

Rebasing of mid-year population estimates following Scotland's Census 2022

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This statistical report provides revised population estimates for Scotland, its council areas and NHS boards, by sex and age for the years 2011 to 2021, and revised migration estimates for 2011 to 2022

Main points

Population

- The new, rebased, figures showed that the population of Scotland increased by 2.2% between 2011 and 2021. The original figures showed the population increasing by 3.4% over the same period. The difference is mainly due to improvements in the figures for international migration.
- The rebasing had a bigger impact on the population estimates for young adults, and the figures for the largest cities. This is because these are the age groups and areas where international migration is highest.
- These statistics replace the previously published mid-year population estimates and form the new official estimates for the population of Scotland from 2011 to 2021.

Migration

- Net migration into Scotland in 2021-22 was substantially higher than any other year in the past decade. Net migration more than doubled between 2020-21 and 2021-22, from 22,200 to 48,800. The next highest figure from the last decade was 28,100 in 2018-19.
- Total migration into Scotland is a combination of international migration and migration from other parts of the UK. The increase in total migration was largely due to an increase in international migration.
- Average net migration from other parts of the UK has been fairly stable over the last decade, averaging +9,000 people. It was higher in 2021-22, at +12,500 people.
- Most of the increase in total migration in 2021-22 was due to higher levels of international migration. The net figures for international migration increased from 13,300 in 2020-21 to 36,300 in 2021-22. This was due to a combination of more in-migration in the last year, and lower levels of out-migration over the past two years.
- Published data from the Higher Education Statistics Agency shows that the increase in international migration is largely due to a significant increase in the number of international students studying at universities in Scotland.

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Related publications

Results from [Scotland's Census 2022](#).

[Mid-year population estimates 2022](#), rolled forward from Census Day. These figures are consistent with the rebased mid-year population estimates for 2011 to 2021 that are included in this report.

[Reconciliation report](#), comparing the results from Scotland's Census 2022 with the annual mid-year population estimates, and explaining the differences.

Updated population estimates for [Centenarians and people aged 90 and over](#) were published at the same time as this report.

Purpose of this report

Each year, National Records of Scotland (NRS) produces [mid-year population estimates](#) for Scotland. These population estimates are based on the most recent census and are updated with current data on births, deaths and migration. Over the years between censuses, these rolled-forward estimates can 'drift' away from the true population. This is expected and it is standard practice to investigate the size and causes of the drift, and to rebase our population estimates accordingly once a new census has been held. In March 2024 we published a [reconciliation report](#) following Scotland's Census 2022. This identified differences between Scotland's Census 2022 and the rolled-forward population estimates (based on the 2011 Census with 11 years of births, deaths and migration incorporated).

The [reconciliation report](#) showed that the 2022 census population was 1.1% lower than the rolled-forward estimate of Scotland as at Census Day. That report then looked at potential causes of these differences. In this report we correct for those differences and provide a rebased set of mid-year population estimates for Scotland, as well as updated migration estimates.

How we have revised components of population change

Our starting point for rebasing is the mid-year population estimate for 2022, rolled forward from the 2011 Census. It was found that this estimate was 79,000 above the mid-year population estimate for 2022 that was based on the 2022 Census. In [Table 1](#) we show how we have moved from that initial 2011 rolled forward figure (79,000) by attributing changes to different components, to the final estimates for 2011 to 2022.

The recording of births and deaths in Scotland is mandatory and therefore these figures are highly accurate. They only changed by a small amount, to reflect small numbers that were registered very late.

Table 1: Revised components of population change, and how they impacted the back series of population estimates

Component	Impact on the population estimates back series (2011-2022)
Initial difference given by our 2022 mid-year population estimate rolled forward from the 2011 Census.	79,000
Adjustment to the 2011 Census to mid-year figures, due to improvements in estimation of those aged 0/1 years in 2011.	0
Revision to net international migration flows due to improved methods and data.	-12,100
Further adjustment to improve the migration flows of British Nationals.	-36,700
Revisions to take into account births that were registered very late.	80
Revisions to take into account deaths that were registered very late.	-33
Other (assigned as Unattributable Population Change).	-30,100

Notes

Some of these figures have been rounded to the nearest 100.

Totals may not sum due to rounding

Improvements in estimation of those aged 0/1 years in 2011 affected the figures for those age groups, but not the total population estimates.

More information on how the rebasing was carried out is in the [Methodology](#) section of this report.

Results

Population

The population of Scotland has increased between 2011 and 2021, though the rate of increase is slightly lower than shown in the population estimates rolled forward from the 2011 census. The new, rebased, figures showed that the population of Scotland increased by 2.2% between 2011 and 2021. The original figures showed the population increasing by 3.4% over the same period.

