Indicators of Mental Health Activity in London: Adjusting for Sociodemographic Need

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February 2004

Executive summary

Background and Objectives

In 2003 the London Development Centre for Mental Health (LDC) working on behalf of London's Mental Health Trust Chief Executive (CE) Group, commissioned the London Health Observatory (LHO) and the Institute of Psychiatry to develop a means of adjusting mental health activity data for need. The specific aims of the project were:

- To identify a process and methodology for adjusting existing crude mental health indicator data for factors other than Trust performance.
- To help identify indicators of mental health services that can be adjusted at local authority/PCT level to help inform differences in performance.
- To identify gaps in the information needed to do this, and especially to inform recommendations regarding future data collection.

Interim findings were reported in May 2003 and this final report has been submitted in February 2004.

Data and Methods

The data used to develop the model have been collected to an agreed set of definitions by London's mental health Trusts, and cover two time-periods (July 2001-December 2001 and April 2002-March 2003). Much of the data relate to standard measures of inpatient care, with some data collected on staffing of community services and numbers of people cared for under the Care Programme Approach (CPA). Such unadjusted data inevitably exhibit wide variation between boroughs and we set out to explore such variation in relation to socio-demographic need.

An initial phase of the work piloted the use of the indices of need commonly used in the mental health field – (MINI, Psychiatric Needs Index, Index of Multiple deprivation). This work showed that the MINI explained the greatest amount of variation – so was deployed in the later work. In addition to using the MINI, a further model, based on a factor–analysis of a wider range of socio-demographic information, was also used.

Variation in four key variables was explored: acute admissions, acute in-patient days, number of people on the enhanced level of the Care Programme Approach and readmissions at 28 days. In addition to completeness, the indicators were chosen because they are regarded as important elsewhere in the performance system.

Findings

Unadjusted activity did show substantial variation. The MINI was able to explain 25% of variation in admissions, 42% of variation in bed days, 11% of variation in readmissions and 6% of variation in enhanced CPA rates. The factor analysis model, however, was able to explain 60%, 73%, 30% and 45% of variation in these four measures respectively. Adjusted rates of activity were subsequently calculated using the factor analysis model. There remained some large differences observed between areas even after adjusting for need.

Despite some data limitations, this exercise has clearly shown that a very significant proportion of the variation observed in mental health service activity in the capital can be explained by variations in sociodemographic need. Significant variation does however remain, and this requires further local discussion and interpretation.

Potential Uses of such adjusted data

- **Benchmarking to improve local performance**

  This could assist both providers and commissioners in the best use of resources. The consistent use of good quality adjusted activity data will help to provide better objective evidence of where resources need to be shifted over time.

- **Distribution of resources within areas**

  Further work could be done at below-borough level – perhaps at team level to compare use of resources in a standardised way.

- **Explaining variations in star ratings**

  A clear methodology for adjusting data could help facilitate further discussions with CHAI and others about how need should be taken into account when reviewing local performance in future.

Recommendations and next steps

The following recommendations and 'next steps' have been discussed and agreed with Mental Health Trust Chief Executives:

- The 'factor analysis' approach to needs adjustment should be adopted by London's mental health services to assist it in reviewing use of resources, and variations in performance across London. This tool should be used on an annualised basis.

- The findings of this work should be used to inform local discussions about use of resources.

- Consideration could be given to initiating discussions with CHI/CHAI on the possibility of using such a means of needs adjustment in future performance ratings in order to give a more realistic picture of performance differences that can be addressed at the local level.

- The CE's dataset should be reviewed in light of what is already collected for the Mental Health Minimum Dataset and other routine sources such as HES (Hospital Episode Statistics). Future effort might usefully be focussed on ensuring similar data submitted nationally is as complete and accurate as possible. The CE dataset could be used to validate the accuracy of other data sources.

- Further work on the CE data set could usefully focus on the following:

  - Improving the data quality so that more data items can be used in future.
  - Adding new data items not collected elsewhere but considered to be important. The area of supported housing identified as key in the King's Fund report would be an early area to explore further.
  - Further analyses deploying CE data on the wider spectrum of beds and care could be useful.

  - Consideration should be given to allowing data collected so far to be made more widely available via the LHO so that it can be shared.

- The new Joint Senior Mental Health Analyst Post planned by the London Development Centre and LHO should be involved in helping develop this as part of an annual needs-adjusted London mental health dataset.

- A small additional resource to help enhance the completeness, consistency and quality with which data are collected/reported in London in future could make a significant difference to regular and consistent reporting of routine information about mental health services. This should be seen as an integral part of the implementation of London's ICT strategy in the mental health field.

Paul McCrone, Bobbie Jacobson, 2 February 2004

Acknowledgements

The authors would like to thank the London Development Centre for Mental Health for funding the work and the Chief Executives Group of London's mental health Trusts for commissioning it, for supplying the activity data and for commenting on interim analyses presented at a seminar in May 2003. We would also like to thank David Monk (OLM Group) and Gemma Hughes (London Development Centre for Mental Health) for support and advice through all stages of this piece of work.

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Tables and Figures

1. Introduction and background

The London Mental Health Trust Chief Executives Group has been collecting validated data on mental health services from each of the 10 Mental Health trusts within the Capital providing a full range of acute services for working age adults. The Tavistock and Portman NHS Trust provides specialist services for specific client groups, and does not provide in-patient care. Whilst a key part of the mental health care system in London, it has not been included in the analyses that follow. This work includes agreed definitions and quantification of acute, rehabilitative and community mental health services. Two rounds of data have been collected and these show significant variations across London.

In order to realise the potential for using these crude, and related routine mental health data as a means of benchmarking mental health services within London, further analysis is needed. In particular this includes:

- Adjustment and/or weighting of such indicators of mental health services to reflect differences in the socio-economic and other characteristics of the populations they serve.
- Developing a statistical model incorporating factors that explain the differences in unadjusted acute mental health 'performance' across London.

The London Health Observatory and Institute of Psychiatry have been commissioned to:

- Identify a process and methodology for adjusting existing crude mental health indicator data for factors other than Trust performance.
- To help identify indicators of mental health services that can be adjusted at local authority/PCT level to help inform differences in performance.
- To identify gaps in the information needed to do this especially to inform recommendations regarding future data collection.

If such adjustment is to be of any value over time, then it will be important for a consistent method of adjustment to be used. In recent years, there have been a number of reports reviewing need and performance in mental health and services in London. None of these have used a consistent approach to adjusting mental health data for need.

2. Review of factors influencing need for mental health services at the area level

It is important in considering socio-demographic characteristics that influence need to make a distinction between those measured at the level of an individual and those measured at an area level. Most work, including the analyses presented here that have looked at variation in service provision, has - out of necessity - focused on area level characteristics. These might, for example, tell us that an area that has a disproportionate number of people in a particular age group or from a specific ethnic group has a higher or lower use of mental health services than other areas. In these circumstances it is tempting to assume that it is people in these age group or ethnic groups who are using services in a disproportionate way. However, we have to be careful in making such an inference, which ideally would require us to collect data at the level of individual patients.

The initial step in determining the level of service provision required in a defined area is to establish the size of the population at risk. Estimates of the prevalence of serious mental illness vary substantially across areas and according to the definition of specific disorders. Prevalence is often defined as those who are in contact with services due to their mental health problems. Using such 'treated prevalence' figures is clearly useful in terms of easier measurement (Freeman and Alpert, 1986), but is a function of service supply and **not** need.

If services are in short supply then prevalence figures will be underestimated. In a review by Freeman (1994) three key reasons for the high prevalence of schizophrenia in inner city areas are postulated: social drift (those with mental disorders moving to poorer areas where the demands upon them are less), social residues (where those without mental disorders move away from inner-city areas), and social causation (where the environment causes mental health problems). The social residues theory does not seem plausible now as traditionally poor inner-city areas are becoming increasingly fashionable. The social drift theory has also been criticised, as it seems to only apply within large urban areas, with rural areas not showing the same relationship between social class and prevalence (Warner and de Girolamo, 1995).

Deprivation is likely to influence an area's prevalence of mental illness due to migration, social drift and causative factors (Hirsch, 1988), but does it independently affect the required level of services? Deprivation may have two effects. First, it may influence the **prevalence** of mental illness. Second, it may impact on the **severity** of mental illness, including the likelihood of relapse and the level of social support in the community (Hirsch, 1988). Rural areas may also have lower rates of bed use due to more acceptance of mental illness (Elpers and Crowell, 1982).

A comprehensive review of potential predictors of mental health need (commissioned by the former Lambeth Southwark and Lewisham Health Authority) was recently undertaken (Cronin, 2001). The review focused on the following factors:

- Deprivation – Evidence showed that lower social class increased the risk of schizophrenia, delayed recovery, and resulted in a poorer response to treatment. Social deprivation was also identified as a risk factor for anxiety and depression.

- Age structure and gender – First presentation with a serious mental illness is usually before the age of 45 and service needs may be greater during the early part of the illness course. Whilst gender differences in mental illness are well known at the individual level, they do not appear to have an appreciable impact at the area level.

- Ethnic mix – Young Black Caribbean men are more likely than others to be given a diagnosis of schizophrenia. They are also more likely to be admitted and for admissions to be compulsory. Clearly though there is a complex relationship between ethnicity, social disadvantage and service attitudes.

- Unemployment – This can have an adverse impact on mental health, which in turn can affect the likelihood of gaining employment.

- Housing and homelessness – The prevalence of mental illness is related to overcrowding and homelessness. This is likely to be strongly correlated to other factors such as deprivation, but there may be an independent impact on mental health as well. (The recent King's Fund report suggested that housing was a key issue in the way in which mental health services operated in London.)

- Refugees – There is evidence to suggest that depression, suicidality and posttraumatic stress disorder (PTSD) are more common among refugees. This can be due to the circumstances from which refugees are leaving, but also problems (language, employment, acceptance, etc.) that they can face in their new place of residence.

- Crime – Although there is much media focus on crimes committed by those with mental health problems, the effects of crime can themselves result in illness.

Whilst resource allocation formulae to date have focused on factors mentioned above it should be noted that these models are potentially better predictors of the prevalence of mental illness than of the need for specific services. Recognition that socio-demographic indicators of mental health need do exist has led to a number of composite measures of need. The main measures are described below:

York Index of Psychiatric Need
The University of York were commissioned by the former NHS Executive to produce a formula by which resources could be allocated to Health Authorities according to need. As part of this, a specific index of psychiatric need was developed (Smith et al, 1996). The aim of this was to identify variables that explained variations in the number of in-patient episodes between 'synthetic wards'. A range of demographic factors was examined and these were mainly from the 1991 census. The supply of services was controlled for because it was felt that this would influence utilisation. Using multilevel modelling techniques an index of need was generated based on the following variables:

- proportion of households headed by a lone parent,
- proportion of dependants with no carer,
- proportion of people born in New Commonwealth (1991 census definition),
- proportion of people of pensionable age living alone,
- standardised mortality ratio for those aged below 75
- proportion of adults who are permanently sick

Psychiatric Needs Index
The above formula has been replaced with a new index for allocation of funds to primary care trusts (Department of Health, 2003). This is based on:

- comparative mortality under the age of 65;
- the proportion of people aged over 60 who are claiming Income Support;
- the housing domain of the Index of Multiple deprivation (see below)
- a psycho-social morbidity index derived from analyses conducted on the Health Survey for England

A higher score on the index indicates a higher level of psychiatric need.

Mental Illness Needs Index (MINI)
The MINI was designed specifically to aid resource allocation and planning for local mental health services. It was developed in the early 1990s by identifying population characteristics that explained variations in the prevalence of hospital admission in the electoral wards comprising the (then) North East Thames Regional Health Authority (with 2.4 million people aged between 15 and 64) (Glover et al, 1998). Potential predictors (chosen on theoretical grounds) were drawn from the 1991 census and a model was produced using multivariate analysis. The final model from which the index was calculated included the number of people or households:

- who were single/widowed/divorced
- who were permanently sick
- who were unemployed
- which were without a car
- living a household that was not self-contained
- living in a hostel/lodging house etc

Here we used the 2000 version of the MINI which differs in that it is based on more recent admissions data.

Underprivileged Area Score (UPA8)
This was developed in the 1980s by surveying general practitioners to find out which population based factors contributed to an increased workload or pressure of work (Jarman, 1983 and 1984). The aim was to identify factors that could be measured using census data and eight were finally chosen including:

- number of children aged under five
- unemployment, whether born in UK or elsewhere
- number of single parent households
- number of elderly people living alone
- overcrowding
- social class and number of people moving in past year

Based on scores for these factors (between zero representing no problem and nine representing serious problems) an index of need was generated.

Index of Multiple Deprivation
The ODPDM produces an Index of Multiple Deprivation (IMD) that is derived from indicators of:

- income
- employment
- health and disability
- education, skills & training, housing
- geographical access to services

Scores are generated for each electoral ward in England, and wards, which can then be ranked.

Our experience with the York Index of Psychiatric Need, the UPA index and the MINI has shown these are all strongly correlated with each other- and this was in part borne out in Phase I of this project. In this paper we focus on one of these, the MINI, as well as a model we have used in previous work for the King's Fund (Aziz et al, 2003).

3. Process of data collection

Two rounds of data on a wide range of indicators were collected from Trusts and were reported at the borough level which was deemed to be appropriate given the relative coterminosity between boroughs and PCTs. Data items to be collected were agreed with the Trusts and forms were distributed and circulated within Trusts. The first round of data collection was useful for highlighting any difficulties and thus for informing the second round. As the CEO GROUP commissioned the data, it was important to ensure that any data sent back to the analysts was verified, agreed and 'signed-off' by the CE or someone nominated by them.

Comparisons between Round 1 and Round 2 data are possible but have not been attempted here. We are hesitant to do so for two reasons. First, it is possible that the quality of the data collected has improved over time and therefore we would have more confidence in the Round 2 data. Second, the Round 1 data relate to a six-month period between July and December 2001, whilst the Round 2 data are for the 12 months leading up to the end of March 2003. Therefore, the main reporting of data and analyses that follow all relate to Round 2 data. Information on Round 1 data, and the analyses conducted on it are given in Appendices 1-3. Details of the data provided in Round 2 are summarised in Appendix 4.

In Round 1 we compared inpatient activity rates across London and used the MINI, the IMD and the PNI to explore variations. However, we did not compute adjusted rates of activity.

There were a number of missing items of data from most Trusts. For three variables (covering two measures of readmission and also delayed discharge) this was due to an old form being used in some cases. However, a more common problem was that forms would be returned with some items not filled in. As forms should have been verified and quality checked by Trusts we have made the working assumption that these data are not readily available. Data returned however, were sufficiently complete to allow analyses on a number of indicators of activity. For simplicity we have here focused on four: three measures of inpatient activity (admissions, bed days and readmissions within 28 days) and one measure of community care (number of people on the enhanced level of the Care Programme Approach (CPA). All these items were regarded as important measures of activity in terms of commissioning, provision and performance. We provide a picture of unadjusted variation in staffing levels as well.

For one measure - readmission rates at 28 days - data were incompletely reported and we have drawn the missing values from the current mental health trust star ratings and data later collected from Trusts. For three Trusts we had to assume the same readmission rate for the PCTs in their catchment area. This indicator may though provide helpful information bridging acute and community services.

4. Unadjusted activity data (Round 2)

Figure 1. Unadjusted acute admissions per 100K people (Round 2 data)

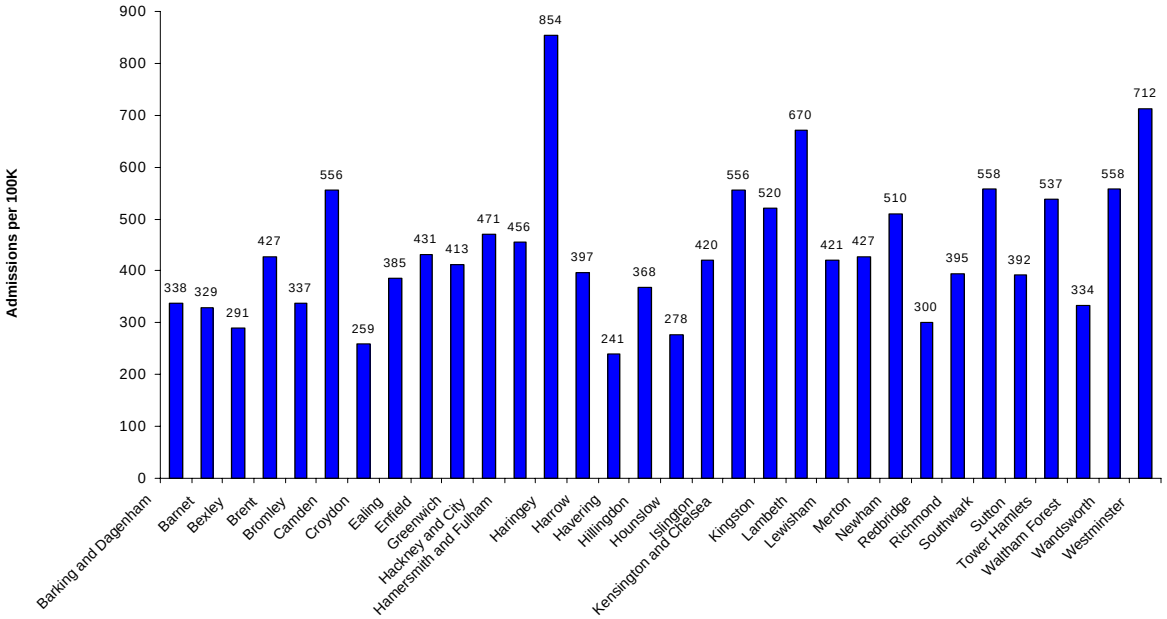


Figure 1 shows the variation in the unadjusted number of acute admissions per 100,000 people. The highest admission rate was in Haringey followed by Westminster. Havering had the lowest admission rate followed by Croydon. The geographical distribution of data reveal a pattern of admissions that would be expected – higher rates in inner-London with lower rates on the outskirts (Figure 2).

