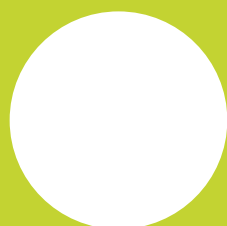
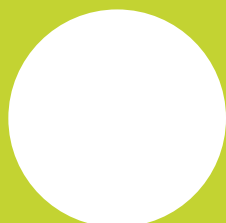
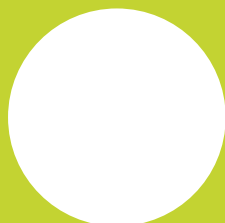
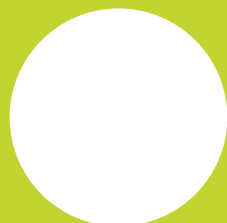
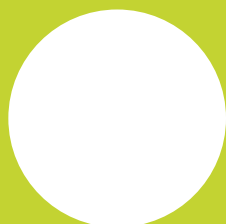
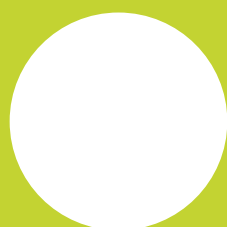


Teacher Workforce Dynamics in England

Nurturing, supporting
and valuing teachers



Teacher Workforce Dynamics in England

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Published in October 2018

By the National Foundation for Educational Research,
The Mere, Upton Park, Slough, Berkshire SL1 2DQ
www.nfer.ac.uk

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Registered Charity No. 313392

ISBN: 978-1-911039-82-2

How to cite this publication:

Worth, J., Lynch, S., Hillary, J., Rennie, C. and Andrade, J. (2018). *Teacher Workforce Dynamics in England*. Slough: NFER.

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Foreword

Concerns over teacher recruitment and retention are not new. Over the past 28 years the School Teachers' Review Body has expressed a fluctuating level of concern over the pressures on the teacher workforce, in the face of complex interactions in the supply of and demand for teachers. However, issues of teacher recruitment and retention have recently moved up the education policy agenda as a result of rising pupil numbers, shortfalls in the number of new trainee teachers and increases in the proportion of teachers leaving (or considering leaving) the profession.

The quality of teaching experienced by children and young people makes a substantial difference to their educational outcomes, future employability and to their life chances more broadly. To deliver on the Industrial Strategy we will need to prepare young people for a knowledge-based economy, by making every effort to secure and preserve a strong supply of able and qualified teachers.

In this context, the Nuffield Foundation has funded research which improves our understanding of the drivers of change in teacher supply to better inform policy development. Key questions addressed by Nuffield-funded researchers have included: How do the dynamics of retention, turnover and career breaks play out? What are the employment journeys, experiences and motivations of teachers joining or leaving teaching? How do the challenges of teaching supply compare with other public sector professions?

This wide ranging and thorough study by the National Foundation for Educational Research (NFER) provides an important contribution to this evidence base. Using an imaginative range of datasets, the research team have shed light on the nature and extent of teacher workforce issues. By comparing teaching to other professions the researchers have been able to assess which issues are distinctive to the teacher labour market.

The report's findings suggest there are chronic problems in the retention of teachers, with the proportion of working-age teachers leaving the profession each year in both the primary and secondary sectors rising steadily since 2010. The report also highlights that workforce issues are particularly acute within London, in shortage subjects and in schools judged 'inadequate' by Ofsted, which often serve more disadvantaged communities.

In the report, the NFER sets out some clear messages for policy-makers. Whilst judicious use of increased pay could improve retention for early career teachers and for those in particular subjects, most teachers are not motivated to leave the profession by the prospect of increased pay and benefits. More significant to teachers are concerns about workload, long hours and job satisfaction. The report makes some important recommendations in relation to offering teachers more and better part-time and flexible working which could improve retention in the longer term.

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The Nuffield Foundation urges policy makers, leaders across the teaching profession and all those interested in teaching quality, to read this report carefully. These research findings should help shape an active and urgent agenda to ensure we have a school workforce that can provide the highest quality of education for all children and young people.



Josh Hillman
Director of Education, Nuffield Foundation

Preface

Since 2010 virtually every aspect of the English education system has been subject to reform – alongside giving schools greater autonomy, the accountability system has been strengthened and the national curriculum, assessment and qualifications systems have all been revised in an attempt to raise standards. The “self-improving” system, including a greater role for schools in delivering teacher education, and a focus on raising the status of the teaching profession, were also intended to increase the quality of teachers and teaching.

In the midst of all these reforms, it is a very different issue that has now risen to the top of the political agenda – the urgent need to ensure there are enough teachers in our schools. This is now arguably the most important domestic challenge facing Education Ministers today.

The demand for teachers is growing – particularly in certain subjects and geographical areas – at the same time as a larger proportion of teachers are leaving the profession. It is getting harder to retain early career teachers, especially in maths, science and modern foreign languages. Pupil numbers are rising, particularly in secondary schools, and the recruitment of new teachers into the profession is not keeping up. This is putting a significant strain on head teachers and policymakers and threatening the quality of education. With teachers leaving the profession in greater numbers and rising staff turnover between schools, school leaders have more vacancies to fill, more staffing uncertainty to deal with and higher recruitment costs.

The Government’s initial response to these challenges was to focus on trying to increase teacher recruitment. However NFER has argued for greater attention to be given to retaining teachers in the profession, and the need to build a better understanding of the dynamics of the teacher workforce - why people move, why they leave the profession, and whether they return. Grant funding from the Nuffield Foundation has enabled us to conduct a major study of these issues – across phases, areas and subjects - and to tease out recommendations for policy makers and school leaders that will help to tackle this complex set of issues.

The scale of the research questions explored, together with the publication of findings throughout the lifecycle of the project, has ensured that the evidence is both relevant and timely. The findings have been shared with Government officials and with system leaders, resulting in new approaches being explored - including trials of financial incentives to retain early career teachers in key subjects and a focus on creating opportunities for flexible working.

As this report demonstrates, nurturing, supporting and valuing teachers is vital to making teaching an attractive and rewarding career choice again. We hope this report will shed light on how we can keep highly talented teachers in the profession to ensure every child has the best education available and can achieve their potential.



Carole Willis
Chief Executive, National Foundation for Educational Research

Acknowledgements

The research team are very grateful to all the people who took part in this research. We would like to thank our NFER colleagues for their invaluable assistance with the study: Giulia de Lazzari, Susan Bamford, and Neelam Basi. We would also like to thank Professor Becky Allen and Professor John Howson for their helpful advice on the project and comments on the reports, and the advisory group for their valuable guidance. We are also grateful for the support of the Royal College of Nursing and College of Policing for imparting to us their understanding of their sectors, and stakeholders from both sectors who gave us further useful insights. Finally, we would like to thank the Nuffield Foundation for funding and assisting with the study.

Nuffield Foundation

The Nuffield Foundation is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at www.nuffieldfoundation.org.



National Foundation for Educational Research

NFER is a leading independent provider of rigorous research and insights in education, working to create an excellent education for all children and young people. We are a not-for-profit organisation and our robust and innovative research, assessments and other services are widely known and used by key decision-makers. Any surplus generated is reinvested in projects to support our charitable purpose.

Executive Summary

Rising pupil numbers, shortfalls in the number of trainee teachers and concerns about the proportion of teachers who say they are considering leaving the profession means that teacher supply in the state sector is a major policy issue in England. Meeting the current and future demand for teachers across school phases and types, subjects and diverse geographical areas is a complex challenge.

There has been significant interest in teacher recruitment and retention among policy makers, and from school leaders who struggle to fill vacancies. Supply pressures will increase most in the secondary sector over the next decade, as pupil numbers are forecast to rise by 19 per cent between 2017 and 2026 (DfE, 2017a). A thorough understanding of the factors associated with teacher supply in the state sector is crucial to assist policy makers and system leaders formulate effective responses to the teacher supply challenge. The Government has consistently focused more on recruitment measures to address shortages, but bodies including the National Audit Office, the House of Commons Education Select Committee and NFER have all called for a greater emphasis on improving teacher retention (NAO, 2017; GB, Parliament. HoC. Education Committee, 2017; Lynch *et al.*, 2016).

NFER has received grant funding from the Nuffield Foundation for an extensive programme of quantitative research to gain a more detailed understanding of the factors associated with teacher retention, turnover and returning to teaching in the state sector. We also carried out in-depth interviews with influential stakeholders in the nursing and policing sectors to understand the nature of retention issues faced by other public sector professions. The research identifies some of the key factors driving teacher retention and turnover, and suggests ways that school leaders can better retain teachers in the profession and ways that Government can develop policies to support them to do so. This report summarises the key findings and recommendations from the research.

Rates of teachers leaving the profession and moving school have both risen since 2010

The number of teachers leaving the profession before retirement has increased since 2010, which has made it more difficult to maintain supply at the desired level. Between 2010-11 and 2014-15, the rate of working-age teachers leaving the profession has increased from 8.9 per cent to 10.3 per cent in primary schools and from 10.8 per cent to 11.8 per cent in secondary schools.

Over the same period, the proportion of teachers moving school has risen more rapidly, from 5.3 per cent to 8.5 per cent for primary teachers and from 4.2 per cent to 8.3 per cent for secondary teachers. This increase in teachers moving around the system, which is likely to have had a more pronounced impact on specific types of school, could have caused a divergence between system-level and school-level perspectives of the current teacher supply situation. The leaving rate matters at a system-level as it affects the overall supply of teachers. However, more teachers leaving the profession and moving school means that school leaders have had more vacancies to fill each year, more staffing uncertainty to deal with and higher costs of recruiting replacements.

Recommendation 1: The Government should give greater attention to the impact of teachers moving around the profession and develop policies to support schools which are disproportionately affected.

The proportion of teachers in the workforce in their 50s has decreased markedly between 2010 and 2016

The proportion of full-time equivalent teachers older than 50 in both primary and secondary schools has decreased from 23 per cent in 2010 to 17 per cent in 2016. This is partly due to the cohort in this age band at the start of the period being larger than the one that followed it, and partly due to a higher rate of older teachers leaving the profession before normal retirement age over the period. If this trend continues, it will increase the scale of the challenge as new, inexperienced teachers will need to be recruited to replace them. This trend comes at a time when demand for secondary school teachers is already growing.

Recommendation 2: The Government should investigate why the rate of leaving among older teachers has been increasing and explore whether they could be incentivised to stay in the profession longer, particularly in subjects with specialist teacher shortages.

The proportion of teachers leaving the profession or moving school increased across all subjects between 2010-11 and 2015-16, although some subjects are more affected than others

Maths, science and modern foreign language (MFL) teachers have above-average rates of leaving the profession, whereas humanities teachers are the least likely to leave. Over the last five years, the number of new teachers being recruited into these subjects has been running below the Government's own targets. Low recruitment and retention rates among science and MFL teachers appears to have limited schools' ability to expand the teaching hours in these subjects, despite the Government's new accountability measures giving schools an incentive to do so.

Science and MFL teacher trainees attract generous bursaries of at least £25,000, which do not appear to be incentivising recruitment or retention to the levels required. Bursaries may be operating ineffectively because the payments are not tied to teachers staying in teaching, which NFER previously recommended should be changed to encourage teachers to stay. The Government's pilot of student loan reimbursement for science and MFL teachers and introduction of phased bursaries for maths teachers, which include retention payments, are both promising developments.

Recommendation 3: The Government should structure bursary payments or other financial incentives such as student loan repayments to explicitly incentivise retention in the teaching profession during the first few years after training.

Teachers work long hours during term time and are dissatisfied with their amount of leisure time

Teachers work considerably longer hours during term time than nurses and police officers work in a normal working week, and may be working additional hours during periods when the school is closed. Teachers have the lowest satisfaction with their amount of leisure time, compared to nurses and police officers. Because of the peaks and troughs of the school year, teachers work more intensively across fewer weeks in the year. Working long hours over prolonged periods, as teachers are doing, can create pressure and stress, with potential negative effects on health and well-being.

High workload, driven by policy changes and the demands of inspection, is the key reason teachers give for working long term-time hours (Lynch *et al.*, 2016; CooperGibson Research, 2018). Teachers who are unable or unwilling to work long hours to keep up with the high workload find their workload becomes unmanageable and are more likely to leave the profession. Unmanageable workload is consistently the most cited reason teachers give for why they leave the profession (DfE, 2017b). The emphasis on supporting the health and well-being of staff has increased over time in the nursing and policing sectors as a result of the perceived increase in workload in those sectors. Effectively promoting teacher well-being may improve their ability to

manage high workloads. The importance of line management support for improving retention, including managers having the skills to give support, is emphasised by stakeholders in nursing and policing. Given that leaving rates are highest among early-career teachers, support for this group is particularly important: support for early-career nurses is considered important for retention in the National Health Service (NHS).

However, effective action to reduce teacher workload – tackling the cause rather than the symptom – is also required. Since 2014, the Government’s ‘workload challenge’ has sought to understand the nature and extent of unnecessary and unproductive workload, and develop a plan of action for reducing it. In March 2018, the Government launched a campaign with Ofsted and teaching and leadership unions aimed at reducing teacher workload. In May 2018, the Government established a workload advisory group to consider how to remove unnecessary workload associated with data collection and management in schools and published a workload reduction toolkit for schools in July 2018. These are welcome steps in the right direction, although the words need to be followed by the right actions from all stakeholders to reduce teachers’ long term-time working hours.

Recommendation 4: School leaders, Government and Ofsted need to continue working together to review the impact their actions are having on the workload of all teachers, to identify practical actions that can be taken to reduce it.

Recommendation 5: Schools should consider having a governor or trustee responsible for staff welfare, or a member of the management team with specific time and responsibilities in this area.

Improving job satisfaction is a key motivation for teachers to leave for another job outside teaching

Despite a background of falling real-terms pay and longer working hours, 78 per cent of teachers report that they are satisfied with their jobs in 2015/16. However, the job satisfaction of teachers who leave teaching for another job increases considerably after they leave, which suggests that the prospect of higher job satisfaction outside teaching is an influential pull factor. Teachers’ job satisfaction also declines in the years before they leave teaching, suggesting that falling job satisfaction was an important factor contributing to their decision to leave. Previous NFER research has identified the quality of school leadership and management, including teacher autonomy and whether staff feel they are supported and valued by managers, and whether or not teachers feel their workload is manageable, are important determinants of job satisfaction (Lynch *et al.*, 2016).

Recommendation 6: School leaders should regularly monitor the job satisfaction and engagement of their staff directly, use line management effectively to identify workload issues, and intervene to increase support and reduce workload pressures where issues are identified.

Teachers are not primarily motivated to leave the profession by the prospect of increased pay

The pay of teachers who leave the profession and take up a new job is, on average, ten per cent less than it was when they were a teacher. Teachers feel this financial hit, as their self-reported satisfaction with their income also falls slightly after leaving. This suggests that most teachers are not leaving to seek a better-paying job, but instead many teachers take a salary cut in their new job to gain other benefits, such as improved job satisfaction or the opportunity to work part-time. In addition, 79 per cent of full-time teachers say they are satisfied with their income, higher than both nurses and police officers, although neither difference is statistically significant.

This does not imply that increasing teachers' pay will have no impact on teacher retention, since a pay increase may compensate for other factors that are driving their decision to leave. But policy responses that aim to increase teacher retention need to consider pay alongside other factors affecting the trade-offs that teachers make, such as their workload, working hours and job satisfaction. Following years of freezes and below-inflation increases, increasing teacher pay is likely to improve retention to some degree. However, there may be more cost-effective ways to improve retention, such as action to reduce teacher workload or targeting pay increases at specific groups.

The wider research evidence suggests that pay increases designed to improve teacher retention are likely to be best value for money when they are targeted at groups of teachers who are most responsive to pay differentials, such as early-career teachers and teachers of subjects with well-paid alternatives outside of teaching, e.g. science and maths (Hutchings, 2011; Sims, 2018). The Government's announced pay increase for 2018/19 of 3.5 per cent for teachers on the main pay scale and two per cent for teachers on the upper pay scale targets the increase at early-career teachers. This would seem to be a relatively effective use of scarce resources. However, the pay increases are not differentiated by subject. Recent research has argued that targeting pay increases or salary supplements at teachers of shortage subjects such as science and maths could have a sizeable impact on their relative undersupply (Sims, 2018; Sibieta, 2018).

Recommendation 7: Policy responses that aim to increase teacher retention must consider pay alongside other factors affecting the trade-offs that teachers make, such as their workload, working hours and job satisfaction.

Recommendation 8: The Government should target teacher pay increases at groups that are likely to be most responsive to pay changes, such as early-career teachers and / or maths and science teachers, as this is likely to be the most cost effective way of improving retention.

A lack of part-time working opportunities is leading some teachers to leave and discouraging potential returners

One in four teachers (26 per cent) in the primary sector works part-time compared to about one in six (18 per cent) in the secondary sector in 2016. Some of this gap between phases is due to there being a greater proportion of female teachers in primary schools, but a large part of the gap persists even when accounting for differences in age, gender and the number/age of teachers' own children. Twenty per cent of full-time secondary teachers who leave teaching for a new job take up part-time work. This suggests that primary schools are better able, or more willing, to accommodate part-time teachers. Part-time secondary teachers also have higher rates of leaving the profession than part-time primary teachers, suggesting that secondary teachers and/or secondary schools have more difficulty making part-time employment work. The secondary school teacher stock has a large cohort of teachers approaching their mid-thirties, which is when part-time employment peaks, meaning the next few years are a critical time for taking action.

Making more part-time opportunities available would mean some full-time staff move to part-time roles, reducing schools' staffing and requiring more teachers to fill the gap in the short-term. However, more and better part-time opportunities could improve teacher supply on balance by outweighing the loss from staff moving to part-time roles in three main ways. Improved part-time opportunities would help to retain full-time teachers who would have left without being able to go part-time, better retain existing part-time teachers and encourage more former teachers who want to return to part-time roles to do so. NFER research found that a lack of part-time and flexible working opportunities is one of the key barriers facing teachers who want to return to teaching (Buchanan *et al.*, 2018).

Over the longer term, teachers who would have left the profession without being able to go part-time may be more likely to return to work full-time in the future, after a period of part-time working. Keeping such teachers teaching could retain their expertise and reduce the risk of losing them from the profession permanently.

The stakeholders we interviewed in the nursing and policing professions thought that retention is affected by a different generation of 'millennials' who want tailored career plans, including flexible working patterns and a 'portfolio career'. Improved availability of flexible working patterns may reduce the number of teachers choosing to be employed flexibly through a supply agency: the NHS has identified this as an important way of potentially retaining more nurses directly in the state-sector, which could also be the case for teachers.

Recommendation 9: The Government and stakeholders in the secondary sector need to look urgently at identifying ways to accommodate more and better part-time working in secondary schools.

Recommendation 10: Further research with secondary schools which successfully offer greater flexibility in working patterns should be undertaken and best practice shared.

There appears to be little evidence to date that MATs are better able to retain teachers in the profession by providing opportunities to move within their structure

Former Education Secretary Nicky Morgan suggested that a model of flexible staff development in MATs would ‘give a clear path to career progression that will keep [teachers and leaders] engaged rather than looking for opportunities elsewhere’ (Morgan, 2016). However, our analysis shows that MATs tend to have a slightly higher than average rate of teachers leaving the profession compared to other school types, even after accounting for the fact that a large number of schools in MATs are sponsored academies. This may be due to different staff management practices in MATs, but could also be due to the way that staff movements from a school to the MAT central team are recorded. Conversely, there is little difference in the levels of churn in MATs compared to other school types. After excluding internal moves within the same MAT, MATs have similar rates of teachers moving school when compared to other schools.

However, our findings do suggest that MAT leaders are making use of the opportunities to redeploy teachers and senior leaders to where they are most needed in their academy trust, which come from being the legal employers of all staff in their schools. Staff movement within MATs tends to be slightly towards schools with more disadvantaged intakes, whereas in general, teachers are more likely than not to move away from such schools when they move. As the system of MATs grows and develops in the future, the opportunities for flexible staff deployment and staff progression and development within the same organisation may lead to longer-term retention benefits.

Recommendation 11: To help improve retention, leaders of MATs should do more to promote the benefits of working in their organisation to their teachers; for example, by raising the profile of the MAT as the structure that teachers belong to, and through promoting career paths for teachers to develop and progress within the MAT.

Teachers in schools rated as being Inadequate by Ofsted are more likely to leave the profession or move school

A school's Ofsted rating is an important predictor of a teacher's probability of moving school and, to a lesser extent, leaving the profession. The rate of teachers leaving the profession and moving school are highest when the school has been rated as being Inadequate in successive inspections. Interestingly, teachers in schools which have been upgraded to Requires Improvement have a higher probability of moving school than after a downgrade to Requires Improvement, perhaps as the after-effect of previously being Inadequate, or as a result of the experience of delivering school improvement being viewed positively in the labour market.

It is not known from the available data how effective the teachers working in Inadequate schools who leave the profession are. Some may be weaker teachers who possibly find they are better suited to jobs in other professions. However, some may be very effective teachers, but have had some of their motivation sapped from working hard to turn an Inadequate school around, perhaps with little support from their school leaders. Headteachers, school governors, LA education teams and MAT leaders should take steps to identify and offer support to these good quality teachers, perhaps by offering financial reward or recognition to them, or offering to move them to a less challenging school after a fixed period, to help retain them in the profession.

Recommendation 12: School and system leaders need to review what more they can do to identify and support good teachers who are working hard to turn Inadequate schools around, so that they do not drift away from the profession

The teacher supply challenge in London is particularly acute when compared to other geographic areas

London has considerably more teachers leaving the profession compared to other areas, including other large cities such as Birmingham and Manchester. Furthermore, while London schools attract a small net gain of teachers in their twenties from other geographic areas, they lose one per cent of teachers in their thirties and 0.6 per cent of teachers in their forties each year. One of the results of these trends is that London is the region with the youngest teaching workforce in the country (Worth *et al.*, 2018). This comes at a time when pupil numbers are rising faster in the capital than other areas. The cost of housing is likely to be a key factor influencing these trends (Worth *et al.*, 2018).

Recommendation 13: Policy makers should look at how policy interventions, such as housing subsidies, could help to recruit and retain teachers in high-cost areas.

Recommendation 14: Further research exploring the geographical flows of trainees into the teacher workforce and during their careers would help to gain an understanding of the detailed dynamic picture within and across different areas and aid the development of policy solutions in areas where teacher supply issues are most acute.

