

Article

Exploring educational attainment and internal migration, within English Travel to Work Areas : 2002 to 2019

Analysis from HM Treasury using the Longitudinal Education Outcomes (LEO) dataset, exploring the variation in educational outcomes across English travel to work areas.

Contact:
HMT Regional Analysis
pressoffice@hmtreasury.gov.uk
+44 2072 70 5238

Release date:
19 September 2023

Next release:
To be announced

Table of contents

1. [Main points](#)
2. [Exploring graduate shares in English TTWAs](#)
3. [Explaining the share of graduates in a TTWA](#)
4. [The graduate participation rate of home residents](#)
5. [The retention rate of home residents](#)
6. [The inflow of new residents](#)
7. [Education outcomes data](#)
8. [Glossary](#)
9. [Data sources and quality](#)
10. [Related links](#)
11. [Cite this article](#)

1 . Main points

- The share of graduates varied across English travel to work areas (TTWAs); 49.3% of young people had graduate level qualifications or higher in London, while this figure was 12.9% for Great Yarmouth.
- Major Conurbation TTWAs had the highest share of graduates among their population in 2018 to 2019 (28.9%) and Rural TTWAs had the lowest share (23.0%).
- The majority of TTWAs, 133 out of 149, observed a lower graduate share than the share of home residents from that TTWA achieving graduate level qualifications (graduate participation rate).
- Major Conurbation TTWAs had the highest median graduate retention rate (68.1%), compared with Rural TTWAs, which had the lowest (41.2%); the retention rate of graduates and non-graduates was higher than 50% in the majority (84 out of 149) of TTWAs.
- Graduate participation rates varied less than the graduate share; Tunbridge Wells had the highest graduate participation rate (46.5%) while Great Yarmouth had the lowest (18.5%).

These are experimental statistics published to illustrate the initial findings from the Longitudinal Education Outcomes (LEO) dataset. These findings should be used with caution because of their experimental nature.

This analysis was conducted on the Office for National Statistics (ONS) Secure Research Service (SRS). This work contains statistical data from the ONS, which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

2 . Exploring graduate shares in English TTWAs

This publication explores how differences in the share of graduates can be explained by differences in mobility and education outcomes across travel to work areas (TTWAs) in England. The publication uses the Longitudinal Education Outcomes (LEO) dataset to explore the variation in graduate shares and graduate mobility across TTWAs.

The LEO dataset is an administrative dataset which allows greater coverage of subnational outcomes and analysis of patterns of mobility than is possible in surveys. The LEO dataset includes individual level records of educational achievement as well as residential location data.

Educational outcomes are split into graduate and non-graduate qualifications. For the purposes of this article, graduates are defined as those individuals who have achieved a Level 6 qualification or higher (see [Section 8: Glossary](#) for the definition of qualification levels).

This publication only contains individuals who took GCSE examinations between 2002 and 2012, and they were generally aged between 21 years and 33 years in 2018 to 2019.

This publication uses 2011 TTWAs. TTWAs reflect self-contained labour market areas or commuting zones. TTWAs are defined as having approximately 75% of workers living in the area and around 75% of residents working in the area.

The geographic component of the data is recorded at two different points in an individual's life. The first is their location during the final year of their GCSE exams. This is fixed, and it is observed once per person. This is the individual's "home" TTWA. The second is their residential address recorded in tax records. This is observed during each tax year in the data. This is the individual's "current" TTWA in the tax year 2018 to 2019.

The graduate share, which is defined in this article as the proportion of graduates residing in a TTWA in 2018 to 2019, varies across English TTWAs. Figure 1 is a heat map showing the share of graduates as a share of all individuals residing in each TTWA within the LEO data in 2018 to 2019. In the tax year 2018 to 2019, 32.3% of individuals in the data had a graduate level qualification compared with a median of 25.3% across all TTWAs. At a TTWA level, the share of graduates ranged from 49.3% in London to 12.9% in Great Yarmouth.

Figure 1: The share of graduates was highest in London

The percentage of graduates residing in a TTWA in the tax year 2018 to 2019

Download the data

[.xlsx](#)

Figure 2 shows the share of graduates in each TTWA using a classification of TTWAs. The classification consists of:

- Major conurbation TTWAs (in which the majority of the population of the TTWA are resident in one of the UK's conurbations as defined by the Rural Urban Classification (RUC))
- Large Town or City TTWAs
- Small Town TTWAs
- Rural TTWAs

More details of the definitions of these categories can be found in [Section 8: Glossary](#).