The difference between the original and rebased population estimates is mainly due to improvements in the figures for international migration.

The biggest impact of the rebasing was to increase the figures for people aged 18 to 22 in the population, and to reduce the figures for those aged 23 to 40 (Figure 1). This reflects more accurate estimates of international migration, as young adults are more likely than other age groups to move long distances.

The impact of rebasing was bigger on the population estimates for males than females (Figure 2). It had a bigger impact in the cities (Figure 3), as these are the areas with the highest levels of international migration.

Figure 1: The overall age distribution of the population was similar, before and after rebasing. The biggest differences were among young adults.

Total population of Scotland by single year of age, mid-2021



Figure 2: Rebasing had more of an impact on the population estimates for males than for females.

Total population of Scotland by single year of age and sex, mid-2021

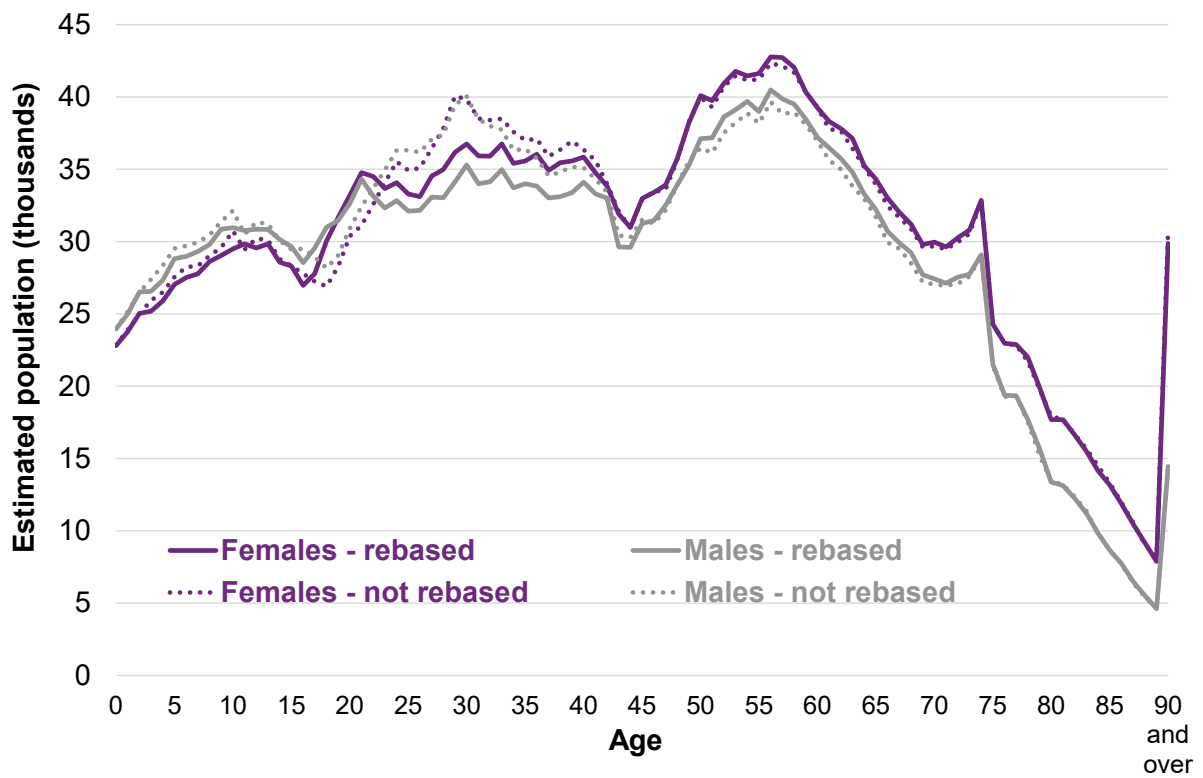
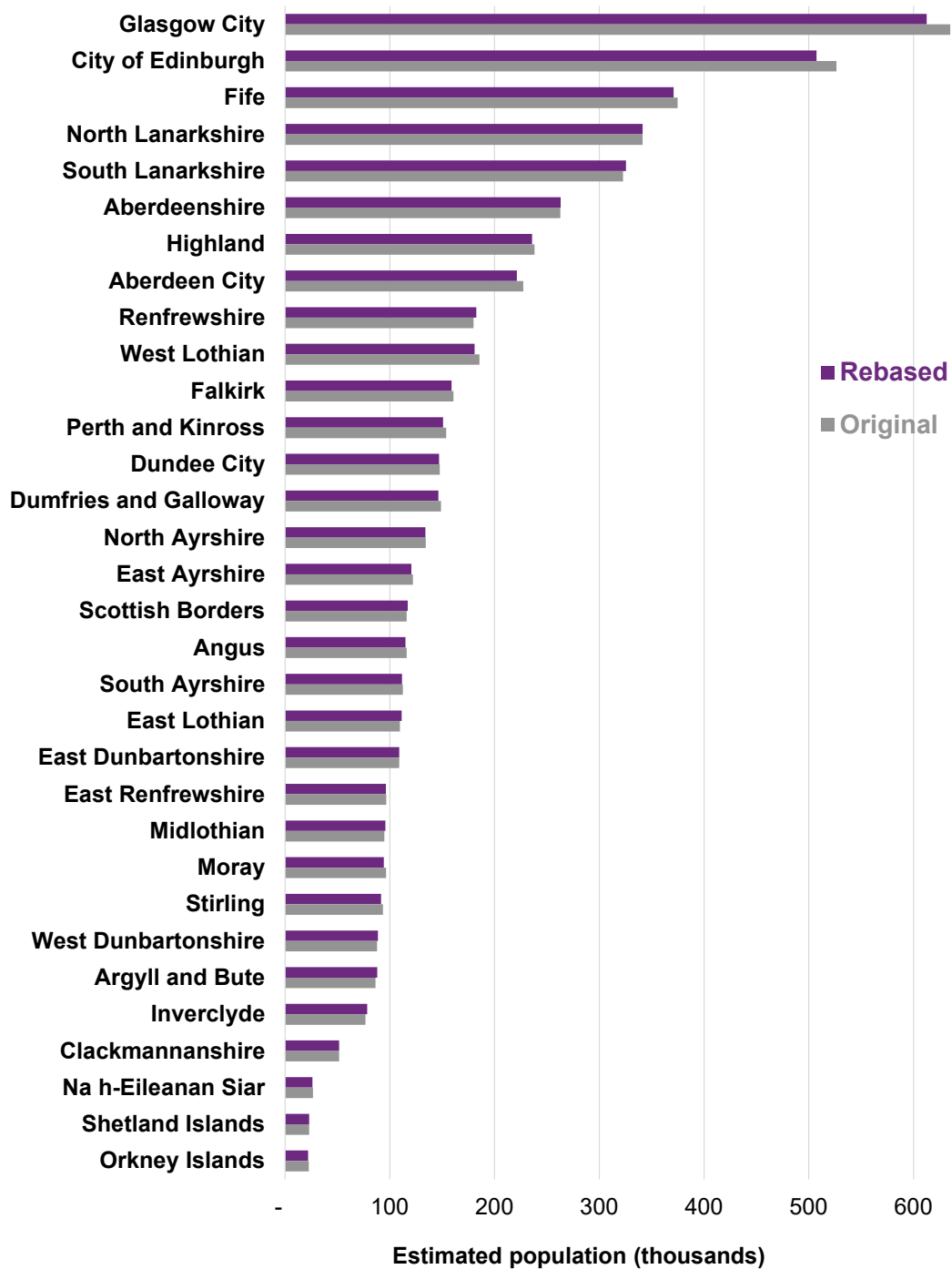