1 Introduction

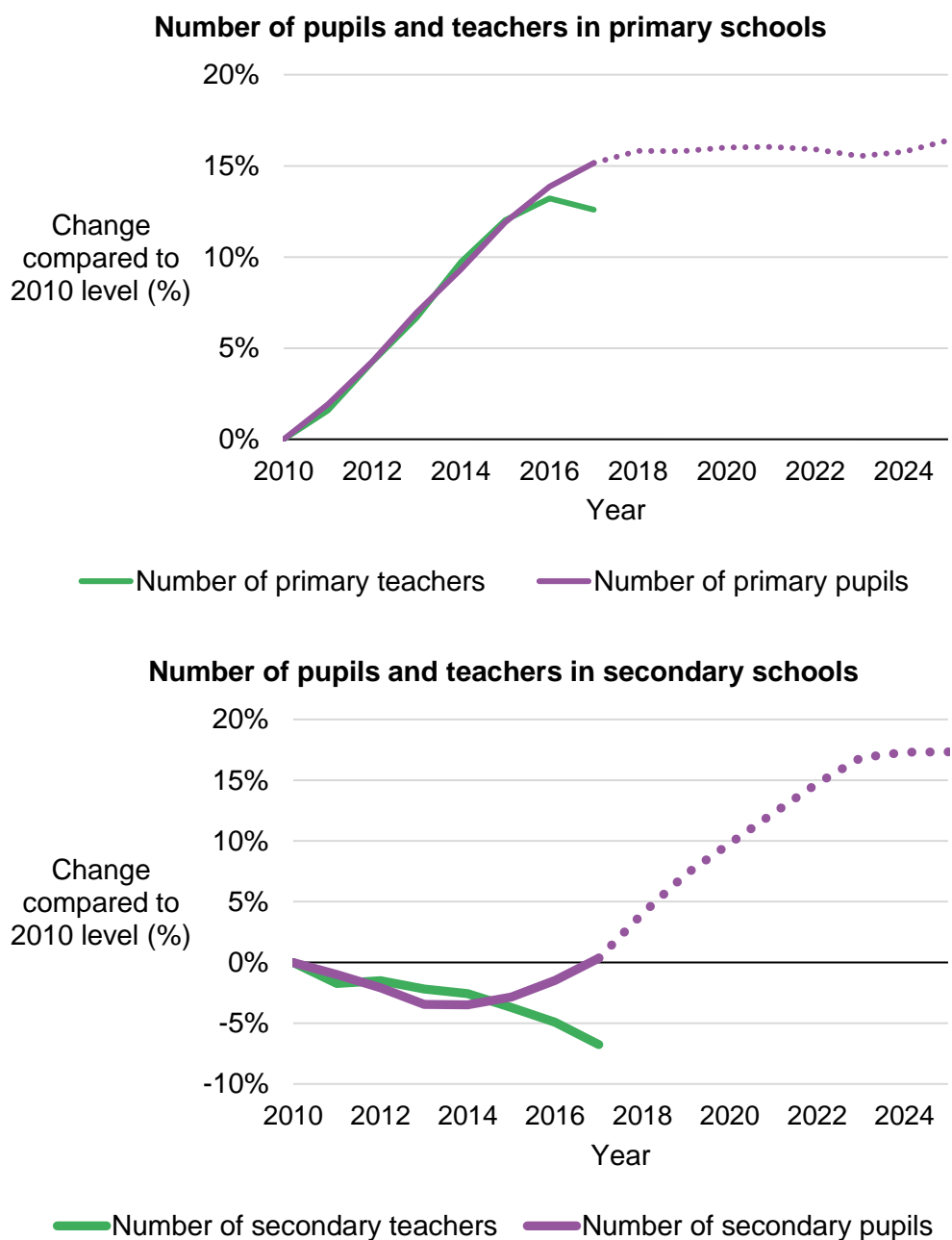
1.1 Policy background

Rising pupil numbers, shortfalls in the number of trainee teachers and concerns about the proportion of teachers who say they are considering leaving the profession mean that teacher supply in the state sector is a major policy issue in England. Meeting the current and future demand for teachers across school phases and types, subjects and diverse geographical areas is a complex challenge. The wide array of data sources for understanding the nature of the challenge make it difficult to get a comprehensive picture of what is happening in the teacher labour market. Formulating effective policy responses to meet this complex challenge is demanding, but essential for improving educational standards.

Education policy changes and economic trends are also influencing teacher supply. The Government's emphasis on schools teaching English Baccalaureate (EBacc) subjects has put particular pressure on the supply of teachers in subjects such as science, maths and modern foreign languages. Research on the effects of wider economic conditions on teacher recruitment and retention suggests that the current low rate of unemployment has made teacher recruitment and retention more difficult (Hutchings, 2011). Teacher pay scales, which are rising more slowly than inflation and pay rates in other sectors, may have also made teaching a less attractive profession to enter, and perhaps to stay in.

The demand for teachers is expected to rise over the next few years as the number of pupils in primary and secondary schools increase. Figure 1 shows how the number of primary (top) and secondary (bottom) school teachers and the respective number of pupils have changed over time since 2010, including the projected pupil numbers over the next decade (dashed line). Overall, primary teacher numbers have kept pace with pupil numbers as they have grown rapidly over the last five years. Primary pupil numbers are forecast to plateau over the next decade (DfE, 2018d). However, secondary pupil numbers have started to grow and the increased growth forecast to take place over the next ten years means the system needs an influx of secondary teachers to meet this demand. The latest data shows that the number of teachers has fallen in both phases despite growing numbers of pupils in both.

Figure 1 Secondary schools will need an influx of teachers to meet demand



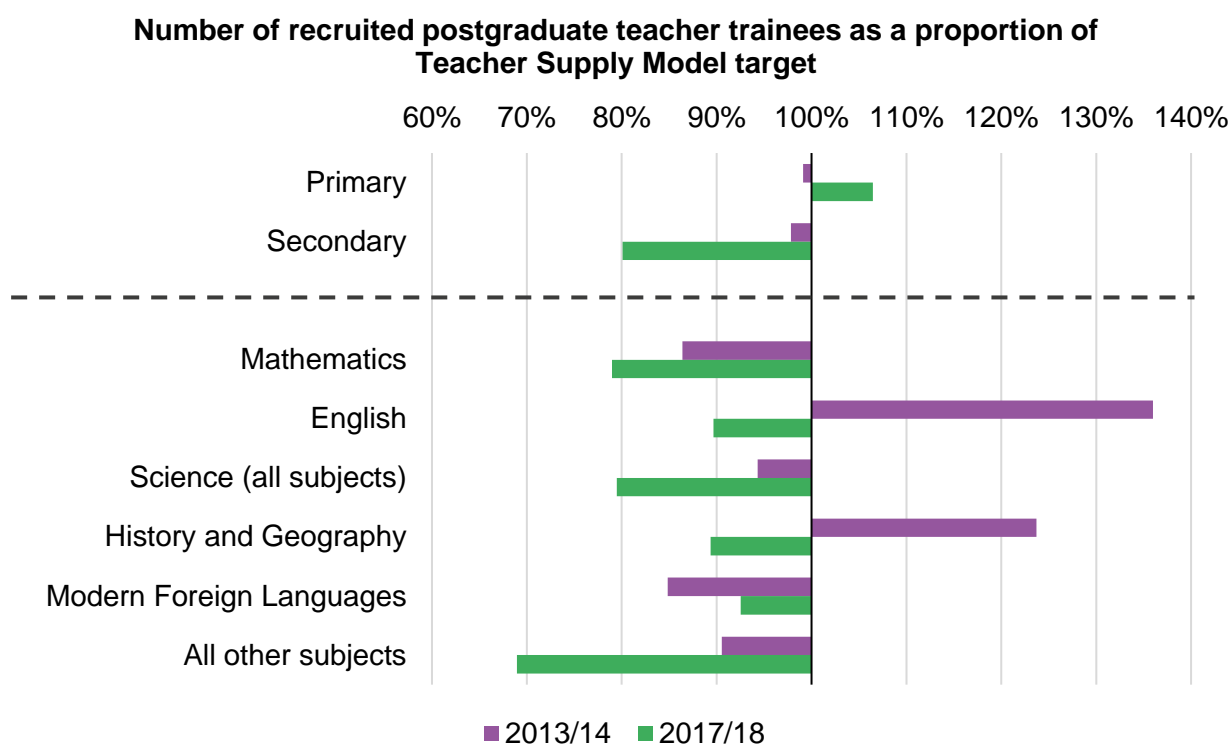
Source: DfE (2018c and d).

The Government uses the pupil number growth forecasts, expected policy changes and expected numbers of teachers leaving and returning, to estimate how many newly qualified teachers are needed in England's state-funded school system over the coming years, through its Teacher Supply Model (TSM) (DfE and NCTL, 2017). The overall number of actual new trainees has been below the targets set by the TSM estimates for each of the five years from 2013/14 – 2017/18. As

shown in Figure 2, secondary trainee numbers have seen a shortfall whereas primary trainee numbers have tracked the targets. The recent shortfalls have been across a range of subjects: the 2017/18 teacher training recruitment target was only achieved in history and physical education.

Shortfalls in recruiting new teacher trainees mean that retaining teachers who are already in the profession is all the more important for managing the current and future supply of teachers. Furthermore, encouraging experienced but inactive teachers to return to teaching in the state-sector is also an important component of meeting future teacher supply needs when there are too few new trainees entering the system.

Figure 2 Shortfalls in the number of new secondary teacher trainees compared to target have widened between 2013/14 and 2017/18



Source: DfE (2017f) *Initial teacher training: trainee number census - 2017 to 2018 (SFR68/2017)*.

1.2 Aims of this research project

Focusing on the overall number of teachers in the education system masks the more detailed and complex teacher supply picture underneath. Understanding this detail is critical for gaining a better understanding of the nuances of England's teacher supply situation and identifying areas where policy changes could have an influence. For example, the House of Commons Education Select Committee has called for more information to be available on teacher retention by subject, region and route into teaching. Recent research has found some important differences in the retention rates of teachers in different regions (DfE, 2016b) and for teachers who take different training routes (Allen *et al.*, 2016a). Our research as part of this project, as well as other research by the

Department for Education, has identified differences in retention rates by subject taught, particularly among early-career teachers (Worth and De Lazzari, 2017; DfE, 2017c).

This NFER research project – funded by the Nuffield Foundation – contributes new quantitative research evidence to this gap in knowledge and seeks to inform policy makers and system leaders to help formulate effective responses to this complex issue. There are three strands to this research:

1. Describe the characteristics of teachers and schools in England, how they have changed during the period 2010-2016, and determine the key factors associated with teachers leaving the profession, moving within the sector and returning to teaching in England. This strand uses data from the School Workforce Census (SWC).
2. Explore what happens to teachers after they leave the profession and what can be concluded about their motivations for leaving, using data from the Understanding Society (USoc) survey.
3. Compare the characteristics and behaviours of teachers with two other public sector professions, nursing and policing, using USoc and Labour Force Survey (LFS) data, and explore what policy solutions have been successfully employed in other professions, to see whether they could be relevant to the teaching profession.

1.3 Report structure

The sections of this report set out the most important and policy-relevant findings from our analysis.

Section 2	Data and methodology	A brief description of the data sources we use and our analysis methodology. A more detailed account of our methodology is in Appendices A and B.
Section 3	System dynamics	Provides an overview of the dynamics that affect the teacher labour market, including the factors influencing the demand for, and supply of, teachers.
Section 4	Teacher characteristics	Explores how the age and experience profile of teachers has changed over time and compares to other professions. It also explores how the subjects that teachers teach have changed over time and examines how age, experience and the subjects taught by teachers relates to retention and turnover.
Section 5	Working hours and job satisfaction	Looks at teachers' working hours and job satisfaction, which are key components of teachers' working conditions, and examines how they compare to nurses and police officers.

Section 6	Part-time and flexible working	Examines the state of part-time working in the teaching profession and considers how improving part-time and flexible working opportunities may improve teacher retention. It also considers flexible working in other sectors.
Section 7	Teacher pay	Explores how teachers' pay differs to that in other professions and the extent to which pay affects retention.
Section 8	Academies and multi-academy trusts	Considers the influence of academy status and multi-academy trusts on the retention and turnover of teachers who work in academy schools.
Section 9	Ofsted ratings	Explores the association between the Ofsted rating of a school and the retention and turnover of teachers in those schools.
Section 10	London	Compares London's teacher labour market with that of other areas of country, including other large cities such as Manchester and Birmingham.

2 Data and methodology

2.1 Data

We used three key datasets for our quantitative analysis of the teacher labour market: the School Workforce Census (SWC), the Understanding Society survey (USoc) and the Labour Force Survey (LFS). Each source is different and provides a unique lens on teacher labour market dynamics. We supplemented the quantitative data analysis with a small number of interviews with stakeholders in the nursing and policing sector, to understand the workforce issues in those professions. This section briefly describes the data sources we use and our methodology. A more detailed account of our methodology is in Appendices A and B.

2.1.1 School Workforce Census

We analyse data from seven consecutive waves (2010-2016) of the Department for Education's SWC, which is the premier data source about teachers in England. This contains information on all teachers employed in state-funded schools in England. The SWC data covers:

- teachers' personal characteristics – e.g. age, gender, ethnicity, when they first entered the state-funded sector
- the nature of teachers' employment – e.g. ID of the school where the teacher works, permanent or temporary contract, part-time or full-time status
- secondary teachers' timetables – e.g. weekly timetabled hours spent teaching different subjects and year groups.

We supplement the teacher-level information in the SWC with other information from a number of sources, including school information from Get Information About Schools and pupil demographic information from the School Census (which are published by the Department for Education), school inspection data published by Ofsted, and local-area pay data and unemployment data from the Office for National Statistics.

Strengths and limitations of SWC data

The SWC has a number of key strengths for analysing and understanding the teacher labour market. It covers almost every teacher in England's state-sector schools, has good coverage for many variables and, as a result, has good representativeness. Its longitudinal nature also means teachers can be tracked from year to year, enabling a detailed analysis of labour market dynamics to be undertaken. It has important educational information on teachers, such as the subject they teach and the ability to match in detailed information about the school where the teacher works.

However, the SWC also has a number of important limitations for gaining a complete picture of the teacher labour market. It contains a number of teacher characteristics, but the data is not as rich as in survey-based datasets such as USoc or the LFS. For example, it does not contain data on how many hours teachers actually work, their job satisfaction or information about their family

circumstances. There is also no reliable destination data in the SWC, other than distinguishing those that have left teaching in the state-funded sector to retire and those that have not retired.

The SWC has a small amount of missing data, which means that measures of rates of teachers leaving the profession are likely to be slightly overestimated. This is because we infer that a teacher has left the profession when they may simply be missing from the data. Some of the missing data is filled in by cross-referencing the SWC with the Database of Teacher Records (DTR - a database drawn from teachers' pension contributions). Earlier censuses (2010-2015) have been cross-referenced with the DTR, but not the most recent year (2016), meaning that trends over time should be interpreted cautiously¹. As the full extent of missing data is not known, it is not possible to make an explicit correction for this overestimate. However, missing data should not be a problem for comparisons between groups of teachers and schools, as long as the rate of missing data is similar between groups.

2.1.2 Understanding Society

USoc is the largest longitudinal household survey in the UK, based on a sample of 40,000 households (University of Essex, 2016). Every individual in the household is interviewed and have subsequently been tracked and re-interviewed across seven waves to date (2009/10 - 2015/16), even if they move house or form a new household during this time. The survey contains extensive data on individuals' employment, education, family life, health and well-being as well as linking to the characteristics of other individuals within the household.

We identify 1,205 individuals who were teachers in a school in England's state sector at some point across the seven waves of data. We define teachers as individuals whose main job is teaching in an English state-funded school, looking at the industry in which each individual worked, their occupation, their country of work, and whether they worked in the public sector:

- Industry = "Primary education" or "General secondary education"
- Occupation = "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 compare our sample of teachers with samples of nurses and police officers to draw comparisons with other professions that can provide context for findings relating to the teaching profession. We define nurses and police officers similarly to teachers – see Table 4 in Appendix B for more details on our definitions.

We observe individuals who were teachers at some point over the seven waves of data an average of 5.2 times. Of the 1,205 teachers identified, 761 remain in state-sector teaching in every time

¹ Based on comparisons between 2010-2015 data and revised 2010-2016 data, we estimate that the rate of teachers leaving the profession is overstated by around 0.7-0.9 percentage points in the most recent year (in this case 2015-16), whereas the rate of moving school is understated by around 0.2 percentage points.

point we observe them. We identify 444 individuals who, at some point across the seven waves, are recorded as not teaching in the state sector, having previously been a teacher. We have destination data in the first year after they left teaching for 435 individuals. Where there is missing data in a crucial field for defining whether an individual is a teacher (e.g. occupation, industry or sector), and therefore makes it ambiguous as to whether a teacher has left teaching, we conservatively exclude the entire data point from our analysis.

We use longitudinal sampling weights in our analysis, which take account of unequal selection probabilities, differential non-response, and potential sampling error. Using statistical weights mean that the findings are representative of the general population. We compare the characteristics of the USoc sample of teachers with data from the SWC to check whether the two samples are similar. We find that individual characteristics are reasonably well balanced, although older teachers are slightly over-represented in the USoc data and the leaving rate is higher in the USoc data than in the SWC (see Table 5 in Appendix B). The USoc sample also under-represents those working part-time, but this is due different definitions used (see section 6 for more details and the implications for analysis).

Strengths and limitations of USoc data

USoc has a number of key strengths for analysing and understanding the teacher labour market. It contains a richer set of characteristics than the SWC, for example data on how many hours teachers say they work, their job satisfaction and information about their family circumstances. It also enables teachers (and members of other professions) to be tracked after they leave the profession, to identify their destination and how pay, hours, satisfaction and other factors have changed after leaving. We apply sample weights, which ensure the overall survey is representative of the UK population. Under the assumption of no differential non-response among English teachers as compared to the population, we can assume that our sample of teachers is also representative of all teachers in England.

USoc also has a number of important limitations for gaining a complete picture of the teacher labour market. It has a relatively small sample size since it is drawn from a sample of UK households. While the number of individuals in the overall survey is relatively large for a survey, the number of teachers in England within the sample is much smaller. The survey also lacks important educational information on teachers, such as the subject(s) they teach and the school where they work. While the survey does have missing data, it is less of a problem for analysis of retention than in the SWC, since we can distinguish teachers who we know leave teaching from those with missing data.

2.1.3 Labour Force Survey

The LFS is a survey of the employment circumstances of the UK population, which is conducted by the Office for National Statistics. It is the largest household survey in the UK and provides the official measures of employment and unemployment. The sample consists of around 41,000 responding households in Great Britain every quarter. The LFS uses a rotational sampling design, whereby a household, once initially selected for interview, is retained in the sample for a total of

five consecutive quarters. The interviews are scheduled to take place exactly 13 weeks apart, so that the fifth interview takes place one year on from the first.

The strengths and limitations of the LFS for our analysis are similar to those of the USoc survey: it is nationally representative, has a richer set of characteristics than the SWC, but has a smaller sample size. The LFS has a less rich set of characteristics than USoc, but a larger sample size than USoc because new individuals are sampled each quarter (whereas USoc follows the same sample of individuals over time).

2.1.4 Interviews with public sector stakeholders

To help interpret the findings from the secondary data analysis, and to understand the nature of retention issues faced by other public sector professions, in-depth qualitative interviews were carried out with influential stakeholders in the nursing and policing sectors. We asked their views on: workforce supply challenges in their sector; why people join and leave the professions; and strategies employed to address any workforce challenges and to boost recruitment and retention. Interviews across other public sectors are useful for exploring whether there are any strategies that might be relevant to the teaching profession, where policy interventions might be focused in future to help meet workforce demands.

2.2 Methodology

2.2.1 Stage 1: Teacher workforce dynamics in the school sector

In the first stage of the research, we use data from the SWC to determine the key factors associated with a teacher leaving the profession, moving within the sector and returning to the profession in England.

We use the data to explore:

- how the composition of the teacher workforce has changed between 2010 and 2016 according to different characteristics such as age, sex, experience, part-time status, and the subjects they teach
- how rates of leaving the profession, moving school and returning to the profession have changed over time, and how they differ between teachers and schools with different characteristics
- how teacher, school and wider geographical factors influence a teacher's likelihood of leaving the profession or moving school, and how these factors interact with one another.

We use a logistic regression model to investigate the relationship between teacher, school and wider geographical characteristics, and the probability of both leaving the profession and of moving school. This statistical technique enables us to assess the importance of a variable in predicting the probability of an event, taking into account a set of other characteristics that are included in the model. More details about our method of analysis and a full list of the variables included in our regression models can be found in Appendix A.

We estimate two different sets of models: the first predicts the probability that a teacher leaves the profession in the following academic year, while the second predicts the probability that a teacher moves to a different school in the following academic year, given that they stay in the profession.

We refer to teachers ‘leaving the profession’ in this report, although it actually refers to teachers leaving teaching in the English state-funded sector. A teacher is considered as having left the teaching profession if they appear in one wave of the SWC but not in the following one. This usually happens because a teacher leaves the teaching profession: to retire, look after family, or pursue a different career. However, the SWC only collects information on teachers that are working in state-sector schools. Therefore, teachers also leave the SWC if, despite continuing to work as a teacher, they move to an independent school, a further education college, to teach in Wales or Scotland, or to teach abroad. They may also take up a non-teaching role in a school, which cannot be identified from the data we have analysed. The proportion of teachers that leave the profession is the number of teachers who left the profession between one year and the next divided by the total number of teachers in the dataset in the base year.

The definition of a teacher that moves school is simply a teacher who appears in two consecutive waves of the SWC, but is employed in different schools in those censuses². Our measure of the proportion of teachers that move school is the number of teachers moving to a different school divided by the total number of teachers in the initial year, excluding those who leave the profession.

We also analyse teachers who return to the profession. We describe the characteristics of all qualified teachers that are identified as returners in a given year, having been identified as having previously taught in the state-sector by matching them to the DTR. We also measure the probability that a teacher who left the profession in 2010 (i.e. was present in the 2010 SWC, but was not present in the 2011 SWC) returns to the profession in future years. Analysis of this subset of returners also enables us to compare the teacher and school characteristics of the role / school each teacher left and the one they joined.

2.2.2 Stage 2: Teacher labour market behaviour

In the second stage of our research, we conduct new statistical analysis of USoc survey data to understand the external and personal factors that are associated with teacher labour market behaviour.

