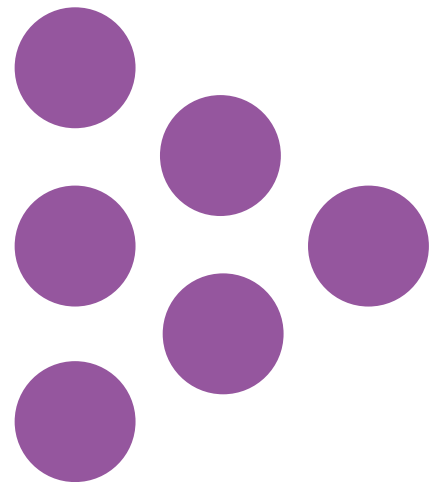

Technical appendix

Methodology appendix – Teacher Labour Market in England: Annual Report 2023

National Foundation for Educational Research (NFER)

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Methodology appendix – Teacher Labour Market in England: Annual Report 2023

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1 Introduction

This methodology appendix explains the data we used to inform our analysis of the teacher labour market in England.

- Section 2 describes the data sources that we used, including the three household survey datasets – the Labour Force Survey (LFS), UK Household Longitudinal Study (UKHLS) and Annual Population Survey (APS) – that we used to measure teachers’ (and similar graduates’) pay, working conditions and well-being.
- Section 3 explains our methodology for reporting on the ITT recruitment, teacher retention and vacancies figures.
- Section 4 explains our methodology for identifying teachers in the household survey datasets.
- Section 5 explains our methodology for identifying groups of similar graduates, by matching their characteristics to the samples of teachers.
- Section 6 explains some details of the analysis we undertake on teacher well-being and working conditions and shows the underlying sample sizes.
- Section 7 describes the different measures we used to describe teachers’ (and similar graduates’) working conditions and well-being.

2 Data sources

The following data sources were used to inform this research report:

- Initial Teacher Training: Trainee Number Census. Available: <https://www.gov.uk/government/collections/statistics-teacher-training>
- Monthly initial teacher training applications. Available: <https://www.apply-for-teacher-training.service.gov.uk/publications/monthly-statistics>
- TeachVac teacher vacancies. More information: <https://www.teachvac.co.uk/>
- School Workforce in England. Available: <https://www.gov.uk/government/collections/statistics-school-workforce>
- LFS / APS. Available from UK Data Service. More information: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployety pes/methodologies/labourforcesurveyuserguidance>
- UKHLS. Available from UK Data Service. More information: <https://www.understandingsociety.ac.uk/>

3 Reporting data on ITT recruitment and teacher retention

Our reporting on overall initial teacher training (ITT) recruitment relative to target was based on figures collected in the Department for Education's (DfE) ITT census. Our reporting of monthly ITT recruitment figures for the 2022/23 and 2023/24 cycles was based on monthly ITT application numbers, which the DfE has been collecting through its DfE Apply platform since the 2022/23 cycle. Previously, ITT recruitment statistics were collected by the Universities and Colleges Admissions Service (UCAS).

Our analysis of teacher retention was based on figures published from the School Workforce Census (SWC). The SWC reports the proportion of the full-time equivalent (FTE) workforce lost due to deaths, retirements and teachers leaving service (which the DfE refers to as 'wastage'). Our reporting was based on the proportion lost due to retirements and wastage.

Retention rates in the SWC are necessarily backwards-looking – two years of data are required to calculate the proportion of the workforce that left teaching between two years. We therefore looked at teacher vacancies data, an indicator of staff turnover, to provide a more recent glimpse of what teacher retention this year is likely to look like.

Our analysis of teacher vacancies was based on data from TeachVac, a teacher job board and data scraping service. TeachVac collects information from virtually all schools in England on the number of job vacancies each school posts over the academic year. TeachVac perform checks on each job posting to ensure it reflects an actual job posted at that school, cross checks the DfE's website for any uncollected teaching vacancies and assigns unique codes to each job posting it scrapes in order. This is to help prevent double-counting re-postings and jobs with long lead times (TeachVac, 2022).

