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Improving Migration and Population Statistics

Local Authority Case Study Report for Barnet

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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 population sub-groups that are known to make estimating population more complex (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.

Barnet was selected to represent a cluster of Outer London Boroughs and some areas outside London with above average population density and migration, high proportions of young males, student and people from non-White ethnic groups. The case study aimed to investigate whether there were additional data sources or methods to those currently used that might have potential to improve the accuracy of the population estimates in areas with these characteristics.

The study identified a number of data sources which might have the potential to be used within population estimation processes in addition to those already used. These sources include the School Census and Department for Work and Pensions (DWP) data on National Insurance numbers allocated to international migrants. 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 use of data on the allocation of National Insurance numbers to overseas nationals in conjunction with other sources should be pursued to help improve estimation of population change, in particular to out-migration.

The study endorsed the importance identified by a previous case study of data on term-time address of students, soon to be collected by the Higher Education Statistics Agency (HESA). This source has potential to improve the estimation of student migration in the population estimates.

Whether the findings of this study are applicable to other similar local authorities will be considered at a local authority workshop at which the findings of the case study will be presented. 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 Barnet Council and Barnet PCT who provided their time and assistance in this case study.

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 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.

Barnet was selected to represent a cluster of 15 areas, mainly Outer London together with some areas outside London. The main factors affecting estimates in

these areas are the high population density, high levels of migration and high proportions of young males, students and particularly people from non-White ethnic groups. 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 Barnet Case Study, including: the research objectives of the case studies as a whole, and for the Barnet 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 topic to address in the Barnet cluster of local authorities is the presence of a high proportion of the population from non-White ethnic groups and to investigate whether this population subgroup is appropriately reflected in Barnet's population estimates.

Four specific objectives have been identified:

1. To gain a general understanding of the population estimates in Barnet, including how the London Borough of Barnet use population estimates and what risks there are to making an accurate estimate of their population.

2. To investigate the availability of data sources which provide information on ethnicity, and to consider whether these indicate a reasonably consistent picture of ethnicity in the borough.

3. To understand better the characteristics of the population from non-White ethnic groups, and to investigate the extent to which this population reflects the characteristics of groups who are hard to estimate.

4. 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 Barnet 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 those areas for which accurate estimation of the population was difficult when the 2001 Census results were reconciled with the rolled-forward estimates, e.g. 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 Barnet (cluster 2 in Appendix B). The most prominent factors in this cluster, from the eight variables listed, are high proportions of people from non-White ethnic groups, students, and young men in the population, as well as high levels of migration and 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 Barnet

This section examines the characteristics of the population in Barnet 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 Barnet 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 Barnet is a high presence of people from non-White ethnic groups, students and young men, high levels of migration and a high population density.

3.2.1 2001 Census Base for Barnet

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 which were lower than the rolled-forward 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 that reduced 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. These reduced the rolled-forward population estimates for England and Wales, mainly due to increased estimates of out-migration.

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 Barnet rounded to the nearest hundred. Further details on the adjustments can be found in Appendix C.

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 Barnet the original inter-censal discrepancy of 38,300 was reduced to 30,600 as a result of the first two adjustments, which were made to 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

4,200 (1.3 per cent) to the 2001 Census-based mid-year estimate of 319,500. The final unexplained difference for Barnet is 26,400 (8.3 per cent of the mid-2001 population estimate).

Table 1:   Inter-censal discrepancy for Barnet

Inter-censal discrepancy	**38,300**
i) 1991 adjustment	2,200
ii) Migration adjustment	5,500
Difference after adjustments i) and ii)	**30,600**
iii) Demographic analyses adjustment	4,200
iv) Local Authority studies 2004	n/a
Remaining unexplained difference	**26,400**

### 3.2.2   Size and extent of Inter-censal drift for Barnet

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

Revisions following the 1991 Census reduced Barnet's population estimates over the preceding decade. The estimate for 1990, for example, was reduced by 12,400. 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 revised estimates for 1982 to 1990, published in 2002, were lower than the revisions following the 1991 Census, and also the originally published estimates for this period.

As noted in 3.2.1, revisions to the 1991 population estimate following the 2001 Census (and subsequent adjustments) reduced the 1991 base level of population in Barnet by 2,200. Over the decade following 1991, the population of Barnet increased steadily. The original rolled-forward series estimated population growth between 1991 and 2000 to be 45,600 (15.2 per cent). The revised series reduced

the estimated growth over this period by 60 per cent to 18,100 (a 6.1 per cent growth between 1991 and 2000).

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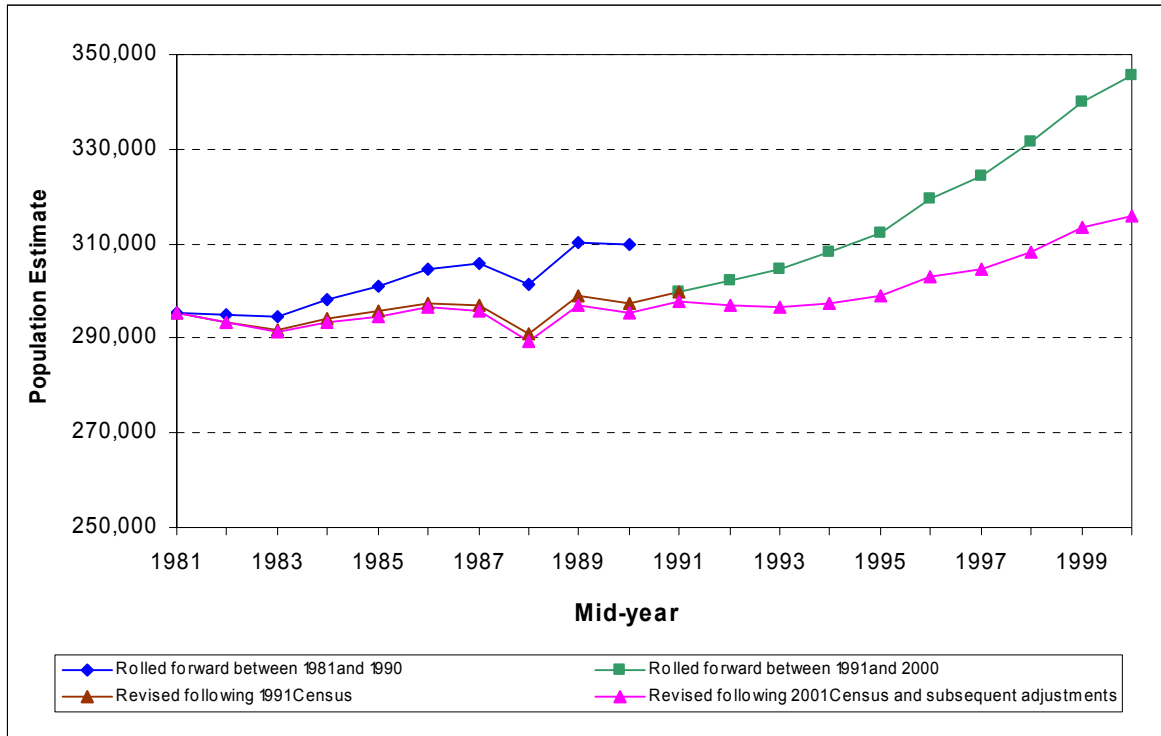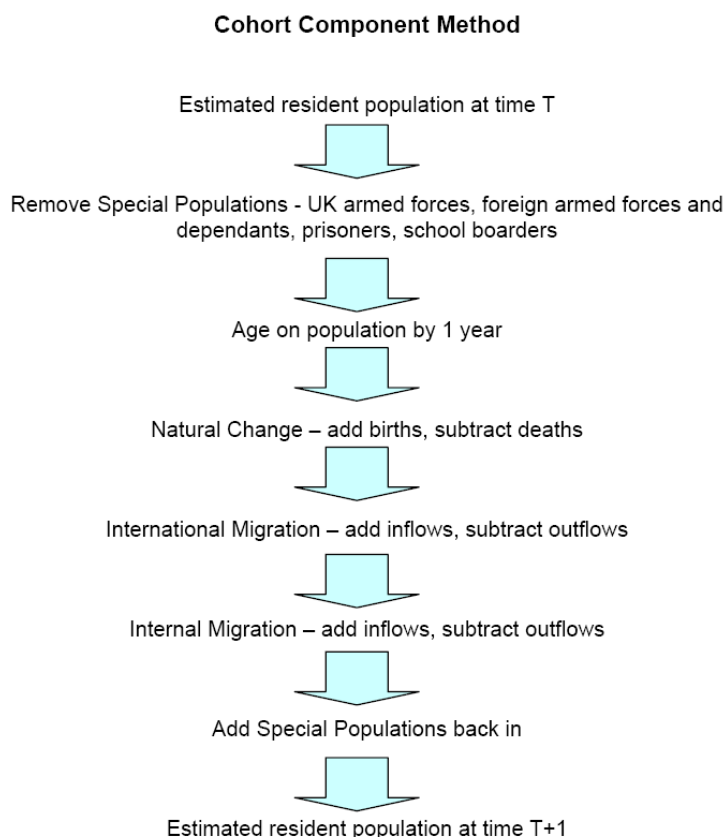

3.2.3 Components of Population Change

Estimates of the population during the inter-censal period are made using a cohort component method. This updates the previous mid-year 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.

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.

Figure 2: Mid-year population estimates methodology

Cohort Component Method

Estimated resident population at time T

⬇

Remove Special Populations - UK armed forces, foreign armed forces and dependants, prisoners, school boarders

⬇

Age on population by 1 year

⬇

Natural Change – add births, subtract deaths

⬇

International Migration – add inflows, subtract outflows

⬇

Internal Migration – add inflows, subtract outflows

⬇

Add Special Populations back in

⬇

Estimated resident population at time T+1

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 Barnet 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 Barnet with those of England and Wales for 2004. This shows that the fertility rates for mothers aged under 30 are noticeably below the national fertility rates (with one exception), the Barnet fertility rates for mothers aged under 30 are also noticeably lower than Outer London as a whole. The fertility rates for older mothers (those aged 30 or over) however are consistently higher than the national fertility rates. Figure 3 also shows that, allowing for the variability inherent with using single year of age data, the fertility rates for Barnet are broadly consistent over time.

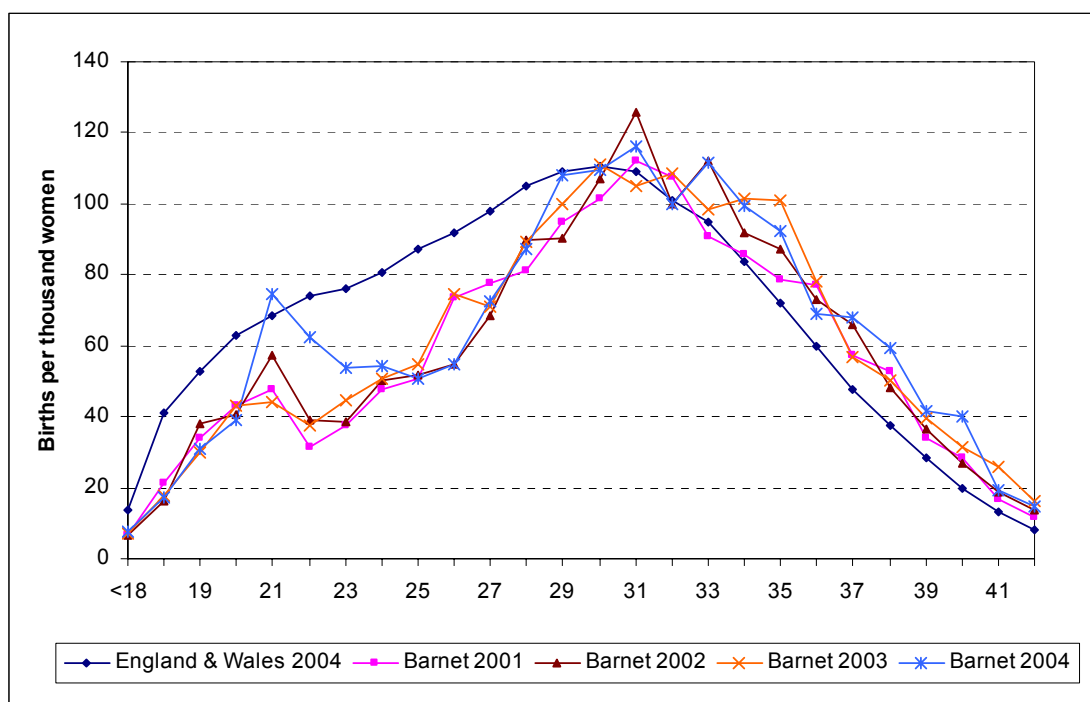**Figure 3: Age specific fertility rates for Barnet, 2001-2004**

Table 2 shows the number of recorded live births in the twelve months leading up to the Census and compares this with the estimate of the number of under 1s in the 2001 Census for Barnet and for England and Wales. The 2001 Census data

has been adjusted to allow for the 2004 LA Studies adjustment. This adjustment affects the number of under 1s for England and Wales but not for Barnet.

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 | |
	Barnet	England and Wales	Barnet	England and Wales	Barnet	England and Wales	Barnet	England and Wales
Males	1,969	299,629	1.31	1.18	2,036	307,310	1.36	1.21
Females	1,976	286,926	1.20	1.07	1,953	292,760	1.19	1.10
Total	3,945	586,555	1.25	1.12	3,989	600,070	1.27	1.15

According to the 2001 Census, 1.3 per cent of the population in Barnet were under the age of one, compared with the national average of 1.1 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 Barnet the live births figure exceeded the Census estimate by 1.1 per cent. Although numbers of male births exceeded the Census count of under 1s, for females this difference was reversed.