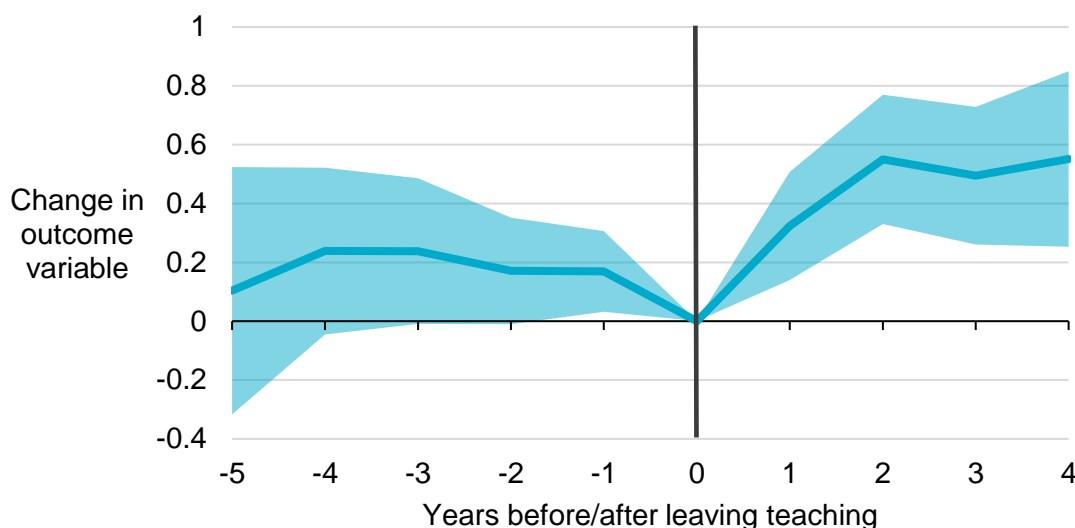
We use USoc data to explore what happens to teachers after they leave teaching. We estimate the change in a range of outcomes (e.g. monthly pay, working hours, etc.) before and after leaving using a fixed effects regression model. Each individual’s outcome measure in a particular year before or after they leave teaching is compared with the outcome measure for that same individual in the year just before they leave teaching.

In the charts we present (see Figure 3 for an example), year 0 represents the reference point, year 1 is the first year after leaving, year -1 is one year before leaving, and so on. The solid line shows

² We identify schools according to their Unique Reference Number (URN) and carefully identify schools that are unchanged except for changing URN, e.g. because of becoming an academy.

the change in outcome in the years before and after leaving, averaged across all leavers. The shaded area shows the 95 per cent confidence interval.

Figure 3 Example chart from analysis of outcomes after leaving



Because of the seven-wave dataset, the sample size of leavers six years after leaving is smaller than the sample of teachers one year after leaving. An individual would need to leave in wave 1 to have six years of post-leaving data, but an individual could leave in any wave between 1 and 6 to have one year of post-leaving data (see Table 7 in Appendix B). This is reflected in the confidence intervals, which are wider when further away from the base year. The sample sizes five and six years after leaving are too small for robust conclusions to be drawn, so they are not reported. The regression model also takes into account the individual's age, as some outcomes are likely to change over time anyway.

2.2.3 Stage 3: Comparing teachers with nurses and police officers

In the third stage of our research, we conduct new statistical analysis of USoc survey data to compare and contrast the characteristics of teachers with those of nurses and police officers. We also analyse the findings from the qualitative interviews with influential stakeholders in the nursing and policing sectors.

We focus on these professions as comparators for three main reasons. First, professionals in the public sector tend to be more “mission-oriented”, meaning a stronger intrinsic motivation relating to the organisation's mission rather than extrinsic motivation to work (Besley and Ghatak, 2005). Second, nursing and policing are two public sector professions that can be reliably identified from standard occupation and industry codes in household surveys, which enables a sample to be derived. Finally, the samples of nurses and police officers we can identify from the household survey data are large enough for robust comparative analysis. For example, it would have been desirable to extend our analysis to consider comparisons with social workers and doctors, but the numbers of individuals from these professions in household datasets are too small.

Nursing and policing have several similarities to teaching. For example, there is a growing demand for professionals across the sectors. A growing and ageing population has meant that, whilst the number of nurses has increased, workforce growth has not kept up with demand. The nursing sector is also facing retention challenges, as the proportion of nurses leaving the profession has increased in recent years. Among police officers, although attrition is lower, the rate is also increasing. Retention in all three sectors is likely to be affected by a different generation of ‘millennials’ who want different things from their working lives (including flexibility). In addition, the pay in all three professions is regulated and influenced by pay review bodies and has in recent years been affected by public sector pay caps.

Another similarity is that teachers, nurses and police officers are all described by key stakeholders as *‘professional groups requiring advanced skills’*. Teaching and nursing are already graduate professions, and policing is moving in that direction. All three roles are complex and require a variety of skills, and skills that are said to be changing: for example, teachers, nurses and police officers have an increasing need to be able to support vulnerable people and those with mental health needs. Teachers, nurses and police officers should be able to spend their core time on the aspects of the roles they are educated and trained to do, whilst being supported by others such as teaching assistants, Nursing Associates and police support staff. All three roles have been described by stakeholders as often isolated, with a need for effective leadership, teamwork, and support networks.

However, there are also important limitations to the comparisons we are able to draw between teaching, nursing and policing as there are notable differences between the professions. For example, their working patterns differ, with teachers usually working most intensively during term-time, while nurses and police officers work all year round. Nurses and police officers also work shift patterns whilst teachers do not (although they do often work outside of their contracted hours in evenings, at weekends and during school holidays). Moreover, although all three professions are likely to deal with high stress situations, the *type* of challenges they face are likely to be different. For example, police officers will face a higher degree of danger, and both police officers and nurses could be making life or death decisions, which are the sorts of challenges unlikely to be faced by teachers. Despite the differences, the similarities between the professions make it useful to conduct comparisons between them, to explore what the teaching sector can learn from the demand and supply challenges faced and the policy solutions that have been employed.

3 System dynamics

The situation in the teacher labour market at a system-level is characterised by whether the supply of teachers is sufficient to meet the demand for teachers. Over time, whether the supply of teachers continues to meet demand, or whether shortages grow or shrink, is determined by the dynamics of supply and demand. This section sets out the main factors that influence changes in teacher supply and demand, and which are therefore crucial for understanding how the teacher labour market has developed over time and how it is likely to develop in the future.

This section, and indeed the rest of the report, focuses on the *number* of teachers and the issue of supply sufficiency, but does not explore the *quality* of teachers. The quality of teachers is a crucially important factor for the quality of education and has an important interplay with teacher supply, but is a complex issue that is beyond the scope of this research.

3.1 Teacher demand

The demand for teachers is primarily driven by pupil numbers. As shown in Figure 1 in the introduction section, pupil numbers have grown rapidly in the primary sector since 2010, but have fallen in the secondary sector. However, growth in pupil numbers is expected to slow for the primary sector over the next decade, while it is forecast to grow rapidly in the secondary sector as the larger cohorts of primary pupils move up to secondary school.

Government policies also affect the overall demand for teachers and the demand for different types of teacher. For example:

- the policy of keeping maximum class sizes fixed at around 30 pupils (including a legal limit for infant pupils) means that pupil growth implies growth in the number of teachers the system needs. The Department for Education assumes that if the number of pupils grows by two per cent then the school system needs the teacher stock to increase by around one per cent (DfE and NCTL, 2017).
- the demand for secondary teachers that teach different subjects is influenced by schools' curriculum approach as well as by Government policy: the policy of incentivising EBacc subjects³ through the Progress 8 (and also EBacc entry) accountability measure has changed the demand for teachers of different subjects. In July 2017, the Government amended its ambition to have 90 per cent of pupils studying GCSEs in the EBacc subjects by 2020, to 75 per cent of pupils doing so by 2024 and 90 per cent by 2027.

3.2 Teacher supply

The number of full-time equivalent teachers in England's state-funded schools has increased from 441,800 in 2010 to 457,300 in 2016, an increase of 3.5 per cent. As shown in Figure 1, this has largely tracked the overall change in demand from increased pupil numbers.

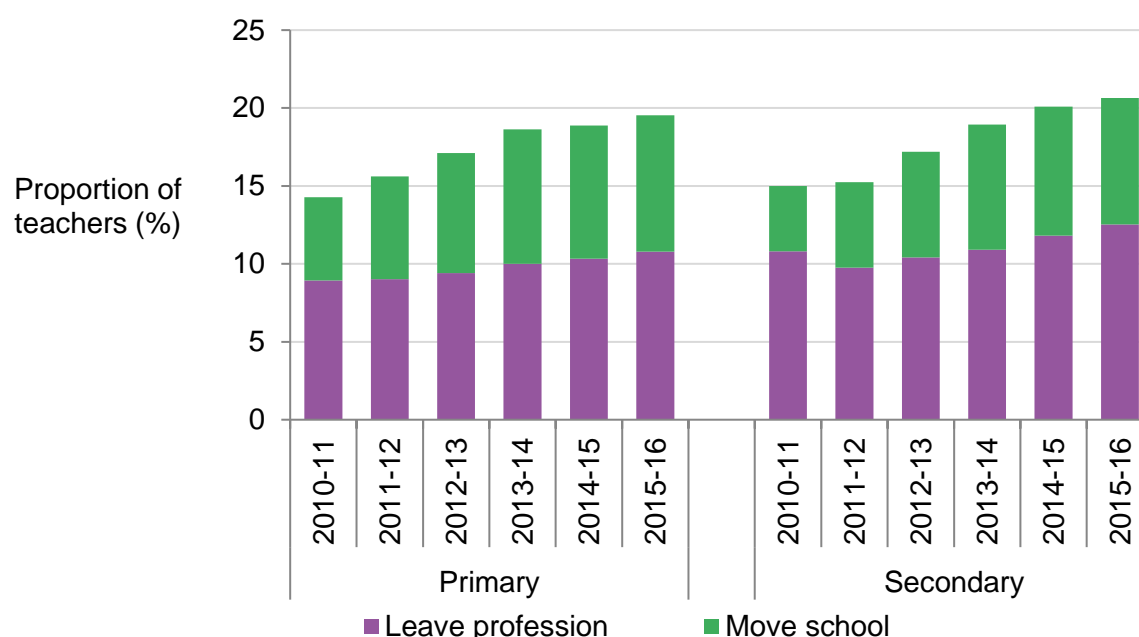
³ English, mathematics, sciences, geography or history and modern foreign languages.

Teacher supply is influenced by teacher labour market dynamics: teachers moving in and out of the state-funded sector. The overall teacher supply situation is affected by the balance between the number of teachers leaving and the numbers joining. The following sections describe the high-level trends in the number of leavers and entrants in England's teaching workforce.

3.2.1 Teacher leaving and moving rates

The purple bars in Figure 4 show that the number of working-age teachers leaving the profession has increased since 2010, making it more difficult to maintain supply at the desired level, especially given rising demand from pupil numbers. A small part of this increase will be caused by measurement error from missing data in the SWC⁴. Nonetheless, the proportion of working-age teachers who leave the profession each year has increased since 2010. Between 2010-11 and 2014-15, the rate of working age teachers leaving the profession has increased from 8.9 per cent to 10.3 per cent in primary schools and 10.8 per cent to 11.8 per cent in secondary schools.

Figure 4 Retaining working-age teachers is getting more challenging



Source: NFER analysis of School Workforce Census data. Includes teachers under age 60.

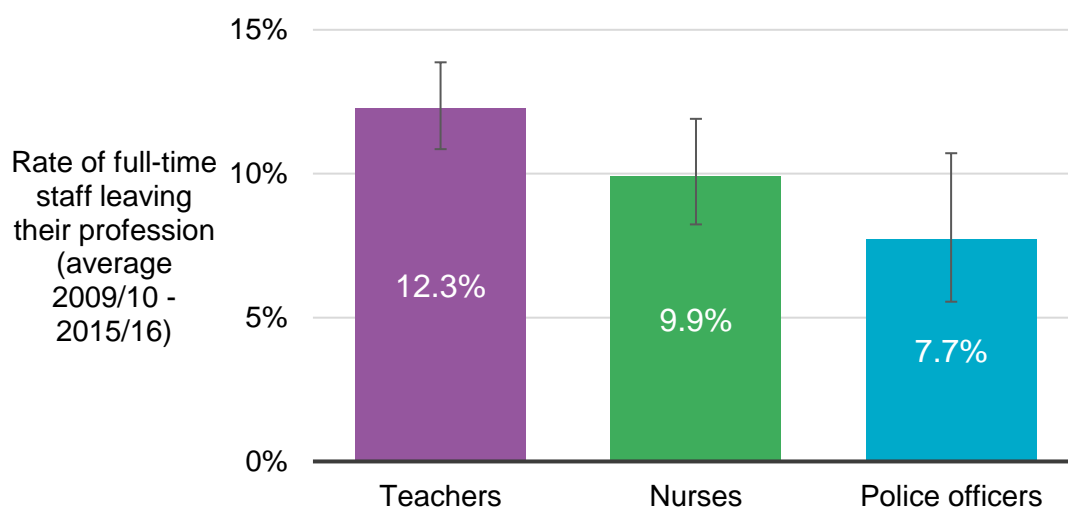
The green bars in Figure 4 show that the proportion of teachers moving school has risen more rapidly over the same time period, from five to nine per cent for primary teachers and four to eight per cent for secondary teachers. This increase in teachers moving around the system, which is likely to have had a more pronounced impact on individual schools or specific types of school, could have caused a divergence between system-level and school-level perspectives on the

⁴ Based on comparisons between 2010-2015 data and revised 2010-2016 data, we estimate that the rate of teachers leaving the profession is overstated by around 0.7-0.9 percentage points in the most recent year (in this case 2015-16), whereas the rate of moving school is understated by around 0.2 percentage points.

current teacher supply situation.⁵ This is because the leaving rate matters at a system-level as it affects the overall supply of teachers. However, more teachers leaving the profession and moving school means that school leaders have had more vacancies to fill each year, more staffing uncertainty to deal with and higher costs of recruiting replacements.

How does the rate of leaving the profession in teaching compare to other professions? Figure 5 shows a comparison of leaving rates between teaching, nursing and policing. We find that the leaving rate is higher in teaching than in the other two. However, there is a statistically significant difference between the leaving rates for teachers and police officers, but not for teachers and nurses. There are likely to be a number of factors why the leaving rates vary between the professions, some of which are general (e.g. do teachers have a greater number of alternative options in the labour market?) and some profession-specific (e.g. the nature of contracts, pension arrangements, the policy environment they are working in).

Figure 5 Teachers have a higher rate of leaving the profession than nurses and police officers

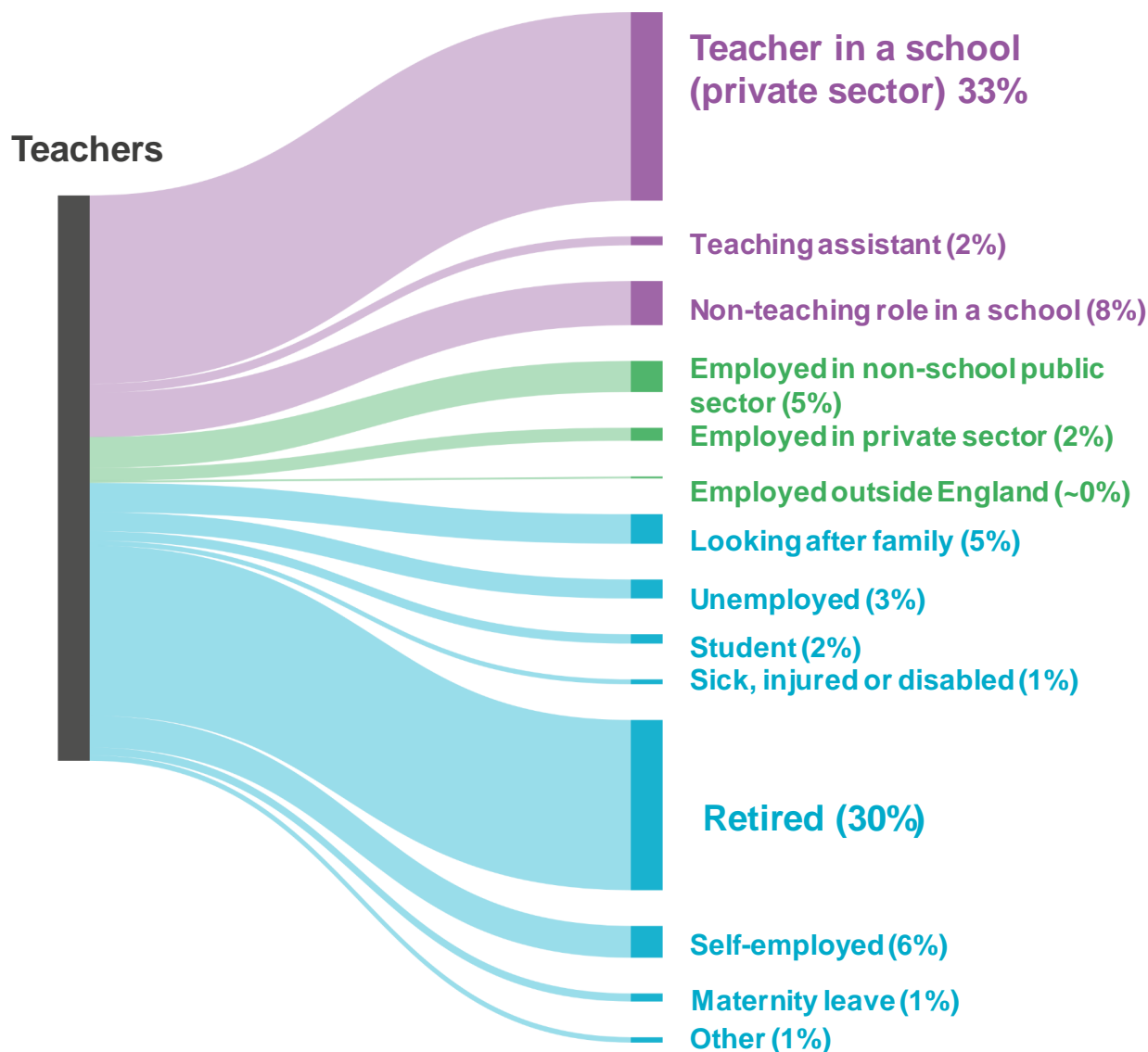


3.2.2 Destinations of leavers

What do teachers who leave the profession do after they leave? The longitudinal design of the USoc survey means we can track what teachers are doing after they leave the teaching profession. We categorise ex-teachers' economic activity and, if they are employed, their occupation, industry and sector codes, to identify their post-teaching destinations. Figure 6 summarises the destinations of 435 state-sector teachers in England who left, in the first year after they left (including 125 who retire).

⁵ The findings from our regression model (see next section and Appendix A for more details) suggest that changes in the composition of teacher or school characteristics do not explain the rise in leaving and churn rates over time. In fact, the rates of leaving the profession and moving school have risen by *more* than the changes to teacher and school characteristics would predict. See Appendix A for a detailed discussion of this finding.

Figure 6 More than half of non-retiring teachers move to work in the wider education sector



Source: NFER analysis of Understanding Society data.

Our previous analysis of destinations using the LFS found that more than half of teachers who leave and do not retire take up a job in the wider education sector (Worth *et al.*, 2015). This USoc analysis confirms that picture, finding that 43 per cent of leavers (and 61 per cent of non-retiring leavers) are working in the wider education sector in the year after they left. A third of teachers who were teaching in an English state-sector school moved to a job teaching in a school, but in the private sector. Many of these teachers are likely to be teaching in the independent sector, but this group could also include supply teachers, since the agency they work for is a private sector firm, but the individual's place of work is a school, which could be in the public sector.

Around eight per cent of leavers are employed in a non-teaching role in a school (although not necessarily employed by a school), which includes education officers, school inspectors, youth and social workers and administrative and secretarial roles. Thirty per cent of leavers retire and a further 13 per cent are ‘economically inactive’ in other ways, for example, looking after family or unemployed.

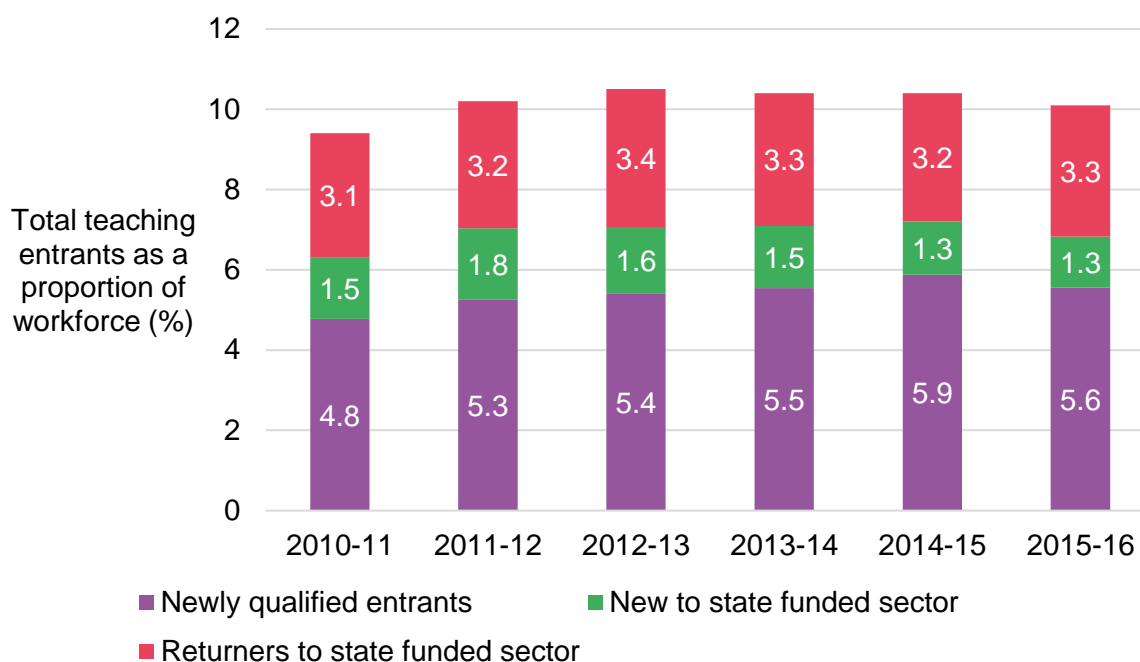
While these findings are largely consistent with our previous findings from the LFS, there is one important difference. Our LFS research found that 15 per cent of non-retiring leavers were employed as teaching assistants, compared to only 1.6 per cent of our USoc sample of teachers. The reasons for this difference are unclear, but could be due to the different methodologies for assigning occupation codes from interviewees’ responses. Both use Standard Occupational Classification codes, but LFS occupations are coded by the interviewer after the interview, whereas the USoc occupation coding is done using a computer-assisted structured coding system. However, it is not clear why such a difference would arise from these different methods, nor which is more likely to be accurate. The question of how many teachers become teaching assistants could potentially be answered with greater certainty using the SWC, since it includes teaching assistants as well as teachers and other school-based staff, but has not been explored as it is outside of the scope of this research.

