



Improving Migration and Population Statistics

**Local Authority Case Study Report
for Hammersmith & Fulham**

June 2007

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Summary

ONS has a continuous programme of research aimed at improving migration and population statistics. Part of this work is the investigation of local and national data sources, working in partnership with local authorities. To identify a small number of partners, all local authorities in England and Wales were grouped into fifteen clusters of areas with similarity across a number of demographic characteristics that were identified as relevant to improving migration and population statistics. This clustering exercise used various indicators, for instance of population sub-groups that are known to make estimating population more complex (mobile population sub-groups such as young adult men, students). Four of the fifteen clusters were chosen to provide a good range of opportunities for investigating, from a local perspective, the complexities that can arise in estimating population. A local authority partner from each cluster was selected using an objective statistical method. ONS has worked collaboratively with these local authorities to investigate the scope for improving data sources and methods used to make population estimates.

Hammersmith & Fulham was selected to represent a cluster of central London Boroughs with a high population density, high rates of migration and a high proportion of young males, and well above the national average proportions of students and population belonging to non-White ethnic groups. The case study aimed to investigate whether there were other data sources or methods that could be used to improve the accuracy of the population estimates in Hammersmith & Fulham and if so, whether these improvements could be applied to the estimates for other areas.

The study identified a number of data sources which may be useful in assessing the plausibility of the population estimates, including the School Census. Further investigation should be made into the potential use of a number of data sources to get a better understanding of their limitations as population counts. The study also concluded that to address the measurement of international migrants, the use of data on the allocation of National Insurance numbers to overseas nationals in conjunction with other sources should be investigated further, endorsing a finding of the recent Inter-departmental Task Force on International Migration Statistics.

The study echoed the findings of a previous Local Authority Case Study in Welwyn Hatfield which identified the importance of data on term-time address of students, soon to be collected by HESA, as a key source to improve the estimation of student migration in the population estimates.

Whether the findings of this study are applicable to other similar London Boroughs will be considered at a local authority workshop at which the findings of the case study will be presented. It is planned that a final report following the workshops for all four case studies will be published by the end of 2007.

ONS is grateful for the contribution of Hammersmith & Fulham Council and Hammersmith & Fulham PCT who provided their time and assistance in this case study.

The research carried out for the Hammersmith & Fulham case study is distinct from the recent improvements made in the estimation of international migration that were made as a result of taking forward the recommendations of previous reviews of the quality of population statistics. The aims of all the Local Authority Case Studies were:

- to get a better understanding of the limitations of population statistics from a local perspective;
- to evaluate local and national data sources that are not currently used in the mid-year estimate process; and
- to assess their potential for use in improvement work.

The findings of all four Local Authority Case Studies will help inform the future work programme.

Chapter 1 Introduction

ONS is responsible for producing estimates of population and migration for local authorities in England and Wales. These are used for a wide range of purposes including the planning and delivery of services by central and local government. Changes in society, particularly increased mobility both within England and Wales and internationally, mean that the population structure can change rapidly in some areas. It is becoming increasingly difficult to make accurate and timely estimates of the population. Coinciding with this, increasingly demanding requests for population estimates for policy purposes necessitate greater precision in the figures, as well as for increasingly localised levels of geography.

For these reasons, ONS is investigating ways of improving the quality of its population estimates. The aim is to find better ways to track population changes, to reduce the gap between future population estimates and the count from the 2011 Census, and to improve our understanding of any discrepancy that does occur. This problem was highlighted by comparisons between population estimates and the 2001 Census. The Improving Migration and Population Statistics (IMPS) project was set up to specifically investigate these issues and to establish where changes to sources and methods could improve the quality of these statistics in the future. Further information can be found on the National Statistics website at:

<http://www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/default.asp>

Local authority case studies form a key component of this project. These involve ONS working in partnership with local authorities to look at national sources used in a local context, and to consider whether there is better local information available, either knowledge about local population or data sources, which might be used in some way to improve population estimates. A further purpose of the case studies work is to gain a better understanding of how local authorities use the population estimates and what particular issues affect these estimates.

Hammersmith & Fulham was selected to represent a cluster of eight central London Boroughs. The main factors affecting estimates in these areas are high levels of migration, and high proportions of young males, students and people who belong to a non-White ethnic group. The term non-White is used for persons describing their ethnicity as something other than White.

This report describes the work carried out for the Hammersmith & Fulham case study, including: the research objectives of the case studies as a whole, and of the Hammersmith & Fulham case study in particular; the research and analysis carried out on a number of different data sources; the findings of this research; further discussion, linking the research back to the original objectives; and a number of recommendations.

Chapter 2 Case Study Aims and Objectives

The overall aim of the local authority case studies is to investigate data sources and methods from a local perspective and to see if any improvements can be made that would impact on either all local authorities, or a group of similar local authorities.

Further to this overall aim, the key topics to address in the Hammersmith & Fulham cluster of central London Boroughs are the impact of high rates of migration, and proportions of young males, students and people from non-White ethnic groups. Therefore, the specific objectives of this case study are:

1. To gain a general understanding of the population estimates in Hammersmith & Fulham, including how Hammersmith & Fulham Council use population estimates and what challenges there are to making an accurate estimate of their population.
2. To investigate whether other local data sources may be available to potentially improve the migration or population estimates, and whether they are available in other local authorities in the same cluster.
3. To identify to what extent the high rates of migration, and high proportions of young males and students may all be inter-related, and to investigate if young males and students are accurately reflected in the population estimates for Hammersmith & Fulham.
4. To understand better the characteristics of people from non-White ethnic groups and to investigate if this population group is accurately reflected in the population estimates for Hammersmith & Fulham.
5. To consider what impact the enlarging of the EU in May 2004 may have had on the borough in terms of 'new' migrants from these accession countries, and to get a better understanding of how many of these migrants are reflected in the population estimates for Hammersmith & Fulham and whether any are likely to be short-term migrants.

Chapter 3 Background

3.1 Selection of Local Authorities for Study

The selection of local authorities for study was carried out using an evidence-based method. The first stage of the selection process involved constructing a framework consisting of the components of population change that have to be estimated and identifying those that present the main challenge in making accurate population estimates. A pictorial representation of this framework can be found in Appendix A.

An initial list of variables was identified to represent the components that are most difficult to estimate. Some of these variables were based on the migration components of population change, which are known to be difficult to measure accurately. Some were proportions of population sub-groups that are known to present challenges in estimating population, such as young adult men who are mobile and often do not register quickly with a new doctor when they change address. Other variables were selected because they are associated with the demographic profile of areas that were identified as being incorrectly estimated when the 2001 Census results were reconciled with the rolled-forward estimates, for example population density and ethnicity. Some factors which met one or other of these criteria were excluded either because the quality of the data was poor, or because the variable was highly correlated with one or more other variables that were retained in the analysis.

As a result, eight variables were identified for use in the next stage, the cluster analysis, where local authorities were grouped into clusters of areas with similarity across a number of demographic characteristics that were identified as relevant to improving migration and population statistics. The eight variables used in the cluster analysis were:

- i) Gross international migration, 2002-03
- ii) Gross internal migration, 2002-03
- iii) Armed forces, 2002-03
- iv) Population from non-White ethnic groups, 2001 Census
- v) Students aged 18-74, 2001 Census
- vi) Population density, Regional Trends
- vii) Prisoners, 2002-03
- viii) Men aged 20-39, 2003 mid-year estimate

In the cluster analysis, all English and Welsh local authorities were grouped into one of 15 clusters using the values for these eight variables. These clusters are listed in Appendix B. Four clusters that had high levels for some of these variables were selected for study, including the cluster which includes Hammersmith & Fulham (cluster 1 in Appendix B). The most prominent factors in this cluster, from the eight variables listed, are high levels of gross international and internal migration, and high proportions of young males, students and people from non-White ethnic groups, together with a high population density.

Given that the case study aimed to see if improvements could be made for a group, or cluster, of similar local authorities, it was important that the case study involved a local authority that could be considered representative of the cluster as a whole. Therefore, it was necessary to use an objective statistical method to select the case study area. The local authority closest to the centroid of each cluster was selected for study. The centroid is the point defined by the average value of each variable across local authorities within the cluster. The extent to which the findings are applicable to other local authorities will be explored at a workshop following publication of this report. Further detail on the methodology that was used is published on the National Statistics website at:

<http://www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/updates/downloads/HowLACaseStudyAreasChosen.pdf>

3.2 Population Characteristics of Hammersmith & Fulham

This section examines the characteristics of the population in Hammersmith & Fulham based on ONS data and research work carried out following the 2001 Census. This has been carried out in the context of assessing whether there are any specific factors in Hammersmith & Fulham that increase the complexity of estimating population. Here, we consider these factors in order to see whether they support the findings of the cluster analysis, that the main challenges to estimating the population accurately in Hammersmith & Fulham are a high population density and high rates of migration and young males and well above the national average proportions of students and people from non-White ethnic groups. In particular, students' mobility might be expected to impact on the data sources used to estimate migration.

3.2.1 2001 Census Base for Hammersmith & Fulham

The first results from the 2001 Census identified a difference of approximately 1.1 million people (2.2 per cent) for England and Wales between the rolled-forward 2001 population estimates and the 2001 Census estimates. ONS undertook an extensive programme of work to identify the reasons for this difference, resulting in a number of adjustments to the population estimates for local authorities in England and Wales. More information about this can be found on the National Statistics website at:

http://www.statistics.gov.uk/about/methodology_by_theme/Revisions_to_Population_Estimates/default.asp

The adjustments consisted of four components. These were:

- i) Adjustments made to the 1991 base of the rolled-forward population estimates between 1992 and 2001.
- ii) Adjustments made to the international migration estimates feeding into the rolled-forward population estimates between 1992 and 2001.
- iii) Adjustments made to the 2001 Census based population estimates following demographic analyses.
- iv) Adjustments made to the 2001 Census based population estimates following the 2004 Local Authority Studies (which included the Manchester and Westminster matching studies).

Table 1 shows the adjustments for Hammersmith & Fulham, rounded to the nearest hundred. Further details on the adjustments can be found in Appendix C.

Table 1: Inter-censal discrepancy for Hammersmith & Fulham

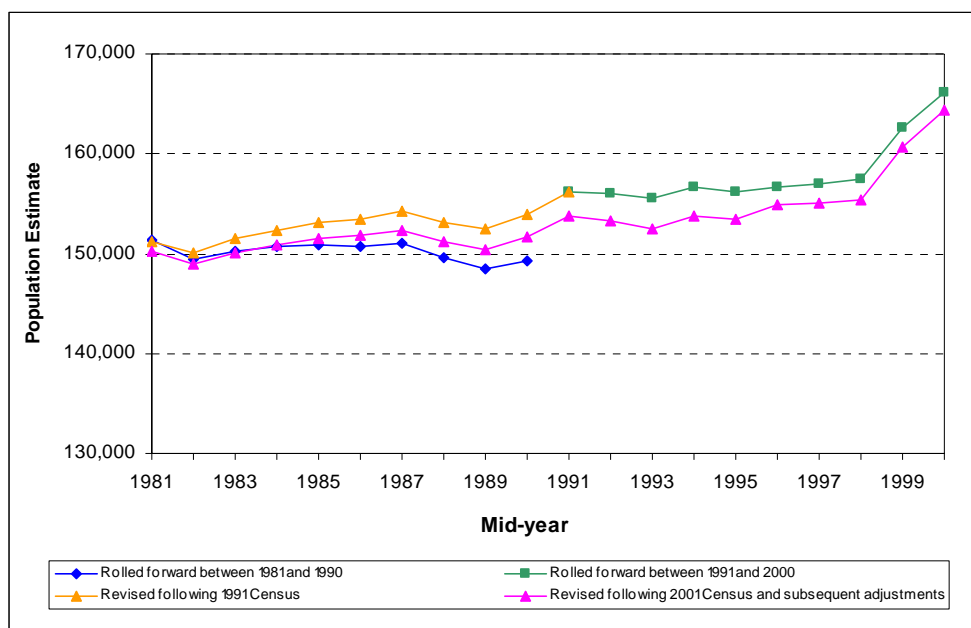
Inter-censal discrepancy	6,300
i) 1991 adjustment	1,300
ii) Migration adjustment	1,600
Difference after adjustments i) and ii)	3,400
iii) Demographic analyses adjustment	3,900
iv) Local Authority studies 2004	n/a
Remaining unexplained difference	-500

The overall effect of these adjustments for England and Wales was to reduce the difference between the rolled-forward 2001 population estimates and the 2001 Census-based mid-year estimates from 1.1 million to 209,000. In Hammersmith & Fulham the original inter-censal discrepancy of 6,300 was reduced to 3,400 as a result of the first two adjustments, which decreased the historic series of population estimates between 1991 and 2000. The remaining two adjustments have been made to the current population estimates for 2001 onwards, and added a further 3,900 to the 2001 Census-based mid-year estimates. The remaining unexplained difference of -500 indicates Hammersmith & Fulham was underestimated by 500 during the inter-censal period.

3.2.2 Size and Extent of Inter-censal Drift for Hammersmith & Fulham

Figure 1 shows four series of population estimates for Hammersmith & Fulham: the originally published rolled-forward estimates for 1981 to 1990 based on the 1981 Census; the revised estimates for 1981 to 1990 published following the 1991 Census; the originally published rolled-forward estimates for 1991 to 2000 based on the 1991 Census; and the final revised estimates for 1981 to 2000 published following the 2001 Census (including adjustments made in 2003 and 2004).

Figure 1: Comparison of rolled-forward population estimates and revised population estimates for Hammersmith & Fulham, 1981-2000



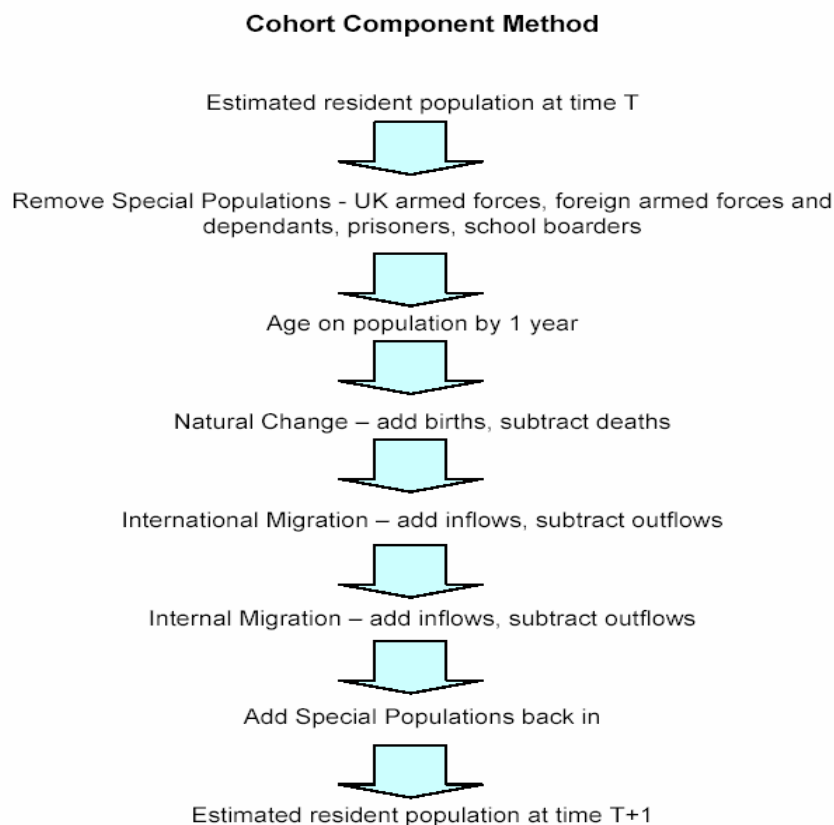
Revisions following the 1991 Census increased Hammersmith & Fulham's population estimates over the preceding decade. The estimate for 1990, for example, was increased by 4,600. Following the 2001 Census, the 1991 Census-based estimate was revised downwards, as were the estimates rolled-forward from this base for 1992 to 2000, and the estimates for 1982 to 1990. The final revised estimates for 1982 to 1990, published in 2002, were lower than the revised estimates following the 1991 Census, but were higher than the originally published estimates for this period.

As noted in 3.2.1, revisions made to the 1991 Census based population estimates following the 2001 Census reduced the base level of population in Hammersmith & Fulham by 1,300. Apart from slight dips during the first half of the 1990s, the population of Hammersmith & Fulham increased steadily over the period to 2000. The original rolled-forward series estimated population growth of 11,000 between 1991 and 2000. The revised series however estimated less growth over this period, approximately 10,600.

3.2.3 Components of Population Change

Estimates of the population during the inter-censal period are made using a cohort component method. This updates the previous year's estimate, allowing for natural change due to births and deaths in the past year and adding on net migration (see Figure 2). This is a standard demographic method and is used by most other national statistics institutions in Census taking countries.

Figure 2: Mid-year population estimates methodology



In England and Wales, population estimates are made for the population resident at the mid-year point, i.e. on 30 June, of the reference year. The starting point for the estimate is the resident population on 30 June in the previous year. This population by single year of age and sex is aged on by one year, before incorporating the individual components of population change.

In addition, adjustments are also made for some special population groups (referred to as 'static populations') that are not captured adequately by data sources currently used to estimate internal and international migration. These are home and foreign armed forces, dependants of foreign armed forces, prisoners and pupils in boarding schools. These populations have age structures which remain fairly constant over time, i.e. the population profile stays static although individuals move on. For this reason, these groups are not aged on with the rest of the population.

Each Individual component of population change must be estimated accurately in order for the population of an area to be reliable, and the extent to which this is readily achievable varies by component and by area. Over the following sections, the level of complexity each component introduces to the population estimates for Hammersmith & Fulham is considered in turn.

Component 1: Births

Births data used in the compilation of mid-year population estimates are obtained from the General Register Office through the compulsory registration of all births that occur in England and Wales. The data have always been of high quality and include the area of usual residence of the mother.

Figure 3 compares the age-specific fertility rates in Hammersmith & Fulham with those of England and Wales. This shows that the fertility rates for mothers aged between 34 and 42 are above the average for England and Wales, whilst the rates for younger mothers aged between 20 and 31 are considerably below the national average. It also shows that, allowing for the variability inherent with using single year of age data, the fertility rates for Hammersmith & Fulham are broadly consistent over time. The total fertility rate for Hammersmith & Fulham in 2004 was 1.46 which is lower than the average for England and Wales of 1.78.

