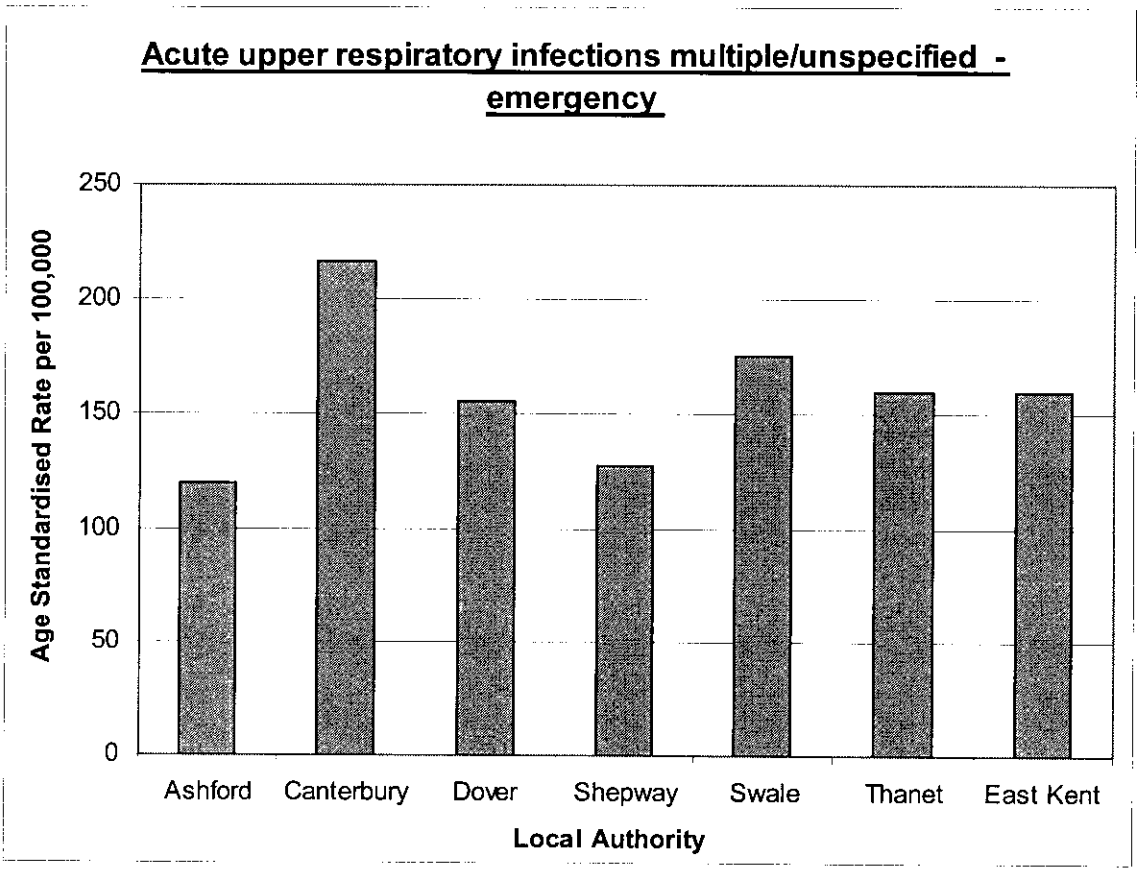

Figure 4 Acute Upper Respiratory Infections Rates, Rates (emergency inpatients), by Local Authority of residence group, with regression line, for East Kent 1999/2000.

The reasons for significant variations between local authorities are not fully understood, they may simply reflect normally variable incidence of morbidity in geographically separate areas. They could possibly be related to the organisation of Primary Care services provision (for example the availability of GP hospital / community beds.) Further investigation might involve looking at rates over a longer time, and at primary care service configurations. In general, however, the system appears to be responding adequately to need.

PRIMARY CARE PREVENTABLE ADMISSION INDICATORS

Heart Failure (emergency inpatients)

The most deprived and third most deprived population groups of East Kent residents have the highest rates of emergency inpatient treatment for Heart Failure. Significantly higher than average rates are seen. (The rate ratios being c.67% & 35% higher than average respectively.)

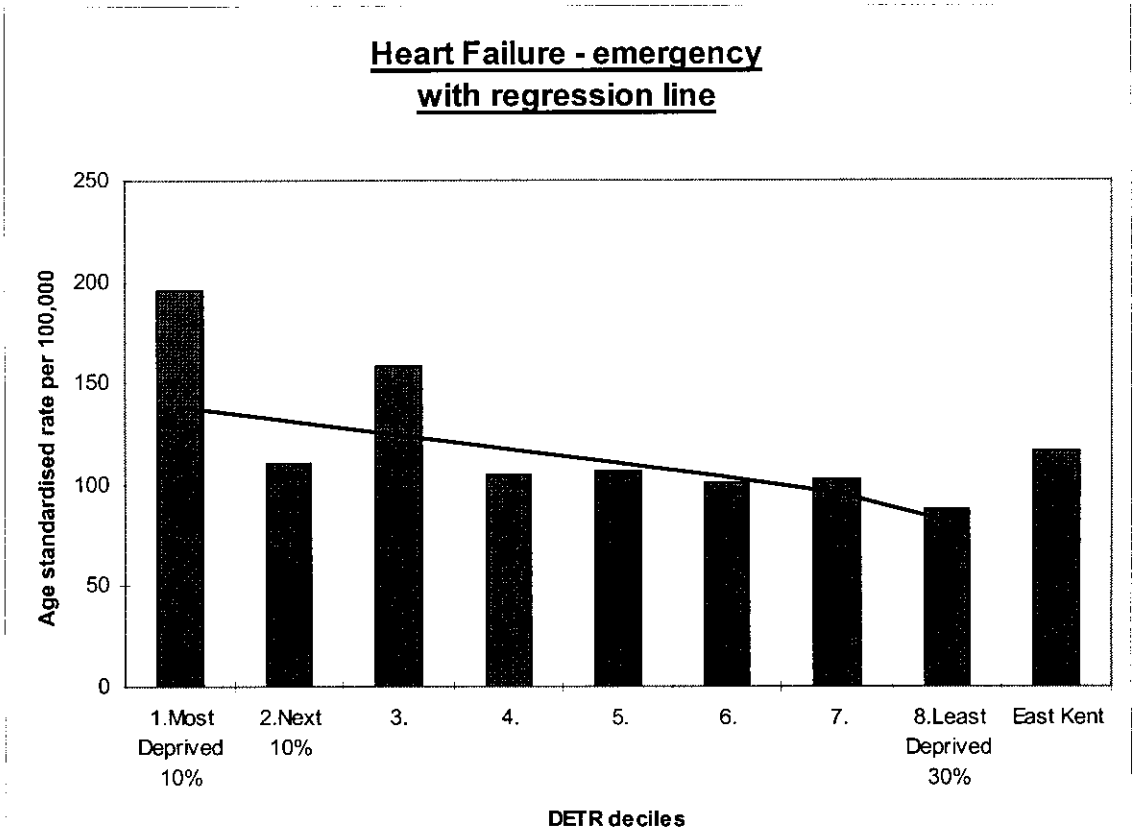

Figure 5. Heart Failure (Emergency Inpatient) Rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

We have seen that when the Standardised Mortality Rate for Coronary Heart Disease is examined for the deprivation groups, that there is an upward gradient from the least to the most deprived, although the rate for the most deprived group is not significantly different from the average. Furthermore, the least deprived 30% of the population have a significantly lower rate than the deprived groups and also are significantly lower than the average. This variance is not reproduced in the data looking at local authorities and therefore could be said to reflect variance in the care across deprivation groups, rather than between acute providers.

Acute cardiac failure, although tending to be recurrent and ultimately terminal, can, in many patients be kept under control, and held off for longer periods through careful and adequate therapy. The fact that there is often wide variance in the way cardiac failure is managed makes it a potential candidate for shared guidelines (along with the appropriate implementation strategy). A focus on primary care management in this condition could improve outcomes. Information which could elucidate the picture further could include:
Comparative prescribing rates for Ischaemic heart disease medications. In hospital and out of hospital death rates for Congestive Cardiac Failure, (incl. A&E).
Comparative private sector rates for Congestive Cardiac Failure. (It is possible that the significantly different rate for the least deprived might shift if these were included.)

Angina Pectoris (emergency inpatients)

The most deprived population group of East Kent residents has the highest rate of angina pectoris (emergency inpatients) episodes (278.13 per 100,000). A rate significantly higher than average is seen. (The rate ratios are c.50% higher than average.)This is likely to be a reflection of the co-relation between deprivation and lifestyle associated illness. As previously mentioned, higher rates of tobacco, inactivity and obesity related disorders, are not uncommon in deprived populations. The rate for this group is significantly at variance with the general population.

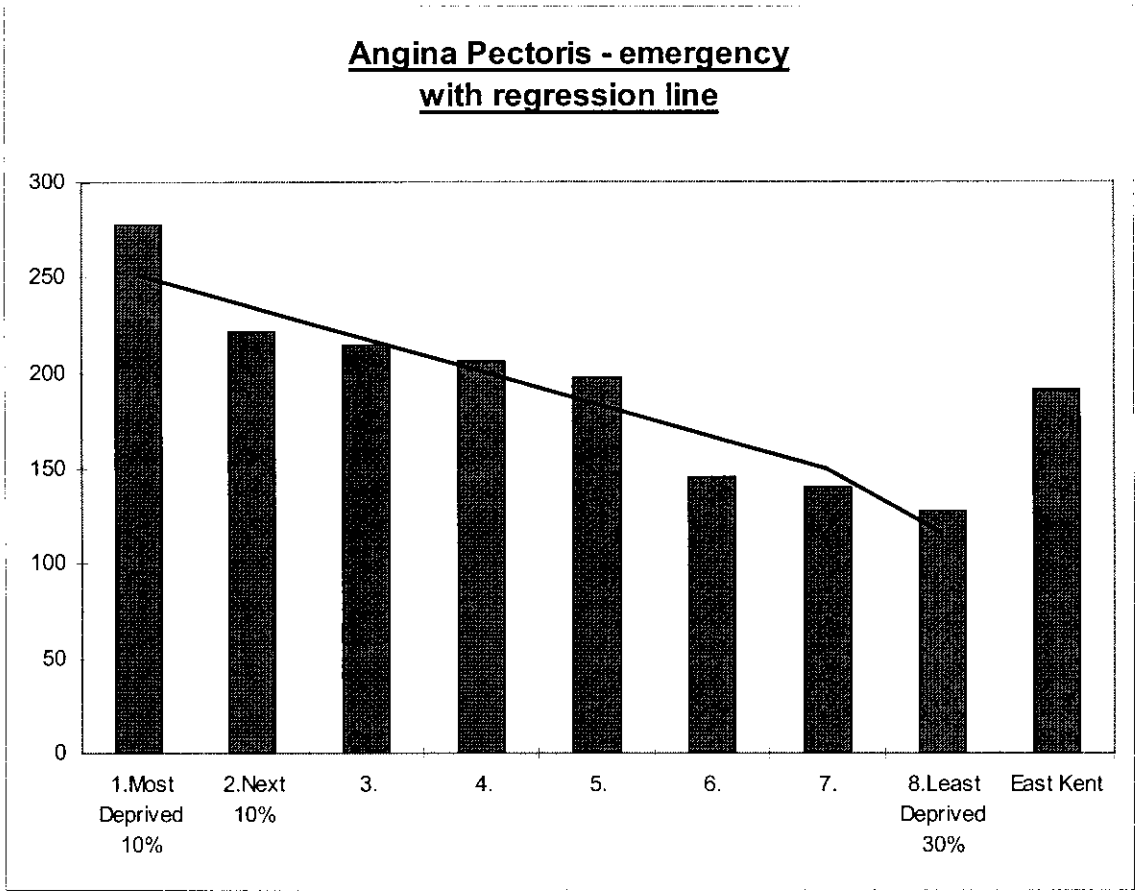

Figure 6. Angina Pectoris (Emergency Inpatient) Rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

The least deprived 50% of the population only account for 21% of hospital episodes for acute angina. It appears that the bulk of the serious morbidity burden from angina is born by the more deprived half of the population and the heaviest burden is carried by the most deprived. When the rates at local authority level are compared it can be seen that Ashford and Shepway have rates significantly *lower than East Kent* as a whole and that Canterbury and Thanet have rates which are significantly *higher*. Only Dover and Swale have rates which are significantly similar to East Kent. This perhaps suggests a weak correlation between the towns and the overall deprivation levels within them as it is such a significant predictor in this instance.

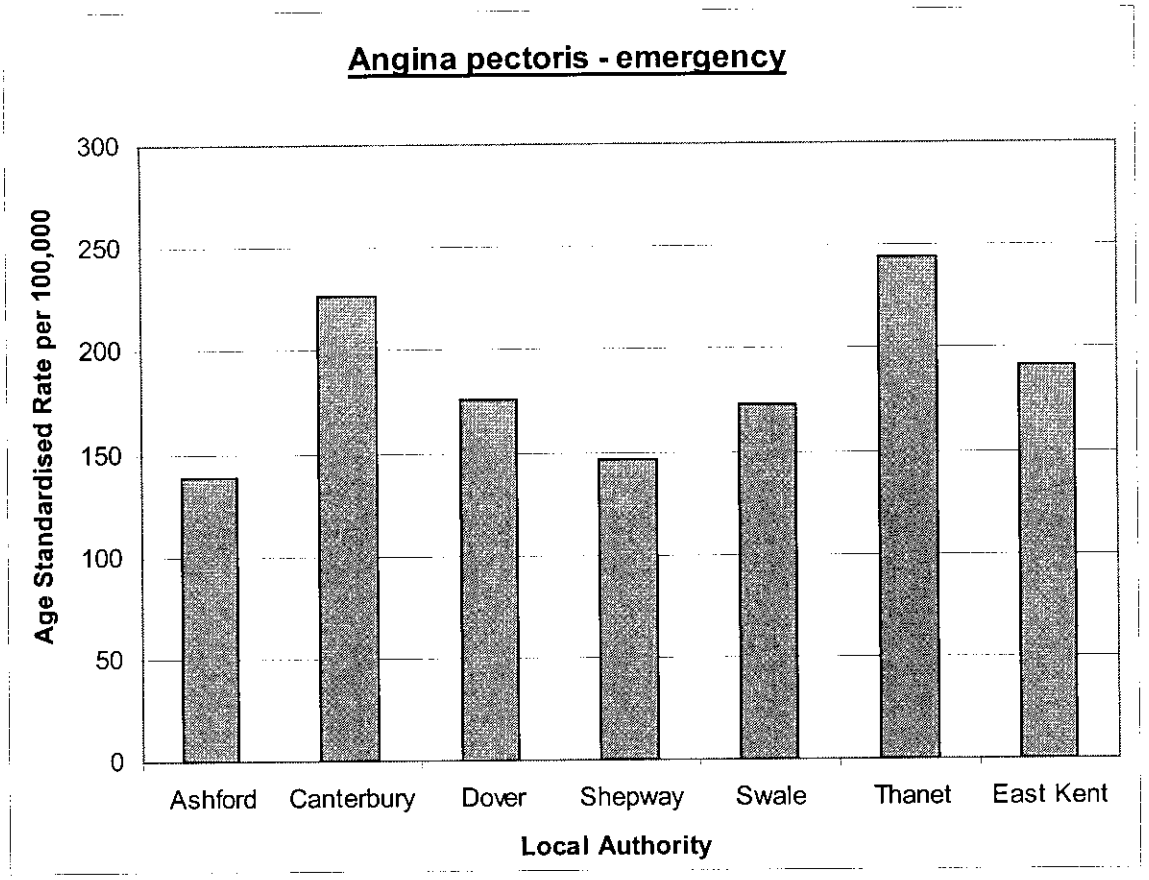

Figure 7. Angina Pectoris (Emergency Inpatient) Rates, by Local Authority group, for East Kent 1999/2000.

When the SMRs for CHD for these deprived groups are looked at, although there is an upward gradient from the least to the most deprived, they are not significantly different from the East Kent population, nor indeed from the least deprived. It would appear therefore that there may be opportunities to refine the management of these groups, possibly in the same strategy as for the Congestive Cardiac Failure group of patients.

Information which could elucidate the picture further could include:
Comparative prescribing rates for Angina medications, such as Calcium channel blockers and others.
Comparative private sector rates for angina. (It is possible that the significantly different rate for the least deprived might shift if these were included.)

Pneumonia, organism unspecified (emergency inpatients)

Significantly higher than average rates are seen among the most deprived (the highest 10% deprivation score) group of East Kent residents . (The rate ratio shows a greater than 50% higher than average rate.) Although there may be some reflection of co-relation between deprivation and a lifestyle associated illness, there is also a question of early access to care.