Figure 2. Distribution of unadjusted acute admissions across London (Round 2 data)

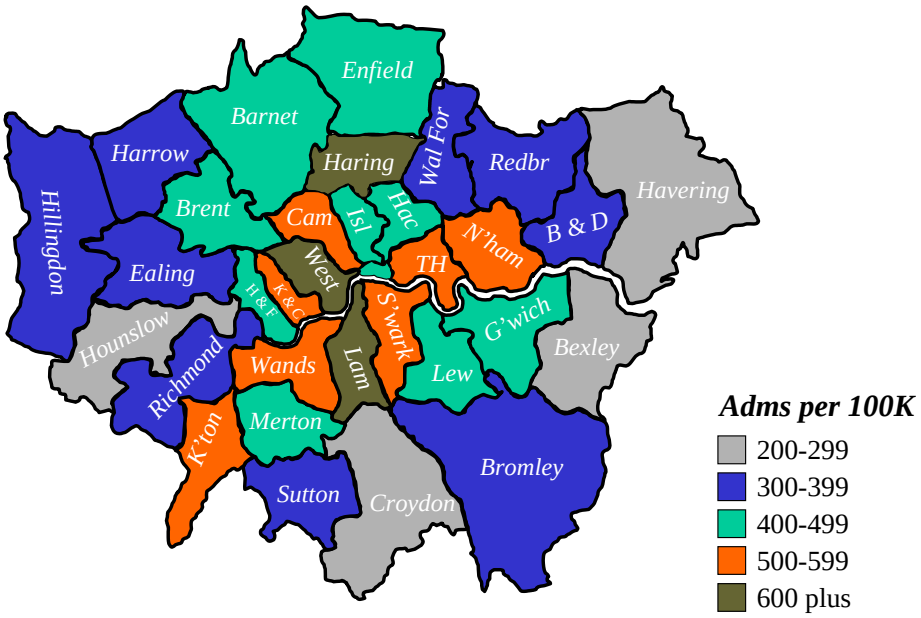
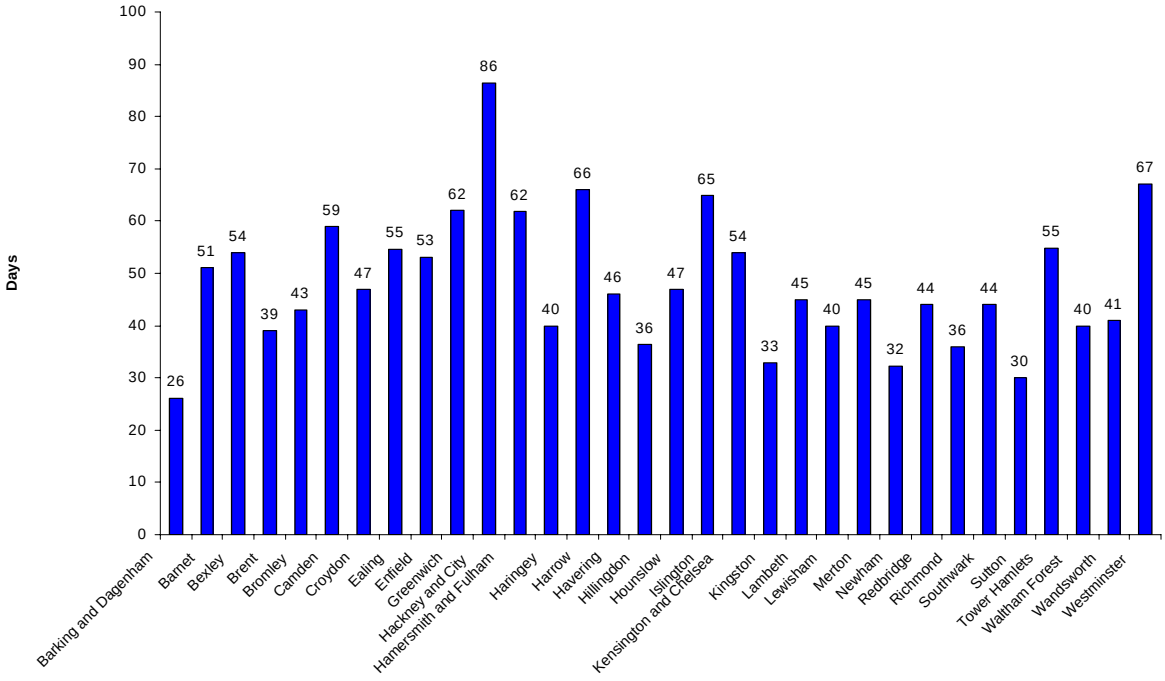
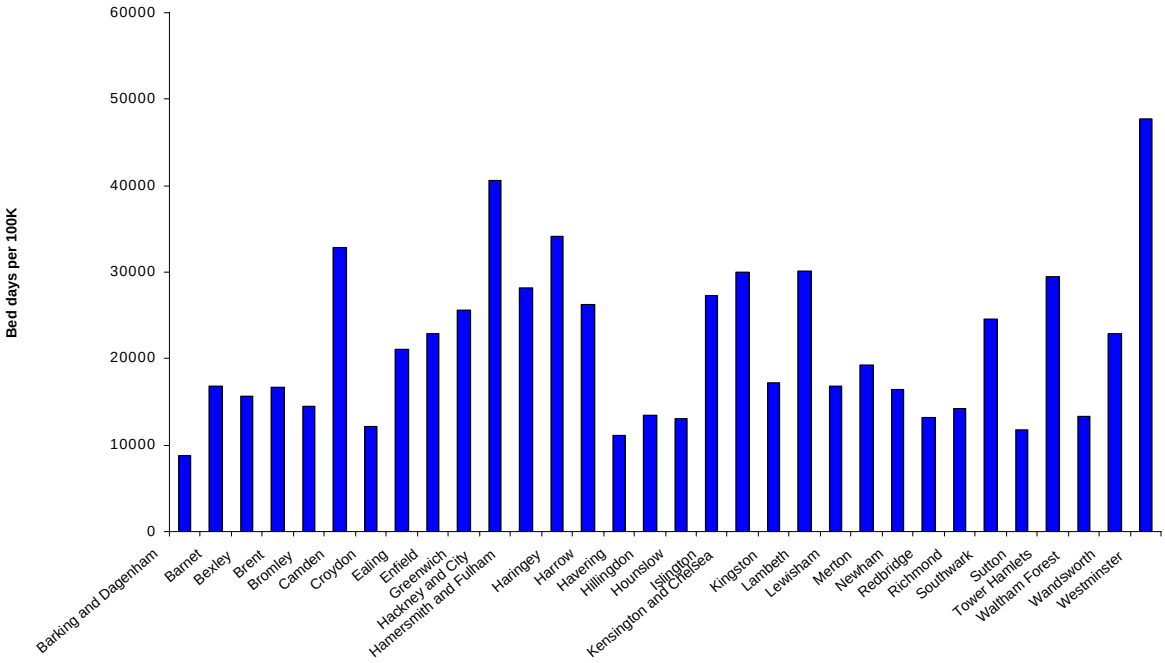


Figure 3. Distribution of unadjusted average length of stay across London (Round 2 data)



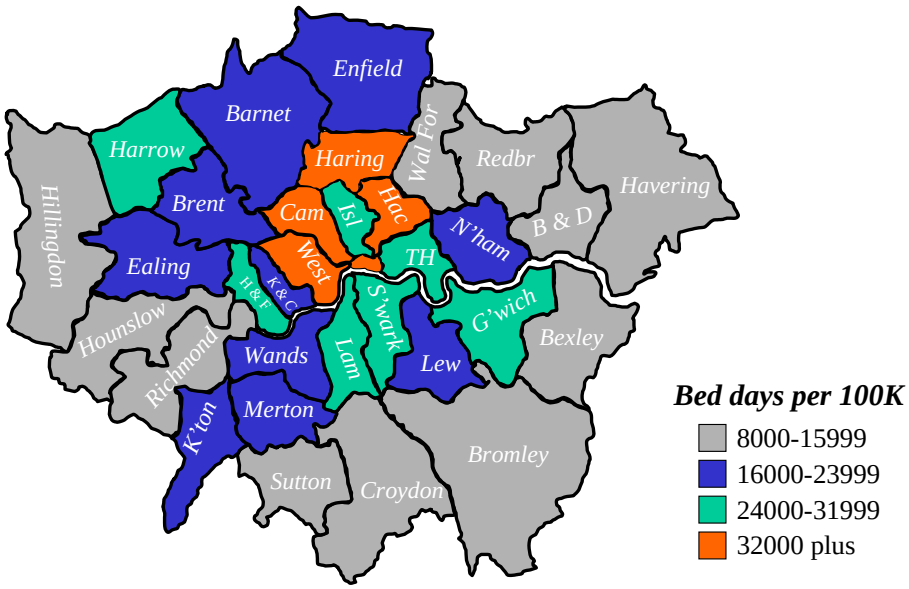
Average length of stay was highest in Hackney & City with the lowest level in Barking & Dagenham (Figure 3). Intriguingly given the Hackney & City finding, the Newham figure was one of the lowest in the capital.

Figure 4. Number of unadjusted acute bed days per 100K people (Round 2 data)



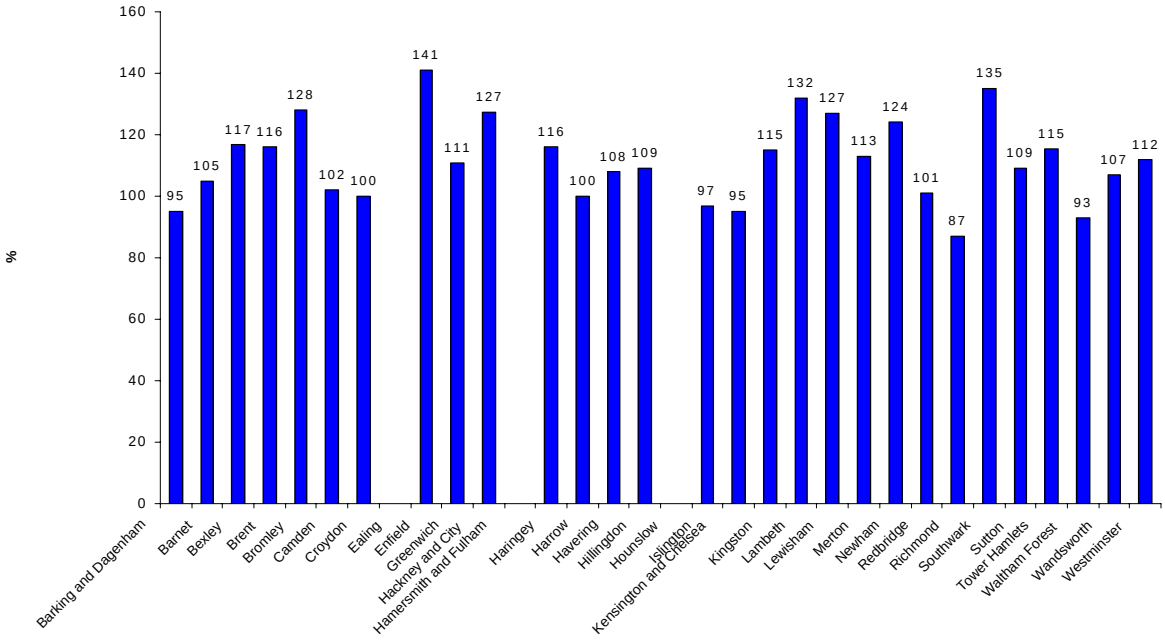
With the data on admissions and length of stay combined (Figure 4), we can see that Westminster has the highest rate of bed day use (47,722 per 100,000 people) followed by Hackney & City (40,665). The lowest rates were in the adjacent boroughs of Barking & Dagenham (8794) and Havering (11,074).

Figure 5. Distribution of unadjusted acute bed days across London (Round 2 data)



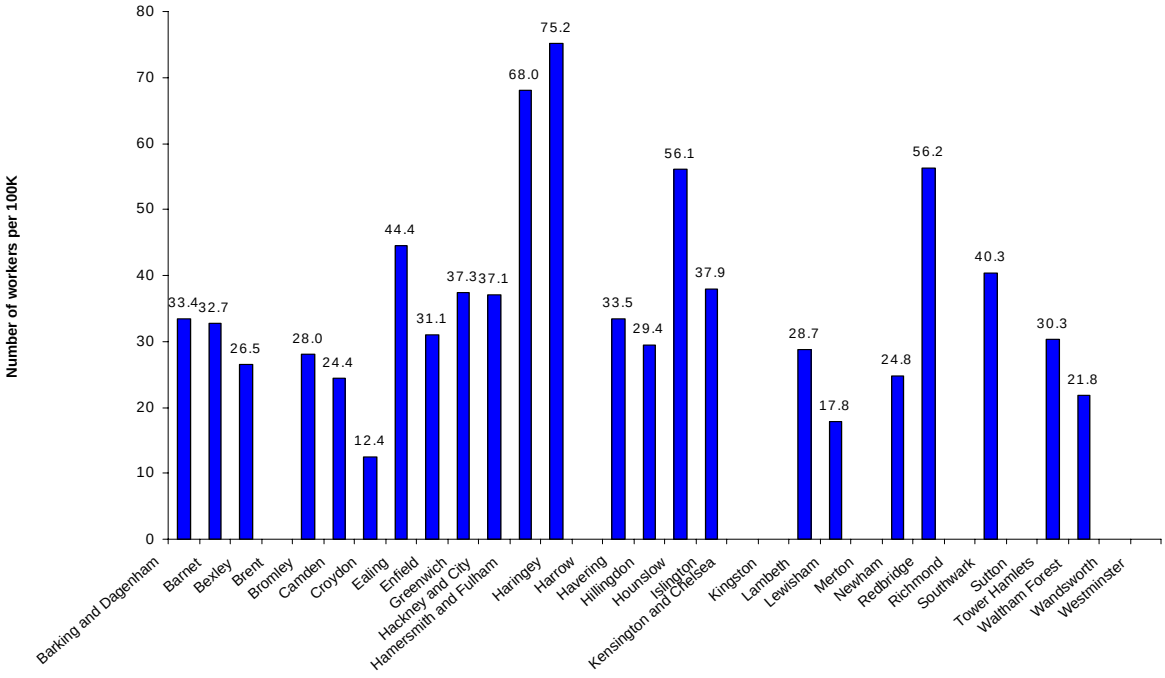
The distribution of acute bed day use follows a definite pattern (Figure 5), with a clear distinction between inner- and outer-London.

Figure 6. Unadjusted acute bed occupancy rate (%) (Round 2 data)



Bed occupancy rates were highest in Enfield and Southwark (Figure 6), and lowest in Richmond. This does not include figures for Ealing, Hounslow and Hammersmith & Fulham, which need verifying.

Figure 7. Unadjusted WTE staff in CMHTs and Assertive Outreach Teams (AOTs) per 100K people (Round 2 data)



Staffing levels were once again quite varied and data were not returned for this variable by a number of Trusts. Haringey had the highest number of workers in CMHTs and assertive outreach teams (Figure 7) with the lowest number in Croydon. Southwark has the highest concentration of consultant psychiatrists and Hillingdon the lowest (Figure 8).