Figure 3: Age specific fertility rates for Hammersmith & Fulham, 2001-2004

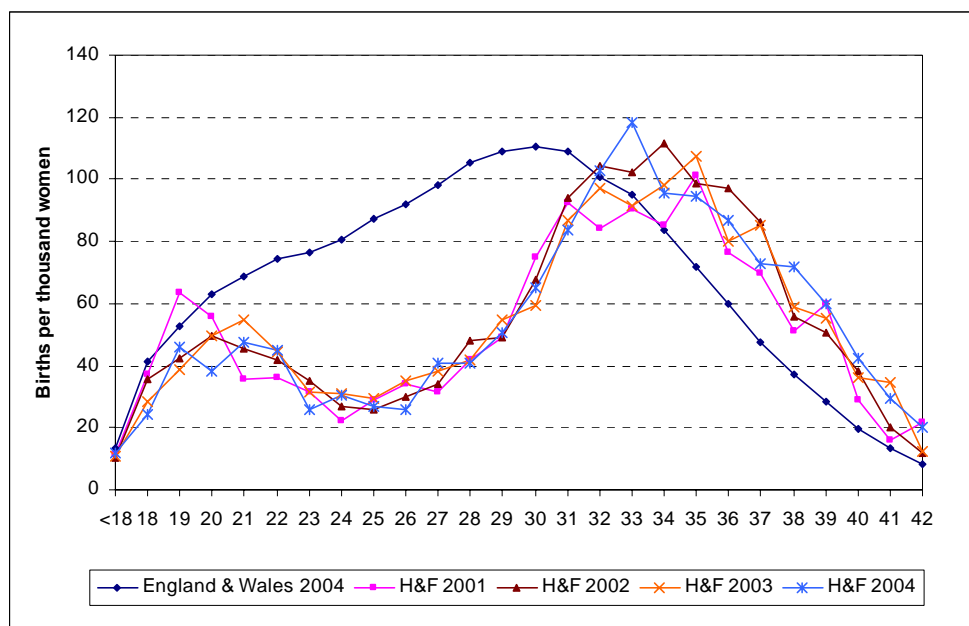


Table 2 shows the number of recorded live births in the twelve months leading up to the 2001 Census and compares this with the estimate of the number of under-1s in the 2001 Census for Hammersmith & Fulham and for England and Wales. The 2001 Census data shown in this table have been adjusted to allow for the 2004 LA Studies adjustment. This affects the number of under-1s for England and Wales but not for Hammersmith & Fulham.

Table 2: Number of under-1s counted in the 2001 Census

	Under 1s in 2001 Census plus 2004 LA studies adjustments				Live births May 2000 to April 2001			
	Number		Percentage of total population		Number		Percentage of total population	
	Hammersmith & Fulham	England & Wales	Hammersmith & Fulham	England & Wales	Hammersmith & Fulham	England & Wales	Hammersmith & Fulham	England & Wales
Males	1,140	299,629	1.44	1.18	1,258	307,310	1.59	1.21
Females	995	286,926	1.15	1.07	1,117	292,760	1.30	1.09
Total	2,135	586,555	1.29	1.12	2,375	600,070	1.44	1.15

According to the 2001 Census, 1.29 per cent of the population in Hammersmith & Fulham were under the age of one, compared with the national figure of 1.12 per cent.

Table 2 also shows that the number of births in the year to April 2001 in England and Wales was 2.3 per cent higher than the 2001 Census estimate of the number of under-1s. These two figures would be expected to differ due to the impact of infant mortality and migration over the course of a year. For Hammersmith & Fulham, the live births figure exceeded the Census estimate by 11.2 per cent, but as this equates to only 240 babies, the impact on total population is small.

A local source of data on maternity services and subsequent GP registration within the borough may yield more information on the migration of under-1s. More information is given in Appendix A and further work is planned in the future improvement work programme to investigate how to improve estimation of the under-1 population in those few areas where it may be problematic due to the mobility of mothers.

Overall, it is concluded that live births data provide a good basis for estimating the under-1 population of Hammersmith & Fulham during the inter-censal period, combined with the current method for estimating their migration. It is concluded that the births component does not represent a significant challenge to the accuracy of population estimates in Hammersmith & Fulham.

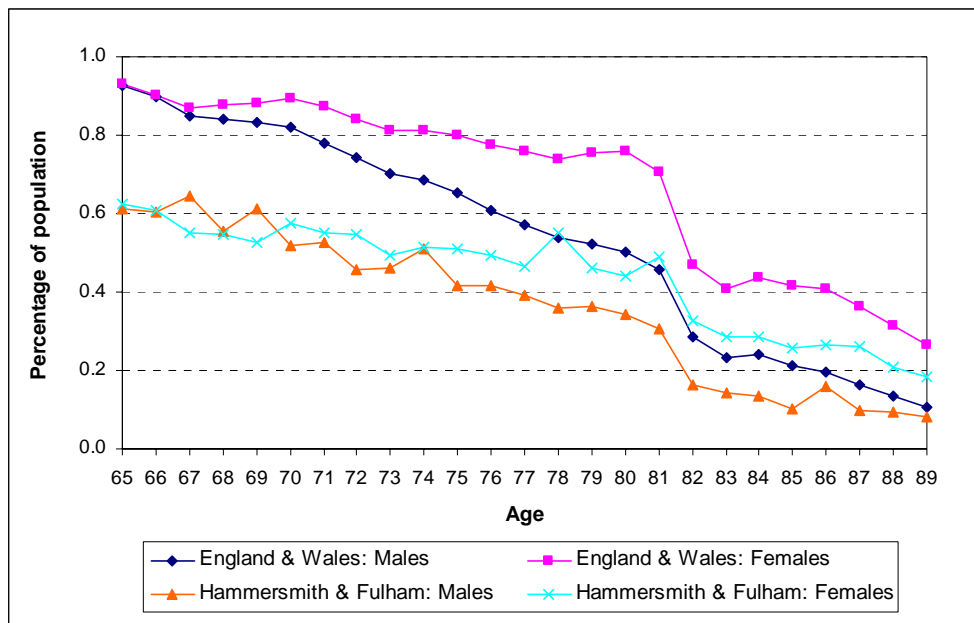
Component 2: Deaths

As is the case for births data, mid-year population estimates use data on the compulsory registration of all deaths in England and Wales provided by the General Register Office. These data have always been reliable, although in areas of high migration of older people, there may be a small level of mismatch between the address at which a death is registered and the area in which the person is counted in the population estimates – if death occurs shortly after moving.

The percentage of people aged 65 and over migrating into Hammersmith & Fulham from the rest of the UK in 2005 represented 1.1 per cent of the authority's population in these ages. Across all local authorities in England and Wales, Hammersmith & Fulham ranked 301st (out of 376) on this percentage. Hammersmith & Fulham was ranked 22nd for the equivalent measure of out-migration with 2.8 per cent of their 65+ population migrating out of the area. The highest proportions of people aged 65+ moving into and out of local authorities within England and Wales were 3.5 and 3.8 per cent, respectively. This would suggest that Hammersmith & Fulham is an area of relatively low in-migration of older people, and the impact of any potential overestimation due to relatively high out-migration is likely to be small.

Figure 4 shows the proportions of males and females aged 65 to 89 in the 2001 Census for Hammersmith & Fulham and England and Wales.

Figure 4: Age distribution of population of Hammersmith & Fulham aged 65-89 compared to England & Wales, 2001 Census



The deaths component is likely to have the greatest impact on population estimates in areas where older people make up a significantly higher than average proportion of the population. Figure 4 shows that in Hammersmith & Fulham, the proportions for all single years of age are lower than the national average. Overall, 10.5 per cent of Hammersmith & Fulham's population in the 2001 Census was aged 65 and over compared to a national average of 16.0 per cent. People aged 65 and over comprised 25 per cent or more of the population of some local authority districts.

Overall, it is concluded that deaths do not present a significant challenge to the accuracy of the population estimates in Hammersmith & Fulham.

Component 3: International Migration

International migration is challenging to estimate at local authority level due to the lack of robust data sources. There is no single data source that captures all migration to and from the UK, so data from a number of sources are used to estimate the international migration component of the mid-year population estimates. These sources are listed in Appendix D. The 2001 Census showed that:

- i. The percentage of residents in Hammersmith & Fulham born outside the UK was 33.6 per cent, over 3.5 times the national average of 8.9 per cent, and 10th highest out of 376 local authorities.
- ii. 3.4 per cent of residents lived outside the UK one year previously, over 4.5 times the national average of 0.7 percent, ranked 8th highest.

On average for the last three years (mid-2003, mid-2004, mid-2005¹), international in- and out-migrants during the year are estimated to have made up 4.0 and 2.6 per cent of Hammersmith & Fulham's population, respectively. These flows are over four times the comparable estimates for England and Wales of 1.0 and 0.6 per cent.

¹ Incorporating indicative revisions to migration flows and population estimates following methodological changes to be implemented in 2007.

International migration is therefore a significant factor for the borough.

In the case of Hammersmith & Fulham, one of the main factors attracting international migrants to the area is the presence of a number of higher education colleges and universities. Some of these will be located within Hammersmith & Fulham, but due to the large number of educational establishments within London as a whole, it is likely that there will be a number of students who reside within Hammersmith & Fulham but whose place of study will be elsewhere within London and vice versa. This is considered more fully later.

London boroughs may be strong attractors of international short-term migrants (people moving for less than 12 months). Short-term migrants are not included in population estimates. However, their potential impact on the Borough of Hammersmith & Fulham is considered in Chapter 5. Census data on the established Polish community in the Borough are discussed in Appendix A.

Hammersmith & Fulham's population also includes a number of asylum seekers. ONS estimates of Total International Migration include data from the Home Office on asylum seekers. These data are provided at government office region level and distributed to local authority level using data from the National Asylum Support Service (NASS) provided by the Home Office. Home Office asylum statistics show that Hammersmith & Fulham was home to approximately 150 asylum seekers receiving NASS support at the end of December 2006. The total across the UK numbered almost 47,800. These numbers include people who applied for asylum in previous years and who continued to receive support in 2006. Nationally, annual asylum applications have fallen steadily from a peak of over 103,000 in 2002 to below 28,000 in 2006. Therefore the extent to which Hammersmith & Fulham's population increased in 2006 due to inflows of asylum seekers is likely to be low relative to previous years.

ONS is implementing improved methods for the international migration component in 2007. These improvements address the distribution of international in-migrants to regional and local authority level; the distribution of international out-migrants to local authority level; and the basis for making assumptions about the proportion of people who will not realise their original intentions at the time of travel, in terms of their expected length of stay in the destination country. Indicative impacts on Hammersmith & Fulham's international migration estimates result in a reduction in in-flows and an increase in out-flows for the area. Nevertheless, as previously explained, international migration flows for Hammersmith & Fulham are still very high.

In conclusion, international migration is a significant factor in the borough, with the proportion of overseas migrants recorded in the 2001 Census confirmed in recent international in-migration estimates, allowing for indicative recent methodological changes, and with an established population originating outside the UK potentially acting as an attractor for new migrants.

Component 4: Internal Migration

For mid-year population estimates, change of address (postcode) details from GP patient register records are used to estimate flows of internal migrants between local authority areas in England and Wales and also to and from Northern Ireland and Scotland. The data sources used are described in Appendix D.

The accuracy of internal migration estimates depends on all patients re-registering with a GP when they move. However, it is known that re-registration rates vary by age and sex and specific population sub-groups. Young people, men in particular, are considered to be the slowest to re-register. Similarly, students starting or finishing higher education and moving to a new area may be slow to re-register. Both these groups are particularly mobile, and are likely to move more frequently than the rest of the population. Due to their age, they also have a low propensity to be ill or to require the services of a GP.

Figures 5 and 6 compare the age distributions of internal migrants moving to and away from Hammersmith & Fulham with the age distribution for all internal migrants in England and Wales. The figures show that more than a quarter of internal migrants moving to Hammersmith & Fulham in the year to mid-2005 were aged between 25 and 29. This was considerably higher than the England and Wales average of 14 per cent. Hammersmith & Fulham also had a considerably higher percentage of out-migrants aged 25-29 and 30-34 than the national average. It should also be noted that ages 20-24 make up a large proportion of in-migrants, but less of a proportion of out-migrants.

Figure 5: Age distribution of internal in-migrants, comparing Hammersmith & Fulham with England and Wales, mid-2005

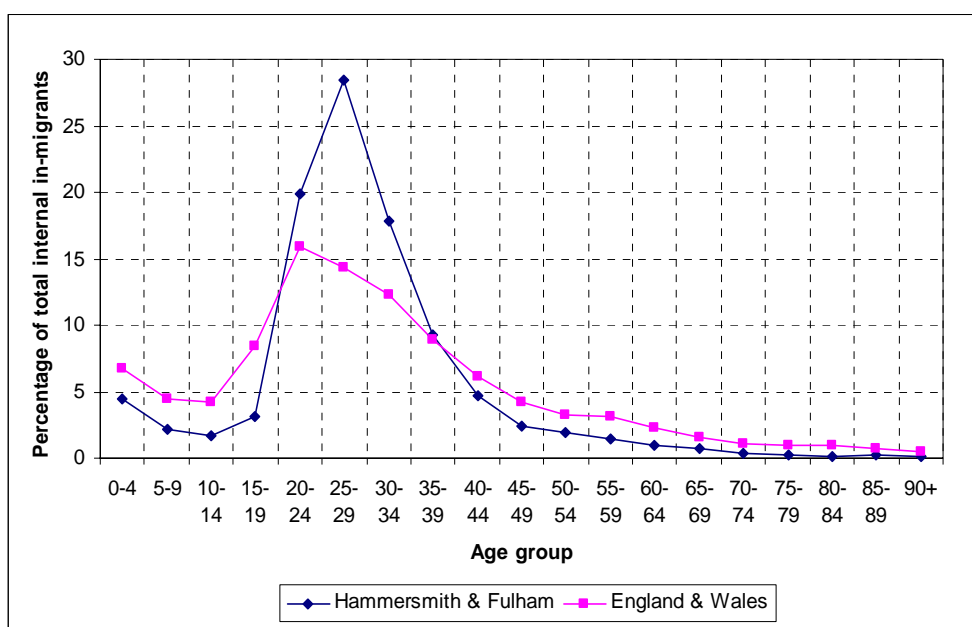
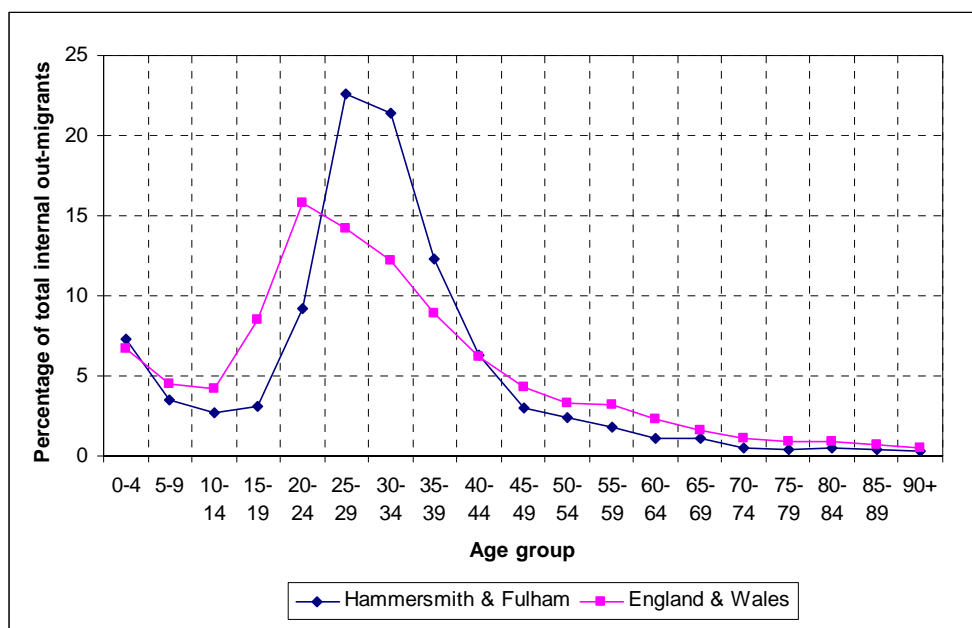


Figure 6: Age distribution of internal out-migrants, comparing Hammersmith & Fulham with England and Wales, mid-2005



Within these distributions of internal migrants, however, there are differences by sex. A table showing sex ratios of young adults in internal migration estimates, comparing Hammersmith & Fulham with England and Wales can be found in Appendix A. This shows that Hammersmith & Fulham sex ratios at young adult ages are consistently below those for England and Wales – up to age 35 on in-flows and to older ages on out-flows, implying that young adult males are either not moving into the area in the same numbers as females, or are not changing their GP registration when they do.

Hammersmith & Fulham is in the top three per cent of English local authorities with the highest estimated levels of both in- and out- internal migration per 1,000 resident population (using internal migration data for the years to mid-2004 and mid-2005). Based on small area population estimates, high levels of in- and out-migration were recorded throughout Hammersmith & Fulham, with the exception of the north of the borough.

The area has a young, mobile population, reflected in the age distributions of internal migrants. There are also larger differences between young adult male and female migration patterns than nationally. Therefore its internal migration estimates may present challenges to estimating the population well.

Component 5: Special Populations

i. Armed Forces

There is no significant armed forces presence in Hammersmith & Fulham, according to both the 2001 Census and more recent MOD data. The data sources used to estimate armed forces personnel are described in Appendix D.

ii. School Boarders

There are no schools in Hammersmith & Fulham recorded as having school boarders.

iii. Prisoners

The 2001 Census showed there to be a single prison, Wormwood Scrubs in Hammersmith & Fulham with over 300 prisoners. From Home Office sources, the mid-2005 estimates reflected under 250 prisoners from this prison².

iv. Other Special Populations not Identified Separately - Students

Hammersmith & Fulham has both a high proportion of students and a young population. There are a number of higher education colleges and Universities with presences within the borough:

- Hammersmith and West London College
- Imperial College London (Charing Cross and Hammersmith campus)
- KLC School of Design
- London Institute, Chelsea College of Art and Design (Bagley's Lane site, Hugon Road site and Lime Grove site)

² These numbers are in accordance with the definition of a prisoner used in the mid-year estimates, being those prisoners who have been sentenced and have served at least 6 months of their sentence as at 30 June in the year of the estimate. The number therefore does not include those who have served less than this time, or who have yet to be sentenced.

It is unknown how many of the students attending these colleges actually reside within the Borough as currently information on student term time address is not available centrally. According to the 2001 Census, full-time students aged 18 and over made up 5.4 per cent of the 18+ population, compared with 3.1 per cent nationally, and the area ranked 43rd out of 376 local authorities.

An analysis of 2001 Census data on students and migration is given in Appendix A. This shows that, while it was the non-students who made up the larger body of international migrants into Hammersmith & Fulham for ages 19-21, international migration was also higher than the national average for full-time students. It also shows that students (particularly males) contributed more than non-students to internal migration into the area. Therefore, the student population is likely to pose a challenge to the accurate estimation of international and internal migration for Hammersmith & Fulham.