A separate investigation is being undertaken into the challenges involved in accurately estimating the population of under 1s, though this does not appear to be a particular issue for Barnet. Initial findings indicate that the main challenge is likely to be limitations in the estimation of migration. This concerns both the movement of under 1s between areas of the UK, and their movement between the UK and other countries. This may help to explain such discrepancies in areas where the number of births indicates a higher population of babies than estimates based on the 2001 Census. Potential reasons for these discrepancies include: some mothers' addresses recorded at registration not being their true resident addresses; and the migration of some mothers shortly after giving birth.

Overall, it is concluded that live births data provide a good basis for estimating the under 1 population of Barnet 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 Barnet.

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 Barnet in 2005 represented 1.8 per cent of the authority's population in these ages. Across all local authorities in England and Wales, Barnet ranked 191st highest (out of 376) on this percentage. Barnet was ranked 75th for the equivalent measure of out-migration, with 2.2 per cent of its 65+ population migrating out of the area. The highest proportions of people aged 65+ moving into and out of local authorities were 3.5 and 3.8 per cent, respectively. This would suggest that Barnet is not an area of high migration of older people and the impact of this issue in Barnet is likely to be small.

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

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 Barnet, the proportions for ages up to 83 are lower than the national average, while those for ages 84 and over are higher. Overall, however, the difference is relatively small. In the 2001 Census, 14.5 per cent of Barnet's population 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.

Figure 4: Age distribution of population of Barnet aged 65-89 compared to England and Wales, 2001 Census
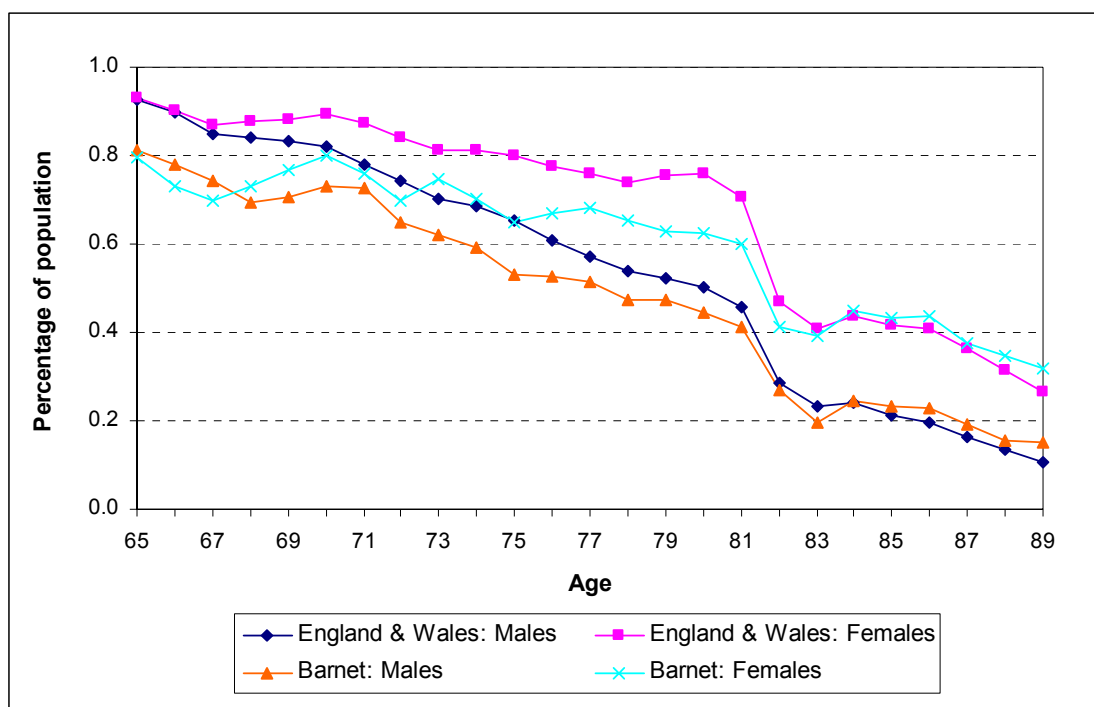
Overall, it is concluded that deaths do not present a significant challenge to the accuracy of the population estimates in Barnet.

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 Barnet born outside the UK was 30.6, the 13th highest local authority, over three times the national average of 8.9 per cent.

ii)   1.8 per cent of residents lived outside the UK one year previously, over twice the national average of 0.7 percent, ranked 25th highest. The highest ranked local authorities had proportions of international migrants of between 2 and 6 per cent.

On average for the last three years (mid-2003, mid-2004, mid-2005[1]), international in-migrants during the year are estimated to have made up 2.3 per cent of Barnet whilst international out-migrants have represented 1.3 per cent of the resident population. These flows in percentage terms are more than double those for England and Wales (1.0 and 0.6 per cent respectively), Barnet ranked 21st highest out of the 376 local authorities in 2005 for international in-migration, and 20th for international out-migration.

International migration is therefore a significant factor for the borough. The impact of this on the Borough of Barnet using indicative numbers of National Insurance number registrations to overseas nationals is considered in Section 5.2.3. One attractor of international migration is likely to be the diverse ethnic mix of the established population. In addition, London boroughs may be strong attractors of international short-term migrants – i.e. people moving for less than 12 months, these short-term migrants are not included in the population estimates.

Barnet'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 (GOR) 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 Barnet was home to approximately 300 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.

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

Therefore the extent to which Barnet'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. Barnet's international migration estimate is affected by all aspects of the new methodology. It should be stressed, however, that with the new methodology Barnet still has a net inflow of international migrants reflected in its population estimates, with an average net inflow of 3,400 over the period 2002 to 2005.

Evidently international migration is a significant factor in Barnet. International in- and out-migration has a noticeable impact on Barnet's population size and its demographic characteristics, which are associated with the ethnic diversity of the established population and the migration of international students.

It is recognised that estimating international migration accurately is challenging, a series of improvements are planned which impact mainly on the method for estimating the geographical distribution of international migrants at local authority level. There is an ongoing programme of work aimed at making further improvements. This study is a part of the future work programme. Further information about this work programme can be found on the National Statistics website at:
http://www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/default.asp

In addition, there is an improvement to the estimation of emigration, taking into account the socio- demographic characteristics of areas and recognising that not all people are equally likely to emigrate, and making full use of evidence that has become available since 2004 on the proportion of people who will change their minds about how long they will stay in the destination country.

In conclusion, international migration is a significant factor of population change in the borough, with the proportion of overseas migrants recorded in the 2001 Census confirmed in recent international in-migration estimates. The main impacts on the Barnet population estimates from international migration are linked to the ethnic diversity of the established population and the migration of international students.

Component 4: Internal Migration

In making 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 people re-registering with a GP when they move. However, it is known that re-registration rates vary by age and sex and specific population subgroups. Young people, men in particular, are considered to be the slowest to re-register. Similarly, some students starting or finishing higher education and moving to a new area may be slow to register, particularly at the end of their studies. 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 Barnet with the age distribution for all internal migrants in England and Wales. The figures show that almost one-fifth of internal migrants moving to Barnet 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. Barnet also had a higher percentage of internal in-migrants aged 30-39 than the national average, but less than half the national average of internal in-migrants aged 15-19. Census data indicates that in-migration to Barnet from outside the borough of 19 year-olds to commence higher education studies is not particularly great (see section 3.2.7), though it may be the case that a number of students moving to Barnet may start their studies at a later age.

Figure 5: Age distribution of internal in-migrants, comparing Barnet with England and Wales, mid-2005
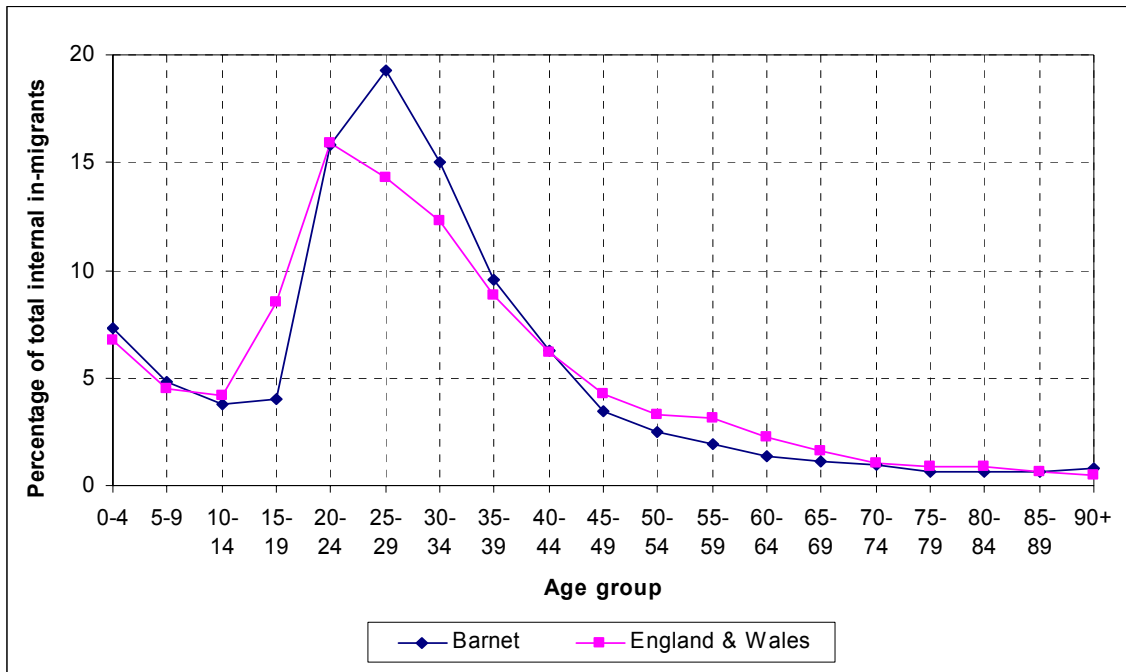
Figure 6: Age distribution of internal out-migrants, comparing Barnet with England and Wales, mid-2005
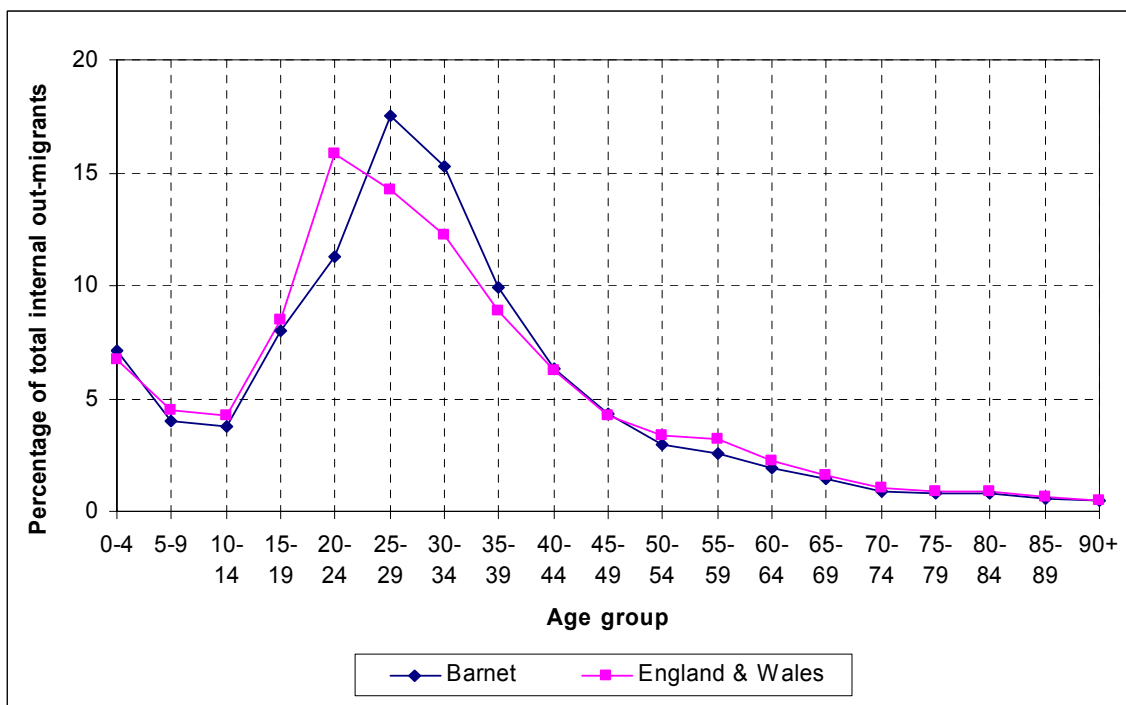
For outflows, ages 25-39 again make up a higher proportion of migrants than the national average, while flows for ages 20-24 were lower. For both in-migrants and out-migrants there is noticeably greater mobility of the population aged 25 to 34

than nationally. Students comprise only 5.4 per cent of the Barnet population within this age group so the impact on in- and out-migration from students for this age group will not be significant.

Barnet was among the top 35 per cent of local authorities with the highest levels of internal in-migration per 1,000 population, and in the top 15 per cent for internal out-migration, according to migration data for mid-2004 to mid-2005. As the area has a young population, reflected in the age distributions of internal migrants moving to and from Barnet, its internal migration estimates may present challenges to estimating the population well.

Component 5: Special Populations

i.   Armed Forces

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. The data sources used to estimate armed forces personnel are described in Appendix D.

- Home armed forces - The Defence Analytical Services Agency (DASA) provides data on where home armed forces are stationed in England and Wales and shows that at present 360 people are stationed in Barnet. The 2001 Census enumerated 364 personnel in Barnet, of whom 243 were stationed elsewhere. Data supplied by the Defence Analytical Services Agency indicates little change has occurred in subsequent years.