Figure 8. Unadjusted WTE consultant psychiatrists per 100K people (Round 2 data)

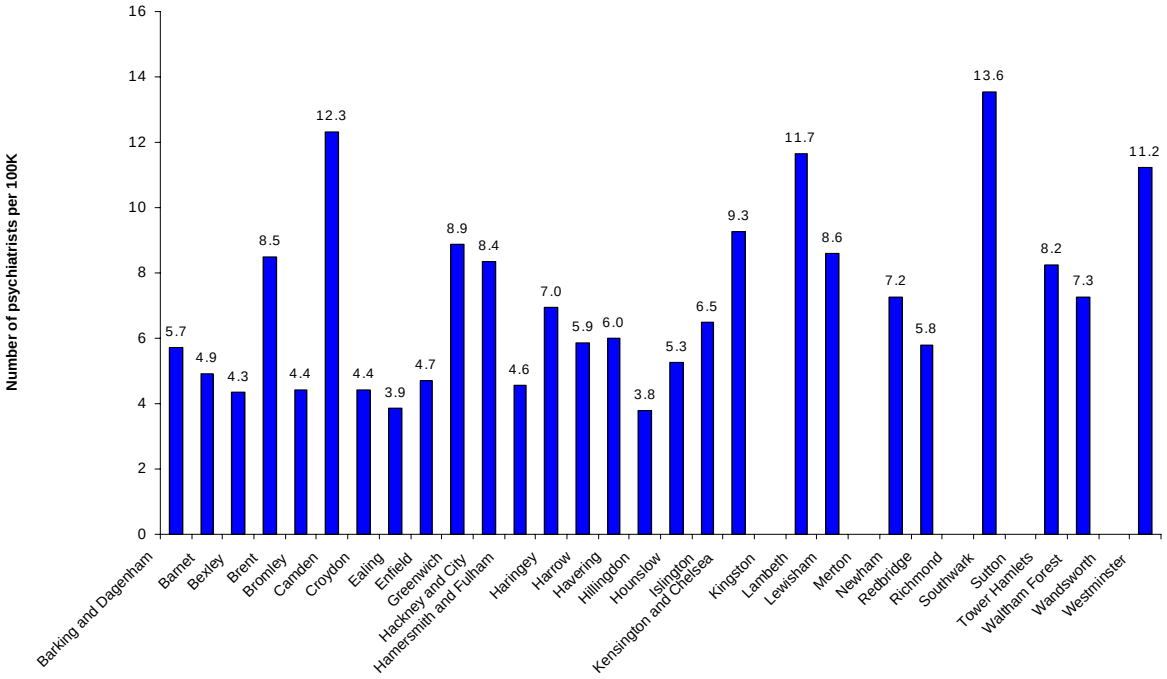


Figure 9. Unadjusted CPA numbers per 100K people (Round 2 data)

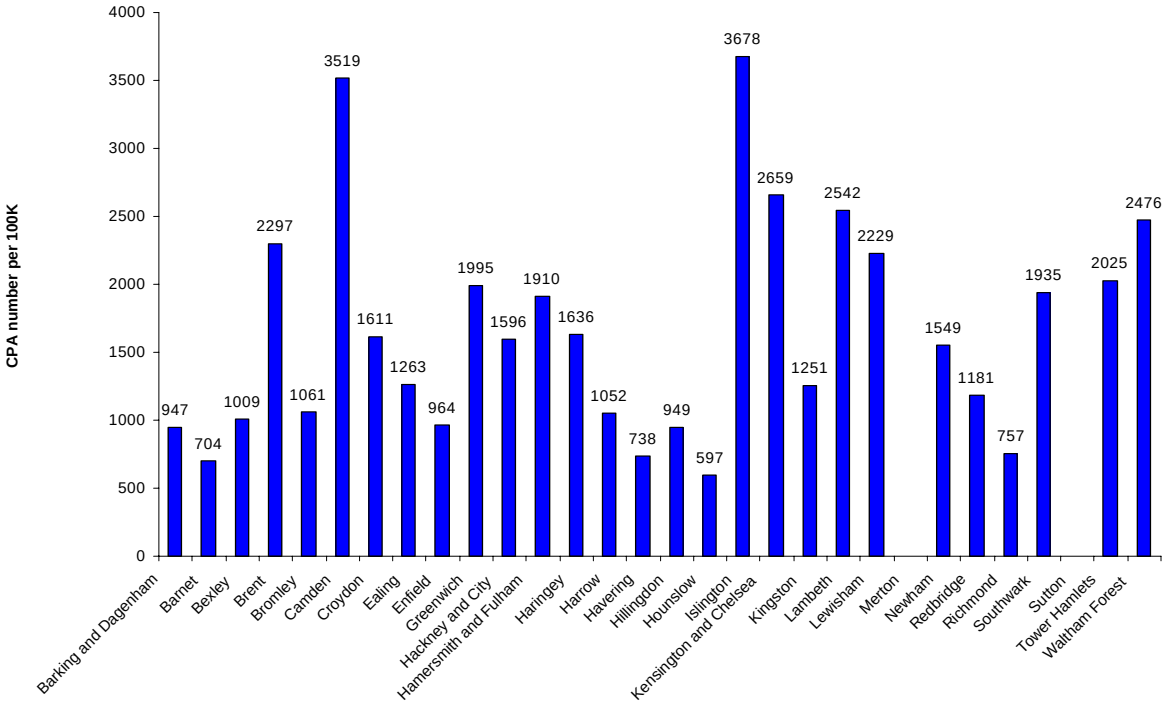
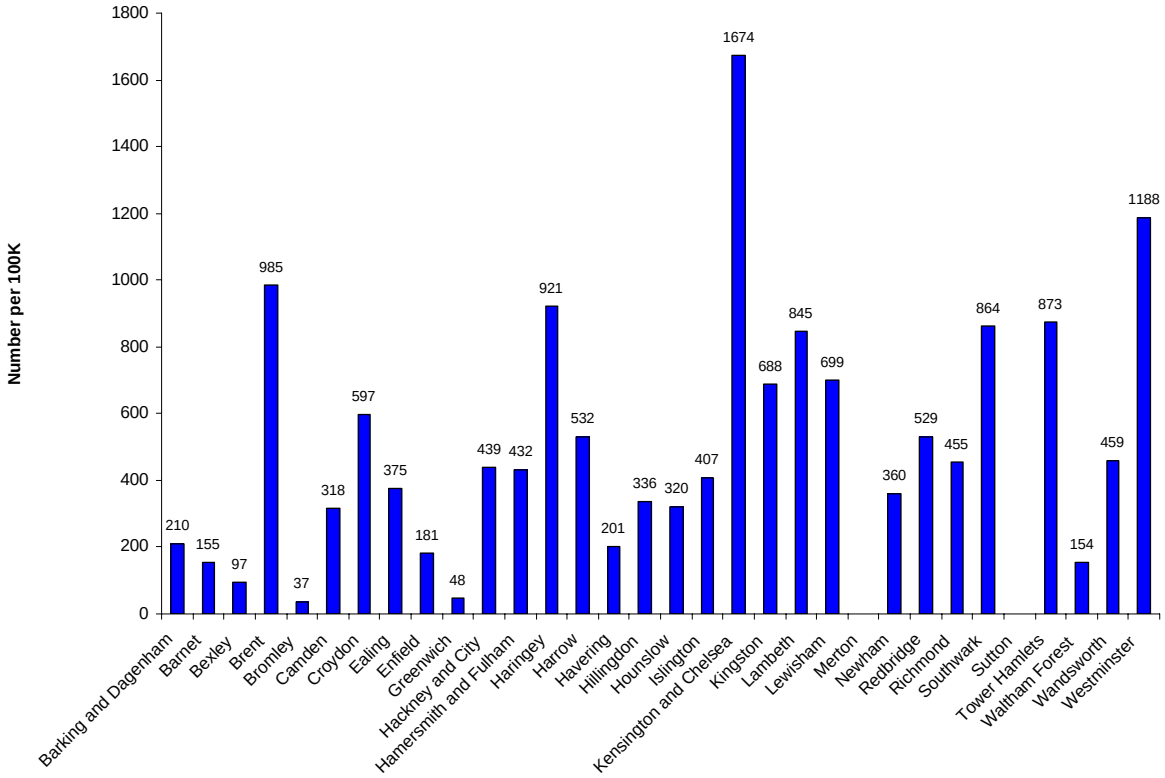
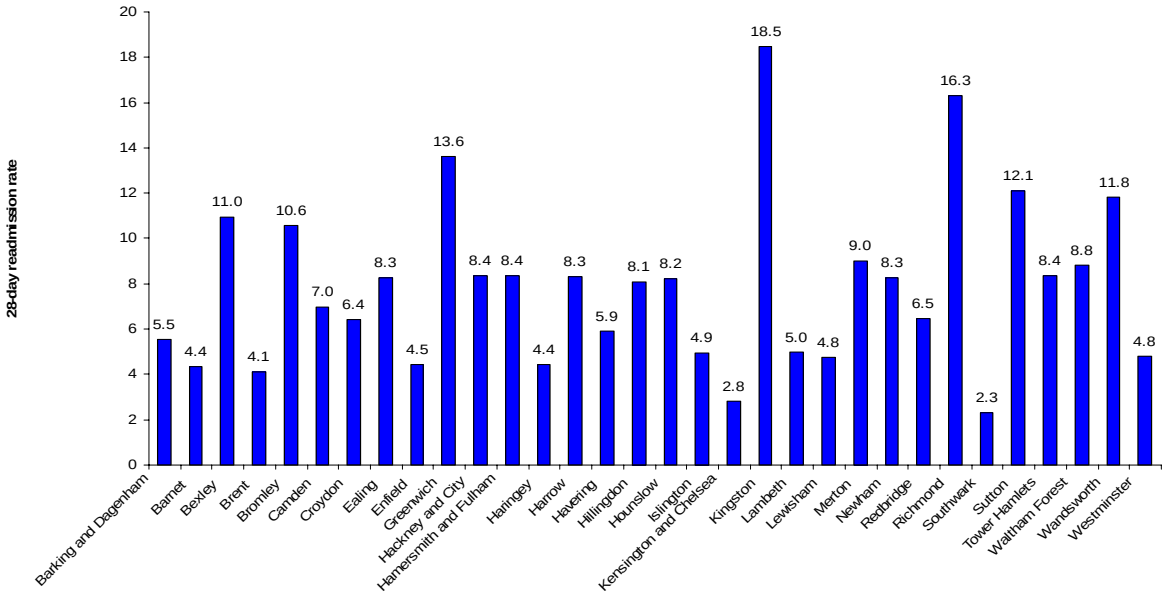


Figure 10. Unadjusted enhanced CPA numbers per 100K people (Round 2 data)



Islington has proportionately more CPA registered patients than any other borough, followed by Camden (Figure 9). Hounslow and Barnet had the lowest numbers of registered patients. Numbers on the enhanced level of the CPA showed substantial variation, with the figure for Kensington and Chelsea being the highest, and those for Bromley and Greenwich being the lowest (Figure 10)

Figure 11. Unadjusted 28-day readmission rate (%)



The rate of readmission within 28 days varied substantially across London (Figure 11). It should be noted though that for three Trusts we have had to assume the same rate for each PCT. Kingston and Richmond had the highest rates of readmission whilst the lowest rates were in Southwark and Kensington & Chelsea.

5. Analysis of variations in service activity

5.1 Model 1: Using the MINI

In Section 2 we discussed a number of reasons why mental health need and service provision might vary. Such variation certainly exists in London as is evident from Section 4. In this section we explore variations in acute admissions, bed day use, the number of patients on the enhanced level of the CPA, and readmissions within 28 days using two models to adjust for need. The first model uses an established measure of mental health need, the 2000 version of the MINI (described in Section 2) which we showed in Phase I of this project to explain a larger proportion of the variation than other indices of need commonly used. The MINI has been used extensively to aid planning and management of mental health services throughout the country. However, as with the Psychiatric Needs Index used in the Department of Health's funding formula, it is essentially a utilisation index rather than a 'pure' needs index in that it was developed by examining factors that influence variation in inpatient admissions. To use it to explore variations in admissions in London may be somewhat tautologous. The UPA index could be argued to be more of a needs index in that it is a composite measure of factors that GPs consider to affect need and it is not based on actual utilisation data. However, the UPA index was not specifically developed for use in mental health planning, but rather for primary care workload planning and may not therefore be appropriate for wider purposes.

5.2 Model 2: Using factor analysis

Our second model is similar in that it is based on socio-demographic factors that are considered to be important indicators of need for mental health services in London. These factors are as follows:

- population density
- % aged 0-15
- % aged 65 and over
- % female
- % single
- % Asian ethnicity
- % Black Caribbean ethnicity
- % Black Other ethnicity
- violent offences per 1000 population
- sexual offences per 1000 population
- robberies per 1000 population
- burglaries per 1000 population
- car theft per 1000 population
- theft from car per 1000 population
- % of residents with no qualifications
- % unemployed
- % of residents aged 18-74 who are students
- % of households with a resident with a long-term illness
- number of asylum seekers on social worker caseloads per 1000 residents

We considered two approaches to examining the impact of these factors on variations in activity. The first approach was to examine the impact of each variable separately (univariate analysis) and then to select the best predictors of variation for use in a multivariate model. However, difficulties with this approach became apparent. The main difficulty was that with only 32 local authorities, any multivariate model could only contain a limited number of 'explanatory' variables (at most six). The other key problem was that most of the above variables were good predictors at a univariate level, but they tended to cancel each other out in multivariate analyses.

Therefore, the second approach we developed was to derive factors based on the individual variables using a different statistical method known as 'factor analysis'. This is described more fully in Appendix 5. Basically, it allows new socioeconomic variables to be created which describe our geographical areas of interest (i.e. boroughs). Depending on how much this description is relevant to a particular area is gauged by the area's 'factor score' for that factor. For example, Richmond would have a high score for a factor that is a composite measure of prosperity, whereas Haringey would have a high score for a factor that is a measure of ethnic diversity.

Four factors were obtained from an analysis of socio-demographic data for all English local authorities. This was important as it enabled us to examine these variables on a substantially larger dataset than London alone could offer. The results for London were then retrieved and used in the analysis of the round 2 service activity. Areas fell into four groups:

Areas scoring highly on Factor 1 are characterised by:

- high crime rates
- many people who are single, widowed or divorced
- a large number of people living alone
- high population density
- relatively high numbers of students

Areas scoring highly on factor 2 are characterised by:

- high levels of the more serious crimes
- large ethnic minority populations
- many single, widowed or divorced residents
- high population density
- relatively few older people

Factor 3 is representative of areas with:

- many younger people
- large numbers of people with no formal qualifications
- high unemployment rates
- a high percentage of women
- a large number of households containing residents with long-term illness

Finally, areas with high scores on factor 4 tended to have:

- fewer young and more elderly residents
- a relatively large number of residents living alone
- a relatively high proportion of women

Every borough had a score for each factor. These four factor scores were then incorporated into a multivariate model, along with the asylum seeker variable (which could not be used in the national factor analysis as it was only available for London), in order to explain variations in activity. It is helpful to see how LAs relate to each other in terms of sociodemographic need. We have not performed a formal 'cluster analysis' of the data but in Table A5.2 of Appendix 5 the individual factor scores for each area are ranked and this enables those who are interested to see which areas are similar for each of the four factors.

5.3 Analysis of variation in admission rates

Figure 12. Relationship between actual and predicted admissions (MINI model, Round 2 data)

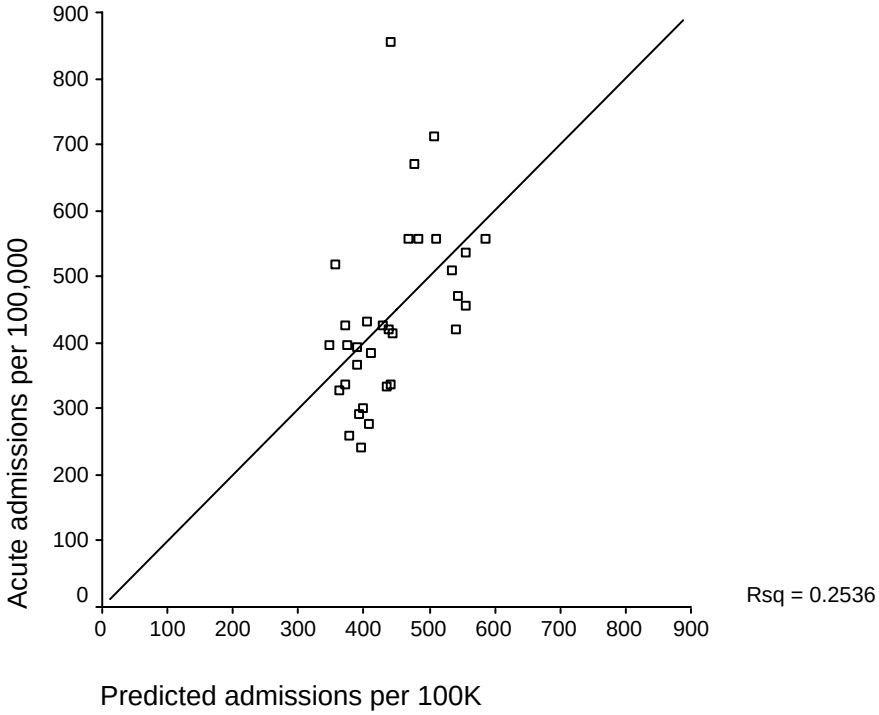
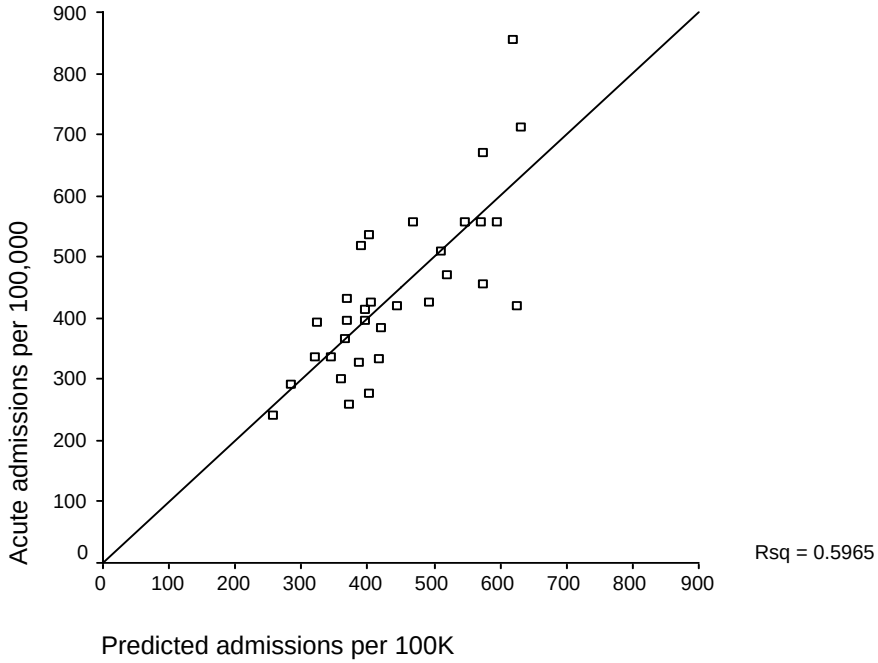


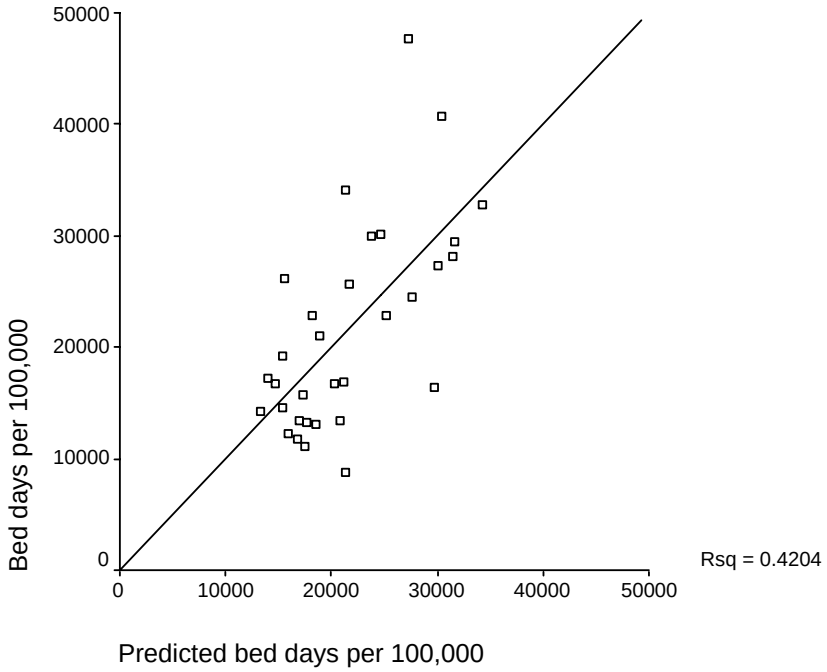
Figure 13. Relationship between actual and predicted admissions (factor analysis model, Round 2 data)



The relationship between the MINI and the number of admissions per 100K people is shown in Figure 12. Each point on the chart represents an individual borough and the 'Rsq' figure (Coefficient of variation) shows how much variation in bed use can be explained by the model, and it can be seen that this figure is 25% (An Rsq of 1 would mean that there was a perfect relationship and all points would fall on the straight line.) However, the model using factors based on socio-demographic characteristics is able to explain more than twice this amount (Figure 13).