The Higher Education Statistics Agency (HESA) currently only holds information for a student's parental home (or usual address), prior to studying. There are however plans to collect term-time address from 2007 onwards which will be available in 2009. One of the recommendations of the Welwyn Hatfield case study was to pursue the feasibility of making a student adjustment or treating students as a special population group using this enhanced HESA data, once they are available. This should lead to improvements in the population estimates of both UK and overseas students.

3.2.4 Sex Ratio Analysis

A sex ratio shows the number of males in the population relative to the number of females. It is calculated by simply dividing a male population estimate by the female population estimate for the same place, time and cohort.

Figures 7 and 8 show quinary sex ratios for Hammersmith & Fulham, compared with both Greater London and England and Wales, for the mid-2001 and mid-2005 population estimates respectively. The Hammersmith & Fulham figures are low between ages one and 24 in 2001 and peak between 30 and 34 (more males than females). In 2005, the Hammersmith & Fulham sex ratios show a peak for ages 30 to 39. The 30-34 figure is noticeably greater in 2005 than in 2001, and also appears to have been aged forward to create the 35-39 peak. This could indicate that male in-migration since 2001 for persons in their 30s is far higher than for females, or that young men of this age moving out of the area are slow to change their GP registration.

Data for 2001 and 2005 both indicate low sex ratios (more females than males) for ages 20 to 24. This is exaggerated in 2005, and in addition aged on to the next age group. This could be due to internal migration of young women to the area, or young men not registering with a GP on moving to the area.

Figure 7: Sex ratio by age for Hammersmith & Fulham, Greater London and England & Wales, 2001 population estimate

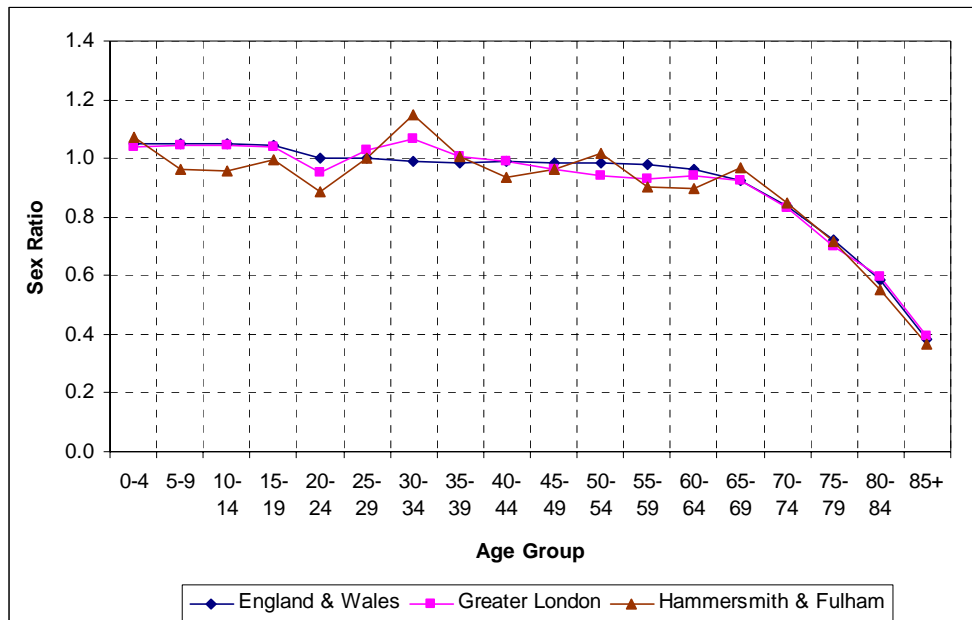
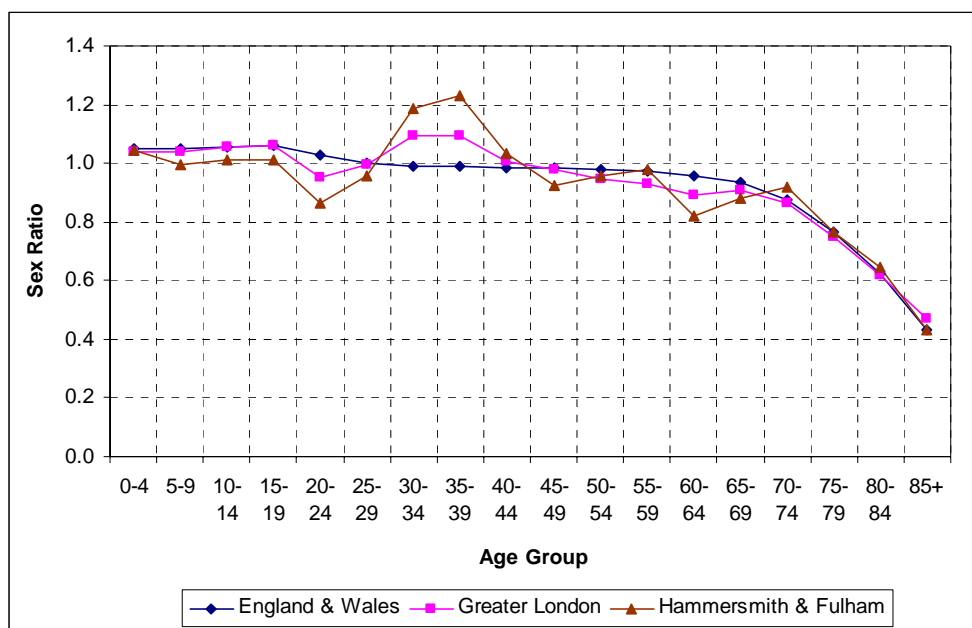


Figure 8: Sex ratio by age for Hammersmith & Fulham, Greater London and England & Wales, 2005 population estimate



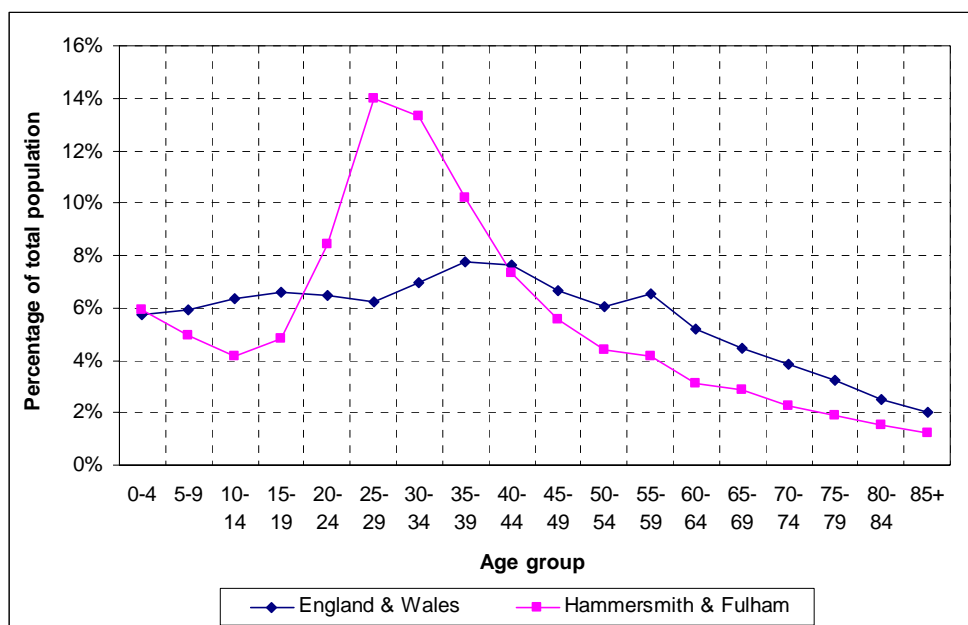
Young men not changing their GP registration when they move out of the area stay on the register and are aged on, hence contributing to falsely inflated numbers in the 30-39 age group. Some of this inflation will be compensated for by men moving in who do not change their GP registration to a Hammersmith & Fulham address. However as internal migration inflows are lower than outflows, the overall impact will be false inflation of numbers. For ages 20-24, however, the inflows are much higher than the outflows, potentially leading to lower numbers in this age group than in reality, as there are not compensating numbers leaving the borough whose GP registration details remain within the area.

In conclusion, investigation of the sex ratios for young adults highlights the point made previously that there may be challenges to the accuracy of estimating Hammersmith & Fulham's young adult population.

3.2.5 Age Distribution

Figure 9 compares the age distribution by quinary age group for Hammersmith & Fulham with England and Wales, based on the 2005 mid-year population estimates.

Figure 9: Age distribution, comparing Hammersmith & Fulham with England and Wales, 2005 mid-year estimates



This shows that Hammersmith & Fulham has a noticeably different age structure to England & Wales. Hammersmith & Fulham has lower percentages than nationally for ages five to 19 and 45 years and over, but a noticeably higher percentage of its population aged 20 to 39, with a peak in the 25 to 29 year age group. In 2001 this peak was more marked in the 25-29 age group. This age distribution mirrors a similar pattern in London as a whole.

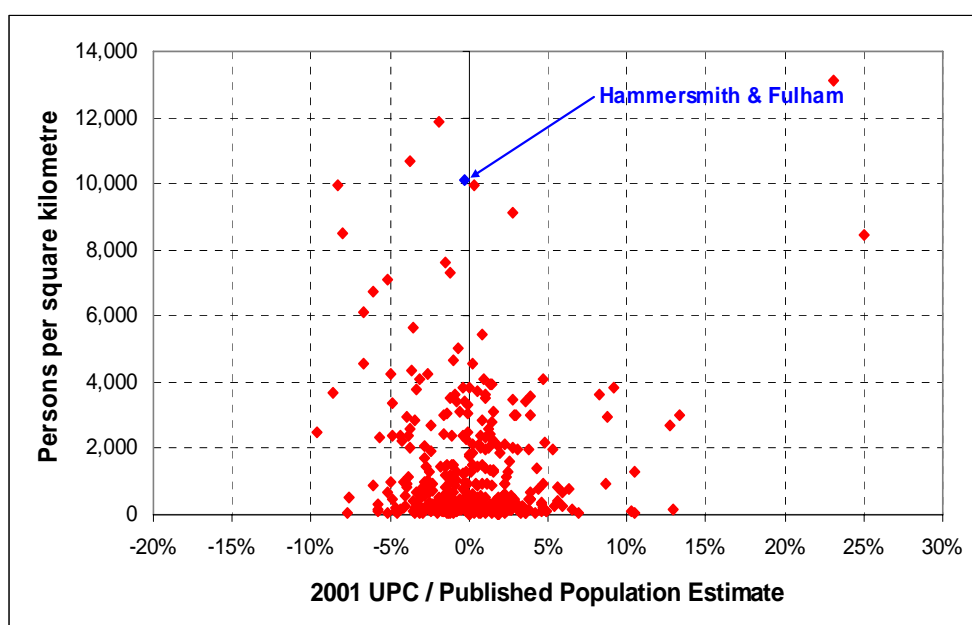
Improvements that will be implemented in 2007 include improvements to age distributions and, therefore, these are subject to change.

3.2.6 Population Density

Hammersmith & Fulham was the 4th most densely populated local authority district in England and Wales in 2005, with 11,241 residents per square kilometre, compared to 4,782 persons per square kilometre in London as a whole. The three more densely populated areas, Islington, Kensington & Chelsea and Westminster are all within the same cluster. Population density for the other local authorities in the same cluster as Hammersmith & Fulham ranged from 3,062 in City of London to 16,353 in Kensington & Chelsea. In general, the middle of the Borough is more densely populated than the north and south, but densities do show great variation within the Borough.

Figure 10 shows population density by local authority plotted against a measure of the level of difficulty experienced in estimating population between the 1991 and 2001 censuses. Unattributable population change (UPC) is the remaining difference between the 2001 rolled-forward and census-based population estimates after the adjustments detailed in 3.2.1 have been made. In Figure 10, the UPC measure for each local authority has been calculated as a proportion of the revised mid-2001 population estimate. Where this measure is positive, the rolled-forward population estimate for 2001 exceeds the census-based estimate. The reverse is true where the measure is negative.

Figure 10: UPC as a percentage of population vs. population density by local authority, 2001



There are two data points that appear as outliers to the extreme right of the chart. These are Kensington & Chelsea and Westminster. The populations of these London boroughs were greatly overestimated during the 1990s.

Figure 10 shows that 18 of the 26 local authorities with population density above 4,000 people per square kilometre had a negative UPC in 2001. This suggests that areas with high population density were more likely to have had their population underestimated than overestimated. It should be noted, however, that all but four of these 26 local authorities are London boroughs. The over-estimation of population in Kensington & Chelsea and Westminster during the 1990s may have contributed towards underestimation of population elsewhere in London. Recent improvements to the estimation of international migration component of population estimates are aimed at avoiding this issue when results become available from the 2011 Census.

3.2.7 Population by Ethnic Group

Table 3 shows the breakdown of the population from the 2004 Population Estimates by Ethnic Group. Hammersmith & Fulham has a sizeable population who are not White British or White Irish, broadly similar to London as a whole. The main differences between Hammersmith & Fulham and London are the below average proportion of Asian or Asian British, which is at the same level as the England average, and above average proportion in the 'Other White' group. According to the 2001 Census, the 'Other Whites' in the area were principally from Australia, New Zealand and South Africa. The other boroughs in this cluster (i.e. the rest of Inner London) also had very high proportions of 'Other Whites'.

Table 3: Population by Ethnic Group for Hammersmith & Fulham, London and England, 2004 estimates

Ethnic group	Hammersmith & Fulham		London		England	
	Number	%	Number	%	Number	%
All groups	176,800	100.0	7,428,600	100.0	50,093,100	100.0
White: British or Irish	110,900	62.7	4,537,100	61.1	43,310,300	86.5
White: Other White	26,700	15.1	645,100	8.7	1,523,700	3.0
Mixed	6,800	3.8	247,700	3.3	752,800	1.5
Asian or Asian British	9,000	5.1	949,100	12.8	2,579,600	5.1
Black or Black British	17,700	10.0	809,000	10.9	1,315,900	2.6
Chinese	1,900	1.1	103,000	1.4	312,400	0.6
Other	3,800	2.1	137,500	1.9	298,600	0.6

Note:

1. Population Estimates by Ethnic Group are experimental statistics
2. Figure are rounded to the nearest hundred

Since 2001, expansion of the European Union (in May 2004 and January 2007) has meant that there has been a recent increase in the migration of people, especially from Poland, who are likely to describe themselves as in the 'Other White' ethnic group. This increase is not yet reflected in the most recent population estimates by ethnic group, which are for mid-2004.

Of the non-White ethnic groups, the largest group is comprised of Black or Black British, with a similar proportion to London as a whole and almost four times the England average.

ONS recently carried out a Race Impact Assessment (RIA) on the methodology and data sources used to produce population estimates. More details of the findings of this are given in Chapter 6. In summary, the various analyses underpinning the RIA bring a reasonable level of reassurance on the potential for biases, while recognising that there are challenges in measuring the migration of people more generally. Current ONS plans to improve migration statistics are likely to reduce the risk of biases in the estimates and projections still further.

3.3 Factors Identified for Further Investigation by the Hammersmith & Fulham Case Study

Section 3.1 listed the eight variables that were used in the cluster analysis to group local authorities into clusters with similar demographic characteristics. The cluster from which Hammersmith & Fulham was selected includes the eight other central London Boroughs. The main factors that present challenges to estimating populations accurately for these local authorities were identified as the high rates of migration and proportion of young males, and high proportions of students and people from non-White ethnic groups within the usually resident population.

Section 3.2 considers the population characteristics of Hammersmith & Fulham, including an analysis of each of the data sources that feed into the cohort component method used to produce population estimates. The conclusion of this initial data analysis is that the high levels of migration, both international and internal, to and from the area represent the main challenge to accurately estimating Hammersmith & Fulham's population. The area may also be an attractor of short-term international migrants, a topic which is currently being researched as part of the wider programme to improve population and migration statistics.

Students were investigated in the Welwyn Hatfield case study, which recommended pursuing the feasibility of making a student adjustment or treating students as a special population group using HESA data, once they are enhanced with term-time address.

Chapter 4 Approach

The general approach taken to the study of the estimation of the resident population in Hammersmith & Fulham was to investigate what alternative data sources existed that might provide information about the location and movement of specific sub-groups of the population. This was achieved through working with representatives from Hammersmith & Fulham Council and other relevant local organisations to identify appropriate data sources. A number of sources were considered for their relevance and possible use in population estimation. Comparisons with sources were also used to validate the population and migration estimates. This chapter describes how these data sources were obtained.

The wider ONS developments to improve population statistics that are relevant to this case study are also considered here.

4.1 Obtaining Data

Data sources were investigated that had the potential to estimate either the stock or flow of specific sub-groups of the population. A number of data sources were considered and information on these obtained directly from Hammersmith & Fulham Council together with an assessment of their quality. These data sources (described in more detail in Appendix D) include sources on people:

- Client Service index
- Electoral register

and sources on households:

- Gazetteer property database
- Council Tax
 - Including data on the number of properties in Hammersmith & Fulham with student exemptions
- Hammersmith & Fulham Council Housing Needs Survey 2003

In addition, ONS is also investigating some key national data sources that have potential to improve migration and population statistics and which are available for all local authorities. These were obtained from relevant government departments and other organisations. These include:

- Data on the allocation of National Insurance numbers to overseas nationals entering the UK
- Data on the number of students at higher education institutions from the Higher Education Statistics Agency (HESA)
- Data collected by the School Census on the number pupils within the state system

The results of considering all these data sources can be found in Chapter 5.

4.2 Related Research

As part of the wider ONS developments to improve population statistics, research has already taken place to determine whether there are any administrative data sources that could produce better estimates of migration or be used as a quality check of the current estimates.

i. Improving Migration Estimates - both Internal and International

Potentially relevant data sources have been considered for their use in estimating the movement of certain sub-groups of the population including students, young men and school-aged children. A number of data sources have been identified as having potential for informing both internal and international migration estimates of sub-groups of the population. The Department for Work and Pensions (DWP) Longitudinal Study (WPLS) and HESA student data were identified as having the potential to provide information on the migration patterns of young adults and workers. The potential use of these data for estimating migration will be investigated as part of ONS's future work programme.

The availability of WPLS, a data source holding linked information on employment and earnings information on all individuals on the PAYE scheme, is being investigated. In addition, attempts have been made to match students' home postcodes on HESA data with GP patient registration data to investigate the registration patterns of students at the start of study. Further research to investigate potential improvements to internal migration estimates for certain sub-groups of the population is planned. IMPS research has also identified Council Tax Billing Lists as a potential source for identifying student areas. Other potential uses for council tax data are discussed below.

ii. Enhancing Quality Checks of Population Estimates

ONS is investigating the potential of administrative data sources for improving estimates of the population, either for use directly in the estimation process or as a data source to be used in assessing the plausibility of the estimates. This work includes investigating the potential of household datasets, such as council tax, to give an indication of household dwellings. While these data can be used to give an estimate of households, they cannot be used directly to estimate a population. A method is therefore needed to convert households to population - one possible method would be to use average household size. It is likely however that more than one method would be needed for different types of local authorities. Datasets on households and our knowledge about these sources will be considered in the research programme described above.