- Foreign armed forces and their dependants - Foreign armed forces in England and Wales comprise US military personnel. At present there are a negligible number of personnel, dependents or civilians living in Barnet. The 2001 Census did enumerate a small number of foreign armed forces personnel and dependents in Barnet.

ii. School Boarders

There is one school in Barnet which houses school boarders. Figures from the Department for Education and Skills (DfES) show that between mid-2001 and mid-2005 the total numbers of boarders in Barnet has varied between 160 and 175.

iii. Prisoners

The 2001 Census showed there were no prison establishments or prisoners in Barnet. Recent information from the Home Office, for 2005, confirms that this continues to be the case.

iv. Other Special Populations not identified separately - Students

Barnet has both a high proportion of students and a young population. There are a number of higher education colleges and Universities with a presence in the borough:

- Barnet College, operates at 5 sites within Barnet

- Leo Baeck College, Finchley N3 - Centre for Jewish Education

- London School of Jewish Studies, Hendon NW4

- Middlesex University, Hendon NW4

- Oak Hill School of Theology, Southgate N14

Middlesex University has a number of campuses in North London, including sites in Barnet and just over the border in Enfield. Data from HESA which covers publicly funded higher education institutions showed that in the academic year 2004/05, there were 24,900 students registered at Middlesex University, of whom 24 per cent were international students. This is almost twice the England and Wales average of 13.4 per cent for overseas students at higher education establishments, and is the 8th highest higher education institution in England and Wales in terms of the numbers of international students attending. Of these 5,300 overseas students, 25.5 per cent were first year undergraduates, who are likely to have been international in-migrants that year. Halls of residence for the university located in Barnet at Hendon have the capacity to house around 900 students.

According to the 2001 Census, approximately 15,000 of Barnet's population were full-time students (4.8 per cent, 51st highest out of 376 local authorities), this will include students whose place of study is outside the borough.

HESA does currently hold information for students on their parental home, or usual address if different, prior to studying. There are however plans to collect term-time address from 2007 onwards which will be available in 2009.

As already identified in the discussion of Components 3 and 4, the high student population will impact on the high levels of migration, both international and internal for Barnet and hence on the accuracy of the population estimates. It is not considered however that students pose a particularly high risk factor to the accuracy of the population estimates in Barnet through their impact on migration or their presence within the overall population.

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 dividing a male population estimate by the female population estimate for the same place, time and age group.

Figures 7 and 8 show sex ratios for quinary age groups for Barnet compared to England and Wales, based on population estimates from the 2001 and 2005 mid-year population estimates respectively. The main differences are in the age ranges 25-34 in 2001. These are the only age groups where the Barnet sex ratio is higher than the equivalent for England and Wales. The sex ratios for 2005 show that this peak has been aged forward to the 30-39 age groups in the population estimates. Another point of interest is the 20-24 age groups in both years. This shows an age rather than cohort effect, and is likely to be linked to the student population – Middlesex University has had a sex ratio of 0.73 on average over the past few years (more females than males).

Figure 7: Sex ratio by quinary age for Barnet and England and Wales, 2001 mid-year estimates
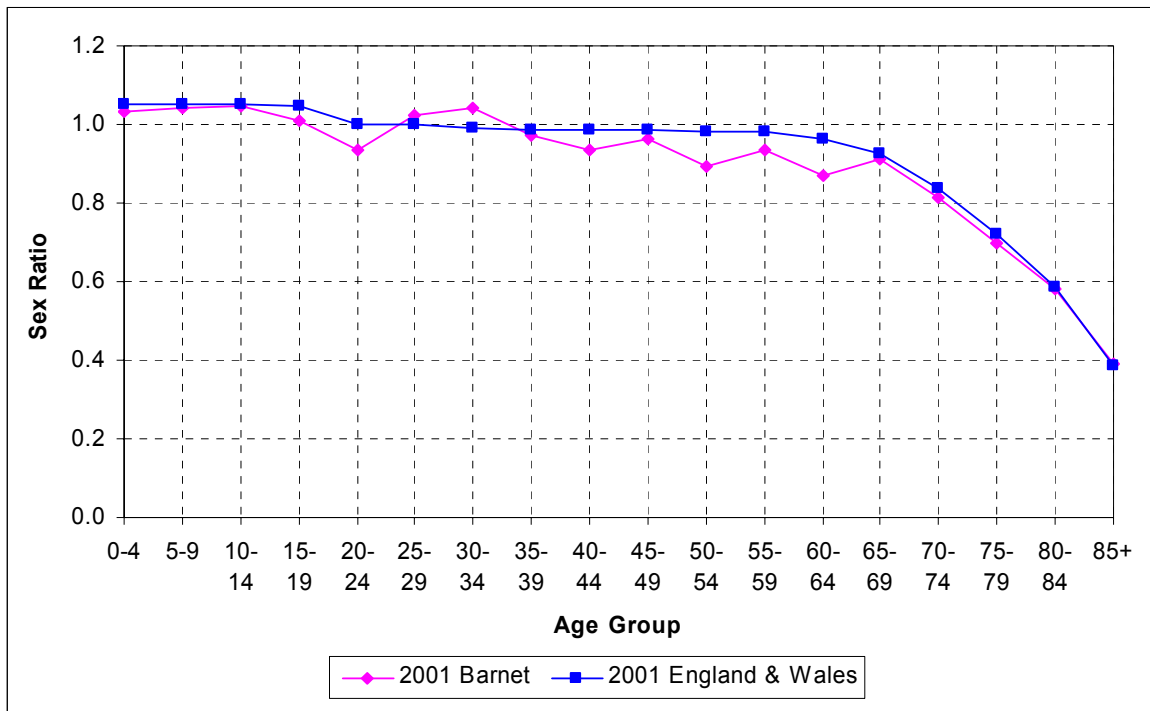
Figure 8: Sex ratio by quinary age for Barnet and England and Wales, 2005 mid-year estimates
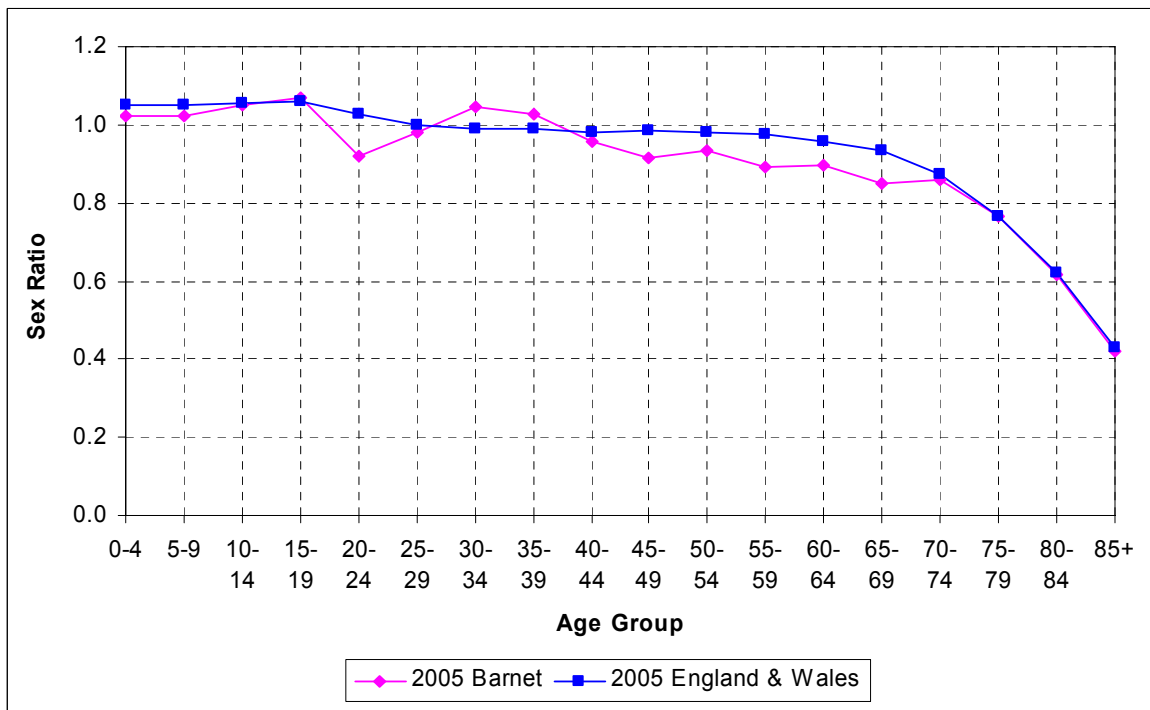
It is known that young women are generally quicker to register with a GP after moving than young men. If young men have moved away from the area between

2001 and 2005, but have not registered with a GP in their new area of residence, they will still be included in the Barnet population estimates. This may in some areas contribute to high sex ratios (i.e. more males than females) however this does not appear to be the case in Barnet for people aged 20-29.

In conclusion, investigation of the sex ratios may highlight the fact that in some areas there are age specific challenges to the accurate estimation of males and females. For Barnet there are no specific concerns identified from the sex ratio analysis.

3.2.5 Age Distribution

Figure 9 compares the age distribution by quinary age group for Barnet with England and Wales, based on the 2005 mid-year estimates. This shows far higher than average proportions aged 25-39, while the proportions for ages 20-24 and 40-44 are similar to the national levels.

Figure 9: Age distribution, comparing Barnet with England and Wales, 2005 mid-year estimates
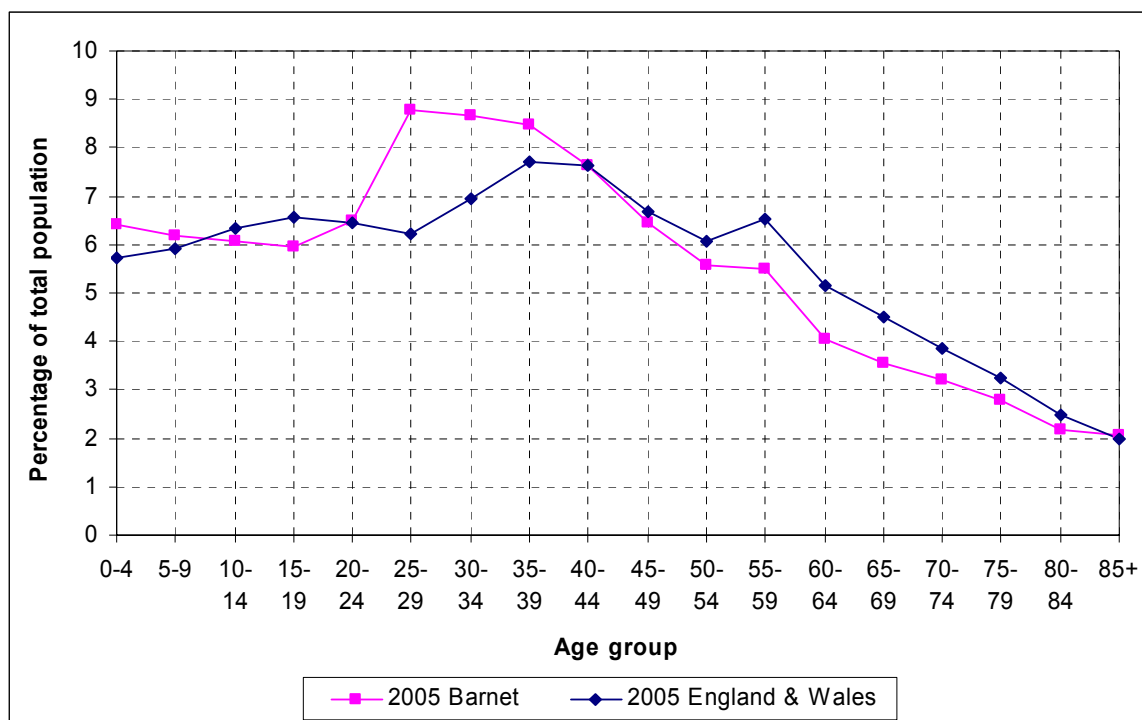
The difference in distributions for children suggests that there is a greater presence of families with very young children in Barnet than the national average (though slightly lower than for London as a whole), but a lower presence of families with children of secondary school age (though slightly higher than for London as a whole). Generally, Barnet has a younger population than the national average, with all ages from 45 and above making up a lower proportion of the population than for England and Wales.

The age distribution shown in Figure 9 is subject to change when the mid-2005 estimates, and preceding estimates for mid-2002 to mid-2004 are revised as a result of the improved methodology for estimating international migration.

3.2.6 Population Density

Above average population density is a feature of cluster 2 local authorities. Barnet was the 34th most densely populated local authority district in England and Wales in 2005, with almost 3,800 people per square kilometre. Of the areas more densely populated, 25 are London boroughs. Population density (persons per square kilometre) for the other 14 local authorities in the same cluster as Barnet ranged from 2,176 in Hillingdon to 5,745 in Waltham Forest.