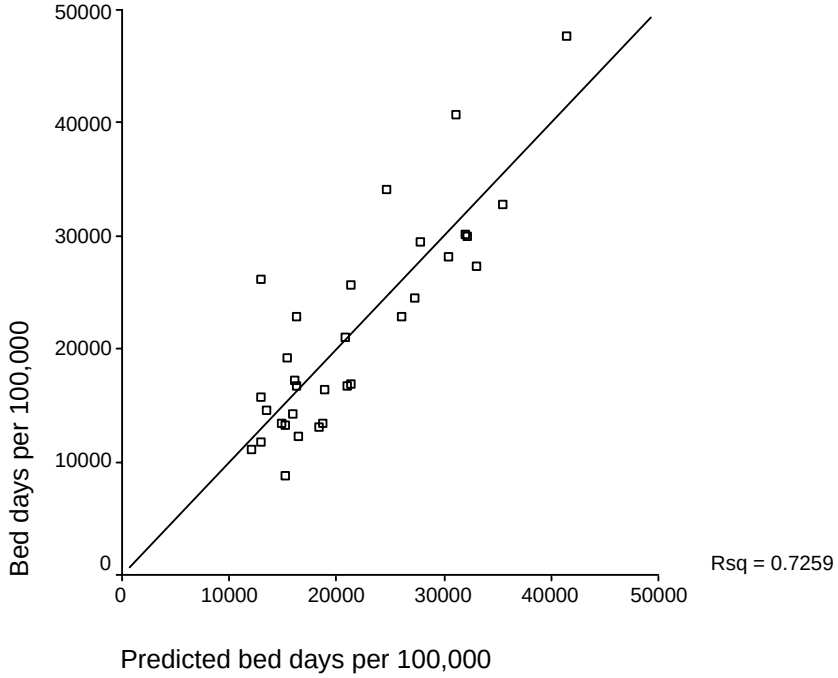
5.4 Analysis of variation in acute bed days

Figure 14. Relationship between actual and predicted bed use (MINI model, Round 2 data)



The substantial variation in this variable has already been seen in Figure 1, with around a four-fold difference between the area with highest rate of bed use and that with the lowest. Figure 14 shows the relationship between the MINI and bed use reported for Round 2. In this case the MINI can explain 42% of variation. Whilst this leaves substantial variation unexplained, it is still a reasonable amount.

Figure 15. Relationship between actual and predicted bed use (factor analysis model, Round 2 data)

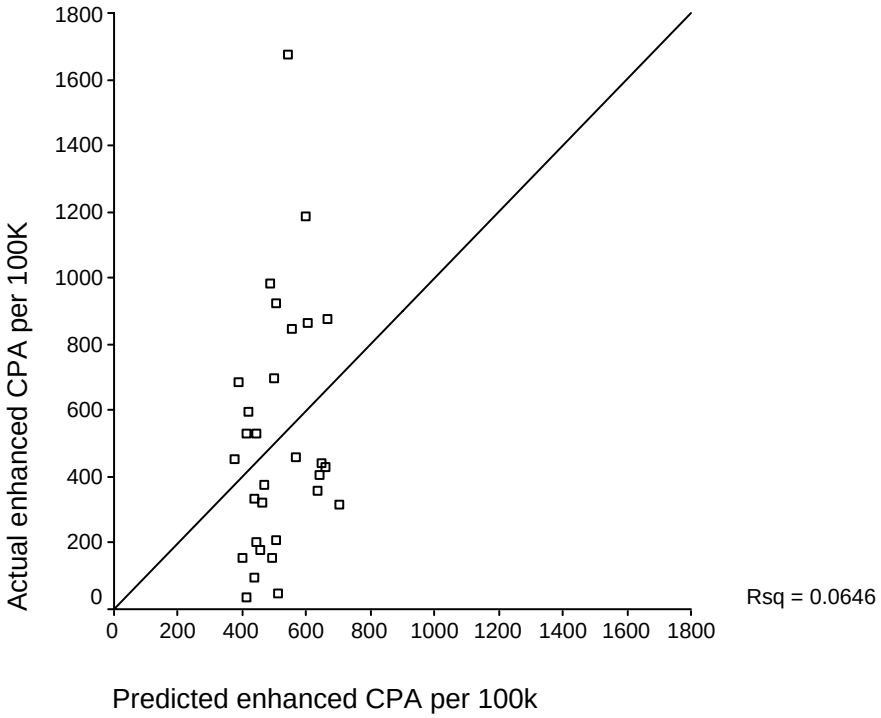


When socio-demographic variables were combined using the factor analysis, and with the inclusion of the asylum seeker variable 73% of variation in Round 2 bed use data can be explained by the model (Figure 15), which is substantially better than the MINI model.

5.5 Analysis of variation in enhanced CPA numbers

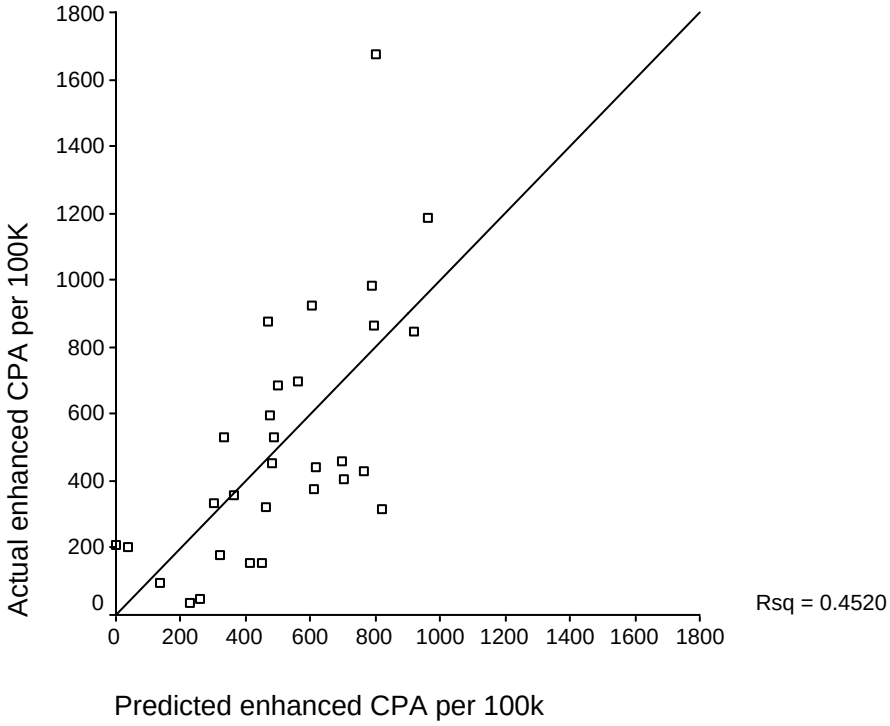
The above analysis has focussed on inpatient activity. Enhanced CPA rates are a reasonable approximation of the number of people in a locality with the most serious mental health needs, which will not necessarily mean inpatient care.

Figure 16. Relationship between actual and predicted enhanced CPA numbers (MINI model, Round 2 data)



The MINI score is able to explain only 6% of variation in CPA numbers at Round 2 (Figure 16).

Figure 17. Relationship between actual and predicted enhanced CPA numbers (factor analysis model, Round 2 data)



By contrast, the factor analysis model can explain 45% of variation in Round 2 enhanced CPA numbers (Figure 17).

5.6 Analysis of variation in 28-day readmission rates

Figure 18. Relationship between actual and predicted enhanced 28-day readmission rates (MINI model, Round 2 data)

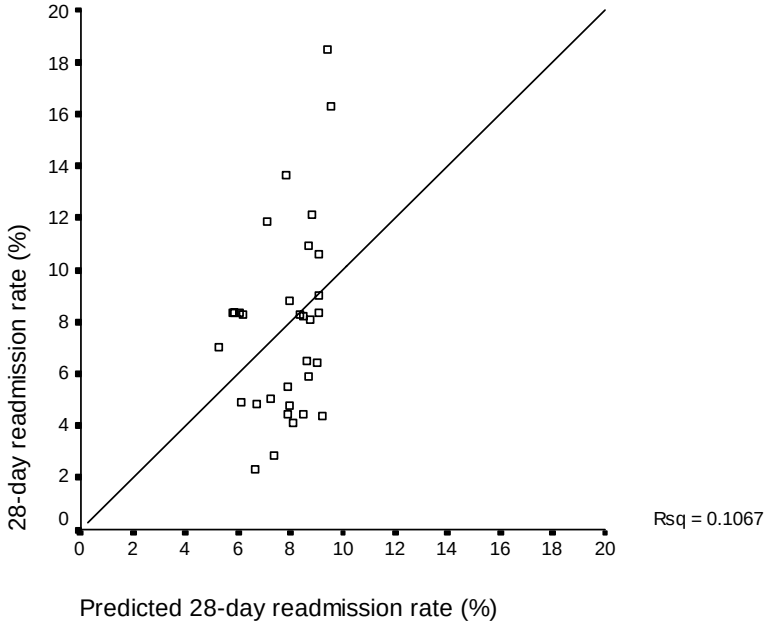
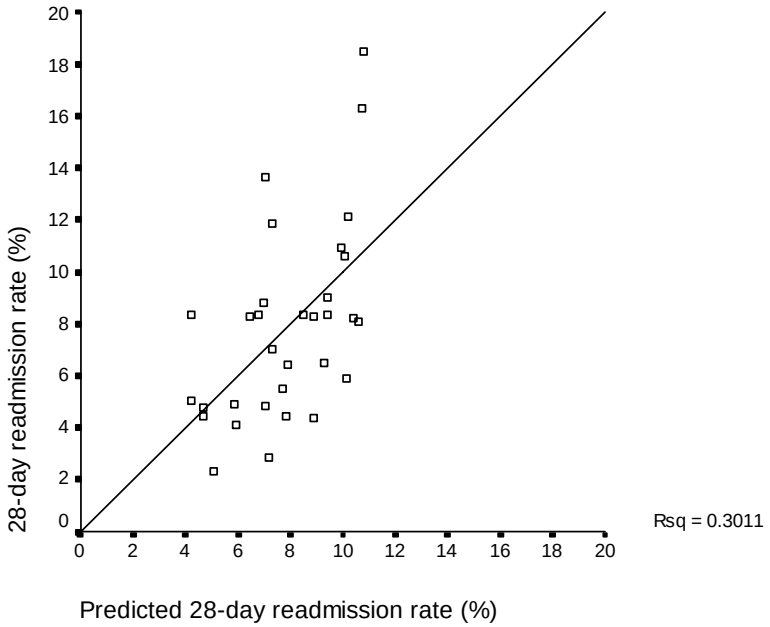


Figure 19. Relationship between actual and predicted enhanced 28-day readmission rates (factor analysis model, Round 2 data)



Eleven percent of the variation in 28-day readmission rates can be explained by the MINI (Figure 18). The factor analysis model is able to explain 30%, but this still leaves over two-thirds of variation unexplained (Figure 19).

5.7 Adjusted activity rates

Activity rates are standardised for population differences and some of the remaining variation is due to differences in need. The regression analyses allow us to estimate activity rates after making adjustments for socio-demographic need. In effect we are stating what the level of activity would be if needs were the same in each area. If needs were identical then ideally we would expect to see activity rates that were very similar between areas.