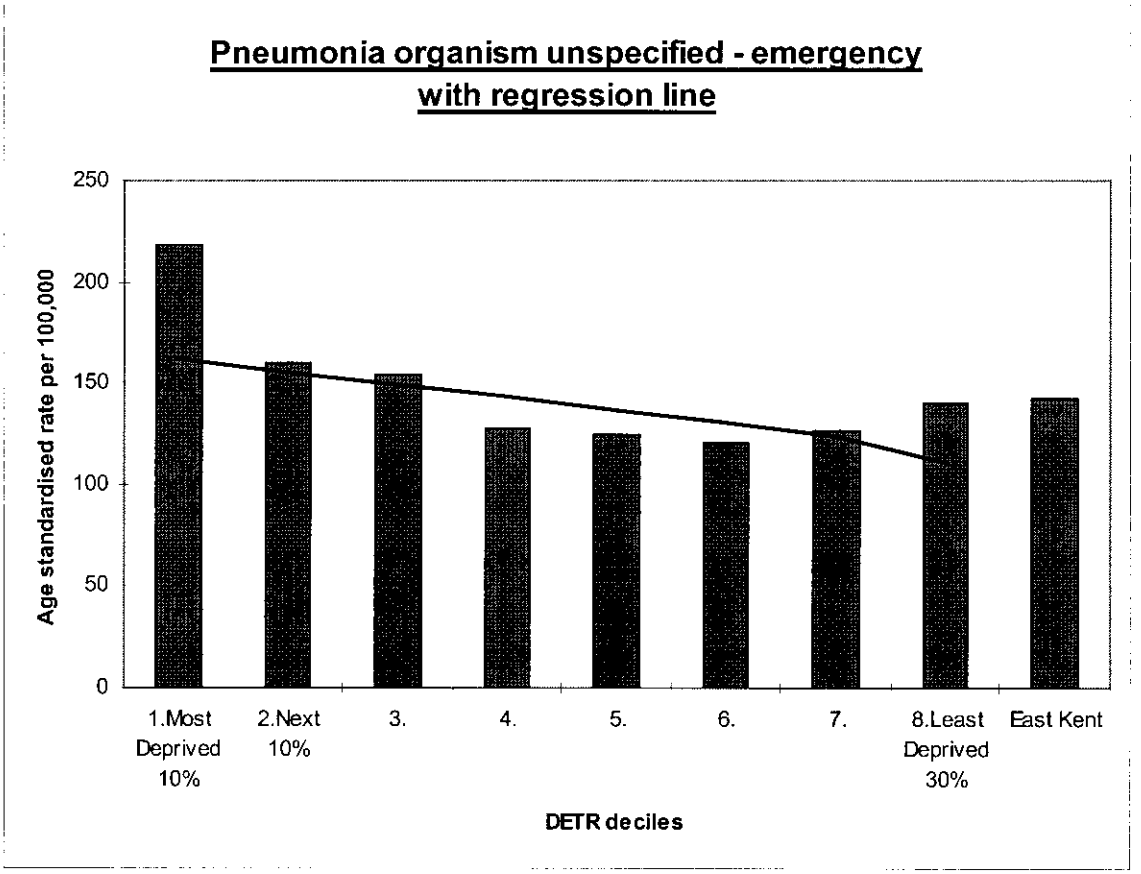

Figure 8. Pneumonia Emergency Rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

As pneumonia frequently complicates prior respiratory infection, a proportion of the acute hospital morbidity load may be preventable, through focusing more effective primary care on this group. Emergency admission rates for Pneumonia are sometimes as an index for 'primary care preventable

Asthma (emergency inpatients)

The age standardised rate for East Kent is 116.97 per 100,000. There is no significant difference in rates between deprivation groups. There are however significant differences between local authorities with the highest rate at Canterbury and the lowest at Thanet, both significantly different to the rate for East Kent.

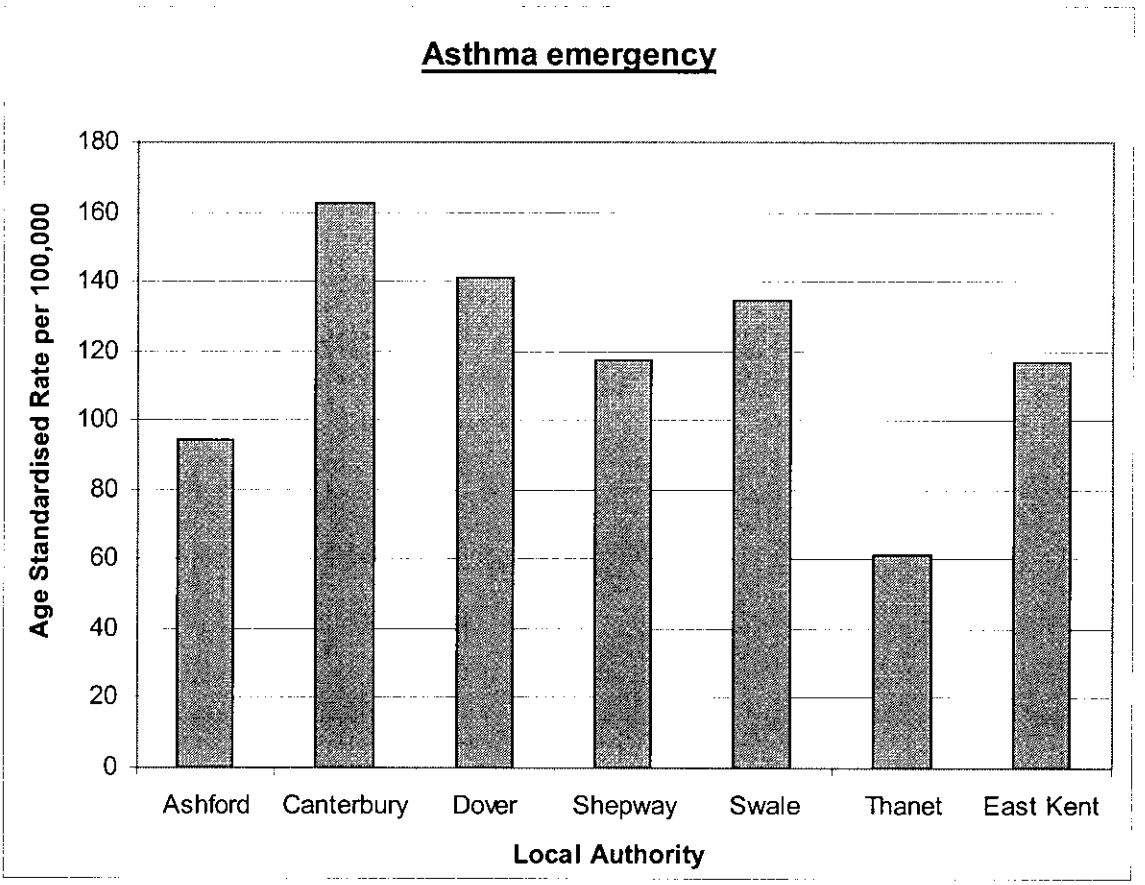

Figure 9. Asthma (Emergency Inpatient) Rates, by Local Authority group, without regression line for East Kent 1999/2000.

This result might suggest the possibility of more effective primary care in Thanet than elsewhere. As to whether this is the case or not, it would need further enquiry. The episode rates alone are not robust enough to support this inference, it could in fact be the opposite if there was for example a highly organised secondary care heavily referred to. Further analysis might include asthma mortality rates and the presence of schemes for effective asthma management. Comparison of strategies for asthma care across the districts could be useful.

Diabetic keto acidosis and coma

Significantly higher than average rates are seen among the most deprived (the highest 10% deprivation score) group of East Kent residents . (The rate ratio shows a higher than average rate by more than three and a half fold.) This is a strong indicator of lack of early intervention in this group.

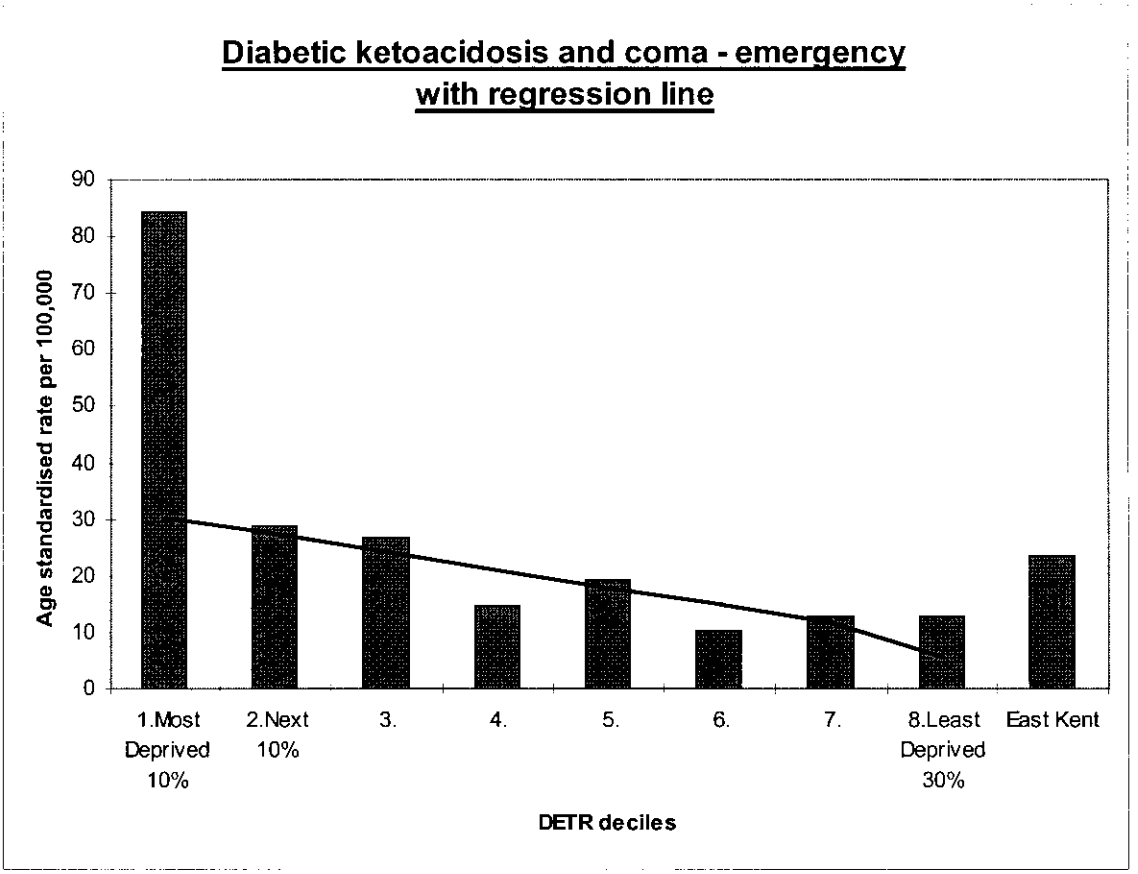

Figure 10. Diabetic Keto-acidosis and Coma Rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

Diabetic keto acidosis and coma (cont.)

When rates for local authorities are compared Thanet has the highest rate which is significantly different from East Kent. This might again be suggesting a weak correlation between the towns and the overall deprivation levels within them.

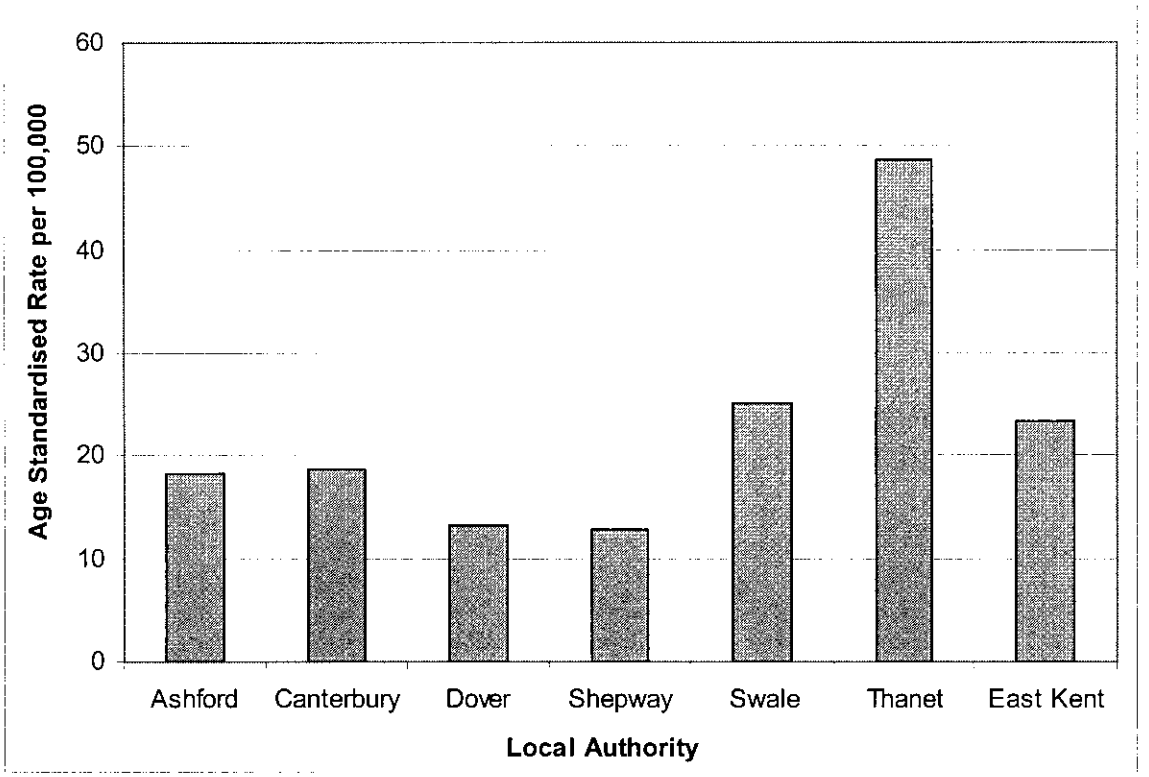

Figure 11. Diabetic Ketoacidosis and Coma Rates, by Local Authority group, for East Kent 1999/2000.

Although less effective primary care might be considered a possible underlying cause, the existence or not of specific diabetes strategies should be taken into account. Also the participation and compliance of the client population needs to be considered along with such issues as recidivism and registers. (Furthermore the numbers are rather small (145 FCEs for the year) and may have had some effect on the significance.)

Accidental Injuries

Although often not directly preventable through primary care interventions, combined primary and community care may well have responsibilities in this respect. For that reason it is included in this section.

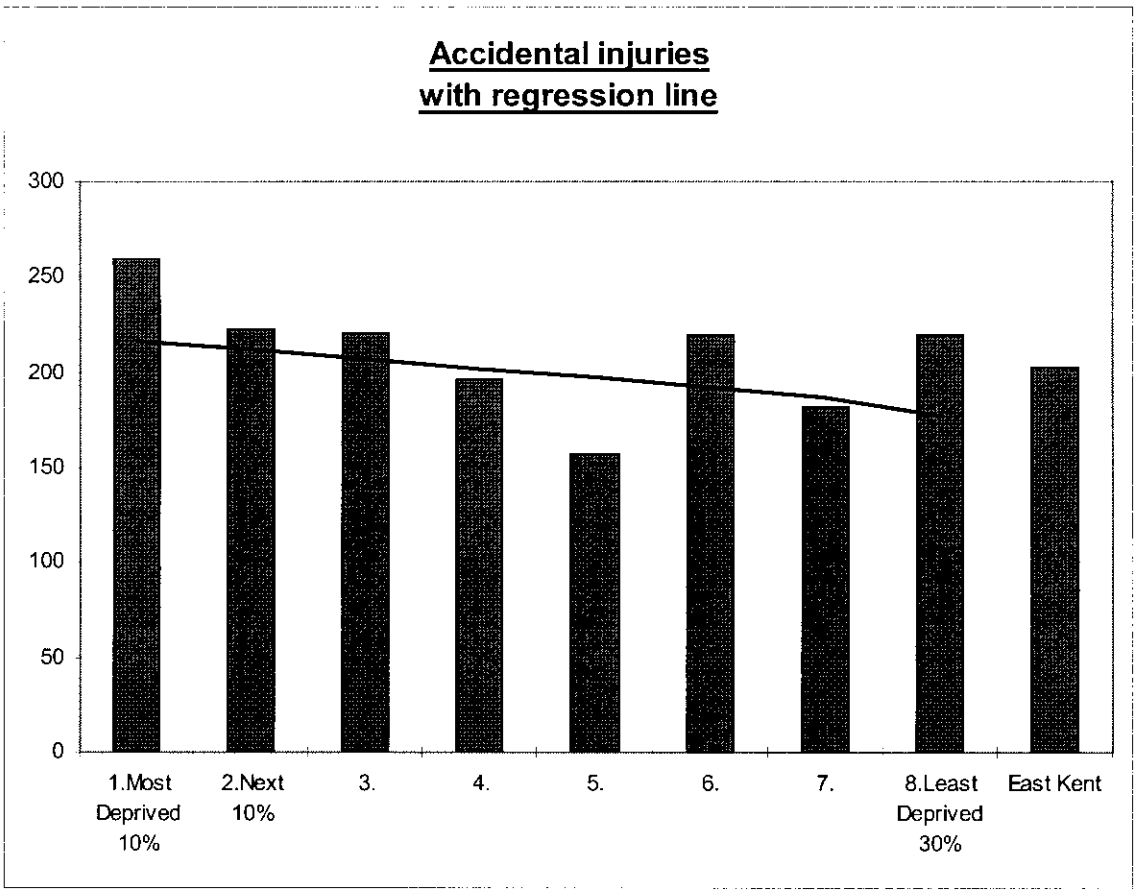

Figure 12. Accidental Injury Rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

The most deprived group show the highest rate at 259.41 significantly different to the average. As a rate ratio it is less than 28% higher than the East Kent rate.

