

Article

Report on international migration data sources: July 2018

A report on international migration data sources.

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Table of contents

1. [Introduction](#)
2. [Part 1 – How are we using Home Office administrative data to further our understanding of international migration?](#)
3. [Part 2: International Passenger Survey \(IPS\) development and independent quality review](#)
4. [Going forward](#)

1 . Introduction

This report sets out the latest update of our work on the overall quality of migration statistics and how best to meet users' needs to provide the best possible trends in migration.

Part one – What we have found by comparing International Passenger Survey (IPS) and visa data for non-EU migrants (also referred to as “Home Office administrative data”). This work builds on the analysis of long-term emigration of former students we published in [August 2017 and incorporates work, family and other visas](#). We have also updated on our review of the current “switcher” methodology used to produce Long-Term International Migration (LTIM) estimates. This was to assess whether the assumptions that underpin it are still valid.

Part two – Our investigation into the quality of the IPS following the processing error we found in May 2018. This went beyond just looking at the processing error and we present all information we discovered relating to the quality of the IPS that was discovered during the investigation.

What has come through strongly from this work is that people's lives are complex. In a globalised economy their movements between countries do not conform neatly to our traditional statistical definitions of migration. Our analysis of travel patterns using Home Office administrative data showed this complexity:

- not all non-EU citizens holding a visa for 12 months or longer remained in the country for the whole length of their visa – it showed that around 60% of migrants stayed in the UK for less than three-quarters of their visa length; this does not necessarily mean they left early as they may have been in and out the country for considerable periods
- the analysis also showed that around 13% of journeys made out of the UK were for at least three months, with return journeys made within a valid visa period

No single source of information can fully reflect this complexity, however when we look at all the sources together it provides a much clearer picture of international migration. Visa data combined with travel histories, by its nature, provides data about what people actually did, and shows that visa length is not a consistent proxy for length of stay. From a different perspective, the IPS is intentions-based and, for example, the data collected about people leaving for longer than three months will be highly dependent on what the person believes their intention is irrespective of what happens later.

This work does not mean we can draw conclusions about the relative merits of one source over another. Further analysis is needed to fully understand how much of the difference in numbers between sources is due to their differing definitions and processes, but once accounted for, they are actually very consistent.

The work does, however, show how the approach in the latest [Migration Statistics Quarterly Report \(MSQR\)](#) of drawing strength from the wide range of sources provides a much better picture of migration. This can best be explained by looking at student migration.

The apparent decrease in the IPS between 2015 and 2016 and increase into 2017 in student immigration was not reflected in the most comparable Home Office's student visa data or Higher Education Statistics Agency (HESA) first year student enrolments data. Our independent assurance review of the IPS showed this is probably due to 2016 having fewer than the expected number of interview shifts with a high number of migrants compared to normal, during the peak student migration month of September. However, by drawing strength from the relatively consistent levels of comparable administrative data and our in-depth understanding of the IPS, we can give a better overall picture.

Next steps

Alongside the workplan already announced we need to put urgent attention into understanding how the complexity of people's lives can be better reflected within our migration statistics. This concept of people frequently arriving and departing is often referred to as circular migration. We will be working with users of migration statistics to understand more fully what their requirements are and with our Government Statistical Service (GSS) colleagues to develop how we can best measure this and communicate it.

This is not easy – there will be many different views as to what should count for people who are in this category based on their contribution to the economy, impact on services and other factors; Office for National Statistics (ONS) will ensure we take time to understand all these issues.

The [next stage in our transformation](#) (as previously published) is to consult with users later this year about how we can design a system of migration statistics with users at the heart of them, this will also look at circular migration and how best to measure it.

2 . Part 1 – How are we using Home Office administrative data to further our understanding of international migration?

Main points

This part of the report provides an update on the exploratory research Office for National Statistics (ONS) has undertaken using Home Office administrative data. The work is focused on comparing Home Office administrative data and the International Passenger Survey (IPS) to further our understanding of how long-term non-EU migrants are residing in the UK based on recorded travel patterns. We have worked closely with Home Office experts to improve our understanding of these data.

Our experimental analysis of two years' worth of Home Office administrative data has highlighted that migration patterns are changing and since migrants are moving more frequently, aligning to the UN definition of a long-term migrant is becoming more challenging. Access to administrative data has allowed us to build a clearer picture of migration patterns. For example, allowing us to understand more about temporary or circular migration, which is not possible using the IPS.

We previously reported [known reasons why the IPS estimates of long-term emigration of former students are lower](#), and our new analysis suggests the reasons for these differences still hold. We concluded that the IPS figures for long-term emigration alone do not provide a good indication of how many international students remain in the UK after their initial period of leave to study.

Our latest analysis has highlighted that migrants do not necessarily stay for the full duration of their visas and that is especially the case for dependants of individuals on study and work visas. Moving forward, there is much more work to do on understanding how migrants interact with administrative data sources, to fully understand how these might be used to enhance migration statistics. As we continue to improve our understanding of administrative data, our future reporting will aim to integrate evidence from further sources, where appropriate.

Understanding migration patterns using administrative data is complicated. Comparisons of administrative data against the IPS show a difference in figures but there are a multitude of reasons for this including the fact that the data sources are measuring different things – intentions (IPS) compared with actual travel (administrative data). No single source of information will provide a clear view of migration; therefore, our transformation programme aims to triangulate the multiple sources to build a more comprehensive and granular evidence base for migration in the UK.

Exploratory research using Home Office administrative data relates to non-EU migrants and we cannot, therefore, draw conclusions about net migration. More research is needed to look at EU and British migration as part of our wider transformation programme.

Introduction

As Office for National Statistics (ONS) set out in September 2017, the [context for our work is changing](#). Our role as independent government statisticians is to meet the demand from users of the statistics – in this case, a clear understanding of the latest trends in international migration¹ and improving the evidence base to provide more information on the impact migrants have while they are in the UK. That includes the sectors in which they work, the communities they live in and the impact they have on public services. This programme of work, therefore forms one piece of a larger [transformation plan](#) to meet these user needs and which will begin to put administrative data at the core of evidence on migration in 2019.

We provided an [update](#) on these plans in May 2018. In August 2017, ONS and the Home Office published a [comprehensive update on statistics on emigration after study based on Home Office administrative data](#). The analysis was done in response to public debates on international student migration in the UK. Since then, we have been undertaking further exploration of Home Office administrative data to better understand the movements of migrants across the different visa routes (study, work and family). This exploratory analysis is helping to increase our understanding of the quality of the International Passenger Survey (IPS) long-term immigration and emigration estimates for migrants who originally came to the UK for 12 months or more, and better understand the different patterns of migrants' journeys.

The work we have undertaken collaboratively with Home Office experts has been complex and has involved ONS improving its understanding of data produced by the UK's immigration control administrative systems. This has included reviewing the assumptions and methods underpinning our [August 2017](#) analysis of international students using Home Office administrative data.

We have also started to develop our understanding of how long non-EU migrants are residing in the UK based on recorded travel patterns – in particular, those non-EU nationals who migrate to study or work, or are coming for family reasons (including dependents accompanying those coming as main applicants to work or study). The Home Office have supplied large data extracts allowing further analysis of migrant journeys and ONS is working with other departments to obtain access to other administrative data to provide a more comprehensive picture.

Understanding the complexity of international migration utilising administrative data

Traditionally, migration statistics have been designed to feed into population estimates as an important component of change and aligned to be consistent with the UN definition of an international migrant². In recent years, the demand for information on migration has increased. There is now much more interest in the characteristics of migrants who reside in the UK and the impact they have on the economy and society. There are sources of data that shed some light on this but these only go so far in meeting the needs of the public, media and policymakers with no one source of data providing a full picture.