A further potential use of council tax data is to use discount information to identify second homes. Second homes can cause difficulties when producing population estimates since they are based on usual residence and some people who have addresses in an area may be owners of second homes and be usually resident elsewhere.

ONS is considering how more information can be gathered on people with two addresses via surveys. In particular, ONS is actively considering the inclusion of a question on second address on the census form for 2011.

4.2.1 Relevant Findings from the Welwyn Hatfield Case Study

The case study carried out for Welwyn Hatfield investigated how well students were estimated in the borough. Research found some evidence that the current internal migration data source may not be capturing all student moves to university at the start of study or moves out of university areas at the end of study. This could result in an under or over estimate of the population or an age distribution that does not adequately represent the student population. The study found that data on the term-time address of students were a key source that was needed to improve the estimation of student migration in the population estimates. There are plans for HESA to collect term-time address on all students at higher education institutions in the UK in 2007/08 and this additional information would improve estimation of student migration.

If these data do become available, they should make it possible to make a student adjustment or treat students as a special population group in the estimation process. By using the estimate of students resident in a local authority, it might be possible to estimate this population group separately as a 'static' population. However, if a data source is used to estimate students separately in the population and migration estimates, information is needed on the proportion of students whose migration is also captured using the GP registration methodology. If this is not taken into account, the migration of some students may be counted twice. The study recommended that the feasibility of making such an adjustment should be investigated further.

Since Hammersmith & Fulham has a significant student population, the research into improving the inclusion of students in the inter-censal population estimates will be relevant to population estimation in Hammersmith & Fulham.

4.2.2 Relevant Findings from the Derby Case Study

The Case Study in Derby aimed to investigate whether there were additional data sources or methods to those currently used that could improve the estimation of young adults and in particular, young men. The study identified a number of data sources which may be used in assessing the plausibility of population estimates including PeopleUK - a classification tool produced by CACI based on sources including electoral registers and lifestyle surveys. Other sources were identified which may have the potential to indicate flows of migrants and change over time and included School Census and data collected in Derby for the School's School Inclusion and Development team. The study concluded that further investigation should be made into the potential use of these sources to get a better understanding of their limitations as population counts. Further work undertaken as a result of the findings of the case study in Derby is likely to be relevant to Hammersmith & Fulham.

4.2.3 Relevant findings from the Barnet Case Study

The Barnet case study looked at the implications of high ethnic minority populations for population estimation in the Borough. The findings are likely to be of interest to other London Boroughs although there were some noticeable differences in the ethnic minority populations of Barnet and Hammersmith & Fulham in the 2001 Census. For example, Hammersmith & Fulham had higher proportions on non-British White people (20 per cent compared to 14 per cent) and Black and Black British people (11 per cent compared to 6 per cent). Barnet had a higher proportion of Asian people (12 per cent compared to 4 per cent). More recent data published as part of the experimental population estimates by ethnic group are shown in Table 4 and show similar proportions.

Table 4: Population estimates by ethnic group (shown in percentages), mid-2004

	White: British	White: Irish	White: Other white	Mixed: White and other	Asian or Asian British	Black or Black British	Chinese	Other
London	58.4	2.7	8.7	3.3	12.8	10.9	1.4	1.9
H&F	58.8	4.0	15.1	3.8	5.1	10.0	1.1	2.1
Barnet	58.0	3.0	10.7	3.3	12.9	6.7	2.3	3.1

4.2.4 Babies Aged Under One

Work has commenced as part of the wider ONS population statistics development work to investigate the estimation of the population of babies aged under one which has been shown to be potentially difficult in a few areas. This work has been started because the 2001 Census indicated that there was a potential inaccuracy in the estimate of the population aged under one, particularly in a number of boroughs in London. However, for the majority of local authorities in England and Wales, there is no reason to doubt the accuracy of the estimate of the population aged under one.

Work so far has considered each of the components in the population process to assess why it may be more difficult to estimate the population aged under one. Registration data for births and deaths have always been reliable and so it is suspected that migration, both internal and international, is the component that is making the population aged under one more difficult to estimate in a small number of areas. Further research work will focus on the way that the movement of people with babies both in and out of areas is captured in the population estimates.

Hammersmith & Fulham has a relatively young population. The fertility rates for mothers aged under 32 is noticeably below the national average, while the fertility rates for mothers aged between 34 and 42 are above the average for England and Wales. The total fertility rate for Hammersmith & Fulham in 2004 was 1.46 which is lower than the average for England and Wales which was 1.79. Since Hammersmith & Fulham has a lower total fertility rate than the national average, the findings of this research are likely to have less relevance to how babies under one are estimated in the Borough than other areas in England and Wales.

4.3 Consultation with Local Organisations

One of the aims of the case studies is to work with the local authorities selected so as to draw on local knowledge and data sources. This was achieved through meetings with Hammersmith & Fulham Council attended by representatives from various departments within the Council. Representatives from Hammersmith & Fulham PCT also attended.

These meetings discussed how the Council currently uses population statistics and what research could be carried out which might identify alternative local data sources. At that time, the Council did not have specialist demographic expertise as it mostly relied on the Greater London Authority (GLA) for information on particular population and household matters relating to the borough.

At the first meeting in December 2005, the Council indicated that they had not identified any particular issues with the mid-year estimates for their borough. However, this was prior to data being released on the number of A8 migrants which is now an issue for the borough.

The key task identified during discussions was to get an impression of any intercensal drift in the ONS population estimates, whether for particular age groups or for the total population. Also discussed was the fact that major differences between local data sources and the ONS estimates may occur due to the varying presence of mobile populations in administrative data (students, international migrants, asylum seekers, seasonal workers, etc).

For the borough there was anecdotal evidence that most migration into or out of the borough was work related. Whilst GP patient registration data could potentially indicate inter-censal drift, it was recognised that patient register list inflation did exist, whereby the registered count of people on GP lists exceeded the known or estimated population.

Chapter 5 Data Sources Investigated

In consultation with contacts at Hammersmith & Fulham Council and Hammersmith & Fulham PCT, a number of local and national data sources were identified which could be used to investigate how young people and in particular, young men are estimated in the population estimates. The mid-year population estimates used in the comparisons will differ slightly when the planned changes to the estimation of the international migration component are implemented in August 2007.

This chapter first compares the adult population of Hammersmith & Fulham as estimated by a number of administrative data sources. It then goes on to discuss these and other data sources and conclusions are made regarding their relevance to the study and whether they may be used in the population estimation process.

5.1 Comparison of Population Counts in Hammersmith & Fulham

Table 5 shows the total number of persons aged 18 and over in Hammersmith & Fulham according to a number of administrative sources.

Table 5: Comparison of population counts in Hammersmith & Fulham

Source	Population estimate	Reference date
Electoral register	117,770	1 st December 2005
Population estimates – persons aged 18 and over	147,999	30 th June 2005
Patient registers – persons aged 18 and over	157,822	31 st July 2005

The estimate of the population aged 18 and over based on the electoral register is 30,200 lower than the mid-2005 population estimate. However, the number of people eligible to vote is not the same as the resident population aged 18 and over since not all residents are entitled to vote and some choose not to register to vote. Since Hammersmith & Fulham has a large student population, it is possible that a proportion of these do not register to vote in the area where they study. The quality of electoral registers in Hammersmith & Fulham is considered later in this chapter.

The number of persons aged 18 and over registered with a GP who are resident in Hammersmith & Fulham is approximately 9,800 greater than the number of persons aged 18 and over in the 2005 population estimate. However, it is a well known and accepted fact that patient registers are prone to list inflation caused by delays in removing people who have died or moved out of the area from the register. There are also incidences of people with duplicate entries or having more than one NHS number. The Audit Commission's National Duplication Registration Initiative has taken some steps to address this problem and is discussed later in this chapter. The degree of list inflation varies across the country – it tends to be higher in areas with large numbers of students who tend to be slow in re-registering with a GP when they leave higher education.

As an area with a large student population, the evidence indicates that the GP registers in Hammersmith & Fulham do suffer from list inflation. In addition to students, there are other groups in the population that may also cause inflation on the GP registers but do not fit the definition of a usual resident used in the population estimates. These include short-term migrants who register with a GP in Hammersmith & Fulham but do not stay in the country for 12 months or more, so they do not fit the definition of usual residence used in the population estimates. If they do not inform their GP when they leave the country they will continue to be included on the GP registers. In addition, there may be people registered with a GP in the Borough who have a second main residence outside London.

For Hammersmith & Fulham the 2005 patient register count for all persons was 190,531, around 10,700 (5.9 per cent) higher than the mid-year estimate. This compares to national patient register list inflation of 5.3 per cent, and 10.7 per cent for London.

5.2 Administrative Sources Investigated

ONS considered a number of data sources produced by Hammersmith & Fulham Council, together with administrative sources arising out of other research. The following section lists all data sources that have been considered in this study. Background information on each data source can be found in Appendix D.

- Electoral Registers
- GP Patient Registers
- GP Patient Register Flag 4 Data
- National Insurance Allocations to Overseas Nationals
- Registered Social Landlords (RSL) Data (CORE)
- School Census
- Housing Needs Survey
- Council Tax
- Other Council Sources
- HESA Data
- Other Sources

5.2.1 Electoral Registers

The Electoral Register records people resident in each local authority who will be 18 or older during each year. The register is published each year on 1st December and electors are eligible to vote in local government, GLA and/or parliamentary elections and European elections.

Age information is only available for attainers (those eligible to vote for the first time as a result of reaching the age of 18 during the currency of the register). In addition, there are definitional differences between electoral registers and population estimates which make them sub-optimal in estimating population or migration.

Information from Hammersmith & Fulham Council indicates that the electoral roll data are around 96 per cent complete as assessed against the eligible population. Local information indicates most non-compliance to register on the electoral roll comes from residents who consider themselves to be temporary residents and may be moving in the future. Anecdotal evidence suggests that this particularly applies to Australians and New Zealanders. There will also be short-term migrants who will not consider themselves eligible to vote if they are intending to stay in the country for a limited time.

Electoral registration in Hammersmith & Fulham shows a considerable increase in voters from the new EU states in the period 2003-04, with lower increases the following year. A large proportion of the voters from the new EU states are Polish.

Table 6: Electoral registrations from EU in Hammersmith & Fulham

	2003	2004	2005	% Change 2003-04	% Change 2004-05	% Change 2003-05
Polish	715	1,242	1,564	73.7	25.9	118.7
All New EU	929	1,639	2,109	76.4	28.7	127.0

Source: Hammersmith & Fulham Council Annual Voter Registration Canvas

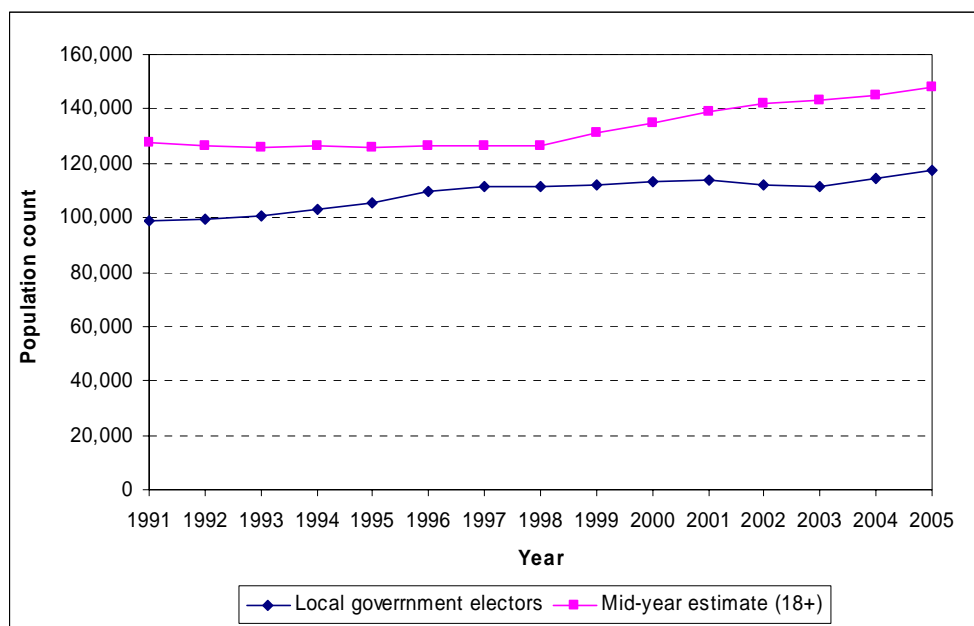
At December 2005 EU citizens made up 9.7 per cent of the electorate in Hammersmith & Fulham, and there is little evidence that 'new' EU citizens do not register. At the annual canvass in Hammersmith & Fulham, all eligible residents contacted are registered regardless of whether they indicate that they are just there for a short or medium stay.

Council information indicates that there is reluctance on the part of young people to register. One key problem is the high number of sharing, non-related households where nobody takes the responsibility to fill in the registration forms (including reminders). The Council are proactive in promoting rolling registration outside the annual canvass period, however such registration is voluntary and many people may not register if they are planning to move shortly or no general election is forthcoming.

Electoral registration data show a considerable increase in voters from the new EU states, with electoral registrations for Polish rising from 715 in 2003 to 1,564 in 2005 (+119 per cent). This information comes from the Annual Voter Registration Canvass. In 2005 the Polish represented nearly three-quarters of all voters from the EU states.

Figure 11 shows a comparison between the electoral registers and the population estimates in Hammersmith & Fulham. The graph shows that the population estimates are consistently above the number of electors on the electoral register. However, this is to be expected since the population estimates will include foreign nationals who are not entitled to vote. Hammersmith & Fulham Borough Council estimate that only 84% of the adult population are eligible to be on the electoral register. Apart from the period during the late 1990s when the two sources converged slightly, the difference between the population estimates and the electoral register has stayed the same.

Figure 11: Comparison of mid-year estimates (age 18 and above) and electoral registration data for Hammersmith & Fulham 1991-2005

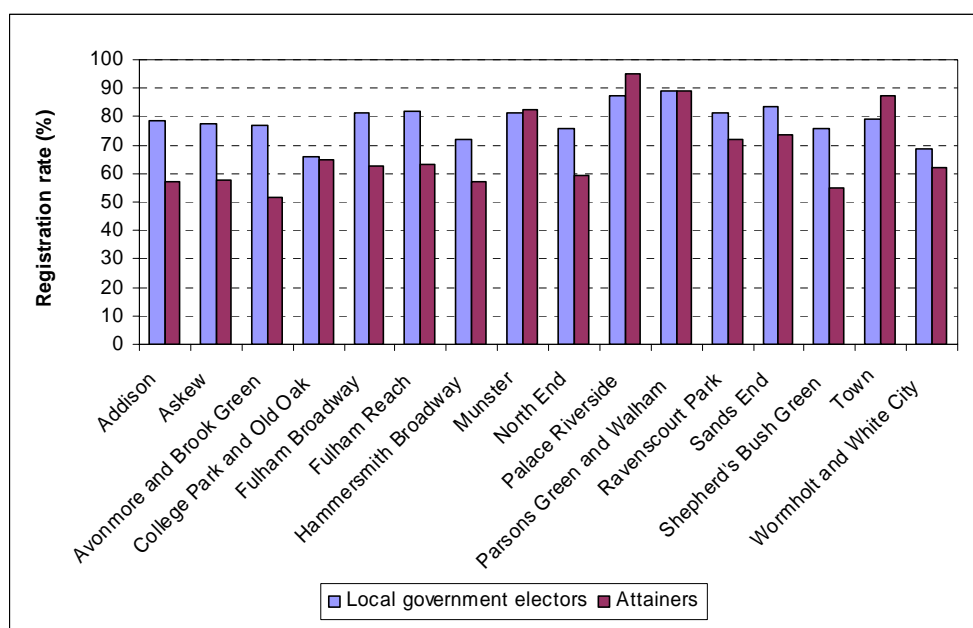


Note:

1. Figures for local government electors exclude attainders.
2. Figures for local government electors relate to each mid-year and have been calculated by interpolating electoral registration counts from the current and previous year's registers of electors.
3. Mid-year population estimate for 2006 is not yet available.

Figure 12 shows the electoral registration rates for Hammersmith & Fulham by ward for 2004. These have been produced using electoral registration data and mid-2004 small area population estimates and show the proportion of the population registered to vote. The population estimates will include persons who are not eligible to vote but it is not possible to identify the non-eligible population separately.

Figure 12: Electoral registration rates for Hammersmith & Fulham by ward for 2004



Note:

1. Figures for attainers are at the mid-year and have been calculated by interpolating electoral counts from the current and previous year's registers of electors.
2. The ward population is derived using the mid-2004 ONS Super Output Area Population Estimates (experimental)
3. The 'registration rate' is defined as the number of electors registered as a percentage of the voting age resident population.

Registration rates vary by ward with Palace Riverside and Parsons Green & Walham having the highest registration rates. Both of these wards have low numbers of foreign nationals. Two wards have registration rates below 70 per cent; Wormholt & White City and College Park & Old Oak. The Council believe that these low rates of registration are likely to be due to these wards having a number of foreign nationals. According to the 2001 Census, both are student areas, so this may also affect the registration rates since students are less likely to register to vote in the area that they live while studying.

Nationally, registration rates for attainers are lower than for the rest of the electoral population. In Hammersmith & Fulham, registration rates are noticeably low in Avonmore and Brook Green although Council officials do not consider this to reflect reality. The variation in the registration rates for attainers may be a result of inaccuracies in the small area population estimates for these age groups (16/17 year olds).

5.2.2 GP Patient Registers

Hammersmith & Fulham Primary care Trust (PCT) holds registrations for GPs within the Hammersmith & Fulham Borough area. People who register with a GP practice in Hammersmith & Fulham may live outside the Borough. Alternatively, some people who reside within the Borough may be registered with a GP outside the Borough.

ONS has access to GP patient register data for the whole of England and Wales and so can identify the age and sex characteristics for all persons recorded on the patient register who reside within the Borough. Comparisons can be made between the patient register counts and the mid-year estimates to identify if any particular age groups by sex show a patient register count greater than the mid-year estimate count, as this may indicate a potential underestimate with the mid-year estimates. However, patient registers are prone to list inflation, which occurs when there are delays in removing people who have died or moved out of the area from the register and this should be considered when making this comparison.

Figures 13 and 14 compare the population estimates with the number of persons registered with a GP who are resident in Hammersmith & Fulham.