In spite of the rate ratio being only a quarter above the East Kent average, the rate difference this represents over 50 hospitalisation episodes more per 100,000 of the population each year, and if preventable may represent significant health gain. The severely deprived therefore may represent a target group for more focused accident and injury prevention strategies.

There is no variance, (compared with East Kent), for any local authority of residence. Location of residence does not therefore appear to be a significant predictor of excess accident or injury in East Kent.

INDICATORS OF ACCESS

Chronic Ischaemic Heart Disease (elective inpatients).
The purpose of Elective Chronic Ischaemic Heart Disease episodes tends to be for the investigation of Ischaemic Heart Disease.

When variations across the deprivation groups are looked at the highest rate (157.55per 100,000) is seen in the most deprived 10% of the population and the lowest rate is seen in the

group between 60th to 70th of least deprived percentiles. None of the groups show a rate significantly at variance with the general population.

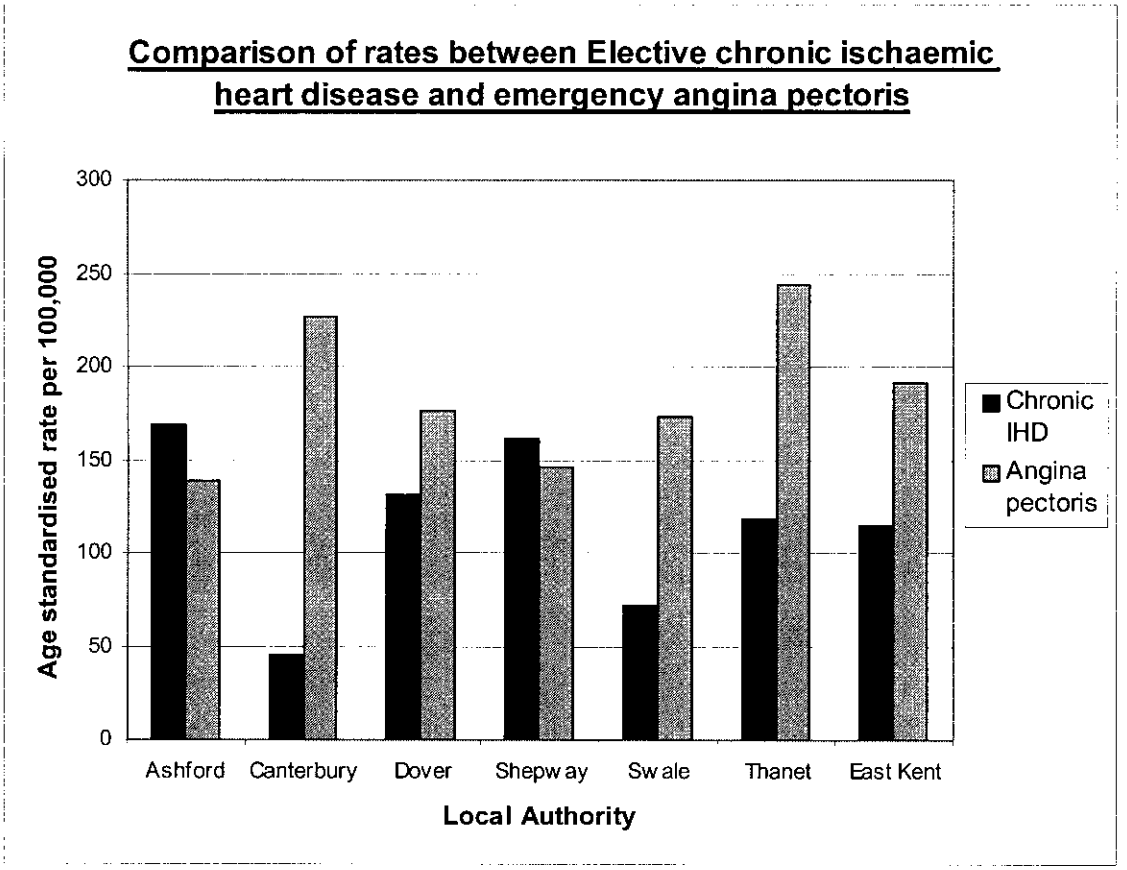

Figure 13. Chronic Ischaemic Heart Disease (Elective Inpatients) Rates and Angina Pectoris (Emergency Inpatient) Rates, by Local Authority group, for East Kent 1999/2000.

As we have seen the SMR for CHD shows a similar upward gradient from the least to the most deprived, and no group's rate is significantly different from the East Kent population. It would appear therefore that, when looking at deprivation groups, the indicator of access for chronic ischaemic heart disease mirrors the underlying morbidity for the condition. This may however be quite misleading. If we recall from above, the symptomatic ischaemic heart disease rates (ie Acute Angina episodes) showed a strong correlation with deprivation and significant differences across local authorities (L.A.s), with two L.A.s showing significantly higher than average rates (Canterbury and Thanet) and two showing significantly lower (Ashford and Shepway). When these elective Ischaemic Heart Disease Episode rates are examined by local authority, and compared with the Acute Angina episode's across L.A.s significant differences start to appear. The Chronic Disease picture is almost (but not exactly) the reverse of the acute symptomatic picture. Canterbury (which had significantly the highest of all rate for episodes of acute angina) shows significantly the lowest rates for elective episodes for Chronic Ischaemic Heart Disease. At the same time the local authority with the lowest apparent burden of symptomatic Ischaemic Heart Disease (reflected in Acute Angina episodes), Ashford, has the highest rate of elective episodes for Chronic Ischaemic Heart Disease.

Many, (but not all) elective admission episodes for Chronic Ischaemic Heart Disease will have been for investigation. Even when only a proportion of such episodes are for investigation, if the proportion is substantial then variation in access to adequate investigation of chronic ischaemic heart disease would still be inferred. This picture suggests that there are significant

geographic disparities in access across East Kent for people with Ischaemic Heart Disease. [There are certain caveats. The data are based on hospital consultant episodes and could be subject to distortion (in either direction) relating to multiple admissions of the same patient. In the deprivation groups no significant differences were seen for elective Ischaemic Heart Disease Episodes however this might be changed if private sector data was included as the rates in that sector tend to be high.]

Total Prosthetic Replacement of Hip Joint, and Knee Joint age 65+

Significantly lower than average Hip Joint replacement rates are seen among the most deprived (the highest 10% deprivation score) group of East Kent residents . (The rate ratios show that the hip replacement rate in this group is less than 65% of the average rate for E. Kent.)

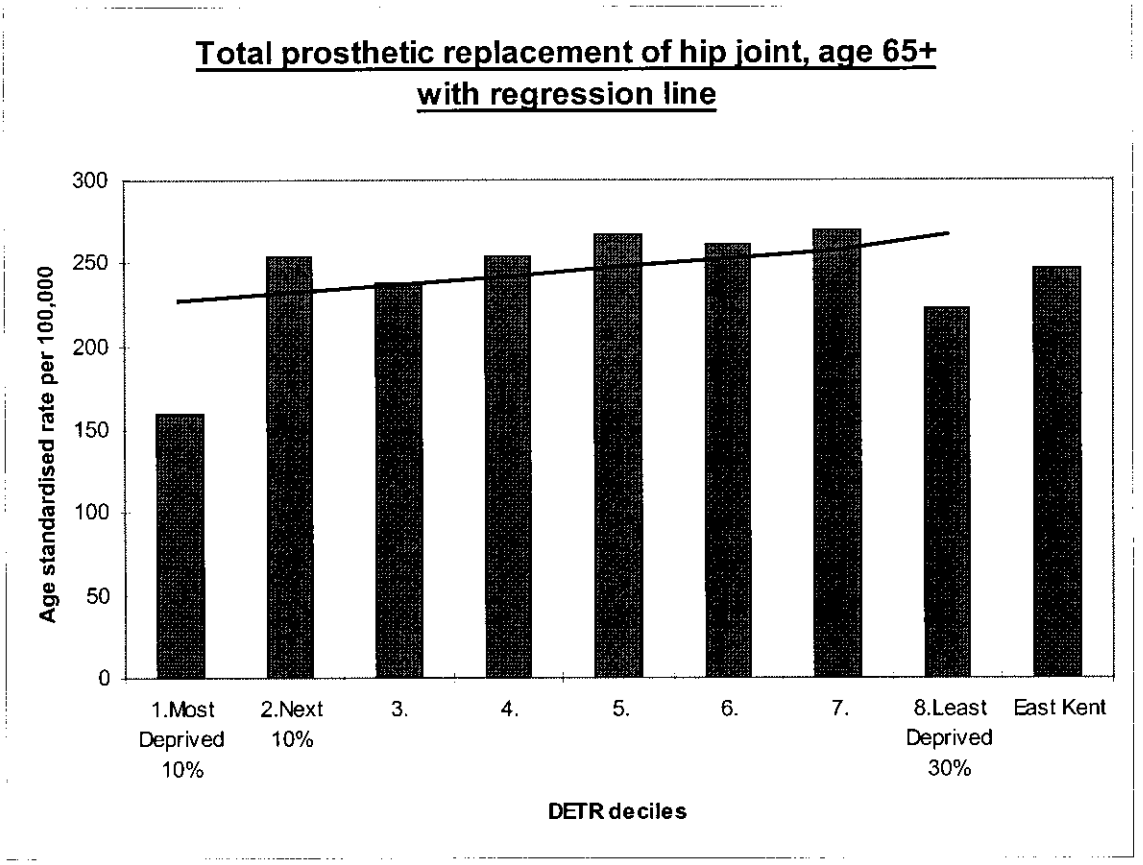

Figure 14. Hip Joint Replacement Rates age 65+, by IMD 2000 group, with regression line, for East Kent 1999/2000.

Total Prosthetic Replacement of Hip Joint, and Knee Joint age 65+ (cont.)

The same picture is seen in Knee replacement rate.

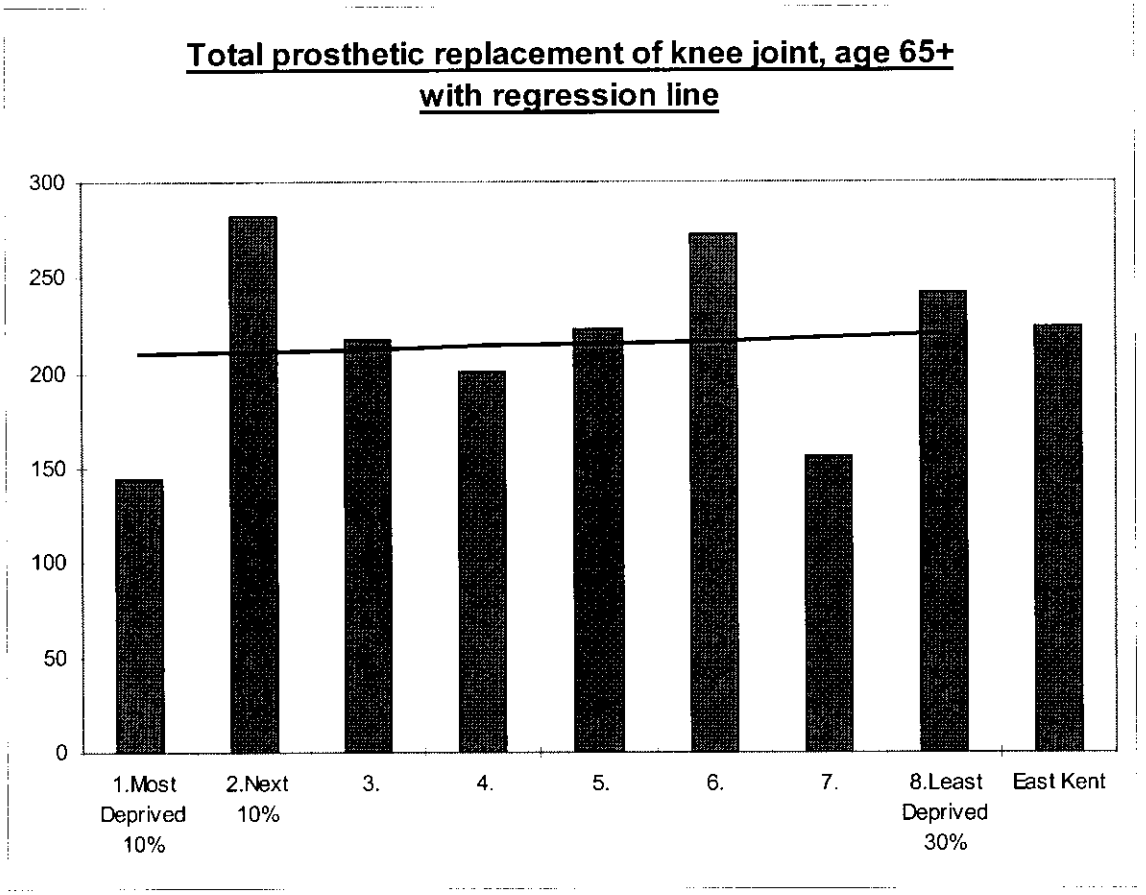

Figure 15. Knee Joint Replacement Rates age 65+, by IMD 2000 group, with regression line, for East Kent 1999/2000.

On the face of it, access to appropriate care might appears to be limited. However, this assumes 'average' morbidity from osteo-arthritis of the hip for this group. The actual numbers of in the most deprived group of persons over 65 is relatively small (6195, being c.5% of the population over 65). This might limit the veracity of the finding. Other factors which might mitigate are that, because of the lower life expectancy of deprived populations , there may be less 'very elderly' persons in this group than others so that the age structure within cohorts may differ, while it would not have been accounted for by the age standardization procedure used. So the background morbidity might actually be different. Also the evidence is not coherent with findings for all other 'access indicators. For example, (as shown below), no such barrier exists for cataracts where the episodes probably reflect prevalence and need. It is not possible to draw strong conclusions about this apparent limited access to care for the most deprived. The issue is worthy of further investigation.

Total Prosthetic Replacement of Hip Joint, and Knee Joint age 65+ (cont.)

When local authorities are looked at they all are shown to differ significantly from each other statistically but the actual rate differences are small and of no real consequence except for one. The exception is Ashford which has an age standardised hip replacement rate almost 100 higher than the East Kent rate.

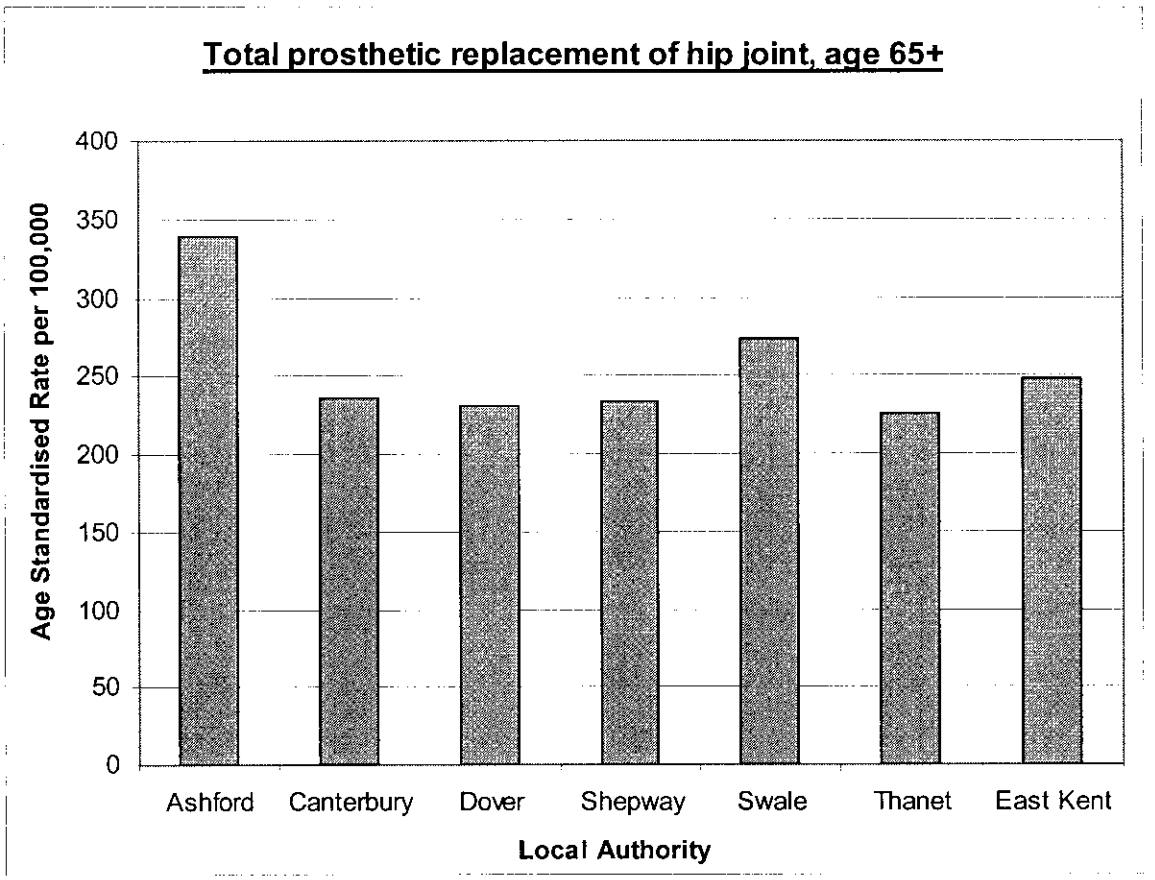

Figure 16. Hip Joint Replacement Rates age 65+, by Local Authority group, without regression line, for East Kent 1999/2000.