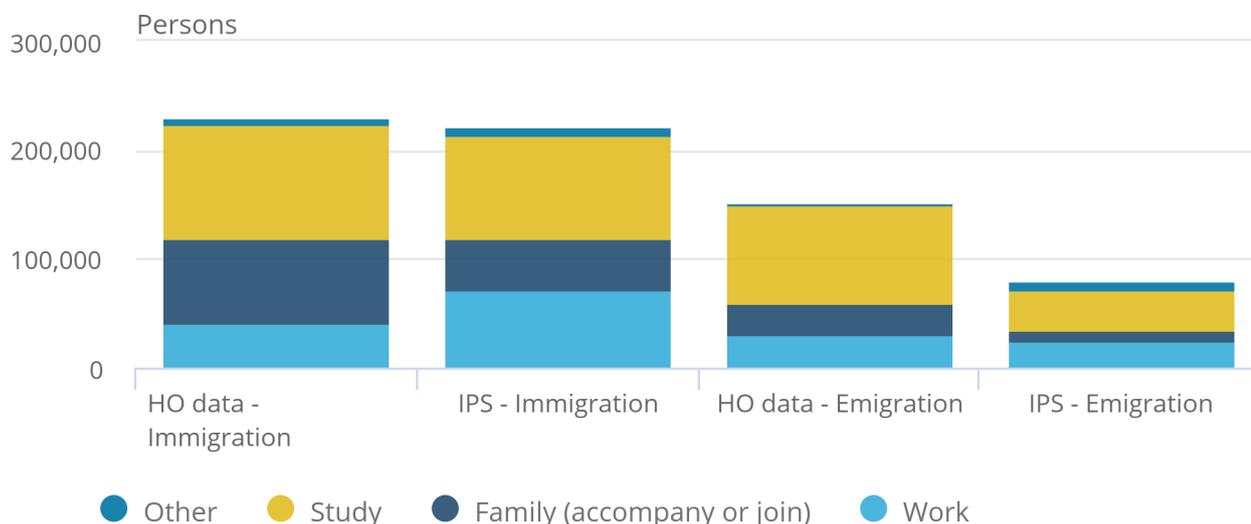
In addition, [migration patterns and behaviours have changed](#) and the traditional definition of an international migrant is becoming less relevant. Circular migration³ is a topic of growing importance and a dimension that is difficult to measure. Circular migration is not a single event taking place at a particular point of time, but rather a series of several events happening within a specific period. Again, this type of migration is not well captured because we have yet to develop the necessary methods to measure it regularly and reliably within the data sources available. All this makes measuring migration overall much more challenging and statisticians need to adapt data collection and the methods we use to meet users' needs.

As our analysis throughout this report shows, we can compare results from individual sources, however, these data sources are not capturing the same information in the same way and are not used for the same purpose. The International Passenger Survey (IPS) is an intentions-based survey, capturing the intentions of a sample of people arriving and departing in the UK. In comparison, the Home Office administrative data included within this report are based on actual travel patterns of migrants in the UK on visas, and different definitions are possible, for example, [visa length](#) as used in our report in August 2017, or first assumed arrival and last assumed departure, to determine whether they are long- or short-term migrants. Intentions do not necessarily reflect actual behaviour and may not neatly fit into our definitions of a long-term or short-term migrant either.

Figure 1 illustrates the differences between the measures of migration derived from Home Office administrative data and the IPS figures. These differences may be due to the type of data collected (intentions compared with travel details used for operational purposes), the way it is collected (a face-to-face sample survey versus an operational system with data supplied by air, rail and sea carriers), the quality of the two data sources, and in the assumptions made to process these data.

Figure 1: Preliminary Home Office (HO) administrative data results compared with International Passenger Survey (IPS) data – long-term migration, UK, 2016 to 2017

Figure 1: Preliminary Home Office (HO) administrative data results compared with International Passenger Survey (IPS) data – long-term migration, UK, 2016 to 2017



Source: Office for National Statistics analysis of Home Office administrative data and International Passenger Survey (IPS) data

Notes:

1. ONS analysis using methodology detailed within this report (first arrival and last departure date where available, otherwise visa length for work, study, family and other types of visa or permission to stay in the UK).
2. Comparisons of the Home Office administrative data and IPS estimates illustrate that there are differences between the measures of migration available from the two sources; for example, in the: data being collected (intentions vs operational travel details); way it is collected (face-to-face survey vs operational systems); quality (both sources will include unit and item non-response or recording errors, IPS estimates will include sampling error whilst administrative data is affected by the processes from which the data is obtained); and assumptions made to process the data. Neither source directly measures whether an individual is usually resident whilst in the UK or elsewhere.
3. All numbers are rounded to the nearest thousand. Totals may not sum due to rounding.

Our analysis has shown that whilst there are some similar travel patterns, depending on the type of visa migrants apply for, it is not straightforward to generalise the patterns that are seen within the data to come up with definitive rules around how to classify someone as a long-term migrant.

Table 1 further illustrates the complexity of these travel patterns for non-EU migrants. The table shows the estimated number of visits migrants are making in and out of the UK, dependent on the length of visa they have, and the average length of each visit, based on travel data from Home Office administrative systems. This analysis shows that the shorter the visa, the fewer number of visits migrants are making within this period, however, there is both variance and censoring⁴ within these data and further analysis is needed to understand these travel patterns within the different visa types.

Table 1: Distribution of the number of visits and average visit length by visa length, non-EU nationals with visas expiring April 2017 to April 2018

Length of Visa	Number of Visits (percentage)										Average Length of Visit (Days)	Average number of visits
	1	2	3	4	5	6	7	8	9	10 +		
< 1 year	30.1	19.1	14.2	9.8	7.1	5.5	4.0	2.7	1.8	5.6	75.8	3.6
1 - 2 years	5.5	9.9	12.2	12.8	11.9	10.2	8.2	6.3	4.8	18.1	83.8	6.7
2 - 3 years	1.7	5.1	5.9	6.1	6.1	6.4	5.9	5.7	5.2	52.0	80.1	13.7
3 - 4 years	1.2	3.2	3.8	3.9	3.9	4.0	4.2	4.4	4.7	66.7	82.6	19.8
5 + years	0.8	2.7	3.7	4.2	4.4	4.8	4.5	4.6	4.4	65.8	115.6	18.0
All	5.0	6.6	7.2	7.0	6.6	6.3	5.5	5.0	4.5	46.2	85.7	13.5

Source: ONS analysis of Home Office administrative data

Notes:

1. A cohort was selected based on those whose visas were due to expire between 8 April 2017 and 7 April 2018.
2. Based on all visas or extensions of leave granted for work, study, family or other categories; excluding categories granting permission to stay permanently (settlement) or those with right of abode who are family members of European Economic Area (EEA) nationals exercising Treaty rights.
3. To calculate the average length of visit, only those that had complete information for arrival and departure for each visit were included in the analysis.
4. Travel history data from Home Office administrative systems is incomplete prior to the introduction of the Exit Checks programme in April 2015, therefore the number of visit estimates for visas in the categories 2 to 3 years, 3 to 4 years and 5 or more years may be undercounts as the distributions shown in Table 1 may be less reliable.
5. Average number of visits and average length of stay rounded to nearest whole number.

People are often making multiple journeys to and from the UK and Table 2 illustrates that of these, approximately 13% of journeys away from the UK are for a period of longer than three months before travelling back to the UK whilst holding a valid visa. Example 1 discusses the complexity of migrant travel patterns in more detail.

Table 2: Periods greater than three months (90 days) outside of the UK whilst holding a valid visa, UK, 2017 to 2018 cohort

Total gaps	Number of gaps >90 days	Percentage
1,491,000	197,000	13%

Source: ONS analysis of Home Office administrative data

Notes:

1. Cohort includes visas of up to two years duration that are expiring between 8 April 2017 and 7 April 2018.
2. Work, family, study and other visas included.
3. Identified journeys of 90 days or more are entirely within a valid visa period and will not include final departures from the UK.
4. Journeys away from the UK were identified where there was evidence of a person departing the UK and then subsequently returning, whilst still in the validity of their visa period.
5. All numbers are rounded to nearest thousand.

People making frequent journeys will be picked up within the IPS in many different ways and classified as a visitor, a short-term migrant or a long-term migrant. The way they are categorised within the IPS will depend on the way they answer the questions. Whilst instructions to IPS interviewers make clear that holiday periods are to be excluded, for some individuals making multiple trips back and forth to the UK, it is possible that this will mean that their travel patterns do not allow them to easily fit into our statistical definitions based on their answers. Similarly, the way we classify migrants in the administrative data will depend on the assumptions we make based on their interactions with the systems. Consequently, looking at the IPS and Home Office administrative sources in isolation will produce different results. As part of the Government Statistical Service (GSS) transformation programme, bringing together multiple sources of information will allow a more granular level of detail to understand migrant travel patterns more fully.