Figure 3: The impact of rebasing was biggest in the biggest cities, which have the most international migration.

Total population by council area, mid-2021



Migration

Migration is the most difficult part of population change to estimate. There is no comprehensive system that registers international migration in the UK, and so estimates rely on the best available proxy data. The biggest impact of the rebasing was to correct for an undercount of out-migration over the last decade. This had the most impact on the figures for the cities and on numbers of young adults, as young adults are the age group most likely to move between countries, and international migration is highest in and out of the biggest cities.

Net migration into Scotland in 2021-22 was substantially higher than any other year in the past decade ([Figure 4](#)). Net migration more than doubled between 2020-21 and 2021-22, from 22,200 to 48,800. The next highest figure from the last decade was 28,100 in 2018-19.

Total migration into Scotland is a combination of international migration and migration from other parts of the UK. The increase in total migration was largely due to an increase in international migration.

Average net migration from other parts of the UK has been fairly stable over the last decade, averaging +9,000 people. It was higher in 2021-22, at +12,500 people.

The net figures for international migration increased from 13,300 in 2020-21 to 36,300 in 2021-22 ([Figure 5](#)). This was due to a combination of more in-migration in the last year, and lower levels of out-migration over the past two years.

For all types of in-migration, the numbers are highest for the two biggest cities - Glasgow City and the City of Edinburgh. Over the last decade, levels of international migration into Glasgow and Edinburgh were fairly similar. However, more people from other parts of Scotland moved to Glasgow, and more people from other parts of the UK moved to Edinburgh.

Figure 4: International migration has fluctuated over time. Figures in 2021-22 were significantly higher than previous years.

Total net migration, Scotland, year ending mid-2012 to mid-2022

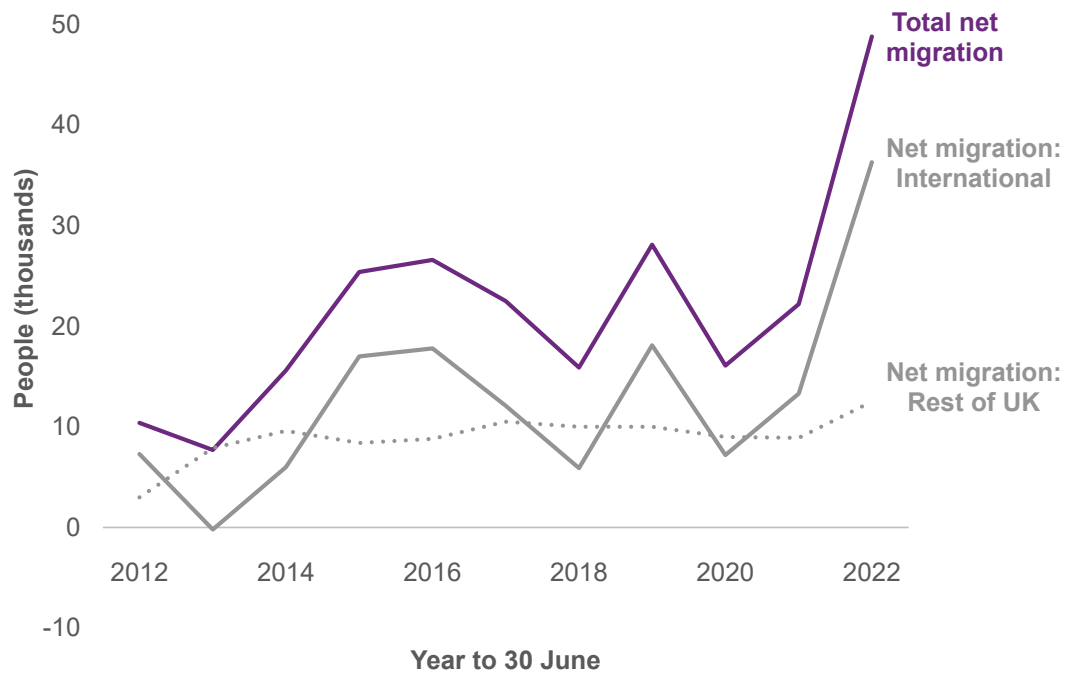
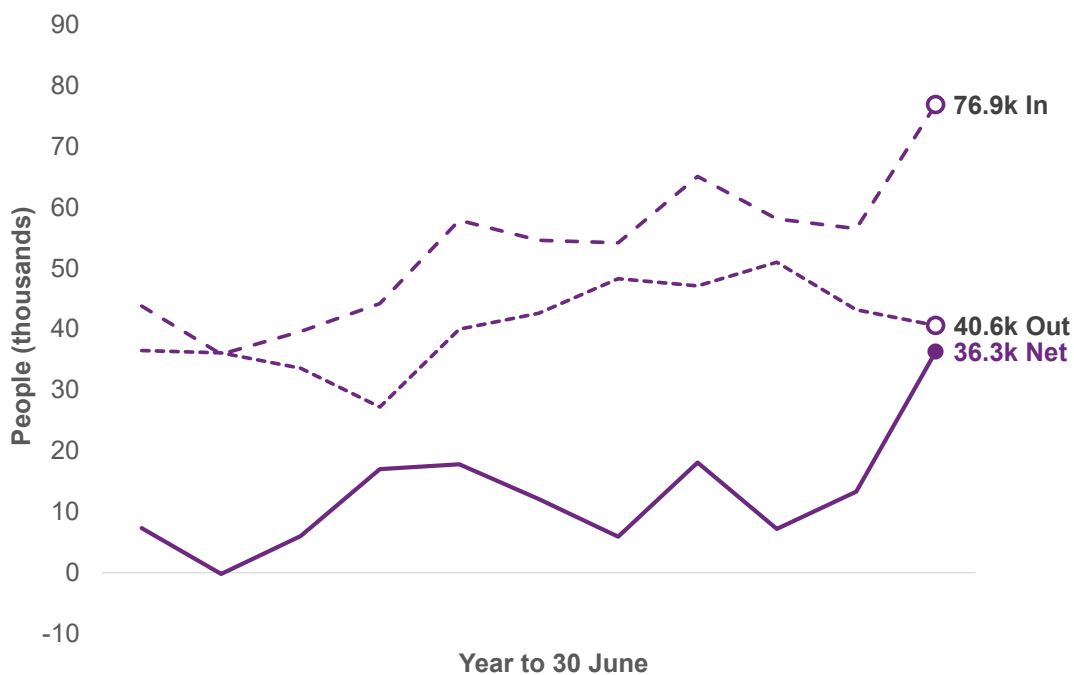