Total Prosthetic Replacement of Hip Joint, and Knee Joint age 65+ (cont.)

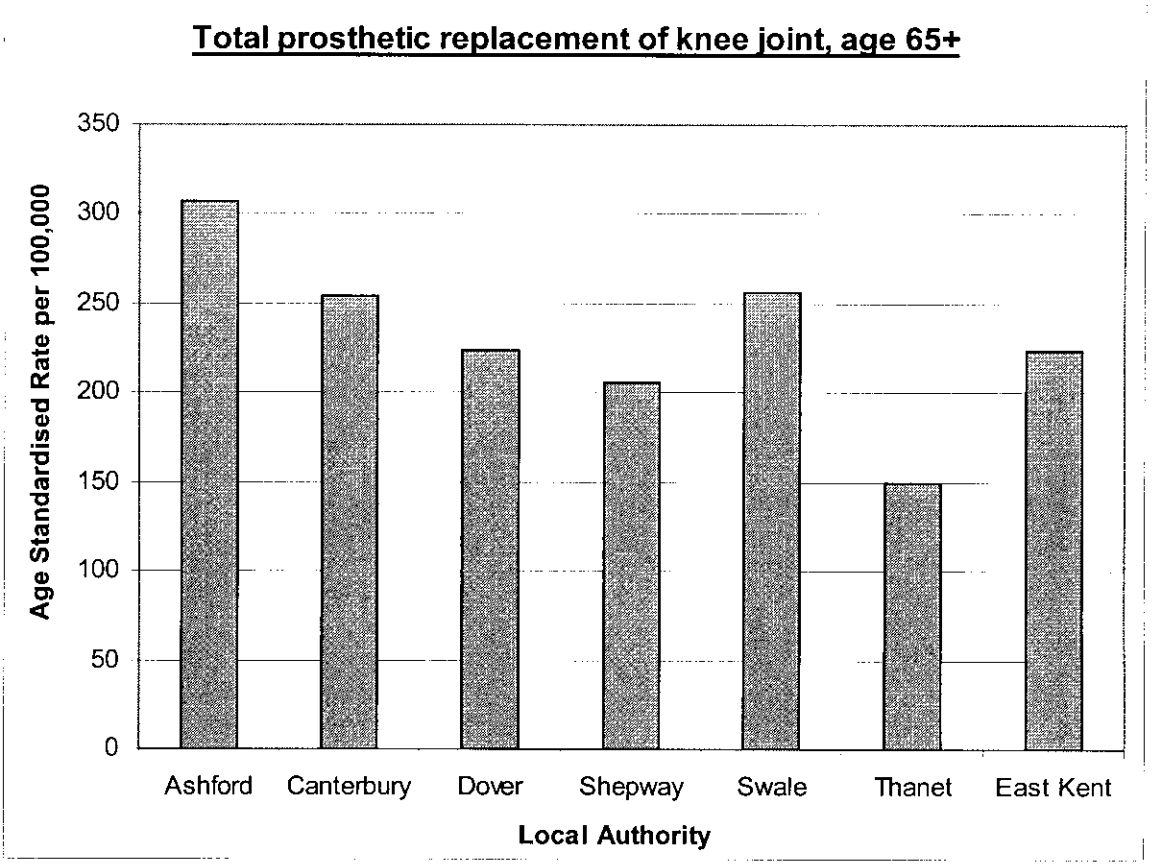

Figure 17. Knee Joint Replacement Rates age 65+, by Local Authority group, for East Kent 1999/2000.

The geographic variations are possibly due to different throughput rates (as most patients tend to wish to use their local services). Ashford residents appear to have access to services with a higher / faster turnover than other East Kent residents. This may be related to staffing or facilities at one particular unit. The most important predictor of throughput is operating clinician time. A comparative inventory of in-hospital hours of consultants, and clinical assistants (& possibly final year registrars) may elucidate the reasons for this higher capacity. Another notable feature of these data is that in the deprivation groups the least deprived also have a relatively low rate. This, presumably, is a reflection of egress from this group of patients to the private sector. Patients with hip replacement needs, (and hence chronic pain), who can afford to do so, opt out of NHS queues and use the private sector.

Primary repair of inguinal hernia

When deprivation groups are looked at the rates are similar across the board except for the most deprived group which has a significantly higher rate.

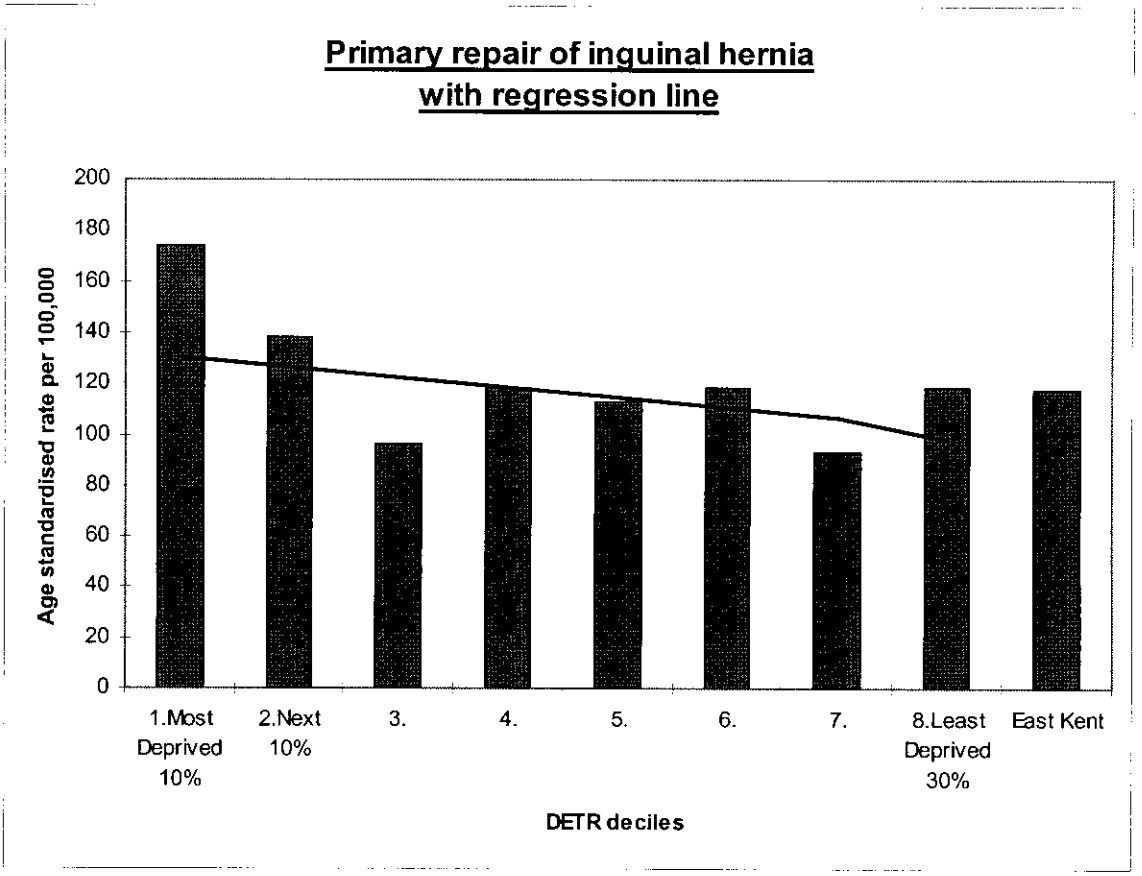

Figure 18. Primary Inguinal Hernia Repair Rates age 65+, by IMD 2000 group, with regression line, for East Kent 1999/2000.

This may reflect morbidity in a group known to have a higher prevalence of lifestyle risk factors for this condition such as smoking, lack of exercise and obesity.

Primary repair of inguinal hernia (cont.)

When local authorities are looked at they do not differ significantly from each other statistically except for Swale which has a markedly lower rate than the others at half the East Kent rate.

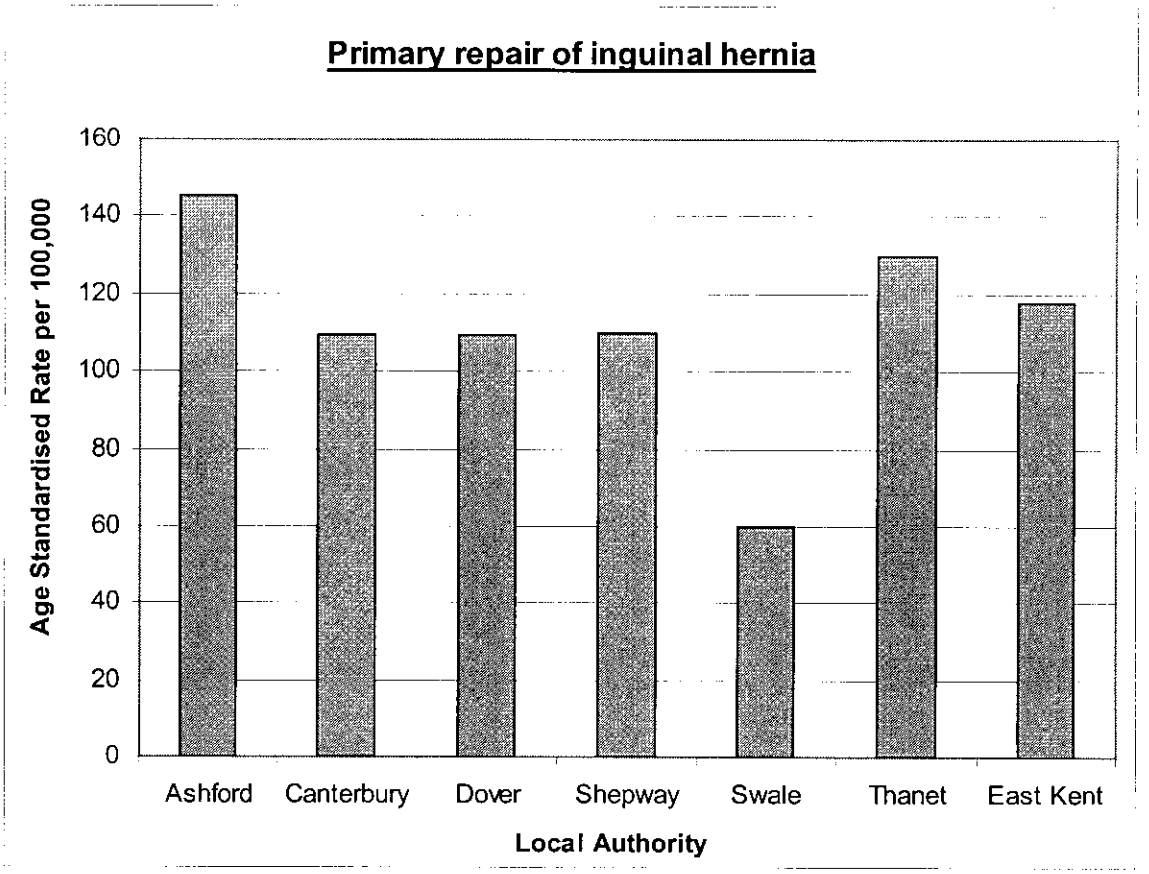

Figure 19. Inguinal Hernia Repair Rates, by Local Authority group, without regression line, for East Kent 1999/2000.

There does not appear to be any problem of access based on deprivation. The higher rates for the most deprived are possibly a reflection of lifestyle. The cause for the low geographical distribution rate at Swale is not immediately apparent. There may be some anomaly in management or referral practice.

Cataract Replacement

When deprivation groups are compared the rates show a gradient which appears to correlate with deprivation and appears to demonstrate appropriate access.

When looked at across districts Shepway has a statistically significant lower rate (16% below average) of cataract episodes than East Kent as a whole. The rate for Thanet is significantly higher than average by over 28%.

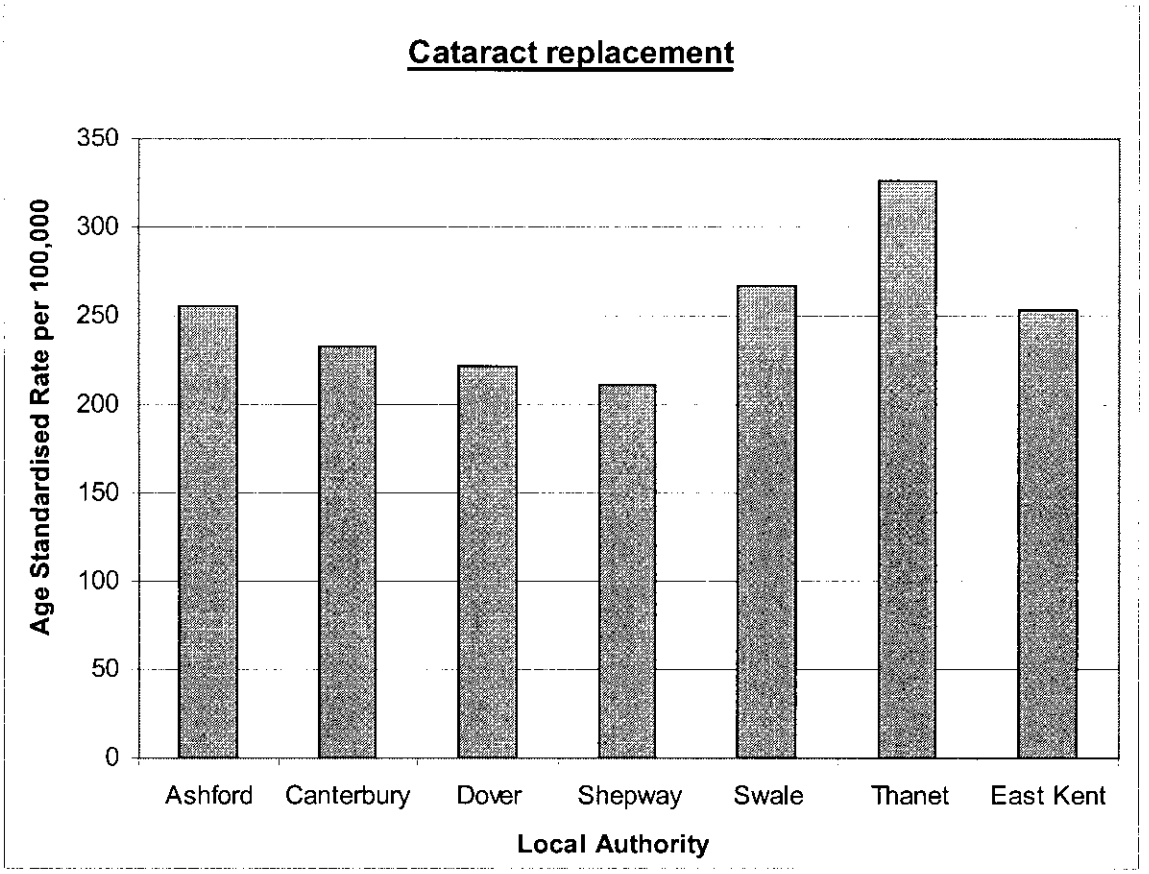

Figure 20. Cataract Replacement, by Local Authority group, with regression line, for East Kent 1999/2000.

There do not appear to be any real barriers to access. Some residential groups appear to more the subject of throughput variations than others. This may substantially effect their waiting times.

Revascularisation Associated Investigations and Procedures.
We have treated these procedures collectively under access as they are interlinked. The procedures in question are as follows.
Angiography,
Percutaneous transluminal coronary angioplasty (PTCA) (elective inpatients),
PTCA (elective and emergency inpatients combined),
Emergency PTCA,
Coronary Artery By-pass Graft (CABG) (elective inpatients),
CABG (elective and emergency inpatients combined),
All revascularisations (elective inpatients),
All revascularisations (elective and emergency inpatients combined).

Angiography - The age standardised rate for angiography is 15.08 per 100,000. There is significant variation across deprivation groups with the three most deprived groups all showing significantly higher than average rates.

