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Topic 4

**THE MEASUREMENT OF INTERNATIONAL MIGRATION FLOWS TO AND FROM THE  
UNITED KINGDOM: RECENT AND PLANNED IMPROVEMENTS**

**Invited Paper by the Office for National Statistics, United Kingdom<sup>1</sup>**

- (i) This paper describes the data sources used to estimate migration flows in the United Kingdom, draws particular attention to the International Passenger Survey and describes some of the recent and planned improvements to the survey and its ability to produce migration estimates.
- (ii) The paper does not cover the estimation of migrant stocks in the UK. These are estimated using information from the Labour Force Survey and the 1991 Census.

**1. Background:**

- 1.1. The measurement of migration flows into and out of the United Kingdom is not straightforward as there is no compulsory system within the UK to record movements of the population, either into the country from abroad or within the country. Nevertheless we can estimate these movements from available data sources and so monitor migration trends and patterns. There are three main data sources used to estimate the flow of international migration in the United Kingdom.
- data from the International Passenger Survey (IPS), a sample survey of passengers arriving at, and departing from, the main United Kingdom air and sea ports.
  - administrative data from the Home Office, on people who entered the UK as asylum seekers or as other 'visitor switchers', i.e. as short term visitors who were subsequently granted an

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extension to stay for a year or more, for example as asylum seekers, students or on the basis of marriage; and

- estimates of migration between the UK and the Irish Republic estimated using information from the Irish Labour Force Survey and the National Health Service Central Register (which centrally records the transfers of National Health Service patients from the lists of one health authority to that of another), agreed between the Irish Central Statistics Office and the ONS.

1.2. The IPS, is the richest source of information on international migration. These are the data that are published by ONS in the publication 'International Migration Statistics' and provided to Eurostat. It is however, necessary to combine the more limited information from the other two sources, to get a full picture of total international migration into and out of the UK. This is because the IPS does not fully cover all types of migration. Firstly it excludes routes between the UK and the Republic of Ireland. Also the IPS is highly likely to exclude asylum seekers and other visitor switchers.

1.3. These data are combined with information from the 1991 Census in the calculation of population estimates and projections. This is because data from the three sources above, when used directly, cannot produce robust estimates of international migration flows for the necessary age and area disaggregations.

## 2. **The International Passenger Survey (IPS) :**

2.1. The IPS is a large multi-purpose survey that collects information from passengers as they enter and leave the UK. In addition to international migration, the survey also collects information for balance of payments purposes and for informing decisions on tourism policy. The IPS is based on face to face interviews with a sample of passengers travelling via the principal airports, sea routes and the Channel Tunnel. The number of interviews in 1998 was 263,000 and represented about 0.2 per cent of all travellers. The IPS sample is stratified to ensure that it is representative by mode of travel (air, sea or tunnel), route and time of day. Interviews are conducted throughout the year. The frequency of sampling within each stratum is varied according to the variability in tourist expenditure, the volume of migrants and the cost of interviewing. The information collected by the survey is used to produce estimates of migration. A complex weighting procedure is used to do this. This takes into account various factors to improve the estimates. This is explained below.

2.2. *Sample Design:* The IPS uses a multi-stage sample design that is carried out separately for air, sea and tunnel travel. The underlying principle is that in the absence of a sampling frame of travellers, time shifts or sea crossings are selected and then travellers are systematically chosen at fixed intervals within these shifts or crossings.

2.3. The main UK airports are always included in the sample. Smaller airports are reviewed on an annual basis for inclusion. This depends on the volume of international traffic at those airports. Sea routes are treated similarly to the smaller airports, in that they are included or excluded in the sample based on the size of their international traffic.

2.4. At all the airports, a certain number of shifts are sampled randomly each quarter, stratified by time of day and by day of the week. Passengers are counted as they cross a predetermined line and every  $n^{\text{th}}$  one is interviewed. At sea ports, passengers may be sampled on the quayside as they embark or disembark. Sometimes it is difficult to interview passengers following disembarkation, so IPS interviewers also travel to some French and Irish ports to conduct quayside embarkation interviews with passengers travelling to the UK. The sampling approach is similar to that at the main airports as the timing of the interviewing shift is selected randomly. At other ports, interviewers travel on the boats and sample

passengers systematically. For tunnel routes, the method is different for passenger trains and vehicle shuttles. Passenger trains are treated in a similar way to airports, where time shifts are selected and then a sampling interval used within a time shift. In contrast for vehicle shuttles, crossing are randomly selected and interviewing takes place on board the shuttles themselves.