3.2.3 Teacher joining rates

The number of new entrants into teaching has also increased since 2010, helping to maintain supply. However, as shown in Figure 2 in the introduction, the number of new entrants from teacher training is below what the Government estimates is required to maintain future teacher supply, and the overall secondary teacher recruitment targets have been missed for the last five years. The targets have got more and more stretching at the same time, due in part to rising pupil numbers. Delivery of EBacc, which requires challenging targets in harder-to-recruit subjects such as modern foreign languages, has also made the secondary targets more difficult to achieve.

Figure 7 shows that the number of newly qualified entrants has been increasing as a proportion of the workforce, from 4.8 per cent in 2010 to 5.6 per cent in 2016. Over the same period the recruitment targets have also been increasing due to growing demand, hence why the targets continue to be missed in spite of more newly-qualified entrants. To some extent, the shortfalls in new teacher trainees have been met with increased numbers of teachers returning to teach in the state-funded sector. The proportion of the full-time equivalent teacher workforce that are returners has increased from 3.1 per cent in 2010-11 to 3.3 per cent in 2015-16. However, over the same period the number of qualified teachers who enter state-sector teaching several years after initially qualifying (new to the state-funded sector) has fallen as a proportion of the workforce from 1.5 per cent in 2010-11 to 1.3 per cent in 2015-16.

Figure 7 The number of entrants to teaching has risen since 2010



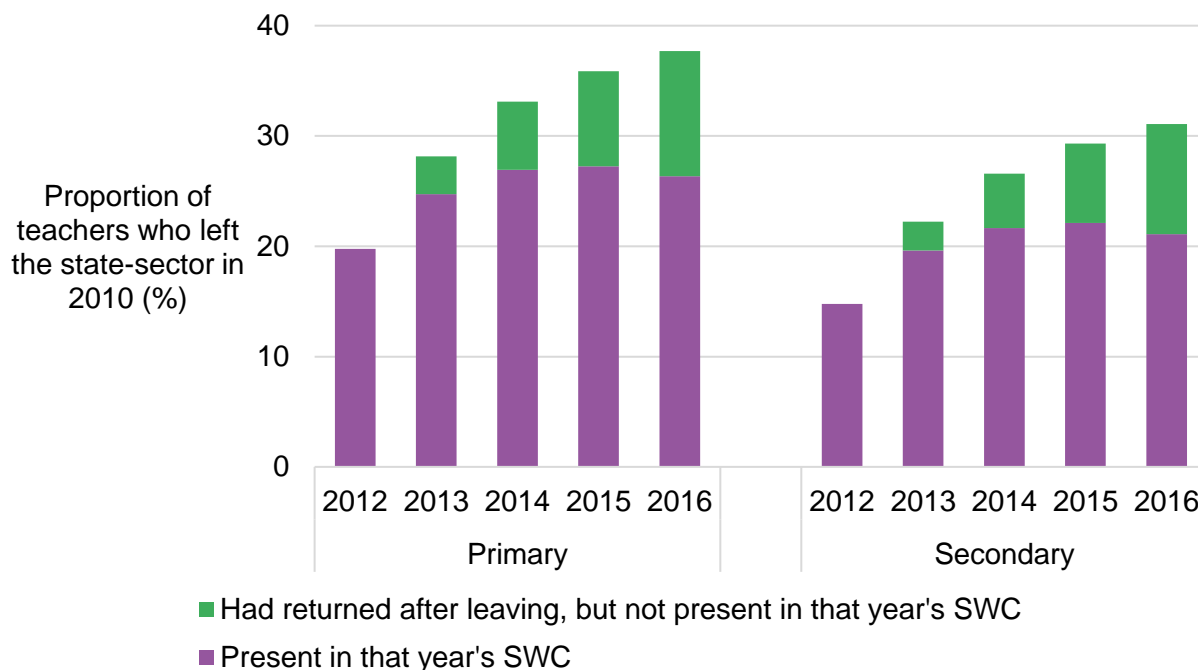
Source: *School Workforce in England 2016 (SFR25/2017, Table 7b)*.

3.2.4 Returners

Data published by the Department for Education shows that in 2015 there were 243,900 qualified teachers aged under 60 who were out of service, but had previously worked as a teacher in the state-sector (DfE, 2017d). Seven per cent of them (17,230) entered teaching as returners in 2016. As shown in Figure 7 above, these entrants represented 3.3 per cent of the full-time equivalent (FTE) teacher workforce in 2016. A large proportion of returners are those who left the profession in recent years. For example, 83 per cent of the teachers who returned to teaching in the state-sector in 2016 were present in one or more of the 2010-2014 SWCs.

We analyse the extent to which teachers return to the profession in the short-term by identifying the group of teachers who left teaching in 2010, and measuring their frequency in subsequent censuses. Figure 8 presents the data: the purple bars show the proportion of 2010 leavers who are present in each subsequent census. The green bars show the proportion of 2010 leavers who are not present in a particular subsequent census, but had returned at some point before that (e.g. a teacher who returned in 2012, but then left and wasn't present in the 2013 census). The total of the two bars shows the number of leavers who returned at some point between leaving and that year.

Figure 8 Around a third of teachers who leave the teaching profession return at some point over the next five years



Source: NFER analysis of School Workforce Census data.

The data shows that 20 per cent of primary teachers who left in 2010 and 15 per cent of secondary teachers who left in 2010 were present in the 2012 census. By 2016, 38 per cent of primary teachers and 31 per cent of secondary teachers who had left in 2010 had subsequently returned at some point over the next five years. Most of those who do return in the five years after leaving do so in the first year after being out the profession. These figures highlight that a large proportion of the roughly ten per cent of teachers who leave the profession each year are not lost forever, and indeed many of them return fairly quickly. Indeed, many may not seem like returners at all: a teacher who leaves one school in July and is employed in a new school from January would be classed as a returner for this analysis because they were not present in the intervening SWC, collected in November.

Among these short-term returners, 80 per cent returned to a different school to the one they left. This suggests that most returners are re-entering teaching by applying for jobs through the open labour market, rather than making arrangements to return with a former employer. Given that only one in five returners returns to the same school, it also suggests that schools may be able to benefit from teachers returning if they stay in touch with their former teachers.

4 Teacher characteristics

In the previous section, we showed how the system-level demand and supply of teachers has changed between 2010 and 2016. In this section, we look beyond the overall dynamics to how the composition of the teacher workforce has changed over time, and how teacher characteristics are associated with retention and turnover.

We use a logistic regression model to explore the relationship between the probability of a teacher leaving the profession and teacher, school and geographical factors. We also explore the relationship between these factors and the probability of a teacher moving school. These models enable us to assess the importance of a variable in predicting the probability of an event, taking into account the set of other characteristics that are also included in the model. See Appendix A for a detailed discussion of our methodology.

Among the teacher, school and geographical characteristics that we use to try and explain variation in the rate of teachers leaving the profession and moving school, the teacher characteristics are by far the most important. The set of teacher characteristics in our logistic regression model explain around 95 per cent of the variation in the probability of leaving the profession that the whole model is able to explain⁶. In terms of moving school, the set of teacher characteristics explains a lower, but still substantial, proportion of the variation we are able to explain: around 55 per cent.

Two individual characteristics stand out from our analysis as being important for understanding teacher dynamics:

- a teacher's age and years of experience are jointly the most important predictor of whether or not they leave the profession, and are also important predictors of their likelihood of moving school
- the numbers of teachers teaching each subject, which has changed over the period 2010-2016, influenced by a combination of policy changes, school finances and teacher supply constraints.

In the rest of this section, we show how these characteristics have changed since 2010 and the association they have with a teacher's probability of leaving the profession, moving school and returning to teaching.

4.1 Age and experience

4.1.1 Change over time

The age profile of teachers in both primary and secondary schools has changed in important ways between 2010 and 2016. In particular, the proportion of full-time equivalent teachers older than 50 has decreased from 23 per cent in 2010 to 17 per cent in 2016, in both primary and secondary

⁶ However, a large proportion of the variation is unexplained by the whole model – see Appendix A for discussion of this. The results are very similar for both primary and secondary school teachers.

schools. At the same time, the proportion of primary teachers who are younger than 30 and secondary teachers in their 30s and early 40s have increased since 2010.

Figure 9 shows how the *number* of teachers of different ages has changed between 2010 and 2016. This sheds light on how much of these changes are down to ‘cohort effects’ (i.e. some cohorts of teachers are larger than others and move through the age distribution over time) or ‘age effects’ (i.e. different age groups are disproportionately more or less likely to join or leave the profession).

Figure 9 The number of teachers in their fifties has fallen since 2010



Source: NFER analysis of School Workforce Census data.

In both primary and secondary schools, the number of teachers who were older than 50 has decreased. The data shows that this was a particularly large cohort of teachers: those aged 51-59

in 2010 entered the profession during the boom in secondary pupil numbers that peaked in 1981 (Bolton, 2012). This cohort was also born between 1951 and 1959, which corresponds to the last years of the post-war baby boom.

However, most of these individuals have not reached the normal retirement age: more than half of teachers aged 50-59 who leave the profession are retiring early (58 per cent in primary and 62 per cent in secondary) while some are likely to be leaving for other opportunities and for other reasons. The increase in the propensity to leave before normal retirement age for teachers older than 50 could be for a number of reasons which we cannot identify from the SWC data alone. It may be due to all the major reforms in education – to the National Curriculum, the accountability system, and to qualifications – that are likely to have increased workload and may have encouraged some teachers to leave.

A Government review has described the wider research evidence on the factors that may be driving older teachers to leave the profession as “limited, with most of what is currently available focussing on early exits or the pension benefits taken (but not the reasons behind the retirement route involved)” (DfE, 2017e). This suggests that more research is needed to investigate why the rate of leaving among older teachers has been increasing and explore ways of incentivising them to stay in the profession longer. Given there are subjects with specialist teacher shortages, research into what may encourage older teachers of these subjects to work for longer would be particularly beneficial. For example, a managed reduction in working hours may be attractive for some older teachers who might otherwise leave without an option of part-time working (see section 6 on part-time working)

The decrease in the proportion of older teachers is a combination of both a ‘cohort effect’ and an ‘age effect’. The cohort of teachers in their fifties in 2010 was larger than the cohort it was followed by. This partly explains why the proportion of teachers in their 50s in the profession has fallen over time. However, there has also been a high rate of older teachers leaving, which has accelerated the decline in the proportion of the workforce that is over 50.

The increase in the number of young teachers in primary schools reflects the rise in the number of pupils enrolled in primary schools following a boost in birth rates starting from 2002, which resulted in a 13 per cent increase in the number of pupils in the primary sector between 2010 and 2016. This in turn led to an increase in the number of new teachers recruited into primary schools, who tend to be in their early 20s.

The increase in the number of secondary teachers in their 30s is due to the large cohort that were recruited and trained during the last period of growth in secondary pupil numbers, which peaked in 2004, moving up the age distribution. Secondary pupil numbers have been falling since then, but are set to increase again, by 19 per cent, between 2017 and 2026 (DfE, 2017a).

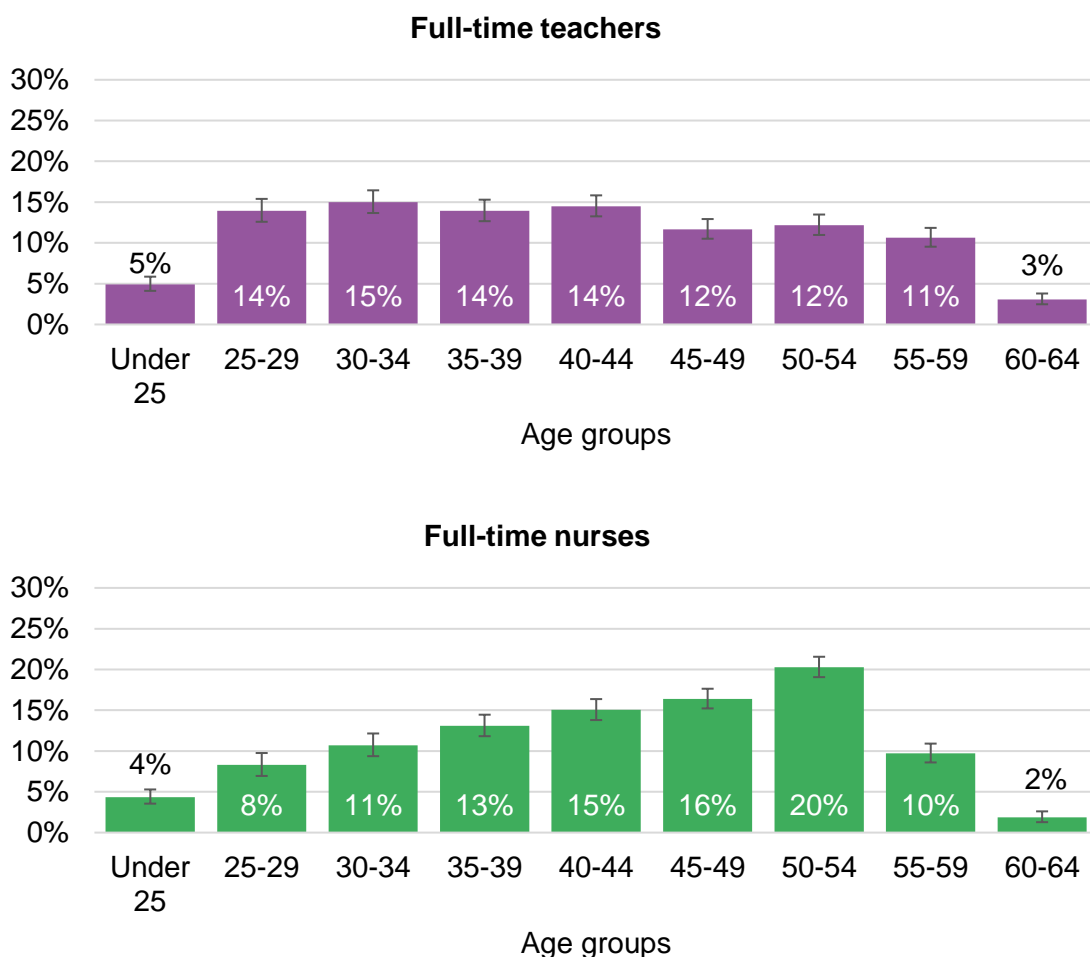
4.1.2 Comparing professions

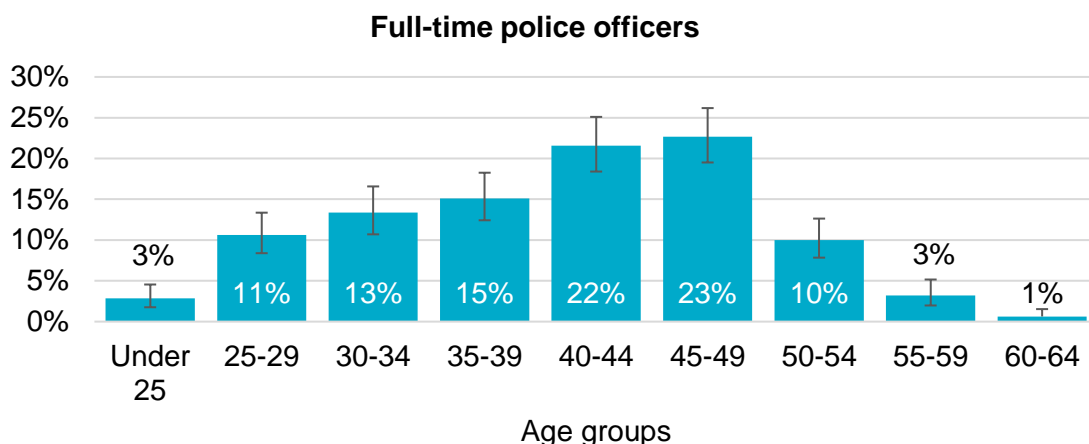
As part of this research, we examine how full-time teachers compare to full-time nurses and police officers, two of the other large and important public sector professions in England. Figure 10 shows that the age distribution among teachers differs substantially from nurses and police officers. USoc

data shows that nurses are the oldest on average, with an average age of 44 years old, followed by teachers (42 years) and police officers (40 years). Part of the reason that the police are younger on average may be due to the physical demands of their role. It may also be due to the police pension scheme that was in place up to 2006, where police officers could retire on a full pension at the age of 50 if they had served at least 30 years.

The teacher workforce is fairly evenly distributed, with a slight decline for older age groups. Conversely the nursing workforce is skewed towards older nurses, with about a third being aged 50 or older, which are likely to need to be replaced in the next five to 10 years. This could be challenging for the profession given the relatively low numbers of young nurses entering the profession.

Figure 10 Teachers have a younger age profile than nurses and police officers





Source: NFER analysis of Understanding Society data.

Nearly half of police officers are aged 40 to 49. Many of these officers are likely to have joined the police prior to the 2006 pension changes, so could be planning to retire in the next five to ten years when they have completed their 30 years' service. Although police numbers have declined in recent years and the work of police officers is shifting in focus, the profession may face a similar challenge to the nursing profession to recruit new police officers or retain current staff to replace those who are likely to retire.

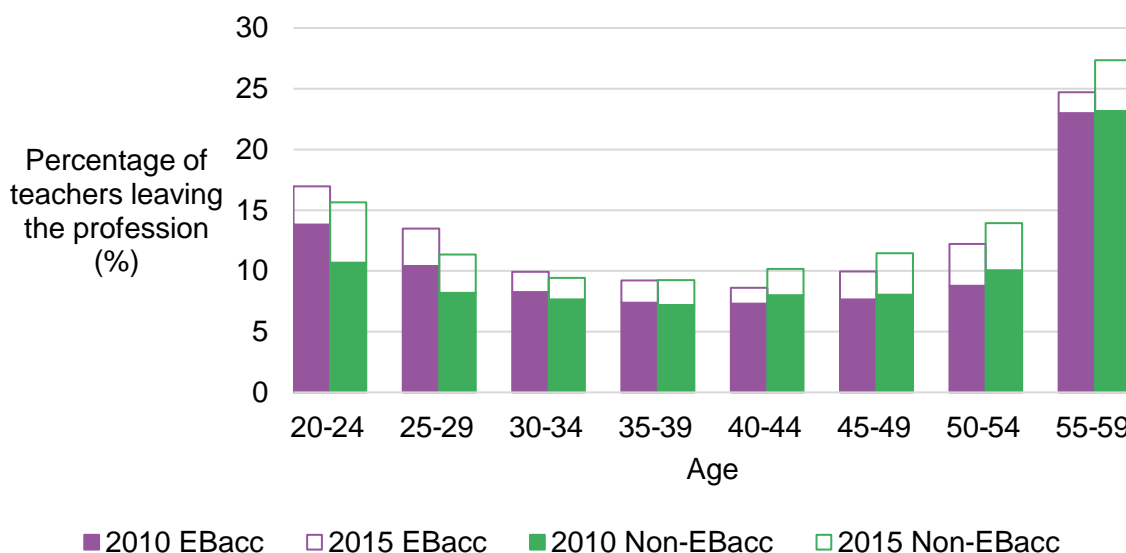
4.1.3 Teacher leaving and moving rates by age

Figure 11 shows the proportion of secondary teachers leaving the profession in 2010 and 2016⁷ by age group and by EBacc/ non-EBacc subject⁸. This shows that the proportion of teachers leaving the profession has increased across every age group since 2010, for both EBacc and non-EBacc subjects. The leaving rate is highest among teachers aged 55-59, and the rate of non-EBacc teachers who are older than 50 leaving the profession has seen a large increase. This finding confirms that older teachers of non-EBacc subjects have been an important driver of the reduction in the proportion of teachers aged over 50.

⁷ The leaving rate in a given year represents the proportion of teachers that leave the profession between that year and the following one.

⁸ This graph is specific for secondary schools as we do not have information regarding the subject teachers teach in primary schools.

Figure 11 Younger and older secondary teachers have the highest rates of leaving the profession



Source: NFER analysis of School Workforce Census data.

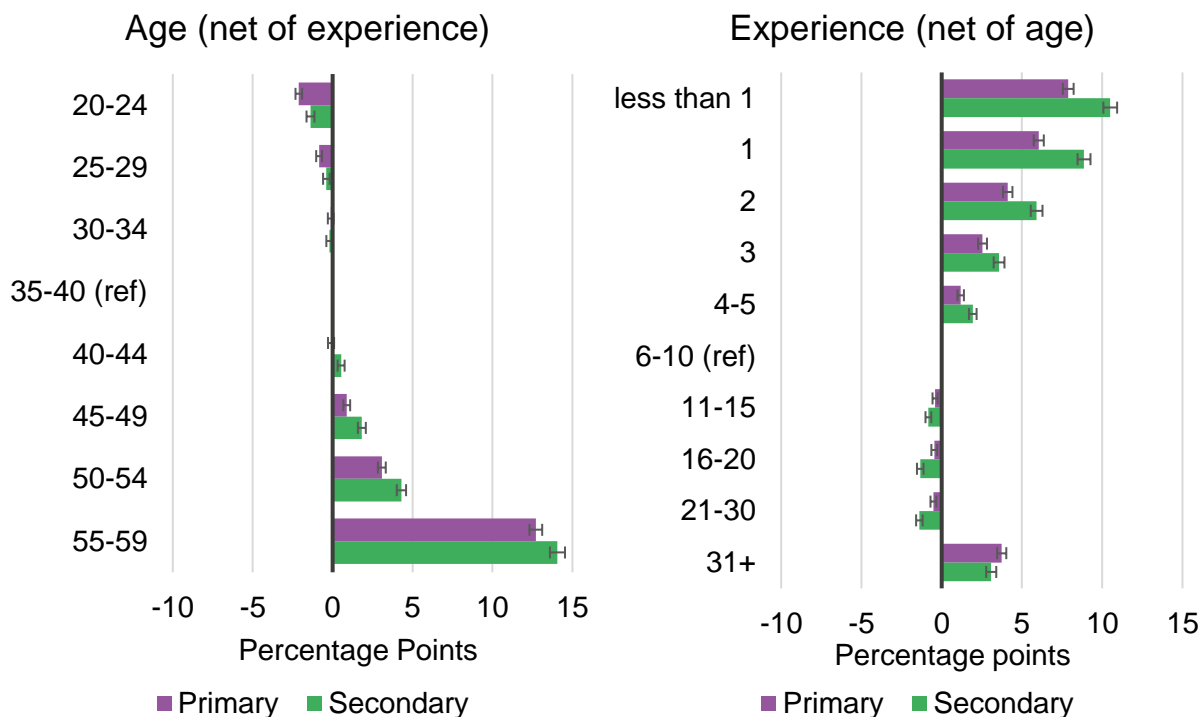
The probability of leaving the teaching profession is highest for older and younger individuals, while the probability of moving school is highest for teachers in their 20s and decreases with age. Older teachers are the least likely to move school.