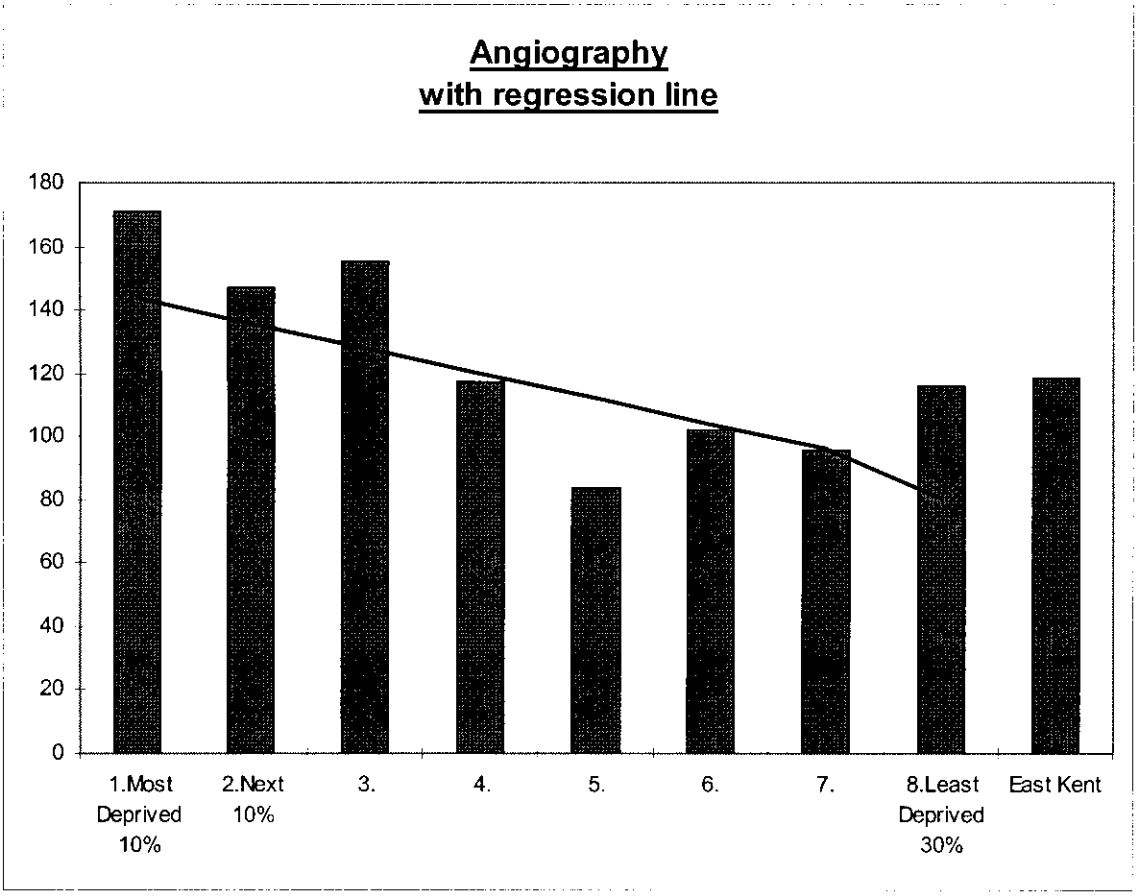

Figure 21. Angiography episode rates, by IMD 2000 group, with regression line, for East Kent 1999/2000.

On the assumption that this reflects the increased burden of cardiovascular morbidity which goes with deprivation, then deprivation does not appear to be a barrier to access to the available angiography for residents of East Kent. The comparative position of East Kent with other health authorities is not part of this work. However it is worthy of note that the overall East Kent age standardised rate is relatively low, as are the related therapeutic interventions.

Angiography (cont.)

When looked at by location of residence there is significant geographic variation Residents of Canterbury in particular and also Swale show significantly lower rates than for East Kent as a whole.

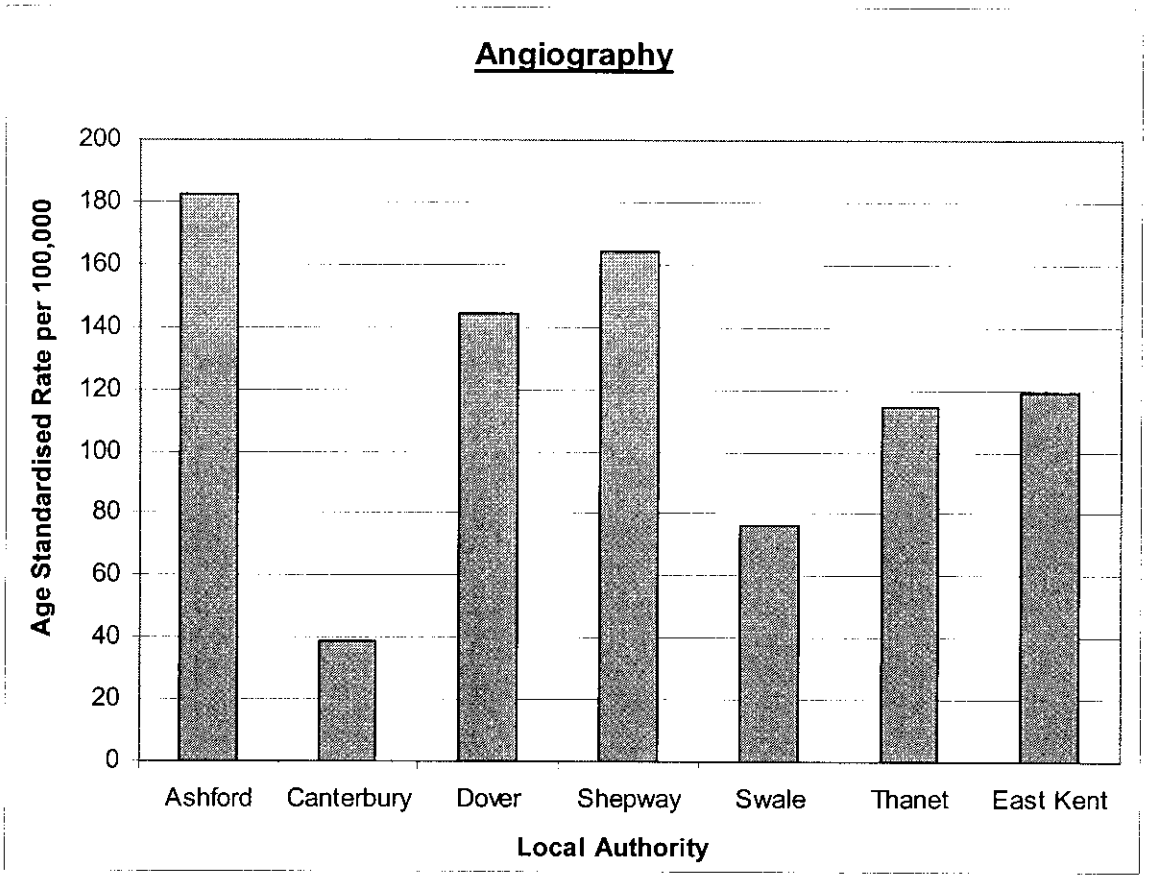

Figure 22. Angiography rates, by Local Authority group, for East Kent 1999/2000.

Access to Angiography may be inhibited according to place of residence.

PTCA (elective and emergency inpatients combined)

There is no significant variation across the deprivation groups for elective angioplasty episodes or for all angioplasty episodes. This is possibly due to the fact that the numbers are small and therefore not capable of demonstrating significant differences.

When looked at by residential location there is significant geographic variation. Canterbury shows significantly lower than average rates of all PTCAs.

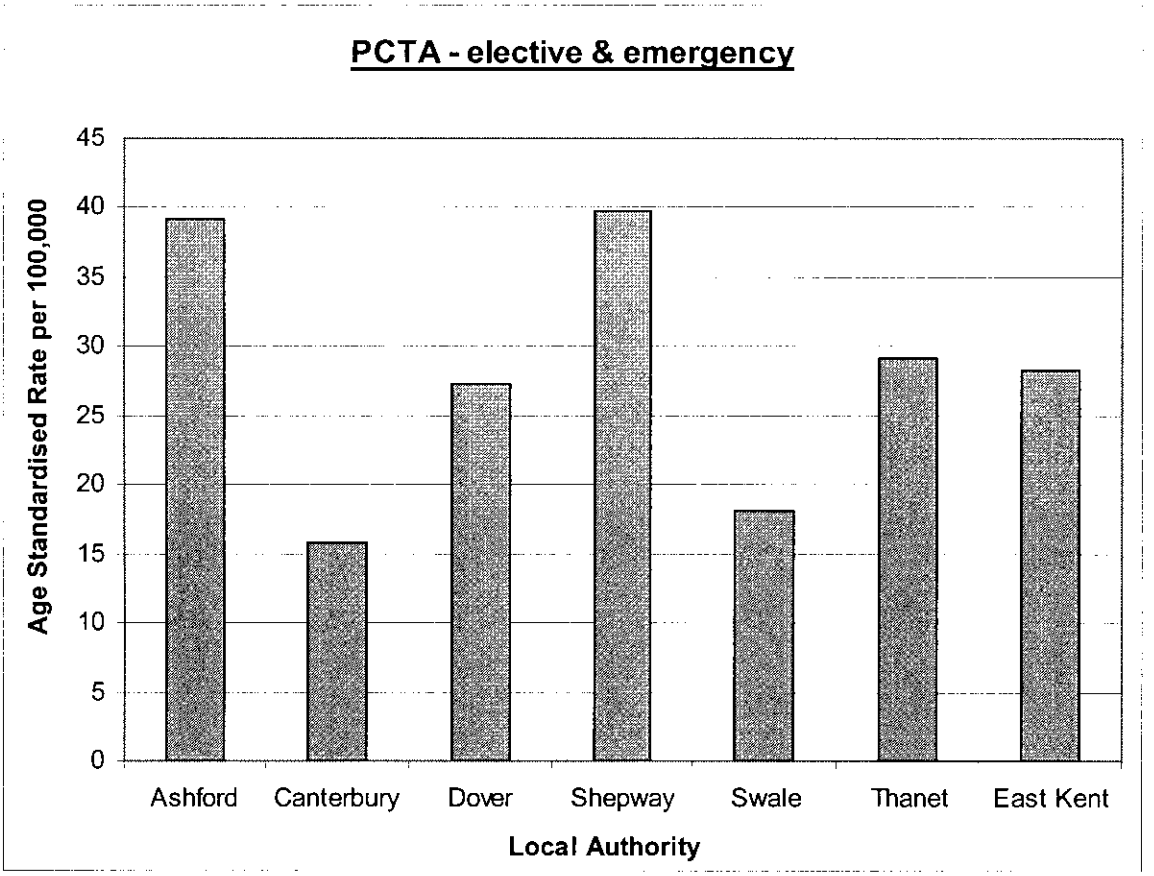

Figure 23. PTCA rates, by Local Authority group, with regression line, for East Kent 1999/2000.

This adds further evidence to the suggestion that Canterbury as a location of residence may be a barrier to access for investigation and management of Ischaemic Heart Disease.

Coronary Artery By-pass Graft (CABG) (elective inpatients), CABG (elective and emergency inpatients combined)

When elective CABG episodes are examined there appear to be no significant differences across deprivation groups. When emergency episodes are included the rate for the least deprived, which is highest, becomes statistically significant.

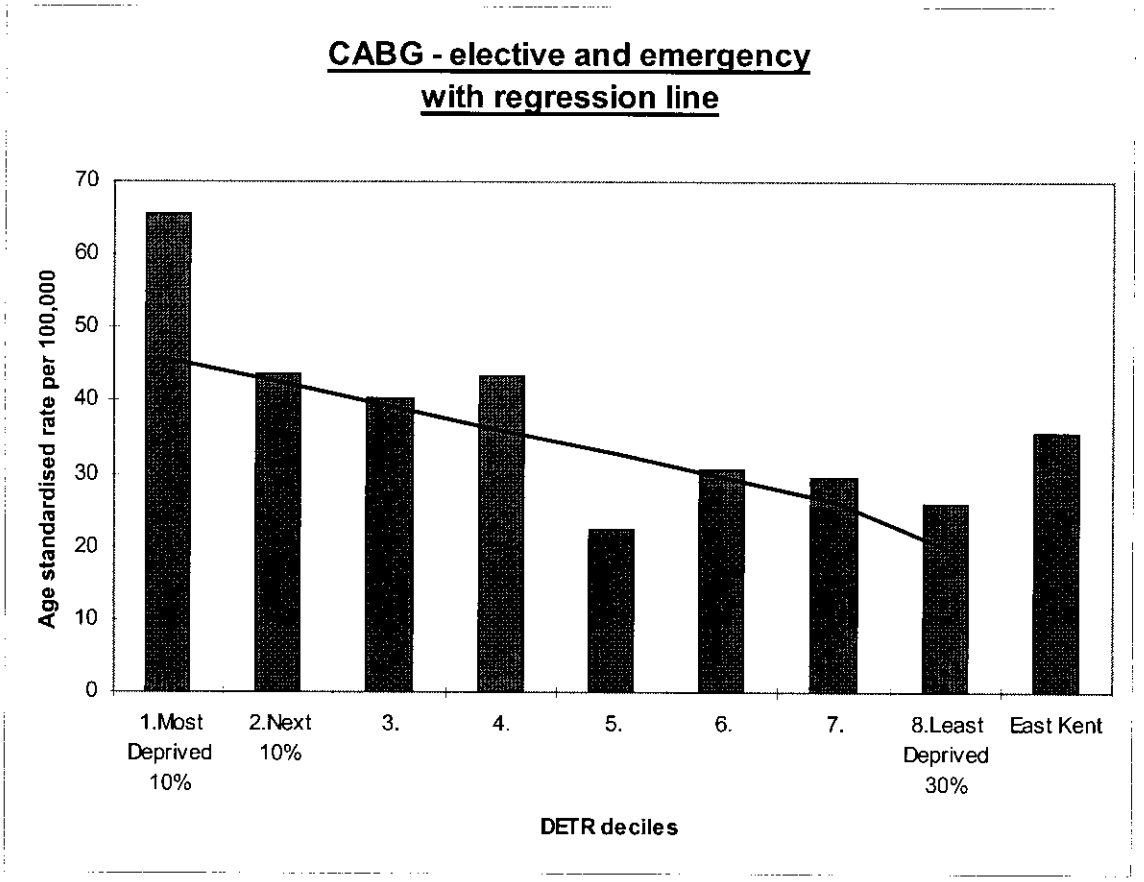

Figure 24. CABG Rates (elective and emergency combined), by IMD 2000 group, with regression line, for East Kent 1999/2000.

This fits with the expected situation reflecting SMR for CHD and adds further evidence to the suggestion that there are no barriers to access on grounds of deprivation

Coronary Artery By-pass Graft (CABG) (elective inpatients), CABG (elective and emergency inpatients combined) (Cont.)

When the data are examined according to geographic location of residence significant differences appear.

