International Passenger Survey: Quality Information in Relation to Migration Flows

Introduction

This document provides an overview of the quality and reliability of the International Passenger Survey (IPS) in relation to producing estimates of long-term international migration flows, that is flows of migrants intending to remain in or out of the UK for twelve months or more. International migration data collected by the IPS are the largest component of Long-Term International Migration (LTIM) estimates. Therefore, it is important that anyone using LTIM estimates understands the reliability and quality of the IPS. As it is difficult to explain every aspect of how the IPS is used to produce LTIM estimates in a summary document, links to more detailed quality and methodological information will be provided throughout.

What is the International Passenger Survey (IPS)?

The IPS is a large multi-purpose sample survey that collects information from passengers as they enter or leave the UK. It is carried out by the Office for National Statistics (ONS) for a range of public and private sector organisations. It is mainly used to provide data about international migration, travel expenditure and tourism. The IPS has been running continuously since 1961, although many changes have been made to the survey since. A pilot is conducted each year by the IPS research team on new questions or revisions that have been requested for the following survey year.

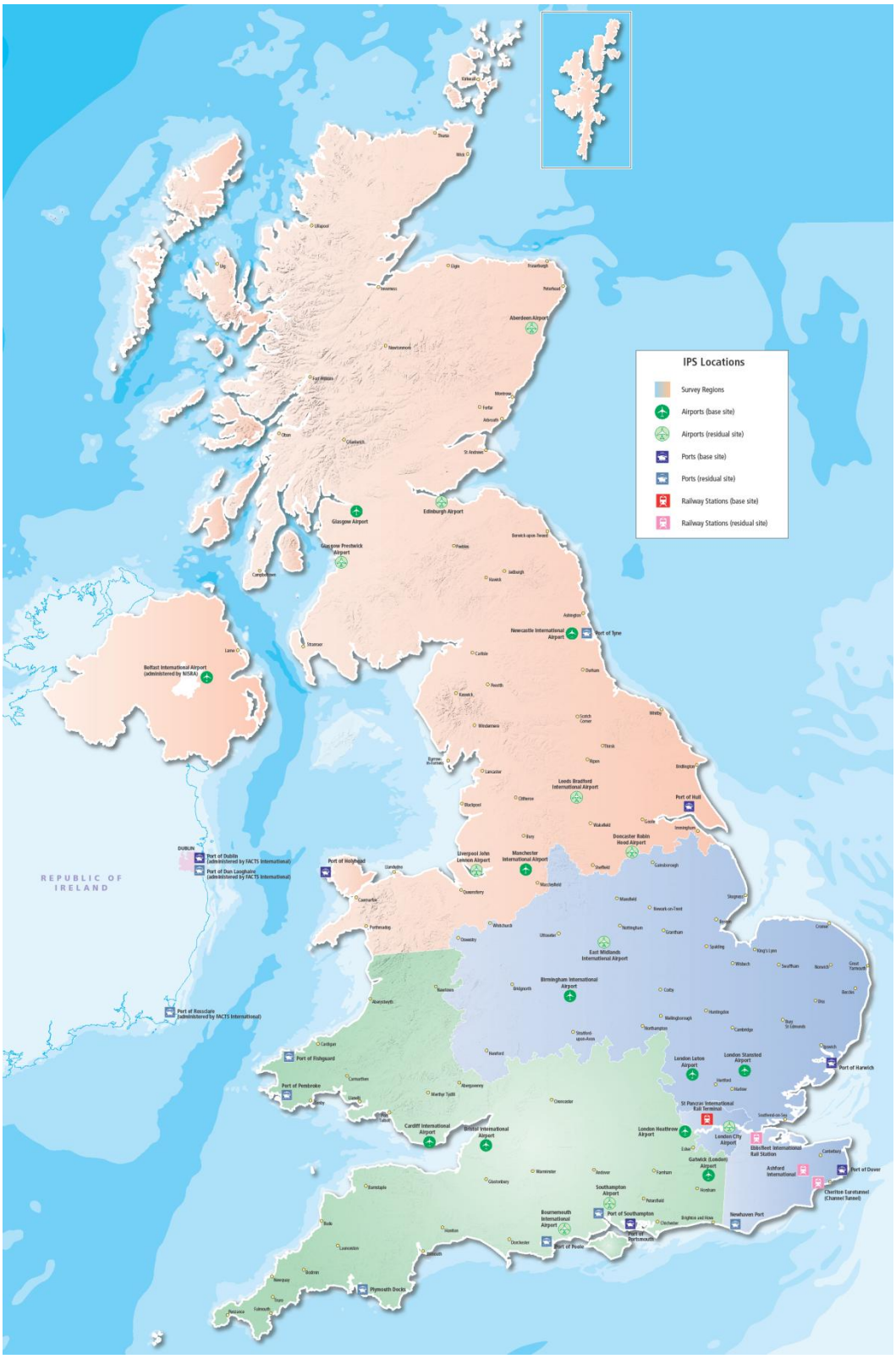
For more information about the survey design of the IPS and how it is carried out, please refer to the IPS Quality and Methodology Information Paper.