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
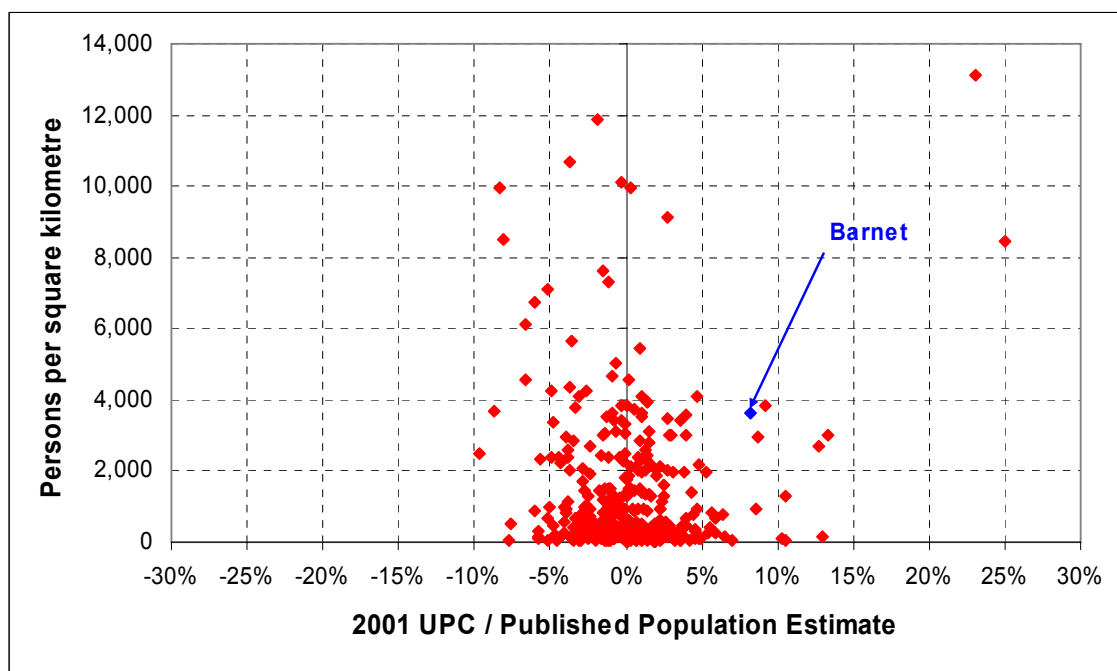

Figure 10 shows that 18 of the 26 local authorities with population density above 4,000 people per square kilometre had a negative UPC in 2001, all but four of these local authorities are London boroughs. This suggests that areas with high population density were more likely to have had their population underestimated than overestimated. Barnet on the other hand with a population density of 3,789 people per square kilometre, had its 2001 rolled forward estimate overestimated. The overestimation of population in Kensington & Chelsea and Westminster during the 1990s is thought to have contributed towards an underestimation of the population in some London boroughs.

Recent improvements to the estimation of the international migration component of the population estimates are aimed at avoiding this issue when results become available from the 2011 Census.

3.2.7 Students and Migrants

The 2001 Census provides a wealth of information about the population characteristics of an area. One of the features of the cluster containing Barnet is 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 3 separately identifies male and female students aged 19 to 21 by place of residence one year previously. It would be expected that students residing in Barnet who have completed a year or longer of their studies would have been likely to have been residing in Barnet one year previously. The 2001 Census data however suggests that a greater proportion of students aged 19 previously resided in Barnet than for those aged 19 to 21. This may be explained by the fact that many overseas students or even students from elsewhere within the UK may not have been aged 19 when they commenced their studies.

Table 3: Student and Migrant Status for Males and Females aged 19 in Barnet, 2001 Census

Student status	percentage of residents aged 19-21		
Address 1 year ago	Male	Female	**Total**
Full Time Students			
Living within Barnet	19.6	19.4	**39.0**
Living elsewhere in UK	3.2	5.5	**8.7**
Living outside UK	0.7	1.6	**2.4**
Total	**23.6**	**26.5**	**50.1**
Non-students			
Living within Barnet	20.6	20.6	**41.2**
Living elsewhere in UK	2.4	3.8	**6.1**
Living outside UK	0.6	2.0	**2.6**
Total	**23.5**	**26.4**	**49.9**
All residents			
Living within Barnet	40.2	40.0	**80.2**
Living elsewhere in UK	5.5	9.3	**14.8**
Living outside UK	1.3	3.6	**4.9**
Total	**47.1**	**52.9**	100.0

For males and females aged 19 to 21, the number of students was marginally higher than non-students (nationally two-thirds were non-students), and the numbers who were living in the Borough one year previously greatly exceeded the number living elsewhere. This suggests that whilst Barnet has a sizeable student population, many of the full-time students previously resided within the Borough before commencing their studies, indicating that Barnet is not a major attractor of students from elsewhere in the UK (only 17 per cent lived one year previously elsewhere in the UK). Students who were living one year previously outside the

UK accounted for 4.7 per cent of all students within the 19 to 21 age group. A smaller proportion of Barnet's students therefore previously lived elsewhere in the UK than was the case for many other London Boroughs.

The only University which has a presence in the Borough is Middlesex University which has a campus at Hendon, and whilst HESA data indicate around 6,000 undergraduates from overseas at the University (for 2004/05), it is not currently possible to identify how many reside in Barnet.

In conclusion it appears that students coming to study is not a main reason for the relatively high level of migration among young males into Barnet, though undoubtedly students will be a major reason for the relatively high international migration amongst young adults.

3.2.8 Population by Ethnic Group

Barnet has a sizeable population from non-White ethnic groups, broadly similar to London as a whole, though with a slightly smaller proportion of people from non-White ethnic groups. Table 4 shows the ethnic group breakdown of the population from the 2001 Census.

Table 4: Population by Ethnic Group for Barnet and England, 2001 Census

Ethnic group	Barnet		England	
	Number	%	Number	%
All groups	314,600	100.0	49,138,800	100.0
White	232,900	74.0	44,679,400	90.9
Mixed	9,500	3.0	643,400	1.3
Asian or Asian British	38,800	12.3	2,248,300	4.6
Black or Black British	18,900	6.0	1,132,500	2.3
Chinese	6,400	2.0	220,700	0.4
Other	8,200	2.6	214,600	0.4

Note:
1. Figures are rounded to the nearest hundred

Barnet has a lower percentage of its population from the White ethnic group than for England, whilst the area has more than twice the national percentage in each of the other defined ethnic groups.

ONS recently carried out a Race Impact Assessment on population estimates, more detail of the findings of this are given in chapter 5. In summary though, the various analyses underpinning the Race Impact Assessment bring a reasonable level of reassurance on the potential for bias. So, while Barnet has a high proportion of people from non-White ethnic groups, it is not believed that this directly leads to a poor estimation of the population.

3.2.9 Population by Religion

The 2001 Census indicated that less than half of Barnet's population was reported as Christian, a smaller proportion than reported for both London as a whole and England and Wales (Table 5). Nearly 15 per cent of Barnet's population were reported as Jewish, this is the highest percentage for any of the 376 local authorities in England and Wales. Harrow at 6.3 per cent was the London borough with the 2nd highest percentage of people reported as Jewish.

Table 5: Population by Religion for Barnet, London and England & Wales, 2001 Census

Percentages

Area	Christian	Jewish	Hindu	Muslim	Other	No religion/ not stated
Barnet	47.3	14.8	6.7	6.2	2.5	22.5
London	58.2	2.1	4.1	8.5	2.7	24.4
England & Wales	71.7	0.5	1.1	3.0	1.1	22.5

As a percentage of its total population, Barnet also had a much higher reporting of people of Hindu (8th highest local authority in England and Wales) and Muslim faiths than nationally. The 2001 Census data therefore highlights the religious diversity within the Borough.

Whilst religion alone is not considered as a factor which may result in particular challenges to estimating an areas population well, it does contribute to a better understanding of the characteristics of an area which can explain differences in some datasets. For example section 5.2.6 looks at differences between the estimating/recording of children of school age from the White ethnic group in the mid-year estimates and LEA School Census data. The prevalence of a number of

private Jewish schools in Barnet is thought to be a contributory factor to these differences.

3.2.10 Population by Socio-economic Classification

The socio-economic structure of Barnet is noticeably different to that for England and Wales, though is broadly representative for London as a whole (Table 6).

Table 6: Population by Socio-economic Classification for Barnet, London and England & Wales, 2001 Census

Percentages

Area	Occupations			Never worked[1], not classified[2] and long-term unemployed
	Managerial and professional	Intermediate	Routine and manual	
Barnet	37.7	17.9	15.7	28.7
London	34.3	16.6	19.8	29.2
England & Wales	27.1	16.4	27.9	28.7

1 Includes students

2 includes people whose occupation has not been coded

Barnet has a noticeably higher proportion of its working age population in higher managerial and professional occupations than nationally, and a much smaller proportion in routine and manual occupations. The 2001 Census indicated that for Barnet the different occupation types saw similar levels of in- and out-migration to/from the rest of the UK. From this one-year snapshot there is therefore the indication that Barnet has a slightly higher proportion of people in higher managerial/professional positions in-migrating than out-migrating, i.e. a net inflow of people for these occupations.

3.3 Factors identified for further investigation by the Barnet 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 Barnet was selected includes Outer London boroughs together with some areas outside London. The main factors that present challenges to estimating populations accurately for these local authorities were identified as the high proportion of people from non-White ethnic groups, students and young

males, high levels of migration and a high population density within the usually resident population.

Section 3.2 considers the population characteristics of Barnet, 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 ethnically diverse population, high proportion of young adults and international students in the area represent the main challenge to accurately estimating Barnet's population. Investigation into the impact of high proportions of young adults in the population was a focus of the Derby Case Study, while students were investigated in the Welwyn Hatfield Case Study.

Chapter 4   Approach

The general approach taken to study the estimation of the resident population in Barnet was to investigate what alternative data sources existed that might provide information about the location and movement of specific subgroups of the population. This was achieved through working with representatives from the London Borough of Barnet 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 and these sources are discussed in Chapter 5.

The relevance of wider ONS developments to improve population statistics to the Barnet Case Study is also considered here.

4.1   Obtaining Data

Data sources were investigated that had the potential to inform about either the stock or flow of specific subgroups of the population or to provide information on household numbers. In particular, data sources that could estimate the population by ethnic group were investigated. Council data sources considered included the following (described in more detail in Appendix D):

- Electoral registers
- Barnet Council Housing Needs Survey 2001 and 2006

Other data sources that have been investigated are sources that have been obtained for all local authorities from various government departments and other organisations for research into improving migration and population statistics. 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 of pupils within Local Education Authority (LEA) schools

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 internal migration or be used as a quality check of the current estimates. 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 internal 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 people. The potential use of these data for estimating internal 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. ONS research has also considered Council Tax Billing Lists as a potential source for identifying student areas. Further research to investigate potential improvements to internal migration estimates for certain sub-groups of the population is planned.

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. There was 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 was 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, ONS will investigate the potential to use them to improve population estimates e.g. through making a student adjustment or by treating 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.

Students who choose to study in an area away from their parental home are by definition a mobile sub-group of the population. This mobility makes students more difficult to estimate. Since Barnet has a significant student population, the findings of the case study in Welwyn Hatfield on student estimation have direct relevance to population estimation in Barnet.

4.2.2 Relevant Findings from the Derby Case Study

Research into young men was part of the principal investigations as part of the Derby Case Study. Some of the key findings from this case study are the fact that no data source has been identified that can provide a better estimate of young men than those currently used in the population estimates, though there are data sources which provide information about a sub-set of the young male population. These include data on the allocation of National insurance numbers to migrant workers from overseas and data on children arriving in schools that are likely to have arrived in the country accompanied by an adult migrant.

4.2.3 Relevant Findings from the Hammersmith & Fulham Case Study

The case study included an investigation 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.

The patient register data for Hammersmith and 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. 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 e.g. HESA data which may help to inform the estimation of this population sub-group.

4.3 Consultation with Local Organisations

One of the aims of the case studies is to work with the local authorities selected to draw on local knowledge and data sources. This was achieved through meetings with Barnet Council attended by representatives from various departments within the Council. A representative from Barnet 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. The latest ONS estimates available during these discussions were for mid-2004.

Barnet Council indicated that they had not identified any particular issues with the more recent published mid-year estimates for their borough, though they did have previous concerns over the discrepancy between their mid-2000 estimates and the 2001 Census which led to an independent assessment and report[2] of the 2001 Census and revised mid-year estimates. The findings of this assessment concluded with ONS research and findings after the 2001 Census that the original mid-year estimates for 1992 to 2000 were overestimates. The report concluded that whilst there was evidence that there was an undercount with the 2001 Census, that this undercount was adequately corrected in the revised mid-2001 estimates.

The key task identified during discussions was to get a better understanding of the availability of data sources which could inform ONS about the Barnet population, and the robustness of its mid-year estimates, and in particular to identify data sources which may better inform us about the numbers from different ethnic groups.

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[2] Middlesex University Business School, The population of LB Barnet: assessment of the 2001 census results and revised mid-year estimates

Chapter 5   Data Sources Investigated

In consultation with contacts at Barnet Council and Barnet PCT, a number of local and national data sources were identified which could be used to inform us about how the population from non-White ethnic groups may be recorded on administrative datasets and how young people and in particular males and students are estimated. This chapter discusses each data source and conclusions are made regarding its relevance to the study and whether it may be used in the population estimation process. Background information on each data source can be found in Appendix D.

5.1 Comparison of Population Counts in Barnet

Table 7 shows the total number of people aged 18 and over in Barnet according to two administrative sources.

The estimate of the population aged 18 and over based on the electoral register is 43,100 lower (-16.8 per cent) 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. This does not however explain the very large observed difference between the electorate count and the mid-year estimate. Since Barnet has a noticeable student population, it is likely that a proportion of these do not register to vote in the area where they reside, though this does not fully explain the large observed difference.

Table 7: Comparison of population counts in Barnet

Source	Population estimate	Reference date
Electoral register	213,036	1st December 2005
Population estimates – people aged 18 and over	256,167	30th June 2005
Patient registers – people aged 18 and over	290,887	31st July 2005

The number of people aged 18 and over registered with a GP who are resident in Barnet is approximately 34,700 greater (13.6 per cent) than the number of people aged 18 and over in the 2005 population estimate. However, it is recognised 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. An Audit Commission National Duplication Registration Initiative has taken some steps to address this problem in a number of areas, but this did not include Barnet. Barnet PCT however does have its own strategy for removing duplicate entries. 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.

GP registers in Barnet may also include short-term migrants who are excluded from population estimates. These are migrants who register with a GP in Barnet but do not stay in the country for 12 months or more. If they do not inform their GP when they leave the country they will be incorrectly included in the GP registers until the practice establishes that they are no longer in the local area and they are de-registered.