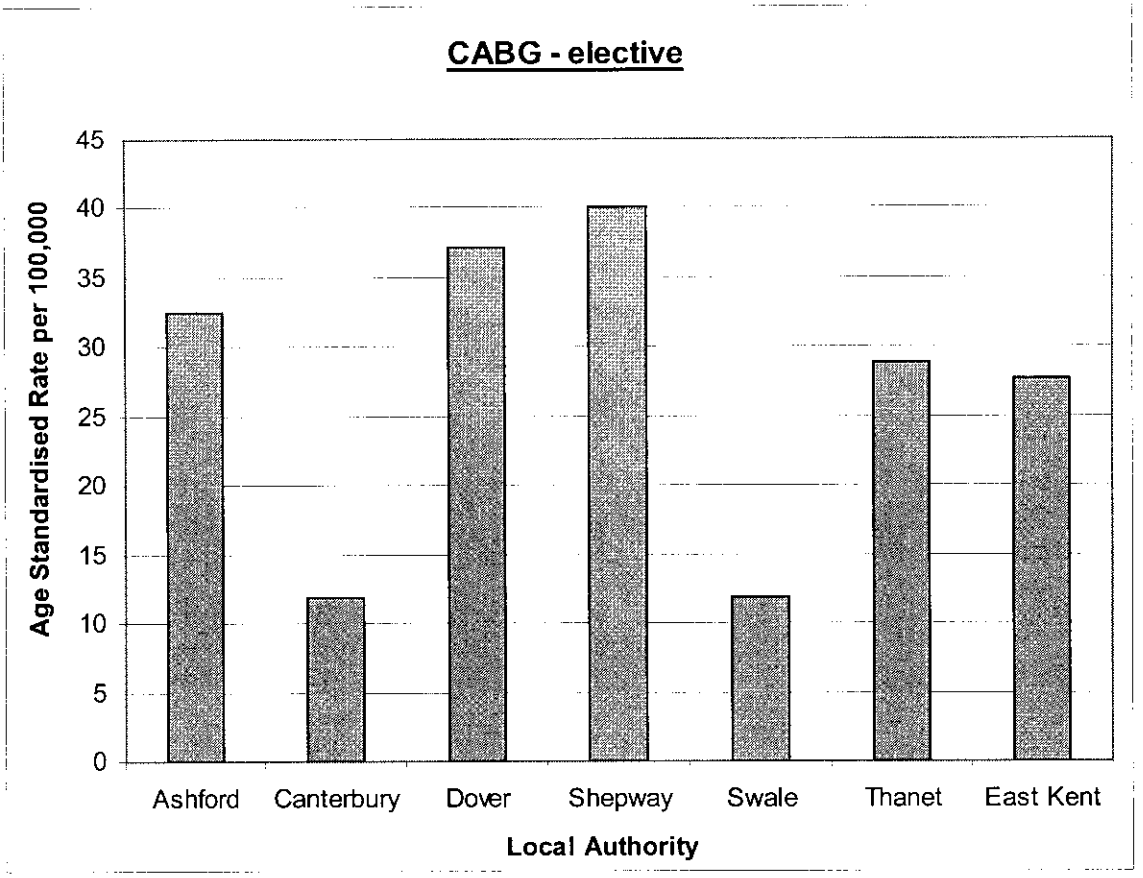

Figure 25. CABG rates (elective only), by Local Authority group, for East Kent 1999/2000

Significantly low rates are seen for Canterbury and Swale

Coronary Artery By-pass Graft (CABG) (elective inpatients), CABG (elective and emergency inpatients combined)

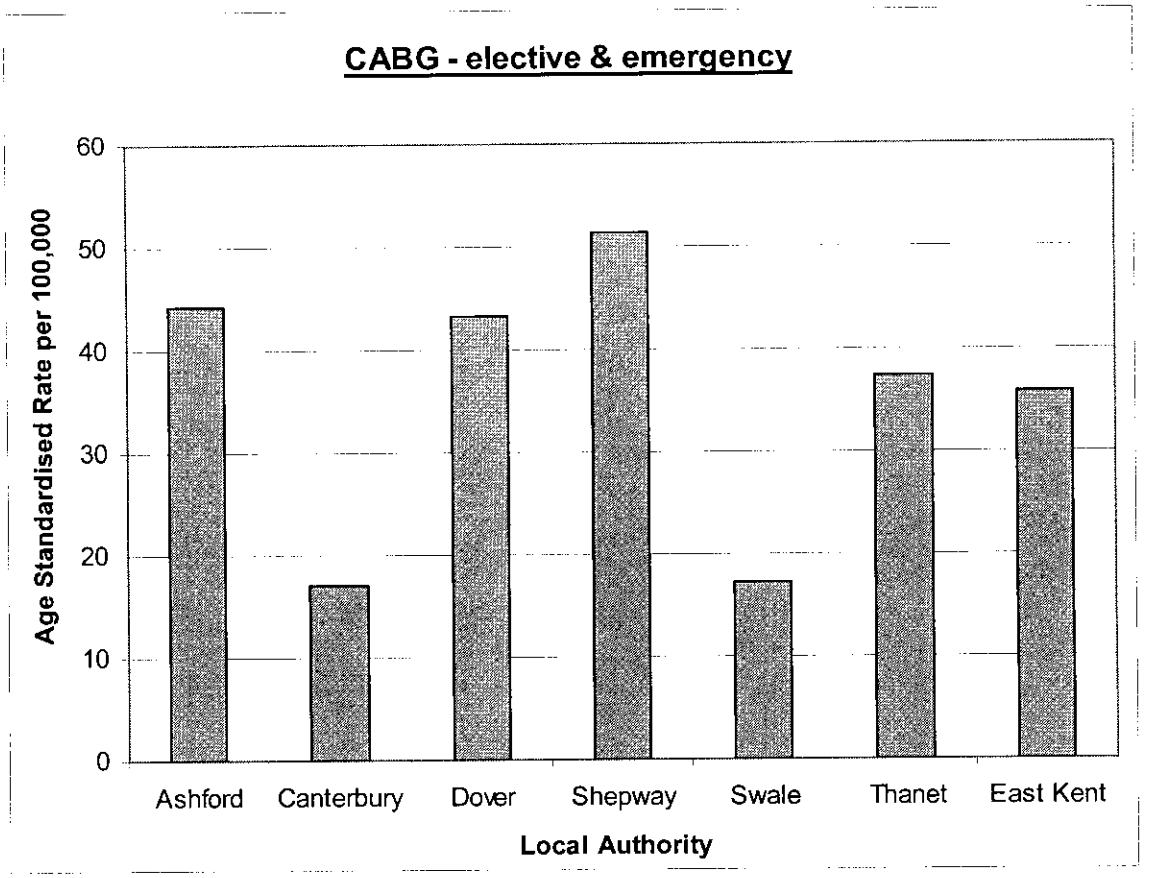

Figure 26. CABG rates (elective and emergency), by Local Authority group, for East Kent 1999/2000.

The significantly low rates seen for Canterbury and Swale persist when the emergency rates are included. Once again this is further evidence supporting the suggestion that location of residence may be a barrier to access for investigation and management of Ischaemic Heart Disease, is demonstrated.

All revascularisations (elective inpatients), All revascularisations (elective and emergency inpatients combined). When elective re-vascularisation episodes are examined by deprivation group, there are no significant variances between groups. This does not change when emergency episodes are included (except that the middle order deprivation group shows a statistically significant low rate. Why this should be so, is not immediately apparent).

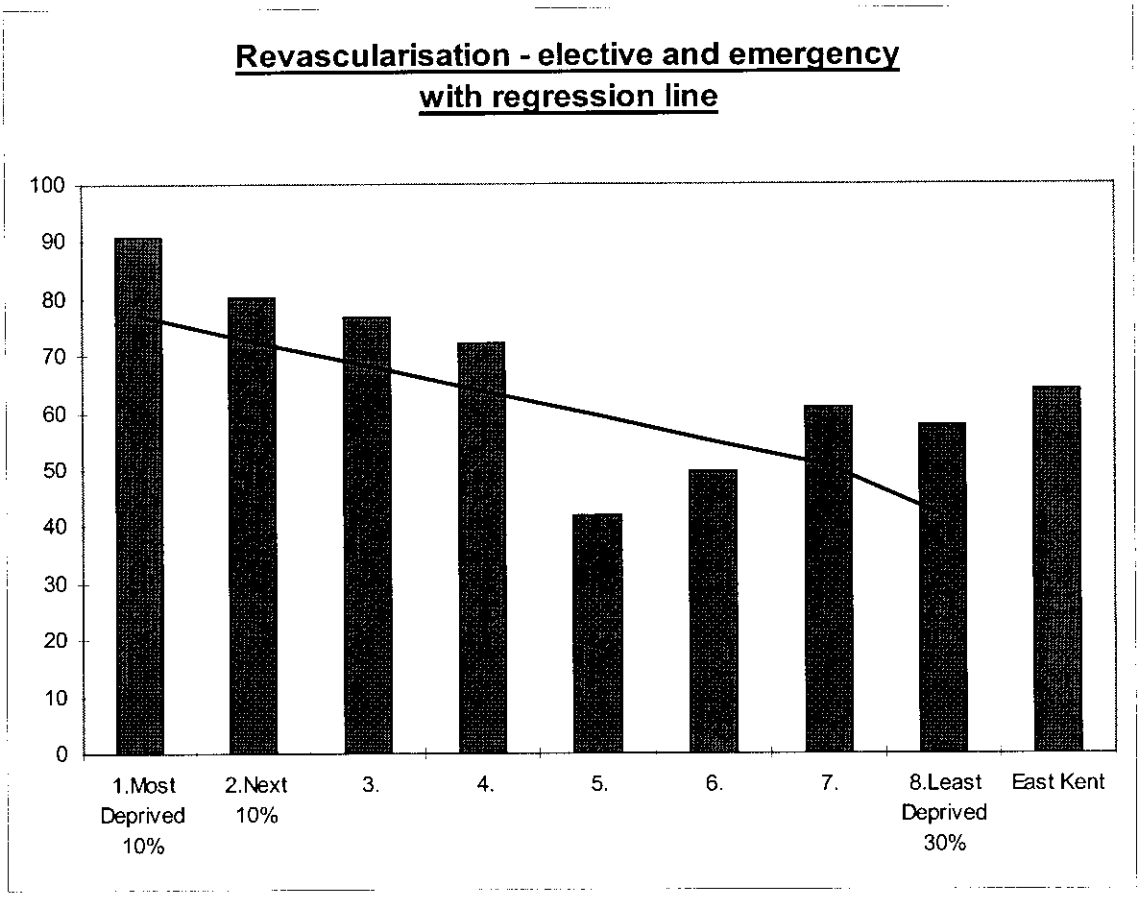

Figure 27. Revascularisation Rates (elective and emergency combined), by IMD 2000 group, with regression line, for East Kent 1999/2000.

This fits with the expected situation reflecting SMR for CHD and again adds further evidence to the suggestion that there are no barriers to access on grounds of deprivation.

All revascularisations (elective inpatients), All revascularisations (elective and emergency inpatients combined). (Cont.)

When the data are examined according to geographic location of residence significant differences appear, significantly low rates are again seen for Canterbury and Swale and these persist when the emergency rates are included.

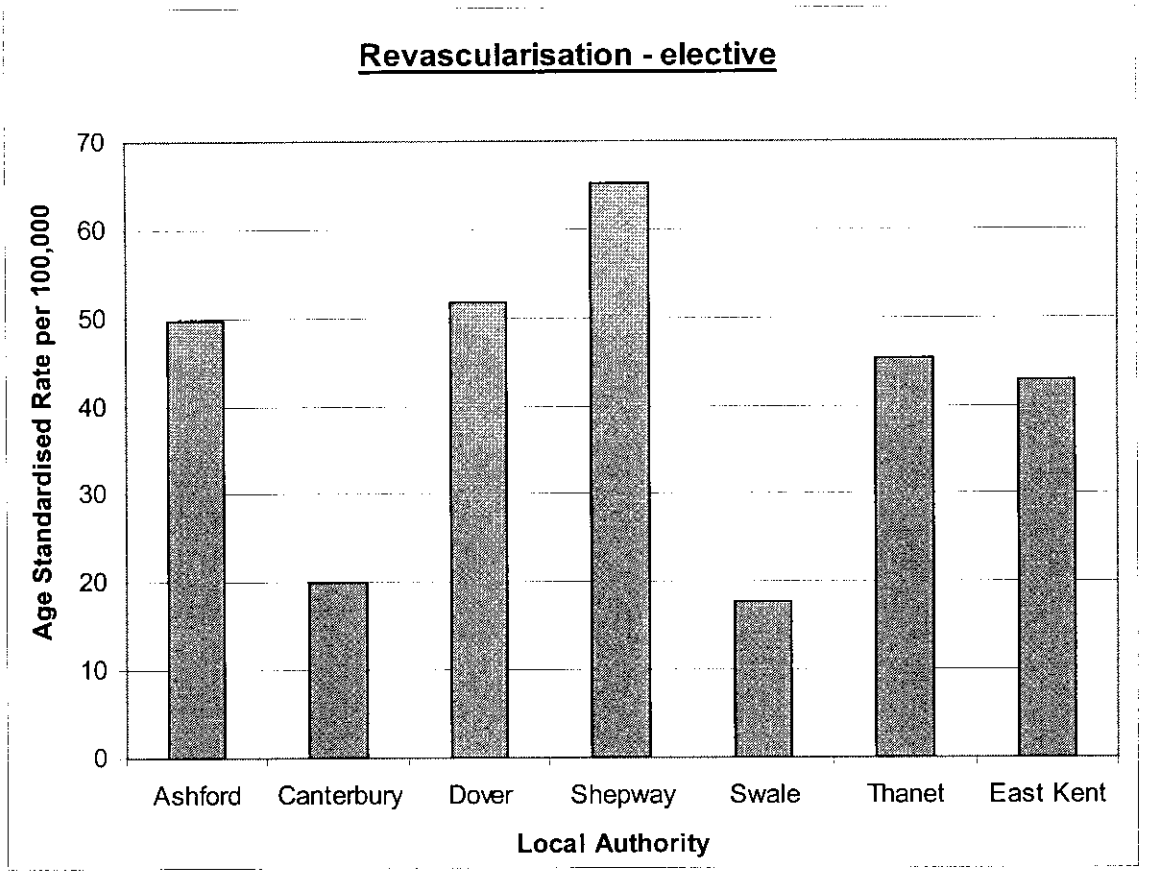

Figure 28. Revascularisation Rates (elective only), by Local Authority group, for East Kent 1999/2000.

All revascularisations (elective inpatients), All revascularisations (elective and emergency inpatients combined). (Cont.)

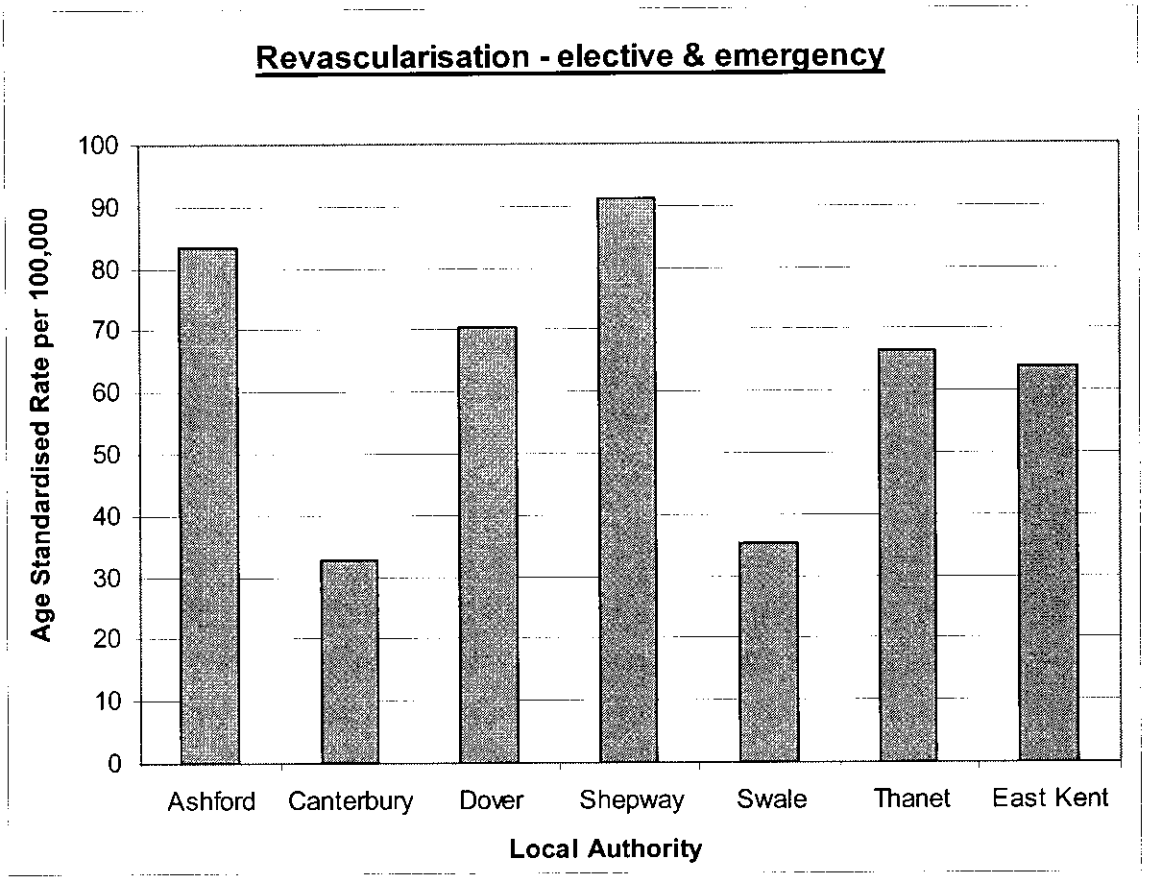

Figure 29. Revascularisation Rates (elective and emergency), by Local Authority group, for East Kent 1999/2000

Thus the suggestion that barriers to appropriate access may exist for residents of Canterbury and Swale is further reinforced. At the same time, when all procedures are combined, the age standardised episode rate for Shepway demonstrates significant variance in the opposite direction. It becomes significantly higher than the others suggesting that residents of this local authority possibly have better access to this type of care than the rest of the population.

Further investigation - Methodologies are described for estimating appropriate investigation and intervention rates, based on primary care prevalence and hospital admission rates. They may be useful for identifying discrepancies between need and supply and explaining these variations further.

INDICATORS OF APPROPRIATE UPTAKE

Stroke (not specified as haemorrhage or infarction) (emergency inpatients)

Significant variation seen in the least deprived groups.
There is no significant difference from the East Kent rate seen in the six most deprived groups, (ie. those with deprivation scores in the highest six deciles and accounting for 82% of the population) It is only when the least deprived groups, with scores in the lower 40%, that significantly different rates are seen. These rates are significantly lower than population average.