Figure 2: Major Conurbation TTWAs had the highest share of graduates, while Rural TTWAs had the lowest

The percentage of graduates residing in a TTWA by the TTWA classification in the tax year 2018 to 2019

Download the data

[.xlsx](#)

The Major Conurbation TTWA group observed the highest median share of graduates at 28.9%, compared with 25.3% for all TTWAs. There was variation within the Major Conurbation TTWA group; London had the highest proportion of graduates of any TTWA at 49.3%, while Barnsley had the 13th lowest share of graduates of all TTWAs at 17.5%.

The median share of graduates in Large Town or City TTWAs was 26.9%, approximately two percentage points lower than Major Conurbation TTWAs and ranged from 15.1% in Grimsby to 40.9% in Cheltenham. The median Large Town or City TTWA had a similar graduate share to the median Major Conurbation TTWA, with 22 out of 59 Large Town or City TTWAs having a higher graduate share.

The median share of graduates was the lowest for Small Town TTWAs at 21.8%. Within this group, Leamington Spa and Tunbridge Wells observed the highest share of graduates.

The median graduate share of Rural TTWAs was 23.0%; 21 out of 33 Rural TTWAs observed a share of graduates below the England median.

The majority of TTWAs, 133 out of 149, observed a lower graduate share than the share of home residents from that TTWA achieving graduate level qualifications (the graduate participation rate). Approximately 9 out of the 16 TTWAs that observed a higher graduate share than graduate participation rate were classified as Major Conurbation TTWAs. Five were Large Town or City TTWAs and the remaining two were Small Town TTWAs. All Rural TTWAs observed a higher graduate participation rate than the graduate share.

3 . Explaining the share of graduates in a TTWA

The graduate share within a travel to work area (TTWA) can be broken down into three main components:

- the qualification level of home residents as measured by the graduate participation rate of home residents: a local area may have a high share of graduates if a high share of home residents achieved graduate level qualifications; in this article, this is calculated as the proportion of people who achieve a graduate level qualification based on their home TTWA
- the qualification level of residents who remain in their home TTWA as measured by the retention rate of graduates and non-graduates: a local area may have a high share of graduates if a high share of home graduates remained in the area; this is calculated as the proportion of graduate and non-graduates who remain in their home TTWA
- the qualification level of new residents measured by the inward migration rates for graduates and non-graduates: a local area may have a high share of graduates if it attracts graduates from elsewhere (the inward migration rate is defined as the share of residents who moved to a TTWA as a proportion of the home population in that TTWA, this rate is calculated for both graduates and non-graduates); the article also considers the net gain, which is calculated as the difference between the outflow and inflow of residents as a proportion of the home population.

The three components interact to lead to average qualification levels of workers in 2018 to 2019. It is calculated as (graduate participation rate multiplied by retention rate) plus inwards migration of graduates equals graduate share in 2018 to 2019.

The LEO data is used to estimate how all three components affect the graduate share in each English TTWA in 2018 to 2019.

Figure 3: Explore how the educational make up of each TTWA is influenced by those three components

Graduate participation, graduate retention rate, inward graduate migration rate, graduate net gain and graduate share in the tax year 2018 to 2019

Download the data

[.xlsx](#)

Analysing graduate shares in Leeds, Preston, Bridlington and Launceston using the three components

This section explores how the three components explain the differences in the graduate share in one TTWA from each of the four TTWA groups:

- Leeds (Major Conurbation TTWA)
- Preston (Large Town or City TTWA)
- Bridlington (Small Town TTWA)
- Launceston (Rural TTWA)

The graduate participation rates were similar in Leeds (29.6%), Preston (33.0%) and Launceston (30.5%), while it was lower in Bridlington (22.2%).

Only Leeds saw an increase (of 8.2 percentage points) between its graduate participation rate and its graduate share (37.8%). Preston (31.3%), Launceston (21.8%) and Bridlington (13.5%) had falls of 1.7, 8.7 and 8.7 percentage points respectively.

Preston retained the largest proportion of its home graduates (66.8%) followed by Leeds (66.5%), Bridlington (39.5%), then Launceston (38.0%). In all four areas, the non-graduate retention rate was higher than the graduate retention rate.

The inwards migration rates of graduates was highest in Leeds (24.6%), followed by Preston (9.6%), Launceston (7.7%) and Bridlington (3.4%).