Figure 5: International net migration increased in the year to mid-2022. This was due to a combination of more in-migration in the last year, and lower levels of out-migration over the past two years.

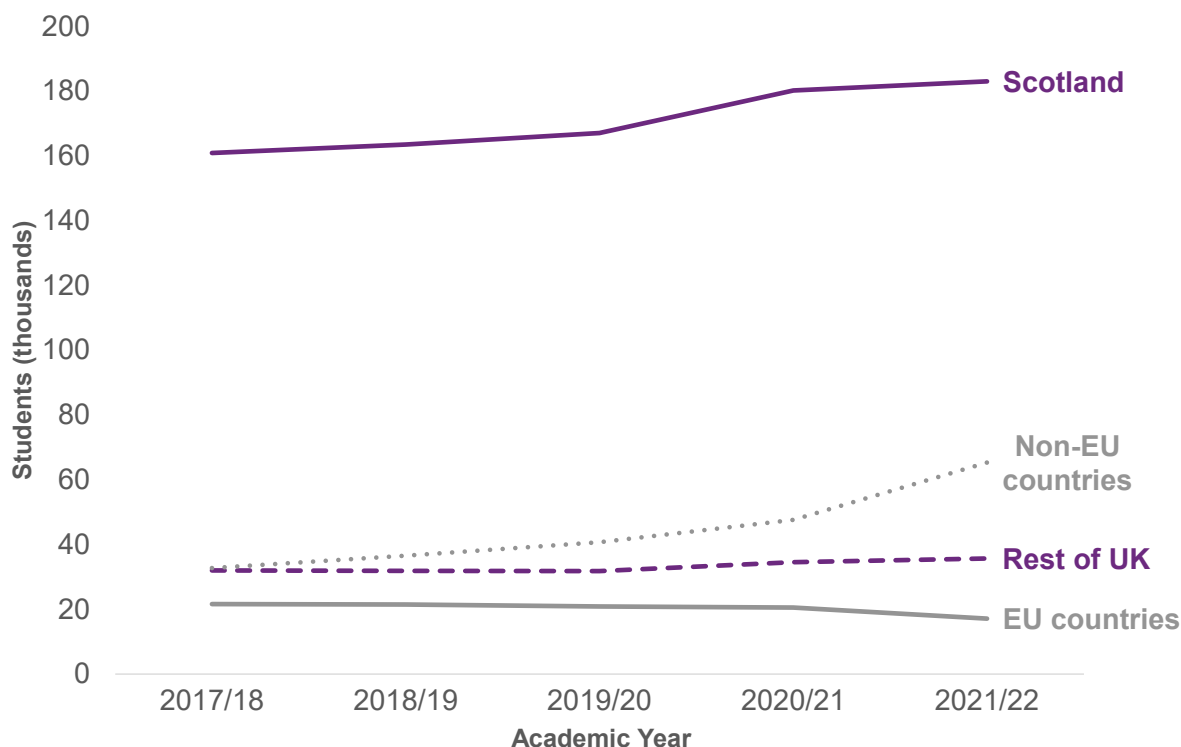
International migration, Scotland, year ending mid-2012 to mid-2022



Data from the [Higher Education Statistics Agency](#) (HESA) confirms that the recent increase in international migration into Scotland can largely be explained by an increase in international students studying at universities in Scotland, as shown in [Figure 6](#) below. The number of non-EU students has increased substantially, whereas the number of EU students studying at universities in Scotland has fallen.