Very similar relationships with rates of leaving the profession and moving school are seen when looking at age and experience⁹. This is because the two variables are closely related. However, age and experience are not perfectly correlated, as teachers enter the profession at different ages.

Our regression model is able to explain both the association between age and leaving the profession / moving school net of experience, and the association with experience net of age. Figure 12 shows the relationship between age and experience and the probability of a teacher leaving the profession, after accounting for other teacher, school and geographical factors. The effects are estimated separately for primary (purple bars) and secondary teachers (green bars). Each bar shows the average difference in the leaving rate between individuals of a certain age or experience level and the reference category (age: those age 35-39; experience: those with 6-10 years of experience), in terms of percentage points. For example, a secondary teacher with less than one year of experience is almost ten percentage points more likely to leave the profession than a similar individual with 6-10 years' experience. The black lines show the 95 per cent confidence interval: if the interval covers the zero line then that difference is likely to have arisen purely by chance.

⁹ The SWC does not contain data about the number of years of teaching experience a teacher has, so we use a proxy, which is the difference in years between the current year and the year when each teacher first taught in the state sector. See Appendix A for more details about the limitations of this as a proxy for teaching experience.

Figure 12 Older and less experienced individuals have a higher probability of leaving the teaching profession



Source: NFER analysis of School Workforce Census data.

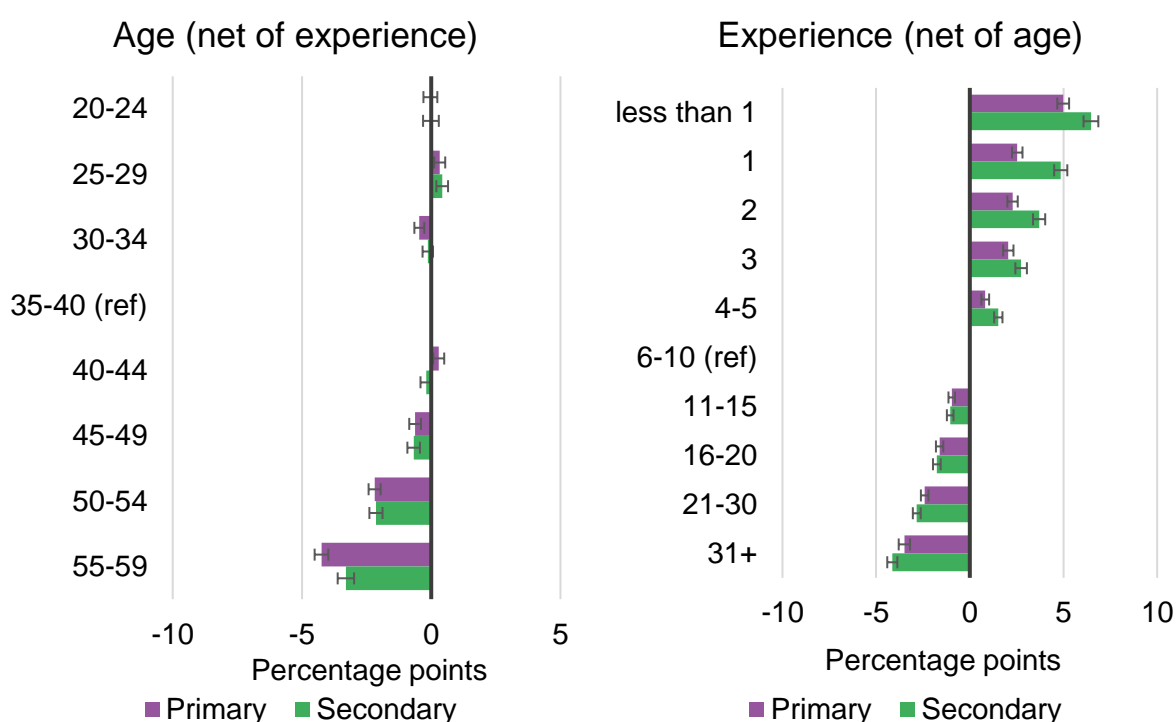
The probability of a teacher leaving the profession decreases as the number of years of experience increases, with the exception of the most experienced teachers. This is likely to be because career changes are more likely at the beginning of a career. On the other hand, younger teachers are less likely to leave the profession, after accounting for their low level of experience. This indicates that the higher chance of leaving the profession among younger teachers is the result of inexperience rather than being young. In contrast, for older individuals, age is more important for predicting the chance of leaving the profession compared to the number of years of experience.

Overall, the regression models suggest that lack of experience drives the high leaving rate among young teachers, while age is the main driver at the opposite end of the spectrum. This may suggest that inexperienced teachers need greater support during the first few years of their career to increase retention in the profession. The Government has recently consulted on plans to give greater support to teachers in the first few years after they enter teaching, including an extended induction period that lasts for two years instead of one, enhanced availability of mentoring and opportunities for professional development, and development of new specialist qualifications to support subject specialisms (DfE, 2018a). Initiatives to increase the engagement of more experienced teachers, including job flexibility, may also encourage them to continue teaching as they get older.

Figure 13 reports similar estimates from the regression models that predict the probability of moving school. The results indicate that, in line with our expectations, the older and the more experienced the teacher, the less likely they are to move school. Except for the oldest individuals, the effect of experience seems to be more important than age for explaining churn. The particularly high rate of inexperienced teachers moving school could be a consequence of wanting to gain more experience in different schools, improve their pay, gain a promotion or find a school with a culture that suits them. The decline of moving school with age is consistent with greater ties (e.g. settled family, or partner's job) and other responsibilities (e.g. caring) making moving more difficult.

Experience also explains a higher proportion of the variation explained by the model than age. At primary level, experience represents nine per cent of explained variation compared to five per cent for age. At secondary level, experience represents 12 per cent of explained variation compared to two per cent for age.

Figure 13 The older and more experienced the teacher the lower the probability of moving school



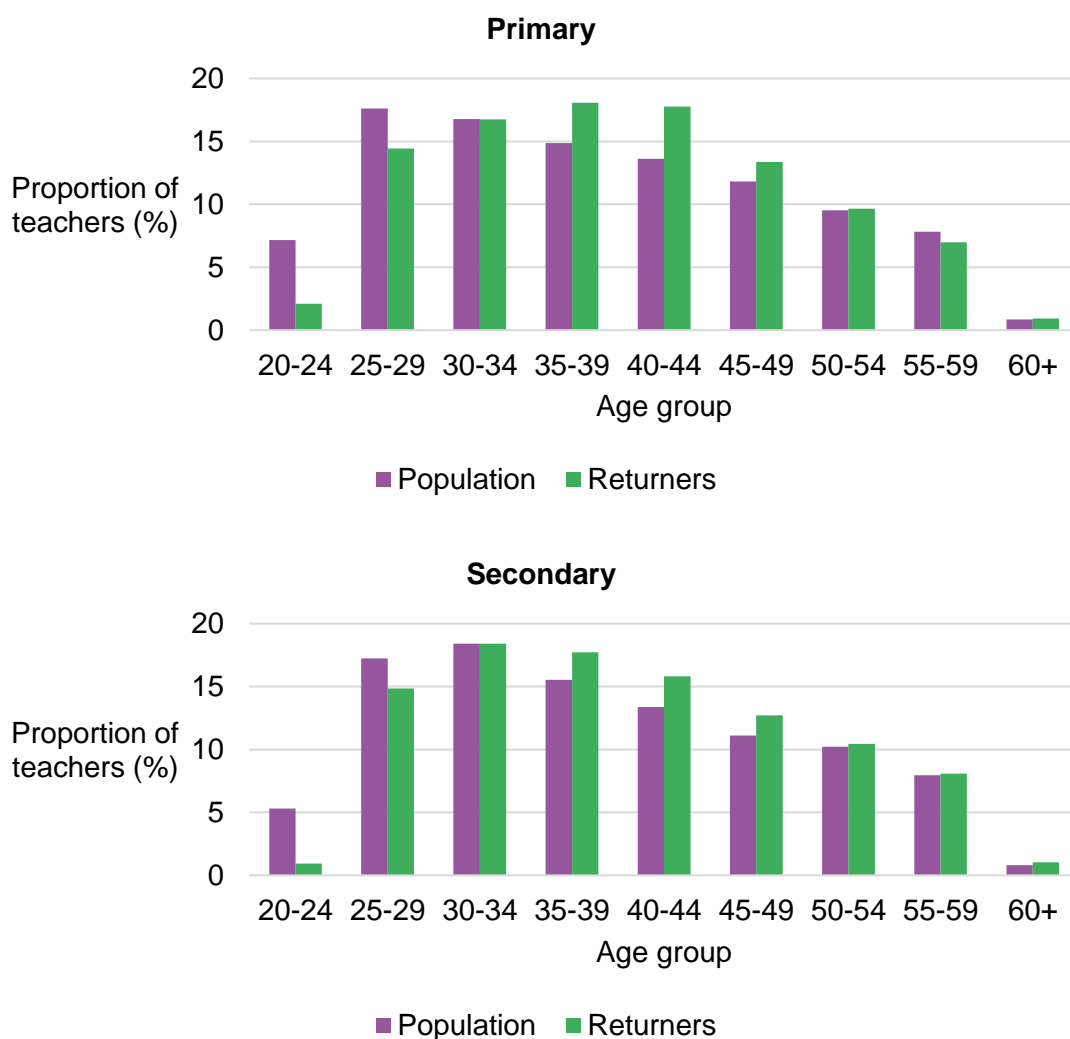
Source: NFER analysis of School Workforce Census data.

4.1.4 Returning to the profession

Figure 14 shows that teachers who return to state-sector teaching, having previously taught in the sector, tend to be older on average. Given that a returning teacher needs to have entered teaching, left and then entered again, this perhaps is not so surprising. However, older teachers who are out of the profession may have been less likely to return, having committed to alternative

careers or decided against returning for other reasons (Buchanan *et al.*, 2018). Returning teachers are more likely to be in their late thirties and forties when compared to the average teacher.

Figure 14 Returners are more likely to be in their late thirties and forties than the average teacher



Source: NFER analysis of School Workforce Census data.

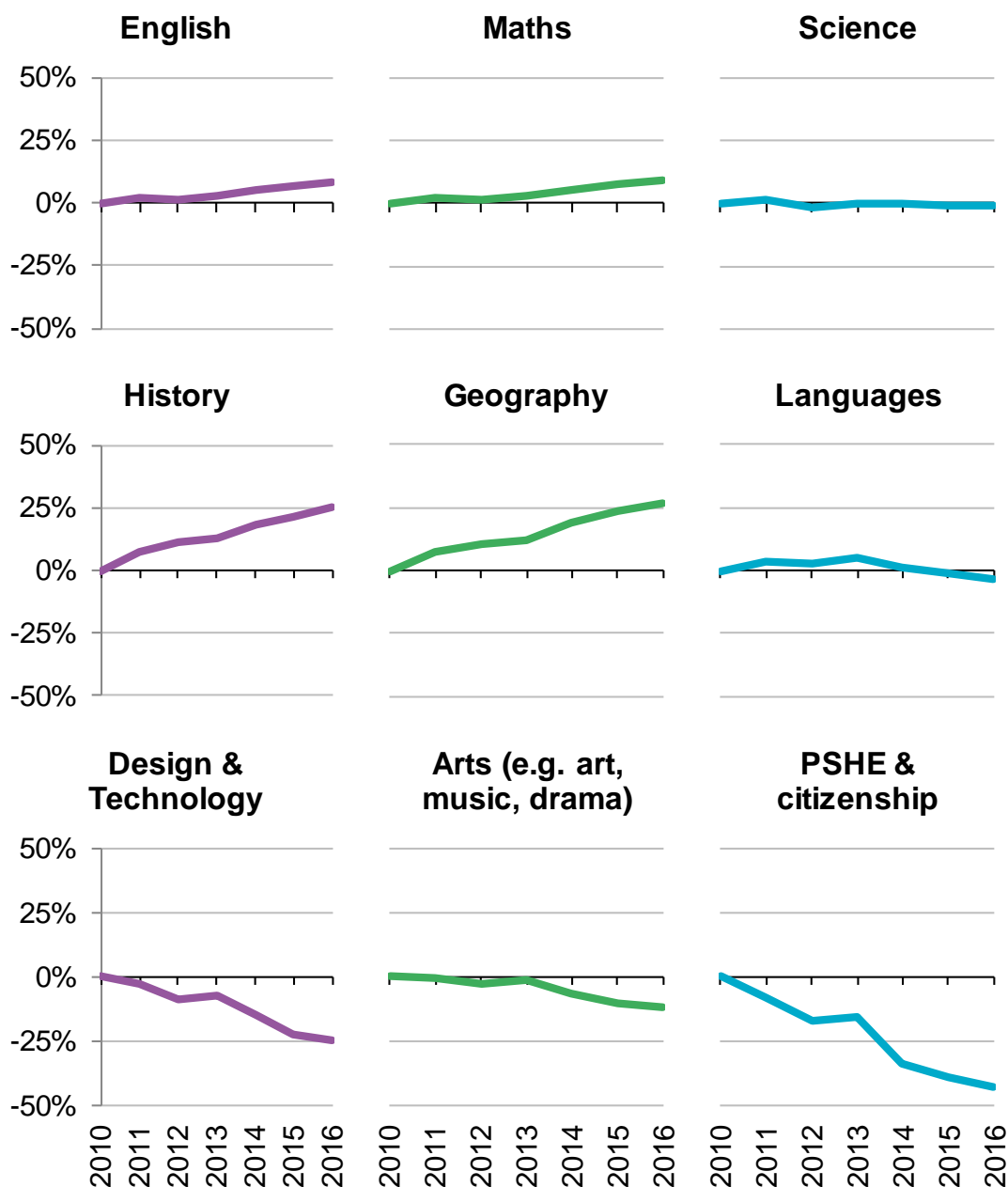
4.2 Subjects

4.2.1 Change over time

The subjects that are taught in secondary schools has changed over the period between 2010 and 2016. Figure 15 shows the overall percentage change in total curriculum hours per pupil between 2010 and 2016 for each subject group. The change in the amount of teaching time dedicated to different subjects has varied considerably between different subjects.

Figure 15 Teaching time of EBacc subjects has mostly increased since 2010, while teaching time for non-EBacc subjects has fallen

Vertical axis: percentage change in total timetabled hours per pupil, compared to 2010



Source: NFER analysis of School Workforce Census data.

The biggest differences are between EBacc subjects and non-EBacc subjects: EBacc subjects have generally seen an increase in teaching time while teaching time in non-EBacc subjects has generally fallen. New accountability measures introduced by the Government since 2010 – EBacc and Progress 8 – have provided schools with an incentive to particularly prioritise the teaching of

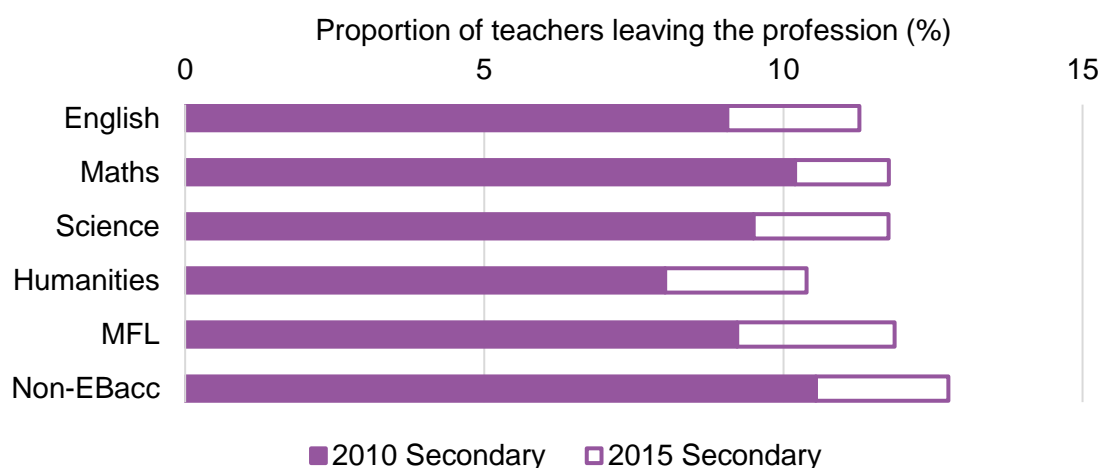
EBacc subjects. However, there are also differences between EBacc subjects. History and geography have each seen a significant increase in teaching time since 2010, while science and languages have remained largely unchanged.

School spending per pupil has been stable in real terms over this time period, so increases in a particular subject area may have often meant reductions in other subjects (Williams and Grayson, 2018; Belfield *et al.*, 2017). Teacher supply in particular subjects has also acted as a constraint on the ability to expand teaching in these subjects. For example, subjects that have been close to, or above, the TSM recruitment targets for ITT, such as history and geography, have expanded whereas subjects that have been well below target, such as science subjects, have not. Differential rates of teacher retention across subjects are also likely to have acted as a supply constraint, as explained in the next section.

4.2.2 Teacher leaving and moving rates by subject

Figure 16 shows the percentage of teachers leaving the profession in 2010-11 and 2015-16, split by the main subject that the teacher teaches¹⁰. The proportion of teachers leaving the profession has increased for all subject groups, but by different amounts across the groups. Non-EBacc teachers have the highest probability of leaving the profession, but maths, science and languages teachers also have high rates of leaving the profession. Humanities teachers have the lowest probability of leaving the profession.

Figure 16 Non-EBacc teachers have the highest probability of leaving the profession, while humanities teachers have the lowest

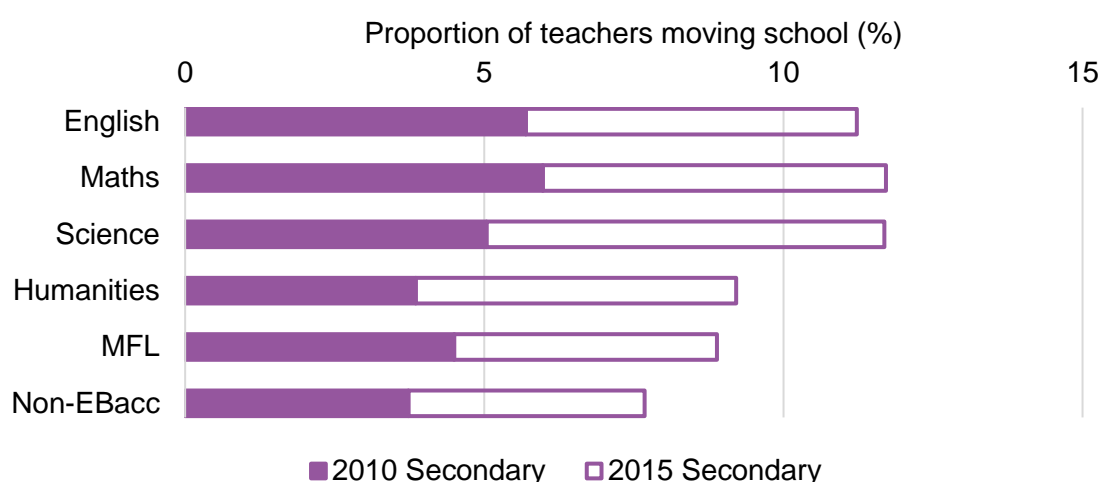


Source: NFER analysis of School Workforce Census data.

¹⁰ The results presented in this section are specific for secondary schools as no information on the subject taught by primary teachers is available. We have identified six main subjects that are: English, Maths, Science, Humanities, MFL and non-EBacc subjects. To be classified as an English teacher, a teacher needs to teach at least 10 hours a week of English and at least 50 per cent of her total time needs to be spent teaching English. The non-EBacc group is a residual category that includes mostly teachers of non-EBacc subjects, but also teachers that do not satisfy one of the above criteria.

Figure 17 shows the percentage of teachers moving school in 2010-11 and 2015-16. In contrast to having the highest probability of leaving the profession, non-EBacc teachers have the lowest probability of moving school. The limited mobility of non-EBacc teachers is consistent with fewer available opportunities due to the reduction of schools' curriculum time dedicated to non-EBacc subjects. The high mobility of English, science and maths teachers could be a consequence of the fact that they have bigger departments within schools and hence there are more opportunities for teachers to move to a different school, coupled with increased demand for teachers of these subjects across schools.

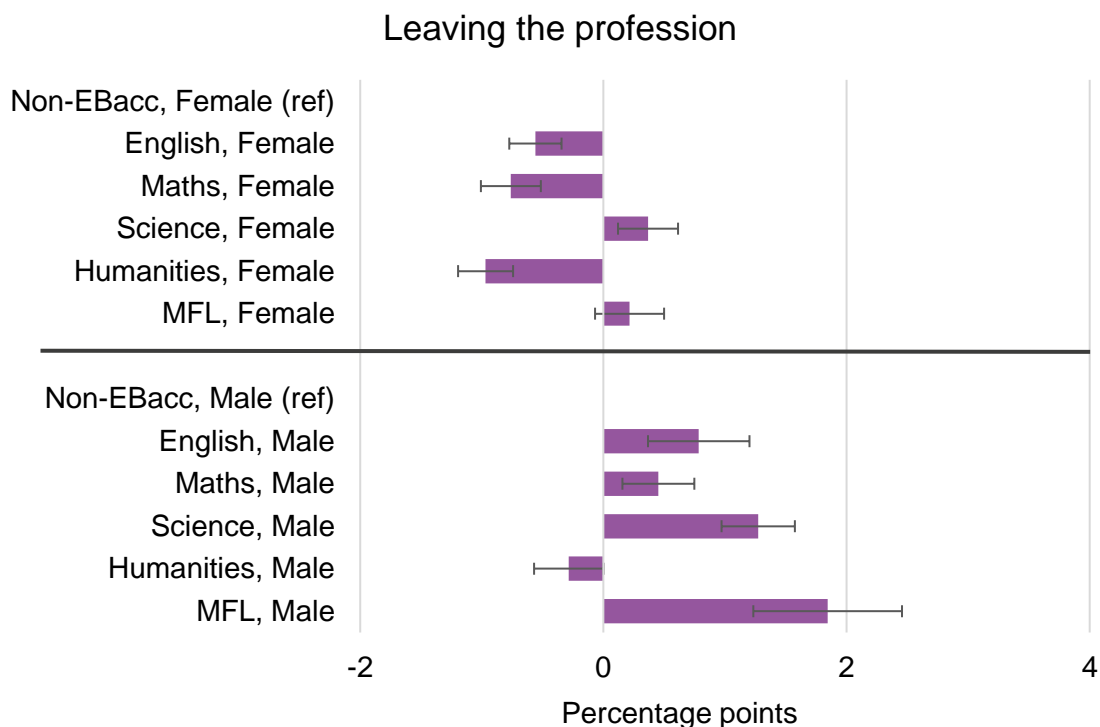
Figure 17 Maths and science teachers have the highest probabilities of moving school, while Non-EBacc teachers have the lowest probability



Source: NFER analysis of School Workforce Census data.

