

Article

What can administrative data sources tell us about the patterns of presence of non-EU students?

Research article investigating the patterns and length of non-EU student presence in England and Wales using linked Higher Education Statistics Agency (HESA) and Home Office administrative data.

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1 . Introduction

As set out in our [latest plans for the transformation of population and migration statistics](#), we are continuing to develop our understanding of the strengths and limitations of administrative data sources and what they can tell us about different groups of the population. Understanding student travel patterns and how they appear in administrative data is important, as study is one of the two most common reasons for people to move to the UK. In the year ending June 2019, around 212,000 people (35% of all international migrants) arrived for study with the intention of staying long-term (for a year or more).

In January 2019, we published a research case study using linked Home Office Exit Checks and Higher Education Statistics Agency (HESA) student records data to look at the [travel patterns of non-EU students](#). This explored how long students in their first year of study spent in the country, to find out whether appearing within the HESA student record is evidence that a non-EU student is actually residing in England and Wales.

The research presented in this article builds on this previous work and supports the [wider research on international migration concepts and definitions](#) published today (14 February 2020).

2 . Main findings

We have investigated two important research questions related to presence in England and Wales:

- How long are non-EU students present in the country during the period for which they are included in the Higher Education Statistics Agency (HESA) student records data?
- What are the patterns of presence of non-EU students throughout the year?

For both of these questions we investigated the impact of various characteristics such as level of study (undergraduate or postgraduate), age, sex and geography. We also expanded this work to look at whether length of stay varies by year of study or the time period over which we measure their length of time present in the country (12 months or 16 months).

Length of presence

We found that:

- over a 12-month period, less than half of non-EU undergraduate students resided in the country for more than 10 months; this confirms the previous finding that appearing within the HESA student record does not necessarily indicate that a student will be present in the country for the whole year
- over the same 12-month period, more than half of non-EU postgraduate students were present for more than 10 months; this suggests that, for this group, appearing within the HESA student record is a good indicator of longer periods of residence in the country
- the same patterns hold true when looking at being present for more or less than 12 months in a 16-month period

Patterns of presence

[Feedback from stakeholders on our January 2019 research engagement report](#) highlighted an interest in seeing the peaks and troughs in student travel patterns throughout the academic year. We know that students arrive and leave at certain times of the year, so within this article we set out to produce a visual representation of this and, for the first time, quantify how much non-EU student populations increase and decrease at certain points in the year, including at local level. We have explored the national picture by level and year of study, and created breakdowns by age, sex, geography and country of domicile.

Results were as expected:

- non-EU undergraduate students show a general term-time pattern of presence, with higher proportions of students present during academic term times and absent during academic breaks
- in contrast, non-EU postgraduate students do not show clear term-time patterns of presence
- the term-time patterns found are mainly accounted for by the youngest age group (17 to 24 years); this is likely to be driven by the differences found with undergraduate and postgraduate patterns
- these term-time patterns are not accounted for by geography, domicile or sex

3 . Things you need to know about this release

Disclaimer

The findings reported here on non-EU international student patterns of presence in the UK are not [official statistics](#). They are Research Outputs published to inform users of international migration statistics about progress on the transformation of our population and migration statistics.

These Research Outputs are based on experimental analysis of linked Higher Education Statistics Agency (HESA) and Home Office Exit Checks data. We are still developing the methods behind this linkage and therefore the numbers and proportions presented here may change in future reports. Further information on this linkage is included in Annex B.

Who does our analysis include?

Our analysis includes two cohorts of non-EU nationals on Tier 4 study visas who are registered at higher education institutions (HEI) in England and Wales in the academic years ending 2016 and 2017; 1 August to 31 July is the academic year as defined by HESA. Tier 4 (sponsored study) was implemented from 31 March 2009 and replaced previous entry routes for study by providing a route for students to study with an approved education provider.