Figure 6: There has been a significant increase in students from non-EU countries studying at universities in Scotland

Higher Education student enrolments at Scottish universities by domicile, 2017/18 to 2021/22



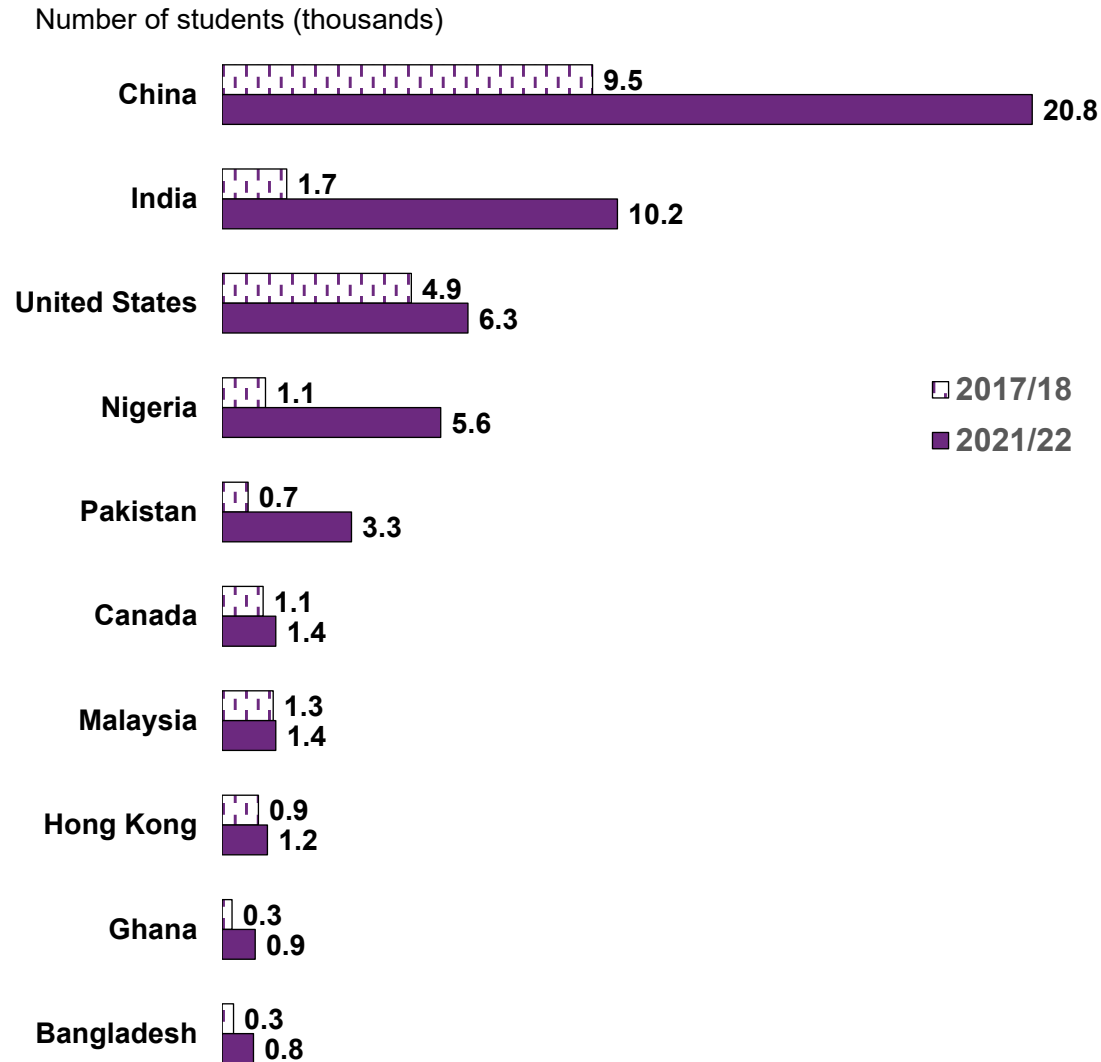
Source: [Higher Education Statistics Agency](#) (HESA)

The largest increase has been among non-EU students doing taught postgraduate courses. While the majority of international students are aged 24 or under, there has been an increase in those in their late twenties and thirties.

[Figure 7](#) and [Figure 8](#) show the number of international students in 2017/18 and 2021/22. Most of the increase was in the most recent year, but for comparison purposes, a year before the pandemic was chosen.

Figure 7: The highest numbers of international students at universities in Scotland are from China. The number of students from the top 10 non-EU countries have all increased.