What our initial analysis of Home Office administrative data has told us

The work we undertook in August 2017 on [international students studying in the UK](#) demonstrated that many people do not simply immigrate for study and leave afterwards; their lives are more complex. For example, some people may arrive on a study visa and then switch to a work visa route. We also saw that people are often travelling back to their home countries during breaks and holidays, and so may not accurately recall their original timing or reason for coming to the UK or fail to be picked up as a long-term migrant. Therefore, some former students may well appear in other categories such as work or family in the International Passenger Survey (IPS) emigration estimates.

Our Survey of Graduating International Students (SoGIS) showed that for many students, they have a high degree of uncertainty about what they will do after completing their studies. This makes measuring the intentions for this group more challenging. Our comparison of Home Office administrative data to intentions reported in the SoGIS by non-EU graduating students departing the UK, confirmed that a lower proportion of departing students in the Home Office administrative data returned within 12 months (6%) compared with the proportion (28%) who reported such an intention⁵ on departing the UK.

Home Office administrative data provided a more accurate picture of what non-EU students do after their studies. This knowledge has given us greater insight into derived international migration statistics from the IPS as it relates to the most recent cohorts of non-EU students. This led us to conclude that the IPS was likely to be underestimating former student emigration and we therefore concluded that any implied non-EU student net migration figure is likely to be an overestimate. We advised users of our migration statistics to take caution in over-interpreting emigration by reason for originally coming to the UK and confirmed the view of the Office for Statistics Regulation, UK Statistics Authority that these [experimental estimates should not be used to produce implied student net migration figures \(PDF, 512KB\)](#).

This work gave us a better, but not complete, understanding of how students contribute to net migration. We concluded that this analysis did not, at that time, provide sufficient evidence to suggest that these findings affected total net migration figures. Our analysis highlighted that further work was needed to investigate other migrant groups who are on work or family visas (including dependants), and to extend our analysis of Home Office administrative data to cover long-term immigration so we had a more complete picture for non-EU migrants. However, this work will still only give us part of the overall picture (Figure 2).

There is more work for us to do, in partnership with colleagues across the Government Statistical Service (GSS), as part of our ambition to put administrative data at the core of migration statistics in 2019. Further work is planned using sources of data about international students and other migrants, which identify them as being resident in the UK (for example, Higher Education Statistics Agency (HESA) data as well as HM Revenue and Customs (HMRC) tax and benefits records), which will enable us to refine and improve our estimates further, as travel records alone may not be a complete indication of whether an individual is a long-term international migrant ⁶.

Figure 2: The picture in August 2017 for long-term migration of non-EU students

For long-term migration....

	UK	EU	Non-EU
Immigration	?	?	?
Emigration	?	?	✓



.....There are also short-term migrants and visitors to take into account

Improving our assumptions and methods

Part of our work to better understand the movements of non-EU long-term migrants in the work, family and other categories, has been to challenge and improve the initial assumptions we developed for non-EU student emigration and test whether these assumptions hold for long-term departures from the UK for those on work, family and other visas. We are also starting to develop methods to identify long-term immigrants in the Home Office administrative data for those on work, family, study and other visas.

Last year we reported in [What's happening with international student migration?](#) that the number of long-term departures seen in the Home Office administrative data for students ⁷ were substantially higher (118,000) than International Passenger Survey (IPS) estimates of emigrating former students (46,000). Working with Home Office experts, we have assessed the robustness of our assumptions and started to explore how we could account for the difference between the two figures now we have a better understanding of the Home Office data. Some of the difference can be explained by:

- differences between intentions stated to IPS interviewers and actual migration behaviour
- differences between the category of visa individuals use to enter the UK and their main reason for migration as stated to an IPS interviewer, as in practice individuals may well have more than one reason for migrating (for example, a dependant or somebody travelling on the family route may choose to migrate or not in part depending on their employment prospects in the UK)
- differences in the way we operationalise the UN definition in the IPS (intentions) and Home Office data (taking the difference between first arrival and last departure)
- overestimating long-term departures in the Home Office administrative data where subsequent arrival data are missing or censored⁸, or underestimating long-term departures where departure data are missing or censored
- sampling variability and other survey-related error, such as recall error or non-response bias
- quality issues in Home Office administrative data⁹
- our initial analysis possibly understated emigration as we only included those whose visa expired between April 2015 and April 2017, so would not include those who did depart during this time but still had valid leave to remain

For any given departing cohort, we need data for the following 12 months to confirm if those that departed did so long-term. The time period covered by the Home Office administrative data extract we had last year only allowed us to look at emigration for a cohort departing between April 2015 and April 2016, but a new extended extract of data has allowed us to produce emigration figures for those departing between April 2016 and April 2017, as we now have travel event data up to April 2018.

The initial assumptions we made for student emigration included how we identified:

- the length of time non-EU students were resident in the UK – we used the length of visa as a simple proxy for length of residence¹⁰
- those returning within 12 months of their last departure date – we included those returning on a visit visa as a long-term emigrant, assuming that they departed again within 12 months; this assumption was based on their first recorded return in the Home Office administrative data
- that dependants on work or study visas will have similar migration behaviours as those on a family-related visas

As part of this work we have also reviewed the IPS switcher adjustment that accounts for people who changed their intentions regarding their travel plans¹¹. This review included a check of whether our assumptions of people's intentions have altered since the last [review](#) in April 2014.

We may classify some people as long-term international migrants according to their visa status and length

We tested visa length as a proxy for length of residence by recalculating length of stay in the UK in each valid visa period or extension of leave to remain¹², based on the first recorded arrival in the UK in Home Office administrative data extract and last recorded departure date in the same extract. Our assessment of first arrival and last departure dates indicated that for the 2015 to 2016 cohort¹³, 67% of expiring visas had complete first arrival and last departure data. The remainder either had a missing first arrival or last departure date¹⁴. Where both first arrival and last departure dates were present we calculated a new length of stay, which was then compared with the length of the valid visa period or extension of leave to remain for non-EU nationals on work, study, family-related and other routes.

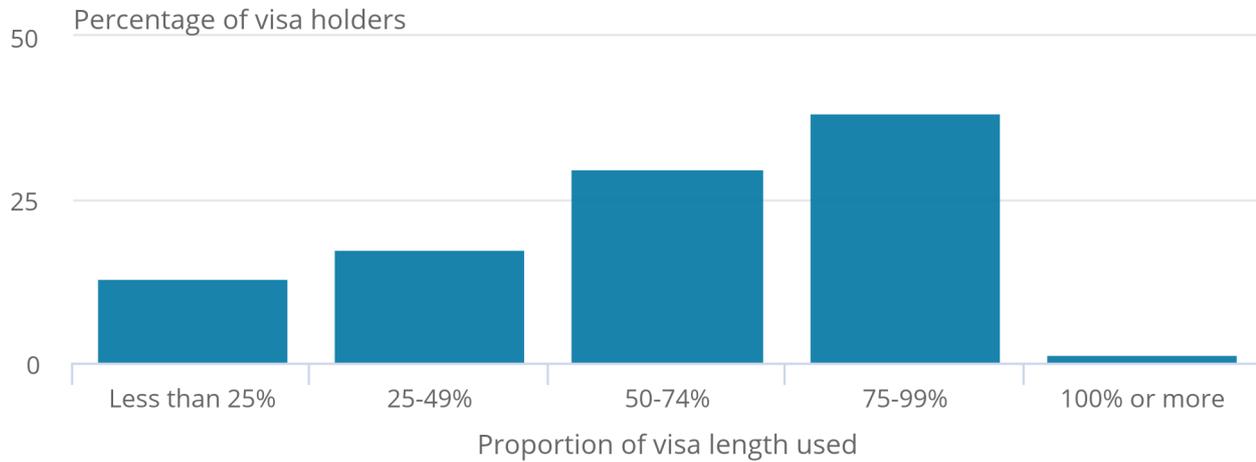
Figure 3 shows that individuals do not necessarily stay for the full duration of their valid visa or extension of leave to remain. Approximately 30% of non-EU nationals stayed between half and three-quarters of their valid visa length (50% to 74%) and 38% stayed for over three-quarters of their visa length or up to almost the full length (75% to 99%). Very few stayed for the full duration of their valid visa (or subsequent extension of leave to remain), which is not surprising as most individuals would be expected to depart compliantly, that is, on or before their visa or extension expires, as confirmed by [previous Home Office analysis](#).