Where is the IPS carried out?

Since the IPS began in 1961, its coverage has been extended so that it includes all the main air, sea and tunnel ports or routes into and out of the UK. The only routes excluded from the survey are sea routes to and from the Channel Islands, the land border with the Republic of Ireland, and cruise ships travelling to and from the UK. Map 1 shows each port at which IPS interviewing currently takes place.

Other sources of data are used to cover routes not included in the IPS when estimating figures for LTIM. Please refer to Section 2.1 of the LTIM Methodology Document for further information.

Map 1: IPS locations (UK)



Source: International Passenger Survey

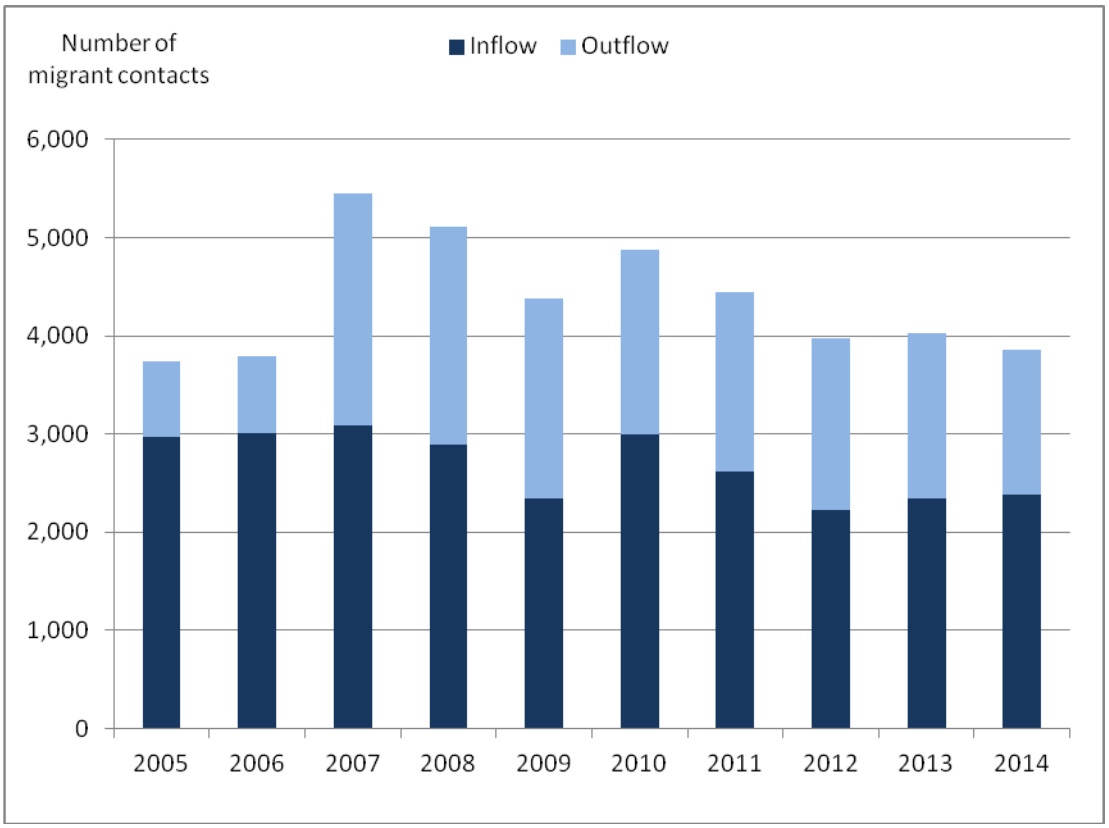
Who could be included in the IPS sample?