The Home Office Exit Checks programme was designed for operational purposes in order to check compliance with visa conditions for non-EU nationals, and the Exit Checks data include information about arrival and departure dates (Annex A provides more detail on this data and student compliance). The HESA student record provides information on the characteristics of students and the courses they undertake. By linking the two datasets together, we were able to work out how long students spend in the country whilst appearing within the HESA student record, and in which months they were present or out of the country. Annex B provides information on the linkage of the two datasets and match rates.

It is important to note that the findings in our analysis cannot be generalised to all students as we focus specifically on non-EU students at a higher education institution who linked to the HESA data and, within that, a select few years of study. EU students will be excluded as they do not currently require a visa, and their travel patterns may be different because of their home proximity and other factors. Furthermore, some study is possible for people arriving on visit visas if that is not the main purpose of their visit.

As such, conclusions about overall student immigration cannot be made from our analysis and our findings are not directly comparable with our long-term international migration figures. This is because this research is based on recorded management information from two administrative data sources, whereas estimates of long-term international migration are based on data from the [International Passenger Survey](#) on people's travel intentions (which may not always reflect what actually happens once someone is in the UK).

4 . Presence of non-EU students in the UK

Presence in a 12-month period of interest

In order to understand whether being present on Higher Education Statistics Agency (HESA) data is evidence that an international student is residing in England and Wales, we investigated how long students are in the UK for during their study within a 12-month window following their HESA commencement date.

Exit Checks arrival and departure dates were used to count the number of days in the country and the number of days out of the country within the 12-month period. This has been broken down into how long non-EU students spent in the country by level of study and further years of study.

Over half of non-EU undergraduate students spend less than 10 months in the country, during a 12-month period

Our analysis showed that for non-EU first- and second-year undergraduate students, more than half stayed in the country for less than 10 months out of 12 (Figure 1). First-year and second-year undergraduates had a median stay of 241 to 250 days (approximately eight months). Therefore, drawing an assumption that HESA records indicate undergraduate students are present for a complete year could give misleading results; a large proportion of students are in the UK for less than 12 months. Third-year undergraduate students could not be included as the two cohorts included in our analysis had not reached that stage of their studies during the time period covered by the data available.

These findings do not imply that international students are likely to be wrongly included in published long-term international migration estimates. The results presented are Research Outputs and show time spent residing in the country rather than seeking to define long-term migrants.

The picture is different for non-EU first-year postgraduate students (79% of which are masters students), as over half spent more than 10 months in the country during a year of study (median: 311 to 320 days). This suggests that among postgraduate students, appearing on HESA is indicative of overall longer periods residing in the country.

Figure 1: Time spent in England and Wales as a percentage of all stays, non-EU students studying at higher education institutions

This analysis is based on the linked dataset only and will not be representative of all non-EU students. For more information on the quality of Exit Checks data see the article on [An error framework for longitudinal administrative sources](#).

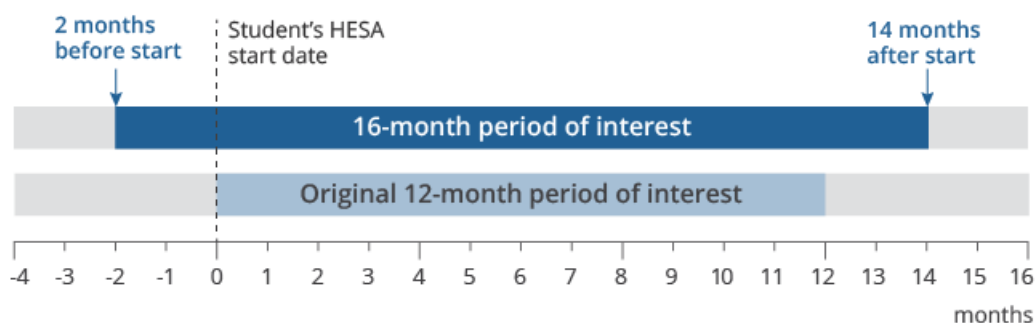
Presence in a 16-month period of interest

In order to find out whether the patterns observed within a 12-month period would still hold true when looking at different time periods of interest, we have also analysed non-EU students' presence within a 16-month period of interest (Figure 2). This was chosen as it is similar to [other definitions used internationally](#). This allows us to look at whether students are resident for 12 of the 16 months.