Our reporting was based on the total number of vacancies in state-sector schools in England throughout the academic year. We included postings for classroom teachers and middle leaders, but excluded senior leaders from the analysis.

4 Defining teachers in household survey datasets

In the LFS/APS data, we defined our sample of teachers as: teachers employed in England's state-funded primary, secondary and special schools. Specifically, we defined our sample as:

- Industry (Standard industrial classification) = 'Primary education' or 'General secondary education'
- Occupation (Standard Occupational Classifications) = 'Primary and nursery education teaching professionals' or 'Secondary education teaching professionals' or 'Special needs education teaching professionals' or 'Senior professionals of educational establishments'
- Country of work = 'England'
- Sector = 'Public'.

We specifically excluded from our definition the following occupations:

- 'Teaching and Educational Professionals not elsewhere classified', which includes adult education tutors, education consultants and private tutors
- 'Education advisers and school inspectors'
- 'Higher education teaching professionals'
- 'Further education teaching professionals'.

5 Methodology for identifying similar graduates

The aim of our analysis of teachers' pay, well-being and working conditions was three-fold. We sought to measure how:

1. teachers' pay, working conditions and well-being have changed over time (and particularly since the pandemic)
2. teachers' pay, working conditions and well-being compared to those in other occupations
3. the difference in pay, working conditions and well-being between teachers and other occupations has changed over time.

Previous teacher labour market reports have compared teacher pay, well-being and working conditions to other professionals working outside teaching. However, recent NFER research has shown that a significant proportion of teachers who leave teaching leave for other, non-professional occupations (Worth and McLean, 2022). Comparing teachers to a wider group of graduates likely includes all the graduate-level occupations that teachers may be more likely to actually consider transitioning into, which may be a more relevant comparator to teachers' pay and working conditions.

Comparing teachers to all graduate employees in a meaningful way is also challenging because the two groups are likely to differ in a number of important ways. For example, they may be different because people with different characteristics or motivations select to go into different occupations. No comparison of different occupations should therefore be interpreted as the effect of entering that profession, although working conditions, and employees' perceptions of them, can be influenced by entering that occupation rather than another.

We aimed to improve the comparability of our analysis as much as we could. Instead of comparing all teachers to all graduate employees, we analysed a group of graduates with similar characteristics to teachers. The group included those with at least an undergraduate degree who were working in any private or public sector occupation outside of teaching. We identified graduates across all years using the variable recording the highest level of education achieved by the respondent. In the LFS/APS, this was the variable *HIQUAL*, while in the UKHLS, this was the variable *hiqual_dv*.

We re-weighted the graduates group to improve comparability in the underlying personal characteristics between the teacher and graduates groups. This ensured that the distribution of gender, age and region was the same among the teachers and the group of graduates. We used a technique called entropy balancing to re-weight the graduates group within each survey wave and derive a 'similar graduates' group (Hainmueller, 2012). This re-weighting approach did not remove all the underlying differences in characteristics and motivations between teachers and 'other graduates'. However, it minimised the risk that any observed differences in working conditions were driven by differences in the distribution of gender, age and region between the two groups.

6 Analysis and sample sizes

6.1 LFS/ APS data

We conducted the analysis using an approximation to an academic year, combining the four quarterly datasets from the beginning of July to the end of the following June. For the analysis, we used the cross-sectional analysis weights provided in the data set, ensuring the analysis was representative of UK households, and therefore, of English teachers in the state sector.

The sample sizes in the LFS/ APS analysis are shown in Table 3. Sample sizes for each individual measure differed, depending on the extent of missing data for each measure. The sample sizes of both teachers and other graduates have generally been falling slightly over time, which is due to falling response rates to the LFS across the whole population (see the [Office for National Statistics methodology report for more details](#)).