The high retention rate and high inward migration rate for Leeds resulted in a net gain of graduates (more graduates migrate in than leave), which increased its graduate share. In the other three TTWAs, this was not the case. The net migration of graduates was negative, resulting in a net loss which was largest in Bridlington, followed by Launceston, while Preston saw a small net loss of graduates.

4 . The graduate participation rate of home residents

The analysis in this section uses the location in which individuals took their Key Stage 4 (KS4) exams to estimate the graduate participation rate of home residents by travel to work area (TTWA).

Figure 4: The graduate participation rate was similar across different TTWA classifications

The percentage of individuals who achieved a degree by the TTWA in which they studied Key Stage 4 grouped by the TTWA classification in the tax year 2018 to 2019

Download the data

[.xlsx](#)

The median graduate participation rates of each group were close to the median for all TTWAs of 29.7%:

- 30.6% for Large Town or City TTWAs
- 30.5% for Rural TTWAs
- 28.5% for Major Conurbation TTWAs
- 27.0% for Small Town TTWAs

There was large variation in the graduate participation rate within each TTWA group. The largest variation was in the Small Town TTWA group, which included the TTWAs with the highest graduate participation rate (Tunbridge Wells, 46.5%) and the lowest (Great Yarmouth, 18.5%) in England.

There was less variation in the median graduate participation rate compared with the median graduate share across TTWAs. The range between the maximum and the minimum across TTWAs was smaller for the graduate participation rate (28 percentage points) than for the graduate share (36 percentage points).

TTWAs had a higher graduate participation rate where a high proportion of older residents had some form of higher education. Figure 5 plots data from Longitudinal Education Outcomes (LEO) and the 2011 Census, which shows the positive relationship between the graduate participation rate for individuals in LEO in 2018 to 2019 and high education levels (Level 4 and above) for all residents aged 35 to 64 years in 2011.

Figure 5: TTWAs had a higher graduate participation rate where a high proportion of older residents had some form of higher education

The percentage of individuals in the LEO dataset who had achieved a degree in the TTWA they studied Key Stage 4 (KS4) in 2018 to 2019 by the share of individuals aged 34 to 64 years in 2012 who had achieved an NVQ level four and above in each TTWA

Download the data

[.xlsx](#)

5 . The retention rate of home residents

This section includes analysis of the retention rate for all individuals as well as comparing the retention rate for graduates and non-graduates.

Figure 6: Major Conurbation TTWAs had the highest retention rate for graduates, non-graduates, and all individuals

The retention rate of individuals who studied Key Stage 4 (KS4) in a TTWA grouped by the TTWA classification in the tax year 2018 to 2019

Download the data

[.xlsx](#)

The median TTWA retention rate for all individuals (including graduates and non-graduates) was 70.1%. Out of all TTWA types, Major Conurbation TTWAs had the highest median retention rate (80.4%) while Rural TTWAs had the lowest (61.1%). In the majority of TTWAs (84 out of 149), the graduate and non-graduate retention rate was higher than 50%.

Major Conurbation TTWAs also had a high retention rate when considering graduates and non-graduates separately. All Major Conurbation TTWAs except Slough and Heathrow had graduate and non-graduate retention rates above the England median, while 30 out of 33 Rural TTWAs had a graduate and non-graduate retention rate below the England median.

London was the only TTWA to have a higher graduate retention rate than its non-graduate retention rate (84.2% compared with 83.7%). This contributed to the high graduate share in London.

Figure 7: London was the only TTWA to have a higher graduate retention rate than its non-graduate retention rate

The graduate retention rate plotted against the non-graduate retention rate in English TTWAs in the tax year 2018 to 2019

Download the data

[.xlsx](#)

The dotted line shows where the non-graduate and graduate retention rates are the same. A TTWA above the line has a higher non-graduate retention rate than graduate retention rate while the opposite is true for a TTWA below the line.

6 . The inflow of new residents

The analysis in this section uses the location in which individuals currently live and the travel to work area (TTWA) in which they took their Key Stage 4 (KS4) qualification to estimate the proportion who moved into a TTWA.

Figure 8: There was large variation in the inward migration rate within each TTWA classification

Inward migration rate of all individuals into a TTWA in which they reside grouped by the TTWA classification, 2018 to 2019

Download the data

[.xlsx](#)

The median TTWA inwards migration rate for all individuals (including graduates and non-graduates) was 24.3%. The median inwards migration rate was larger in Rural TTWAs (26.5%) than for Major Conurbation TTWAs (19.1%).