Figure 13: Comparison of mid-year population estimates and patient register data for males in Hammersmith & Fulham, 2005

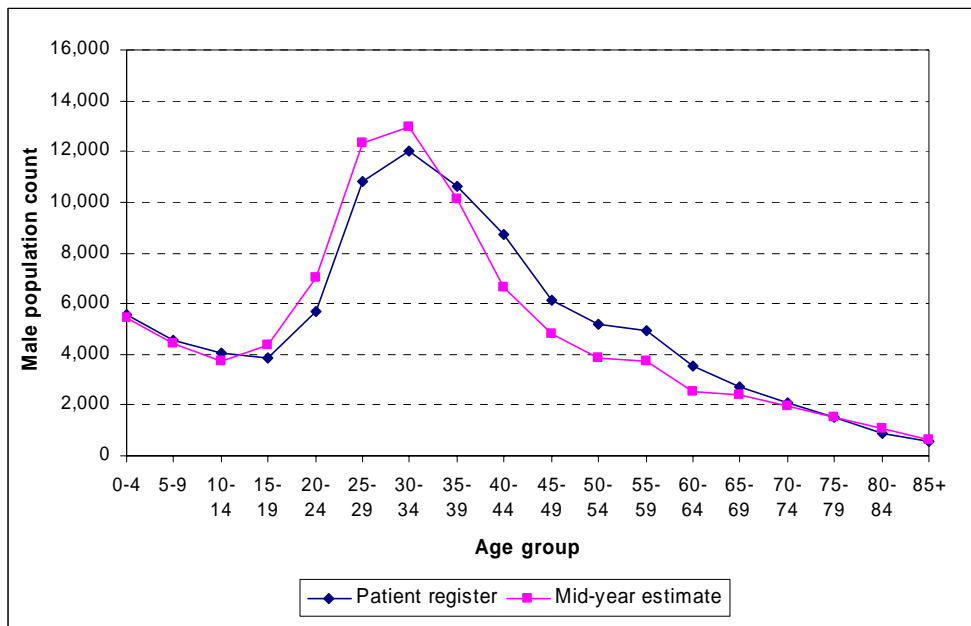
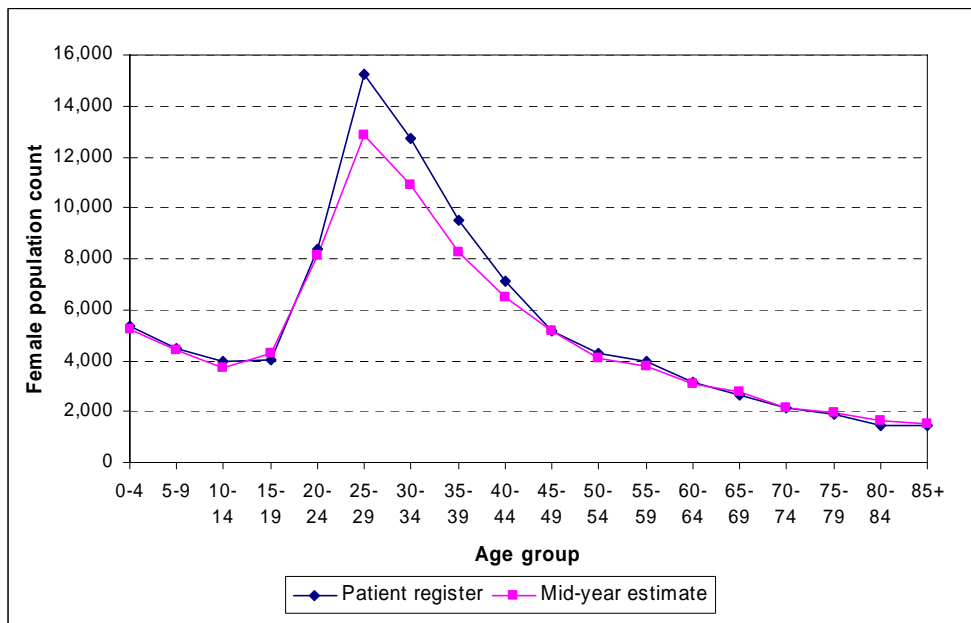


Figure 14: Comparison of mid-year population estimates and patient register data for females in Hammersmith & Fulham, 2005



For males, this comparison shows that the patient registers are generally lower than the population estimates in the 20 to 34 year age group, whilst for males aged 35 and over, the patient register counts generally exceed the mid-year estimate. For the 0 to 14 and 65 and over age groups there is broad consistency between the patient register and mid-year estimates. Overall the patient registers exceed the population estimate for males by 4,000.

It is usual for list inflation to occur in the young adult groups and so the lower patient register counts for males in the younger age groups suggest that not all young males are registering with a GP when they move into the Borough. Since internal migration is based on GP registrations, this would imply that these males are international migrants whose moves into the country are being captured in the International Passenger Survey. However, list inflation may be the cause of the higher patient register count at the older ages. The list inflation for males in Hammersmith & Fulham is 4.4%.

For females, this comparison shows that the patient registers are higher than the population estimates in the age groups 25 to 44. For age groups 0 to 24 and 45 years and over there is a strong similarity between the patient register and mid-year estimates. The list inflation for females in Hammersmith & Fulham is 7.4% and occurs in the age groups 25 to 44 and is consistent with the usual patterns of list inflation.

Within London as a whole, the patient register counts for males exceeded mid-year estimates by more than 13 per cent in 2005. This is significantly higher than the equivalent figure for Hammersmith & Fulham (4.4 per cent) and can be seen in particular in the 25-60 age group. Also in contrast to Hammersmith & Fulham, patient register counts in London are higher than mid-year estimates across nearly all age groups except the older age groups (70 and over) where the two counts are broadly consistent.

For females in London, the total 2005 patient register count was 7.6 per cent higher than the equivalent mid-year estimate. This proportion is very similar to that of Hammersmith & Fulham (7.4 per cent) and occurs primarily in the 25-44 age groups also. In contrast to Hammersmith & Fulham however, the patient register counts for females are higher than mid-year estimates for all age groups except those aged 75 and above. This is the same pattern seen for males in London.

In conclusion, this comparison suggests that young men are not registering with a GP in Hammersmith & Fulham. If this is the case, their migration into the borough has been captured via the International Passenger Survey. An alternative explanation is that either the population is overestimated in the young adult age groups for males or the age distribution in the population estimates is incorrect.

5.2.3 GP Patient Register Flag 4 Data

A flag 4 record on the patient register data indicates a person who resided outside the UK for at least 3 months prior to their first registration with a GP in the UK. It is therefore an indication of the number of recorded international in-migrants into an area, registering with a GP for the first time. As soon as a person with a flag 4 re-registers with another GP on moving, the flag 4 indicator is lost. Flag 4 data are considered here as an alternative source for the capture of international migrants.

There is a risk of undercount and overcount in the level of overseas migration from flag 4 and the moment of registration can be different from the moment of arrival in the UK. The minimum stay of 3 months also means that flag 4 records are technically not all international migrants because for inclusion in the mid-year estimates, a person needs to be resident in the UK for at least 12 months.

Table 7: 2003 Flag 4 data, male age distribution in Hammersmith & Fulham

Age group	Number of males with 'Flag 4' marker	%
0-9	827	8.3
10-19	817	8.2
20-29	3957	39.8
30-39	3050	30.7
40-49	809	8.1
50-59	273	2.7
60+	205	2.1
<i>Total</i>	<i>9938</i>	<i>100.0</i>

Tabulating the flag 4 records at mid-year point by age and sex for a number of years can be done to estimate inflows from abroad. The flag 4 records analysed for 2003 show a different age distribution to the patient registers as a whole. In Hammersmith & Fulham 87 per cent of all men with a flag 4 record were aged less than 40 (Table 7), compared to 39.1 per cent for all male patient register counts. The flag 4 records indicate that international male migrants registering with a GP in Hammersmith & Fulham have a younger age distribution than that for all registered males. This is in line with migration age distributions. The number of women with flag 4 indicators exceeds the number of men which either suggests that there are more female migrants than males or further evidence of male under registration.

It should be noted that some flag 4 records will be for short-term migrants and these do not fit the UN definition of a migrant that is included in the population estimates i.e. someone who intends to stay in a country for a period of 12 months or more.

In the 2003 patient register data, the number of flag 4 records for males (9,938) accounted for 10.7 per cent of all registered males. This suggests that a sizeable element of Hammersmith & Fulham's male population is international migrants.

Hammersmith & Fulham received 7,600 international migrants in mid 2003 according to the Total International Migration estimates. Of these, around half are likely to be males. Therefore, the number of flag 4 registrations for males is greater than the number of international migrants and illustrates the fact that the flag 4 data will include many short-term migrants that would not be included in the Total International Migration estimates. The previous comparison of patient registers with population estimates suggests that not all international migrants are registering with a GP when they enter the country which means that migrants staying for a year or more are likely to be underestimated in the flag 4 data.

On the other hand, the inclusion of short-term migrants who are not included in the Total International Migration estimates used in the population estimation process make health data likely to be an overestimate. There are further issues which complicate the use of these data. Not all migrants, short-term or otherwise, will register with a GP when they arrive in the country and flag 4 indicators are only retained on the patient record until an internal migratory move is made – at this point, the flag 4 indicator is removed. Conversely, a migrant could feasibly retain their flag 4 indicator for a number of years, if they do not make any further internal migratory moves after entering the country. For these reasons, these data do not give a true picture of long term migrants.

An analysis of new flag 4 registrations would be a better proxy for flows of international migrants but this is not easily accessible from the patient registration data available to ONS since there is no indication of when a flag 4 is assigned to a patient record. Comparing the number of flag 4 registrations (or stocks) from one year to the next would not identify new registrations since flag 4 registrations are deleted when an internal migratory move is made making this comparison invalid.

The possible use of flag 4 patient register data for helping to estimate international migrants is currently under consideration as part of the wider programme of work for making improvements to the migration and population estimates. However, variation between areas and differences in definition makes it difficult to use these data in a consistent way in the population estimates process. It can be concluded that without histories being attached to flag 4 data to inform on flows as well as stocks, the information that the flag 4 data provide does not provide a better source on international migration than the data sources currently used.

5.2.4 National Insurance Allocations to Overseas Nationals

Of the young male population in Hammersmith & Fulham, a proportion are likely to be migrant workers. Officials from the Council believe that this proportion is significant. This is based on anecdotal evidence and data sources which indicate an increase in the uptake of services by migrants, particularly from the Accession countries which joined the European Union on 1 May 2004. There were the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. On 1 January 2007, Bulgaria and Romania also joined the European Union.

National Insurance numbers are required for all types of work for whatever the length of stay in the UK (including students working part-time), or to claim benefits or tax credits. Data are available from DWP on the number of overseas nationals who register for a National Insurance Number (NINo) when they arrive in the UK. Some of these people will not meet the UN definition of a migrant i.e. someone that stays in a country for a period of 12 months or more. The data that ONS have obtained from DWP are not linked and so there are no migration histories. This means that there is no information about whether a migrant moves internally within the country or decides to leave the country and return home. It should also be recognised that migrants may not always notify the relevant departments even if they do make a further move. Therefore, these data do not give an indication of the stock of migrants, but they do show whether an area attracts overseas nationals.

Further detail on these data can be found in Appendix D. Work is being done currently on the feasibility of producing estimates of short-term migration and ONS plan to issue national figures later this year. Estimates for local areas are more difficult to provide. ONS is investigating potential methods and will report on this research later this year.

The data show that there was a stock of 8,790 overseas nationals with an address in Hammersmith & Fulham when they registered for a NINo in 2005, and increase of more than 40 per cent since 2004 (6,190). When the 2005 figure is compared to other local authorities in England and Wales, Hammersmith & Fulham ranked 15th (out of 376). This number expressed as a percentage of the population of Hammersmith & Fulham is 4.7 per cent and ranks 4th (out of 376) when compared to other local authorities in England and Wales.

The Total International Migration estimates show that 7,500 international migrants arrived in Hammersmith & Fulham in 2005 that intended to stay for a year or more although a proportion of these will not be of working age.

Hammersmith & Fulham is high amongst LAs (13th with 1,182 registrations) in the tables for the number of registrations from A8 countries during the financial year 2004/05. DWP data provided to Hammersmith & Fulham Council indicate that Polish registrations have been increasing, from 200 in 2002/3 to 1,280 in 2005/6. In the UK as a whole 63 per cent of all registrations to Accession nationals were Polish in the year 2005/6, in Hammersmith & Fulham the figure was 72 per cent.

Data on NINOs allocated to overseas nationals include people from the countries that joined the European Union in 2004 and 2007. As more recent data on NINo allocations become available, the impact of these changes made to the European Union on the number of overseas nationals arriving in the UK will become more apparent.

The Task Force on International Migration, an initiative set up across government to advise on timely improvements that could be made to migration estimates, identified a number of projects either taking place or being considered which may improve the quality of National Insurance data and enhance their potential use in migrant populations. These projects include work being carried out by HM Revenue and Customs (HMRC) and DWP which are identifying data quality issues. It is hoped that as this work continues, the quality of these data for statistical purposes will improve. DWP are also considering a project to gain a better understanding of the last economic activity of customers. This work might indicate whether a migrant is still in the country by looking at the latest use of the NI number. Other work by DWP is planned which links National Insurance numbers to Work and Pensions Longitudinal Study (WPLS) data which record information on earnings, tax and benefits in an effort to identify stocks of migrants.

5.2.5 Registered Social Landlords (RSL) Data (CORE)

CORE (COntinuous REcording) is a national information source funded jointly by the Housing Corporation and the Department for Communities and Local Government (DCLG) and records information on the characteristics of housing association and local authority new social housing tenants and the homes they rent and buy.

All Housing Associations with a stock of 200 properties or greater are legally required to submit CORE forms to the (HA) CORE dataset. The (LA) CORE dataset records lettings made by local authorities and not all local authorities currently contribute information to this.

Each record in the data corresponds to a letting and therefore, a household. For each record, complex information is collected for the main tenant together with more general demographic information on the other household members. CORE holds information on tenants including ethnicity, age and sex, economic status, primary reason for housing and previous area of residence. Further information on CORE data can be found in Appendix D.

Table 8: Previous residence of male moves into Registered Social Landlord (RSL) housing in Hammersmith & Fulham in 2005-6 by age of first listed male tenant in the household

		Moves	% of Moves
Under 20 years	Hammersmith & Fulham	5	71.4
	Camden	*	14.3
	Hillingdon	*	14.3
20-29 years	Hammersmith & Fulham	21	67.7
	Ealing	*	6.5
	Hillingdon	*	3.2
	Hounslow	*	6.5
	Kensington & Chelsea	*	9.7
	Westminster	*	6.5
	30-39 years	Hammersmith & Fulham	24
Brent	*	5.0	
Ealing	*	7.5	
Hounslow	*	2.5	
Islington	*	2.5	
Kensington & Chelsea	*	7.5	
Lambeth	*	2.5	
Richmond upon Thames	*	2.5	
Wandsworth	*	5.0	
Westminster	*	5.0	
40-49 years	Hammersmith & Fulham	36	78.3
	Barnet	*	2.2
	Ealing	*	2.2
	Hounslow	*	2.2
	Kensington & Chelsea	*	4.3
	Kingston upon Thames	*	2.2
	Lambeth	*	2.2
	Redbridge	*	2.2
	Wandsworth	*	4.3
	50 years and over	Hammersmith & Fulham	25
Ealing	*	3.4	
Hillingdon	*	3.4	
Kensington & Chelsea	*	3.4	
Westminster	*	3.4	

Note: * denotes a count of less than 5

Table 8 shows that most men in RSL housing in Hammersmith & Fulham have moved from another address within the Borough. However, in the younger age groups, there is a higher proportion of men moving into the Borough from surrounding areas.

The 2001 Census found that of the 75,438 households in Hammersmith & Fulham, 13.5 per cent of these were RSL housing, whilst 19.2 per cent were Council housing. Therefore, while the CORE data can be used to produce a profile of young men living in RSL housing, it is a relatively small subset of the population and so it cannot be used to make better estimates of all young men in the population. Further analysis of these data could give some indication of the type of people in RSL housing.

5.2.6 School Census

There is considerable movement of school children into and out of the Borough. Similarly, there are a large number of higher education and further education students living in Hammersmith & Fulham, but many of these students may attend college elsewhere in London.

The School Census is a snapshot of pupils within the state school system, which is now taken each term in England and annually in the rest of the UK. It contains variables that could be used as proxies for migration e.g. information is collected on ethnicity and whether English is the pupil's first language.

Data from the school census can be used as an indicator for migration of migrant families with children e.g. by using the variables described above and by identifying children who join the system at an age above the start of schooling.

Information from schools in the Borough indicates a rise in the number of Polish-speaking pupils over the period 2002 to 2006. During this time the number of Polish-speaking pupils within the Borough's nursery and primary schools has increased from 114 to 152 (33 per cent increase). The number of Polish-speaking pupils within secondary schools has remained almost constant, but the majority of these pupils travel in from outside the Borough.

Although the Borough has seen a rise in the number of Polish-speaking pupils, it is also an attractor for migrants of other nationalities due to the established population originating outside the UK.

ONS have obtained School Census data for the years 2002 to 2005 and a quality assessment has been carried out. Findings include:

- The quality of postcode information varies, with London having the least complete postcode information. In 2006, 99.9 per cent of pupil records nationally had a valid postcode.
- In 2004, there were 219 schools where 30 per cent or more of pupil's ethnicity was not obtained. In 2006, this figure had reduced to 44 schools where 30 per cent or more of pupil's ethnicity was not obtained.

According to School Census data, there were 1,592 pupils from 'other White' ethnic groups in Hammersmith & Fulham in 2005, 10.0 per cent of the pupil population (in 2004, this figure was 1,534 (9.6 per cent)). The percentage of pupils of 'other White' for English LEA schools was 2.2 per cent. For the case studies, an ethnicity of 'other White' was selected to identify migrants from the Accession countries. This group excludes 'White British' and 'White Irish' but should include white people from all other groups, for example Europeans (including people from Accession countries), New Zealanders and Australians. The School Census data also showed that there were 6,512 pupils where English was not their first language in Hammersmith & Fulham in 2005, 40.8 per cent of the pupil population. The national percentage of pupils where English was not their first language was 11.4 per cent.

School Census data were considered by the Task Force on International Migration Statistics which recognised the potential value of this data source. The Task Force recommended that potential uses of these data for improving migration and population statistics should be investigated. The Task Force also suggested that School Census data may be useful if linked to other sources to provide more information about migrants and their children, for example linking school census data to surveys or censuses could provide information not readily available elsewhere about child migrants, children of migrants and, by association, the parents themselves.

If used alone, School Census data do show where there are increases of specific ethnic groups in an area but it is not a direct indication of numbers. Further investigation of this dataset with a view to using it to inform migration estimates is needed and it is intended that this will be carried out as part of the work to take forward the recommendations from the Task Force on International Migration.