- 2.5. The main sample was 263,000 interviews in 1998. Of these, approximately, 1200 were migrant interviews. Population and Vital Statistics division sponsors additional 'Migration Filter Shifts' on the inward (arrival) flows at the four Heathrow and two Gatwick terminals to boost the sample of migrants. The interviewer team sizes and the sampling intervals on these shifts are smaller; contacts are asked a brief series of questions to identify whether or not they are migrants, and only migrants are given a full interview. These shifts yield approximately another 1400 migrant interviews. The two terminals at Manchester airport were included in the sample for 1998 as a trial but this has not continued due to the small number of interviews obtained.
- 2.6. *Grossing the interviews to total numbers travelling* The interviews are grossed to the total number of migrants using a complex weighting system. The method of grossing the interviews to national estimates varies depending on the method of travel.
- 2.7. Main airports: An initial weight is given to each interviewee, which indicates the number of people that they represent in the traffic flow. This is the inverse of the sampling interval. This is then adjusted to take account of non-contacts during the interviewing time and people refusing to be interviewed. Further adjustment within country of residence and nationality is then made to allow for interviews in which only minimum information is collected. These contacts are then discounted. The assumption is that these respondents are similar to those of a similar residence and nationality status who provide fuller information. Adjustments are then made for passengers that arrive outside the eligible times for sampling, for example, during the night time period, based on information from the Civil Aviation Authority (CAA). The resulting weights are then summed to give estimated total passenger flows.
- 2.8. Smaller airports, seaports and the Channel Tunnel: For the other ports, sample figures are directly scaled to known passenger flows. For smaller (or residual) airports these figures come from the CAA, while for the seaports, traffic information comes from the Department of Environment, Transport and the Regions (DETR). For the Channel Tunnel, passenger numbers come directly from the operators.
- 2.9. *Quality of the survey data:* The IPS, is a sample survey, and is therefore subject to some uncertainty. Standard errors can be calculated for estimates from the IPS. This is a measure of how much a sample estimate is likely to differ from the true value because of random effects. Given the structure of the sample, the standard error for an estimated 1,000 migrants will be in the region of 40 per cent. This reduces to about ten per cent for an estimate of 40 thousand migrants. For 1998, the overall standard error for the estimated total inflow of 332 thousand migrants is 4.3 per cent. This gives a range of between 304 thousand and 361 thousand migrants as the 95 per cent confidence interval for the number of migrants entering the UK during 1998 (obtained as  $\pm 2$  times the standard error). For the outflow, of 199 thousand migrants, the standard error is 5.5 per cent, giving a range of 177 thousand to 221 thousand migrants as the corresponding 95 per cent confidence interval for the outflow of migrants during 1998. Without the additional migration filter shifts described above, the quality of the estimates of the inflow of migrants would be substantially lower than that of the outflow.

- 2.10. In addition to sampling errors, there may also be non-sampling errors on the estimates of IPS migration. The first of these may be due to non-response. Bias will occur when passengers who do not respond to the survey are different in the characteristics that matter to the whole sample. Possible low levels of response that might be expected due to the respondent not speaking English have been reduced in recent years by the introduction of separate sampling arrangements at the Port Health Channel. The improvement was at least partly because interviewers can more easily enlist the help of relatives or interpreters to translate for contacts who do not speak English. A further source of bias may arise from contacts deliberately concealing their migration intentions from the interviewers. In addition, the question that determines whether the contact is a migrant or not: their length of stay is based on intentions and not actual behaviour. Measurement errors could therefore be introduced if there is a discrepancy between those intending to migrate but who subsequently stay less than a year, and those not intending to migrate but staying for a year or more.
- 2.11. For those contacts identified by the IPS as migrants, the level of non-response is very low for most characteristics as shown in the table below. For most characteristics the level of non-response is very low at less than one per cent in 1998. The main exception is the question regarding area of intended residence in the UK for migrants entering, and vice versa for those departing. In 1998, about 15 per cent of incoming migrants were unable to give a definite answer to this question, but about half of those were able to state that residence would be within Greater London. There was a similar but much smaller problem for departing migrants, with about seven per cent giving an undefined area of last residence. The non-response on this question creates some problems in the use of the IPS data for population estimates and projections. However, there is improvement on the position since the early eighties.

**Table : Non-response to migration questions in the IPS, 1998**

<b>Characteristic</b>	<b>Inflow %</b>	<b>Outflow %</b>
<b>Last or nest residence</b>	-	-
<b>Citizenship</b>	-	-
<b>UK destination or origin</b>	15.2	7.1
<b>of which :</b>		
<b>UK not stated</b>	3.0	0.9
<b>Greater London not stated</b>	9.5	0.6
<b>Other area not stated</b>	2.7	5.6
<b>Occupation*</b>	3.0	4.1
<b>Sex</b>	-	-
<b>Age</b>	0.2	-
<b>Marital status</b>	1.1	1.6
<b>Country of birth</b>	1.3	1.4
<b>Total flow (thousands)</b>	<b>332.4</b>	<b>198.9</b>

**\* Non-response for occupation is expressed as a percentage of the proportion of the numbers aged 16 and over**

### **3. Asylum Seekers and Other Visitor Switchers**

- 3.1. While the IPS identifies persons intending to migrate for a year or longer, it cannot identify those migrants that actually return within the year or person entering or leaving with the intention of a short stay but actually stay for a year or longer. Therefore Home Office

estimates of asylum seekers and other visitor switchers need to be added to the estimates that are derived from the IPS. The calculation of these is included for completeness but will not be discussed further.