Figure 20. Acute admissions per 100K adjusted for need

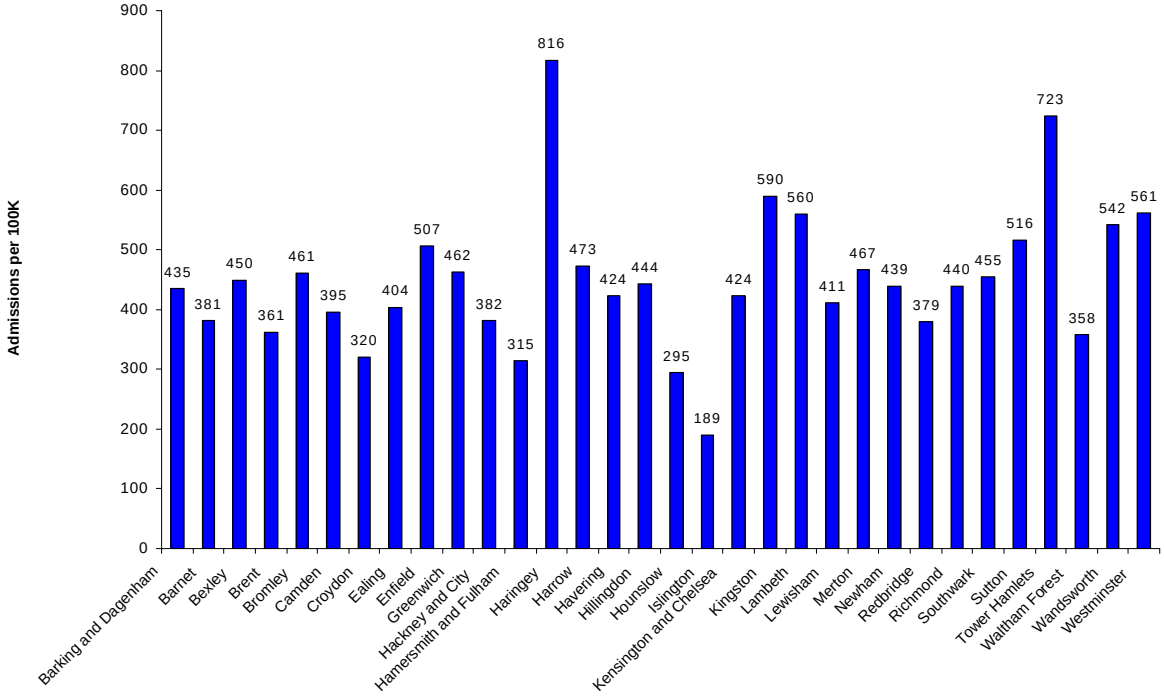


Figure 21. Bed days per 100K adjusted for need

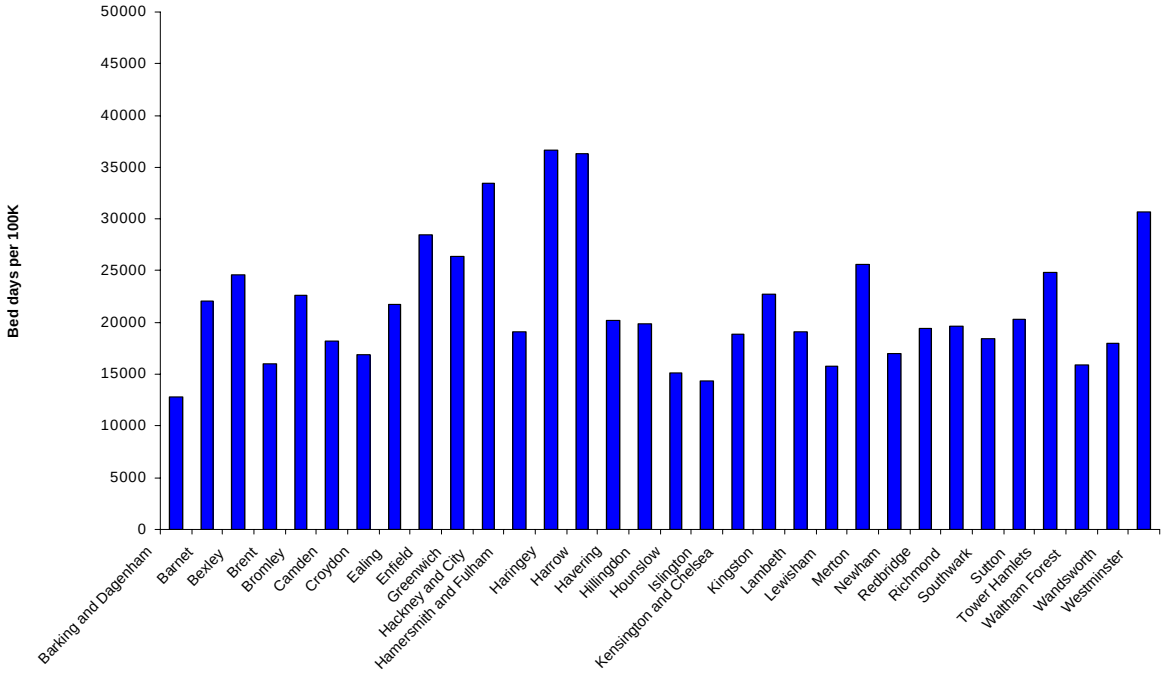


Figure 22. Enhanced CPA numbers per 100K adjusted for need

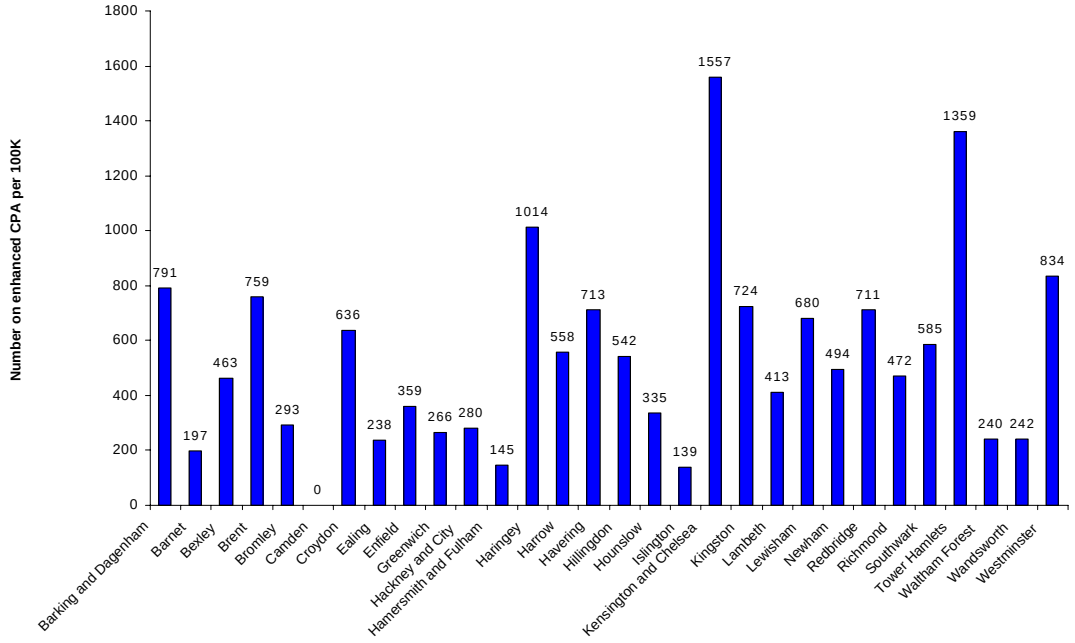


Figure 23. 28-day readmission rate (%) adjusted for need

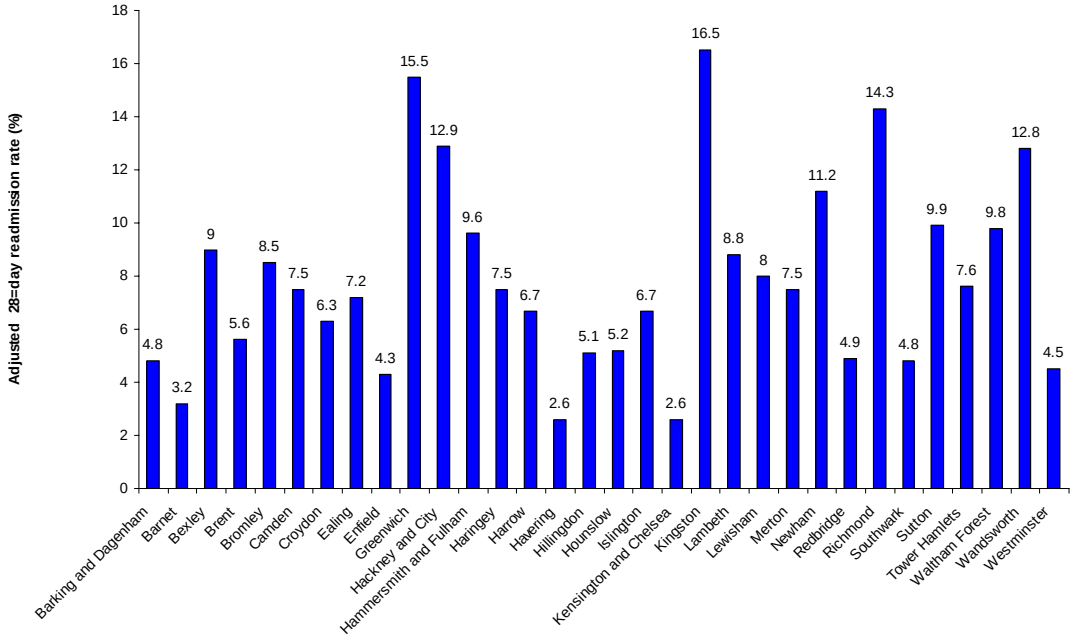
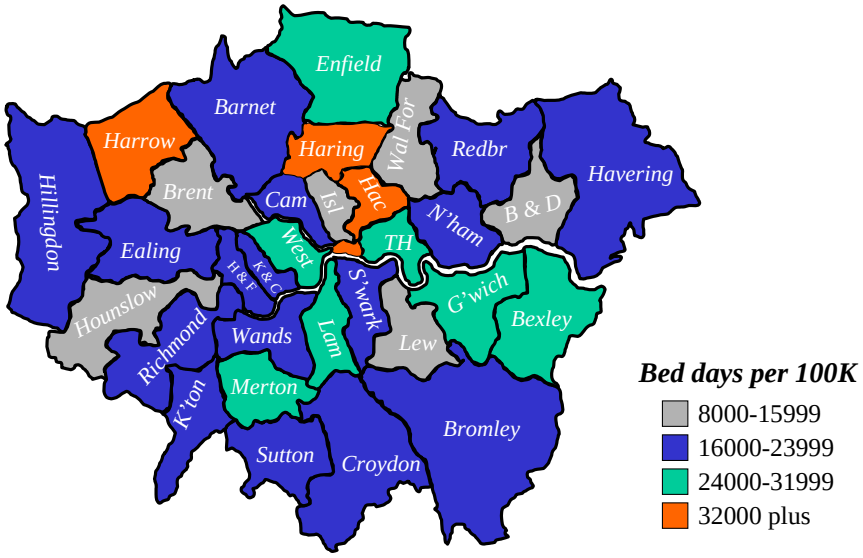


Figure 20 shows the adjusted rates of admission based on our model. It can be seen that even after adjusting for need much variation still exists. The same applies to acute in-patient days (Figure 21 and Figure 24), although this distribution is flatter than the unadjusted figures. The greatest variations after adjusting for need are for numbers of people on the enhanced level of the CPA (Figure 22) and the 28-day readmission rate (Figure 23). The adjusted figures for these variables are better indicators than the unadjusted figures because they account for some level of need. However, they are far from perfect because measured need can only explain a small amount of the variation in the raw figures.

Figure 24. Bed days per 100K across London adjusted for need



6. *Summary and discussion of key findings*

6.1 Key Findings

The key findings from the analysis are as follows:

- There was wide variation across boroughs in all unadjusted activity measures analysed. There was also substantial variation (three-fold between highest and lowest) in staffing levels but incomplete returns prevented further analysis.

- Adjusting for need for selected indicators (admission rates, bed use, enhanced CPA and 28-day readmission rates) using the MINI was able to explain some of the variation: 25% for admissions, 42% for bed use (bed days), 11% for readmissions at 28 days and 6% for enhanced CPA.

- Our factor analysis model however, was able to explain substantially more variation: 60% for admissions, 73% for bed use and 45% for enhanced CPA and 30% for readmissions.

- Adjusted activity rates showed much less overall variation but there is still significant unexplained variation (especially for readmissions and enhanced CPA rates) between boroughs that is probably not related to socio-demographic need.

6.2 Discussion

It is clear that the factor-analysis–based approach can explain a far greater amount of variation than the model using the MINI. The reasons for this are probably explained by the wider group of variables that the analysis encompasses plus the subsequent inclusion of the asylum seeker factor. In the case of readmissions, relatively little variation was explained by the factor analysis model and this may have been due to a lack of data from three PCTs.

Unfortunately, there are no sufficiently discriminating data on housing that could be entered into the model. This is an omission that merits further work in light of the evidence from the King's Fund enquiry and elsewhere of the importance of housing, and supported housing in particular.

The remaining variation between boroughs cannot thus be explained on the basis of socio-demographic need as measured here. Taking bed use alone, other explanations must be found. Systematic local review of factors that explain outlying positions is likely to provide a clearer view. It is possible that inaccuracies in the data – both in collection and recording – could be a factor in some, but other factors will also need to be considered such as spectrum of care available, different clinical and managerial policies practices that impact care for clients etc. In some cases the nature of the catchment population may play a small part as our analyses are based on resident rather than catchment populations served.

It is important to note that because the geographical pattern of adjusted activity is significantly different from unadjusted activity, the way in which unadjusted data are often used to comment on performance merits further discussion both with commissioners and those monitoring performance.

The activity indicators we selected for testing in our model were used partly because they reflect significant use of resources and are regarded as important currency by both commissioners and those managing performance. In the case of the data we had access to, they were also selected because they were returned by most Trusts (although there were some missing values, especially for readmission rates). It is important to recognise that indicators of outcome would be preferable but are not yet available. As such data are planned for collection as part of the mental health information strategy, there will be scope for further work with these in the future.

Comment should be made on the robustness of the indicators used. It is widely known that indicators of bed use are influenced by the number of beds available. However very low or very high adjusted levels of use should prompt questions about appropriateness. The patterns of variation in adjusted enhanced CPA that we have presented are new and represent the first pan-London perspective on this relatively new indicator - which is also part of the mental health Minimum dataset. This indicator is likely to be subject to a number of other influences that should prompt local audit – including variations in clinical thresholds for using this classification. It is widely thought that in areas of high need, thresholds are higher for classifying patients as needing enhanced CPA. This sort of clearly defined collection of data may help explain the differences we have demonstrated – in the context of local benchmarking/audit. One of the Trusts has developed its own locally agreed consistent definitions of CPA categories, which merits further exploration.

Finally a comment should be made about data quality and completeness. We were not able to use all the data items agreed because of missing items. We are not in a position to comment on data quality, but the CEO group has taken important steps in agreeing clear data definitions and collecting more complete data than any routine sources for London. Differences in definitions will though inevitably still occur. Further joint work on reviewing data quality might be one of the logical next steps in this joint work.

6.3 Potential Uses of such Adjusted data

- **Benchmarking to Improve Local performance**

  This could help assist both providers and commissioners in the best use of resources. The consistent use of good quality adjusted activity will help to provide better objective evidence of where resources need to be shifted over time.

- **Distribution of resources within areas**

  Further work could be done at below-borough level - perhaps at team level - to compare use of resources in a standardised way.

- **Explaining variations in star ratings**

  A clear methodology and supporting adjusted data could help facilitate further discussions with CHAI and others about how need should be taken into account when reviewing local performance in future.

7. *Recommendations and Next steps*

The following recommendations and 'next steps' have been discussed and agreed with Mental Health Trust Chief Executives:

- The factor analysis approach to needs adjustment should be adopted by London's mental health services to assist them in reviewing use of resources, and variations in performance across London. This tool should be used on an annualised basis.

- The findings of this work should be published and disseminated in an agreed manner via the LDC/LHO and Trusts/SHAs to help local commissioners and providers to investigate variations in service use across London.

- Consideration could be given to initiating discussions with CHI/CHAI on the possibility of using such a means of needs adjustment in future performance ratings in order to give a more realistic picture of performance differences that can be changed at the local level.

- The CEs' dataset should be reviewed in light of what is already collected for the Mental Health Minimum Dataset and other routine sources such as HES (Hospital Episode Statistics). Future effort might usefully be focussed on ensuring similar data submitted nationally is as complete and accurate as possible. The CE dataset could be used to validate the accuracy of other data sources.

- Further work on the CE data set could usefully focus on the following:

  - Improving the data quality so that more data items can be used in future.
  - Adding new data items not collected elsewhere but considered to be important. The area of supported housing identified as key in the King's Fund report would be an early area to explore further as there is no satisfactory routine data.
  - Wider sharing of the data. The LHO would be pleased to help facilitate this as part of its R&D programme of access to non-routine data.

- The new Joint Senior Mental Health Analyst Post planned by the London Development Centre and LHO should be involved in helping develop this as part of an Annual Needs - Adjusted London mental Indicator Set.

- A small pan-London resource to help enhance the completeness, consistency and quality with which data are collected/reported in London in future could make a significant difference to regular reporting of routine information about mental health services. This should be seen as an integral part of the implementation of London's ICT strategy in the Mental Health field.

References

Aziz F, McCrone P, Boyle S, Knapp M (2003) *Financing Mental Health Services in London: Central Funding and Local Expenditure*. King's Fund, London.

Cronin E, Salimee S, Wallace M (2001) *Adult Mental Health Needs in Lambeth, Southwark and Lewisham. A Rapid Review.*

Department of Health (2003) *Resource Allocation: Weighted Capitation Formula*. http://www.doh.gov.uk/allocations/review/pdf/weightedcapitationformula.pdf

Elpers JR, Crowell A (1982) How many beds? An overview of resource planning. *Hospital and Community Psychiatry*, 33, 755-761.

Freeman H (1994) Schizophrenia and city residence. *British Journal of Psychiatry*, 164 (suppl. 23), 39-50.

Freeman H, Alpert M (1986) Prevalence of schizophrenia in an urban population. *British Journal of Psychiatry*, 149, 603-611.

Glover GR, Robin E, Emami J, Arabscheibani GR (1998) A needs index for mental health care. *Social Psychiatry and Psychiatric Epidemiology*, 33, 89-96.

Hirsch SR (1988) *Psychiatric Beds and Resources: Factors Influencing Bed Use and Service Planning.* Gaskell, London.

Jarman B (1983) Identification of underprivileged areas. *British Medical Journal*, 286, 1705-1709.

Jarman B (1984) Underprivileged areas: validation and distribution of scores. *British Medical Journal*, 289, 1587-1592.

Smith P, Sheldon TA, Martin S (1996) An index of need for psychiatric services based on in-patients utilisation. *British Journal of Psychiatry*, 169, 308-316.

Warner R, de Girolamo G (1995) *Schizophrenia*. World Health Organization: Geneva.

Appendix 1. Details of Round 1 data

Trust	Borough	Average length of stay	Av length of stay trimmed	Occ rate (inc leave beds)	Occ rate (ex leave beds)	Admissions	Number of PICU beds	Number of NHS rehab beds	Number of 24-hr hostel places	Number of adms from A&E
BEH	Barnet	40	28	100	91	282	12	20	9	34
BEH	Enfield	41	27	120	107	664	5	25	6	104
BEH	Haringey	29	29	121	108	676	12	24	34	660
C&I	Camden	41	26	110	94	620	13	26		392
C&I	Islington	70	30	97	94	257	13	26		108
CNWL	Brent	42	27	123	97	338	13	48	27	102
CNWL	Harrow									
CNWL	Kensington and Chelsea	44	29	113	100	207	12	7	0	43
CNWL	Westminster	46	26	116	89	375	24	6	13	92
EL&C	Hackney and City	73		107	84	338	15	35		
EL&C	Newham	34		126	108	323	8	15	12	
EL&C	Tower Hamlets	51		108	108	321	9	10		
HILL	Hillingdon	64	26	123	103	275	0	16	0	
NEL	Barking and Dagenham	38	29	102	80	158	0	13	0	10
NEL	Havering	68	32	103	77	149	0	13	0	4
NEL	Redbridge	61	40	89	70	231	15	40	0	116
NEL	Waltham Forest	30	26	91	74	372	0	18	42	
OXLEAS	Bexley	70	31	108	90	140	1	34		22
OXLEAS	Bromley	46	25	143	114	306	3	12		56
OXLEAS	Greenwich	61	29	106	89	204	6	31		69
SLAM	Croydon	34	23	105	100	324	11	8		
SLAM	Lambeth	40	24	145	100	385	12	27		
SLAM	Lewisham	42	26	148	100	615	8	24		
SLAM	Southwark	37	24	135	100	375	17	43		
SWLStG	Kingston	34	24	116		208	8	28	20	35
SWLStG	Merton	35	27	111	91	271	6	34	11	52
SWLStG	Richmond	41	30	93		122		28	0	28
SWLStG	Sutton	41	29	86	71	217	10	3	0	45
SWLStG	Wandsworth	44	28	108	81	511	6	34	35	95
WL	Ealing	38	29	130	99	432	8	19	17	140
WL	Hammersmith and Fulham	42	31	137	100	305	8	15	13	206
WL	Hounslow									

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item

Appendix 1 (continued)

Trust	Borough	Enhanced CPA	Standard CPA	CPA total	No. wte NHS CMHT & AO wkrs	No. wte con psychs	No. wte ment health soc wkrs	No. wte NHS HTT & CI wkrs	No. HTT & CI patients	Delayed discharge
BEH	Barnet	792	2012	2804	100.0	10.5	28.0	0.0	0	19
BEH	Enfield	388	1820	2208	65.0	17.0	24.0	0.0	0	12
BEH	Haringey	1800	1407	3207	95.0	17.0	25.0	0.0	0	35
C&I	Camden	1182	212	1394		11.7		24.0		
C&I	Islington	911	397	1308		5.0		31.0		
CNWL	Brent	1172	4410	5582	28.0	10.6	0.0	0.0	3	5
CNWL	Harrow									
CNWL	Kensington and Chelsea	713	2526	3239	33.0	10.0	0.0	0.0	231	13
CNWL	Westminster	828	3771	4599	48.6	13.5	0.0	0.0	142	31
EL&C	Hackney and City	558	181	853	90.6	12.6				57
EL&C	Newham	491	342	833	44.8	11.9				26
EL&C	Tower Hamlets	1124	282	1414	38.6	10.1		11.1		12
HILL	Hillingdon	535	1365	1900	42.1	7.0	16.5			10
NEL	Barking and Dagenham	266	838	1104	26.7	3.5	10.9	0.0	0	27
NEL	Havering	328	1075	1403	26.4	3.5	10.9	0.0	0	15
NEL	Redbridge	941	713	1654	34.5	9.0	17.0	0.0	0	0
NEL	Waltham Forest	219	848	1067	41.0	16.0	16.0	8.0	152	0
OXLEAS	Bexley	296	1006	2741	21.0	6.0	22.8			12
OXLEAS	Bromley	607	1044	3975	52.8	9.0	29.5			11
OXLEAS	Greenwich	494	262	4854	37.2	14.0	18.5		527	18
SLAM	Croydon	910	626	1536	105.7	8.5	0.0	12.2		19
SLAM	Lambeth	1724	1734	3458	116.8	9.9		25.2		60
SLAM	Lewisham	1165	1816	2981	114.1	5.0		22.5		11
SLAM	Southwark	1354	505	1859	42.7	11.9		19.2		58
SWLStG	Kingston	685	516	1201	43.6	5.1	20.0	0.0	0	11
SWLStG	Merton	441	785	1226	53.1	4.2	12.0		107	8
SWLStG	Richmond	689	689	1378	65.5	4.0	23.1	0.0	0	8
SWLStG	Sutton	523	930	1453	41.7	4.7	9.0		213	8
SWLStG	Wandsworth	1070	1160	2230	82.6	9.1	45.0		213	9
WL	Ealing	1168	2448	3616	48.8	7.0	38.0	3.0	454	13
WL	Hammersmith and Fulham	675	1420	2095	40.0	4.9	20.0	3.0	514	39
WL	Hounslow									

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item

Appendix 1 (continued)

Trust	Borough	Number of acute beds
BEH	Barnet	90
BEH	Enfield	63
BEH	Haringey	116
C&I	Camden	130
C&I	Islington	94
CNWL	Brent	85
CNWL	Harrow	
CNWL	Kensington and Chelsea	65
CNWL	Westminster	80
EL&C	Hackney and City	85
EL&C	Newham	78
EL&C	Tower Hamlets	90
HILL	Hillingdon	51
NEL	Barking and Dagenham	46
NEL	Havering	41
NEL	Redbridge	51
NEL	Waltham Forest	87
OXLEAS	Bexley	39
OXLEAS	Bromley	46
OXLEAS	Greenwich	64
SLAM	Croydon	73
SLAM	Lambeth	135
SLAM	Lewisham	74
SLAM	Southwark	106
SWLStG	Kingston	
SWLStG	Merton	45
SWLStG	Richmond	
SWLStG	Sutton	34
SWLStG	Wandsworth	93
WL	Ealing	81
WL	Hammersmith and Fulham	90
WL	Hounslow	

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item

Appendix 2. Summary of Round 1 data

The data are relatively complete. However, all information was missing for the boroughs of Harrow and Hounslow. (Only admissions data are currently available for Camden because other data are reported for North and South Camden separately. Full details are provided in Appendix 1. Here description of some key measures will be provided that will also be used in the analyses described in Appendix 3.