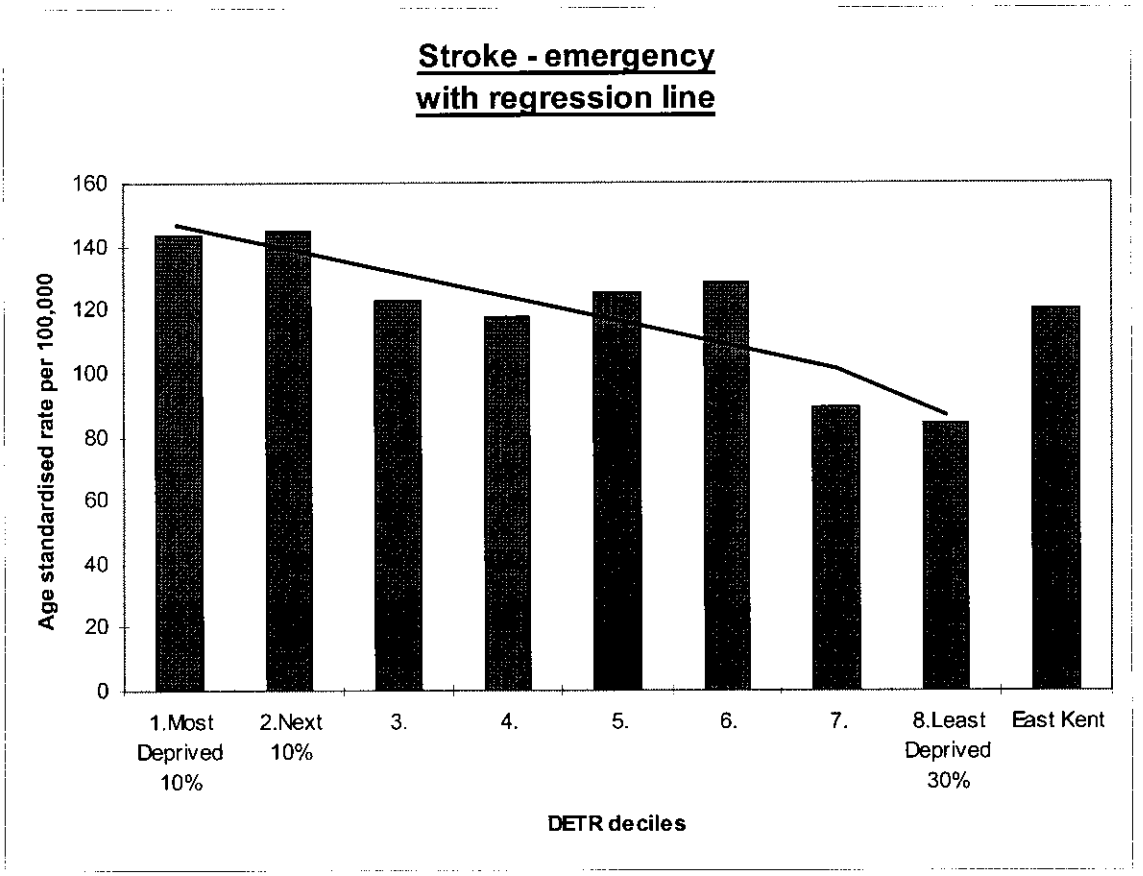

Figure 30 Stroke (not specified as haemorrhage or infarction) (emergency inpatients) Rates (elective and emergency combined), by IMD 2000 group, with regression line, for East Kent 1999/2000

Stroke (not specified as haemorrhage or infarction) (emergency inpatients) (Cont.)

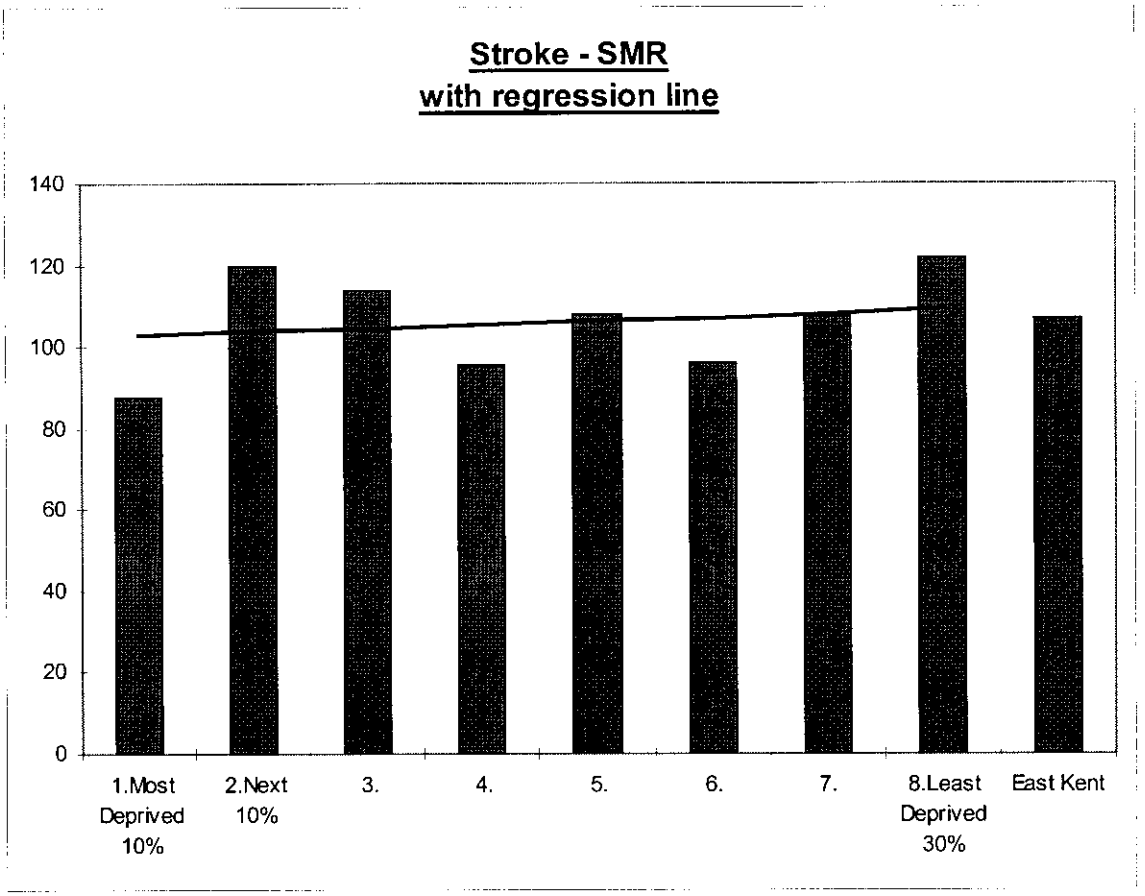

Figure 31. Standardised Mortality Rates (SMR)for Stroke, by IMD 2000 group, with regression line, for East Kent 1999/2000

The SMRs for individual deprivation groups, for Stroke in East Kent, do not show significant variance from the whole population.

As seen with angina, the least deprived have acute episode rates which are significantly lower than overall East Kent rate. It appears again for Stroke that the bulk of the serious morbidity burden is born by the more deprived half of the population. This tends to suggest that the incidence of the vascular disease is a major determinant of rates as they stand.

However, the use of alternative types of care for stroke eg . low levels of intervention in care versus high levels of intervention through stroke policy including the use of stroke units may also be operative in explaining some variation and may be considered for further investigation. A further factor to consider in respect to variation in stroke admission rates is preventability. It has been estimated that through treatment of mild hypertension with ACE Inhibitors that 2 strokes per 1000 patients treated can be prevented per year. Further investigation could be focused on prescribing practice.(ref.). Audit of the use of such therapies in primary care can be useful in determining any further potential for health improvement.

Stroke (not specified as haemorrhage or infarction) (emergency inpatients) (Cont.)

When the rates at local authority level are compared Ashford has rates significantly lower than East Kent as a whole.

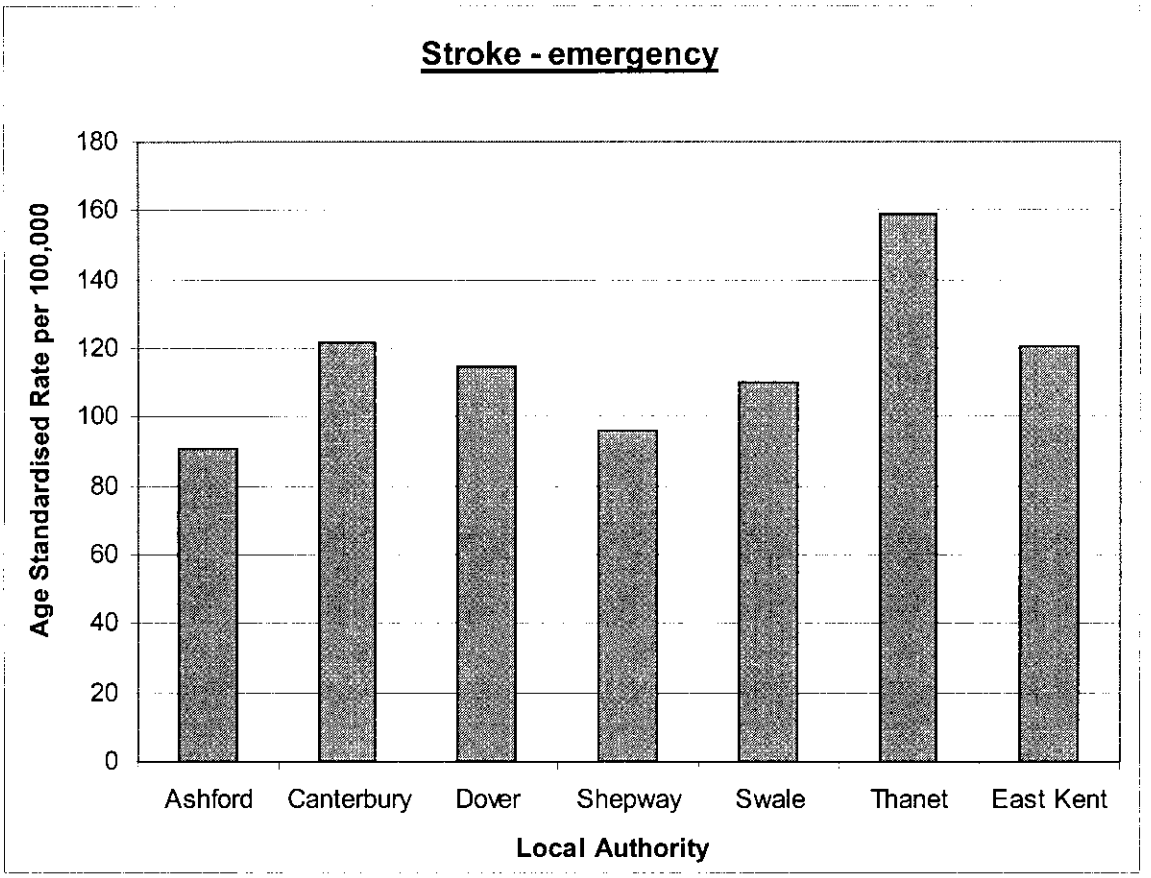

Figure 32. Stroke (not specified as haemorrhage or infarction) (emergency inpatients)Rates (elective and emergency combined), by Local Authority group for East Kent 1999/2000

Stroke (not specified as haemorrhage or infarction) (emergency inpatients) (Cont.)

When Standarised Mortality Rates for Stroke (SMRs) are analysed, by local authority, Swale appears to be the only residential location with a significantly different (lower) SMR to East Kent as a whole.

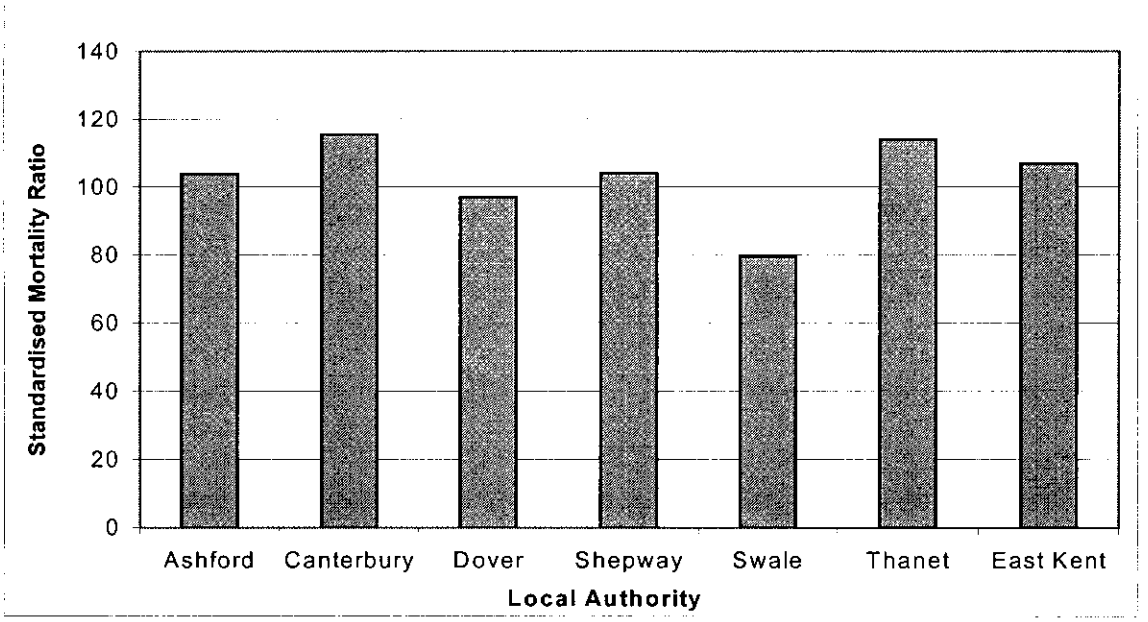

Figure 33. Standardised Mortality Rates (SMR) for Stroke, by Local Authority groupfor East Kent 1999/2000.

Diagnostic Endoscopy bladder

Only one deprivation group has shown significant variance from the East Kent rate, and in real terms it is less than 17% variance from the East Kent rate. It is doubtful that this has any clinical significance as the intervals for repeat endoscopies will vary with the clinical course of some diseases. *There is no direct rate relationship between Cystoscopy episodes and deprivation and the uptake rates look fairly uniform and are probably highly appropriate.*

When looked at across local authorities Dover has a statistically significant lower rate of Bladder Endoscopy episodes than East Kent as a whole. Also the rate for Thanet is significantly higher. However the size of the variance is similar to that described above and of doubtful clinical significance.

Diagnostic endoscopic colon examinations

In all deprivation groups the rates for this procedure are not significantly higher than average except for the group which is mid range on the deprivation scale. *Although it has a statistically significant higher rate the rate ratio compared with the average 1.2 to 1) is not very large and it is not known what inference if any might be drawn from this small anomaly. One group (that with the second highest deprivation score) has a statistically significant lower than average rate which is c. 80% of the average. This could possibly reflect a low uptake of appropriate investigation for cancer and other lower intestinal disorders, signaling a need for improving client awareness. However the rate ratios are again not very dramatic and one might want to see more evidence of a problem before making such an inference.*

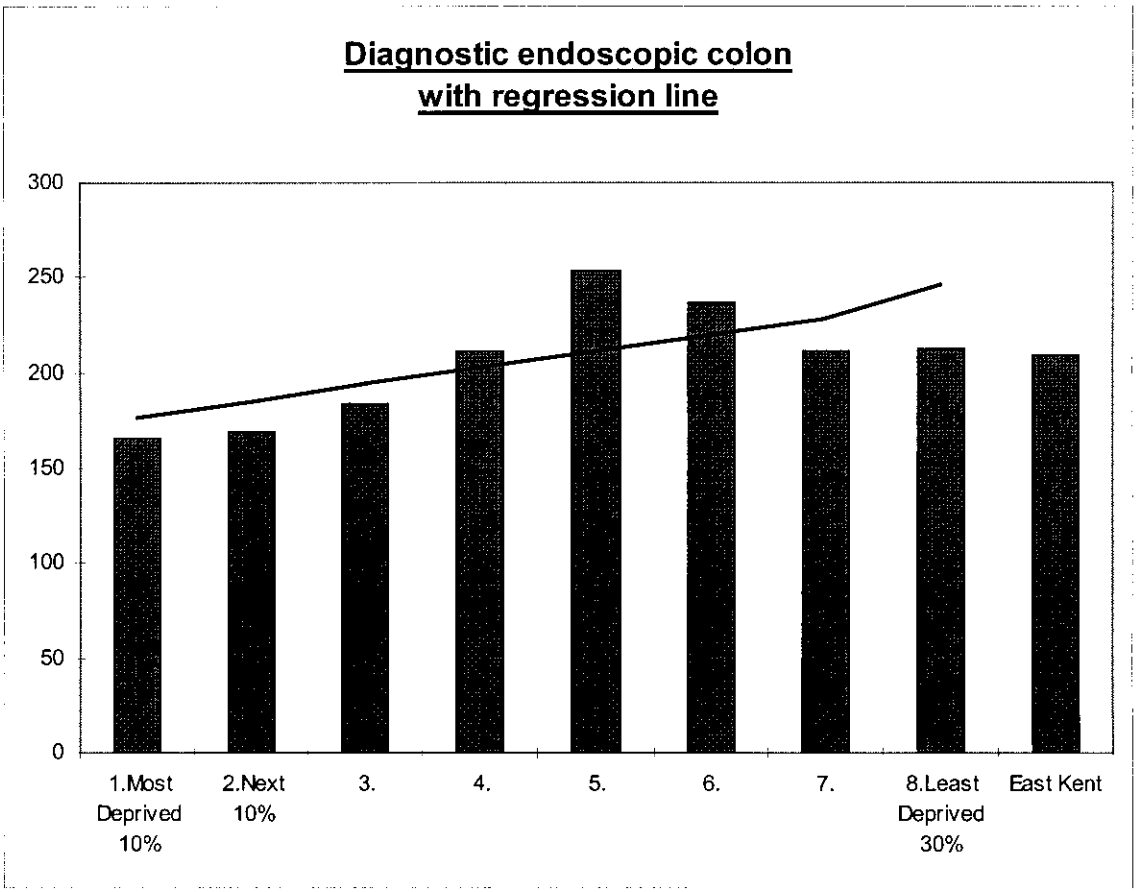

Figure 34. Colon Endoscopy Rates, by IMD 2000 group, with regression line for East Kent 1999/2000.