- 3.2. These data can be divided into three groups: port asylum seekers, after entry asylum seekers and other visitor switchers.
- 3.3. *Port asylum seekers*: It was thought initially that the IPS covered port asylum seekers. However investigations have shown that the IPS data included very few contacts that stated 'seeking asylum' when asked their reason for entry. The Immigration Service explained that while, most port asylum seekers would cross the IPS counting line to retrieve their baggage, they would be escorted and so contact with anyone else would be actively discouraged, they would be returned to the examination area for processing and subsequently leave the airport by another route. Therefore the estimate of these migrants is made by making an allowance for the fact that some do not stay for a year or longer and hence are not migrants, and that some are included in the IPS.
- 3.4. *After entry asylum seekers*: The Home Office is able to estimate this group of migrants using Immigration data. Again, allowance is made for the fact that some do not stay for a year or longer, or were likely to have initially entered the country for a year or longer and therefore should not be included again.
- 3.5. *Other visitor switchers*: These are those migrants who state on arrival that they intend to stay for less than a year but their intentions change and they are granted an extension of stay for a year or more, for example as students or on the basis of marriage. Estimates of non-European Economic Area (EEA) national visitor switchers are made from the Home Office database of after-entry applications to remain in the UK. It is assumed that the information about planned duration of stay given to the IPS interviewer is the same as that given to the Immigration officer. Some visitor switching cannot be estimated. This includes the switching by EEA nationals. Data on this group are not available as the free movement provisions of EU law cover such persons. In general there is no information about outward visitor switching to the USA, other Commonwealth countries and EEA. It is assumed that the net effect of visitor switching to and from these countries is zero. For countries other than the USA, other Commonwealth and EEA countries, an adjustment is made in respect of people coming to the UK but not for outward visitor switchers. This is because there is a tendency for people emigrating from the UK to those countries to return home to settle their affairs and then leave as a migrant.

#### **4. Estimates of Migration between the UK and the Irish Republic**

- 4.1. The International Passenger does not currently cover routes between the UK and the Irish Republic. Hence no migration estimates can be derived from this source. Data collection on these routes has started during 1999. For the moment, the flows between the Irish Republic and the UK need to be estimated using other sources. For this, close co-operation is needed between the Central Statistics Office (CSO) in Ireland and the ONS and the figures are agreed.
- 4.2. Estimates of outflows from the UK to the Irish Republic are made using data from the Irish Labour Force Survey (LFS). The LFS is a rich source of migration as it asks questions on nationality, and country of residence one year before the survey, along with the date and month of arrival in Ireland. These estimates are provided by the Irish CSO.

- 4.3. The inflow of migrants from the Irish Republic to the UK is estimated using a number of data sources. These are the National Health Service Central Register, the Census of Population and the Country of Residence Survey.

## 5. Programme of Improvements for the IPS:

- 5.1. There is a continuous programme of improvements in the quality of the IPS, both in terms of value for money and the quality of the estimates that are derived from it. Summarised below are the improvements that should improve the quality of the migration estimates.
- 5.2. *Take forward methodological research to improve the quality of the current migration estimates:* Eurostat have recently let a contract to Social Survey Division of ONS to investigate the way that the IPS weights attributed to migrants are calculated, with a view to documenting the methodology and suggesting any improvements with the way that the weighting is carried out. The report is now complete and the conclusion was that it was recognised that the survey produces unbiased estimates of migration. However it also contained some recommendations for small changes to the way that the weights are calculated for migrants. These are as follows:
- changes to the way that the initial weights are calculated when ordinary shifts are run alongside migration filter shifts
  - changes to the out-of-hours weights at the main air sample to ensure consistency for all types of flight
  - Moving to include the final weight to uplift to the total traffic flows at all ports.
- 5.3. The effect that these changes have on the estimates of migration is very small. A number of tests are currently being conducted to assess the likely impact of changing the method of calculating the initial weights to better take account of migration filter shifts; and to amend the method of applying the out of hours uplifts to migration filter shift interviews. ONS are hoping to make these improvements, all of which will reduce the sampling errors, to the 2000 estimates of international migration.
- 5.4. *Evaluation of out of hours traffic:* currently the IPS cover approximately sixteen hours of passenger traffic. Traffic outside these hours is not sampled but is accounted for in the IPS weighting system. Sampled traffic for each terminal and direction is grouped into seven regions of the world, defined by the flight origin and destination. Further research has since extended this to ten regions. Figures for the volume of unsampled traffic are obtained from the Civil Aviation Authority (CAA) and the sampled traffic is weighted up within the region group to account for this. The chief assumption of the weighting is that daytime and night-time passengers within this group are similar. However, the unsampled traffic is not evenly distributed across the country groups and it is known that particular types of flights are being missed.
- 5.5. It has been decided to carry out some research to investigate whether the above assumption of the similar nature of the travellers is valid. This is of particular concern to those responsible for migration statistics, as the number of migrants, relative to the number of other travellers has reduced over recent years. If a large proportion of flights, from any particular group of destinations occur out of hours, then the IPS weights will be large and the resultant standard errors will be large. Therefore the quality of the migration estimates will be lower.