Similarly, it is not surprising that many students leave the UK outside term time or that other migrants leave the UK temporarily (for example, holidays or going back home). However, this does not mean that these individuals were not usually resident in the UK or were not migrants. For example, a student who held an initial three-year visa to study in the UK and then extended their stay with a one-year extension that expired in 2015 to 2016 and used nine months of the extension, would be in the 38% group but would clearly have been an international migrant (see Example 1).

However, this analysis will also be incomplete since exit and arrivals data were not fully captured in the Home Office administrative systems prior to April 2015. Therefore, the analysis will unduly emphasise results for those on short extensions or short-term visas.

Figure 3: Length of stay as a proportion of visa length, UK, 2015 to 2016 cohort

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Source: Office for National Statistics analysis of Home Office administrative data

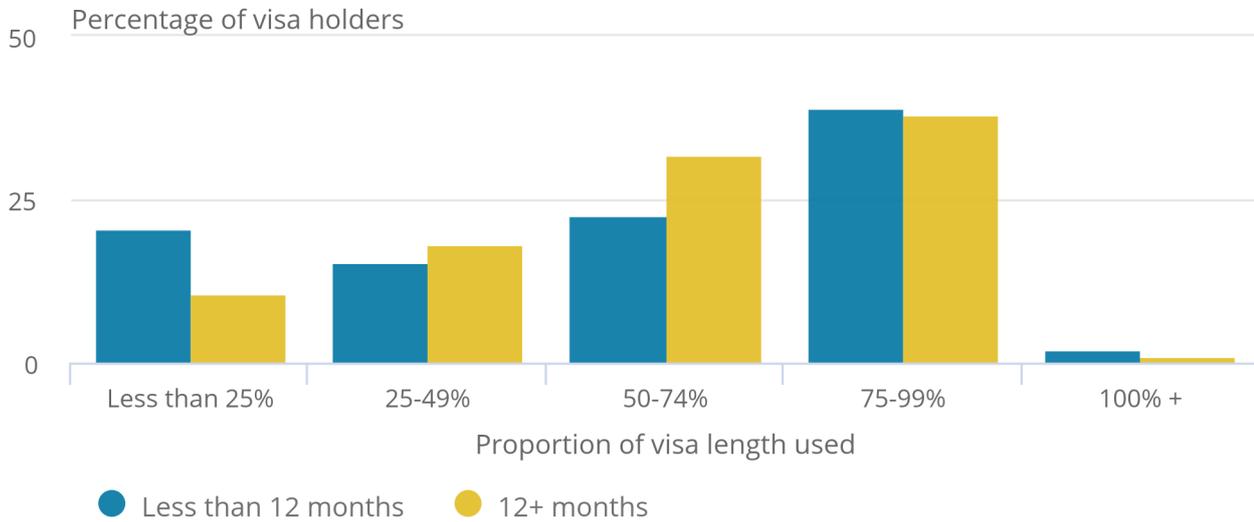
Notes:

1. The chart shows length of stay (between first arrival and latest departure) as a proportion of the valid visa period or subsequent extension of that visa.
2. The chart is based on a cohort of visas expiring between 8 April 2015 and 7 April 2016, with first arrival date and last departure dates as recorded on the Home Office immigration control administrative systems.
3. Work, family, study and other visas are included.
4. Proportion of visa length is grouped into five categories: less than 25%, 25% to 49%, 50% to 74%, 75% to 99% and 100% or more.
5. The category '100% or more' includes those who departed after their visa expired.
6. Percentages are based on numbers that are rounded to the nearest thousand. Totals may not sum due to rounding.

Those on a short-term visa (less than 12 months) are more likely to stay for less than 25% of the valid visa or extension period than those on longer-term visas. But, broadly equal proportions of those on either short-term or long-term visas may stay between 75% and 100% of their valid visa or extension period (Figure 4).

Figure 4: Length of stay as a proportion of visa length, broken down by visa length, UK, 2016 to 2017 cohort

Figure 4: Length of stay as a proportion of visa length, broken down by visa length, UK, 2016 to 2017 cohort



Source: Office for National Statistics analysis of Home Office administrative data

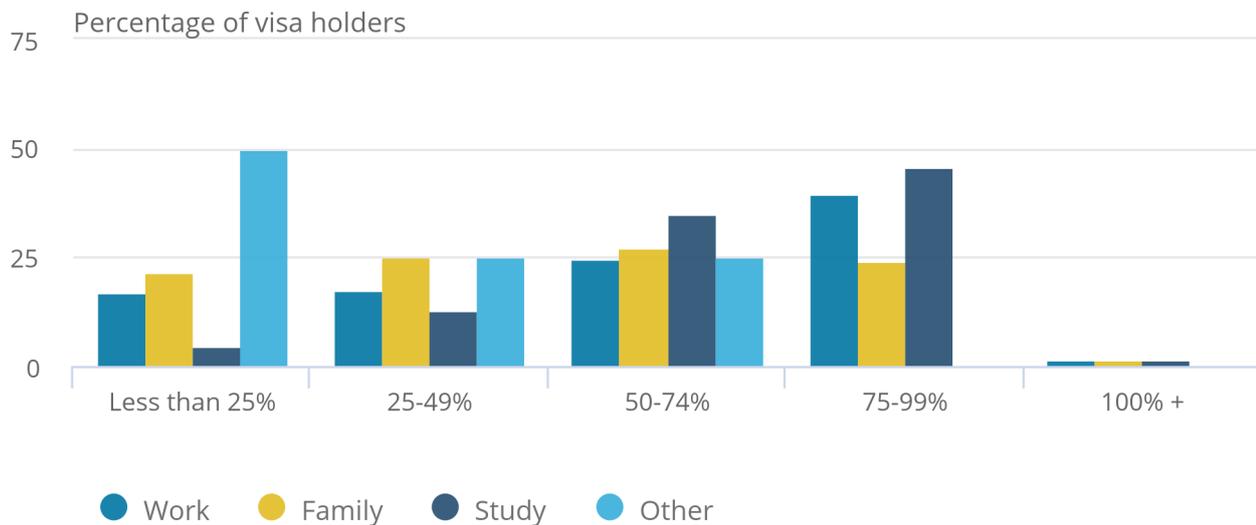
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Further analysis by visa type indicates that those on study and work visas were more likely to stay for 75% to 99% of their valid visa duration (Figure 5).

Figure 5: Length of stay as a proportion of visa length, broken down by migrant group, UK, 2015 to 2016 cohort

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Source: Office for National Statistics analysis of Home Office administrative data

Notes:

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5. Percentages are based on numbers that are rounded to the nearest thousand. Totals may not sum due to rounding.

Using first arrival and latest departure¹⁵ to identify length of time in the UK is an enhancement to the method that we applied to our initial international student migration analysis. At best it is an approximation of length of stay in the UK. However, it does not consider journeys to and from the UK between these time points, or across an individual's entire leave to remain in the UK (Example1 and Figure 6).

Example 1: Examples of the complexity of migrant travel patterns

How long during a 12-month period does an individual need to be in the UK to be usually resident? Seven months? Nine months? 11 months?

