

How workforce qualification levels differ across England and Wales, technical annex: Census 2021

A technical annex to the article Census 2021: How workforce qualification levels differ across England and Wales, including quality and methods information and definitions.

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1 . Main points

- The Highest Level of Qualification (HLQ) variable was derived from the individual qualification questions asked in questions 28 to 31 of Census 2021.
- Respondents were asked to record any qualifications they have ever achieved including equivalents, even if they are not currently using them.
- They were asked if they have completed an apprenticeship, a qualification at degree level or above, and any other qualifications with prompts for GCSEs, AS or A levels and National Vocational Qualifications (NVQs) or equivalents.
- The question was worded as "degree level or above", but the census did not collect specific data on graduates, this classification includes all higher education, including that below bachelor's degree level (Level 6), so will be referred to as "higher education qualifications" from now on.
- Questions were asked to everyone aged over 16 years.
- Qualifications for England and Wales had a [non-response rate of 2.7%](#), the variable was imputed where the questions were not answered.
- The data in this publication include the current workforce, which consists of people who are employed, as well as those people defined as unemployed, seeking work and ready to start in two weeks, who can be considered as potential workforce.
- There are quality considerations about higher education qualifications, including those at Level 4 and above, responses from older people and international migrants, and comparability with the 2011 Census data.

2 . Quality summary

Residents of England and Wales aged 16 years and over were asked to record any qualifications (including academic, vocational, and professional) they had ever achieved in England, Wales or worldwide, even if they were not using them now. This can be used to calculate the highest level of qualification, as per our Glossary definition, using the following categories:

- no qualifications: no formal qualifications
- Level 1: one to four GCSEs passes (for example grade A* to C or grade 4 and above) and any other GCSEs at other grades, or equivalent qualifications
- Level 2: five or more GCSE passes (for example grade A* to C or grade 4 and above) or equivalent qualifications
- apprenticeships
- Level 3: two or more A levels or equivalent qualifications
- Level 4 or above: Higher National Certificate, Higher National Diploma, Bachelor's degree, or post-graduate qualifications
- other qualifications, of unknown level

Census questions did not identify the level or type of apprenticeships, so the apprenticeship Highest Level of Qualification (HLQ) was placed between Level 2 and Level 3. Care must be taken when interpreting this classification.

The HLQ categories in Census 2021 did not change from the 2011 Census classification. However, the changes to the question and structure does mean that any change over time observed will partly represent real change and partly be an artefact of the change in data collection methods.

A Census Quality Survey (CQS) was carried out several weeks after Census Day, to measure the accuracy of the responses that people gave to the census questions. Evidence from the CQS shows that the highest level of qualification classification has a low agreement rate, which suggests inconsistency in respondents' answers. There are many known reasons why this agreement rate is low, which can be seen in our [Qualifications question development for Census 2021 report](#).

Read more in our [Education quality information for Census 2021 methodology](#).

Quality considerations, along with the strengths and limitations of Census 2021 more generally, can be found in the [Quality and Methodology Information \(QMI\) for Census 2021](#).

3 . Statistical methods

Highest level of qualification index score

For Census 2021, we use a qualification rank index score to compare how highly qualified population groups are. It converts a person's highest qualification into a single metric and creates an average rank score for the population.

The ranking system is based on the qualification levels attained at different phases of education: secondary education, post-16 further or upper secondary education and higher education. The ranks assigned to the qualification levels can be seen in Table 1.

Table 1: Rank assigned to qualification levels and types

Rank Highest level of qualification	
Highest	4 Higher education qualifications of Level 4 and above
	3 Upper secondary and advanced further education qualifications at Level 3 and apprenticeships
	2 Qualifications equivalent to secondary education (Level 2)
	1 Qualifications below secondary education (Level 1 and entry level)
Lowest	0 No qualifications

Notes

1. Apprenticeships data collected by the census did not include the level or type of an apprenticeship. Advanced further education was deemed the best fit overall for traditional trade or craft and modern apprenticeships.

The index score assigns every individual aged 16 years and over in the population a rank based on their highest level of qualification, excluding those whose highest level of qualification is unknown. The index score is then the average rank of all individuals in that population.

The theoretical maximum value for the index score is 4.00, indicating that 100% of individuals in a population have obtained Level 4 or above qualifications. The minimum value for the index score is 0.00, indicating that 100% of individuals in a population have obtained no qualifications.

However, the scores for the index do not always relate directly to the proportion of the population who are highly qualified. For example, a population with a score of 3.0 does not simply have twice the proportion of highly qualified people as a population with a score of 1.5. It is recommended that group order or decile, but not the raw score in isolation, are used in interpreting the index. As the index is a compound summary measure to evaluate differences in raw scores between two population groups, the index must be used in conjunction with the component rank proportions. For example, if population A has a score 0.35 higher than population B, this is primarily explained by population B having a 7.0% higher proportion of people with no qualifications.

The index does not account for differences in population characteristics within an area and can be sensitive to the number of people with a certain characteristic. At lower-level geographies or with smaller population groups, the population differences will have a greater effect on the index score. For example, an area with a higher student population is likely to have a lower index score, because they may not have completed their highest qualification level yet.

Five most similar

An algorithm was used to find the local authorities with the most similar proportions of each highest level of qualification. Similarity was measured by using the shortest Euclidean distance between local authority education profiles. Euclidean distance measures the distance between two points in multi-dimensional space. It is calculated here by taking the square root of the sum of the squared differences in proportions for each highest level of qualification between any two local authorities.