The benefit of using a 16-month period when exploring student presence in the country, is that it provides a realistic window of a student's arrival and departure from the UK around their study. A two-month window prior to students' commencement dates on HESA allows them time to arrive in advance of starting their course (for example, for housing or pre-sessional reasons). Then allowing one year and two months after their commencement date on HESA gives a duration in which students could leave after a year of study (Figure 3). Exit Checks arrival and departure dates were used to count the number of days in the country and the number of days out of the country within the 16-month period.

Figure 2: 16-month period of interest

England and Wales



Source: Office for National Statistics – Higher Education Statistics Agency

Notes:

1. Further detail about the period of interest calculations can be found in [Annex C](#).

Over half of non-EU undergraduate students spend less than a year in the country, during a 16-month period

This analysis showed that first- and second-year undergraduate students spent less than 365 days residing in the country during a 16-month period (487 days). Half of these students spent less than 300 days in the country. For first-year postgraduate students (79% being masters students), almost half spent a year or more in the country during the 16-month period (median: 351 to 360 days).

These findings back up the conclusions drawn based on the 12-month period of interest that appearing on HESA data could be used as evidence that postgraduate students are present for longer durations. However, we cannot assume this for undergraduate students in either their first or second year of study. Sensitivity testing to adjust the window for the start and end of the period of interest did not affect the patterns found ([Annex C](#)).

Figure 3: Time spent in England and Wales as a percentage of all stays, non-EU students studying at higher education institutions

This analysis is based on the linked dataset only and will not be representative of all non-EU students. For more information on the quality of Exit Checks data see the article on [An error framework for longitudinal administrative sources](#).

5 . Patterns of presence among non-EU students in the UK

We know from the earlier analyses that non-EU undergraduate students are often present in the country for less than a year, during a year of study, and presume that their populations decrease during academic term breaks. Understanding how populations of students change throughout the year would be useful when analysing the impact and contribution of migrants to society and the economy at certain points of the year. This is especially true if these analyses were extended to more detailed geographies, as in some areas student migrants form a larger percentage of the population.

Therefore, we explored the patterns of presence of students during a calendar year. If a student appears on Higher Education Statistics Agency (HESA), are there particular months in the year we can expect them to be present or absent, and which students are likely to be present or absent at different points of the year?

For each month in the academic years (1 August to 31 July) ending 2016 and 2017, we calculated the proportion of all students who appeared in that academic year who were present. We used a rule that students must be present in the UK for at least 25 days a month to be counted as present in that month and used Exit Checks data to count the number of days in each month using arrival and departure dates.

Non-EU undergraduate students show a clear term-time pattern of presence across years of study

For undergraduate students, the months coinciding with the first academic term (October and November) and leading up to the main examination period (April and May) had the highest proportions of students present (Figure 4). The months coinciding with the summer break (particularly August) and the winter break (December to January), had the lowest proportions of presence, as would be expected. This was consistent across academic years and the first and second years of undergraduate study. In contrast, there was a stable proportion of non-EU postgraduate students during each month of the academic year.

Term times may differ across higher education institutions.

It should be noted that these analyses look at the proportions of students resident per month. This does not therefore represent the total amount of time the person is resident and if they are resident from one month to the next.

Figure 4: Percentage of students present per month by academic year

England and Wales

The overall pattern differs by age

The national pattern does not differ based on sex. However, when broken down by age, the youngest age group (17 to 24 years) appears to account for most for the pattern shown. Older age groups showed higher proportions of presence throughout the year, potentially reflecting completion of postgraduate degrees, which may require more regular attendance throughout the year (for example, completion of a dissertation over the summer).