5.2.7 Housing Needs Survey

Hammersmith & Fulham Council carried out a Housing Needs Survey in 2003. The main aim of this survey was to investigate the housing needs and aspirations for the borough, and is part of a rolling programme of such surveys across London. However from this survey it is also possible to derive information about migration in to and out of Hammersmith & Fulham. The survey covered 2 per cent of households, and had a 45 per cent response rate.

From the grossed up survey results it is estimated that 35,394 households have moved to their current accommodation within the last five years (46.4 per cent of all households).

Table 9: Location of previous home (movers in last five years)

Location	No. households	% households
Within H&F	17,349	49.0
Elsewhere in London	11,885	33.6
Elsewhere in the South East	1,488	4.2
Elsewhere in UK	2,092	5.9
Abroad	2,579	7.3
Total	35,393	100.0

Source: Hammersmith & Fulham Council – Housing Needs Survey 2003

Table 9 indicates that just under half of household moves took place within the Borough. The housing survey report says that a significant proportion of household moves were from nearby local authorities, notably Kensington & Chelsea. A more detailed analysis of previous location of movers into their current accommodation would indicate to what extent moves are from neighbouring boroughs.

The survey also indicated that households moving within the Borough are more likely to live in social rented housing, and in-migrant households are most likely to live in private rented housing. Private rented housing accounts for 22.2% of housing in the area, and council and RSL housing account for 17.7% and 16% respectively.

Other ONS developmental work to improve population statistics has been carried out to investigate whether it was possible to predict population change from changes in housing stock. However, increases in house building did not always relate to an increase in population. This work concluded that there was not a simple relationship between population and household size and further work was needed in order to understand the complexities of this relationship. Ageing, divorce and changes in household formation norms have all contributed to increasing proportions of the population living in one-person households, leading to a demand on housing but not necessarily to an increase in overall population.

This research also found that there are large variations in household size, formation rates and composition both between and within local authorities. This means that any relationships found between housing and population numbers are unlikely to be uniform and consistent across local authorities. For these reasons, information from housing surveys do not provide a reliable estimate of population and migration. However, they can give an indication of population change and the housing needs of the population in an area.

There are a number of areas within ONS that are interested in the value of administrative data sources. Data generated from housing surveys may provide intelligence for data collection elsewhere within the organisation e.g. surveys managed by ONS and the 2011 Census.

5.2.8 Council Tax

Council tax data are a potentially valuable source that ONS is considering in the work to make improvements to the population and migration estimates. The council tax billing list is collected in each local authority and can identify properties which are exempt from council tax where they are occupied solely by students or eligible for a discount where they are occupied by a single person.

Data on student exempt properties were analysed for the Derby and Welwyn Hatfield case studies to illustrate the areas where most students live. Although this data source has value in this respect, there are a number of limitations which make it unsuitable for estimating the number of students who may be living in Hammersmith & Fulham. For example, it is not possible to determine counts of residents in student exempt properties, only the numbers of properties which are exempt. In terms of coverage, those properties which are jointly occupied by both students and non-students (including students living in parental homes) cannot be identified as well as properties solely or partly occupied by part-time students. These students will be missed. An understanding of the 'average' household size of student properties could enable a crude estimate of the student population of an area to be made, but the coverage issues mentioned above may make such an estimate quite unreliable. As identified in the Welwyn Hatfield case study, the best data source on numbers of students living in an area continues to be the individual educational institutions and HESA (from 2008 onwards).

Hammersmith & Fulham have investigated the use of council tax data to identify migrants. People moving in and out of households are generally not recorded on council tax data and name changes could be interpreted as a migration whereas in fact the change may have been due to other factors such as marriage or widowhood. In Hammersmith & Fulham, there are about 15,000 changes recorded per year, though these do not all relate to moves of people, and where they do refer to moves, the number of people involved is not recorded. For these reasons, this data source was not considered suitable for providing information about the number of persons moving in and out of properties within the Borough.

Council tax data can also be used as an estimate of households. Council tax billing lists were used in the ONS 2004 local authority studies exercise and helped to identify wards where the One Number Census process had not worked as well as it could. Adjustments were made to the population estimates for a small number of local authorities as a result of this work. More information can be found at the following link:

http://www.statistics.gov.uk/about/Methodology_by_theme/LAStudies.asp

One aspect of this work was to compare the number of occupied addresses identified on council tax data with the number of occupied properties identified in the Census. Where there were considerably more council tax properties, this indicated that there may have been a problem with enumeration in the Census. In addition, this could indicate areas with a large number of second homes which would inflate the council tax property list. This occurred in Westminster where difficulties in enumeration and second homes were both issues. In Hammersmith & Fulham, there were 2,700 more properties identified in the Census than on council tax records. This would suggest that second homes are not a significant issue in Hammersmith & Fulham.

Council tax data obtained from the Department of Communities and Local Government (DCLG) has information on the number of properties eligible for either a single person discount or a second home discount. This information has been used in conjunction with the average household size to produce a rough estimate of the population that could be used as a plausibility check - this is not a robust estimate of the population. This is shown in Table 10.

Table 10: An estimate of the population of Hammersmith & Fulham using council tax data and average household size

Council Tax data 2004-05	Number
Total number of properties	77,453
Number of properties exempt	2,332
Number of second homes	3,780
Number of properties occupied by one or more persons and subject to council tax	71,341
<i>Average household size (2001 Census)</i>	2.16
Total estimate of persons in households liable to council tax	154,097

This illustrates how an estimate of population may be made from council tax data. This estimate does not include students who are living in wholly student households, people living in exempt properties or people living in communal establishments such as halls of residence, so the estimate of the population of 154,097 will underestimate the usually resident population³. Conversely, the estimate will include persons who do not fit the definition of a usual resident used in the population estimates. In particular, the estimate will include short-term migrants who do not stay in the country for more than a year, whose inclusion will result in an overestimate of the usually resident population.

ONS want to investigate the potential use of council tax data in population estimation but the exercise above illustrates that a robust method is needed to convert these data into population estimates. It is likely that more than one method would be needed for different types of areas.

³ In 2001 Census, FT students aged 18-74 numbered 8,863, residents in communal establishments excluding students aged 18+ in halls numbered 1,888, resulting in a possible additional 10,751 in 2001. This still excludes those living in exempt properties.

5.2.9 Other Council Sources

The primary database is the gazetteer property database, which supplies changes to information to other database holders (planning, council tax, client service index and electoral statistics). Updates received by other data managers are fed back to the gazetteer data. Many address lists, with differing information and coverage are currently used by various Council departments and services.

In addition to the gazetteer property database, a number of individual data sources are also kept and updated, covering Council Tax, Housing and council tax benefits, Library, Social Services, Electoral Roll and Council housing tenant data. These do not all however intentionally contain demographic information, and so linking of data sources is only possible in a limited way. There is a plan to link household data with client service data, covering all services, benefits and grants to households within the Borough. The data on all Social Service contacts may contain age, but the whole population is not covered.

The general conclusion was that neither of the council databases was kept for demographic purposes and this limited their use in population and migration estimation. If the individual data sources were linked, they would cover the majority of the population and could provide an indication of population stocks. However, information would need to be kept up to date on each of the sources. In their current unlinked state, there is insufficient detailed information on the people living in the borough to enable them to be used as a robust compiled data source for production of population estimates at this point in time.

5.2.10 HESA Data

The 2001 Census indicates that a significant proportion of young males in Hammersmith & Fulham were students. Data are available from HESA on home postcode for students entering higher education from within the UK or country of domicile immediately prior to entry for others. No information is collected on the term-time address of students and this is a limitation of the current data collection.

However, the term-time full postcode will be collected from 2007/08. If both the home and term-time address were available, these data would inform both internal migration estimates of students and international migration of foreign students. HESA were considered by the Inter Departmental Task Force on International Migration Statistics set up by ONS which recommended that additional information on student migrants should be collected from this source.

Whilst data are available from HESA for students studying at institutions within Hammersmith & Fulham, because of the large number of educational establishments in central London, there are a significant number of students who study at institutions within Hammersmith & Fulham but reside elsewhere in London. In addition, there will be students who live in Hammersmith & Fulham but study elsewhere in London. For this reason it is not meaningful to attempt to compare HESA data on students studying within Hammersmith & Fulham with the mid-year estimates.

It is noticeable from HESA data that the number of Higher Education students within the UK has risen steadily in recent years. It is not, however, apparent from the data by institution which students are studying within London, as many London-based institutions have campuses and affiliated colleges elsewhere whose numbers are attributed to the main body. For instance, Thames Valley University which is based in Ealing merged with Reading College and School of Arts and Design in January 2004, thereby doubling their student numbers with a campus which is not within London. Plans to collect term-time address on HESA data will make it easier to identify students who are resident in a particular borough.

While council tax data records information on properties that are exempt from council tax because they are solely occupied by students, it is not possible to use this information to obtain an estimate of the student population. This is because students that live in properties with non-students cannot be identified on this source.

5.2.11 Other Sources

Other administrative sources have been investigated as part of the ONS development work to improve population statistics which are relevant to the case study in Hammersmith & Fulham. For example, data from the Driver and Vehicle Licensing Agency (DVLA) have been considered for possible use in international migration since persons who hold a driving licence and are moving abroad may inform the DVLA. This source should include young people and young men in particular who hold a driving licence.

However, the work has found that these data are of insufficient quality for this purpose. This is because data on persons who emigrate and inform the DVLA can't be distinguished from those who have informed DVLA that they have lost their licence while on holiday. This source has not been investigated as an estimate of population stocks because it only includes a subset of the population and address information is not considered to be reliable in some cases. Other sources have been considered e.g. child benefit data and the European Health Insurance Card (EHIC) as possible sources to estimate the number of UK citizens emigrating but were rejected, mainly due to definitional issues. Many datasets could not be used because there was no indicator to identify short-term migrants from those emigrating for a period of a year or more.

The Worker Registration Scheme (WRS) was introduced by the Home Office prior to Accession in order to monitor the impact of EU Accession on the labour market. WRS data can provide a cumulative figure of the number of workers applying to the WRS but does not provide any information on departures. It should be noted that the WRS will only be available for a limited period into the future. Under the Accession Treaty, countries could regulate access to their labour market for up to five years as a transitional measure. For this reason, these data will not provide a long term method for estimation of temporary foreign workers. Therefore, these data have not been pursued further as part of this case study which is investigating data sources and methods that can be used into the future.

ONS have been considering data from the WRS together with other data sources as part of the research into estimating short-term migrants. There is some uncertainty about the reliability of the residential address recorded in the WRS data and it is thought that the workplace address may be more accurate. However, the workplace definition is not consistent with the residence definition that underlies the population statistics. A paper on this research is to be published later this year.

Chapter 6 Findings

In this section, the data sources that have been considered for their relevance to, and possible use in, improving population and migration estimates are reviewed. The research has been focused around the five objectives of the Hammersmith & Fulham study outlined in Chapter 2 of this report. Each objective is considered below.

1. To gain a general understanding of the population estimates in Hammersmith & Fulham, including how Hammersmith & Fulham Council use population estimates and what challenges there are to making an accurate estimate of their population.

The population estimates are used in Hammersmith & Fulham primarily as a denominator for rates and performance indicators. The mid-year estimates and the Census results were close to the Council's expectations. However, there is a clear need for the mid-year estimates to accurately reflect demographic change within Hammersmith & Fulham, most noticeably in terms of population change as a result of the relatively high levels of internal and international migration.

In order to identify the factors that make it difficult to produce accurate estimates of the population in Hammersmith & Fulham, the components of the population estimation process that present the greatest challenges were considered. The data analysis did not identify any evidence to suggest that the population estimate were incorrect although the high rate of migration was identified as the main challenge to estimating Hammersmith & Fulham's population accurately. The high proportion of students and young adults also contribute to that challenge. Other factors given some consideration were the high proportion of people from non-White ethnic groups and the impact of migrants, and in particular, migrants who have arrived since Accession in 2004. Some of these migrants will be short-term migrants which are being investigated in a separate project. Other factors described above have been investigated in other case studies (the study of Welwyn Hatfield focused on students, Derby on young males and Barnet on ethnic groups).

2. To investigate whether other local data sources may be available to potentially improve the migration or population estimates, and whether they are available in other local authorities in the same cluster.

A number of data sources were investigated to see if they could be used as a potential data source for improving the migration estimates or population estimates. Some of these sources had definitional issues which make them unsuitable for direct estimates of the population. For example the patient register flag 4 records are not consistent with the definition of a migrant used in the mid-year estimates; this is also a feature of the DWP data of National Insurance numbers for overseas nationals entering the UK. The electoral registers are a source of information about other EU citizens residing in the Borough although they are limited by their lack of age and sex information. However, these sources do help to build up a picture of population change in the Borough, and have the potential to provide some broad quality assurance checks on the migration estimates used in the mid-year estimates. As these are all nationally available datasets then they also have relevance for other local authorities both within and outside Cluster 1.

The Property Gazetteer was considered as a potential data source but it is household based and does not help to estimate populations. However, ONS is investigating the potential of council tax data to inform population estimation if a method could be derived to convert estimates of households into people.

3. To identify to what extent the high rates of migration, and high proportions of young males and students may all be inter-related, and to investigate if young males and students are accurately reflected in the population estimates for Hammersmith & Fulham.

2001 Census has indicated that high rates of migration and high proportions of young males and students are to some extent inter-related. It is a known feature of the patient registers nationally that young males (and females) are over recorded, thus resulting in 'list inflation' for this element of the population. The patient register data for Hammersmith & Fulham suggest that young males are not adequately covered on the patient registers, as these counts are below the mid-year estimates. This inconsistency for young males between the numbers recorded on the patient registers and the mid-year estimates for Hammersmith & Fulham may require further investigation.

To improve estimates of international migration, it may be possible to use data on registrations of National Insurance numbers to overseas nationals, although further work will be required to assess the feasibility. Estimates of internal migration should be improved when term-time address is collected on HESA data, due to commence in 2007/08. This could help to make better estimates of student migration in the population estimates.

Although this study has found no single data source which can provide a better estimate of young men and students than those currently used in the population estimates, it has identified sources which may help to inform the estimation of this population sub-group.

4. To understand better the characteristics of the population from non-White ethnic groups and to investigate if this population group is accurately reflected in the population estimates for Hammersmith & Fulham.

Generally the ethnicity of individuals is not recorded on administrative datasets, as historically this information has not been needed for the administrative purpose for which the data have been collected. Where it is currently collected e.g. Schools Census, schools are asked to survey the parent to establish ethnicity. In some cases, this is not happening and the pupil or the school is determining ethnicity. This is a potential source of inconsistency in the way this information is collected.

Information does exist on a number of national ONS surveys, for example the Longitudinal Study, the General Household Survey and the Labour Force Survey, which are available at a national level but cannot be used down to local authority level due to a relatively small sample size by local authority. Hospital Episode Statistics do record ethnic group of child and for some areas, ethnic group of the mother, but this will only provide information on a relatively small part of the population.

A Race Impact Assessment has been carried out by ONS to assess if the methodology and data sources used to produce its population estimates might cause any biases in the estimates for those local authorities who have high Black and Minority Ethnic (BME) populations. A copy of the report is published on the ONS website. The various analyses underpinning this assessment bring a reasonable level of reassurance on the potential for biases. However, the study recommended that ONS continues to make concerted efforts to improve its migration estimates. It also recommended that ONS pursues a coherent strategy to ensure the highest possible level of response from various ethnic groups in the 2011 Census.

5. To consider what impact the enlarging of the EU in May 2004 may have had had on the borough in terms of 'new' migrants from these accession countries, and to get a better understanding of how many of these migrants are reflected in the population estimates for Hammersmith & Fulham and how many are short-term migrants.

There is evidence from a number of sources (for example electoral registers and National Insurance number allocations to overseas nationals) that Hammersmith & Fulham has received an increase in international migrants from the Accession countries since the enlarging of the EU in May 2004. There is also evidence that these migrants are recorded on other administrative datasets e.g. school records and the patient registers. Whilst no data source has been identified which could provide a more accurate count of international migrants, there is no evidence to indicate that these migrants are not adequately reflected in the mid-year estimates. However, data sources such as the DWP data on National Insurance number allocations could be used in assessing the plausibility of international migration estimates.

ONS have been investigating the feasibility of making estimates of short-term migration using administrative data sources such as National Insurance number allocations and WRS data. This work has indicated that local estimates of short-term migration will not be available for some time. A paper on this research is to be published later this year.

Chapter 7 Discussion

The case study for Hammersmith & Fulham focused on the investigation of how young people, and in particular, young men, students and migrants were estimated in the population estimates.

Young men living in Hammersmith & Fulham may be international migrants, migrants who have moved from elsewhere in the UK or another London borough or already be living in the Borough. Whether or not they are migrants, they can be broadly classified into three groups: students, young working males and people who are not in employment, education or training (NEET). This study has considered how well each of these groups is represented in the population estimates.

Students are not readily identifiable from the key administrative datasets used to make population estimates and the extent to which students may be under or over represented in the mid-year estimates is difficult to quantify. In the student age groups for males, the population estimates are higher than the patient registers. This is unusual and suggests that either the population estimate is an overestimate in these age groups or that young men are not changing their GP registration when they move into the area which would mean that their internal migratory moves will not be captured. Students are a very mobile sub-group of the population so this would imply that their moves may not be captured into and out of the Borough.

Migration, both internal and international has been identified as a feature of central London Boroughs in Cluster 1, and data sources have been identified (for example patient register flag 4 data and National Insurance number allocations) which may help to assess the plausibility of migration estimates to and from Hammersmith & Fulham. Data on flag 4s illustrated the large volume of international migrants resident in Hammersmith & Fulham. However, many of these could be short-term migrants who do not stay in the country for over a year. The study has not found a definitive data source which provides better data on this population component of change than current sources, but in the future these sources may help in the estimation of flows of migrants from overseas.

The research work has identified a number of administrative sources that provide some information about these different sub-groups of the population. Estimates of the population aged 18 and over based on distinct data sources result in differences that need reconciling. A number of these sources could be used indirectly in population estimation even if it is not possible to reconcile the differences.

The presence of students in Hammersmith & Fulham was identified as a factor that might present a challenge in making accurate estimates of the population. It was decided not to give greater focus on students in this study because the case study of Welwyn Hatfield concentrated on students and how they could be estimated in population statistics. That work recognised the importance of the plans to collect term-time address on HESA data from 2007/08 and concluded that this information could be used to make a student adjustment or to estimate students in the population estimates as a special population group. Any future improvements to how students are estimated would therefore be beneficial to the population estimate of Hammersmith & Fulham which has a significant student population. The use of HESA data for this purpose is being taken forward as part of the recommendations of the Task Force on International Migration.