It is important to note that while the article presents the five most similar, the local authorities considered "similar" to another local authority may in fact have very different profiles.

When calculating the five most similar profiles, the raw percentage of the population with each highest level of qualification was used, as opposed to a standard score. This is because using standard scores would have paired local authorities that did not appear to have similar profiles in terms of proportions of each highest level of qualification. This means that the five most similar profiles are heavily influenced by the proportion of the population with Level 4 and above qualifications, as this is the most common highest level of qualification and has the largest range of all highest levels of qualification. As such, a 1 percentage point difference in the proportion of the population with these qualifications (which is a relatively small difference for this qualification level) is measured equally to a 1 percentage point difference in other qualifications (which might be a relatively large difference for that qualification level).

4 . Glossary

We have published standard and derived variables, classifications and datasets in our [Census 2021 dictionary](#).

The definitions used for Census 2021 aimed to be consistent with the international definitions where possible. We also work closely with Northern Ireland Statistics and Research Agency (NISRA) and National Records of Scotland (NRS) to harmonise definitions across the UK censuses, where possible; read our [UK census data webpage](#) for more information.

Census Quality Survey (CQS)

The Census Quality Survey was carried out after the census to measure the accuracy of the responses that people gave to the census questions. The survey re-interviewed a sample of people who responded to the census, and compared the responses given to the CQS answers with those provided on their census questionnaire.

Economically active

People aged 16 years and over are [economically active](#) if, between 15 March and 21 March 2021, they were:

- in employment (an employee or self-employed)
- unemployed, but looking for work and could start within two weeks
- unemployed, but waiting to start a job that had been offered and accepted

Census 2021 responses were collected during the coronavirus (COVID-19) pandemic. Estimates related to the labour market will have been affected by the national lockdown, associated guidance and furlough measures.

Data collected from the census differ to that collected on the Labour Force Survey (LFS) because of data collection and question design differences. For further information see our [Comparing Census 2021 and Labour Force Survey estimates of the labour market, England and Wales: March 2021 article](#).

Highest level of qualification (HLQ)

The highest level of qualification is derived from the question asking people to indicate all qualifications held, or their nearest equivalent

This may include non-UK qualifications where they were matched to the closest UK equivalent.

The equivalent qualifications for "highest level of qualification" are as follows (please note, this is not an exhaustive list and therefore does not include every possible qualification):

- Level 1 and entry level qualifications: any GCSEs at other grades, O levels or CSEs (any grades), Foundation Welsh Baccaulaureate, 1 AS level, National Vocational Qualification (NVQ) level 1, Basic or Essential Skills, skills for life, literacy and numeracy, Level 2 Scottish Vocational qualifications
- Level 2 qualifications: five or more GCSEs (A* to C or 9 to 4), O levels (passes), CSEs (grade 1), Intermediate Welsh Baccaulaureate, one A level, two to three AS levels, NVQ level 2, Business and Technology Education Council (BTEC) General, City and Guilds Craft, Level 2 Scottish Vocational qualifications
- Level 3 qualifications: two or more A levels, four or more AS levels, Advanced Welsh Baccaulaureate, NVQ level 3, City and Guilds Advanced Craft, Ordinary National Certificate (ONC), Ordinary National Diploma (OND), BTEC National, International Baccaulaureate, Level 3 Scottish Vocational qualifications
- Level 4 qualifications and above: degree, foundation degree, PHD, Master's degrees, Higher National Diploma (HND) or Higher National Certificate (HNC), NVQ level 4 and above, professional qualifications (for example, teaching or nursing)
- other: any other qualifications, equivalent unknown

Usual resident

A usual resident is anyone who on Census Day, 21 March 2021 was in the UK and had stayed or intended to stay in the UK for a period of 12 months or more, or had a permanent UK address and was outside the UK and intended to be outside the UK for less than 12 months.

Workforce

The workforce consists of people who are employed, as well as those people defined as unemployed, seeking work and ready to start in two weeks, who can be considered as current workforce on Census Day.

5 . Related links

[Education in Wales \(Census 2021\)](#)

Statistical bulletin | Released 10 January 2023

A summary by Welsh Government of Census 2021 data about education in Wales.

[Education quality information for Census 2021](#)

Methodology | Released 10 January 2023

Known quality information affecting education data from Census 2021 in England and Wales.

[Education variables, Census 2021](#)

Supporting information | Released 10 January 2023

Variables and classifications used in Census 2021 data about education.

[Education, England and Wales: Census 2021](#)

Statistical bulletin | Released 10 January 2023

Usual residents aged 16 years and over who have academic, vocational, or professional qualifications, as well as the number of schoolchildren and full-time students, Census 2021 data.

[How we assured the quality of Census 2021 estimates](#)

Methodology | Released 7 November 2022

Methodology for the validation of Census 2021 population estimates for England and Wales, including the assurance of processes, assessment of estimates, and involvement of local authorities.

[Qualifications question development for Census 2021](#)

Question Development | Released 29 July 2020

Developing and testing questions on qualifications, including apprenticeships, further and higher education, NVQs, A levels and GCSEs for Census 2021.

[Quality and methodology information for Census 2021](#)

QMI | Updated 26 January 2023

Details the data strengths, limitations, uses, users and methods used for Census 2021, England and Wales.

6 . Cite this methodology

Office for National Statistics (ONS), released 17 February 2023, ONS website, methodology, [How workforce qualification levels differ across England and Wales, technical annex: Census 2021](#)