Coverage

The IPS is carried out 362 days a year and approximately 90% of passengers entering and leaving the UK are covered. The remainder are either passengers travelling on those routes too small in volume or too expensive to be covered by the IPS, or those travelling at night. Interview shifts at airports run between the hours of approximately 06:00 and 22:00. Passenger traffic for ”out-of-hours” periods is allocated to passengers travelling on the same routes as those who arrive and depart in these hours. An assumption is made that the passengers on these routes travelling out of hours are similar to those travelling in hours. The passenger totals are weighted to reflect the fact that flights to and from some regions of the world are more likely than others to arrive or take off at night when no interviewing is conducted at airports.

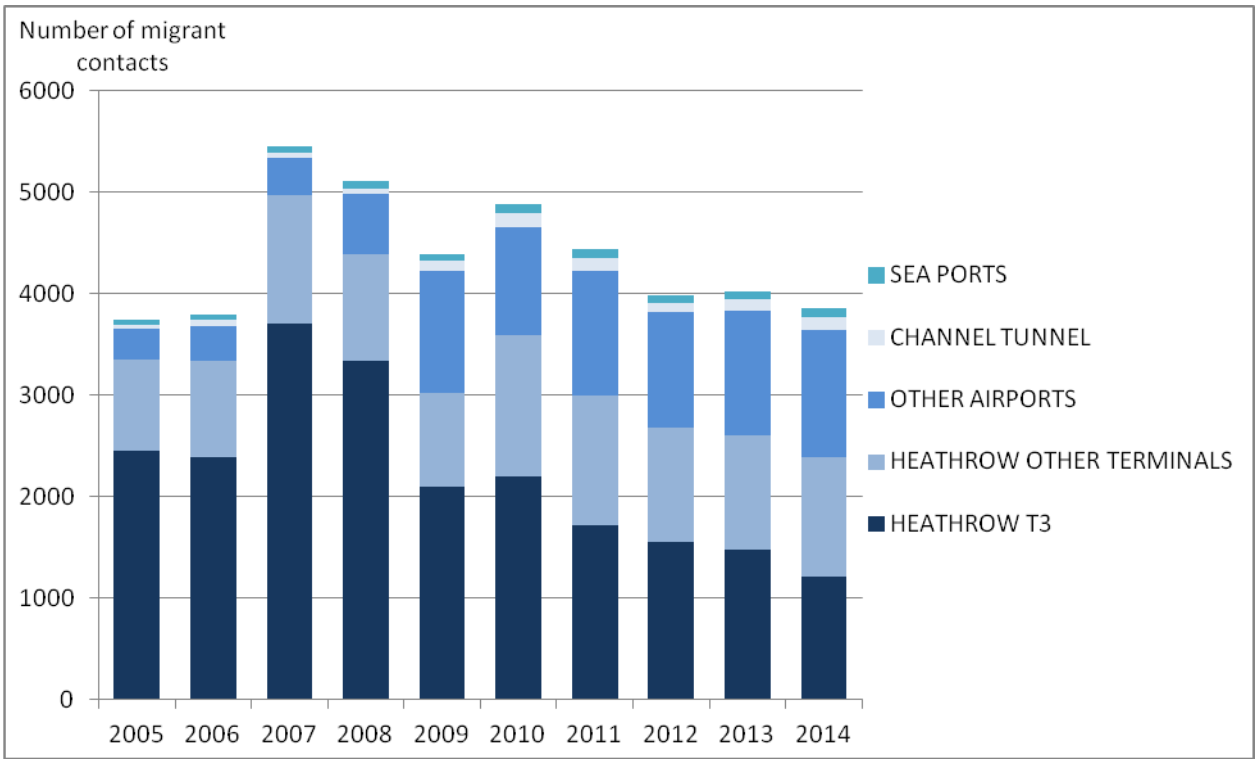
In total, between 700,000 and 800,000 IPS interviews are conducted each year for migration purposes. Of these, around 4,000 interviewees are identified as long-term international migrants, although the proportions vary from year to year, as shown in Figure 1. The number of outflow migrant contacts increased considerably from 2007, following the recommendation of the Port Survey Review to establish migration filter shifts for emigration.