The overall pattern is similar across local authorities and student domiciles

Although there are slight differences in the term-time patterns across local authorities of term-time residence and countries of domicile, the national pattern of presence generally applies. For undergraduate students, the highest proportions are present in England and Wales during October, November, April and May, and the lowest proportions of students are present during the summer and winter breaks, regardless of local authority or country of domicile. For postgraduate students (79% of which are masters students), there was not a clear pattern consistent from year to year.

6 . Conclusions and next steps

Conclusions

This work has explored presence of non-EU students in England and Wales using administrative data. Among non-EU undergraduate students, the linked dataset indicates that students will reside in the country for less than 12 months as they spend time away from England and Wales, generally out of term-times. Among non-EU postgraduate students, Exit Checks data suggest longer periods of residence in England and Wales.

While the results from the analysis of a term-time pattern of presence were as expected, it provides useful insight into the differences between non-EU undergraduate and postgraduate students, and demonstrates how this may impact analysis of other important demographic variables such as age and sex.

These findings provide important evidence for developing our understanding of how to define and measure international migrant students using administrative data and support the research reported in the article [Defining and measuring international migration](#) that has been published alongside this report. This work highlights potential methods for how to apply the [UN recommended definition¹ \(PDF, 2.47MB\)](#) for counting international migrants as resident or long-term as well as new, alternative definitions based on different lengths of stay in the UK. It is also useful for understanding the strengths and limitations of using Higher Education Statistics Agency (HESA) data to inform definitions of long-term international student migration.

Next steps

This research includes two cohorts of students (academic years (1 August to 31 July) ending 2016 and 2017). We will continue to monitor the patterns as more years of data become available and future changes to immigration policy take effect. From 2021, [international students who enrol on undergraduate or postgraduate courses in the UK will be permitted to reside in the country for two years after they graduate](#). International students are only permitted to reside in the country for up to four months after graduating at present, so it is possible that their travel patterns may change in future.

Other next steps may include:

- further breakdown of the postgraduate group to look at patterns of presence for different years of study and for any variation between people studying for different types of degree (doctorate, masters, and so on)
- assessing patterns over an extended timeframe using additional years of Exit Checks and HESA data
- investigating possible sources of data to look at EU student migration and how patterns of residence may differ from non-EU students

We also welcome your feedback on the direction and results of our research. It is important to us to ensure that we are transforming our statistics in the right way and that we understand what you need from Office for National Statistics (ONS) population and migration statistics in future. In particular, we would like your feedback on the following questions:

- We have looked at student presence across two time periods (12 months and 16 months), are there any other time periods you think we should investigate?
- What other evidence would you find useful on students' length of stay or patterns of presence during the year?

Please send any feedback on these questions to pop.info@ons.gov.uk.

Please indicate in your response if you do not wish for the Centre for International Migration (ONS) to keep your details. Your personal information will be stored and processed securely as outlined in the [Privacy information for our stakeholders](#) document.

Notes for: Conclusions and next steps

1. "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 . Annex A: Home Office Exit Checks data

The Home Office Exit Checks programme was designed for operational purposes in order to check compliance with visa conditions for non-EU nationals. Annual [Exit Checks reports](#) provide the latest statistical assessment of visa compliance for non-EU nationals and show that the vast majority (97.5%) of students whose leave expired between 2018 and 2019 were compliant with their visa lengths. The combination and matching of data from multiple administrative systems, including (via carriers) passengers' ticket bookings, passport swipes at the border and immigration records, produce statistics that have provided useful insights for the Home Office and the Office for National Statistics (ONS). Main variables include arrival and departure dates, length of presence, number of journeys made and visa type. These data have, to date, provided the most comprehensive picture available so far on non-EU nationals entering and leaving the UK.

8 . Annex B: How we linked the data

Higher Education Statistics Agency (HESA) and Exit Checks data do not share a common unique identifier such as National Insurance number, NHS number or passport number.

The linkage between HESA and Exit Checks data was done using the Office for National Statistics (ONS) [matchkeys methodology \(PDF, 319KB\)](#) to produce one-to-one matches.