Figure 18 shows how the probability of leaving the profession (top) and moving school (bottom) differs across subjects, after accounting for other individual, school and geographical characteristics. We estimate the coefficients separately for men and women and report using non-EBacc teachers, male and female respectively, as a reference category. Positive (negative) coefficients are interpreted as a higher (lower) probability of leaving the profession for a certain teacher compared to a non-EBacc teacher of the same gender.

Figure 18 Science and MFL teachers are the most likely to leave the profession, after accounting for other characteristics



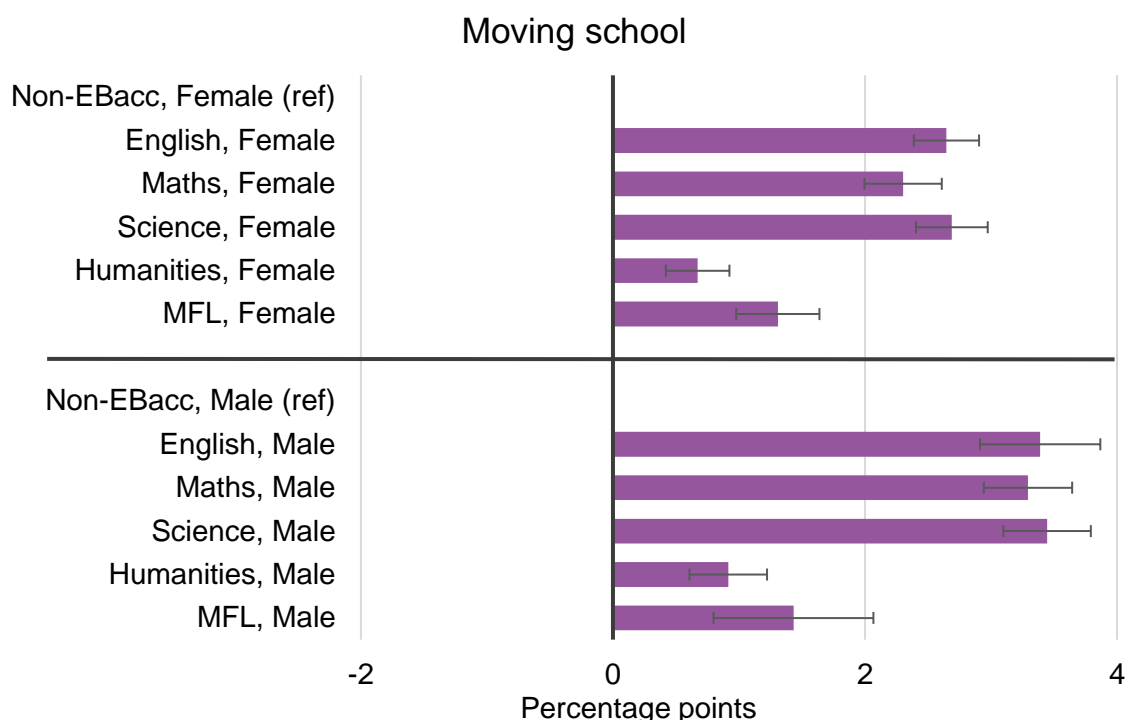
Source: NFER analysis of School Workforce Census data.

For both men and women, MFL and science teachers are the most likely to leave the profession, while humanities teachers are the least likely to leave. Higher leaving rates among MFL and science teachers implies more trainees or returning teachers are required each year to maintain supply. The number of teacher trainees for both science and MFL have been below the Government's target for five years (DfE, 2016f). Lower recruitment and retention rates in sciences and languages may have constrained schools' ability to offer more teaching in these subjects in response to the incentive to do so provided by the way EBacc is embedded in Progress 8, the main accountability measure for secondary schools (Worth and De Lazzari, 2017).

Humanities (history and geography) teachers have lower rates of leaving the profession than other subjects, and teaching time in these subjects have risen by 25 and 27 per cent respectively since 2010. This suggests that higher recruitment and retention rates in humanities subjects have enabled schools to offer more teaching in response to an incentive to do so from EBacc.

As shown in Figure 19, our regression model results confirm that teachers of non-EBacc subjects are the least likely to move school, while English, maths and science teachers are the most likely to move school. In general, the direction of the coefficients estimated for men and women are very similar.

Figure 19 English, Maths and Science teachers are the most likely to move school



Source: NFER analysis of School Workforce Census data.

Despite there being differences in the probability of leaving the profession and moving school between different subjects that are statistically significant, the subject taught by a teacher explains a relatively small amount of the overall variation in the models. The amount of variation explained by subject in the model predicting the probability of leaving the profession is smaller than the variation it explains in terms of the probability of moving school (0.3 per cent vs 5.8 per cent). Therefore, the most important influences on teacher retention in the profession appear to be general factors that apply to all teachers, regardless of which subject they teach.

4.3 Implications for policy

The proportion of teachers in the workforce in their 50s has decreased markedly between 2010 and 2016. This is partly due to the cohort in this age group at the start of the period being larger than the one that followed it, and partly due to a higher rate of older teachers leaving the profession before normal retirement age over the period. If this trend continues, it will increase the scale of the challenge as new, inexperienced teachers will need to be recruited to replace them. This trend comes at a time when demand for secondary school teachers is already growing. The Government should investigate why the rate of leaving among older teachers has been increasing and explore whether they could be incentivised to stay in the profession longer, particularly in subjects with specialist teacher shortages.

Low recruitment and retention rates among science and MFL teachers appears to have limited schools' ability to expand the teaching hours in these subjects, despite the Government's new accountability measures giving schools an incentive to do so. In response to the incentives embedded in the Progress 8 measure, and enabled by relatively high recruitment and retention rates in these subjects, schools have increased teaching time in history and geography considerably since 2010.

The constraints on individual EBacc subjects also constrains the Government's ability to achieve its aim for a greater proportion of pupils to be entered for qualification in the EBacc subjects. In recognition of this constraint, the Government revised its timescale for schools entering 90 per cent of pupils in EBacc subjects at GCSE in July 2017.

Science and MFL teacher trainees attract generous bursaries of at least £25,000, yet these payments are not currently linked to retention in teaching. In isolation, high-leaving rates are not evidence of the impact of bursaries, since we don't know what entry rates or retention rates would have been in their absence. Nonetheless, given the higher than average retention rates in these subjects, evaluation of the impact of bursaries on entry and retention rates is urgently needed to assess their cost effectiveness. The Government is expected to publish research on the effectiveness of bursaries in the near future (GB, Parliament. HoC. Committee of Public Accounts, 2018).

Bursary payments are likely to be more effective if they are restructured to explicitly incentivise retention in the teaching profession during the first few years after training. This may include other ways of linking financial incentives to staying in the profession after training to teach a particular subject, such as student loan repayments. The Government recently announced piloting student loan reimbursement for science and MFL teachers and introducing bursaries for maths teachers that include retention payments, which is a promising development (DfE and Greening, 2017).

5 Working hours and satisfaction

Teacher characteristics can explain some of the variation in rates of teachers leaving the profession and moving school. However, even after including a range of additional school and geographical characteristics, we are able to explain relatively little variation. Our logistic regression model of teachers leaving the profession is able to explain around 12 per cent of the overall variance, whereas our model of teachers moving school is only able to explain four and six per cent of the overall variance for primary and secondary schools respectively. This means that even with the wealth of data available in administrative datasets about a teacher and about the school they work in, we are not able to predict with a great degree of certainty whether they will leave the profession or move to a different school in the following year.

However, administrative data lacks important information about teachers' working conditions, particularly on their actual working hours and job satisfaction. This section uses USoc data to examine how teachers' working hours and job satisfaction compare to nurses and police officers, how they influence teachers' retention decisions and how they change after teachers do decide to leave.

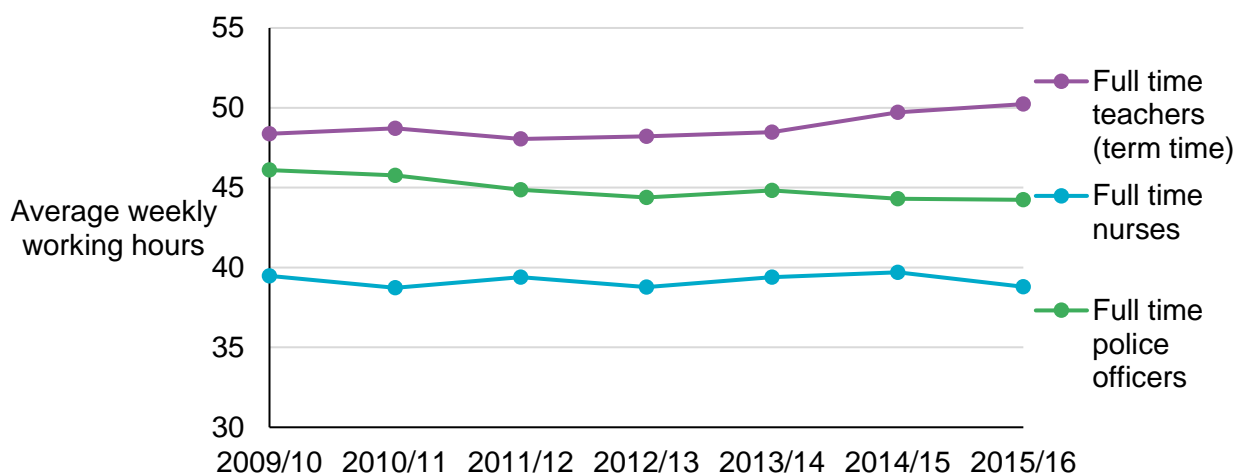
5.1 Working hours and leisure time satisfaction

5.1.1 Compared to other professions

We use USoc data to examine the number of hours that full-time teachers, nurses and police officers report they work in a typical working week¹¹. Figure 20 shows that teachers report working 50 hours per week during term time in 2015/16, which is more than nurses and police officers work in a normal week. The chart also shows that teacher working hours have increased since 2009/10, although this increase is not statistically significant. This is lower than the average 57 working hours reported for full-time teachers in the 2016 Teacher Workload Survey (DfE, 2017g), but similar to the reported working hours of lower secondary school teachers in England in the 2013 OECD TALIS survey (Micklewright *et al.*, 2014, Sellen, 2016).

¹¹ We focus on full-time workers because comparing the working hours of all workers is complicated by the different ratios of full-time to part-time workers in the different professions, and any differences in the full-time equivalent working patterns between professions, which are not measured in USoc.

Figure 20 Teachers work longer hours in a typical working week than nurses and police officers



Source: NFER analysis of Understanding Society data.

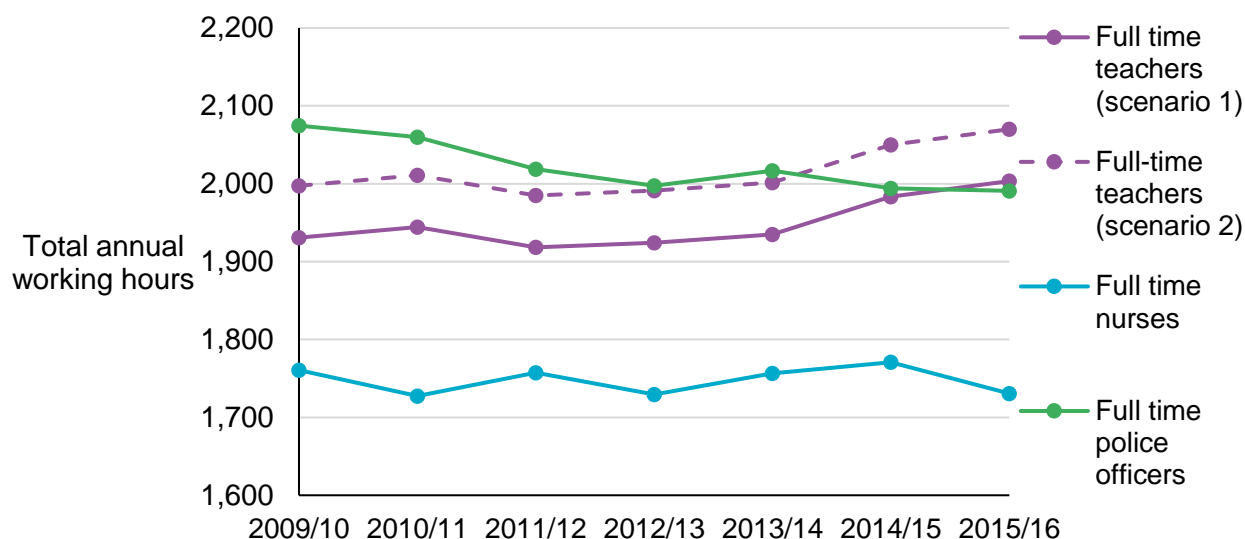
Note: includes overtime hours worked for nurses and police officers

However, teachers have more time when pupils are on school holidays, which should be taken into account when comparing professions. We account for this by calculating the number of hours worked over the whole year by each profession, making assumptions about the time teachers work during school holidays (see Appendix B for details of our method). As we do not know from established sources how many hours teachers work during school holidays, we present two scenarios:

- The first scenario assumes teachers work the day before and the day after each term starts/ends (see the solid purple line in Figure 21). In this scenario, teachers work 40.2 weeks per year compared to 44.6 weeks for nurses and 45 weeks for police officers.
- The second scenario assumes teachers work for three weeks during the school holiday period (see the dotted purple line in Figure 21). In this scenario, full-time teachers work 80 hours more per year than police officers, which is equivalent to nearly two extra hours per week.

The data shows that full-time teachers and police officers worked a comparable number of total annual hours in 2015/16. This has not always been the case. In 2009/10, police officers worked a lot more hours annually, but teacher working hours have been increasing since then, while police officers' working hours decreased slightly over the same period. While neither change in total working hours per year since 2009/10 is statistically significant, the gap between the two professions has closed completely.

Figure 21 Teachers work similar hours per year to police officers, but in fewer weeks



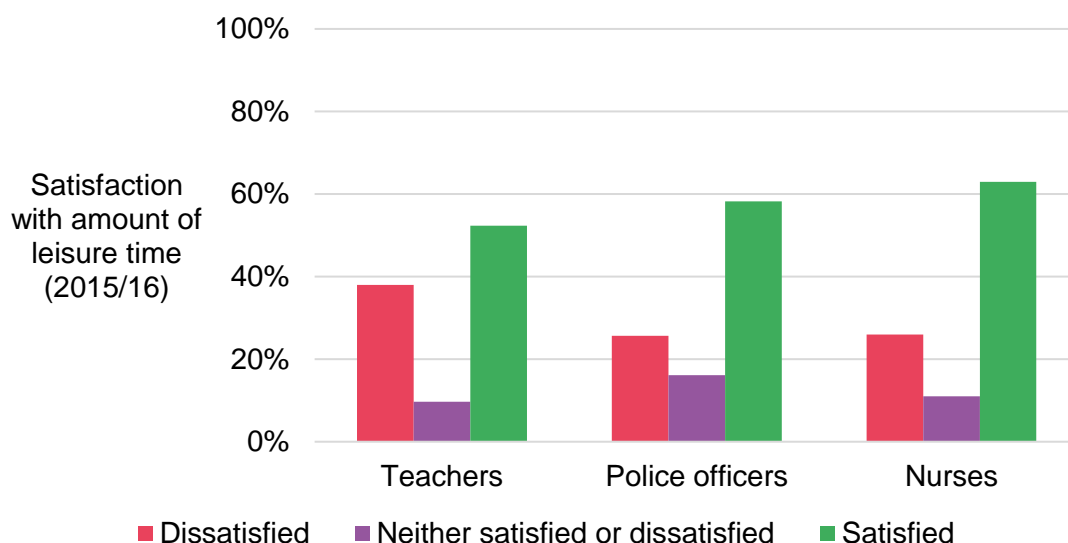
Source: NFER analysis of Understanding Society data.

There are also differences in the way teachers and police officers accumulate their annual hours. Teachers work more intensively across fewer weeks in the year, whereas police officers accumulate their working hours over a longer time period.

It is often said that because teachers get longer holidays than other professions, this makes up for the hours they work during term time. However, it is the case that the hours that teachers work during term time substantially exceeds the amount of extra holiday time they may receive, even if they do not work during the holidays. We find that full-time teachers work the equivalent of 45 per hours per week if spread across the number of weeks worked by full-time nurses and police officers annually, which is more than both of these professions.

Working long hours over prolonged periods, as teachers are doing, can create pressure and stress, with potential negative effects on health and well-being. Figure 22 shows that teachers' long term-time working hours correspond with them having the lowest satisfaction of their amount of leisure time compared to nurses and police officers.

Figure 22 Teachers are the least satisfied with their amount of leisure time



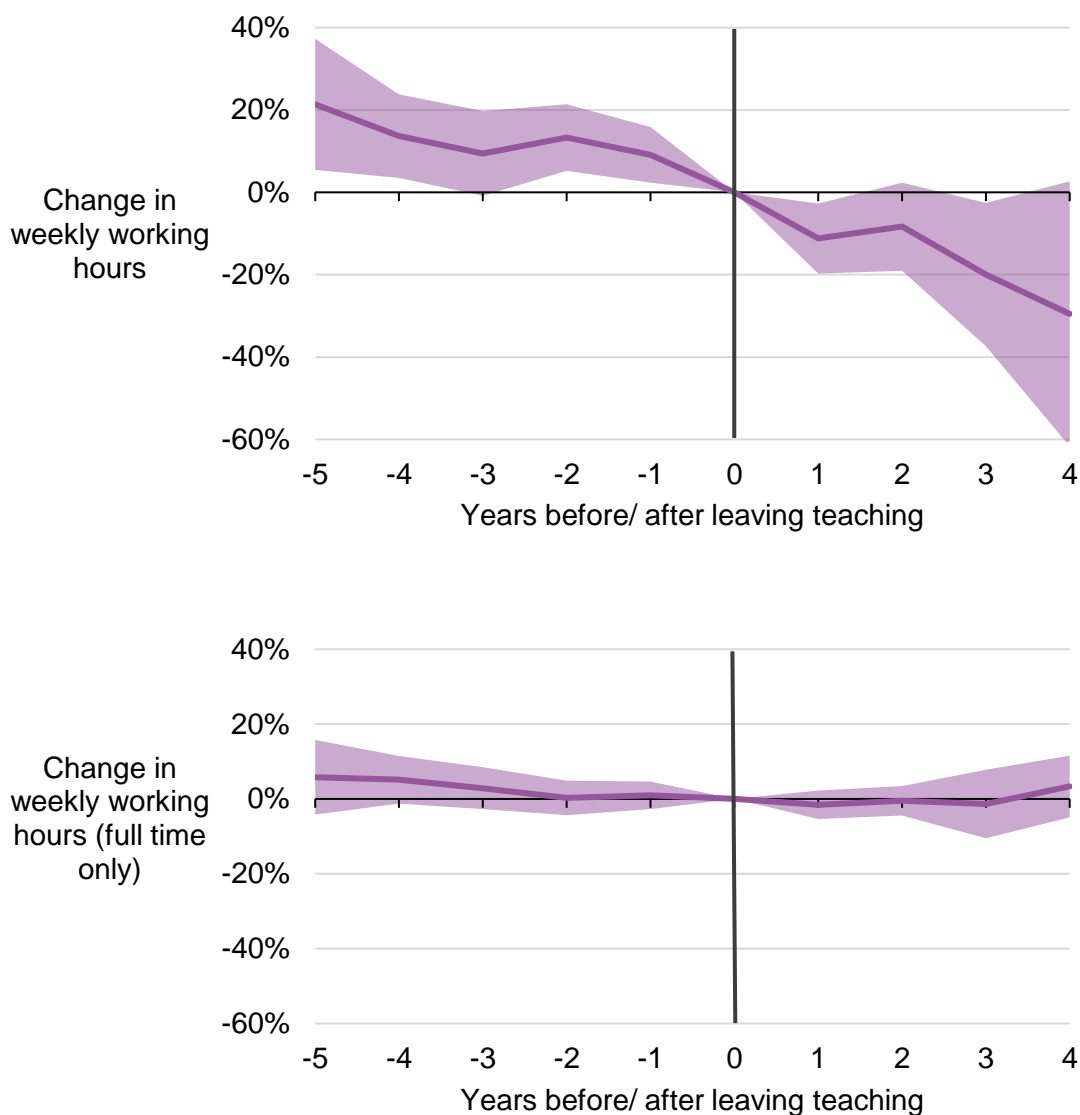
Source: NFER analysis of Understanding Society data.

This figure shows the raw differences between professions, but does not account for differences in the composition of the workforces, which may independently influence their satisfaction with leisure time. After accounting for an individual's age, gender and number of (their own) children, full-time teachers have a lower level of satisfaction with their amount of leisure time than nurses (statistically significant difference of 0.35 of a standard deviation) and a similar level to police officers. There is no significant difference in satisfaction with their amount of leisure time between primary and secondary school teachers.

5.1.2 After leaving the profession

We analyse what happens to teachers' working hours after they leave teaching, using longitudinal USoc data. The top chart in Figure 23 shows that teachers' weekly working hours drop, on average, by 11 per cent in the year after leaving and remain below the level they were at just before leaving in the subsequent years. However, the bottom chart in Figure 23 shows there is no significant change in the weekly working hours among teachers who work full-time, both before and after leaving teaching. The average reduction in teachers' working hours after leaving is therefore driven almost entirely by more teachers taking up part-time work after leaving teaching (see section 6 for more on part-time working), or by part-time teachers reducing their hours after leaving, which could also be a factor.