Figure 1: Number of migrant contacts in the IPS, inflows and outflows, 2005 to 2014



Source: Office for National Statistics – Table 1.02, Long Term International Migration 1 Series.

Figure 2: Number of migrant contacts in the IPS by route, 2005 to 2014



Source: Office for National Statistics

Figure 2 shows that between 2004 and 2014, the majority of migrant contacts in the IPS travelled through Heathrow airport. Because Heathrow terminal 3 is very busy and has more long-haul flights and less common routes than other terminals, it has a larger number of migrants passing through it than other terminals. The overall survey design of the IPS accounts for the variation in passenger numbers for different ports. For example, in 2014 there were 280 in Heathrow terminal 3, compared to 82 arrivals shifts at Birmingham Airport. The shifts at each port are balanced in terms of the time of day (morning, afternoon and evening) and the day of the week. This survey design is intended to give a more robust picture of the profile of migrants travelling through different routes. Figure 2 also shows that the overall proportion of migrant contacts at Heathrow has decreased since 2008, when sampling was changed so that more interviewing took place at ports outside of Heathrow. This change followed the recommendation of the Port Survey Review.

With regards to migrants travelling by coach, all IPS contacts are interviewed at their point of arrival in the UK, which for migrants travelling by car or coach would be the Channel Tunnel or a sea port. It is down to the discretion of the coach driver as to whether to allow IPS interviewers to board the coach and interview passengers, although feedback from interviewers indicates that this is not a frequent problem. Any missed contacts on the coach due to driver refusal to board would be included in the non-response rate of the relevant port.

Response rates

The overall response rate (complete and partial interviews) for the 2014 IPS was 79%. Response rates vary across routes, as shown in Table 1. Specific non-response rates to migration questions within the IPS are also collected and are shown in Table 2.

It should be noted that a response rate of 79% does not necessarily mean that 21% of passengers approached to participate in the IPS refused to answer the survey. A proportion of the 21% "non-response" to the IPS is due to occasions when all the interviewers were already interviewing other passengers. Certain passengers passing an interview line in the port are systematically chosen for interview using a pre-set interval (for example, every 1 in 20). In busier ports, the selected passengers may be counted very quickly after one another and before the interviewers have had time to complete their previous interviews. This can explain why overall response rates on busier routes, such as at Heathrow Airport terminals, are lower than those on quieter routes, where interviewers will have more time to complete an interview before the next contact is counted. Not contacting passengers because of a lack of interviewers is unlikely to skew the profile of the IPS sample. This is because the data are weighted according to Civil Aviation Authority data to produce estimates and most non-response occurs randomly.

A further proportion of the "non-response" figure is due to a passenger refusing to answer the survey, or being unavailable to answer it, for example, if they are using their mobile phone (it is IPS policy not to interrupt passengers when they are on the phone).

Table 1: IPS response rates, 2013 and 2014

Route	Complete or Partial Response Rate (%)	
	2013	2014
Heathrow terminal 1	71	75
Heathrow terminal 3	78	82
Heathrow terminal 4	71	73
Heathrow terminal 5	75	77
Heathrow transits	86	89
Gatwick North	76	65
Gatwick South	77	65
Manchester terminal 1	84	83
Manchester terminal 2	91	92
Manchester terminal 3	85	82
Stansted	86	80
Other airports	81	83
Sea	91	87
Channel Tunnel	86	79
Total	**81**	**79**

Source: Office for National Statistics

Table 2: IPS non-response to migration questions, 2014

Characteristic	Immigration non-response (%)	Emigration non-response (%)
Last or next residence	0.0	0.0
Citizenship	0.0	0.0
Area of destination or origin within UK	1.9	1.9
Usual occupation prior to migration	5.8	4.3
Sex	0.1	0.6
Age	4.8	4.7
Marital status	1.9	2.4
Country of birth	0.7	1.9
Total flow	**583,000**	**297,000**

Source: Office for National Statistics – Table 1.03, Long-Term International Migration 1-Series

Note to Table 2:

"Non-response" to migration questions refers to the percentage of interviewees who, during their interview, refused to answer specific questions about different characteristics, for example, how old they were.