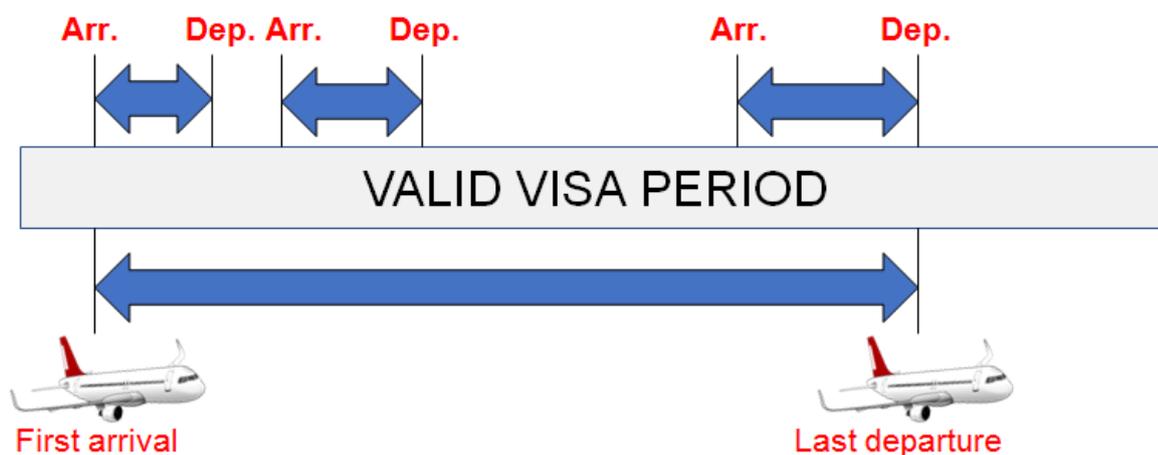
Example: A student is resident in the UK for term time over three successive years during an initial degree, then returns for a research Masters degree and is resident for two terms then completes a six-month dissertation mainly whilst abroad, and returns for their graduation ceremony. When did their long-term migration start and when did it finish?

Example: An investor obtains a standard length visa of two years and spends seven months a year in the UK during that period. Are they a long-term migrant?

Example: An individual obtains a short term 11.5 month visa as a skilled worker as an intra-company transfer, and spends 10 periods of one month in the UK with short trips back home in between. Are they a long-term migrant? (They may have spent more time in the UK in the year than a student, but have only a short-term visa.)

This is further illustrated in Figure 6.

Figure 6: Hypothetical example of an individual's travel patterns during the period of their visa



Source: Office for National Statistics

Notes:

1. The chart shows a hypothetical example of an individual's travel patterns during the period of their leave.
2. The individual has three separate stays in the UK during their visa period.
3. The Home Office immigration control system records the individual's first arrival date as the first time they entered the UK and their latest departure date as the last time they depart the UK after their third visit.
4. Using first arrival and latest departure would result in an overestimate of the time spent in the UK, in comparison to the sum of their three individual journeys.

There is more work for us to do on this, which we have planned for in our cross-Government Statistical Service (GSS) transformation programme for international migration statistics; including:

- further exploration of migrant journeys in Home Office administrative data using event history analysis ¹⁶; this will enable us to explore journey lengths for migrants, giving a more reliable evidence base for their length of stay
- considering what definitions of an international migrant are appropriate and reflect usual residence in the UK, as well as holidays abroad and short-term stays by migrants who are usually resident in the UK
- understand whether migrants were resident in the UK (and when) using alternative sources of data including HESA records and tax and benefit records
- developing rules to classify journey patterns in migration terms – this will help us to identify different groups of migrants in administrative data sources and this work will be ongoing within our transformation plan in collaboration with colleagues across the GSS
- migrant journeys are complex and patterns can change so consideration needs to be given to the flexibility of any model

Do the International Passenger Survey (IPS) switcher assumptions of people’s intentions altering still hold?

The current [methodology for estimating international migration](#) is based primarily on how long respondents to the International Passenger Survey (IPS) say that they intend to be in or out of the UK. However, it is known that actual behaviour does not always match intentions, as we saw for [non-EU international students](#). To account for this, the following “switcher” adjustments are made to the IPS estimates to produce the long-term international migration estimates (LTIM):

- visitor switcher adjustment – this adjustment accounts for people who intend to stay in or out of the UK for less than 12 months but actually stay for 12 months or more; this adds people to the LTIM migration estimates
- migrant switcher adjustment – this adjustment accounts for people who intend to stay in or out of the UK for 12 months or more but actually stay for less than 12 months; this removes people from the LTIM migration estimates

Visitor and migrant switchers adjustments are made to both immigration and emigration estimates. Since 2004, switchers have been identified through questions on the IPS that ask about the respondent’s intentions on their previous entry or exit from the UK. These intentions can be compared with their actual travel behaviour to identify whether they are a switcher.

Switcher review

In January 2018, Office for National Statistics (ONS) started a review of the current switcher methodology to assess whether the assumptions that underpin it are still valid. [These assumptions were last reviewed in April 2014](#). The first phase of the review focused on what we can learn from the IPS data and the second phase is looking at alternative data sources.

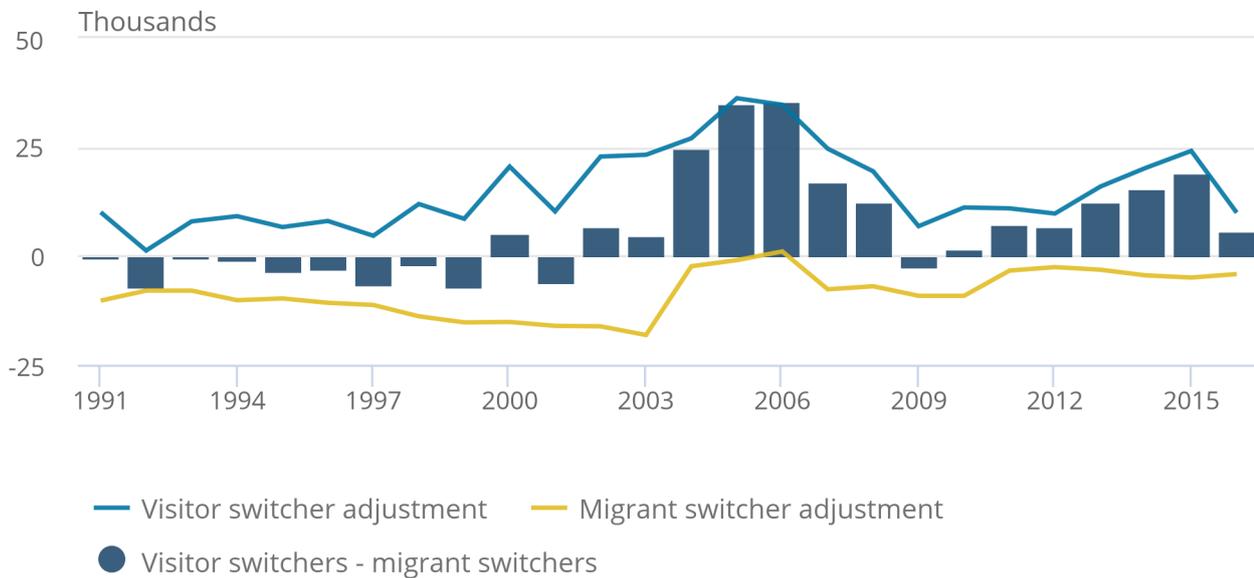
What does the IPS tell us about changing intentions?

The main findings from phase 1 were:

- the switcher adjustments are having a relatively small impact on net migration estimates (Figure 7)
- the switcher adjustments are likely to be an underestimate of the number of switchers due to only a subset of respondents being asked the switcher questions on the IPS questionnaire
- it is not possible to produce the switcher adjustment by nationality or reason for migration due to the [small number of "migrant contacts" in the IPS](#)

Figure 7: Net switcher adjustments to the migration estimates, thousands, UK, 1991 to 2016

Figure 7: Net switcher adjustments to the migration estimates, thousands, UK, 1991 to 2016



Source: International Passenger Survey (IPS)

Notes:

1. The yellow line shows the migrant switcher adjustment and the blue line the visitor switcher adjustment. The net switcher adjustment (the difference between the number of visitor switchers and migrant switchers) is shown by the blue bars.
2. Visitor switchers are people who intend to stay in or out of the UK for less than 12 months but actually stay for 12 months or more. A positive net value indicates that there are more inflow visitor switchers than outflow visitor switchers so the visitor switcher adjustments are adding people to the net migration figures.
3. Migrant switchers are people who intend to stay in or out of the UK for 12 months or more but actually stay for less than 12 months. A positive net value indicates that the migrant switcher adjustments are removing more people from the emigration estimates than from the immigration estimates, so overall are adding people to the net migration estimates.
4. Switchers are identified through questions on the International Passenger Survey (IPS). To be asked the migrant switcher question, the respondent must have been in or out of the UK for more than one month. For visitor switchers, the respondent must be making a subsequent trip into or out of the UK with an intended stay of three months or more (or 12 months or more, depending on country of birth).