Data on National Insurance number allocations to overseas nationals can give an indication of the number of overseas nationals who arrive in the country and seek work. There are issues with these data that mean that they cannot be used directly either to estimate migration flows or numbers of migrants resident in the county. This is because it is not currently possible to distinguish between short-term and long-term migrants within these data as there is no indication of length of stay or whether a migrant has subsequently left the country. There are plans to improve the quality of this data source by identifying those National Insurance numbers that are inactive and identifying reasons for this, so as to provide better evidence on which National Insurance numbers related to those that have left the country. Once this work is complete, it may be possible to use these data, possibly in combination with other sources. The Task Force on International Migration recommended the Work and Pensions Longitudinal Study (WPLS) as a possible supplement to unlinked National Insurance data, alongside the use of NHS Central Register data.

Other sources have been identified which cannot be used to estimate stocks of migrants but might have the potential to indicate flows of migrants or changes in the stock of population sub-groups over time. However, there are issues that need resolving with this use of these data sources. These include School Census data which include information on ethnicity and whether English is the pupil's first language. Although these variables are not direct indicators that a pupil is a migrant, the data may be used to show how particular sub-groups of the population have changed over time.

When investigating population estimates in the Derby Case Study, the potential of PeopleUK, a combination of electoral registers and lifestyle surveys, was identified as an indicator of change in the number of adults in the population over time. This information is available on a national basis. However, it has not been examined for its applicability to areas other than Derby. Since this source is a national data set, its availability, relevance and data quality for other local authorities should be investigated.

A more in-depth investigation into data sources covering ethnic groups was undertaken as part of the Barnet Case Study, as so has not been a main focus of this report. The findings of that study will be published shortly

Chapter 8 Recommendations

The following recommendations are proposed as a result of the case study for Hammersmith & Fulham and the other case studies undertaken:

- 1) Migrants, both students and non-students, have been identified as a significant population sub-group in Hammersmith & Fulham. To address the measurement of international migrants, work should take place to look at data on the allocation of National Insurance numbers to overseas nationals and information collected by the NHS about the arrival of new migrants. This endorses the finding of the Task Force which recommended that key data sources such as the Work and Pensions Longitudinal Study (WPLS) should be used in combination with health and education data.
- 2) Further investigation should be made into nationally available data sources which may be used to assess the plausibility of the population estimates. These sources include School Census data and data from PeopleUK. These sources if available nationally could help indicate population change over time although further work is needed to understand differences between the numbers obtained from these sources.
- 3) There is evidence of a potential inaccuracy in the estimate of the population aged under one, particularly in a number of boroughs in London although the numbers involved are small relative to the total population. Further work will be taken forward at a national level on how babies aged under one are estimated in the population statistics, subject to prioritisation within the work programme.

- 4) Further work is needed to investigate whether the internal migration of young men is being captured properly. Within young adults in Hammersmith & Fulham, students are a significant population sub-group. Further work should be taken forward in conjunction with the findings of the Welwyn Hatfield study which recommended pursuing the feasibility of making a student adjustment or treating students as a special population group using HESA data, once it is enhanced with term-time address. Work will also investigate the necessity and feasibility of making further adjustments to internal migration estimates in respect of young men who are not students.
- 5) Hammersmith & Fulham has an established and growing Polish community. ONS is investigating the feasibility of producing short-term migration estimates. The Hammersmith & Fulham study endorses the need for that work.

Appendix A Supporting Analysis

1. Framework of 'Risk Factors'

In selecting local authorities for further study, a framework was constructed to provide a comprehensive analysis of where there might be risks to the population estimates. This is shown overleaf.

<input type="text" value="Did the Census underestimate the population? (LA 2004)"/>	CENSUS BASE
<input type="text" value="Did the Census overestimate the population?"/>	
<input type="text" value="Did the Census incorrectly apportion the ONC adjustments across local authorities within EAs?"/>	
<input type="text" value="Are there births that do not get registered?"/>	BIRTHS
<input type="text" value="Are there births registered where the baby should not be counted in the population? E.g. family leave the country immediately"/>	
<input type="text" value="Are there deaths which are registered in the wrong LA?"/>	DEATHS
<input type="text" value="Are there people who move but the move is not counted because they do not register in the new area?"/>	INTERNAL MIGRATION
<input type="text" value="Are there adults who never register so remain counted in the area they were in full time education?"/>	
<input type="text" value="Are there people who move but the move is incorrectly counted because they register in the new area but were not registered in the old area?"/>	
<input type="text" value="Are asylum seekers coming in correctly allocated to local authorities? (Census)"/>	INTERNATIONAL MIGRATION
<input type="text" value="Are asylum seekers who leave correctly subtracted from local authorities? (IPS)"/>	
<input type="text" value="How are asylum seeker centres accounted for?"/>	
<input type="text" value="Are visitor switchers correctly allocated to local authorities?"/>	
<input type="text" value="Are other international migrants coming into the UK correctly allocated to local authorities? (IPS)"/>	
<input type="text" value="Are other international emigrants correctly subtracted from LA? (IPS)"/>	
<input type="text" value="Are flows to and from Ireland correctly apportioned to local authorities?"/>	
<input type="text" value="Armed Forces"/> <input type="text" value="Boarders"/> <input type="text" value="Students"/> <input type="text" value="Prisoners"/>	MOBILE/DIFFICULT GROUPS
<input type="text" value="Are sex ratios plausible?"/>	NEW BASE
<input type="text" value="Are age / sex percentages plausible?"/>	

2. Alternative Sources of Data on Births in the Area

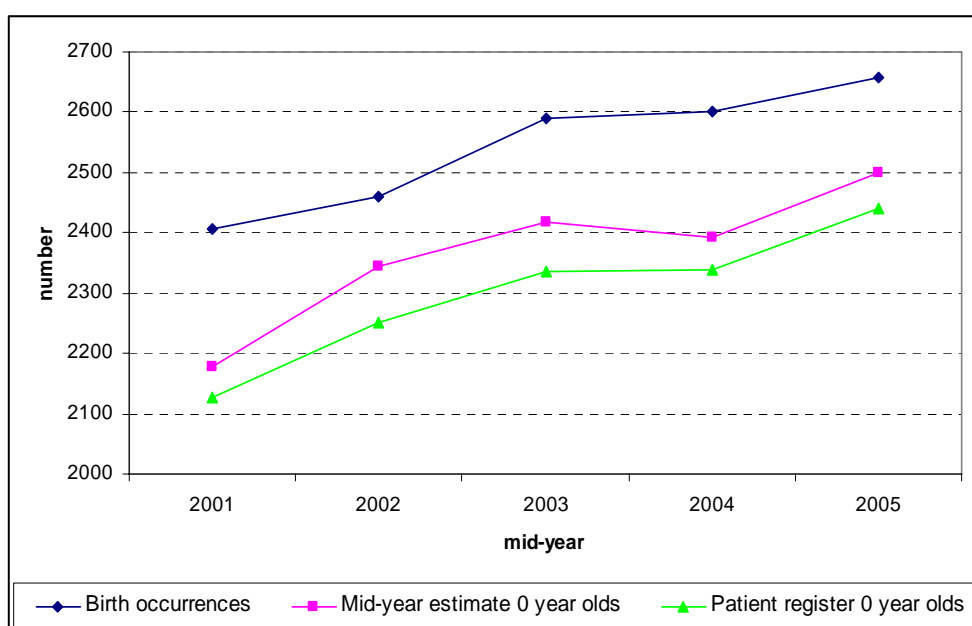
Data on the maternity service at Hammersmith's Queen Charlotte Hospital are kept by the NW London Strategic Health Authority, along with statistics from the Chelsea and Westminster Hospital in Kensington & Chelsea. These hospitals cater for patients across a wide area of London, and so special analysis of home address of mothers is required to identify those births to mothers who reside solely within Hammersmith & Fulham.

Some work has been done by Hammersmith & Fulham PCT to link the NHS numbers of babies born at these two hospitals in 2004 with registers of Hammersmith & Fulham GPs in September 2005, in order to attempt to quantify migration of under-1s over this period. Further work is required on this potentially useful source. ONS is carrying out a separate piece of research to investigate the challenges in accurately estimating the population of under-1s, and local data sources that could yield information about place of residence versus place of birth would be potentially useful in this work.

3. Comparison of Recorded Births, Mid-year Estimates and Patient Registers in Hammersmith & Fulham

Figure 15 shows differences since 2001 between birth occurrences, mid-year estimates and patient registers. The patient registers are lowest because there is sometimes a lag in babies being registered with GPs.

Figure 15: Recorded births and 0-year-olds in mid-year estimates and patient registers in Hammersmith & Fulham, 2001 to 2005



4. Census Data on the Polish Community in Hammersmith & Fulham

The 2001 Census recorded 1,138 Borough residents who were born in Poland, a significant group within the Borough, though less than 1 per cent of the total population. These made up almost 2 per cent of the total national Polish-born population, the 4th highest proportion of the 376 local authorities. Polish households were fairly evenly distributed through the Borough. This Polish-born population had an older age structure than for the Borough as a whole, with almost one-third aged 65 or over, compared to 11 per cent for the Borough as a whole. It is assumed that this reflects the established settlement of Polish people around the time of the Second World War.

In May 2004 Poland joined the EU and Polish workers gained full rights to work in this country. It is possible that established Polish communities act as attractors to new migrants. Indicative numbers of National Insurance number registrations by Polish nationals are discussed in section 5.2.4. These are not, however, directly related to the resident population as not all will be long-term migrants.

5. Sex Ratios of Young Adult Migrants

Table 11: Sex ratios for young adults in internal migration estimates, comparing Hammersmith & Fulham with England and Wales, mid-2005

	Inflow		Outflow	
	Hammersmith & Fulham	England & Wales	Hammersmith & Fulham	England & Wales
All ages	0.8	0.9	0.8	0.9
15-19	0.8	0.8	0.7	0.8
20-24	0.5	0.7	0.5	0.7
25-29	0.6	0.8	0.5	0.8
30-34	0.9	1.0	0.8	1.0
35-39	1.2	1.2	1.1	1.2
40-44	1.3	1.3	1.2	1.3

6. Students and Migrants

Three of the features of Cluster 1 containing Hammersmith & Fulham are the high rate of migration, and high proportions of young males and students. It is possible from the 2001 Census to identify to what extent (if any) the high rates of migration, young males and students may all be inter-related.

Table 12 shows the percentages of the 19-21 population split by sex and student and migrant status.

Table 12: Student and Migrant Status for males and females aged 19 to 21 in Hammersmith & Fulham, 2001 Census

Student status Address 1 year ago	Percentage of residents aged 19-21		
	Male	Female	Total
Full Time Students			
Living within Hammersmith & Fulham	16.2	14.0	30.2
Living elsewhere in UK	10.6	8.8	19.4
Living outside UK	0.8	1.6	2.4
Total	27.6	24.4	52.0
Not Full Time Student			
Living within Hammersmith & Fulham	16.2	18.9	35.1
Living elsewhere in UK	3.6	5.5	9.1
Living outside UK	1.1	2.7	3.8
Total	21.0	27.0	48.0
All residents			
Living within Hammersmith & Fulham	32.4	32.9	65.3
Living elsewhere in UK	14.3	14.3	28.6
Living outside UK	2.0	4.2	6.2
Total	48.6	51.4	100.0

For ease of reference in the following paragraphs, ‘students’ refers to full-time students, ‘non-students’ to all other 19-21 year olds (i.e. non-students and part-time students); ‘internal migrants’ refers to those living elsewhere within the UK one year previously and ‘international migrants’ refers to those living outside the UK one year ago.

For ages 19-21 in Hammersmith and Fulham:

- The proportion of students was higher than national average (52 per cent compared with 35 per cent);
- There were slightly more male students than female ones:
 - With proportionately slightly more male than female internal migrants;
 - But with twice as many female students from overseas than males.
- For internal migration, there were more than twice as many student migrants as non-student migrants;

- For international migration, there were twice the national average student migrants (2.4 per cent of 19-21 year olds compared with 1.2 per cent for England and Wales), but:
 - Non-students were the larger body of international migrants (3.8 per cent, compares with 0.8 per cent for England and Wales); and
 - Again, more female than male international migrants.

In summary, the 2001 Census data show that students had more internal migration moves than non-students, while non-students had more international migration than students. There were slightly more male students than females, and more female than male international migrants regardless of student status.

Appendix B Clusters of Local Authorities

To identify areas for study, cluster analysis was used to group local authorities into fifteen clusters of areas with similar demographic characteristics. Hammersmith & Fulham is included in cluster 1. The clusters are as follows:

Cluster 1

Central London Boroughs with the highest population density and rates of migration and young males, and well above the national average proportions of students and people from non-White ethnic groups:

Camden, City of London, Hammersmith & Fulham, Islington, Kensington and Chelsea, Lambeth, Wandsworth, Westminster

Cluster 2

Outer London Boroughs, together with some areas outside London. These local authorities also exhibit above average population density and migration and rates of young males and students, but not as high as Cluster 1. Their non-White proportions are typically higher than in Cluster 1.

Barking and Dagenham, Barnet, Croydon, Enfield, Greenwich, Harrow, Hillingdon, Hounslow, Leicester UA, Luton UA, Merton, Redbridge, Slough UA, Waltham Forest, Watford

Cluster 3

Mainly urban areas spread across England with above average population density and young males but lower than average values of the other variables:

Basildon, Basingstoke and Deane, Bedford, Bexley, Bromley, Broxbourne, Bury, Cannock Chase, Chelmsford, Crawley, Gloucester, Gravesham, Harlow, Hastings, Havering, Hyndburn, Ipswich, Kettering, Kingston upon Hull UA, Medway UA, Middlesbrough UA, Milton Keynes UA, Northampton, Pendle, Peterborough UA, Plymouth UA, Redditch, Salford, South Gloucestershire UA, Southend-on-Sea UA, Stevenage, Stoke-on-Trent UA, Sutton, Swindon UA, Tamworth, Telford and Wrekin UA, Thurrock UA, Trafford, Worcester, Worthing

Cluster 4

Other Inner London Boroughs with the highest proportions of people from non-White ethnic groups and above average population density and proportions of migrants, students and young males:

Brent, Ealing, Hackney, Haringey, Lewisham, Newham, Southwark, Tower Hamlets

Cluster 5

Mainly Southern parts of England with above average internal migration and Armed Forces:

Blackpool UA, Bracknell Forest UA, Broxtowe, Cherwell, Chester, Colchester, Dartford, East Cambridgeshire, East Hertfordshire, East Northamptonshire, Eastleigh, Elmbridge, Epping Forest, Epsom and Ewell, Fareham, Gosport, Hart, Hertsmere, Kennet, Mid Bedfordshire, North Hertfordshire, North Kesteven, North Wiltshire, Reigate and Banstead, Rushcliffe, Rushmoor, Salisbury, South Bedfordshire, South Cambridgeshire, South Derbyshire, South Oxfordshire, Spelthorne, St. Albans, Surrey Heath, Test Valley, Three Rivers, Tunbridge Wells, Vale of White Horse, West Berkshire UA, West Oxfordshire, Winchester, Windsor and Maidenhead UA, Woking, Wokingham UA, Wycombe

Cluster 6

University towns and cities with high proportions of students, young males and migrants, and somewhat above average rates of non-Whites:

Brighton and Hove UA, Bristol UA, Exeter, Kingston upon Thames, Manchester, Norwich, Nottingham UA, Portsmouth UA, Reading UA, Richmond upon Thames, Southampton UA

Cluster 7

Urban areas in the North, Midlands and Wales with below average values on all the risk factors:

Allerdale, Barnsley, Barrow-in-Furness, Blaenau Gwent, Blyth Valley, Bolton, Bridgnorth, Caerphilly, Calderdale, Carlisle, Carmarthenshire, Chesterfield, Copeland, Corby, Darlington UA, Derwentside, Doncaster, Dudley, Easington, Ellesmere Port and Neston, Flintshire, Gateshead, Halton UA, Hartlepool UA, Isle of Anglesey, Knowsley, Merthyr Tydfil, Neath Port Talbot, Newport, North East Lincolnshire UA, North Lincolnshire UA, North Tyneside, Nuneaton and Bedworth, Oldham, Redcar and Cleveland UA, Rhondda, Cynon, Taff, Rochdale, Rotherham, Sefton, South Tyneside, St. Helens, Stockport, Stockton-on-Tees UA, Sunderland, Swansea, Tameside, Torfaen, Wakefield, Walsall, Wansbeck, Warrington UA, Wigan, Wirral, Wrexham, Wyre Forest

Cluster 8

Large cities in the North and Midlands with above average proportions of non-Whites, students and young males but low rates of internal migration:

Birmingham, Blackburn with Darwen UA, Bradford, Coventry, Derby UA, Kirklees, Leeds, Liverpool, Preston, Sandwell, Sheffield, Wolverhampton

Cluster 9

More rural areas with low population density and well below average values on the other risk factors:

Alnwick, Amber Valley, Arun, Ashfield, Ashford, Berwick-upon-Tweed, Bolsover, Braintree, Broadland, Burnley, Caradon, Castle Point, Chester-le-Street, Congleton, Conwy, Crewe and Nantwich, Denbighshire, Dover, Eden, Erewash, Forest of Dean, Gedling, Great Yarmouth, Gwynedd, Hambleton, Harrogate, Havant, Herefordshire; County of UA, High Peak, Hinckley and Bosworth, Kerrier, King's Lynn and West Norfolk, Macclesfield, Maldon, Mansfield, Melton, Mendip, Mid Suffolk, New Forest, Newcastle-under-Lyme, North Devon, North East Derbyshire, North Norfolk, North Somerset UA, North Warwickshire, North West Leicestershire, Oswestry, Pembrokeshire, Penwith, Powys, Restormel, Ribble Valley, Rochford, Rossendale, Rugby, Ryedale, Scarborough, Sedgefield, Sedgemoor, Selby, Shepway, Shrewsbury and Atcham, Solihull, South Holland, South Kesteven, South Lakeland, South Ribble, South Somerset, Staffordshire Moorlands, Stroud, Suffolk Coastal, Taunton Deane, Tendring, Thanet, The Vale of Glamorgan, Tynedale, Vale Royal, Waveney, Wear Valley, West Lancashire, West Wiltshire

Cluster 10

Sparsely populated areas with average rates of internal migration and above average proportions of prisoners:

Aylesbury Vale, Bassetlaw, Blaby, Boston, Breckland, Bridgend, Bromsgrove, Dacorum, Derbyshire Dales, East Riding of Yorkshire UA, East Staffordshire, Fenland, Fylde, Harborough, Huntingdonshire, Lichfield, Maidstone, Monmouthshire, Newark and Sherwood, North Dorset, North Shropshire, South Staffordshire, St. Edmundsbury, Stafford, Teignbridge, Wellingborough, Wychavon

Cluster 11

Mainly university towns with high proportions of students but slightly below average population density and people from non-White ethnic groups:

Bath and North East Somerset UA, Bournemouth UA, Canterbury, Cardiff, Ceredigion, Charnwood, Cheltenham, Durham, Guildford, Lancaster, Lincoln, Newcastle upon Tyne, Oadby and Wigston, Runnymede, Warwick, Welwyn Hatfield, York UA

Cluster 12

Areas with the highest proportions of prisoners, average rates of migration and Armed Forces but below average on the other risk factors:

Castle Morpeth, Chorley, Daventry, Isle of Wight UA, Rutland UA, Swale, Teesdale, West Devon, Weymouth and Portland

Cluster 13

Mainly retirement areas with the lowest proportions of young males, but above average internal migration:

Adur, Babergh, Brentwood, Carrick, Chichester, Chiltern, Christchurch, Cotswold, Craven, East Devon, East Dorset, East Hampshire, East Lindsey, Eastbourne, Horsham, Lewes, Malvern Hills, Mid Devon, Mid Sussex, Mole Valley, North Cornwall, Poole UA, Purbeck, Rother, Sevenoaks, South Bucks, South Hams, South Norfolk, South Northamptonshire, South Shropshire, Stratford-on-Avon, Tandridge, Tewkesbury, Tonbridge and Malling, Torbay UA, Torrington, Uttlesford, Waverley, Wealden, West Dorset, West Lindsey, West Somerset, Wyre

Cluster 14

Oxford and Cambridge, which have the highest rates of students and internal migration and large proportions of young males.