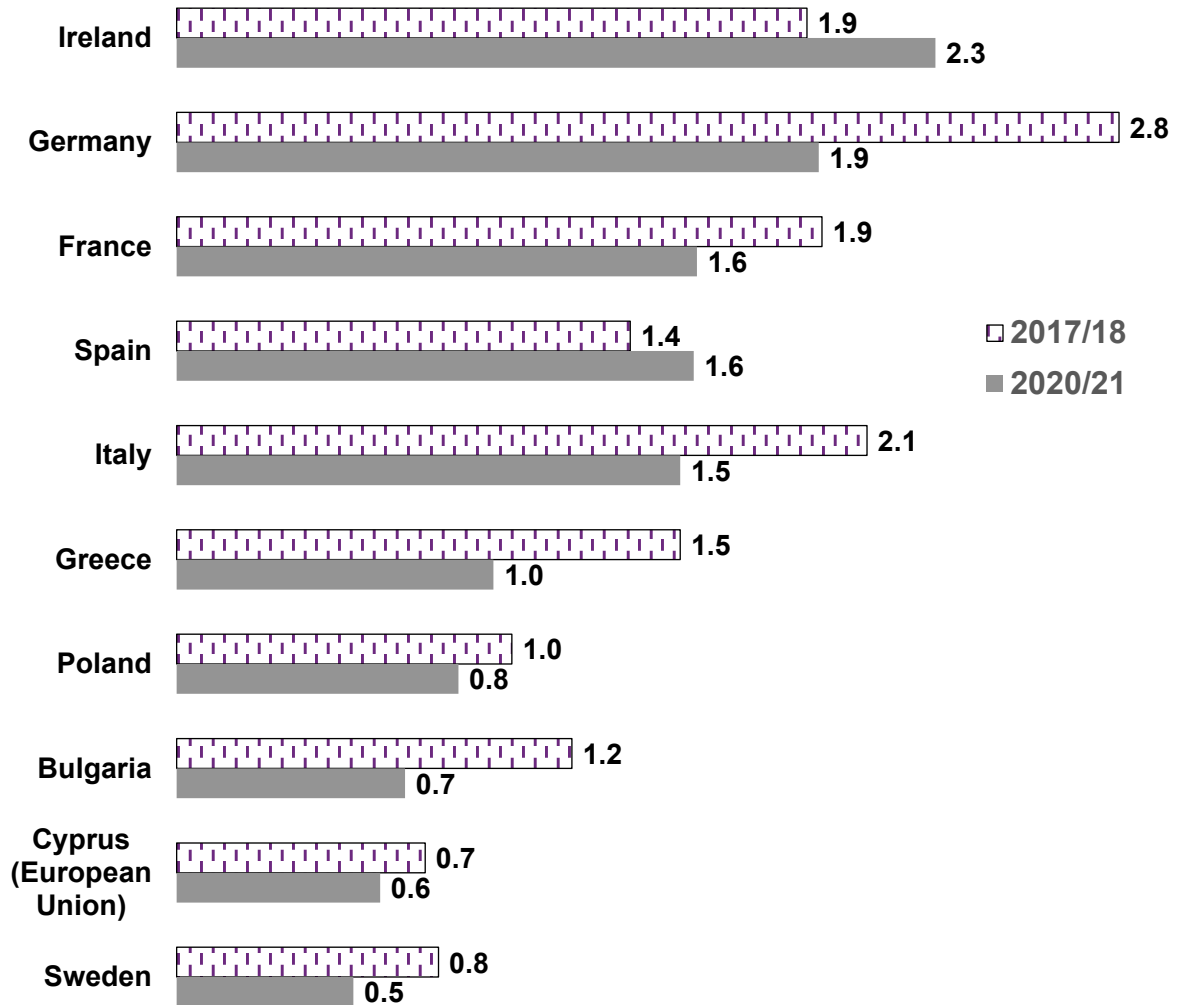
International students at universities in Scotland – top 10 non-EU countries



Source: [Higher Education Statistics Agency](#) (HESA)

Figure 8: The number of students from most EU countries has fallen.
 International students at universities in Scotland – top 10 EU countries

Number of students (thousands)



Source: [Higher Education Statistics Agency](#) (HESA)

Methodology

Population estimates contained within this report have been revised in line with the most recent population estimates based on Scotland's Census 2022. This rebasing was carried out by examining the difference between the population estimates rolled forward from Scotland's Census 2011 for mid-2022, and the estimates based on Scotland's Census 2022. We incorporated improved estimates of international migration over the period from 2012 to 2022 which rely more on administrative data, as well as using the 2011 and 2022 census to better account for outward migration of British nationals.