Due to the filtering in the IPS questionnaire, not all respondents are asked the switcher questions. To be asked the migrant switcher question, the respondent must have been in or out of the UK for more than one month. For visitor switchers, the respondent must be making a subsequent trip into or out of the UK with an intended stay of three months or more (or 12 months or more, depending on country of birth).

There is good reason that this filtering is in place, given the time limitations involved with completing IPS interviews. However, it does mean that the IPS is likely to be underestimating the number of switchers. It is not currently possible to quantify the size of the possible switcher underestimation and it is not practicable to start asking all respondents the switcher questions. Additionally, we cannot draw conclusions on the impact of the underestimation on net migration, as it may be the case that the underestimation on inflow and outflow balance each other out.

Alternative data sources – Home Office administrative data

We also looked at what other data sources can tell us about switchers. The work is still in the early stages but initial analyses have focused on identifying inflow visitor switchers in Home Office administrative data. We have looked at visa information to identify individuals who have entered the UK on a short-term visa and then extended their visa in-country to enable them to stay long-term. This assumes that if an individual has a short-term visa, they have an initial intended length of stay of less than 12 months. It also assumes that if someone extends their visa to long-term, they will remain in the UK for 12 months or more.

Early results support the findings that the current International Passenger Survey (IPS) adjustment is likely to be an underestimate of the number of switchers. Of the 163,000¹⁸ non-visit short-term visas applied for out-of-country in 2016, around 47,000 were extended in-country to long-term. Visa extensions were most common for people who entered on family (21,000) and study (20,000) visas. The IPS inflow switcher adjustment for non-EU nationals (all reasons for migration) was lower at around 5,000 in 2016. However, we cannot draw conclusions on net “switching” in these data as we have only looked at inflow visitor switchers.

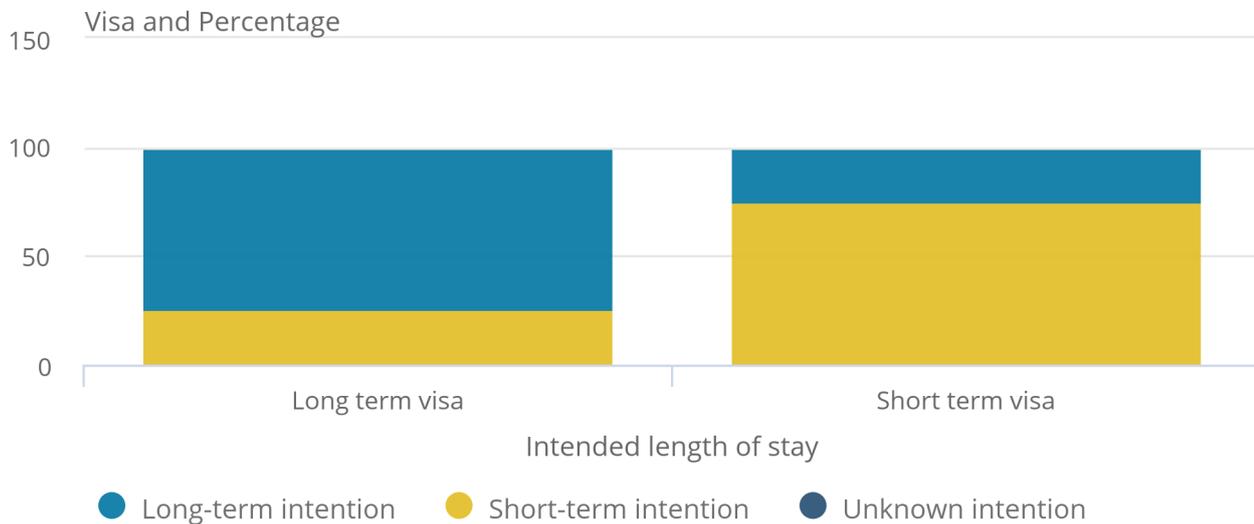
There is a question in the IPS arrivals questionnaire about the type and length of visa that non-EU nationals are arriving on. This question is asked of people arriving with an intended stay of three months or more. The data from this question can provide some insight into how intended length of stay on arrival compares with visa length (Figure 8).

In 2016, 69% of people arrived on a long-term visa and 31% arrived on a short-term visa. Of those arriving on a long-term visa, 75% intended to stay for 12 months or more, 24% for less than 12 months and 1% were unsure on how long they would stay for.

Of those arriving on a short-term visa, 74% intended to stay for less than 12 months and 26% for 12 months or more. If the 26% did stay long-term, using their visa length as a proxy for intention would suggest that they were a switcher when in reality, they always intended to stay long-term.

Figure 8: Intended length of stay by visa length for non-EU nationals arriving in the UK, 2016

Figure 8: Intended length of stay by visa length for non-EU nationals arriving in the UK, 2016



Source: International Passenger Survey (IPS), Office for National Statistics

Notes:

1. Chart is for the calendar year 2016.
2. Percentages are the weighted percentages based on 1,278 valid responses to the visa question in 2016, but exclude those who responded that they “don’t know” to this question.
3. Short-term refers to visas valid for less than 12 months. Long-term refers to visas valid for 12 months or more.

As previously mentioned, it is important to bear in mind that the IPS and Home Office administrative data are not directly comparable. One important factor is that someone entering the country on a short-term visa may always be planning to extend so may tell an IPS interviewer that they intend to stay in the UK long-term. Additionally, this analysis has only looked at visa length and we know that some people may not stay for the full length of their visa. The planned next steps are to investigate the travel history data available in the Home Office administrative data to test the assumption that if someone extends to a long-term visa, they will remain in the UK for 12 months or more.

Notes for: Part 1 – How are we using Home Office administrative data to further our understanding of international migration?

1. This is referred to as migration throughout this report.
2. The UN definition of a long-term international migrant refers to a person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence.
3. Circular migration or repeat migration is the temporary and usually repetitive movement of a migrant worker between home and host areas, typically for the purpose of employment. It represents an established pattern of population mobility, whether cross-country or rural-urban.
4. Travel history data from Home Office administrative systems is incomplete prior to the introduction of the Exit Checks programme in April 2015, therefore, the estimates for visas in the categories 2 to 3 years, 3 to 4 years and 5 or more years will be undercounts and the distributions shown in Table 1 may be less reliable.
5. Proportion in the Survey of Graduating International Students (SoGIS) who stated that they were unsure how long they would be out of the UK or that they intended to return within 12 months.
6. The UN definition of a long-term international migrant refers to a person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence.
7. These estimates were for a cohort of non-EU students whose study visas expired between April 2015 and April 2016.
8. Censoring may occur in the travel history data from Home Office administrative system where it is incomplete prior to the introduction of the Exit Checks programme in April 2015, or where further years of travel data are needed to confirm if someone has been resident in the UK long-term (one year or more).
9. For more information, see [Second report on statistics being collected under the Exit Checks programme, Home Office 2017](#).
10. For more information, see [Long-Term International Migration \(LTIM\) methodology document](#).
11. For more information, see [Long-Term International Migration \(LTIM\) methodology document](#).
12. To test this assumption, we included all visas expiring between April 2015 and April 2016.
13. The 2015 to 2016 cohort includes those who immigrated for study, work or family reasons for 12 months or more according to the length of their visa or subsequent visa extension (main applicants and dependants where applicable) with an identified visa expiry date between 8 April 2015 and 7 April 2016 in the Home Office administrative data.
14. Missing arrival dates could occur where the visa has been extended via an in-country visa application, the arrival was before the Home Office Exit Checks programme started on 8 April 2015 or where there are known data quality issues. Departure dates could be missing where an individual has no identified departure, extended their visa in country and did not depart before their valid leave to remain expired, or matching error in the Home Office administrative data.
15. As recorded on Home Office immigration control administrative systems.
16. [Event history analysis \(PDF, 433.26KB\)](#) is a longitudinal analysis of the timing of the occurrence of one or more types of event
17. Please note this work should not be conflated with the illustrative revised trend for non-EU students described in the MSQR. That work was done to help provide an overall assessment of international net migration.
18. Number of short term initial visas applied for out-of-country in 2016 based on ONS analysis of Home Office administrative data.