Non-English speaking passengers

It is important that the IPS collects information from non-English speaking passengers, as these people may have different characteristics to English speaking passengers. IPS interviewer instructions provide specific guidance and prompts for interviewing passengers whose first language is not English. The IPS team also produce self administered foreign language questionnaires for use by non-English speaking passengers. The questionnaires are produced in up to 13 languages which together account for around three-quarters of potential non-response due to language difficulties. IPS interviewers are instructed to stay with the respondent while they complete the questionnaire and ensure that they answer all the questions. Although it is acknowledged that some of the information collected by the foreign-language surveys may be less accurate than data collected in the main survey, it is still important to record as much information from non-English speaking passengers as possible. A complex weighting system (described in the Methodology) takes account of all minimum responses and non-response in the IPS.

How reliable are migration estimates from the IPS?

There are two broad types of variability associated with migration estimates from the IPS. These are: variability because of the many different samples that could have been drawn during the interview period (known as “sampling error”) and variability due to other factors (“non-sampling error”).

Non-sampling error

Non-response bias would be introduced if those who choose not to respond to the survey have different characteristics to those who do choose to respond. Another example is if at peak times sampled passengers do not complete an IPS questionnaire because there are not enough IPS interviewers available to interview the high volume of passengers. The weighting applied to the estimates on total passenger flows will account for these non-contacts, but if their migration characteristics are different in some way then non-response bias would occur. Measurement error would be introduced, for example, if respondents provide incorrect information to the IPS interviewers. IPS confidence intervals do not take account of non-sampling errors such as non-response bias and measurement errors.

Sampling error

As is the case with all sample surveys, the estimates produced from the IPS are based upon one of a number of samples that could have been drawn during the interview period. This means that there is a degree of variability around the estimates produced. Since August 2012, IPS estimates have been accompanied by confidence intervals, which provide a range within which we could expect the true value to lie had all passengers been interviewed. 95% confidence intervals are used, which is a widely accepted level, meaning that over many repeats of the sample under the same conditions, we would expect the confidence interval to contain the true value 95 times out of 100. Equivalently, we can say that there would be a 1 in 20 chance that the true value would lie outside of the range of the 95% confidence interval. Caution should be exercised when using an estimate with a large confidence interval.

The degree of variability around IPS estimates is also important to consider when comparing differences between estimates, as the variability may sometimes present misleading changes as a

result of the random selection of those included in the sample. If a change or a difference between estimates is described as “statistically significant”, it means that statistical tests have been carried out to reject the hypothesis that the change is likely to have occurred by chance. Therefore significant changes are very likely to reflect real changes in migration patterns.

A quick method of testing the difference between two estimates is to determine if there is an overlap between their confidence intervals; if there is no overlap, the difference can be described as statistically significant. If there is overlap, a t-test can be used to determine if the change is statistically significant. A t-test is a statistical test that calculates a confidence interval for the difference between the estimates, as opposed to the estimates themselves. All the main statistical software packages have the functionality required to perform a t-test. If you need assistance with identifying whether the difference between two international migration estimates is statistically significant then please contact migstatsunit@ons.gov.uk.

How do IPS estimates of long term international migration compare to those from other data sources?

When analysing migration data from different sources it is important to understand exactly what the data represent and whether they cover flows, registrations (which may or may not contribute to long-term movements) or stocks. Depending on how different sources define and measure international migration, the figures they produce may vary. For more information about the variations between different sources of migration data, please refer to the Migration Statistics Quarterly Report (MSQR) User Information. We will also be addressing data reconciliation in detail via 3 research papers, which we will link to upon their publication shortly.

Further Links

- International Passenger Survey Quality and Methodology Information Paper
- International Passenger Survey Methodology
- Long-Term International Migration data tables
- Long-Term International Migration Methodology and User information
- Long-Term International Migration Frequently asked questions and Background notes
- Migration Statistics Quarterly Report
- Port Survey Review
- Travel Trends