The number of acute admissions per 100,000 people in the six-month reporting period varied substantially, ranging from 465 in Haringey to 106 in Bexley (Figure A2.1). Those with higher admission rates tended to be in inner-London (although Enfield was an exception). Figure A2.2 shows the distribution of admissions across London. There does appear to be a relationship between location and admission rates, with higher rates *tending* to be in inner-London, although there are notable exceptions.

Figure A2.1. Unadjusted acute admissions per 100K people (Round 1 data)

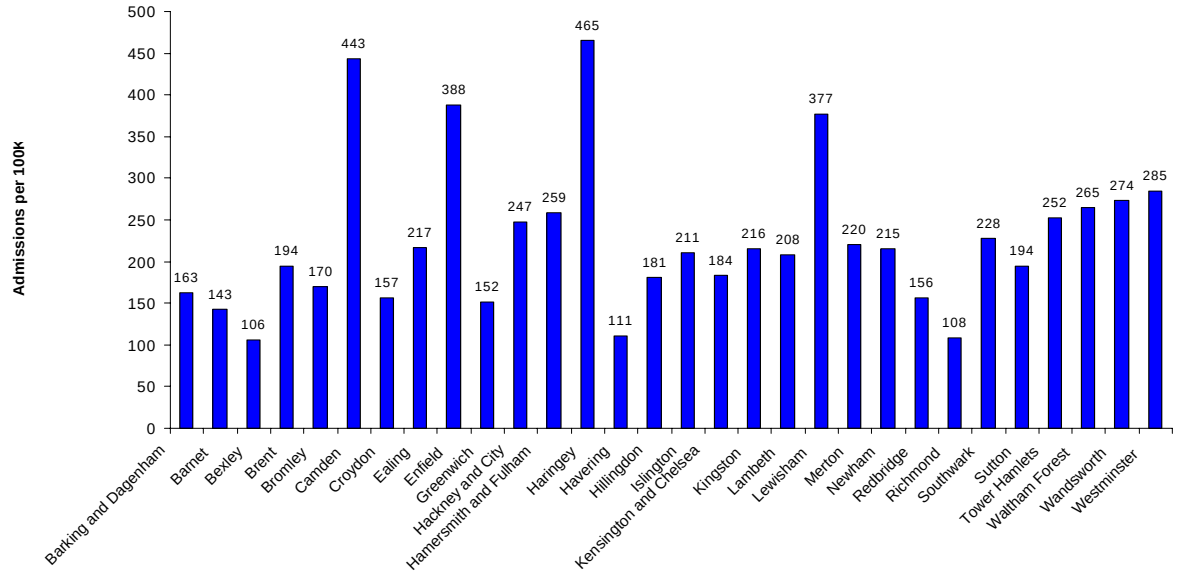
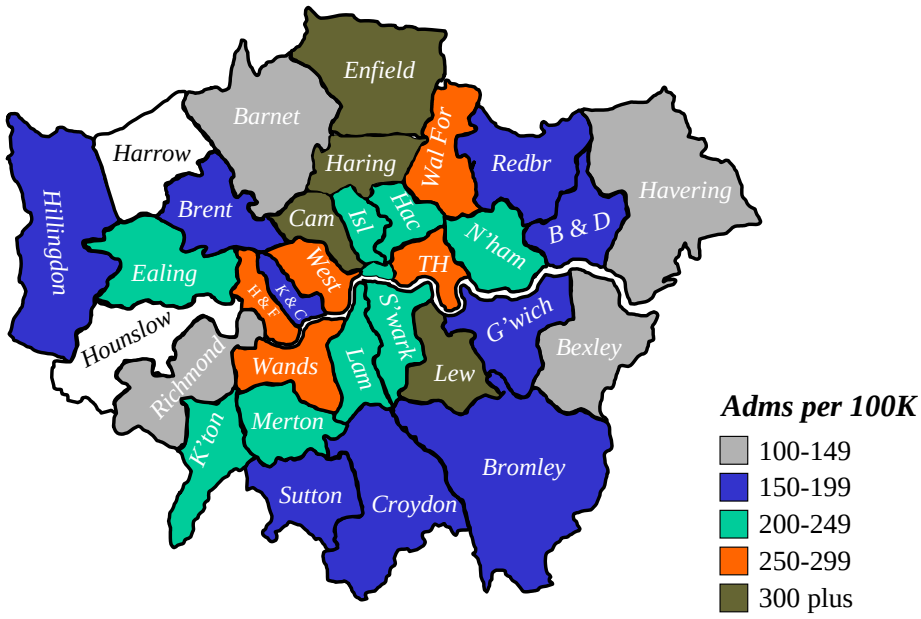
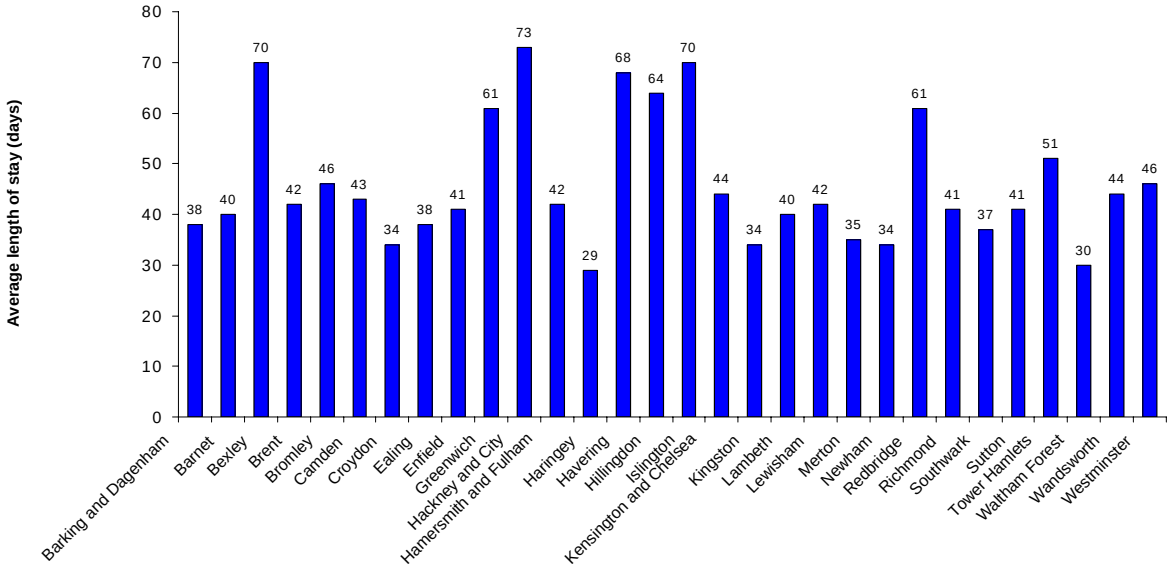


Figure A2.2. Distribution of unadjusted acute admissions across London (Round 1 data)



Admission rates do not themselves indicate pressure on beds as a particular area may have a high rate of admissions with a relatively low length of stay. Average length of stay was highest in Hackney & City, Bexley and Islington (Figure A2.3). Haringey had the shortest length of stay, which is particularly interesting given its high admission rate.

Figure A2.3. Average length of acute stay (Round 1 data)



The product of admission rates and average lengths of stay reveals the number of acute bed days used in each borough (Figure A2.4). Camden had the highest number of bed days per 100,000 people (19,100) followed by Hackney & City (18,100). The lowest use of acute bed days was in Richmond (4400) followed by Croydon (5400).

Figure A2.4. Number of unadjusted acute bed days per 100K people (Round 1 data)

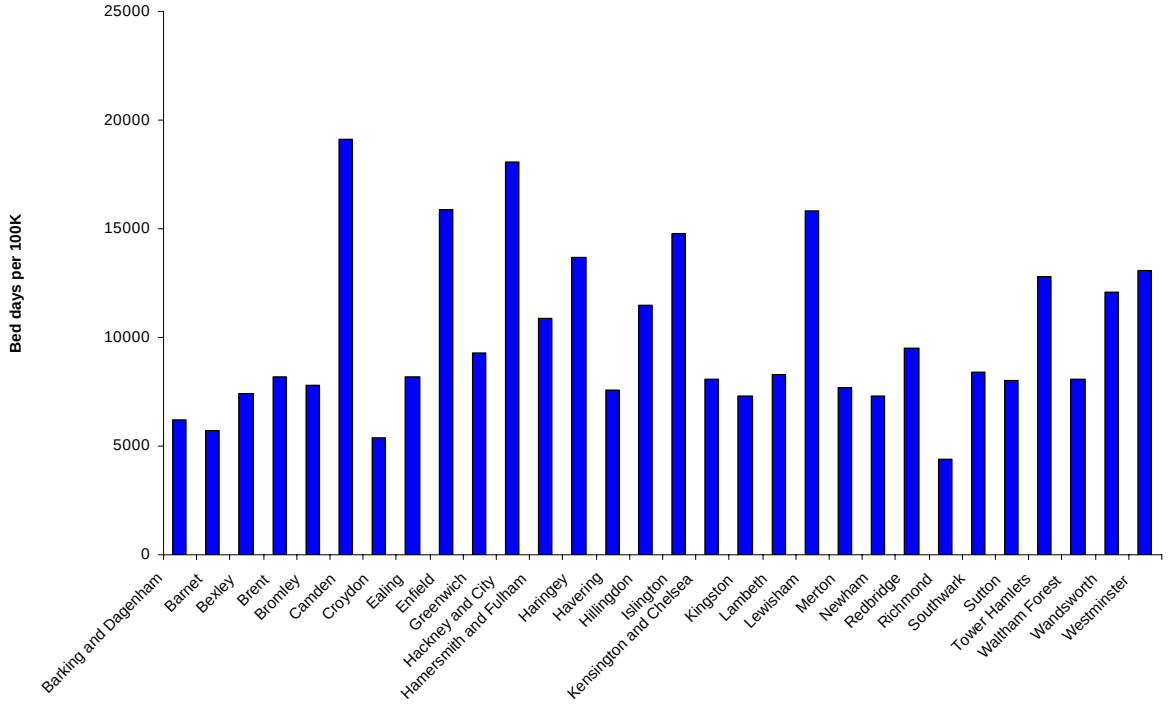
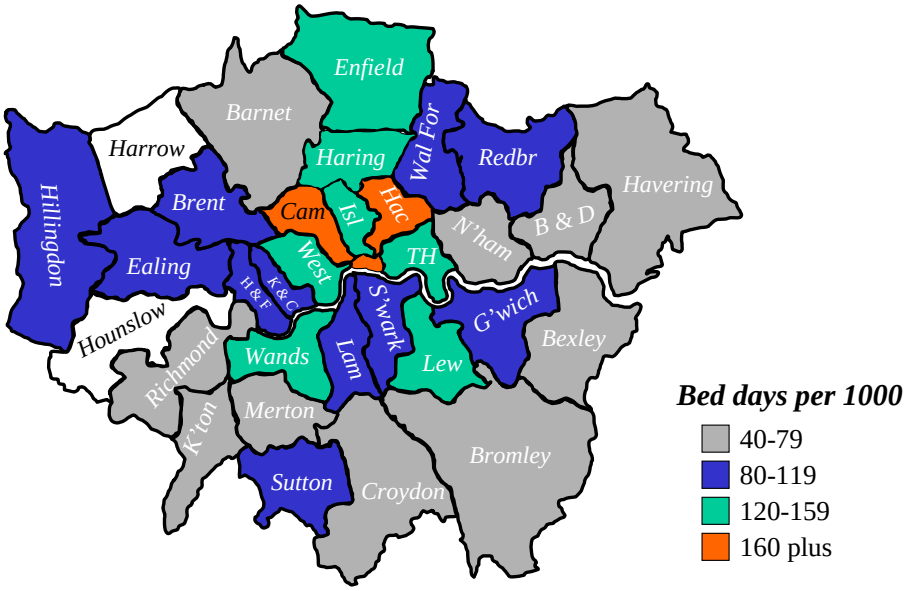


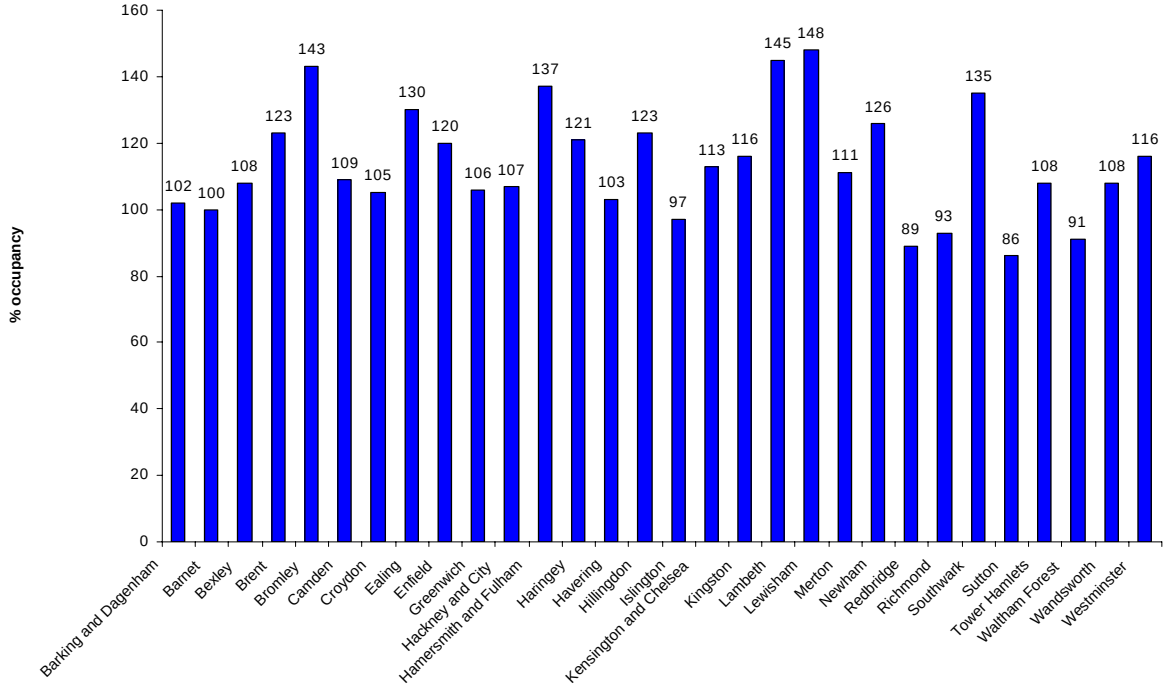
Figure A2.5 shows how use of acute bed days was distributed across London. Again, this shows that whilst there is some weak relationship between bed use and whether the boroughs in inner- or outer-London, there are some areas that have higher or lower rates of bed use than we might expect.

Figure A2.5. Distribution of unadjusted acute bed days across London (Round 1 data)



Bed occupancy is a further important measure of mental heath service activity. Lewisham, Lambeth and Bromley had the greatest bed occupancy rates (Figure A2.6). Only five areas had occupancy rates below 100%, with the lowest figure being in Sutton.

Figure A2.6. Unadjusted acute bed occupancy rate (%) (Round 1 data)



The number of whole-time-equivalent staff in CMHTs and assertive outreach teams per 100,000 people, and the number of whole-team-equivalent consultant psychiatrists both vary substantially across the capital (Figures A2.7 and A2.8).