3 . Part 2: International Passenger Survey (IPS) development and independent quality review

Main points

- The International Passenger Survey (IPS) is subject to an ongoing programme of development, including the introduction of an optimised sample in October 2016, a modernised data collection approach from August 2017 and updated weighting adjustments, which will be introduced in April 2019.
- In May 2018, a temporary processing system used during the implementation of the new data collection approach was found to contain an error that impacted on the IPS dataset; as a result, an in-depth independent review of IPS data quality has been completed.
- In addition to the error already identified in the temporary processing system, the independent data quality review identified a slight error with updated weightings introduced in October 2016.
- The initial impact of the issues identified was a delay in the release of the Migration Statistics Quarterly Report: May 2018 and year ending December 2017 migration estimates.
- Corrections have now been made to the IPS datasets for April to September 2017 and subsequently to the year ending June 2017 and September 2017 migration estimates.
- The net effect of these corrections saw changes to the headline published migration estimates, with a decrease for year ending June 2017 and an increase for the year ending September 2017.

Introduction

On 17 May 2018, we announced the regular [quarterly long-term migration statistics would be delayed due to survey processing issues](#). On 24 May 2018 we published an [update on our migration statistics transformation programme](#), which provided a short note on a processing issue found in the International Passenger Survey data. This technical paper provides an update on the ongoing development of the IPS and details the now complete independent data quality review carried out to ensure that the IPS data and the migration statistics produced are at the quality required.

IPS development update

The International Passenger Survey (IPS) collects information about passengers entering and leaving the UK and has been running continuously since 1961. Between 700,000 and 800,000 interviews a year are conducted at UK ports and airports and the results are currently used to measure the impact of travel expenditure on the UK economy, provide information about international tourism and estimate the numbers and characteristics of migrants into and out of the UK.

The inherent limitations of the IPS sample survey approach to monitoring migration have been recognised for some time (for example, in the [2013 UK Statistics Authority \(UKSA\) report \(PDF, 487.7KB\)](#)) and our recent [migration statistics transformation update](#) therefore outlines our plans to place administrative data at the core of migration statistics.

While the IPS may therefore have a diminished role to play in informing migration estimates in the future, for now it continues to inform migration analysis and more broadly it retains its role informing travel expenditure and tourism. Within this context, Office for National Statistics (ONS) has been conducting work over the last two years to optimise the IPS sampling approach, modernise the data collection methods on the survey and develop revised weightings to address concerns from stakeholders that the survey may be under-reporting some non-migrant visitors.

Sample optimisation

In October 2016, to reduce data collection costs without reducing the quality of the migration estimates, the International Passenger Survey (IPS) sample underwent a process of optimisation. This involved re-balancing the sample so that more shifts were carried out at ports and airports where greater passenger traffic or more variability was present and fewer shifts where there were lower passenger numbers or lower variability in the target variables. Targeting variability in the sample aims to enable greater numbers of people with rarer characteristics to be captured by the survey.

IPS data collection modernisation

In September 2017, Office for National Statistics (ONS) implemented a seven-month programme to phase out our legacy paper-based data collection approach on the International Passenger Survey (IPS) and phase in a new tablet-based approach.

Data collection by tablet offers significant advantages, including improved efficiency through reduced manual data entry, improved translations into different languages, easier survey updates due to greater flexibility, and there is evidence that respondents relate better to the “one-question-per-screen” layout of the tablet, where they can see the questions in writing more easily themselves. While the advantages of introducing tablet data collection are considerable, changes of this scale require extensive testing to identify any potential errors in the transitional or new processing systems, as well as a detailed consideration as to whether the new mode of data collection may have introduced a discontinuity in the data outputs.

Considering each risk, our testing of IPS data for year ending December 2017 data did identify a processing issue introduced during tablet roll-out. Although to be clear, the issues do not relate to data collected from the new tablets but processing of the remaining paper-based forms. To provide assurance this error had been corrected and to more broadly assure IPS data processing an in-depth independent review of IPS data quality has been completed as described in The International Passenger Survey (IPS) independent quality review.

Possible discontinuities arising from the introduction of tablet data collection in the IPS were anticipated, but not necessarily expected. We have worked with academic experts to produce a method of detecting any such discontinuities. While initial analysis suggested there may be a discontinuity in our data on spending by overseas visitors ([as announced in December 2017](#)), subsequent analysis for the full quarter to December 2017 has now shown no detectable discontinuity for any outputs and with only a low proportion of cases collected on tablets up to December 2017 anyway, it is very unlikely that a discontinuity impacts the migration estimates within this report.

We are continuing to collect data to confirm with certainty whether any discontinuities exist in the data collected following the full introduction of the tablets (from April 2018) and will report back separately on this in the future. While the introduction of tablets has not so far resulted in a detectable discontinuity, should further data collection and analysis indicate one exists, then IPS data will be adjusted, as far as possible, to the value consistent with the current time series, before moving to unadjusted tablets data in April 2019.

Updating weighting adjustments to improve IPS data accuracy

International Passenger Survey (IPS) stakeholders have reported concerns in recent years over an imbalance between the IPS estimates for the numbers of visitors between departures and arrivals for different nationalities. This has been particularly noted for Chinese visitors, where the IPS is believed to be under-reporting departures, and for UK residents where the IPS is considered to under-report their return to the UK. To correct this issue, we have therefore developed a new adjustment method, which involves updating the weightings applied during survey processing. Implementation of this method is subject to consultation with stakeholders but it is possible that it could have a small effect on migration estimates.

We currently plan (subject to consultation) to implement the new weighting adjustments for April 2019 IPS estimates onward. This means that the IPS will implement only one, managed, set of discontinuities, for which users will have ample advance notice of the change. We will provide further updates to all IPS users as this work progresses.

The International Passenger Survey (IPS) independent quality review

An ONS review team led by Methods, Data and Research, independent of the IPS and Migration Statistics teams, were tasked with investigating the processing error introduced during tablet roll out, to provide assurance that this issue had been corrected and further to conduct a full end-to-end review of IPS data processing to assure the quality of the IPS outputs. As part of this work the team conducted a further investigation into IPS estimates of student migration.

Summary of the data processing error investigation

In August 2017, in preparation for the move from paper to tablet collection for the International Passenger Survey (IPS), the structure of the database used to store the data for editing and processing was changed. This meant that the data collected from the existing paper questionnaire and coded into the old data structure had to be mapped across to the new structure. This was a transitional arrangement during the IPS tablet roll out and does not relate to data collected from new tablets, only to processing the remaining paper questionnaires while both data collection approaches were running in parallel until April 2018. The coding error in this transitional mapping process, and its subsequent correction, was examined by the review team and then tested as described in this section.

Data assurance checks

The International Passenger Survey (IPS) data processing approach has been mapped out end-to-end and each stage has been investigated, with a particular focus on the areas impacted by the recent changes described previously.

Investigating whether the optimised sample design impacted IPS data – The impact of the optimised sample design was assessed to identify the changes to the number and types of shifts at different airports and ports. Checks were completed to ensure that migrant counts and non-response were not affected by the optimisation and no issues were found requiring correction. Unusual shifts with large numbers of migrants were scrutinised in more detail and original paper records were recovered from archive and checked and confirmed to be valid.

Investigating how paper questionnaire data are uploaded into the new tablet data structure – Trial data were repeatedly transferred back and forth through the system and compared to confirm data integrity.