For Barnet the July 2005 patient register count (reflecting the mid-year point in time) for all ages was 369,859, around 40,200 higher (12.2 per cent) than the mid-2005 estimate, this compares to patient register list inflation of 5.3 per cent nationally and 10.7 per cent for London.

5.2 Administrative Sources Investigated

ONS considered a number of data sources produced by Barnet Council, together with administrative sources arising out of other research. The following section considers 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 registration data
- National Insurance Number Allocations to Overseas Nationals

- Housing Needs Surveys

- Registered Social Landlords (RSL) data (CORE)

- School Census

- Walk-in NHS medical centres

- HESA Data

- Council Tax

- Other Sources

 - ONS Race Impact Assessment

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 the 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.

Figure 11 compares electoral registration data for Barnet over time with the mid-year estimates for people aged 18 and over.

The number of people registered to vote in 2005 at 213,000 was the lowest recorded since 1994. It is thought that the coverage of the electoral register is closely linked to the quality of local canvassing procedure, rather than actual changes in population. This graph also shows that while the electoral registers were relatively similar to the population estimates in the 1990s, both reflecting a general population increase, since 2002 they have noticeably drifted away. By 2005 the number of people aged 18+ registered to vote was 43,100 lower (-16.8 per cent) than the mid-year estimate.

Figure 11: Comparison of mid-year population estimates (aged 18 and above) and electoral registration data for Barnet 1991-2006
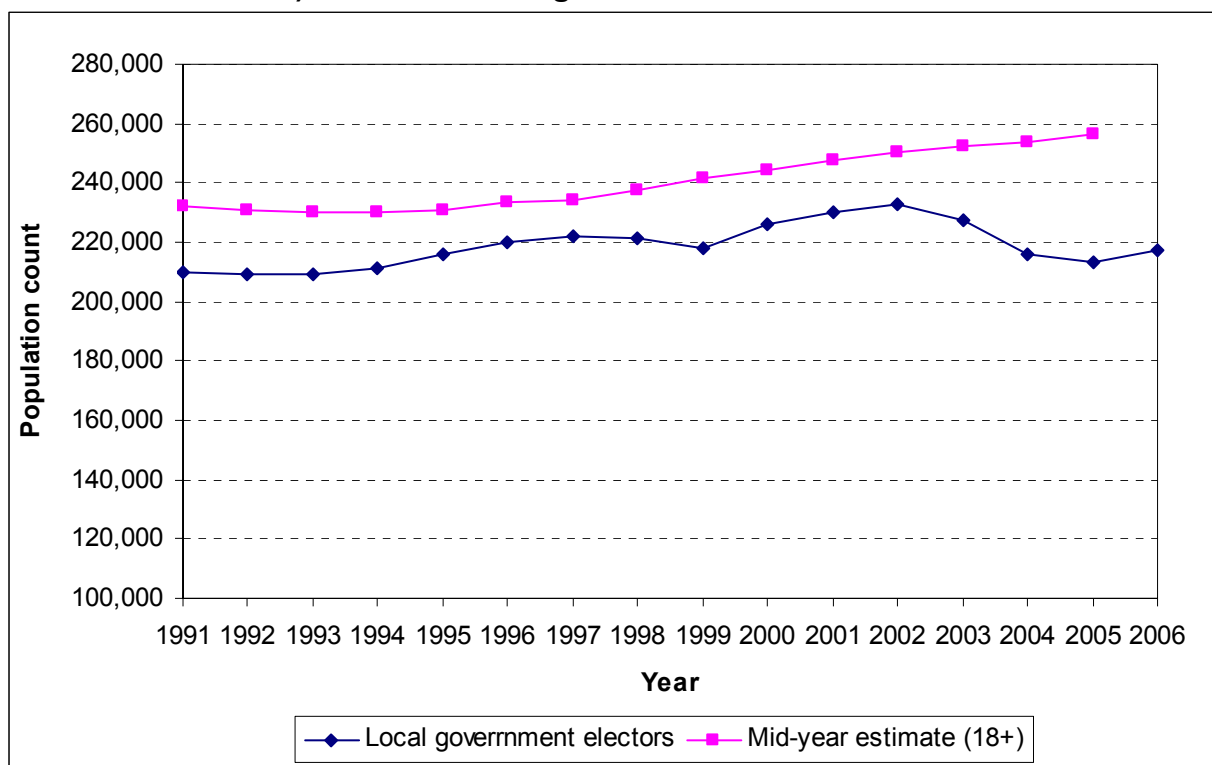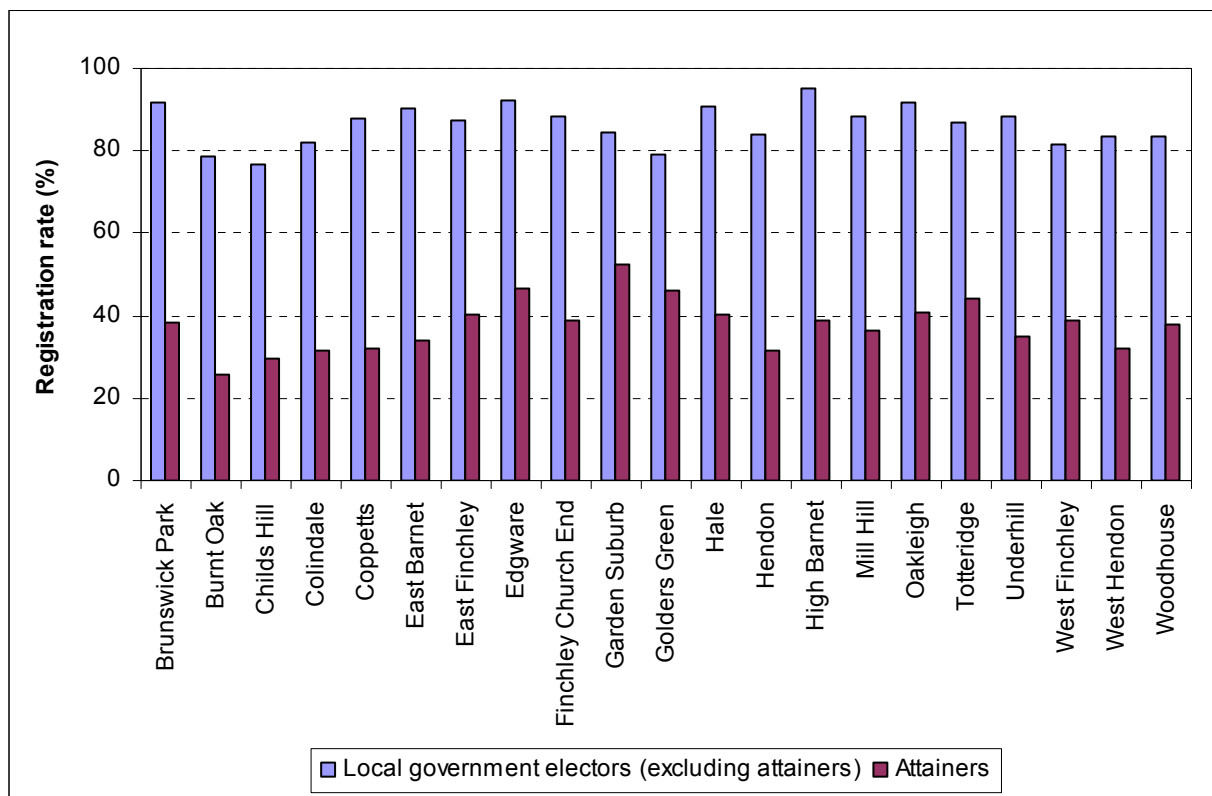

Notes:

1. Figures for local government electors exclude attainers.
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 Barnet by ward for 2004. These have been produced using electoral registration data and mid-2004 small area population estimates and are indicative of the proportion of the population registered to vote.

Registration rates vary by ward with High Barnet and Edgware having the highest registration rates. Three wards have registration rates below 80 per cent; Golders Green, Burnt Oak and Childs Hill. The common feature of these three wards is that they have a high proportion of their population from non-White ethnic groups. In addition, Golders Green and Childs Hill are also characterised as student areas with high level of international migration. These characteristics suggest that people from non-White ethnic groups and students are less likely to register to vote. Additionally

because of nationality requirements, many international migrants will not be eligible to vote.

Figure 12: Electoral registration rates for Barnet by ward for 2004

Notes:

1. The registration rate is defined as the number of electors registered to vote as a percentage of the voting age resident population.
2. The number of registered local government electors and attainers are at the mid-year and have been calculated by interpolating electoral counts from the 1st December 2003 and 1st December 2004 registers of electors.
3. The resident ward population is derived from the mid-2004 ONS Super Output Area Population Estimates (experimental statistics)

Registration rates for attainers are lower than for the rest of the electoral population. However the rates follow a similar distribution, with Burnt Oak and Childs Hill having the lowest registration rates.

Work has also been done by ONS as part of a Race Impact Assessment (see section 5.2.9.1 in this chapter) 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. Looking at electoral registration rates for all local authorities, this work concluded that the propensity to be registered is lower for people from non-White ethnic groups, and that as the proportion of the population from non-White ethnic groups increases, the electoral registration rate decreases. The findings for Barnet are consistent with this conclusion.

Prior to the mid-1999 population estimates, the electoral registers in conjunction with other data were used for estimating internal and international migration at local authority level. Due to the various difficulties involved with estimating migration from electoral registration data (such as problems with coverage of the registers) the use of electoral registers for this purpose was discontinued in favour of using patient register data.

5.2.2 GP Registration Data

Barnet Primary Care Trust (PCT) covers the same area as the Borough of Barnet and holds registrations for GPs within this area. This includes people who may live outside the Borough, and excludes people who reside within the Borough but who have 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 people recorded on the patient register as residing within the Borough, regardless of the location of their GP i.e. within or outside Barnet.

Internal migration estimates are based on change of resident address captured on re-registrations with GPs following a move. Capturing moves is therefore dependent on people registering with a GP when they move into an area and registering with a GP in another area if they move out. Further detail on how internal migration estimates are made and some of the quality issues associated with this method can be found in Appendix D.

Research has shown that young, healthy people, particularly young men, tend to be slow to register with a GP when they move into an area. Other research,

including the case study for Welwyn Hatfield, has suggested that students in particular do not always register with a GP in the area where they live after their studies.

Figures 13 and 14 compare the population estimates with the number of people registered with a GP who are resident in Barnet.
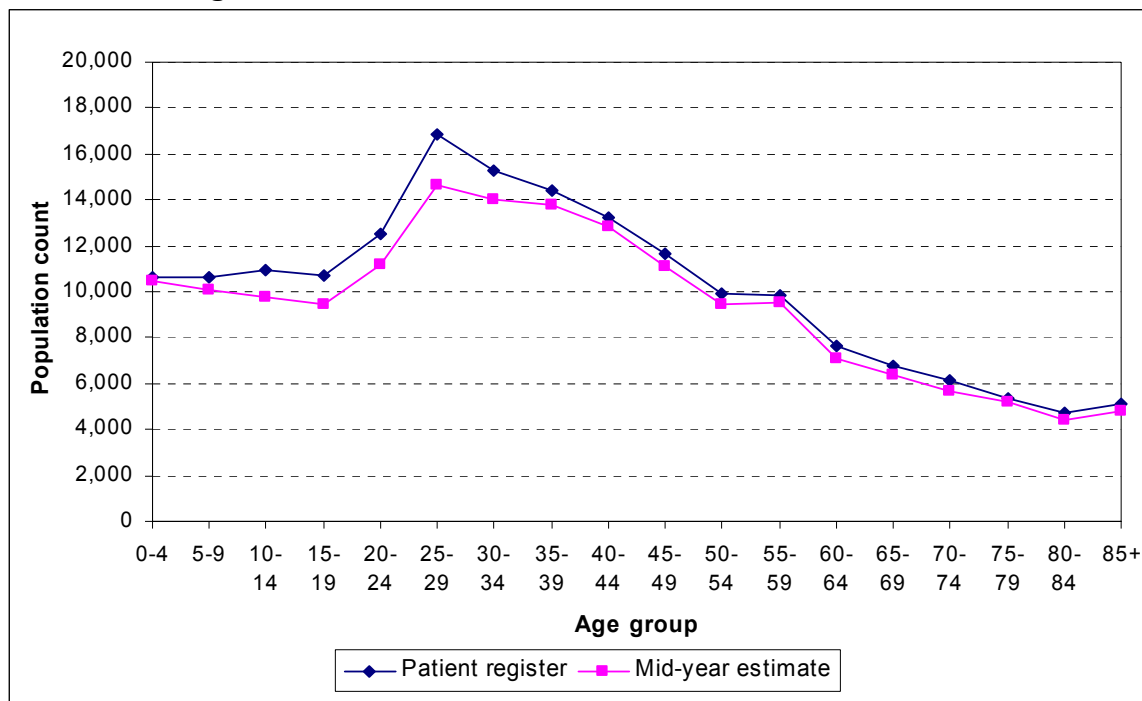
Figure 13: Comparison of mid-year population estimates and patient register data for males in Barnet, 2005
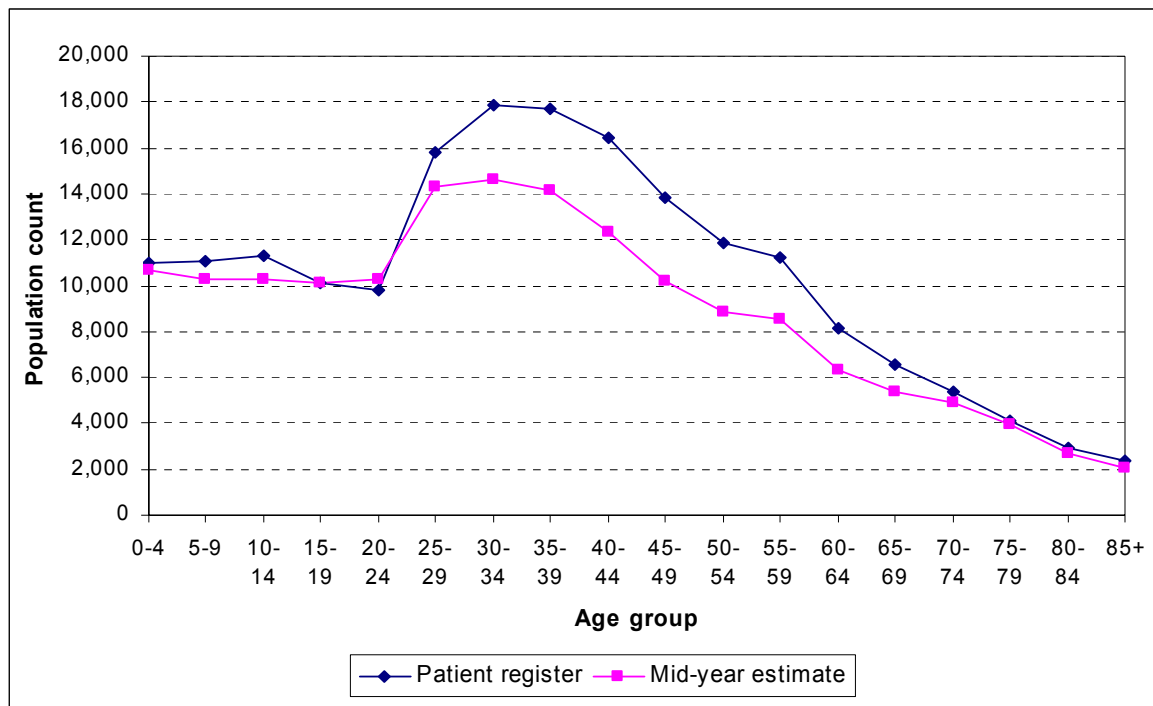
For males, this comparison shows that the patient registers are higher than the population estimates for all age groups except in the 15 to 24 year age groups where the mid-year estimates are marginally higher. There is a noticeable difference between the two datasets for males aged 30 to 59, where the patient register exceeds the mid-year estimate by 20,300 (29.6 per cent). The greatest difference is for males aged 40 to 44 (4,100). For males aged 70 and over, the patient registers and mid-year estimates are similar, thus indicating that the patient register counts for this age group may provide an accurate estimate of the population. Overall male patient register list inflation is over 17 per cent. Possible reasons for the discrepancy between these two data sources are that either the population estimates are not capturing all working age men and/or that the patient