Figure A2. 7. Unadjusted WTE staff in CMHTs and AOTs per 100K people (Round 1 data)

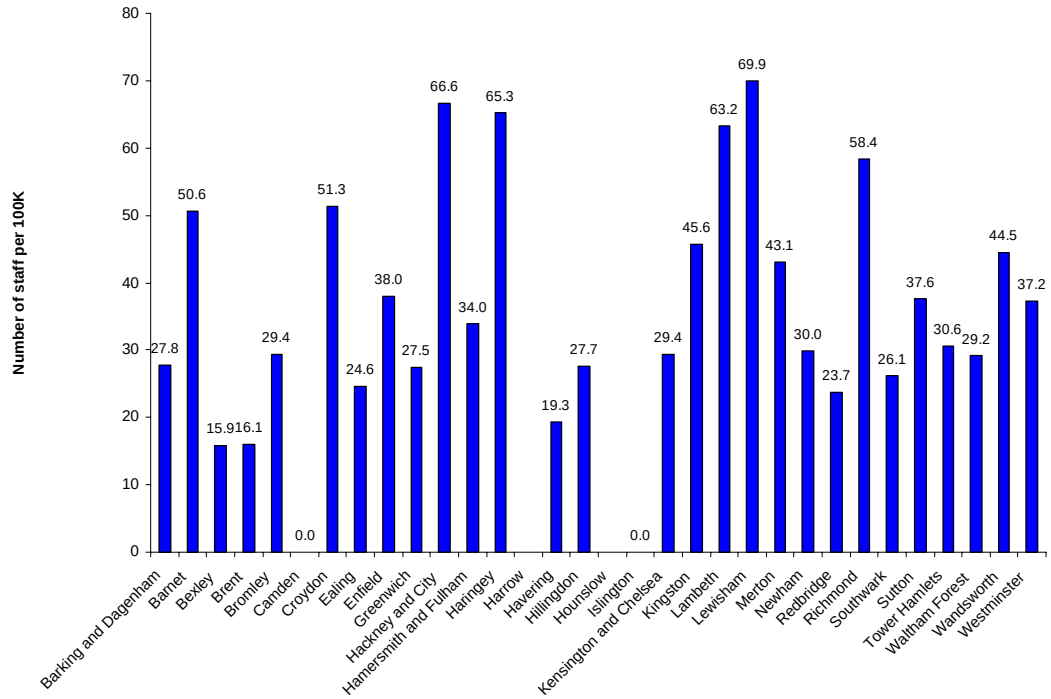
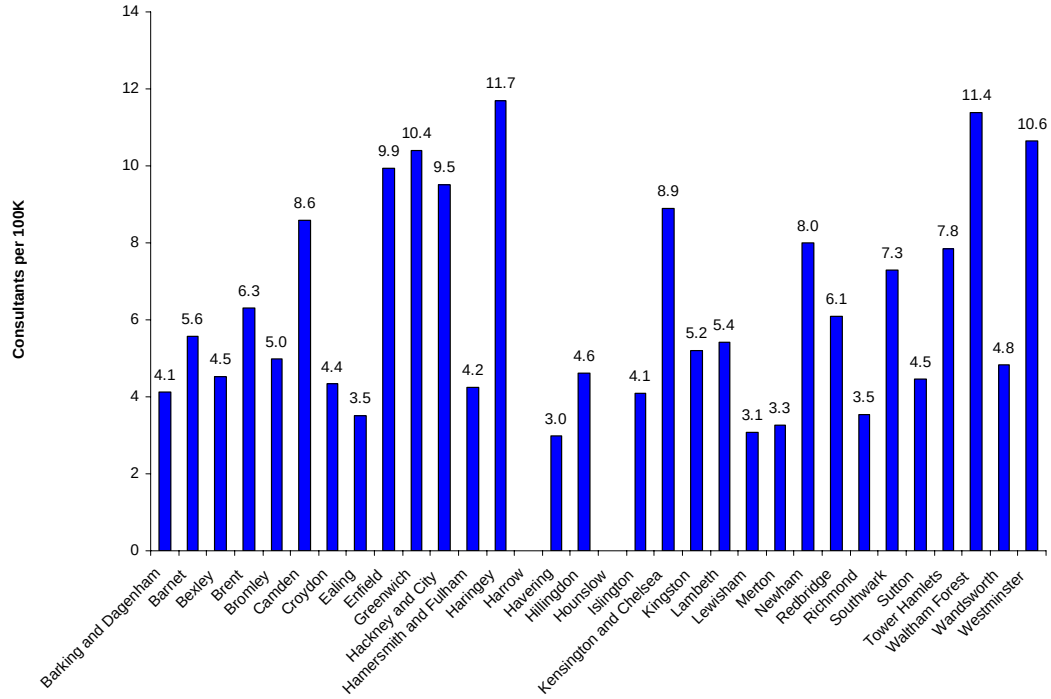


Figure A2.8. Unadjusted WTE consultant psychiatrists per 100K people (Round 1 data)



The highest numbers of staff in CMHTs and assertive outreach teams was in Lewisham, with the lowest number in Brent. Haringey had the highest provision of consultant psychiatrists, whilst the lowest level was in Havering.

The number of people on the CPA (Figure A2.9) was highest in Greenwich (3609 per 100,000 people), followed by Westminster (3495). The lowest numbers were in the

neighbouring areas of Newham (555) and Hackney & City (624). Haringey had the highest rate of enhanced CPA patients and Waltham Forest the lowest (Figure A2.10).

Figure A2.9. Unadjusted CPA number per 100K people (Round 1 data)

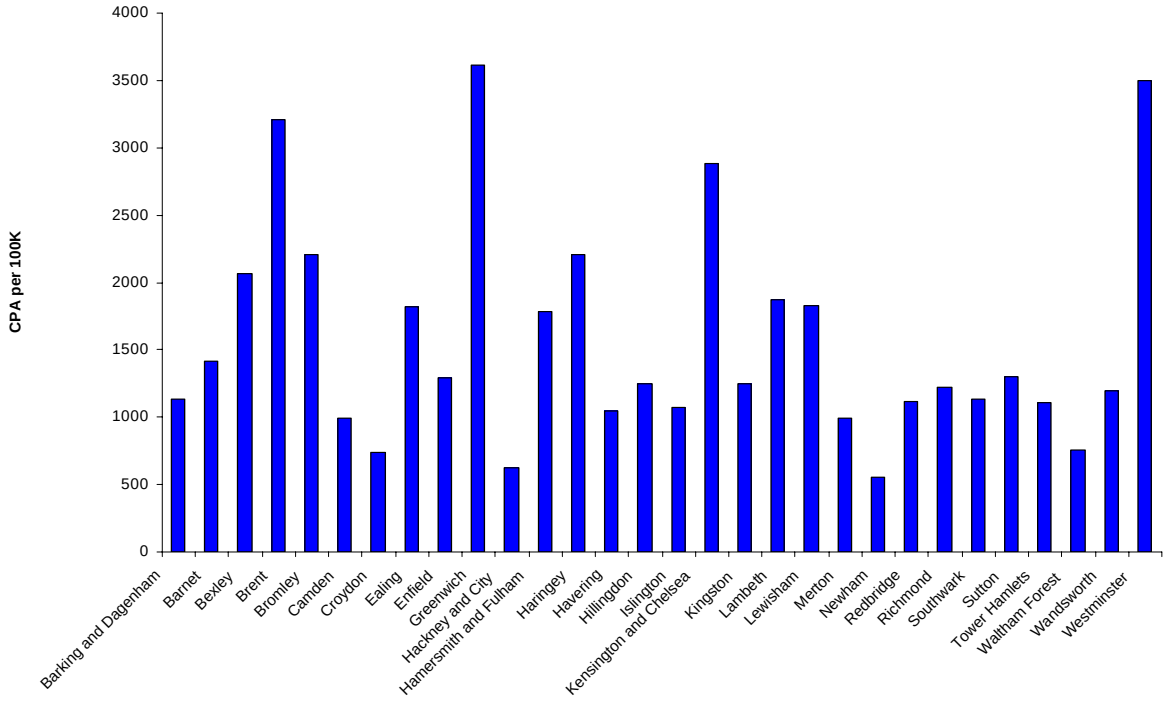
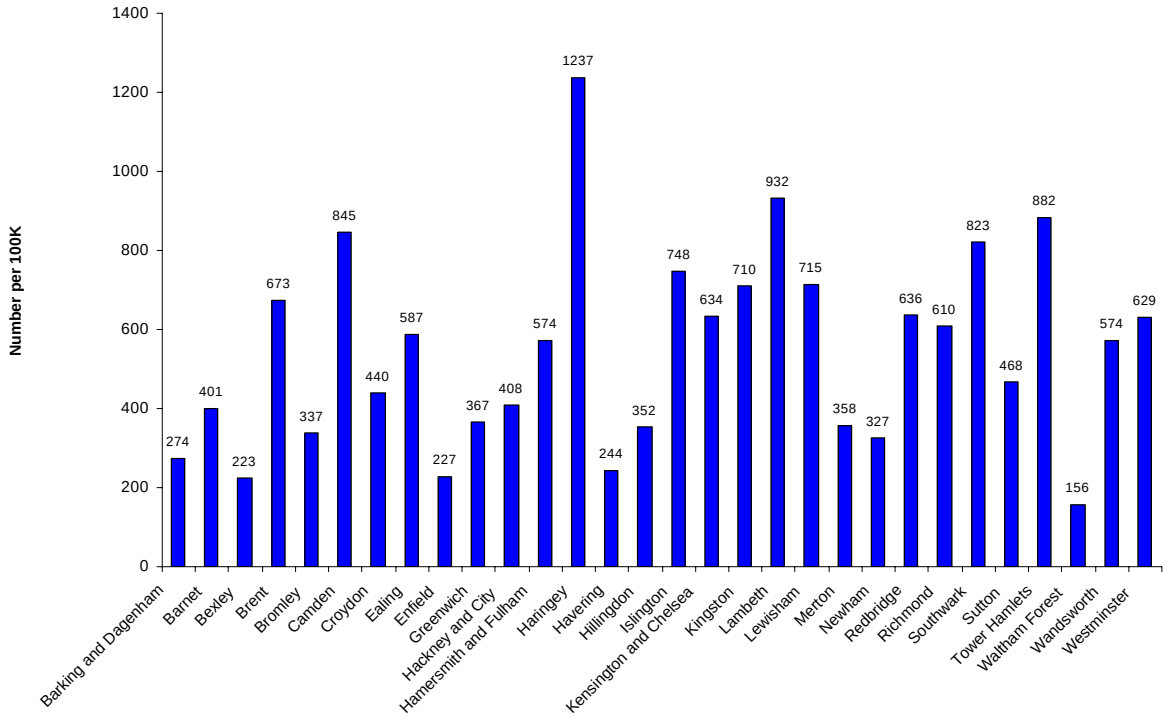


Figure A2.10. Unadjusted enhanced CPA number per 100K people (Round 1 data)



Appendix 3. Analysis of variations in Round 1 activity data

The relationship between the MINI and admission data collected during Round 1 is shown in Figure A3.1. Each point on the figure represents an individual borough. It can be seen that there is a positive relationship between the MINI score and admissions, meaning that areas with higher needs, not surprisingly, have a higher admission rate. The 'Rsq' indicates that 20% of variation can be explained by the MINI. It be seen from Figure A3.2 that the factor analysis model is able to explain more variation in admission rates (32%).

Figure A3.1. Relationship between actual and predicted admissions (MINI model, Round 1 data)

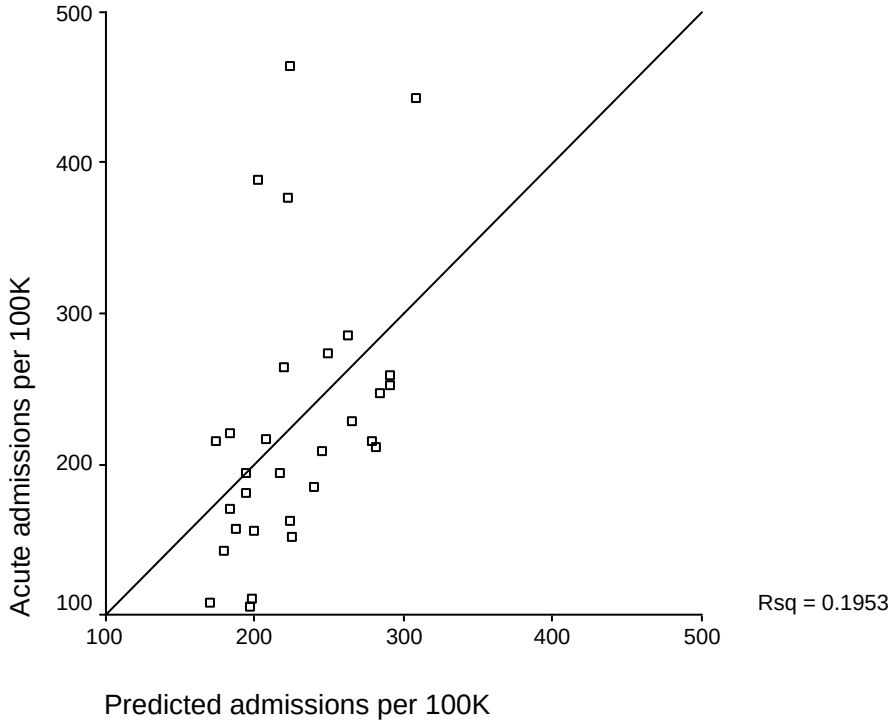


Figure A3.2. Relationship between actual and predicted admissions (factor analysis model, Round 1 data)

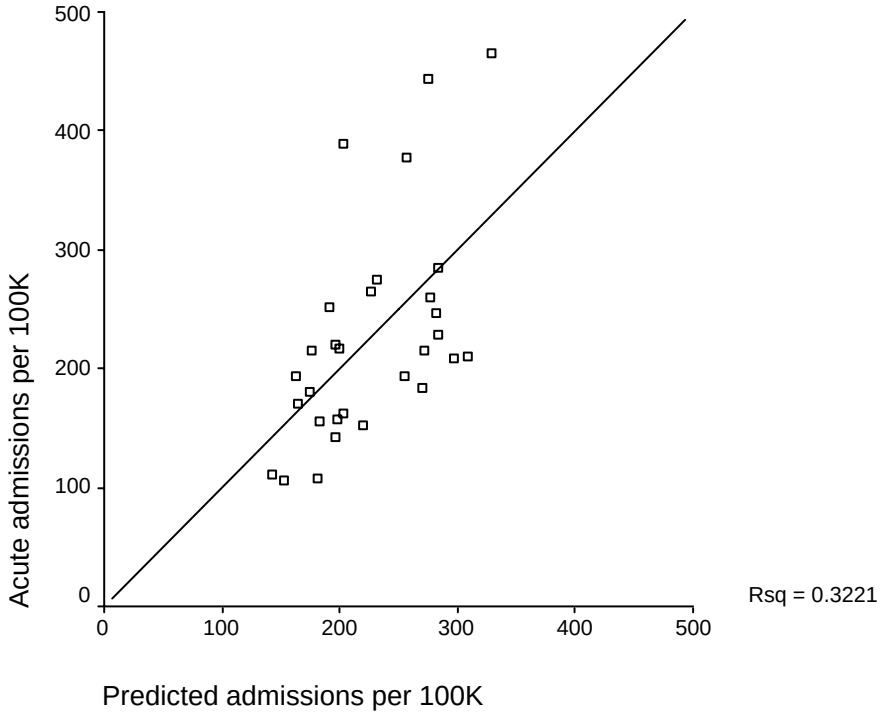
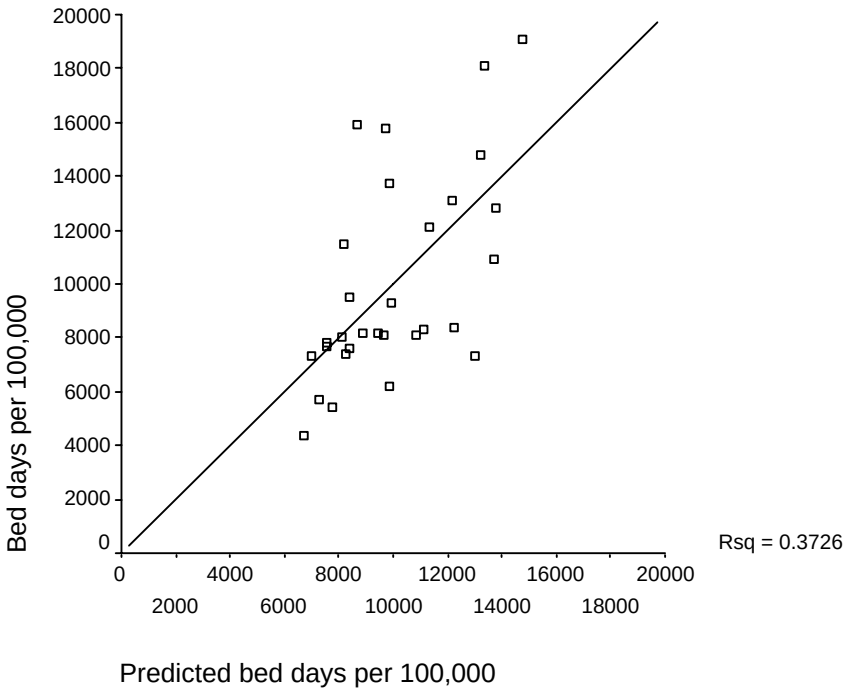


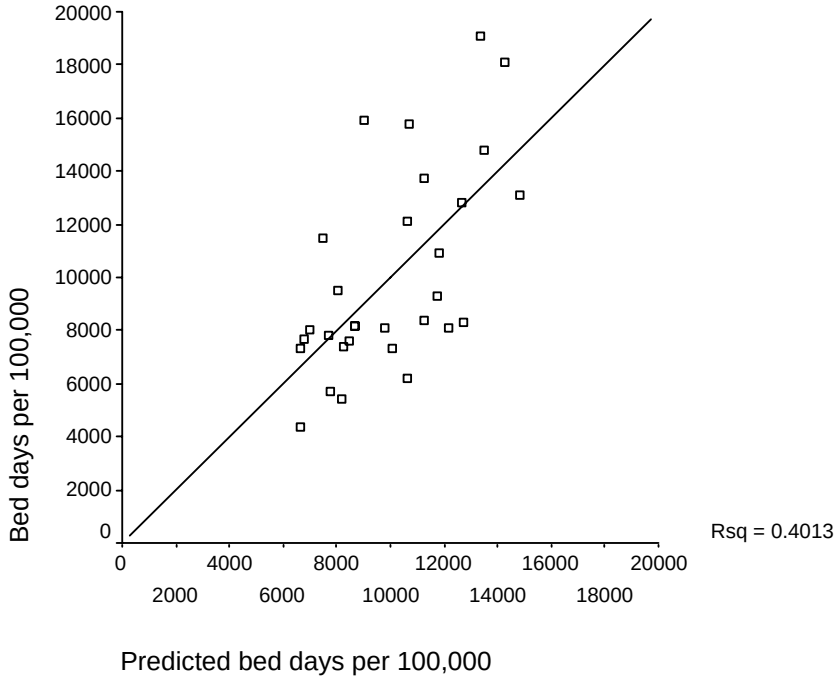
Figure A3.3 shows the relationship between actual bed days per 100,000 people and bed days predicted from a regression model containing the MINI measure of mental health need using data collected in the first round. The 'Rsq' figure reveals that 37% of variation in bed days can be explained by the MINI.