Investigating the processing and editing of the tablet data structure – A systematic random sample of 10,000 cases was selected from August and September 2017, providing data covering all ports and airports and all interviewers. Data for each case pre- and post-edit were compared to confirm integrity and that appropriate edits had been completed. This whole process was repeated for data from October to December 2017. Coupled with the checks on how the paper questionnaire data are uploaded into the new tablet data structure, this step confirmed that the original transitional processing error had been appropriately fixed.

Investigating to ensure weightings are being correctly applied to the edited IPS data – A review of the automated weighting process identified a slight error in the weights given to a small number of shifts as a result of the changes introduced under optimisation. The error was corrected by the IPS team and the data were reprocessed to ensure these shifts were correctly weighted.

With the data assurance checks and corrections completed, continued analysis of the IPS data and migration estimates identified for year ending September 2016 an unusual fall, and subsequently for year ending 2017, a rise in the estimated number of non-EU citizens arriving to study. This fall has been previously investigated and reported in the February Migration Statistics Quarterly Report (MSQR), but with the corrections now applied it was even more pronounced and was not reflected in the most comparable Home Office visa data or Higher Education Statistics Agency data. Further joint work with the IPS and Migration Statistics team was therefore conducted to investigate this issue.

Student migration further investigation

We collated available administrative data for comparison with, and validation of, the International Passenger Survey (IPS) and Long-Term International Migration (LTIM) estimates to ensure our full understanding of the migration story using all the available data. This assessment and illustrative revised trend for non-EU students is included in the MSQR released today.

Our conclusion is that the unusual fall in student numbers for year ending September 2016 was the result of the inherent sampling variability associated with using survey-based estimates. This is particularly the case for students as most students arrive at the start of the academic year creating a cluster effect. Depending on the shifts selected for the IPS sample, the IPS sample may or may not include clusters of students. This is reflected in the numbers of shifts with different numbers of migrant contacts.

Table 3 shows that in 2016 there were no shifts with greater than 20 contacts in Quarter 3 (July to Sept), and there were also fewer shifts with 10 to 15 contacts than in either Quarter 3 2015 or Quarter 3 2017. This suggests that the IPS may be susceptible to larger sampling variability for students who tend to arrive in very clustered groups shortly ahead of the traditional annual university intake. This may be seen in the fluctuating trend of long-term IPS non-EU student immigration as reported in the [July 2018 Migration Statistics Quarterly Report](#).

Table 3: Number of International Passenger Survey (IPS) long-term migrant contacts by number of arrival shifts

Quarter 3 (July to Sept) 2015, Quarter 3 2016 and Quarter 3 2017

	Number		
	2015	2016	2017
1 to 5 migrant contacts	268	256	257
6 to 10 migrant contacts	31	20	19
10 to 15 migrant contacts	6	1	8
15 to 20 migrant contacts	1	2	3
21 to 25 migrant contacts	1	0	2
26 to 30 migrant contacts	1	0	0
Greater than 30 migrant contacts	0	0	1

Source: International Passenger Survey, Office for National Statistics

Note:

1. Shifts where no migrant contacts were made are excluded.

IPS independent quality review conclusions

The in-depth quality review has:

- confirmed that the appropriate corrections have been made to the identified transitional processing error
- identified slight further errors to weightings applied following sample optimisation in October 2016, which have now been corrected
- further investigated International Passenger Survey (IPS) estimates of student migration and confirmed that no systematic error exists, purely sampling variation

The overall conclusion is that while the inherent limitations of using IPS data to estimate migration remain (as evidenced by the variability observed in student migration and the large confidence intervals), the sampling, processing, editing and weighting processes have now been confirmed as robust and free from error.

Impact of corrections on migration estimates

The initial impact of the errors found in the October to December 2017 data was to delay delivery of the International Passenger Survey (IPS) data to the Migration Statistics team and the subsequent delay of the Migration Statistics Quarterly Report until 16 July 2018. The corrections that have now been made to the IPS data and Long-Term International Migration (LTIM) estimates include:

- revisions to the weighting process following sample optimisation led to a small decrease in the immigration, emigration and net migration estimates for years ending June 2017 and September 2017
- the change to the data structure and processing of data to combine tablet and paper questionnaires and the subsequent corrections led to an increase in the immigration, emigration and net migration estimates for year ending September 2017

The net effect of these corrections saw changes to the headline published estimates, as seen in Table 4:

- a decrease for the year ending June 2017
- an increase for the year ending September 2017

Table 4: Comparison of published and corrected headline figures for Long-Term International Migration, UK, year ending June 2017 and year ending September 2017

	Thousands					
	Year ending June 2017			Year ending September 2017		
	Published	Corrected	Difference	Published	Corrected	Difference
Immigration	572	557	-15	578	626	48
Emigration	342	331	-11	334	352	18
Net migration	230	226	-4	244	274	30
British immigration	79	76	-3	73	76	3
British emigration	128	125	-3	125	127	2
British net migration	-49	-49	0	-52	-50	2
EU immigration	230	223	-7	220	245	25
EU emigration	123	118	-5	130	137	7
EU net migration	107	105	-2	90	108	18
Non-EU immigration	263	258	-5	285	305	20
Non-EU emigration	90	89	-1	80	89	9
Non-EU net migration	173	170	-3	205	216	11

Source: Long-Term International Migration, Office for National Statistics

For year ending September 2017, the immigration, emigration and net migration corrected estimates are higher than the published figures, however, when compared with data for a year earlier, there was still no statistically significant difference compared with the year ending September 2016. For year ending September 2017, the corrected net migration estimate was 274,000, compared with 273,000 a year earlier.

4 . Going forward

Working alongside Home Office experts, Office for National Statistics (ONS) research using Home Office administrative data has highlighted that migrant journeys are complex and that it is challenging to define migrant activity by standard UN definitions alone. Our insights are preliminary and increasingly show the complexity of people's lives. They show that the definitions of short-term and long-term migration and the realities of the global economy do not match, and more work is needed to draw together the best information from a range of sources.

Home Office administrative data are a critical source for the transformation of population statistics and to understand the complexity of migrant travel patterns. The data combine multiple sources using sophisticated methods and have the potential to enhance migration statistics. However, it can only provide one part of the picture since only those that require a visa are included.

ONS needs to develop methods for using Home Office administrative data to identify, classify and analyse different types of international migrant. To do this, we need to develop sound methods for handling quality issues and definitional challenges within the data, which will require further analysis. Working in collaboration with the Home Office will ensure this work is of the most benefit to the ongoing Government Statistical Service (GSS) programme of work.

ONS can contribute to the Home Office methodological feedback loop, drawing on statistical insights gained from analysts, methodologists and data scientists, provide feedback on the administrative data record linkage strategy and learn from the Home Office's experience and expertise in linkage of international travellers' data. ONS will then have the ability to develop statistical indicators that will describe and explain the strengths and limitations of these data to our users, which will complement the operational quality indicators in Home Office metadata.

In September 2017, we set out ambitious plans to transform the information that the GSS produces on migration to meet the changing user needs and which will begin to put administrative data at the core of evidence on migration in 2019. This work is complex and multi-faceted, with the research we have been doing into Home Office administrative data being one component of the programme. Moving forward there is much more work to do on understanding how migrants interact with other administrative data sources, to fully understand how these might be used to enhance migration statistics.

Our transformation programme of work includes research into understanding how migrants impact on different sectors within society and the economy and will include research on all types of migrants including: long-term, short-term and circular migrants. This work will provide further clarity on what the available data can tell us and what further work we need to do to provide better evidence to better inform policymakers. These pieces will complement and enhance the work we have been doing with Home Office administrative data and will help to develop a more rounded picture of migration trends in the UK as they will include not only non-EU migrants, but will also start to explore EU migration.

In Autumn 2018, we plan to publish our findings from the feasibility research on using linked administrative data to provide international migration flows. This will bring together work on EU and non-EU nationals from a number of different administrative sources to explore the feasibility of different approaches to putting administrative data at the core of migration statistics. This work is part of the wider transformation to move towards an admin-based population statistics system to replace the census from 2021.

The annual Migration Statistics User Forum will meet on 19 October 2018 and provide an opportunity to engage further with users on some of these plans and new developments. ONS will also be launching a consultation in Autumn 2018, to consult users on their needs and the shape a new administrative-based system should take.