registers are inflated in a number of age groups, due perhaps in part to the inclusion of short-term migrants on the patient registers.

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

For females, this comparison shows that whilst patient registers are higher than the population estimates for each age group, the differences are noticeably less than for males. The largest difference is for females aged 25 to 29 at 2,200 (14.9 per cent). In terms of the numbers and proportions of the female population within each age group, the patient registers and mid-year estimates show a strong consistency. Overall female patient register list inflation is 7.4 per cent.

One cause of list inflation is caused by the inclusion of persons on the patient registers who are short-term migrants i.e. persons who have resided in England and Wales for less than 12 months. Such persons therefore do not meet the criterion of 'usual residents' in the mid-year estimates.

Patient register data can also be used to help identify international in-migrants. 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.

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.

Flag 4 data have been considered as part of the Hammersmith & Fulham Case Study looking at male migrants. This indicated that for 2003, the number of flag 4 records for males in Hammersmith & Fulham accounted for 10.7 per cent of all registered males. This suggests that a sizeable element of Hammersmith & Fulham's male population were previously international migrants.

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.

5.2.3   National Insurance Number Allocations to Overseas Nationals

Of the young male population in Barnet, a proportion is likely to be migrant workers. Officials from the Council believe that this proportion is significant in Barnet. 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 are listed later in this section.

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. While these data do not give an indication of the stock of migrants, they do show whether an area attracts

overseas nationals, or has done so in the past. Further detail on these data can be found in Appendix D.

In the year to mid-2006, the data show that there were 8,270 overseas nationals with an address in Barnet when they registered for a NINo, which is 16.3 per cent higher than the equivalent figure for the year to mid-2005 (7,110). When the mid-2005 to mid-2006 figure is compared to other local authorities in England and Wales, Barnet ranked 15th (out of 376). This number expressed as a percentage of the mid-2005 population of Barnet is 2.5 per cent and ranks 28th (out of 376) when compared to other local authorities in England and Wales. Any foreign students in Barnet who work or claim benefits whilst in the UK would have an NI number but it is not possible to identify students separately from other workers.

Data on NINos allocated to overseas nationals includes people from the ten countries that joined the European Union on 1 May 2004; these 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. As more recent data on NINo allocations becomes available, the impact of these changes 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 provide a better understanding of 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 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.

One of the key limitations in using the NINo data for use in estimating international migrants is that it includes overseas nationals who are short-term migrants ie persons staying for less than 12 months. Work is currently being done on estimating short-term migrants, using administrative datasets, including DWP NINo data, so there is potential that NINo data could be used in the future to help produce estimates of both short-term and long-term international migrants.

5.2.4 Housing Needs Surveys

During 2001 and 2006 surveys were conducted in Barnet to explore the housing needs, aspirations and requirements of those living in Barnet and households who may move into the area. This was part of a rolling programme of such surveys across London. Further detail on how the surveys were carried out can be found in Appendix D together with a link to the report of findings published on the London Borough of Barnet website.

Data from the housing needs survey in Barnet were supplied to ONS and used to build a picture of the ethnic composition, household size and previous household address of the respondents. Analysis has focused on the main respondent to the survey.

The survey results are based on information provided by the household respondent, these responses were then grossed up to reflect all households in Barnet (123,500 in 2001, and 127,800 in 2006). Information from the household respondent can then used as a proxy for household information.

From the grossed up survey results it is estimated that in 2001 one quarter of respondents moved to their Barnet address from elsewhere in the UK (outside Barnet) or from abroad (Table 8). This percentage however may be an underestimate due to the large recording of 'No previous address' as indicated by just over a half of all respondents, which appears unrealistically high.

Table 8: Housing Needs Survey 2001, Location of previous address

Previous address	Number of Households			
	White	Non-white	No ethnicity stated	Total
Within Barnet	20,163	7,852	801	28,816
Elsewhere in UK	21,843	4,728	692	27,263
Abroad	2,697	1,822	79	4,598
No previous address	51,140	9,006	2677	62,823
Total	95,843	23,408	4249	123,500

| Previous address	Percentage of all Households			
	White	Non-white	No ethnicity stated	Total
Within Barnet	16.3	6.4	0.6	23.3
Elsewhere in UK	17.7	3.8	0.6	22.1
Abroad	2.2	1.5	0.1	3.7
No previous address	41.4	7.3	2.2	50.9
Total	77.6	19.0	3.4	100.0

Source: Barnet Council – Housing Needs Survey 2001

The grossed up survey results indicated that respondents from non-White ethnic groups represented 19 per cent of all respondents, however they reflected just 17.3 per cent of all respondents who previously lived elsewhere in the UK, but 39.6 per cent of respondents who previously lived abroad. This suggests that people from non-White ethnic groups are less likely to have moved to Barnet from elsewhere in the UK, but twice as likely to have previously lived abroad than for the private household population as a whole.

The more recent 2006 Housing Needs Survey indicates that whereas in 2001 3.7 per cent of households had a previous address abroad, in 2006 this had risen to 9.9 per cent, indicating an increase in 'international in-migrants households' to Barnet.

Comparisons can be made between 2001 Census data on ethnicity and information obtained from the 2001 Housing Needs Survey (Figure 15). Unlike the 2001 Census, no 'Mixed' ethnic group was used in the Housing Needs Survey, and so the respective figures are not directly comparable, though for the other identified ethnic groups they show a strong similarity.

Figure 15: Barnet ethnic group distribution in the 2001 Census and 2001 Housing Needs Survey
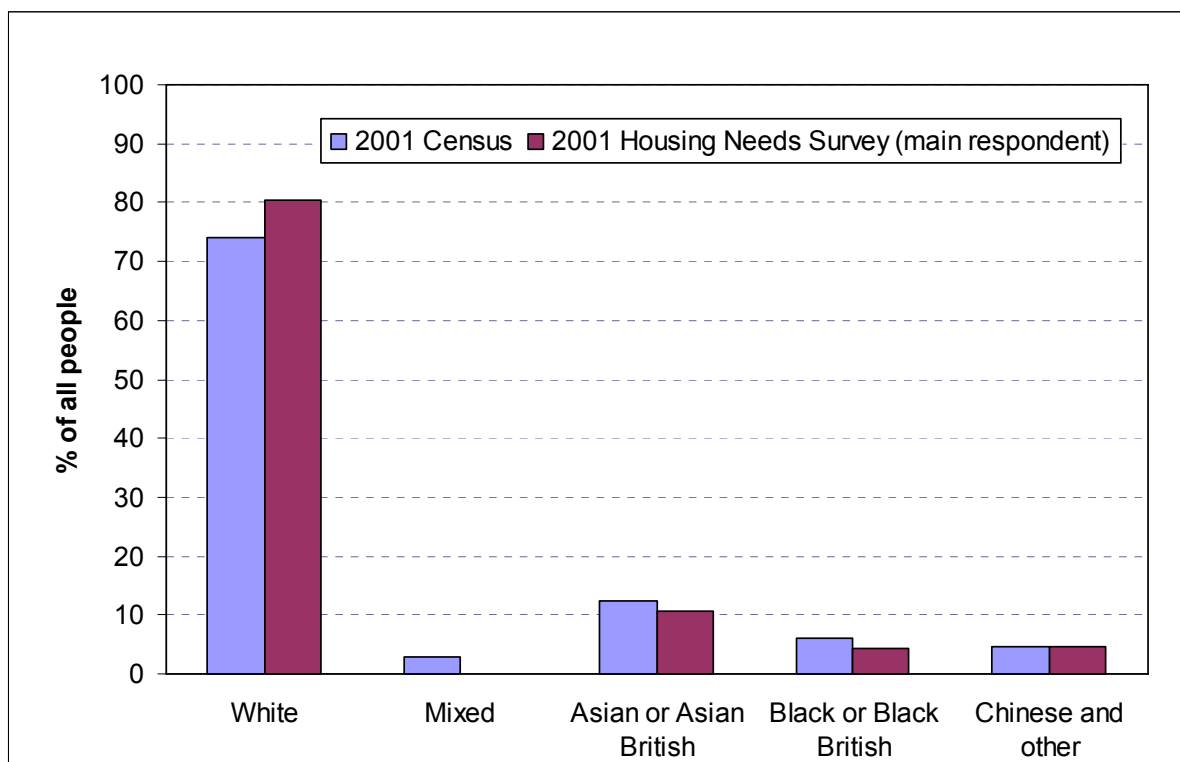
Data from Housing Needs Surveys may therefore provide a useful source of information for monitoring any changes over time in the proportion of people by ethnic group, as well as providing a reasonably up-to-date independent intercensal estimate of the overall numbers by broad ethnic group.

ONS has investigated whether population could be predicted 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. These variations mean that any relationships found between housing and population

numbers are unlikely to be uniform and consistent across local authorities. It is therefore not possible to use information from housing surveys to estimate population and migration. However, they can give an indication of population turnover and the need for housing 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 ONS e.g. surveys and the 2011 Census.

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). CORE 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 more are legally required to submit CORE forms to the (HA) CORE dataset. The (LA) CORE dataset records lettings made by local authorities. Not all local authorities currently provide information although Barnet is one of the local authorities which does.

Each record corresponds to a letting and therefore, a household. For each record, 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, sex, economic status, primary reason for housing and previous area of residence. Further information on CORE data can be found in Appendix D.

Table 9 shows the previous location of men in Registered Social Landlord (RSL) housing.

Table 9: Previous residence of male moves into RSL housing in Barnet in 2005-06 by age of first listed male tenant in the household

		Moves	% of Moves
Under 20 years	**Barnet**	*	**75.0**
	Brent	*	25.0
20-29 years	**Barnet**	13	**92.9**
	Enfield	*	7.1
30-39 years	**Barnet**	22	**81.5**
	Brent	*	3.7
	Haringey	*	7.4
	Kingston upon Thames	*	3.7
	Westminster	*	3.7
40-49 years	**Barnet**	16	**76.2**
	Brent	*	9.5
	Camden	*	4.8
	Enfield	*	4.8
	Islington	*	4.8
50 years and over	**Barnet**	23	**88.5**
	Brent	*	3.8
	Hackney	*	3.8
	Redbridge	*	3.8

Note: * denotes a count of less than 5

This table shows that the majority of men in RSL housing in Barnet have moved from another address within the authority, with all the other moves from elsewhere in London.

The 2001 Census found that of the 126,944 households in Barnet, 4.5 per cent of these were RSL housing, whilst 10.5 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

The School Census is a snapshot of pupils within LEA schools, 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 by identifying 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. In addition, since migrants are known to move into migrant communities that are already established, these data may indicate that an area is likely to also have migrants without school children.

ONS has 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 2004, 99.6 per cent of pupil records had a valid postcode.

- In 2004 nationally there were 219 schools where 30 per cent or more of pupil's ethnicity was not obtained. In 2006, the number of schools where 30 per cent or more of pupil's ethnicity was not obtained had reduced to 44.

According to School Census data, there were 4,725 pupils aged 5 to 15 of 'Other White' ethnicity residing in Barnet 2005, this represents 13 per cent of all LEA school pupils of this age residing in Barnet. The use of a category Other White is a method of identification for white people who are not represented by the other white Census categories – White British or White Irish. This means that Other White contains a diverse collection of people with different countries of birth, religions and languages. In 2004 the Other White figure was 4,700 and in 2003 it was 4,546. This will include for example pupils born in Australia, New Zealand and other European countries.