Our matching produced a high level of links. We linked 80% of records for non-EU students in HESA for academic year ending 2016 and 74% of records for academic year ending 2017. However, 20% and 26% of records respectively for non-EU students were not linked to the Exit Checks data. This may be because of linkage error (that is, should have matched, but did not) or they were not captured in the Exit Checks data (for example, they may have departed via the Common Travel Area, or for other reasons as reported in our [analysis of international students using Exit Checks data](#)).

Figure 5 compares the age and sex distributions for linked HESA and Exit Checks records and also unlinked HESA records for the academic year ending 2017 cohort for our population of interest. These distributions look broadly similar, but a large number of non-EU students have not linked to Exit Checks and will be under-represented in our linked dataset. Further work is being done to look at other characteristics, such as nationality.

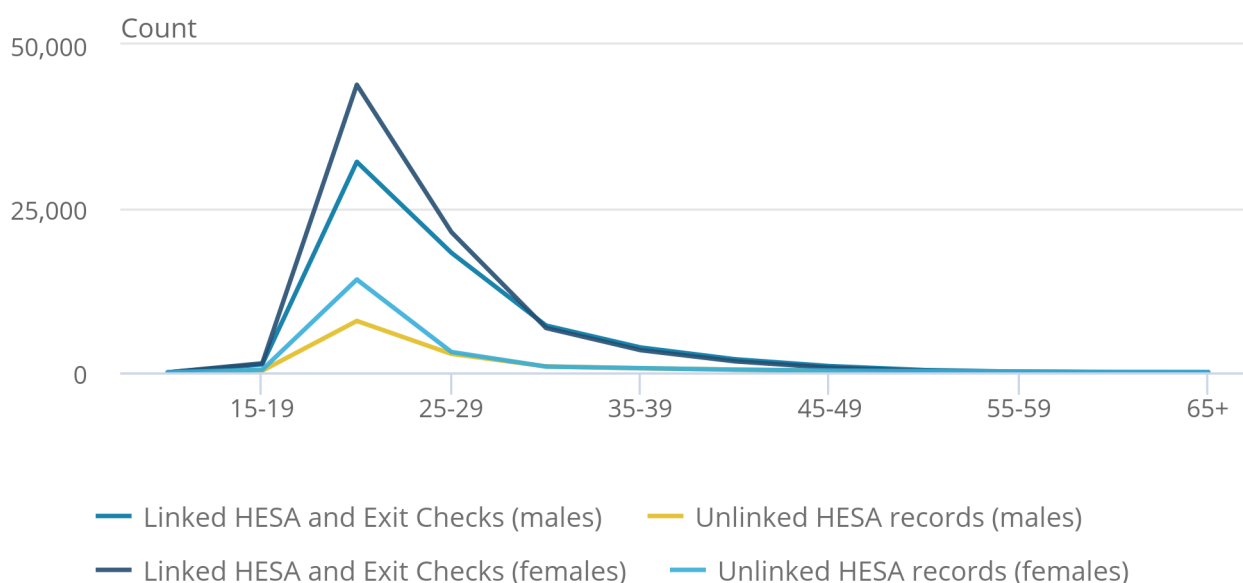
Where we have investigated the effects of breakdowns by characteristics (that is, sex, age, local authority of term-time residence and domicile) the variables used came from HESA.

Figure 5: Age and sex distribution for linked HESA and Exit Checks records and unlinked HESA records for the 2016 to 2017 cohort

England and Wales

Figure 5: Age and sex distribution for linked HESA and Exit Checks records and unlinked HESA records for the 2016 to 2017 cohort

England and Wales



Source: Office for National Statistics – Higher Education Statistics Agency

Further research on improving matching rates is planned as we progress this work. Our analysis only includes non-EU nationals on Tier 4 study visas who are studying in England and Wales for 12 months or more (identified on the Exit Checks data) who linked to the HESA data. These account for 62% of all matched records. The remaining 38% of matched records excluded from our analysis tended to be similarly aged and more mature. We plan further exploratory work into this group.