5.6. The main aims of the research are to:

- Investigate the hypothesis that the characteristics of passengers travelling in the hours surveyed by the IPS are the same as those travelling outside hours
- Collect information on the relative probability of migrants entering and leaving the country on flights out-of-hours so that this can be compared with the probability of their entering or leaving on flights within the same groups during the day.
- Assess the variability of these probabilities over a survey year, as the flight patterns will alter seasonally
- Assess whether it is necessary to collect information on a regular basis out-of-hours or whether a weighting mechanism is sufficient
- If necessary, utilise this information to suggest revisions to the weighting mechanism to reflect differential probabilities
- Alternatively use this information to decide whether to continue to survey outside of the regular hours.

5.7. To minimise costs and to maximise the number of interviews, this extension to the out-of-hours traffic is being done in a targeted manner. This is to extend certain interview shifts at Heathrow and Gatwick to capture long haul arrivals and departures. To capture short haul arrivals and departures, additional shifts will be carried out between 22:00 and 6:00 hours at Gatwick and Heathrow. It is planned that full interviews will be conducted with all those interviewed out of the main survey hours.

5.8. These data will be analysed during 2001 and final recommendations will be made in the autumn of 2001.

5.9. *Extension of the survey to cover routes between the UK and the Republic of Ireland:* Historically the IPS has not covered passengers travelling between the UK and Eire, which has meant that alternative data sources need to be used to estimate migrants between these two countries. Irish routes and those to and from the Channel Islands, were included in the survey for the first time in April 1999. Passengers arriving from and departing from the Irish Republic were interviewed from the second quarter of 1999. This required separate sampling points at Heathrow, Gatwick, Manchester and Birmingham. At residual airports, Irish passengers were to be interviewed where they pass the current sampling points. The main sea routes to Ireland are also now sampled: Holyhead to Dublin Port and Dun Laoghaire, Fishguard and Pembroke to Rosslare, and Swansea to Cork.

5.10. The new Irish interviews have been included to: gain a better understanding of travel to and from the Irish Republic and to produce results that are in line with the rest of the survey. The main benefits are that data will now be available for migrants to and from the Irish Republic that are consistent with other countries of the European Union. ONS are currently investigating the best methods to weight these new interviews, the way that missing data can be imputed and the differences that the new methods will have on the overall results. This investigation will continue alongside the processing of the 1999 data.

5.11. Results for the second and third quarters of 1999 are now being examined to investigate the quality of the data collected. The migration estimates derived from the International Passenger Survey for flows between the UK and the Irish Republic will be

compared with those from the current data sources: the Irish Labour Force Survey and the National Health Service Central Register. The quality of the new data will also be examined. If the data are of sufficient quality, then we would hope to move to using the International Passenger Survey to estimate these flows, thus introducing consistency in treating the Irish Republic like other flows.

- 5.12. *Foreign language questionnaires:* It was estimated that 2% of IPS interviews are effected due to language difficulties. A research project has been undertaken to improve the response of non-English speakers in an attempt to convert minimum response (those where very little information is collected) to partial responses. A questionnaire was designed to carry out the research and interviews held. Several foreign language questionnaires were successfully piloted, in French, German, Spanish, Italian, Greek and Russian. These will form part of the 2000 survey.

## **6. Improvements to the Presentation of Migration Data**

- 6.1. Statistics on international migration are generally presented for the IPS component only, as the other components are not available to the same degree of detail. These are the data that are provided to Eurostat each year. ONS will be working with the Home Office to aim to ensure that all outputs are presented for total international migration. In other words that they are the sum of the IPS, plus asylum seekers and other visitor switchers plus flows between the UK and the Irish Republic. We hope that data for 1999 will be presented on this basis.

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