The percentage school children by ethnicity residing in Barnet over a three-year period to 2005 are shown in Figure 16 for primary schools and Figure 17 for secondary schools. Please note that these figures will exclude pupils residing outside Barnet who attend LEA schools within the Borough, but will include pupils

who reside in Barnet but who attend LEA schools outside Barnet. Information on private school pupils is not included.

Figure 16: Primary school children attending LEA schools who reside in Barnet
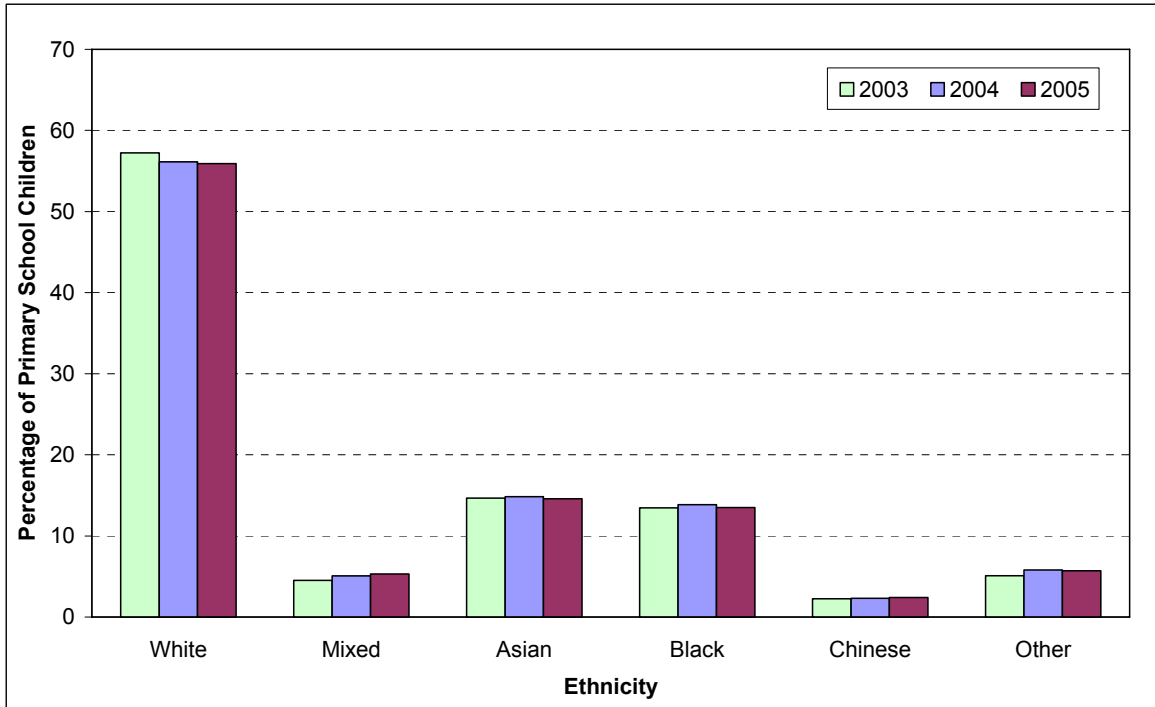
Figure 17: Secondary school children attending LEA schools who reside in Barnet
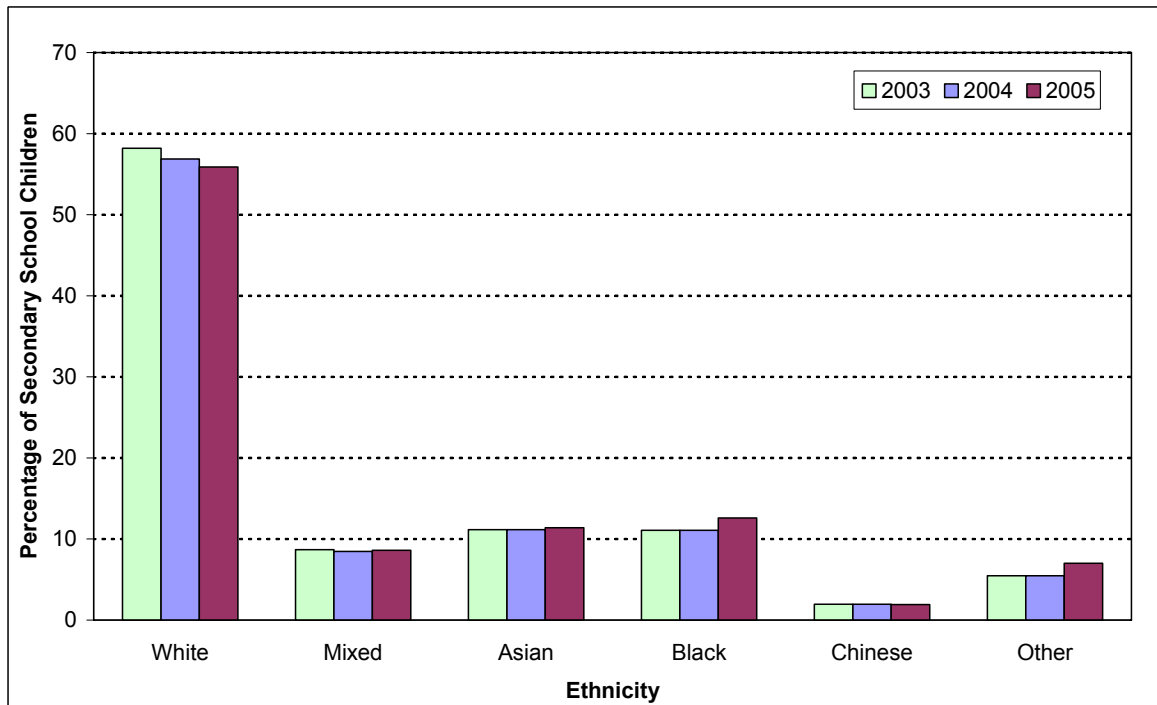
Over this three-year period there is a slight but noticeable change in the distribution by ethnic group of LEA schools pupils residing in Barnet. For children of primary school age for example, pupils from the White ethnic group have fallen by 1.3 percentage points (and fallen in number), whilst pupils from the Mixed and The 'Other' ethnic groups have risen by 0.8 and 0.6 percentage points respectively (and risen in number).

For children of compulsory secondary school age, pupils from White ethnic group have fallen by 2.3 percentage points (and fallen in number) and the Black and Other ethnic groups have both risen by 1.5 percentage points (and risen in number).

Information on ethnicity from the School Census can be compared with 2001 Census data and the published local authority population estimates by ethnic group. Generally the 2001 Census distributions have slightly larger proportions of the school age population from the White ethnic group than are evident in the School Census data, though the School Census data does relate to later point in time (2003 onwards). One explanation for this is that a greater proportion of the pupils from the White ethnic group attend private schools than for pupils from non-White ethnic groups. It may also be the case however that pupils from non-White ethnic groups are increasing in relation to the White ethnic group.

Comparisons have been made between the percentage of pupils by ethnic group from the 2003 School Census data with 2003 mid-year estimates for children of primary school age (Figure 18).

Generally there is broad consistency between the proportions of children within each ethnic group from the two datasets, however there is a noticeably higher proportion of children from White ethnic group in the mid-year estimates compared to the School Census. A similar pattern also exists with children of compulsory secondary school age (11 to 16).

There are a total of 35 independent schools in Barnet, teaching around 6,400 pupils, so it is possible that differences could occur between the proportions of

school age pupils by Ethnic Group between the mid-year estimates and LEA School Census.

Figure 18: Ethnic distribution of Barnet's population aged 5 to 10 year-olds 2003
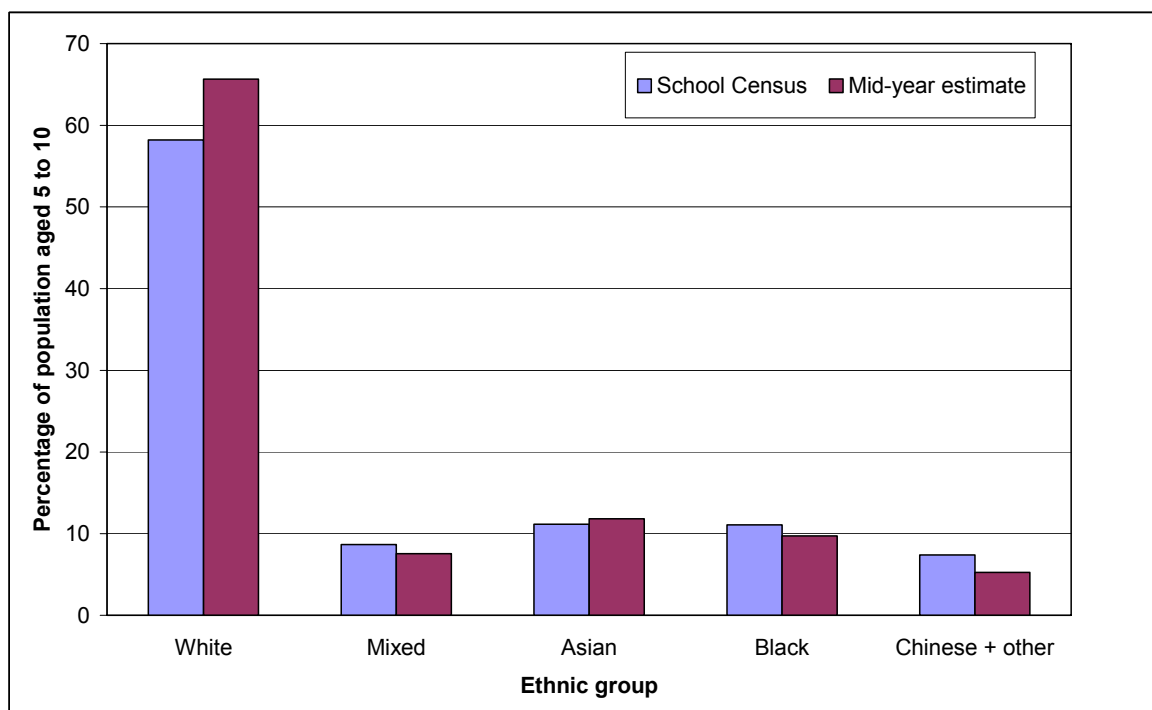
School Census data were considered as part of the Task Force on International Migration which recognised the potential value of this data source. The Task Force recommended that the quality of these data be reviewed for their use in improving migration and population statistics. The Task Force also suggested that School Census data may be useful if linked to other sources to provide more information about migrants and their children e.g. 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 have the potential to provide an indication of international migration by considering change over time although it excludes pupils outside the state education system. Further investigation of this dataset 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 Walk-in NHS medical centres

Generally it is possible that mobile people (including young men) may make use of walk-in centres more often than other sub-groups of the population, in particular when first moving to an area to live. Patient information recorded at point of use including age, sex, ethnicity and address may provide information on their usage by people who live but are not registered with a GP in the area. This information has the potential to be linked to other sources. There are two walk-in centres in Barnet at Edgware Community Hospital and Finchley Memorial Hospital, information on the age, sex and ethnicity of those using these walk-in centres is held by Barnet PCT. This information was not investigated as part of the case study work.

5.2.8 HESA Data

Data are collected on home postcode for students entering higher education from within the UK, or country of domicile immediately prior to entry for others. The term-time full postcode will be collected from 2007/08. This is a limitation of the current data collection. 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 International Departmental Task Force on Migration Statistics set up by ONS which recommended that additional information on student migrants should be collected from this source.

Whilst HESA data by University is available, it is not readily possible to breakdown the student numbers for Middlesex University for those specifically attending the Hendon campus who might be expected to live locally and reside within the Borough, or to identify those students who reside within the Borough but may be attending any of the Middlesex University campuses or other Universities. The planned collection of term-time postcode on HESA data will however enable comparisons to be made between the student population attending the University and other data sources such as the mid-year estimates.

5.2.9 Council Tax

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. Properties which are jointly occupied by both students and non-students cannot be identified in this way.

Data collected by Barnet Council can also be used 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.

5.2.10 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 Barnet. For example, data from the Driver and Vehicle Licensing Agency (DVLA) has been considered for possible use in international migration as this source should include young people and young men in particular who hold a driving licence.

However, research has concluded that these data are of insufficient quality for estimating emigration. This is because data on people who emigrate and inform the DVLA also includes people who have informed DVLA that they have lost their licence while on holiday. 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.

In addition, as the DVLA data only covers people registered to drive, it is unsuitable for use for quality assuring population estimates because of the lack of coverage of non-license holders (including those too young to legally drive).

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 markers for up to 5 years as a transitional measure. For this reason these data will not provide a long term basis for estimation of temporary foreign workers. ONS has been considering data from the WRS as part of the research into estimating short-term migrants. This source has not been considered in the case study for Barnet which is more concerned with potential improvements to the estimation of long-term migrants.

Other datasets such as credit referencing and mobile phone ownership have been considered for this case study but for the data to be inclusive, datasets from a number of suppliers would need to be acquired e.g. data would be needed from all suppliers of mobile phone services. It is also possible that address information on these sources may not be up to date in all cases.

One dataset considered as part of the Derby Case Study was PeopleUK. PeopleUK is an individual life stage based classification tool produced by CACI. It can assign each adult in the UK into one of 50 different types based on their life stage, wealth and lifestyle. PeopleUK has been purchased by Derby City Council and lists all people aged over 18. Whilst the data obtained for Derby does not contain information on age and sex, so young men cannot be identified, it may however have potential as a national dataset to provide an independent estimate of all people aged 18 and over or to indicate changes in population over time if additional year's data were obtained. However, more work needs to be carried out to investigate the quality of this data source.

5.2.10.1 ONS Race Impact Assessment

Earlier in 2007 ONS undertook some work 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.