Although there is some variability across local authority of residence, all groups show less than two fold variability compared to East Kent, and this is probably of no clinical significance. *Rates seen here are probably highly appropriate within East Kent.*

APPROPRIATE PROCEDURE USE RATES

Diagnostic endoscopic upper gastric examinations

Significantly higher than average rates are seen among the most deprived (both the highest and next highest 10% deprivation score) group of East Kent residents . (The rate ratios are not large however being only 20-40% higher than average.)

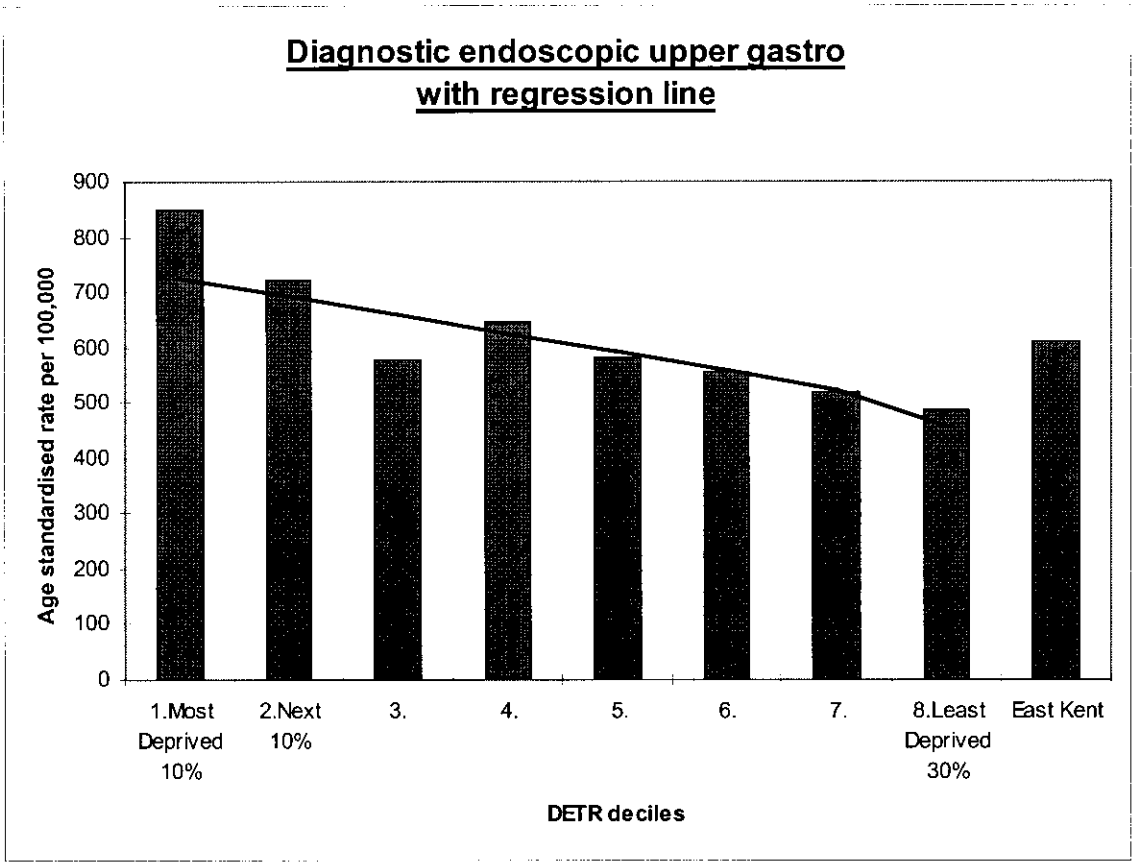

Figure 35. Rates for Episodes of Upper Gastrointestinal Endoscopy, by IMD 2000 group, with regression line for East Kent 1999/2000.

Diagnostic endoscopic upper gastric examinations (Cont.)

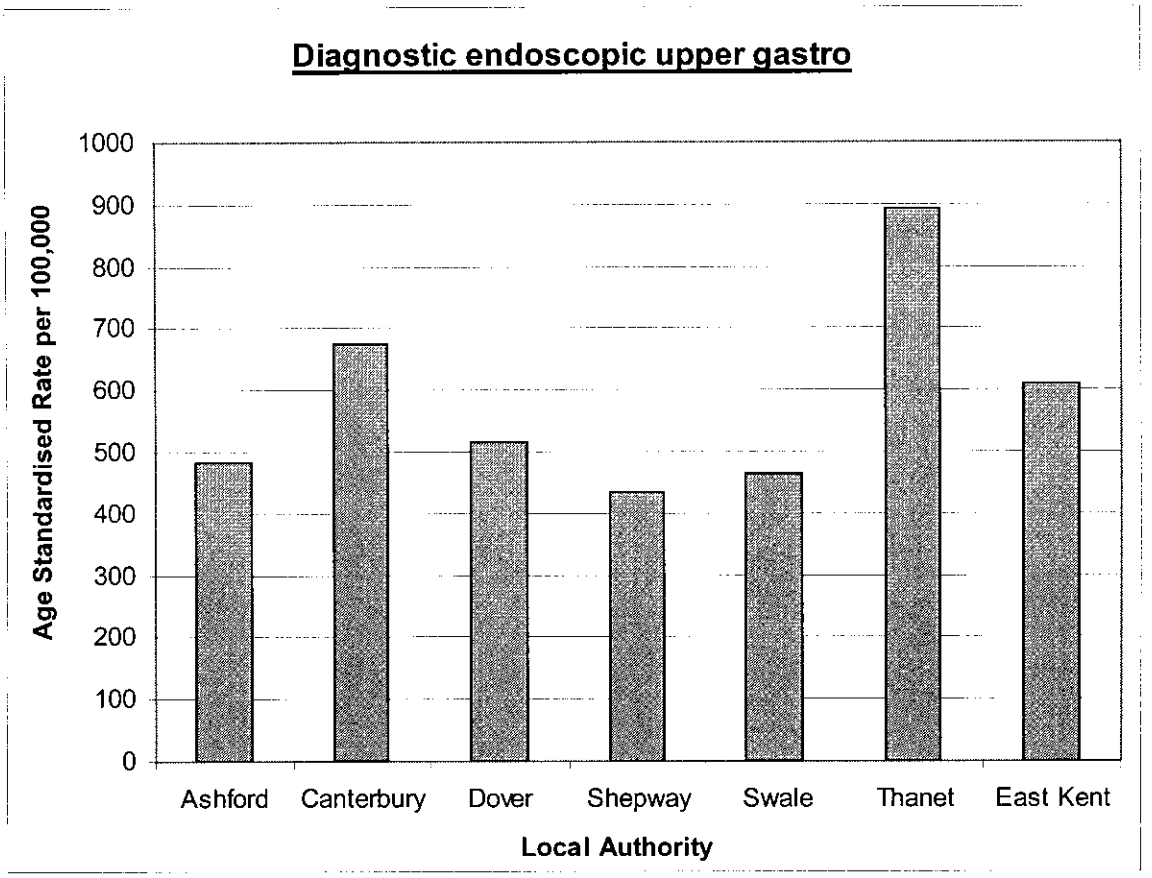

Figure 36. Upper Gastrointestinal Endoscopy Rates, by L.A. without regression line for East Kent 1999/2000.

This is likely to be a reflection of co-relations between deprivation and lifestyle associated illness. Higher rates of alcohol, tobacco and stress related disorders, such as peptic ulcer symptomatology, and investigation of various gastric, liver and upper gastro intestinal disorders are not uncommon in deprived populations. The data for the diagnosis indicator - Abdominal and Pelvic Pain –emergency admission - shows the same pattern. On these results access to investigation and appropriate care for emergency symptoms would appear to be that of a responsive service, while opportunities for targeting further primary prevention present themselves.

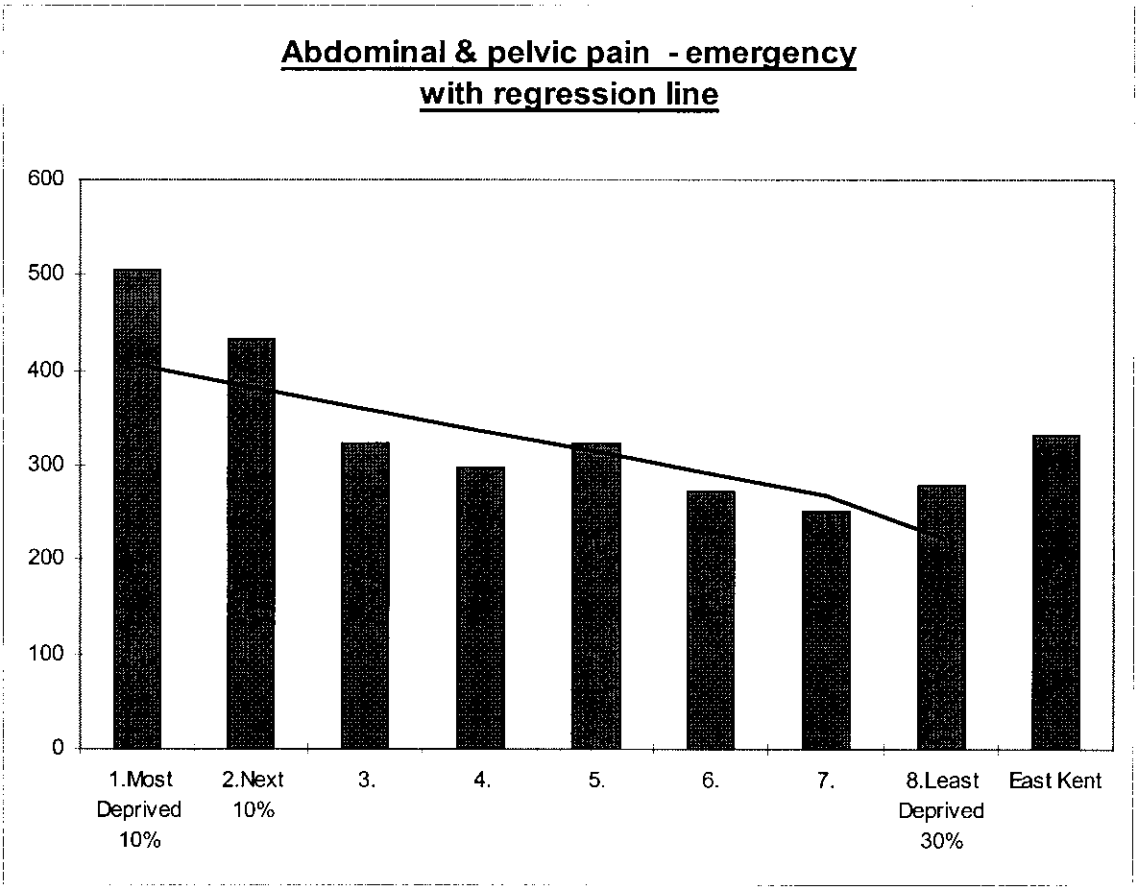

Figure 37 . Rates for Episodes of Abdominal and Pelvic Pain, by IMD 2000 group, with regression line for East Kent 1999/2000.

There is some variability for episodes of upper gastrointesinal endoscopy and episodes of abdominal and pelvic pain, across local authority of residence. However, all show less than two fold variability compared to East Kent and as the numbers are already small this is probably of no clinical significance.

The comparative upper gastro endoscopy rates seen here are probably highly appropriate within East Kent.

Ligation of varicose vein of leg (elective inpatients)

There is no significant variance from the East Kent rate across any of the deprivation groups. There is no direct rate relationship between Varicose There is some variability across local authority of residence.

The one low and one high locality each show less than two fold variability compared to East Kent and as the numbers are already small this is probably of no clinical significance. Vein Ligation rates are low across the board, which probably reflects current NHS practice in this field and is probably highly appropriate.

OTHER

Schizophrenia, Schizotypal and Schizoaffective disorders (emergency inpatients)
The age standardised rate is 51.05 per 100,000. There is no significant variance from the East Kent rate across the deprivation groups. There is no correlation demonstrated between Schizophrenia, Schizotypal and Schizoaffective disorders episodes and deprivation.

The information provided here is not particularly useful, because the numbers are small and the acute hospital episodes represent a small part of the care management fotr these conditions.
There is some variability across local authority of residence. Swale has the lowest rate and Thanet the highest. However, all show less than two fold variability compared to East Kent. The clinical significance of the variations is not particularly helpful for the reasons mentioned above. Other factors and information worth considering are medication an compliance rates in primary care, care in the community, access policies, recurrent admissions for the same individual and any interventions, community data collections, and Health Improvement and Modernisation Plans which focus on the 'Revolving Door Syndrome' for these patients.

CONCLUSION

In this paper inferences have been made in relation to some of the more outstanding examples of statistical variation shown in the inequalities report. Statistical variances are, however, symptoms rather than definitive diagnoses and need to be supported with further evidence before any final decision regarding strategic actions. The process of identification and publication is itself strategic, in that the objective is to alert stakeholders to preliminary findings which point to possible inequality of access for specific groups of residents.

It is hoped that this will be received by stakeholders in that spirit of investigation and lead to further developments in due course.

APPENDIX 1
SECONDARY CARE INDICATOR USE

The dictionary definitions of the verb 'to indicate' include *to point out or show, to suggest or imply, to give symptoms or signs.* As with symptoms and signs in medicine, clinical indicators are rarely absolute and further investigation of potential causes are nearly always required.

The secondary care indicators in this report have been allocated into in accordance with reporting in the literature for such indicator methodologies. These groups are not exclusive, for example fracture neck of femur is listed under need, as it fits this description. It can also however be possibly considered a primary care preventable admission.

The categories chosen are as follows:

Indicators of Need - It is only for very few conditions that hospital activity rates directly reflect morbidity, and therefore need. This is where consensus on how to treat is fairly universal, - eg inpatient care of fractured neck of femur, myocardial infarction (12). Usually, other data are required to identify the various aspects of need and it is only in the understanding of such data that interpretation of variations in hospital activity should be attempted. These other data should include mortality, morbidity from other sources, social class, ethnicity, and also primary care practice and referral patterns (which may reflect both need and demand or responsiveness).
Primary care preventable admission indicators- The term 'Primary or Ambulatory Care Preventable Admissions' represents a methodology described to use secondary care data as indicators of the quality of primary care. This was first described in the USA in the late 1980s and has been used by funders as a measure of primary care quality(2,3,14,15). European studies tended to conclude that it was less useful in European environments where it was suggested that family practice was more developed (6,9,). However recent studies in England and Australia support the use of this methodology and lists of potential indicators have been emerging (16, 1).

Indicators of access - Certain hospital admission rates are useful for demonstrating access. Where access is poor queues may build up because through put is low (eg Joint replacements), or General Practitioners may simply under refer because of their low expectations of the system to provide comprehensive care for certain of their patients (eg Elective work-up of Ischaemic Heart Disease).

Indicators of appropriate uptake – The rates of some routine investigatory procedures tend to be used as markers for appropriate uptake or levels of care (4), where levels are low eg for re-vascularisation procedures it may be that the incidence of CHD is low, but if this is known not to be the case (eg as with a high background SMR for CHD) then there may be failings in providing an appropriate pathway of care from earliest symptoms, through referral and on to adequate treatment.

Appropriate procedure use rates – As the evidence base increases for particular conditions it becomes apparent that in some cases there may be unnecessary over-provision of procedures instead of more conservative or alternative management, as has been demonstrated for conditions such as glue ear (10), menorrhagia (7) in women under 40, benign prostatic hyperplasia (9), and others.

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