In the main report we presented the results from a straightforward analysis of the average of each measure for teachers and similar graduates, split by year. We used a weighted average, with the weight reflecting the cross-sectional survey weight of the respondent and the entropy balancing weight. Where we compared our key measures over time and between teachers and similar graduates, we tested whether any differences were statistically significant by conducting a t-test that the difference was statistically significantly different from zero.

Table 1: Sample sizes for LFS/ APS analysis

Year	Sample size of teachers	Sample size of similar graduates
2010/11	3,771	31,521
2011/12	4,155	37,392
2012/13	3,922	38,201
2013/14	4,072	40,941
2014/15	3,848	40,096
2015/16	3,724	39,125
2016/17	3,410	40,196
2017/18	3,369	41,467
2018/19	3,151	40,133
2019/20	3,049	38,666
2020/21	2,954	42,732
2021/22	2,494	39,108

Source: NFER analysis of Labour Force Survey / Annual Population Survey data.

6.2 UKHLS data

Similarly to the LFS data, we conducted the UKHLS analysis using academic years, which we identified using interview dates. The data is collected in overlapping waves, which last just over two years. The analysis therefore cuts across the wave structure of the study design. We analysed all currently available data, which is from waves 1-12. An implication of this is that estimates for

2020/21 are provisional, pending further data that was collected early in wave 13. This also meant that, while some data for the 2021/22 academic year has been collected across the last few UKHLS waves, the sample size of teachers for 2021/22 was too small to reliably report. The full set of wave 13 data, which will include more data for 2021/22 will be available in November 2023.

We used cross-sectional analysis weights provided as part of the UK Data Service extract for the analysis. This ensured the analysis was representative of UK households, and therefore by extension, of English teachers in the state-sector. The sample sizes used in the UKHLS analysis are shown in Table 2. Sample sizes for each individual measure differed slightly, depending on the extent of missing data for each measure. The sample sizes in both the teacher and similar graduates groups have fallen over time due to longitudinal attrition, while the estimates for 2020/21 have a lower sample size as they do not yet include data from wave 13.

Analysis of our main indicators was, like with the LFS/APS data analysis, based on simple weighted averages. We tested whether differences in key indicators between years and between teachers and similar graduates were statistically significantly different over time using t-tests.

Table 2 Sample sizes for UKHLS analysis

Year	Sample size of teachers	Sample size of similar graduates
2010/11	648	4,364
2011/12	601	3,992
2012/13	573	4,064
2013/14	520	3,894
2014/15	528	3,909
2015/16	528	4,289
2016/17	457	3,840
2017/18	411	3,751
2018/19	360	3,560
2019/20	357	3,567
2020/21	206	2,152

Note: Estimates for 2020/21 are provisional: they are based on a reduced sample size, which will be enhanced with data from wave 13 published in November 2023.

Source: NFER analysis of UKHLS data.

7 Teacher working conditions and well-being measures

7.1 Working conditions measures

Median full-time annual gross salary (real terms)

Source: LFS. Survey question: ‘What would be your usual gross pay for the last [period]?’ Gross weekly pay is a derived variable - see LFS user guidance for how this is constructed. Pay has been inflated to Q1 2019 prices using the quarterly consumer prices index. Similar graduates only – we estimated real, median pay for teachers based on data reported in the SWC, as the SWC pay measure is less volatile over time.

Full-time working hours in the reference week

Source: LFS. Average (mean) response to ‘Thinking now about the seven days ending Sunday the [last week], how many hours did you actually work in your (main) job/business – please exclude meal breaks?’ Only includes respondents who reported being scheduled to work on every day from Monday-Friday in the reference week and did not have any days off in the reference week due to being sick/injured.

Proportion full-time wanting to work fewer hours

Source: LFS. The measure is derived from a combination of responses and routed questions - see LFS user guide for details. Proportion of respondents: ‘Would you rather work shorter hours than in your present job?’ Full-time teachers and similar graduates only.

Proportion who usually work evenings

Source: LFS. The average proportion who responded ‘during the evening’ to the question: ‘Within your regular pattern of work is it usual for you to work:

- during the day
- during the evening
- at night?