9 . Annex C: Periods of interest

To calculate the periods of interest for the 12 in 16 method, we created a “Period of Interest Start” variable for the start of the 16-month period and a “Period of Interest End” variable for the end of the 16-month period. The period of interest for each year of study covered two months before the student’s start date of the year of study and finished 14 months after the student’s start date of the year of study.

The “commencement date” Higher Education Statistics Agency (HESA) variable only relates to each individual student’s first year of study, so we calculated when each of the commencement dates for their years of study would be. Undergraduate third-year students were not included in the analysis as we filtered out commencement dates before 15 August 2015, which automatically excluded all third-year students studying in the academic years ending 2016 or 2017.

Table 1 outlines how the periods of interest were calculated for each year of study.

Table 1: Calculating the 16-month period of interest

Year of study	Period of interest start	Period of interest end
1	Student’s commencement date minus 62 days	Student’s commencement date plus 426 days
2	Student’s commencement date plus 303 days	Student’s commencement date plus 791 days

Source: Office for National Statistics

A similar method was used to calculate the 12-month period of interest (Table 2).

Table 2: Calculating the 12-month period of interest

Year of study	Period of interest start	Period of interest end
1	Student’s commencement date	Student’s commencement date plus 365 days
2	Student’s commencement date plus 365 days	Student’s commencement date plus 730 days

Source: Office for National Statistics

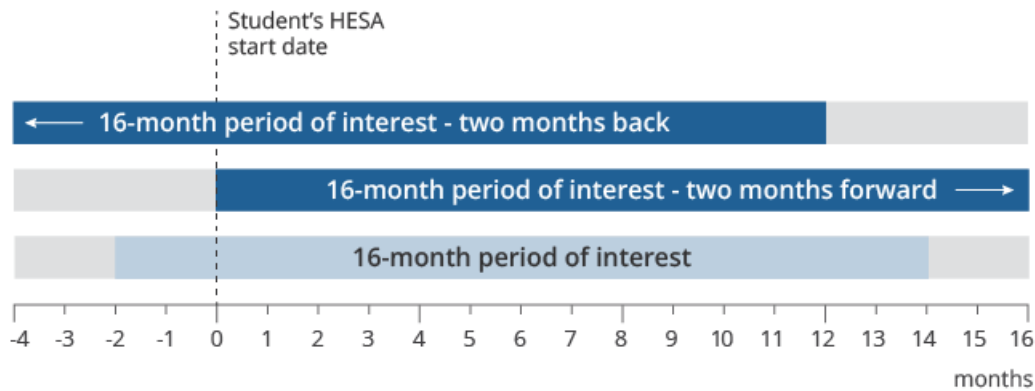
Sensitivity analysis

We carried out sensitivity analysis to find out whether the results would have been different if we had moved the period of interest two months earlier or later. We did this by looking at the average number of days spent in the country over a 16-month window. We then moved this window one day at a time from two months before the initial period of interest, to two months after the initial period of interest.

We found that there was minimal effect of moving the periods of interest, so the results were not affected by the 16-month window chosen.

Figure 6: Sensitivity analysis

England and Wales



Source: Office for National Statistics – Higher Education Statistics Agency

10 . Annex D: Other research into movement of international students

- The Migration Advisory Committee (MAC) has published a report on the impacts of international students in the UK.
- The Office for National Statistics (ONS) has published a research output investigating [what international students do after completing their studies](#).
- The 2017 Centre for Population Change-ONS-Universities UK Survey of Graduating International Students (SoGIS) analysed patterns of working for international students approaching course completion, mainly focused on those studying postgraduate degrees; a follow up [survey \(PDF, 1.32MB\)](#) was undertaken in 2018.
- The Department for Education (DfE) published time series data showing [international graduate outcomes 2006 to 2016 based on their Longitudinal Education Outcomes dataset](#).