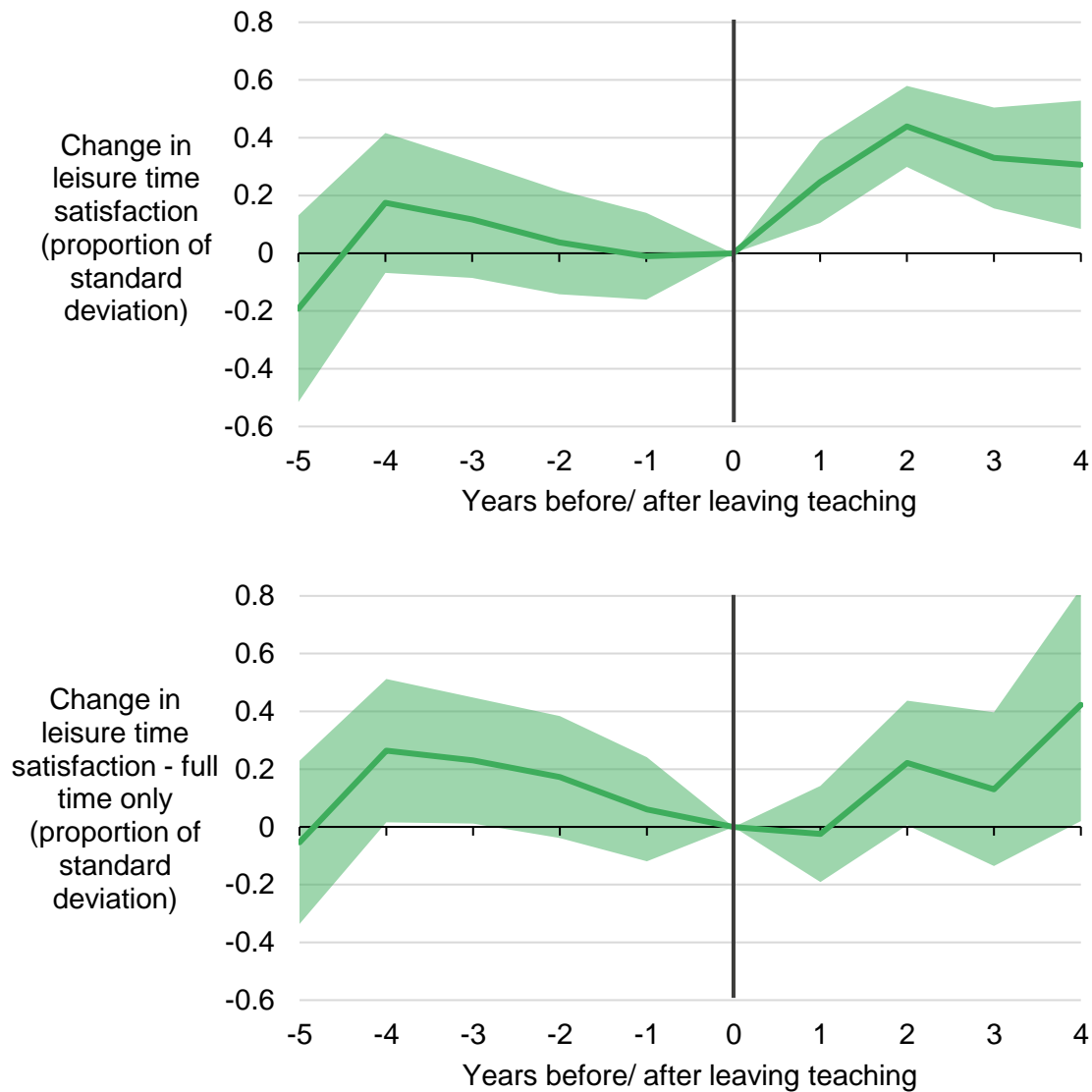
Figure 23 Teacher working hours fall after leaving, among teachers who leave, but the change is driven by take-up of part-time jobs



Source: NFER analysis of Understanding Society data.

Consistent with the finding that, on average, teachers who leave teaching reduce their working hours, Figure 24 shows that teachers' reported satisfaction with their amount of leisure time increases considerably after leaving (top chart). However, there is a small increase that is not statistically significant for teachers who leave full-time roles for another full-time role outside teaching (bottom chart). This suggests that teachers' reported increased satisfaction with their amount of leisure time is also driven by those who leave for part-time roles.

Figure 24 Leisure time satisfaction rises after leaving among teachers who leave, but the change is driven by take-up of part-time jobs



Note: the standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

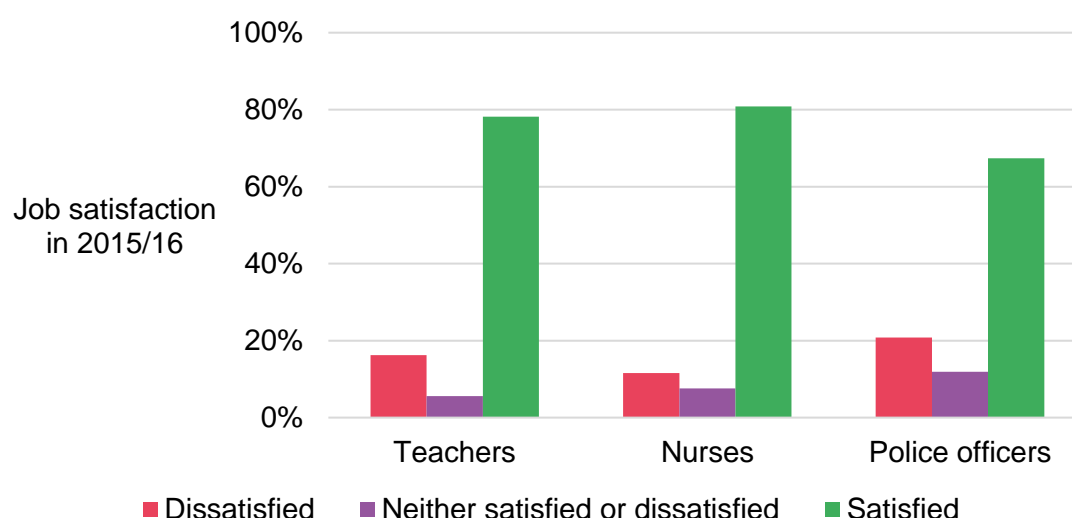
Source: NFER analysis of Understanding Society data.

5.2 Job satisfaction

5.2.1 Compared to other professions

Despite longer term-time working hours and lower satisfaction with their amount of leisure time, 79 per cent of teachers report that they are satisfied with their job. This is slightly lower than nurses (81 per cent) and slightly higher than police officers (67 per cent), although neither difference is statistically significant. Figure 25 shows levels of job satisfaction for full-time teachers, police officers and nurses in 2015/16.

Figure 25 Teachers have a high level of job satisfaction in 2015/16



Source: NFER analysis of Understanding Society data.

After accounting for individuals' age, gender and number of children, teachers have a higher level of job satisfaction than police officers (statistically significant difference of 0.15 of a standard deviation) and a similar level to nurses. Primary school teachers have a higher level of job satisfaction than secondary school teachers (statistically significant difference of 0.14 of a standard deviation).

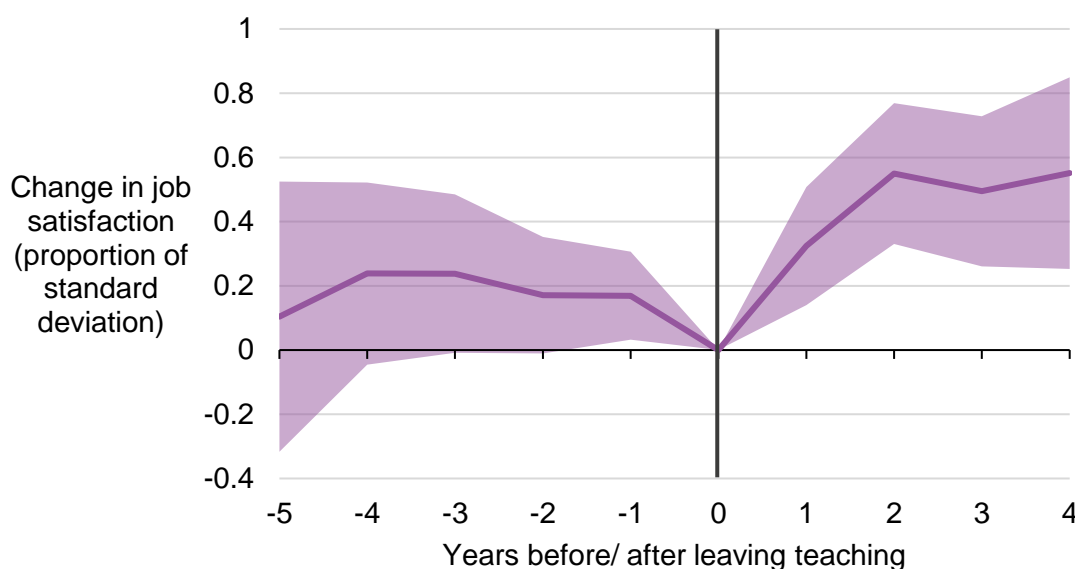
5.2.2 After leaving the profession

Figure 26 shows that self-reported job satisfaction improves considerably after teachers leave the profession for a new job and it consistently remains higher than it was when they were a teacher. This suggests that the prospect of higher job satisfaction outside teaching is an influential pull factor.

This analysis does not suggest that any teacher that leaves teaching would experience the same effect on their job satisfaction. Teachers in our sample who left teaching had a lower level of job satisfaction while they were teaching than teachers who stayed (equivalent to 0.12 of a standard deviation and statistically significant). On average for teachers who left, job satisfaction had also been falling in the years before they left. This suggests that low and falling job satisfaction is an

important contributing factor to teachers' decisions to leave the profession and an early warning sign of leaving. Previous NFER research has also shown a strong relationship between low teacher job satisfaction and a greater intention to leave the profession (Lynch *et al.*, 2016).

Figure 26 Teachers who leave are more satisfied in their new job



Note: the standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

Source: NFER analysis of Understanding Society data.

It could be that this finding is a generic one that could apply to leavers of any profession, rather than being specific to teaching. However, we do not find the same pattern of job satisfaction change among nurses. The job satisfaction of nurses had not been falling in the years before they left, suggesting that other factors played more of a role in their decision to leave. While the job satisfaction of nurses who leave improves after leaving, the increase is smaller than that of teachers (see Appendix C). This suggests that improved job satisfaction outside of nursing may have been a significant pull factor for nurses who left, but not as large a factor as among teachers.

What factors influence teachers' job satisfaction? Recent NFER research has highlighted an important association between teachers' job satisfaction and the quality of school leadership and management, including teacher autonomy and whether staff feel they are supported and valued by managers (Lynch *et al.*, 2016; Sims, 2017). Research by Sims has also highlighted the relationship between the extent to which a teacher regards their workload as unmanageable (rather than their amount of work, *per se*) and low job satisfaction (Sims, 2017).

This suggests that efforts to increase teachers' job satisfaction by reducing their workload could have positive impacts on teacher retention. Since 2014, the Government's 'workload challenge' has sought to understand the nature and extent of unnecessary and unproductive workload, and develop an action plan for reducing it. In March 2018, the Government launched a campaign with

Ofsted and teaching and leadership unions aimed at reducing teacher workload, including an action plan to “remove unnecessary workload for teachers, to help them concentrate on teaching and their own development”, which focuses on the three areas teachers say are the most important drivers of unnecessary workload: marking, planning and data management (DfE, 2018b). In May 2018, the Government established a workload advisory group to consider how to remove unnecessary workload associated with data collection and management in schools and published a workload reduction toolkit for schools in July 2018. These are welcome steps in the right direction, although the words need to be followed by the right actions from all stakeholders to reduce teachers’ long term-time working hours.

5.3 Working hours, job satisfaction and retention

Previous NFER research has shown a strong relationship between low teacher job satisfaction and a greater intention to leave the profession (Lynch *et al.*, 2016). Our analysis of USoc data confirms this association between higher job satisfaction and a lower probability of actually leaving teaching in the following year. The two variables have a statistically significant raw correlation, and also have a statistically significant association with one another after accounting for a number of teacher characteristics¹².

However, our analysis shows a more complex relationship between teacher working hours and retention, when comparing different individuals. Teachers’ probability of leaving the profession and their working hours have a statistically significant negative relationship, suggesting that those who work longer hours tend to have a higher probability of staying in teaching. The relationship is negative but not statistically significant after accounting for a range of teacher characteristics. This suggests that teachers who work longer hours do not have a higher probability of leaving the profession, and are even slightly more likely to *stay* in the profession.

Given that working hours are often used as a proxy for workload, and many teachers who leave cite workload as the key reason why they left (DfE, 2017b), this finding may seem contradictory. However, this is because it is not reflecting the causal effect of working longer hours on teacher retention. The high workload of the teaching job, driven by policy changes and the demands of inspection, is the key reason teachers give for working long term-time hours. Teachers who are unable or unwilling to work long hours to keep up with the high workload find their workload becomes unmanageable. The teachers who find their workload is unmanageable are more likely to leave the profession: unmanageable workload is consistently the most cited reason teachers give for why they leave the profession (DfE, 2017b).

Indeed, our findings are consistent with findings from TALIS data, which has directly explored the relationship between whether staff feel their workload is manageable, their job satisfaction and working hours. Research by Sims shows that “the number of hours worked ... is not related to job satisfaction, but teachers’ assessment of whether their workload is manageable is related to job

¹² We estimate a logistic regression model of the probability of leaving state-sector teaching in the next year, controlling for teachers’ age, gender, number of children, part-time status, phase of education, managerial status, job satisfaction, working hours and their satisfaction with income, leisure time and life overall.

satisfaction” (Sims, 2017). Reducing teachers’ workload could reduce their average working hours, increase their job satisfaction and improve retention.

5.4 What can we learn from nursing and policing about job satisfaction and retention?

NFER’s Engaging Teachers research (Lynch *et al.*, 2016) has shown a relationship between low teacher job satisfaction (influenced by factors including workload and feeling valued and supported by managers) and a greater intention to leave the profession. What can we learn from nursing and policing about why people leave the professions, what triggers low job satisfaction, and what is being done to address this?

One of the main reasons why nurses leave the profession was reported to be a desire for a more flexible working pattern, which is discussed separately in Section 6.4 below. The other main reasons why nurses and police officers leave their professions were perceived to be workload, lack of support, and a decline in opportunities for continuing professional development (CPD). These are discussed in turn below.

5.4.1 Workload

In the nursing sector, stakeholders commented that the number of nurses has increased since 2006 (Royal College of Nursing, 2016). However, interviewees perceived that there are not enough nurses to meet the increasing demands in the system, and that puts pressure on existing staff.

The increased demand was said to result from a number of factors, including: an ageing population; an increase in people with comorbidities (the co-occurrence of two or more long-term conditions); people being more aware of their health and more willing to seek help; and people with more complex needs (including mental health problems). Funding constraints were said to result in a shortfall of nurses in some geographical areas and specialisms (including mental health), meaning the overall size of the nursing workforce has not met overall demand. Comments from stakeholders included:

There are more nurses in the system than ever, but there is a lack of supply in some areas. This creates pressure [on existing nurses].

Pressure of workload is due to high demand in the system. There is more demand, burnout is likely to increase. You then see an increase in vacancy rates.

Similarly, police officers were also said to be under increasing pressure, partly resulting from a reduction in police staff and a perception amongst interviewees that officers are required to carry out tasks that other services would have previously supported them with:

They [police officers] are being asked to do more...more tasks that would have been dealt with before by other services, including social services.

There has been less recruitment, so there is more pressure on those in the role...an increase in their workload.

Pressure on police officers was also said to result from the changing nature of their role (with more focus on protecting vulnerable people) and therefore varied skills required.

As a result of the perceived increase in workload, more emphasis has been put on the health and well-being of staff in both sectors. One interviewee in the nursing sector said that *‘there needs to be a culture shift to make them [nurses] feel valued, wanted and supported in their work’*. In the policing sector, there was said to be an *‘increased well-being offering’*, which included access for police officers and their families to welfare services for advice and counselling.

A similar culture of well-being support is likely to be relevant to the teaching profession, given the evidence of workload demands, together with the fact that teachers work long hours during an average working week, which may create pressure and stress, with potential negative effects on health and well-being. Indeed, in our Engaging Teachers research (Lynch *et al.*, 2016), we recommended that a greater focus should be placed on teacher well-being. This could include schools having a governor or trustee responsible for staff welfare, or a member of the management team with specific time and responsibilities in this area.

5.4.2 Support

Stakeholders we interviewed perceived there to be a relationship between support and retention. Support was felt to be particularly relevant for people early in their career. One nursing professional said:

We are not looking after [early career nurses] enough. They come out of university enthusiastic but they are finding the frontline tough. They are not always supported enough so we’re losing them. They were unprepared for their role.

Our analysis suggests that this might also be the case for teachers: the probability of a teacher leaving the profession decreases as the number of years of experience increases (Worth *et al.*, 2017). Also, the rates of teachers leaving the profession are particularly high among early-career teachers of science, maths and languages (Worth and De Lazzari, 2017). These findings highlight the importance of support for early-career teachers, particularly in some subjects. Indeed, our Engaging Teachers research found that being well supported and valued by school management was significantly associated with a greater intention to stay in the teaching profession (Lynch *et al.*, 2016).

The nursing sector is putting more focus on teamwork and sharing of roles so that nurses feel more supported. One interviewee explained that the new Nurse Associate role has been introduced as a new route into nursing but also in recognition that existing nurses need support in the system:

It frees up some of their time to do what they are highly trained to do.

There is a need to upskill the people who work around the graduate nurses, leaving them time to focus on the parts of the job they have been educated to do.

The role of the teaching assistant could be equally as important. A recent review for the Education Endowment Foundation (Sharples *et al.*, 2015) found evidence that delegating routine administrative tasks to teaching assistants freed up teachers’ time to focus on the core functions of

teaching. Teaching assistant support was also found to be beneficial for reducing teacher workload and for improving their perceptions of stress and job satisfaction.

A need to develop and equip line managers with the time and skills to adequately support nurses was also mentioned by interviewees in the nursing sector, which is likely to also be relevant to senior leaders in the teaching sector. In our Engaging Teachers research, we emphasised that school leaders have a key role to play in supporting and protecting staff from workload pressures (Lynch *et al.*, 2016).

5.4.3 Continuing professional development (CPD)

Another perceived reason for dissatisfaction amongst staff in the nursing and policing professions was a decline in opportunities for continuing professional development (CPD). As one interviewee in the nursing sector speculated, *‘CPD budgets were cut, which could have had an impact on retention’*. Another felt that *‘the risk is that the decline in CPD opportunities could worsen retention rates’*. In the policing sector, a reduction in support staff was thought to result in *‘pressure on the ability of forces to give officers time for development’*, although the likely importance of CPD for retention was acknowledged. Any reduction in CPD could be a risk to retention, as stakeholders in both nursing and policing sectors report the changing nature of the professions and skills required to fulfil roles, suggesting that CPD could be increasingly important.

Our earlier Engaging Teachers research (Lynch *et al.*, 2016) did not find a significant relationship between whether teachers felt their school provided appropriately for their professional development and their intention to remain in or leave the profession. This is arguably an unexpected finding, given other research suggests engaging with high-quality CPD is associated with improved retention in teaching (Allen and Sims, 2017). It could be that teachers participating in our earlier research had low expectations of CPD provision, so answered the survey question positively even though the quality of CPD was poor.

For nurses, part of NHS Improvement’s retention programme involves discussing investment in staff development with individual NHS Trusts and with Government (NHS Improvement, 2017). Health Education England’s workforce strategy consultation also emphasises the need to increase investment in the ongoing development of new and current staff (Health Education England, 2017). For police officers, Policing Vision 2025 sets out the plan for policing over the next ten years, and emphasises the importance of CPD to help the workforce gain recognition for their skills and progress in their careers (NPCC, 2016). Development of effective leaders and managers is considered critical.

5.5 Implications for policy

Teachers work considerably longer hours during term time than nurses and police officers work in a normal working week, and may be working additional hours during periods when the school is closed. Because of the peaks and troughs of the school year, teachers work more intensively across fewer weeks in the year. High workload is the key reason teachers give for working long term-time hours. Policy changes (e.g. changes to the national curriculum, assessment and qualifications) and the demands of Ofsted inspection (both real and as perceived by senior leaders) are cited as key drivers of increased workload. Teachers' intrinsic motivation to teach is also likely to be an important factor driving long working hours, but one shared with other public sector professions (Gregg *et al.*, 2008).

Workload is also often cited by teachers as one of the main reasons for leaving the profession and research suggests that it is when workload feels unmanageable that it is a critical factor (DfE, 2017b). However, an individual teacher's working hours alone are a poor indicator of their job satisfaction, engagement and likelihood of leaving the profession. School leaders should regularly monitor the job satisfaction and engagement of their staff directly, use line management effectively to identify workload issues, and intervene to increase support and reduce workload pressures where issues are identified. Nurturing, supporting, and valuing teachers is vital to keep their job satisfaction and engagement high and improving their retention in the profession.

Indeed, recent research has highlighted that many teachers say that their "level of workload was only manageable because of the long hours that they worked" (CooperGibson, 2018). Therefore school leaders, Government and Ofsted need to work together to review the impact their actions are having on the workload of all teachers, to identify practical actions that can be taken to reduce it. Since 2014, the Government's 'workload challenge' has sought to understand the nature and extent of unnecessary and unproductive workload, and develop a plan of action for reducing it. In March 2018, the Government launched a campaign with Ofsted and teaching and leadership unions aimed at reducing teacher workload. This included a policy paper and action plan on reducing unnecessary teacher workload and a pledge to make no further changes to testing, assessment or qualifications that have not already been announced or implemented, and no changes to the national curriculum until at least 2022. In May 2018, the Government established a workload advisory group to consider how to remove unnecessary workload associated with data collection and management in schools. These are welcome steps in the right direction, although the words need to be followed by the right actions from all stakeholders to reduce teachers' long term-time working hours.

6 Part-time working

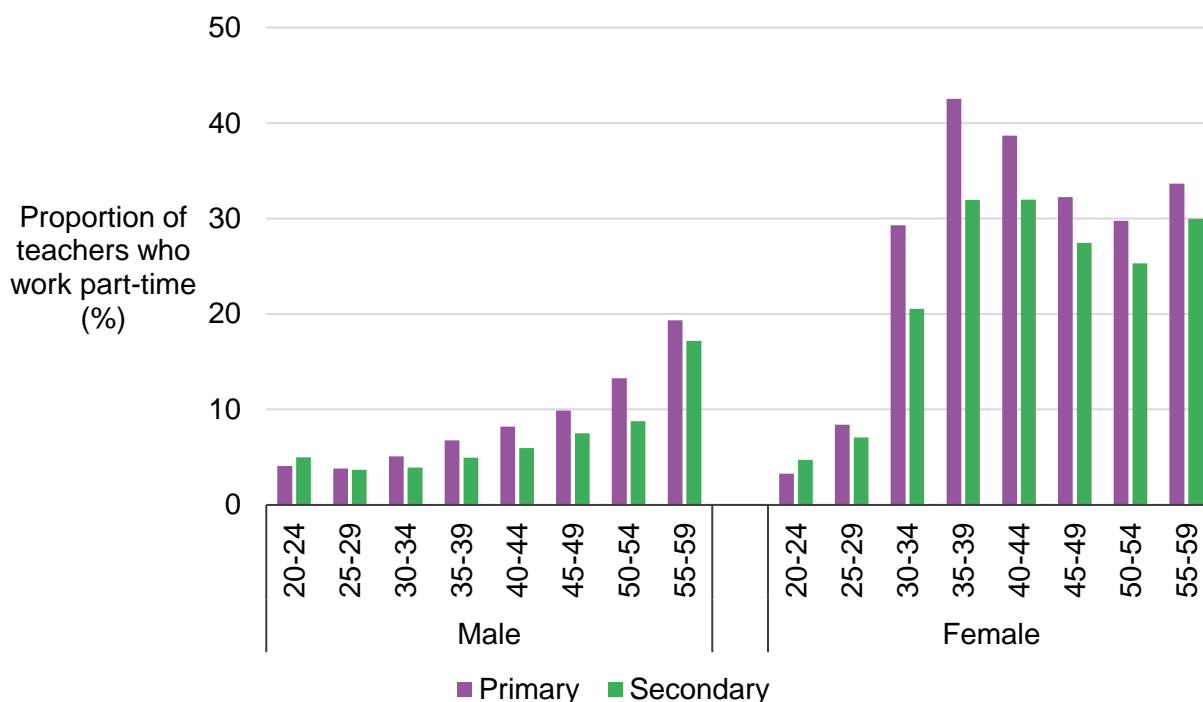
This section examines the state of part-time working in the teaching profession and considers how improving part-time and flexible working opportunities may improve teacher retention.