Ethnic origin is not available on many of the datasets used in compiling population estimates, with the notable exception of the last two Censuses, and this had implications for the range of analyses that could be carried out. As migration is the most difficult component of population change to estimate reliably, local authorities such as Barnet where there are considerable flows of migrants, both internal and international, are more at risk of quality issues associated with their population estimates.

The race impact assessment identified a relationship between high migration levels in local authorities and high BME populations, thus increasing the risk that the population estimates could be under- or overestimated in those local authorities with high BME populations, especially at a time of significant levels of internal and international migration.

An analysis of the mid-year population estimates for 2001 (based on the 1991 Census results and estimated annual population change) and the subsequently revised estimates from the 2001 Census suggests that there was a very small correlation between the accuracy of the mid-year estimate for local authorities and the proportion of the population from non-White ethnic groups.

Population estimates by ethnic group for English local authorities, published by ONS as experimental statistics, indicate that in mid-2001 there were 33 local authorities (out of 354) in which more than 20 per cent of the population were from non-White ethnic groups, this includes Barnet with 26.1 per cent (21st highest). Analysis does indicate some association between the differences and those areas with higher BME populations, though not consistently higher or lower. The differences were on average most positive (the estimates underestimated) in those areas with high BME populations, defined in terms of over 15 per cent of people from non-White ethnic groups. Of the 40 local authorities with over 15 per

cent BME population, 25 had positive differences (revised estimates were higher) and 15 negative differences (revised estimates lower).

For the cluster 2 local authorities, all except Watford have over 15 per cent BME population (as at mid-2001), 7 had positive differences (revised estimates were higher) and 8 negative differences (revised estimates lower).

For the local authority mid-year estimates GP patient register data are used to calculate the internal migration component of the population estimates. Whilst it is acknowledged that moves of young men are undercounted, this does not necessarily mean that young men are not registered with GPs, rather they may not re-register for some time after moving. ONS is not aware of any conclusive evidence on whether or not the propensity to register with a GP differs between ethnic groups, it has been noted that ethnic minority groups lack access to some forms of health provision, but there appear to be no major barriers to the use of GP services.

Whilst nationally in 2005 the patient register counts exceeded the mid-year estimates by 2.80m (5.3 per cent), this list inflation was greatest in London, the region with most of the local authorities that have a high proportion of their population from non-White ethnic groups. There is no indication therefore that patient registers tend to be deficient in areas with the highest proportions of people from non-White ethnic groups.

In summary, the various analyses underpinning this race impact assessment bring a reasonable level of reassurance that the potential for biases is low, whilst recognising that there are challenges in measuring the migration of people more generally. During the 1990s the Barnet population was overestimated, so there is no evidence for Barnet that a high BME is biasing an undercount. Current ONS plans to improve migration statistics are likely to reduce the risk of biases in the estimates and projections still further.

Chapter 6   Findings

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

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

Barnet Council primarily use mid-year population estimates as denominators for performance indicators, for financial budgeting purposes and as part of their Housing Strategy. They publish the estimates on their website and use them within the council for understanding and tracking numbers of people in different age groups.

The Council were concerned that the total One Number Census (ONC) count and the Census figures for subsets of the population were too low. At the request of the Council, an independent assessment of the 2001 Census counts and subsequently revised mid-year mid-2001 estimates was undertaken by Middlesex University. The conclusion reached was that whilst the 2001 Census estimate appeared lower than expected, the undercount was adequately corrected in the revised mid-2001 estimates. After all adjustments Barnet was still overestimated during the 1990s.

In order to identify the factors that make it difficult to produce accurate estimates of the population in Barnet, the components of the population estimation process that present the greatest challenges were considered. The conclusion of this initial data analysis was that the high proportion of young males and students, and the high proportion of migrants who are more likely than non-migrants to be represented are the main challenge to estimating Barnet's population accurately. Some of these factors have been investigated in other case studies (the study of Derby focused on young males and Welwyn Hatfield on students).

2. To investigate the availability of data sources which provide information on ethnicity, and to consider whether these indicate a reasonably consistent picture of ethnicity in the borough.

A number of data sources were investigated to see if they could be used as a potential data source for information on the ethnicity of Barnet's population.

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 has been collected. Where it is collected currently e.g. Schools Census, there is self determination in the choice of ethnic group, which is a potential source of inconsistency in the way this information is collected.

Information does exist on a number of national ONS surveys e.g. Longitudinal Study, General Household Survey and the Labour Force Survey, but there are inherent difficulties associated with grossing up data for 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.

The key datasets investigated which had information on ethnicity were the 2001 Housing Needs Survey and more recent annual School Census data. The main purpose of the Housing Needs Survey is to assess the housing needs, aspirations and requirements of those living in Barnet. Information on ethnicity of the household respondent and household number is collected. By grossing up the survey responses it is possible to derive an estimate on total number of the private household population by ethnic group but not by age and sex. This information could potentially be used to quality assure the ONS local authority ethnic group population estimates for England. Comparisons between 2001 Census data and the 2001 Housing Needs Survey indicated broad consistency in the reporting of ethnicity for the population.

The other key dataset investigated which contain information on ethnicity was the School Census, covering LEA schools only. This dataset showed consistency over

time in the numbers and proportions of both primary and secondary school pupils by ethnic group. There was also a broad consistency between the ethnic distribution of children of compulsory school age (5 to 16) from the 2003 School Census data and the 2003 mid-year population estimates by ethnic group. Unfortunately these two datasets are not directly comparable because the School Census data excludes children attending private schools. However broad plausibility checks of both the overall mid-year population estimates by single year of age and sex and the estimates by ethnic group (experimental statistics) could be done by using the School Census data.

Advantages of the School Census data over Housing Needs Surveys for reporting on ethnicity include the fact that the former is done on an annual basis, whereas Housing Needs Surveys are carried out infrequently, and the fact that the data relate to people rather than household respondent. One key disadvantage however is that the School Census only covers school children, and specifically those within LEA schools.

3. To understand better the characteristics of the population from non-White ethnic groups, and to investigate the extent to which this population reflects the characteristics of groups who are hard to estimate.

The ONS Race Impact Assessment investigated to what extent (if any) areas with a high BME population were also areas with a higher risk of being under or overestimated. This race impact assessment noted that there is a relationship between high migration levels in local authorities and high BME populations. Given that migration is the most difficult component of population change to measure, this makes the risk higher that the population estimates could be under- or overestimated in those local authority areas with high BME populations, especially at a time of significant levels of international and internal migration.

Evidence for Barnet and 7 of the other 14 local authorities in cluster 2 indicated that during the 1990s, the population estimates were to differing degrees overestimated, and on this basis there is no strong evidence that having a high

BME population means there is a greater likelihood of the estimates being underestimated.

There is a greater risk to the accuracy of the Census results on which the mid-year estimates are based if Census response rates are poor, and there is a correlation between such areas and a number of factors that include high BME populations, unemployment and poor housing. These factors may apply to areas with high proportions of their population in White or non-White ethnic groups.

In summary, the various analyses underpinning this race impact assessment 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. The report also recommended that ONS pursues a coherent strategy to ensure the highest possible level of response from various ethnic groups in the 2011 Census.

4. 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 Barnet and whether any are short-term migrants.

There is evidence for Barnet from a number of sources (eg electoral registers and National Insurance number registrations) that Barnet 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 administrative datasets e.g. school records and the patient registers. Whilst no new data source has been identified to provide a more accurate count of international migrants than is currently used or planned in the method used to produce the mid-year estimates, there is no evidence to indicate that these long-term migrants are not adequately reflected in the mid-year estimates. However the availability of additional data sources (eg DWP NINo registrations) for identifying international migrants, and for Barnet particularly those from the new accession countries, does provide an opportunity for additional quality assurance on the international migration component of population change.

Further work is planned to reconcile figures from survey and administrative sources, including identifying differences between long and short-term migrants, in order to bring enhanced confidence that international migrants are indeed being picked up as they should be.

Chapter 7   Discussion

The case study for Barnet primarily focused on the investigation into data sources, both local and national which could be used to inform us about how the population from non-White ethnic groups may be recorded on administrative datasets and how young people and in particular males, and students are estimated.

While many local administrative datasets record information on ethnicity, most deal with only small proportions of the population and therefore are of limited use in this context. Two of the more comprehensive datasets to record ethnicity are Housing Needs Surveys and School Census data. With the latter of these datasets, there is therefore potential to monitor child numbers by ethnic group, and to make comparisons with the published population estimates by ethnic group and age to measure the extent to which there is consistency with the respective numbers by ethnic group. What is currently lacking however is information from private schools about the ethnicity of their pupils.

Students are not readily identifiable from the key administrative datasets considered as part of this study, and the extent to which students may be under or over represented in the mid-year estimates difficult to quantify. As students comprise for some ages (19 to 20) a majority of the population, their appropriate coverage in the mid-year estimates is difficult to truly ascertain.

Migration, both internal and international has been identified as a feature of Outer London Boroughs, together with some areas outside London in Cluster 2, and whilst data sources have been identified (eg patient register flag 4 information, and DWP NINo allocations) which may inform about migration to and from Barnet, there is no definitive data source which provides authoritative data on this population component of change

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 Barnet 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 Barnet which has a sizeable 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 includes information on whether English is the pupil's first language. Although this is not a direct indicator that a pupil is a migrant, the data can be used to give an indication of change over time.

When investigating population estimates in the Derby Case Study, the potential of PeopleUK, a combination of electoral registers and credit card ownership, 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 national data set, its availability, relevance and data quality for other local authorities should be investigated.

Chapter 8   Recommendations

The following recommendations are proposed as a result of the case study for Barnet, and the other case studies undertaken:

1) Work should be taken forward to further analyse information on ethnicity collected as part of the School Census to assess the plausibility of the ONS estimates of the population by ethnic group for compulsory school age. It is recognised however that information on ethnicity of pupils attending independent schools is not currently available.

2) Students are a significant population sub-group in Barnet. 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.

3) Migrants, both student and non-student have been identified as a significant population sub-group in Barnet. 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 pursued. This endorses the finding of the Task Force which recommended that the potential of combining analysis of unlinked National Insurance data with linked sources such as the Work and Pensions Longitudinal Study (WPLS) should be investigated.

4) 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 two particular data sources identified in the Derby Case Study - data collected for the Council's School Inclusion and Development team and data from PeopleUK; these sources if available nationally could all indicate population change over time. Further work is needed to understand differences between the numbers obtained from these sources.

5) Further efforts to improve the migration estimates should be made, thereby supporting the work identified in the Migration Statistics Task Force report is crucial in this respect. In addition more work is needed to reconcile figures from survey and administrative sources, including to identify differences between long and short-term migrants, in order to bring enhanced confidence that international migrants are calculated using the very best data sources and are as accurate as possible.

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.

CENSUS BASE

Did the Census underestimate the population? (LA 2004)

Did the Census overestimate the population?

Did the Census incorrectly apportion the ONC adjustments across local authorities within EAs?

BIRTHS

Are there births that do not get registered?

Are there births registered where the baby should not be counted in the population? E.g. family leave the country immediately

DEATHS

Are there deaths which are registered in the wrong LA?

INTERNAL MIGRATION

Are there people who move but the move is not counted because they do not register in the new area?

Are there adults who never register so remain counted in the area they were in full time education?

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?

INTERNATIONAL MIGRATION

Are asylum seekers coming in correctly allocated to local authorities? (Census)

Are asylum seekers who leave correctly subtracted from local authorities? (IPS)

How are asylum seeker centres accounted for?

Are visitor switchers correctly allocated to local authorities?

Are other international migrants coming into the UK correctly allocated to local authorities? (IPS)

Are other international emigrants correctly subtracted from LA? (IPS)

Are flows to and from Ireland correctly apportioned to local authorities?

MOBILE/DIFFICULT GROUPS

Armed Forces   Boarders   Students   Prisoners

NEW BASE

Are sex ratios plausible?

Are age / sex percentages plausible?

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. Barnet is included in cluster 2. 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 proportions of people from non-White ethnic groups 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 proportions of people from non-White ethnic groups:

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 people from non-White ethnic groups, 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, Torridge, 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 Barnet was a reduction of 2,200 people (-0.8 per cent) in mid-1991 from the original estimate of 299,900 to 297,700.

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-EEA[3] 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 collects 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.

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[3] 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 Barnet experiencing a reduction of approximately 5,500 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 +164,000 was made to England and Wales in 68 local authorities, with an adjustment of +4,100 in Barnet. All the other cluster 2 local authorities received Longitudinal Study adjustments, with an overall adjustment of +37,600 for these 15 local authorities. Of the cluster 2 local authorities, Barnet received the largest Longitudinal Study adjustment.

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 Barnet.

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 Barnet was affected in this way, with an adjustment of +127 made, Croydon within the same cluster also received an adjustment of +278.

4.   2004 LA Studies

The 2004 LA 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. A subsequent adjustment of +107,400 was made within these local authorities. Neither Barnet or any of the other cluster 2 local authorities were selected.

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 Barnet the original intercensal discrepancy of 38,300 was reduced to less than 30,600 as a result of the first two adjustments. The remaining two adjustments added a further 4,200 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 it is 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 are migrant people with 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

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 this 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.

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.

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.   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.

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.

Barnet, as part of a broader London Housing Needs Survey commissioned a Housing Needs Survey in 2001 and 2006 to explore the housing needs, aspirations and requirements of those living in Barnet and households who may move into the area.

Link to 2006 Barnet Housing Needs Survey results:
http://www.barnet.gov.uk/barnet-hna-report-web.pdf

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. Further work is required to explore the potential for this data source to be used in the estimation of international migrants.

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

The School Census provides, every term, a snapshot of data on school pupils in LEA 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/LA 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 local authority of residence) and counts of pupils who cannot speak English on arrival at their school, by local authority. 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 quality assuring 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 built by combining data from lifestyle surveys, Census information and Electoral roll data.

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 local authorities 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/