Cluster 15

Richmondshire and Forest Heath, which have the highest rates of Armed Forces and are above average for young males, but have few students.

Appendix C Adjustments Made to the Population Estimates Following the 2001 Census

1. 1991 Adjustment

An initial assessment immediately following the 1991 Census concluded that certain sub-populations had been under-enumerated and adjustments were made to the 1991 population estimates based on the mid-year estimates rolled forward from 1981. Following the 2001 Census, this initial assessment was reviewed. It was concluded that the under-enumeration in 1991 had not been as great as initially assessed and the adjustments that had been made were amended. The 1991 base was reduced by 351,000 for England and Wales. The impact of this on Hammersmith & Fulham was a reduction of 1,300 people (0.9 per cent) in mid-1991 from the original estimate of 155,100 to 153,800.

2. Revisions to Total International Migration Estimates

Following extensive research, ONS made several improvements to the methodology for estimating Total International Migration estimates. These improvements were applied to revise estimates 1991-2001 (published in June 2003) and produce estimates for 2002 onwards. These improvements are summarised below.

- **Visitor switchers:** Three improvements were made to the estimation of visitor switchers. A new method of estimating the inflow of non-EEA⁴ citizens was applied. A similar method was used to improve estimation of the equivalent outflow. In addition, the inflow and outflow of EEA citizens were estimated. Note that the Home Office only collect data on non-EEA citizens since EEA citizens do not need to apply for either visitor visas or permission to stay for longer. The new methodology allowed for visitor switchers of all citizenships.
- **Migrant switchers:** An allowance was made for travellers who stated the intention in the IPS to stay in the destination country for more than a year and were, therefore, counted as migrants but who actually left sooner.

⁴ The European Economic Area (EEA) consists of the EU member states as well as Iceland, Liechtenstein and Norway.

- Asylum seekers: An estimate of the outflow of failed asylum seekers not captured by the IPS was introduced. An allowance for dependants of asylum seekers not captured in other data sources was also added to the inflows and outflows.

In addition two changes were made that were required only for the historical data.

- Small revisions were made to the visitor switcher and asylum seeker inflows for the years 1992 to 1994 only, in response to advice from the Home Office in the late 1990s.
- Previously published international migration figures from 1999 onwards incorporated improvements to the IPS weighting methodology. An adjustment was made in the years 1992 to 1998 for the estimated effect of applying these weighting improvements earlier.

The net effect of the improvements described in 2 above, was to reduce the 2001 rolled-forward population estimate for England and Wales by 305,000. This reduction was distributed across all local authorities, with Hammersmith & Fulham experiencing a reduction of approximately 1,600 to the 2001 rolled-forward population estimates.

3. Adjustments Made to the 2001 Census-based Population Estimates Following Problems Identified in the 2001 Census

Longitudinal Study adjustment for young males - Research, including demographic analysis of sex ratios, fertility and mortality indicated a possible underestimate of males aged 25-49 (in particular those aged 25-34) in the 2001 Census. Evidence from the Longitudinal Study was used to determine the number and geographic distribution of these males and an adjustment of an additional 164,000 was made to England and Wales in 68 local authorities, with an adjustment of an additional 3,900 in Hammersmith & Fulham. All the other 7 London Boroughs within this cluster received Longitudinal Study adjustments, with an overall adjustment of an additional 1,410,000 for all local authorities within this cluster.

Northern Ireland armed forces adjustment - There was a reduction of some 1,300 people due to double counting of some armed forces personnel. These were personnel stationed in Northern Ireland, with a 'home address' in England and Wales. These personnel had originally been included in both Northern Ireland and England and Wales. Since their usual residence is the place where they were stationed in Northern Ireland they were removed from the England and Wales estimates. This did not affect the population estimate for Hammersmith & Fulham.

Unprocessed forms - The adjustment for unprocessed 2001 Census forms only affected a small number of local authorities, 16 in all. The adjustment was split across all ages and both males and females, with 3,600 additional females and 3,300 males. The population estimate for Hammersmith & Fulham was not affected, although Camden within the same cluster received an adjustment of an additional 700.

4. 2004 LA Studies

The 2004 Local Authority Studies were undertaken to identify local authorities in England and Wales where the 2001 Census population estimates were thought most likely to have been at risk and where a better estimate of the population could be made. From this analysis, 32 local authorities were selected for further study and ONS concluded that better estimates of the population could be made in 15 areas. Hammersmith & Fulham was not selected for further study and along with the majority of local authorities, although Wandsworth and Westminster within the same cluster as Hammersmith & Fulham received adjustments of an additional 4,900 and 17,500 respectively.

The overall effect of these adjustments for England and Wales was to reduce the difference between the rolled-forward 2001 population estimates and the 2001 Census-based mid-year estimates from 1.1 million to 209,000. In Hammersmith & Fulham the original inter-censal discrepancy of 6,300 was reduced to 3,400 as a result of the first two adjustments. The remaining two adjustments added a further 3,900 to the 2001 Census-based mid-year estimates.

Appendix D Glossary of Data Sources

1. Data Sources Used for Estimating Internal Migration Flows

There is no requirement to record internal moves formally, so National Health Service (NHS) sources on General Practitioner (GP) registrations are used as a proxy. These are considered to be good proxies as following a move, most patients will eventually re-register with a new GP. More geographically detailed data from the patient registers are combined with more complete information on all moves between former health authorities (HAs) from the NHSCR to produce internal migration estimates at the local authority level. Former health authorities were the NHS organisations which existed before reorganisation to PCTs in 2001. The following describes the data and methodology currently used for this in England and Wales.

NHS Central Register

The NHS Central Register (NHSCR) provides a comprehensive system to assist with NHS patient administration in England and Wales. NHSCR migration estimates are based on patients moving and informing their doctor as they change residential address. A migration record is created if a patient changes former HA.

The NHSCR data have some limitations when used as a proxy for migration, the main one being that they are dependent on patients re-registering quickly with a doctor when they move. When using the data ONS assume that the average delay between moving house and the NHSCR being notified of a re-registration with a new GP is about one month. However, it is known that re-registration patterns vary by age and sex. Young children, their mothers and the elderly usually re-register quite quickly after moving, while young men are thought to be the slowest to re-register. In addition, there is a known problem for students to fail to de-register with their GP when leaving university at the end of their period of study.

An additional limitation is that the NHSCR system can only record moves between GPs in different former HAs. Therefore migration estimates cannot be produced using this source for geographical levels below former HA level.

Patient Register Data

To record migration at lower levels of geography, NHSCR data are combined with GP data from the patient register data system (PRDS) to produce estimates of migration between local authorities. The PRDS includes the NHS number, sex, date of birth and home postcode for each patient. Comparing records in one year with those of the previous year by linking on NHS number enables identification of people who change their postcode. A migrant is defined as a person who, between one year and the next, changes their area of residence.

However, certain groups of moves that occur during the year are missed. This is because patient registers cannot capture the movement of those migrants who for one reason or another were not registered with a doctor in one of the two years, but who moved during the year. The largest group of these is migrant babies aged less than one year, who would not be on a register at the start of the year. Other people who are not on the register at the start of the year but who move after joining the NHS and before the end of the year would not be captured. Similarly, people who move within the year but are not on a register at the end of the year would also not be captured. Such people would include anyone who moved and then before the end of the year, either died or enlisted in the armed forces or left the country. To address this problem, the more complete information from the NHSCR has been combined with the more geographically detailed data from the patient registers to produce migration estimates for local authority areas.

The two NHS registers described above (NHSCR and PRDS) are due to be replaced by the Personal Demographic Service (PDS) by the end of the decade. It is expected that this service will result in significant improvements to data on internal migration.

Quality Issues

Patient registers are known to suffer from 'list inflation'. This is where there are more people registered with a GP than are estimated to be resident in an area. There are a number of factors that can cause this including people being registered with more than one GP with different NHS numbers, duplicate entries, people who have died remaining on their GP's register for a period of time and people who have moved abroad without notifying their GP. The degree of list inflation varies geographically and it tends to be higher in areas with large numbers of students who tend to be slow in re-registering with a GP when they leave higher education and their area of study.

The Audit Commission's National Duplicate Registration Initiative (NDRI) is the Audit Commission's data matching exercise. It looks at General Practitioner's (GP) patient lists to identify inaccuracies in the data that distort both the wider resource allocation within the NHS, and specifically the payments made to GPs. In 2004 it found 185,000 invalid registrations which were subsequently removed. Further information can be found at:

<http://www.audit-commission.gov.uk/ndri/>

2. Data Sources Used for Estimating International Migration Flows

Data on the number of people intending to stay in the UK or leaving the UK for a year or more are obtained (at national and former health authority level) from the International Passenger Survey. This is an ONS sample survey of passengers arriving and departing from the main UK air and sea ports and the channel tunnel. Data on asylum seekers and their dependants are provided by the Home Office. Estimates of migration between the UK and the Irish Republic are produced using information from the Irish Quarterly National Household Survey and the Irish National Health Service Register.

3. Data Sources Used for Estimating Armed Forces Personnel

Mid-year population estimates include all UK (home) and foreign armed forces usually resident in England and Wales. Population estimates do not include UK armed forces and their dependants based overseas since they are not considered usually resident in England and Wales.

Home Armed Forces

The Defence Analytical Services Agency (DASA) provides data on where home armed forces are stationed in England and Wales. ONS consults with local authorities regarding the validity of the home armed forces estimates for their areas and this provides valuable quality assurance of these data from DASA. Not all home armed forces may live on base in the local authority where they are stationed. Some personnel will be based in one local authority but living in another. Since mid-year estimates are on a 'residence' basis, home armed forces are assigned from areas where they are based to the local authorities where they are likely to be living using a 'base-to-residence' matrix derived from the 2001 Census. The 2001 Census identified a small number of armed forces personnel who both lived and worked in Hammersmith & Fulham and under 100 who were living in the Borough but stationed elsewhere.

Foreign Armed Forces and their Dependants

The vast majority of foreign armed forces stationed in England and Wales belong to the US military (primarily the US Air Force). There are currently no significant numbers of armed forces from countries other than the US except for armed forces on short-term training who are excluded from population estimates. Ghurkha soldiers are included with the home armed forces component. Data for the residential location of foreign armed forces and their dependants (including a small number of US civilians working on US bases) are supplied annually by the US military headquarters in the UK. The 2001 Census enumerated a small number of foreign armed forces personnel and dependants in Hammersmith & Fulham.

4. Electoral Registers

The Electoral Register records people resident in each local authority who will be 18 or older during each year beginning 16th February and are eligible to vote in Local Government and/or Parliamentary elections. The registers are updated annually by canvassing dwellings in the autumn of the preceding year. Some sub-groups of the population including students are able to choose where they register. However, students are not identifiable on the register. When registrations are returned directly from halls of residences, it may be possible to infer that they are for students. However, in practice these numbers are very small.

5. Council Tax Billing and Exemptions

The council tax billing list is based on a register of dwellings kept at the Valuation Office Agency of HM Revenue and Customs. However, each local authority is responsible for administering its own billing list. Data quality is high and it is estimated that 99 per cent of properties are recorded on the list. For each property, the list shows whether a dwelling is occupied by a single occupant, occupied solely by students, used as a second/holiday home or is recorded as empty. No person level information is collected.

It is possible to identify those properties which are solely occupied by students, which is a subset of all properties exempt from council tax. However, there are also properties which are occupied by both students and non-students and these properties cannot be identified. Personal information on the residents of properties is not collected.

6. Information from Walk-in NHS Medical Centres

There are currently 85 NHS walk-in centres throughout England (as at March 2007) and more are being established. They offer fast and convenient access without an appointment or registration to a range of NHS services, including health information, advice and treatment for a range of minor illnesses and injuries. NHS walk-in centres complement GP and hospital services and provide greater choice and option for patients. Patient information recorded at point of use include age, sex and address. Within Hammersmith & Fulham, Charing Cross Hospital has an NHS walk-in centre.

7. Housing Needs Surveys

Housing needs surveys are carried out by all local authorities in England. These are widely recognised as a valuable tool for local housing needs assessment. They are usually commissioned from specialist consultants when there are not sufficient resources or expertise in-house.

Hammersmith & London, as part of a broader London Housing Needs Survey commissioned a Housing Needs Surveys in 2003 to explore the housing needs, aspirations and requirements of those living in Hammersmith & Fulham and households who may move into the area.

8. Higher Education Statistics Agency (HESA) Data

HESA collect data about students attending all publicly-funded higher education institutions in the UK shortly after the end of each academic year (1 August to 31 July). The data are available for general use following the publication of the statistical first release based on them in the following January. These data include all students that have been registered at an institution at any point during the preceding academic year, including those who fail to complete their studies and leave their institution during the year.

Country of domicile immediately prior to entry is collected as a compulsory field, with only about 0.05 per cent 'unknown'. For students of UK domicile, full postcode (but not full address) is also collected. Domicile prior to entry forms the basis for categorising a student as UK ('home'), other EU, or non-EU (together 'foreign'), and the collection covers all these categories. Nationality is known for over 80 per cent of students, and will become a compulsory field from 2007/08. There are substantial differences between domicile and nationality, for example about 100,000 home students do not have UK nationality.

The term-time full postcode (but not full address) will be collected from 2007/08, thereby overcoming a limitation in the coverage of the current data collection. This will inform both internal migration estimates of students and international migration of foreign students.

Through a separate but linked collection, the destination on graduation is collected

from each graduating cohort, with return rates of approximately 80 per cent of UK full-time, 70 per cent of UK part-time, and 45 per cent of other EU students. This collection does not cover non-EU students, and although there would be considerable interest in extending the coverage of the collection to include them, experience with doing so during the 1990s led to the conclusion at that time that return rates were too low to justify the cost of collection.

9. National Insurance Numbers Allocated to Overseas Nationals

Overseas nationals who enter the UK to work can register for a National Insurance Number (NINo) and for those who do, a registration record exists which records age, sex, postcode of residence, country of origin and year of arrival. However, NINo data will only cover those people who apply for a number so that they may work or claim benefits. While these data can provide an estimate of the number of overseas nationals arriving in the UK and choosing to work legally, it does not capture children or those people who choose not to work or claim benefits or those who work illegally. Those people who leave the UK having previously registered for a NINo and who then return to the UK after a stay abroad will also not be included in the numbers that have been issued with a new NINo. It is not currently possible to distinguish between short-term and long-term migrants within these data and there is no indication of length of stay or whether a person has subsequently left the country.

10. School Census (formerly Pupil Level Annual School Census) Data

The School Census provides, every term, a snapshot of data on school pupils in state education in England. It is collected by DfES three times per year from secondary schools from January 2006 and all maintained schools from January 2007. School Census data are used by DfES (for monitoring effectiveness policies and school/local authority funding etc.), local authorities, other government departments, external agencies and educational researchers. In Wales and Northern Ireland the School Census is annual and there are no plans at present to move to a collection per term. Scotland also has an annual collection since 2003 which is carried out by the Scottish Executive Education Department.

Variables collected that may be used to identify migrants include: ethnicity, pupil's home address (and therefore LA of residence) and counts of pupils who cannot speak English on arrival at their school, by LA. However there are limitations to the data, in particular that there are differences across the UK in what variables are collected and there is no single Unique Pupil Number (UPN) scheme in force across the UK; additionally it does not include the independent school sector, pupils in referral units, hospital schools or those educated outside of school (e.g. home educated). Since the School Census relates to the 'stock' of children rather than new children in schools, it is of limited use as a measure of 'flow' migration but by comparing stocks over time, could give some indication of the overall levels of child migration. Therefore, data from this database could play a role in calibrating or assessing the plausibility of both MYEs and estimates of internal migration (moves within the UK).

The UPN is being used in England and in the majority of schools in Wales to match pupil attainment to pupil characteristics such as free school meal entitlement and ethnicity. It may also be used to track internal migration flows within England and Wales and separately within Scotland. School Census data may be useful if linked to other sources to provide more information about migrants and their integration and adjustment to their new host country e.g. ONS plans to explore the feasibility of identifying the parents of migrant children by linking School Census data to surveys or the census.

DfES plans to include those in referral units and those educated outside of the school system in the near future, and have planned a pilot to collect similar data for those in Early Years provision 2007/08 in a separate Census.

11. PeopleUK

PeopleUK is a commercial dataset maintained by CACI which provides an individual life stage based classification tool and can assign each adult in the UK into one of 50 different types based on their life stage, wealth and lifestyle. It is based on Ocean, a CACI database of individuals built up from a variety of different sources including data from the Electoral Roll and lifestyle surveys. Further information can be found at:

<http://www.caci.co.uk/msd.asp?url=cm-data-ocean.htm>

12. CORE Data

CORE (COntinuous REcording) is a national information source funded jointly by the Housing Corporation and the Department for Communities and Local Government (DCLG) that records information on the characteristics of both housing association and local authority new social housing tenants and the homes they rent and buy. Policy makers and practitioners regard the system as an essential tool for monitoring housing costs, assessing affordability and developing policy.

Around 700 housing associations record more than 125,000 general needs lettings, 90,000 supported housing lettings and 16,000 sales per year. Local authorities were invited to join CORE from April 2004. Participation in CORE is currently voluntary for local authorities. However, over two-thirds of LAs have chosen to join CORE within the first two years of the project.

CORE provides a valuable source of information about new lets, sales and tenants. Household characteristics, economic status, ethnicity, primary reason for housing, source of referral and previous tenure of occupant are just some of the variables available through CORE. In addition, since information regarding housing costs is also recorded, broad assessments of housing affordability are also possible through CORE. Information from CORE is used by a range of organisations to inform funding, regulatory and other policy decisions relating to HA activity and contributes to the wider policy debate. The extension of CORE to the local authority sector has provided a consistent set of figures countrywide. Further information can be found at:

<http://www.core.ac.uk/core/>