There was large variation in the inward migration rate of all individuals within each TTWA classification. The largest variation was in the Large town or City TTWA group, which included the TTWA with the highest inward migration rate (Brighton, 56.6%) and the lowest (Middlesbrough and Stockton, 8.6%) in England.

The median graduate inward migration rate was similar across TTWA groups and was higher in Large town or City TTWAs (9.1%). Rural areas had the next highest graduate inward migration rate (7.7%) followed by Major Conurbation TTWAs (6.6%) and Small Town TTWAs (6.2%).

Figure 9: Few TTWAs had a positive net gain of graduates

Net gain of individuals as a percentage of individuals who studied KS4 in the TTWA for the tax year 2018 to 2019

Download the data

[.xlsx](#)

Only 14 out of 149 TTWAs saw a net gain of graduates, which is calculated by the inflow of new graduates minus the outflow of home graduates. Six of the fourteen were Major Conurbations, five were Large Towns or City TTWAs and the rest were Small Town TTWAs. All Rural TTWAs had a net loss of graduates. This was different for non-graduates, as 73 out of 149 TTWAs had a net gain of non-graduates.

[Section 2: Exploring graduate shares in English TTWAs](#) noted that 16 TTWAs observed a higher graduate share than the share of home residents from that TTWA achieving graduate level qualifications. The reason why this does not match the 14 TTWAs that saw a net gain of graduates is because the net migration of non-graduates also had an effect on the share of graduates through its effect on the total.

When considering the overall net migration rate, the inflow of new residents minus the outflow of residents, the median TTWA in each TTWA group lost individuals. The median Rural TTWA lost the most (negative 12.4%), followed by Small Town TTWAs (negative 8.1%), Large Town or City TTWAs (negative 3.2%) and Major Conurbations (negative 1.6%). Approximately 120 out of 149 TTWAs saw a net loss of all individuals, which means that the majority of TTWAs lost population from the cohorts followed in the data.

7 . Education outcomes data

[Longitudinal Education Outcomes \(LEO\) standard release](#)

Dataset | Released 7 July 2021

Education data, including Early Years, school, Further Education, and Higher Education, linked to outcomes data including earnings and benefits. These data can only be accessed by accredited researchers following an approval process.

8 . Glossary

Migration

This analysis studies internal migration and excludes those who migrate both to and from England, as their education or employment records are not recorded.

Travel to work area (TTWA)

The current criteria for defining TTWAs is that, generally, at least 75% of an area's resident workforce work in the area and at least 75% of the people who work in the area also live in the area. The area must also have a working population of at least 3,500. However, for areas with a working population in excess of 25,000, self-containment rates as low as 66.7% are accepted.

Home TTWA is the TTWA in which a person studied Key Stage 4 (KS4). This is used interchangeably with the term "TTWA of where someone grew up". Although this is not 100% accurate, it is a reasonable proxy in the absence of data on a TTWA of where a person spent majority of childhood.

Current TTWA is the TTWA in which a person has a tax address in the tax year 2018 to 2019.

TTWA classification and taxonomy

To produce this classification, population data are combined with the Output Area (OA) version of the England and Wales Rural Urban Classification (RUC) to categorise each TTWA as follows:

- Major Conurbation TTWA, in which the majority of the population of the TTWA are resident in one of the UK's conurbations as defined by the RUC
- Large Town or City TTWA, in which a majority of the population of the TTWA live in an urban area (as defined by the OA version of the RUC), but not a conurbation and the TTWA includes at least one town or city of a population greater than 70,000
- Small Town TTWA, in which a majority of the population of the TTWA live in an urban area, but not a conurbation and the TTWA does not have any towns or cities of a population greater than 70,000
- Rural TTWA, in which a majority of the population of the TTWA live in a rural area as defined by the OA version of the RUC

More information about how this classification was produced together with a map is available in our [Understanding towns in England and Wales: spatial analysis article](#).

Level 6 plus to graduate

A person in the sample who has achieved a National Vocational Qualification (NVQ) level of 6, 7 or 8. This section lists each NVQ.

The following sets out non-graduate NVQs.