- **Revised international migration:** The estimates of international migration into and out of Scotland which inform these population estimates are produced by the Office for National Statistics (ONS). They align with the revised [long-term international migration](#) (LTIM) estimates for the year ending June 2022, published by ONS in May 2024, which are classed as being official statistics in development. They are based on administrative and survey data using a range of data sources, and are part of an ongoing programme of work to transform population and migration statistics. Published ONS revised LTIM estimates were used to replace and enhance our previous LTIM components which relied more heavily on the International Passenger Survey.
- **Adjustments for the migration of British Nationals:** After the incorporation of new admin-based international migration estimates was complete, a further adjustment was made to account for the underestimation of the outward migration of British Nationals. To calculate this adjustment, we took the number of British Nationals recorded in the 2011 Census, added births, subtracted deaths of British Nationals, and compared this to the number of British Nationals recorded in the 2022 Census. This analysis found that an additional 36,700 British Nationals had emigrated between 2011 and 2022. A weighted cohort model was then used to apply these changes across the eleven-year period.
- **Revised births and deaths:** In Scotland, a small sub-set of births and deaths are registered outwith the reference period of mid-year estimates in a given year. We have revised our natural change components to take into account the most up to date Vital Events data for years 2012 to 2022. This revision resulted in a net increase to natural change by +44 persons.
- **Unattributable changes:** After the above revisions are made to our known components of change (births, deaths, and migration), there remains some unattributed change in population (UPC) in the final 2022 estimates. The final UPC for Scotland was -30,100 (-16,290 males and -13,810 females). While it is believed that UPC is largely made up of bias in LTIM data, without further data sources it is not defensible to attribute UPC, either fully or partly, to any of the known components of change. Because of this, UPC has been spread evenly across the eleven years. Cohorts have been taken into account so that

the UPC attributed to a given age group in 2022 is spread evenly over the eleven years.

- **Disaggregation of 90+ age band:** In order to distribute both the UPC and the British National adjustment for those aged 90 or more in 2022, we used a proportional period method for each year between 2012 and 2022. We calculated the proportion of people who turn 90 in a given year, by: subtracting the number of 89-year-olds who had passed away from the total population of 89-year-olds, repeating this process for the 90+ age group and then subtracted the number of 90-year-olds who had passed away during a specific year from the population of 89-year-olds in the previous year. This gave us the count of people who had just turned 90 within the 90+ age band for each year.
- **Adjustment of 0 and 1 year olds in 2011:** An adjustment was made to the 2011 mid-year population estimates to fix an error in the allocation of 0 and 1 year olds. This did not affect the total population, or any other age groups in that year's data.

We produced the rebased back series by taking our refreshed 2011 census stocks and rolling forward in the usual way, taking account of revised natural change and new migration data. The British National adjustment and UPC was when distributed rolling backwards from 2022 to produce the final rebased population estimates. A detailed [methodology guide](#) for the annual mid-year population estimates, including the cohort component method used here, is available from the NRS website.

Future developments

The methodology used in the mid-year population estimates changes as different methods and data sources become available to NRS. Any improvements to the data sources and methodology of these statistics are discussed and assessed with the [Population and Migration Statistics Committee \(Scotland\)](#).

Transformation of population and migration statistics

NRS are working with the Office for National Statistics, and other Government Statistical Service partners, as part of the [transformation programme](#) to improve population and migration statistics.

NRS administrative data based population and household estimates project

One goal of the census programme is to make recommendations for future censuses. This is supported by NRS' Administrative data based population and household estimates project. An aim of the project is to investigate administrative data collected by public bodies and services, which could be used to augment, complement or replace NRS' data collected by a traditional census. The most recent sets of [administrative data based population estimates for 2016 to 2018](#) were published by NRS in August 2023. These are not Official Statistics – they have been

created to allow a discussion with users about the use of administrative data within the field of demographic statistics.

Notes on statistical publications

Accredited Official Statistics

The United Kingdom Statistics Authority (UKSA) has designated these statistics as [Accredited Official Statistics](#), in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the [UKSA](#) website).

Accredited Official Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are [awarded](#) Accredited Official Statistics status in June 2016 following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is National Records of Scotland's responsibility to maintain compliance with the standards expected of Accredited Official Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. Accredited Official Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

National Records of Scotland

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Preserving the past – We look after Scotland's national archives so that they are available for current and future generations, and we make available important information for family history.

Recording the present – At our network of local offices, we register births, marriages, civil partnerships, deaths, divorces and adoptions in Scotland.

Informing the future – We are responsible for the Census of Population in Scotland which we use, with other sources of information, to produce statistics on the population and households.

You can get other detailed statistics that we have produced from the [Statistics](#) section of our website. Scottish Census statistics are available on the [Scotland's Census](#) website.

We also provide information about [future publications](#) on our website. If you would like us to tell you about future statistical publications, you can register your interest on the Scottish Government [ScotStat website](#).

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Enquiries and suggestions

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