Figure A3.3. Relationship between actual and predicted bed use (MINI model, Round 1 data)



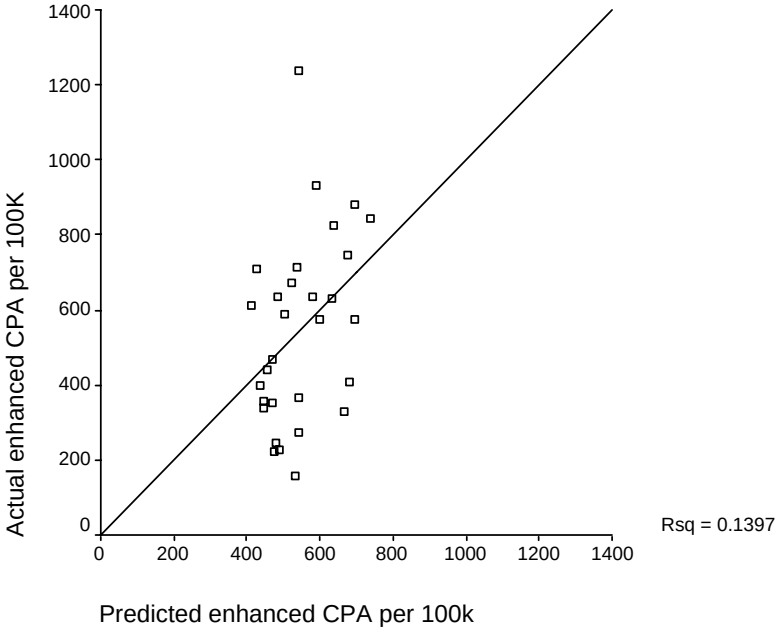
When socio-demographic variables were combined using the factor analysis, and with the inclusion of the asylum seeker variable, 40% of variation in Round 1 bed use could be explained (Figure A3.4), which is only marginally better than the MINI model.

Figure A3.4. Relationship between actual and predicted bed use (factor analysis model, Round 1 data)



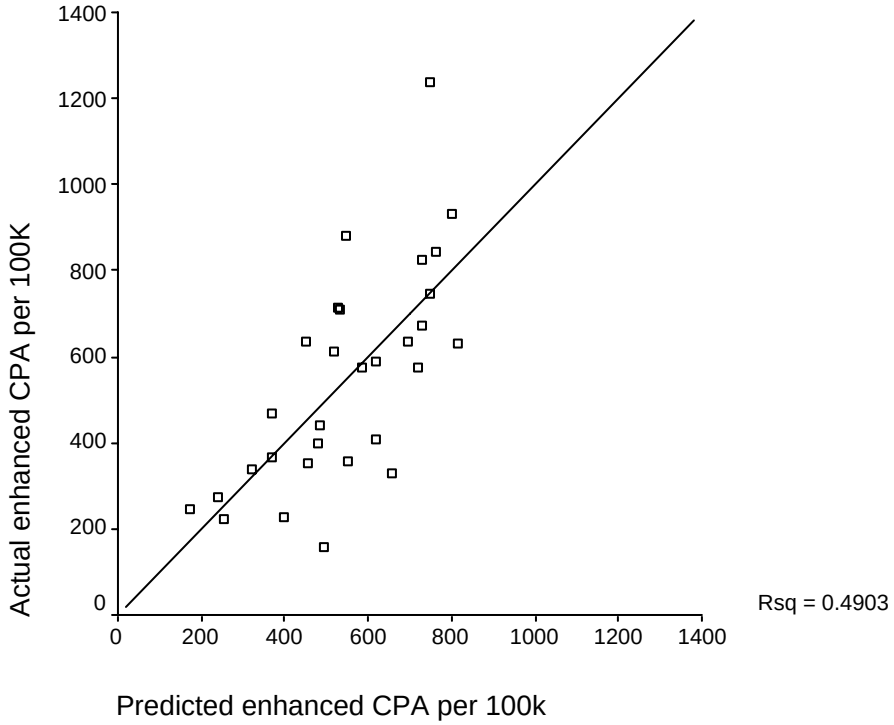
The MINI score is able to explain only 14% of variation in enhanced CPA numbers reported at Round 1 (Figure A3.5).

Figure A3.5. Relationship between actual and predicted enhanced CPA numbers (MINI model, Round 1 data)



By contrast, the factor analysis model can explain 49% of variation in Round 1 enhanced CPA numbers (Figure A3.6)

Figure A3.6. Relationship between actual and predicted enhanced CPA numbers (factor analysis model, Round 1 data)



Appendix 4. Details of Round 2 data

Trust	Borough	Average length of stay	Av length of stay trimmed	Median length of stay	Occ rate (inc leave beds)	Occ rate (ex leave beds)	Total no. adult acute adms	No. adms for psychotic dis	No. adms that are formal	No. readmissions within 28 days
BEH	Barnet	51	37	45	105	98	872		169	***
BEH	Enfield	53	28	23	141	110	1012		233	***
BEH	Haringey	40	31	26	116	94	1289		385	***
C&I	Camden	59	40	32	102	98	801	138	366	***
C&I	Islington	65	42	38	97	85	528	148	486	***
CNWL	Brent	39	29	22	116	92	775	157	227	32
CNWL	Harrow	66	66	51	100	86	541	81	120	45
CNWL	Kensington and Chelsea	54	32	32	95	78	639	105	153	18
CNWL	Westminster	67	29	25	112	91	958	152	267	46
EL&C	Hackney and City	86	35	39	127	97	671		592	***
EL&C	Newham	32	28	20	124	106	810	121	348	***
EL&C	Tower Hamlets	55	30	26	115	115	717	537	428	***
HILL	Hillingdon	36	24	13	109	100	580	29	259	47
NEL	Barking and Dagenham	26	38	14	95	74	344		69	19
NEL	Havering	46	31	25	108	78	338		114	20
NEL	Redbridge	44	32	27	101	76	464		184	30
NEL	Waltham Forest	40	27	19	93	75	488		214	43
OXLEAS	Bexley	54	27	24	117	99	402		139	44
OXLEAS	Bromley	43	25	17	128	106	632	379	171	67
OXLEAS	Greenwich	62	23	17	111	99	580		139	79
SLAM	Croydon	47	27	28	100		559	115	50	36
SLAM	Lambeth	45	26	20	132		1280	679	336	64
SLAM	Lewisham	40	28	22	127		714	269	176	34
SLAM	Southwark	44	26	20	135		950	337	171	22
SWLStG	Kingston	33	21	63	115		520		172	96
SWLStG	Merton	45	23	73	113	97	544		177	49
SWLStG	Richmond	36	23	54	87		460		92	75
SWLStG	Sutton	30	23	58	109	90	455		131	55
SWLStG	Wandsworth	41	25	89	107	96	1065		336	126
WL	Ealing	55	31	27	37	52	797	215	284	***
WL	Hammersmith and Fulham	62	32	27	31	41	550	145	180	***
WL	Hounslow	47	34	29	23	27	401	66	100	***

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item, *** indicates that the item is not available due to the incorrect form being used

Appendix 4. (Continued)

Trust	Borough	No. readmissions within 90 days	Number of PICU beds	No. NHS reh beds & 24hr hostel places	No. of adms from A&E	No. of enhanced CPAs	No. std CPAs	Total CPA numbers	No. wte NHS CMHT & AO wkrs	No. wte adult cons psychs
BEH	Barnet	44	16	29	150	412	1455	1867	87	13
BEH	Enfield	167	5	31	759	425	1837	2262	73	11
BEH	Haringey	99	12	62	1139	1391	1079	2470	114	11
C&I	Camden	83	14	26	520	458	4609	5067	35	18
C&I	Islington	53	12	130	199	511	4112	4623	48	8
CNWL	Brent	66	13	38	195	1787	2379	4166		15
CNWL	Harrow	84	0	0	343	724	709	1433		8
CNWL	Kensington and Chelsea	41	12	7	134	1924	1131	3055		11
CNWL	Westminster	98	12	6	91	1598	2903	4501		15
EL&C	Hackney and City	130	15	102	57	625	1648	2273	53	12
EL&C	Newham	137	8	115	169	571	1888	2459	39	12
EL&C	Tower Hamlets	110	9	31	107	1165	1537	2702	40	11
HILL	Hillingdon	86	0	15	188	530	968	1498	46	6
NEL	Barking and Dagenham	36	1	9	21	214	749	963	34	6
NEL	Havering	37	2	13	11	282	754	1036	47	8
NEL	Redbridge	60	6	39	187	818	1009	1827	87	9
NEL	Waltham Forest	78	5	40	54	225	3395	3620	32	11
OXLEAS	Bexley	58	1	49	61	134	1262	1396	37	6
OXLEAS	Bromley	108	3	12	120	69	1919	1988	53	8
OXLEAS	Greenwich	99	6	31	151	67	2738	2805	53	12
SLAM	Croydon	53	11	64	139	1290	2191	3481	27	10
SLAM	Lambeth	106	12	49	303	1614	3241	4855	55	22
SLAM	Lewisham	47	10	70	264	1184	2594	3778	30	15
SLAM	Southwark	38	15	24	84	1472	1823	3295	69	23
SWLStG	Kingston	166	10	33	33	688	563	1251		
SWLStG	Merton	83		8	181	-99				
SWLStG	Richmond	130		26	21	530	353	883		
SWLStG	Sutton	86			49					
SWLStG	Wandsworth	248	12	80	213	876	688	1564		
WL	Ealing	165	6	40	212	776	1838	2614	92	8
WL	Hammersmith and Fulham	98	6	16	313	521	1782	2303	82	6
WL	Hounslow	45	4	14	171	462	400	862	81	8

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item, *** indicates that the item is not available due to the incorrect form being used

Appendix 4 (continued)

Trust	Borough	No. wte mental health social wkrs	No. wte NHS HTT & CR comm wkrs	No. of HTT & CR patients	No. of HTT & CR episodes	No. adms that exceed 33 days	No. of acute beds
BEH	Barnet	26	0	0	0	60	85
BEH	Enfield	27	0	0	0	98	60
BEH	Haringey	22	0	0	0	60	121
C&I	Camden	36	20	1626		125	129
C&I	Islington	43	28	1323		87	87
CNWL	Brent	25		0	0	304	82
CNWL	Harrow	0		0	0	226	70
CNWL	Kensington and Chelsea	3		298	347	194	62
CNWL	Westminster	48		194	229	332	111
EL&C	Hackney and City			429			93
EL&C	Newham	30	0	0	0	12	68
EL&C	Tower Hamlets	29	0	0	0	19	87
HILL	Hillingdon	16	3	0	0	152	56
NEL	Barking and Dagenham	10	0	0	0	103	31
NEL	Havering	10	5	0	0	136	64
NEL	Redbridge	19	0	0	0	286	62
NEL	Waltham Forest	30	11	284	51	208	97
OXLEAS	Bexley	22	0	0	0	149	35
OXLEAS	Bromley	15	0	0	0	191	44
OXLEAS	Greenwich	17	26	690	859	178	51
SLAM	Croydon	25	17	125	140	202	67
SLAM	Lambeth	63	14	144	217	464	131
SLAM	Lewisham	30	20	388	432	229	70
SLAM	Southwark	21	25	344	734	295	101
SWLStG	Kingston						39.3
SWLStG	Merton						51.5
SWLStG	Richmond						45.0
SWLStG	Sutton						43.3
SWLStG	Wandsworth						99.9
WL	Ealing	41	0	0	0	0	74
WL	Hammersmith and Fulham	24	0	0	0	10	68
WL	Hounslow	33	0	0	0	0	129

Blanks indicate that the data item was not reported, figures in red indicate that assumptions have been made about the data item, *** indicates that the item is not available due to the incorrect form being used

Appendix 5. Details of factor analysis

This method of analysis allowed us to describe areas by determining how much individual variables account for differences between them and other areas. It was a useful strategy because all the variables with one exception were available for all English local authorities, and therefore the factor analysis could be conducted on a large dataset. The 'factor' scores were then obtained for the 32 London boroughs.

Four factors were generated and these are shown in Table 1. The figures are the factor loadings, which indicate the importance of each particular variable to the factor. For the purposes of clarity, only those factor loadings with an absolute value of 0.4 or above are shown.

Table A5.1. Factors obtained from factor analysis

Variable	Factor 1	Factor 2	Factor 3	Factor 4
Age 0–17			0.406	-0.767
Age 65+		-0.474		0.686
Violent offences	0.744	0.463		
Sexual offences	0.622	0.571		
Robberies	0.583	0.722		
Burglaries	0.721			
Car theft	0.794			
Theft from car	0.857			
No qualifications			0.905	
Irish		0.730		
Black Caribbean		0.891		
Black other		0.900		
Asian		0.609		
Single/widowed/divorced	0.758	0.553		
Unemployment			0.831	
Women			0.440	0.628
Living alone	0.757			0.444
Population density	0.515	0.763		
Long-term illness			0.909	
Students	0.628			
Variation explained	28%	26%	15%	10%

Source: King's Fund (2003)

Table A5.2. Factor scores by LA

Factor 1		Factor 2		Factor 3		Factor 4	
Lewisham	-.95	Havering	.23	Wandsworth	-2.32	Newham	-2.45
Harrow	-.90	Bromley	.71	Merton	-1.89	Tower Hamlets	-1.94
Brent	-.83	Richmond	.73	Hounslow	-1.79	Hounslow	-1.19
Croydon	-.72	Bexley	.75	Ealing	-1.69	Redbridge	-.91
Enfield	-.47	Hillingdon	.86	Barnet	-1.63	Ealing	-.84
Merton	-.39	Kingston	.88	Sutton	-1.24	Hillingdon	-.72
Sutton	-.38	Sutton	1.04	Harrow	-1.22	Harrow	-.61
Barnet	-.31	Hounslow	1.35	Hillingdon	-1.06	Waltham Forest	-.42
Waltham Forest	-.28	Barking and Dagenham	1.74	Bromley	-.78	Brent	-.33
Bexley	-.23	Westminster	1.90	Islington	-.68	Barking and Dagenham	-.29
Havering	-.21	Redbridge	1.99	Southwark	-.65	Croydon	-.19
Bromley	-.18	Barnet	2.09	Brent	-.62	Bexley	-.05
Redbridge	-.15	Camden	2.12	Lambeth	-.62	Hackney and City	-.02
Barking and Dagenham	-.06	Kensington and Chelsea	2.12	Croydon	-.50	Enfield	.14
Newham	.10	Tower Hamlets	2.13	Redbridge	-.47	Sutton	.15
Richmond	.29	Merton	2.14	Bexley	-.46	Merton	.17
Kingston	.32	Greenwich	2.33	Havering	-.13	Greenwich	.23
Southwark	.36	Enfield	2.51	Enfield	-.13	Havering	.24
Haringey	.36	Harrow	2.53	Tower Hamlets	-.07	Kingston	.29
Hillingdon	.39	Wandsworth	2.63	Waltham Forest	-.03	Barnet	.40
Ealing	.48	Ealing	2.65	Haringey	.11	Haringey	.41
Greenwich	.56	Hammersmith and Fulham	2.78	Lewisham	.17	Lewisham	.49
Lambeth	.83	Croydon	3.09	Greenwich	.29	Lambeth	.50
Wandsworth	.86	Islington	3.11	Hackney and City	.41	Bromley	.52
Hounslow	.87	Waltham Forest	3.39	Barking and Dagenham	.48	Southwark	.62
Hackney and City	1.16	Newham	4.30	Newham	.72	Richmond	.76
Hammersmith and Fulham	1.80	Hackney and City	4.73	Wandsworth	.73	Islington	1.28
Tower Hamlets	2.17	Haringey	4.78	Merton	.95	Camden	1.58
Kensington and Chelsea	2.21	Southwark	4.83	Hounslow	1.01	Wandsworth	1.64
Islington	2.39	Lewisham	5.05	Ealing	1.17	Hammersmith and Fulham	1.69
Camden	3.08	Brent	5.21	Barnet	1.73	Westminster	2.43
Westminster	4.00	Lambeth	5.51	Sutton	1.86	Kensington and Chelsea	2.59