Entry level:

- entry level award
- entry level certificate (ELC)
- entry level diploma
- entry level English for speakers of other languages (ESOL)
- entry level essential skills
- entry level functional skills
- Skills for Life

Level one:

- first certificate
- GCSE grades three, two, one or grades D, E, F, G
- level one award
- level one certificate
- level one diploma
- level one ESOL
- level one essential skills
- level one functional skills
- level one NVQ
- music grades one, two and three

Level two:

- CSE grade one
- GCSE grades nine, eight, seven, six, five, four or grades A*, A, B, C
- intermediate apprenticeship
- level two award
- level two certificate
- level two diploma
- level two ESOL
- level two essential skills
- level two functional skills
- level two national certificate
- level two national diploma
- level two NVQ
- music grades four and five
- level grade A, B or C

Level three:

- A level
- access to higher education diploma
- advanced apprenticeship
- applied general
- AS level
- international Baccalaureate diploma
- level three award
- level three certificate
- level three diploma
- level three ESOL
- level three national certificate
- level three national diploma
- level three NVQ
- music grades six, seven and eight
- T level
- tech level

Level four:

- certificate of higher education (CertHE)
- higher apprenticeship
- higher national certificate (HNC)
- level four award
- level four certificate
- level four diploma
- level four NVQ

Level five:

- diploma of higher education (DipHE)
- foundation degree
- higher national diploma (HND)
- level five award
- level five certificate
- level five diploma
- level five NVQ

The following sets out graduate NVQs.

Level six:

- degree apprenticeship
- degree with honours, for example, bachelor of the arts (BA) honours, bachelor of science (BSc) honours
- graduate certificate
- graduate diploma
- level six award
- level six certificate
- level six diploma
- level six NVQ
- ordinary degree without honours

Level seven

- integrated master's degree, for example, master of engineering (MEng)
- level seven award
- level seven certificate
- level seven diploma
- level seven NVQ
- master's degree, for example, master of arts (MA), master of science (MSc)
- postgraduate certificate
- postgraduate certificate in education (PGCE)
- postgraduate diploma

Level eight

- doctorate, for example, doctor of philosophy (PhD or DPhil)
- level eight award
- level eight certificate
- level eight diploma

9 . Data sources and quality

This article was produced by analysts in HM Treasury (HMT) and forms part of a series of HMT and the Office for National Statistics (ONS) articles being published on the [ONS website](#) using the Longitudinal Educational Outcomes (LEO) data.

LEO dataset

The LEO dataset collects administrative education data from early years through to higher education from the Department for Education (DfE) and the Higher Education Statistics Agency (HESA) with employment, benefits and earnings data from the Department for Work and Pensions (DWP) and Her Majesty's Revenue and Customs (HMRC).

To be included in the LEO database with school-level education and outcomes data, individuals must have been in the English school education system for a least one school year. It does not include students who were home schooled or moved to England from abroad without entering the school education system for one year.

This analysis uses the version of LEO available to researchers in the Secure Research Service (SRS), also referred to as the "standard release". Further information about LEO is available from DfE or the SRS.

Data methodology

This analysis follows the ten cohorts who took their Key Stage 4 (KS4), also known as GCSE, exams in 2002 to 2012. It includes students from private and public schools. Location at the time they sat their KS4 exams is taken from the School Census and is supplemented with school address if they do not have a residential location from the School Census. Individuals where a location is not observed either through the School Census or through school address are dropped.

The Young Persons Matched Administrative Dataset (YPMAD), Index of Learner Records (ILR) and Higher Education Statistics Authority (HESA) dataset are used to measure attainment. Attainment is measured using the National Vocational Qualification (NVQ) system. Individuals who attain an NVQ level six or higher are defined as being graduates.

Location in the 2018 to 2019 tax year is assigned using the tax record data. Individuals who do not have a location and those who live in a travel to work area (TTWA) that crosses the Scottish or Welsh borders are removed.

The education records are recorded in academic years, while the tax data is recorded in tax years. To convert between the academic year which someone achieves a qualification and the corresponding tax year this analysis follows the approach taken by Moira Nelson and Oliver Anderson in their report on [Post-16 education and labour market activities, pathways, and outcomes](#).

10 . Related links

[Exploring the educational attainment of children and young people in English towns: 2012 to 2013 school year](#)

Article | Released 25 July 2023

Exploring how educational attainment differs across English towns, by town size, deprivation level and the average qualification levels of residents in the previous generation.

[Post-16 education and labour market activities, pathways and outcomes \(LEO\)](#)

Analytical Report | Released 27 May 2021

Analysis of post-16 education and labour market activities and outcomes based on different socioeconomic, demographic and education factors.

11 . Cite this article

Office for National Statistics (ONS), released 19 September 2023, ONS website, article, [Exploring educational attainment and internal migration, within English Travel to Work Areas : 2002 to 2019](#)