Proportion who mainly work from home

Source: LFS. The proportion who responded with either ‘In your own home’, ‘In the same grounds or buildings as your home’ or ‘In different places using home as a base’ to the question ‘In your main job do you work mainly:’

- In your own home
- In the same grounds or buildings as your home
- In different places using home as a base
- Or somewhere quite separate from home

7.2 Well-being measures

Anxiety

Source: APS. Average (mean) response to ‘Overall, how anxious did you feel yesterday?’ on a scale of 0 “not at all” to 10 “completely”.

Life satisfaction

Source: APS. Average (mean) response to ‘Overall, how satisfied are you with your life nowadays?’ on a scale of 0 “not at all” to 10 “completely”.

Happiness

Source: APS. Average (mean) response to ‘Overall, how satisfied are you with your life nowadays?’ on a scale of 0 “not at all” to 10 “completely”.

Feeling that the things you do in your life are worthwhile

Source: APS. Average (mean) response to ‘Overall, to what extent do you feel the things you do in your life are worthwhile?’ on a scale of 0 “not at all” to 10 “completely”.

Feeling like you have good career progression

Source: APS. Proportion responding ‘strongly agree’ or ‘agree’ to the question ‘On a scale of 1 to 5, with 1 being ‘strongly disagree’ and 5 being ‘strongly agree’, to what extent do you disagree or agree with the following statement: My job offers good opportunities for career progression?’

Feeling like you are involved in decision-making

Source: APS. Proportion responding ‘very good’ or ‘good’ to ‘On a scale of 1 to 5, with 1 being ‘very poor’ and 5 being ‘very good’, how poor or good would you say managers at your workplace are at involving employees and their representatives in decision making?’

Satisfaction with leisure time

Source: UKHLS. Proportion responding ‘Completely satisfied’, ‘Mostly satisfied’ or ‘Somewhat satisfied’ to the question: ‘Please choose the number which you feel best describes how dissatisfied or satisfied you are with the following aspects of your current situation: The amount of leisure time you have’. Responses coded on a scale from 1 to 7, with 1 corresponding to ‘Completely dissatisfied’ and 7 corresponding to ‘Completely satisfied’.

Satisfaction with job

Source: UKHLS. Proportion responding ‘Completely satisfied’, ‘Mostly satisfied’ or ‘Somewhat satisfied’ to the question: ‘Please choose the number which you feel best describes how dissatisfied or satisfied you are with the following aspects of your current situation: Your job’. Responses coded on a scale from 1 to 7, with 1 corresponding to ‘Completely dissatisfied’ and 7 corresponding to ‘Completely satisfied’.

Job stress

Source: UKHLS. Job stress was measured across six stress sub-indicators. Respondents answered the question ‘Thinking of the past few weeks, how much of the time has your job made you feel:’

- Uneasy
- Worried
- Depressed
- Gloomy
- Miserable

Each question is coded on a scale from 1 to 5, with 1 corresponding to 'Never' and 5 corresponding to 'All of the time'. We calculated an overall job stress score for each respondent as an average across the six indicators, and reported the average overall job stress score in our reporting for teachers and similar graduates.

Workplace autonomy

Source: UKHLS. Workplace autonomy was measured across four autonomy sub-indicators. Respondents answered the question 'In your current job, how much influence do you have over:'

- What tasks you do in your job
- The pace at which you work
- How you do your work
- The order in which you carry out tasks

We excluded the measure of autonomy over 'the time you start or finish your working day' as this was likely to differ significantly between teachers working full-time and part-time. Each question was coded on a scale from 1 to 4, with 1 corresponding to 'A lot' and 4 corresponding to 'None'. We reversed the scales so that, in our reporting, 1 corresponded to 'None' and 4 corresponding to 'A lot' of autonomy. We then calculated an overall workplace autonomy score for each respondent as an average across the four indicators, and reported the average overall workplace autonomy score in our reporting for teachers and similar graduates.

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