6.1 Extent of part-time working and change over time

The proportion of teachers working part-time is higher in primary schools than it is in secondary schools. In 2016, 26 per cent of primary teachers worked part-time compared to 18 per cent of secondary teachers. The proportion of teachers working part-time has increased slightly over time, from 25 per cent in 2010 to 26 per cent in 2016 in primary schools and from 16 per cent to 18 per cent in secondary schools.

Figure 27 shows the the proportion of part-time teachers in different age groups, broken down by phase and gender. Part-time employment peaks among women in their late 30s and early 40s, which corresponds to the period in which women are most likely to decrease their employment workload to take on childcare responsibilities. There is no evidence of an equivalent spike in part-time rates for men at the same ages. For both genders, the proportion of part-time teachers increases with age as individuals approach retirement and may seek to reduce their working hours as part of transitioning into retirement. Individuals may also need to spend more time caring for older relatives at an older age.

Figure 27 Part-time employment peaks between 35 and 45 for women



Source: NFER analysis of School Workforce Census data.

The overall gap in part-time employment between primary and secondary schools is partly explained by the fact that a greater proportion of primary teachers are female (86 per cent in primary, compared to 64 per cent in secondary), who are more likely to work part-time. However, Figure 27 shows that the gap between the primary and secondary phases is also apparent when comparing teachers of the same age and gender.

We explore this gap further by comparing the primary-secondary gap in part-time take-up using LFS data¹³. After accounting for individuals' age, gender and number of children, the primary-secondary gap is five percentage points and statistically significant in the LFS. This suggests that primary schools seem to be better able to accommodate part-time working than secondaries.

6.2 Comparisons with other professions

USoc data shows that nurses are more likely to work part-time than teachers, with 29 per cent of the nursing profession working part-time compared to 16 per cent of the teaching workforce. Police officers (four per cent) are less likely than both nurses and teachers to work part-time. However, these comparisons do not take account of differences in characteristics between the professions. The large difference in gender composition between teaching and policing is an important context for comparisons of part-time working.

After accounting for individuals' age, gender and number of children, the USoc data shows that nurses are eight percentage points more likely to work part-time than teachers, which is a statistically significant difference. Police officers are five percentage points less likely to work part-time than teachers, which is also a statistically significant difference, after accounting for differences in workforce composition.

Data from the LFS confirms these same patterns, although the magnitudes of the comparisons are different. After accounting for individuals' age, gender and number of children, nurses are four percentage points more likely to work part-time than teachers and police officers are ten percentage points less likely to work part-time than teachers. Both differences are statistically significant.

The different magnitudes in the findings from the two datasets are due to a difference in the way part-time working is collected. The LFS questionnaire has a direct question on self-reported part-time status, whereas USoc derives a proxy from working hours (those working less than thirty hours are considered to work part-time). This explains why the proportion of teachers working part-time is lower in USoc than it is in the LFS¹⁴. There may be a considerable number of part-time teachers (e.g. working 0.6 or 0.8 FTE) who are working more than thirty hours a week, including

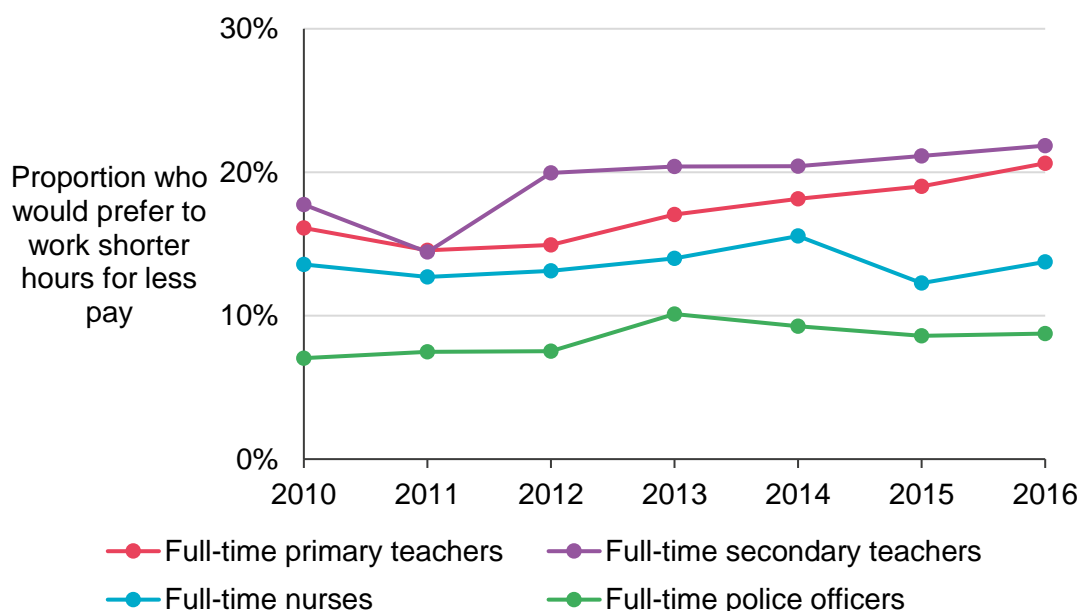
¹³ We also analyse the primary-secondary gap and differences between professions using USoc data. The USoc results broadly confirm the patterns seen in the LFS analysis. However, the LFS part-time measure (self-reported part-time status) is better than the USoc measure (people who work less than 30 hours in a typical working week).

¹⁴ This is also confirmed by comparing USoc data to SWC data – see Table 5 in Appendix B.

their hours outside the classroom. The LFS data is therefore likely to be giving the most robust comparison.

Full-time teachers are also more likely than both full-time nurses and police officers to want to work part-time. Figure 28 shows data from the LFS on the proportion of individuals who would prefer to work shorter hours, even if it involved less pay. We consider this to be a good proxy for the unmet demand for part-time working, as it is based on an explicit consideration that a move to part-time work would mean reduced pay. However, it may be an overestimate of the demand for part-time working if respondents do not take into account whether they can afford to work less hours, given less pay.

Figure 28 Teachers are more likely than nurses and police officers to want to work shorter hours, even if it meant less pay



Source: NFER analysis of Labour Force Survey data.

The data shows that full-time secondary teachers have a slightly greater demand for part-time working opportunities than primary teachers, which is consistent with our evidence from the SWC data. The data also shows that demand for part-time work has risen between 2010 and 2016 for both primary and secondary school teachers.

After accounting for individuals' age, gender and number of children, the LFS data shows that full-time nurses are eight percentage points less likely to want to work part-time than teachers and full-time police officers are ten percentage points less likely. Both differences are statistically significant.

After accounting for differences in workforce composition, full-time secondary teachers are just as likely to want to work part-time as full-time primary teachers. In contrast to the findings in section 6.1, this indicates that there is roughly equal demand for part-time work among full-time primary

and secondary teachers, when comparing individuals with similar characteristics. It suggests that there is unmet demand for part-time working in the primary sector as well as in secondary.

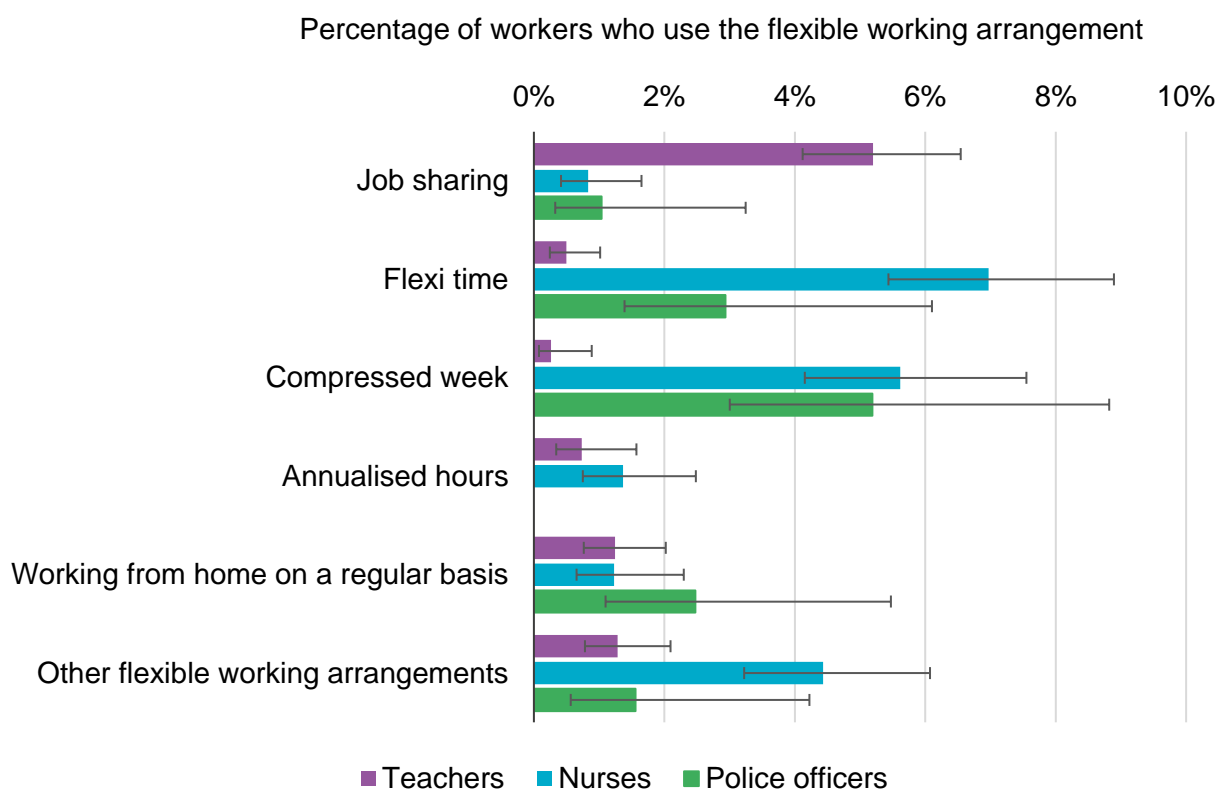
6.3 Flexible working arrangements

Part-time working is just one form of flexible working arrangement. The USoc survey collects information on a range of flexible working arrangements used by individuals, including job sharing, flexi-time, working compressed hours, and regularly working from home.

Figure 29 shows that around five per cent of teachers job share, compared to one per cent of nurses and police officers. This is perhaps unsurprising given the shift-working nature of nursing and policing that means explicit job sharing is unnecessary.

Teachers are less likely to work flexi-time than nurses and police officers, which is also unsurprising given the need for a structured school timetable. Virtually no teachers work compressed hours in a week (i.e. longer hours per day in fewer days), compared to around five per cent of nurses and police officers. The shift-work nature of nursing and policing may make this a more feasible option to incorporate than with the fixed length of the school day. Due to the on-site nature of the work in all three professions, it is also unsurprising that the percentage saying they regularly work from home is very low (although teachers appear not to have interpreted the question as including marking or lesson planning, which they are likely to do some of at home).

Figure 29 Few teachers have flexible working arrangements



Source: NFER analysis of Understanding Society data.

6.4 Part-time and flexible working in nursing and policing

Interviews with stakeholders in the nursing sector suggest that although more nurses work part-time than teachers and police officers, there is still more demand for increased flexibility in the nursing sector. One interviewee expressed that *'flexibility is absolutely key'*. Other comments included:

We are not being responsive to people's working pattern needs.

We need a system that helps people make the choices they want. We're looking at how to provide that flexibility.

Our data analysis suggests this is also true for teachers. What can the teaching sector learn from other professions about flexible working patterns? Interviewees referred to Health Education England's draft workforce strategy for the healthcare service published for consultation at the end of 2017. One of its six principles is ensuring that the NHS is a *'modern model employer with flexible working patterns'*. Stakeholders emphasised a need for a system which is flexible and adaptable to the needs of the workforce. They also referred to NHS Improvement's retention programme, which includes masterclasses for directors of nursing and HR directors, with a focus on how to offer nurses opportunities for flexible working patterns (NHS Improvement, 2017).

Interviewees emphasised how the *'heavily feminised'* nursing sector needs to be more flexible to support those returning to the profession after having a family:

People see flexible working arrangements as much more important to fit in with their lifestyle and their life choices. If they have a family, they find it difficult to re-enter the profession.

Flexibility of employment is an issue. [People] don't want to work 12-hour shifts, they want to work around school hours.

The nursing sector is also trying to improve flexible opportunities for people who want to re-enter the profession after retirement: *'We're not good with flexibility to get them back in the system after they have retired'*. NHS Improvement is working with a number of NHS Trusts to devise retirement plans for individuals which incorporate flexible working arrangements if they desire to return. *'Half would say they would want to come back but they want bespoke conditions'*.

Improving the availability of flexible working patterns was seen as important to reduce the proportion of returners who *'find it easier to resign and come back via an agency as they get the flexibility they need'*. The same could be the case for teachers who may choose agency work to meet their needs for flexibility. One interviewee in the nursing sector said:

We want people to work for the NHS [rather than for agencies] so we're looking at how we can make it a more flexible profession. We need them in the system to develop the future pipeline.

Interviewees in the nursing and policing sectors said that employers need to be adaptable to the needs of different generations in the workforce. They talked about *'a new generation of millennials'* and needing to respond to what they want from a career:

Millennials are a different generation with different working pattern requirements. We need more flexible options. The younger generation want work-life balance.

[Millennials] *are a different generation who don't necessarily want a career for life.*

This is also likely to be relevant to young people entering the teaching profession.

Flexibility was said to not only relate to working hours, but also to a desire for a '*portfolio career*' which enables people to move around the system and experience varied opportunities:

It is an evolving society. It is not like it used to be when you had a set career path. People look to move around and change jobs. People's outlook is changing.

There was a perception that it should be seen to be more acceptable to move roles more frequently within or outside of the sector. The same could be said for teachers, who could benefit from opportunities to move across schools or on to different careers within the education sector.

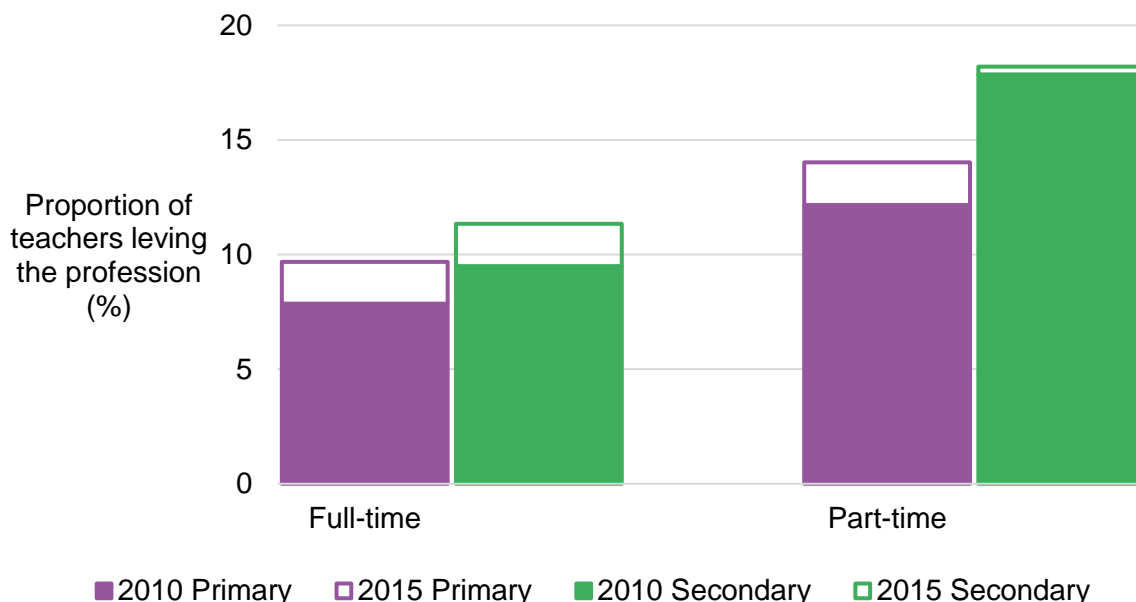
Career breaks were identified as a potential way to retain staff, given the potential benefits of individuals developing new skills in other sectors and then bringing them back to their own.

Given that the data analysis shows that some teachers would like to work reduced hours, Government and school leaders should look at how teaching could be a more flexible profession. In recognition, the Department for Education published guidance on flexible working in schools in 2017, but more needs to be understood about the nature and extent of flexible working patterns across schools and examples of good practice (DfE, 2017h).

6.5 Leaving rates

Figure 30 shows the rate of leaving the profession for full-time and part-time teachers in primary and secondary schools. The leaving rate among part-time teachers in secondary schools (18 per cent in 2016) is considerably higher than among full-time secondary teachers (11 per cent) and is also higher than part-time teachers in primary schools (14 per cent). Part-time teachers in primary schools also have a rate of leaving the profession that is higher than their full-time counterparts (10 per cent).

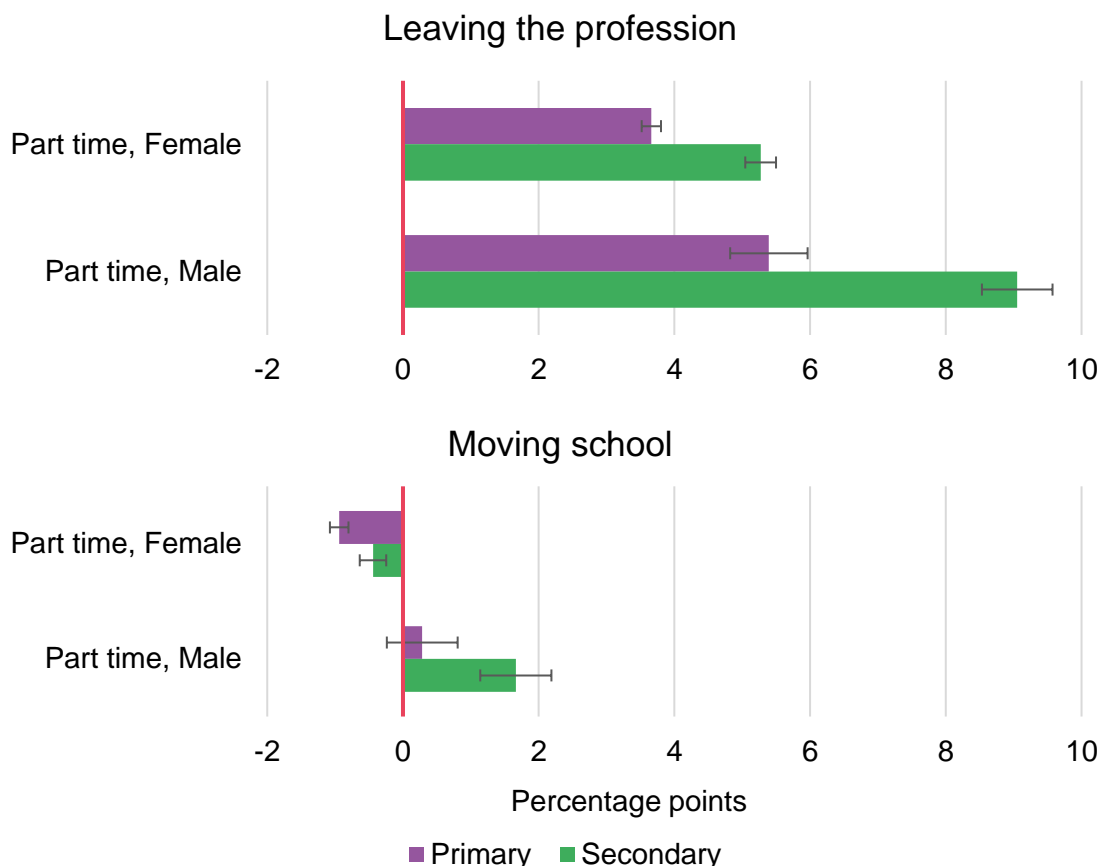
Figure 30 Part-time teachers are more likely to leave the profession than full-time teachers



Source: NFER analysis of School Workforce Census data.

Figure 31 shows the difference in the probability of leaving the profession (top) and moving school (bottom) between part-time and full-time teachers from our regression model, after controlling for other individual, school and geographical characteristics. We have estimated the effect of part-time employment separately by gender because, as we have seen, there are big differences between male and female take-up of part-time employment. The reference category for each comparison is with full-time teachers of the same gender.

Figure 31 Part-time teachers are more likely to leave the profession than full-time teachers



Source: NFER analysis of School Workforce Census data.

This shows that part-time teachers are more likely to leave the profession than full-time teachers in both primary and secondary schools. After accounting for other characteristics such as their age, female part-time secondary teachers are five percentage points more likely to leave the profession than their full-time colleagues. Female primary teachers are around four percentage points more likely to leave the profession than their full-time colleagues, after accounting for other characteristics. The effect is more pronounced for men, which perhaps indicates that specific events or responsibilities may be pushing men firstly into part-time employment and then out of the teaching profession.

The difference in the leaving rates between part-time and full-time teachers is greater in secondary schools. This may be indicative of primary schools seeming to be better able to accommodate part-time working in their timetabling than secondary schools. Part-time teachers in secondary schools may find it more difficult to sustain the demands of part-time working alongside their other responsibilities.

Differences in the probability of moving school between part-time and full-time teachers are much smaller than the differences in the probability of leaving the profession after accounting for other characteristics.

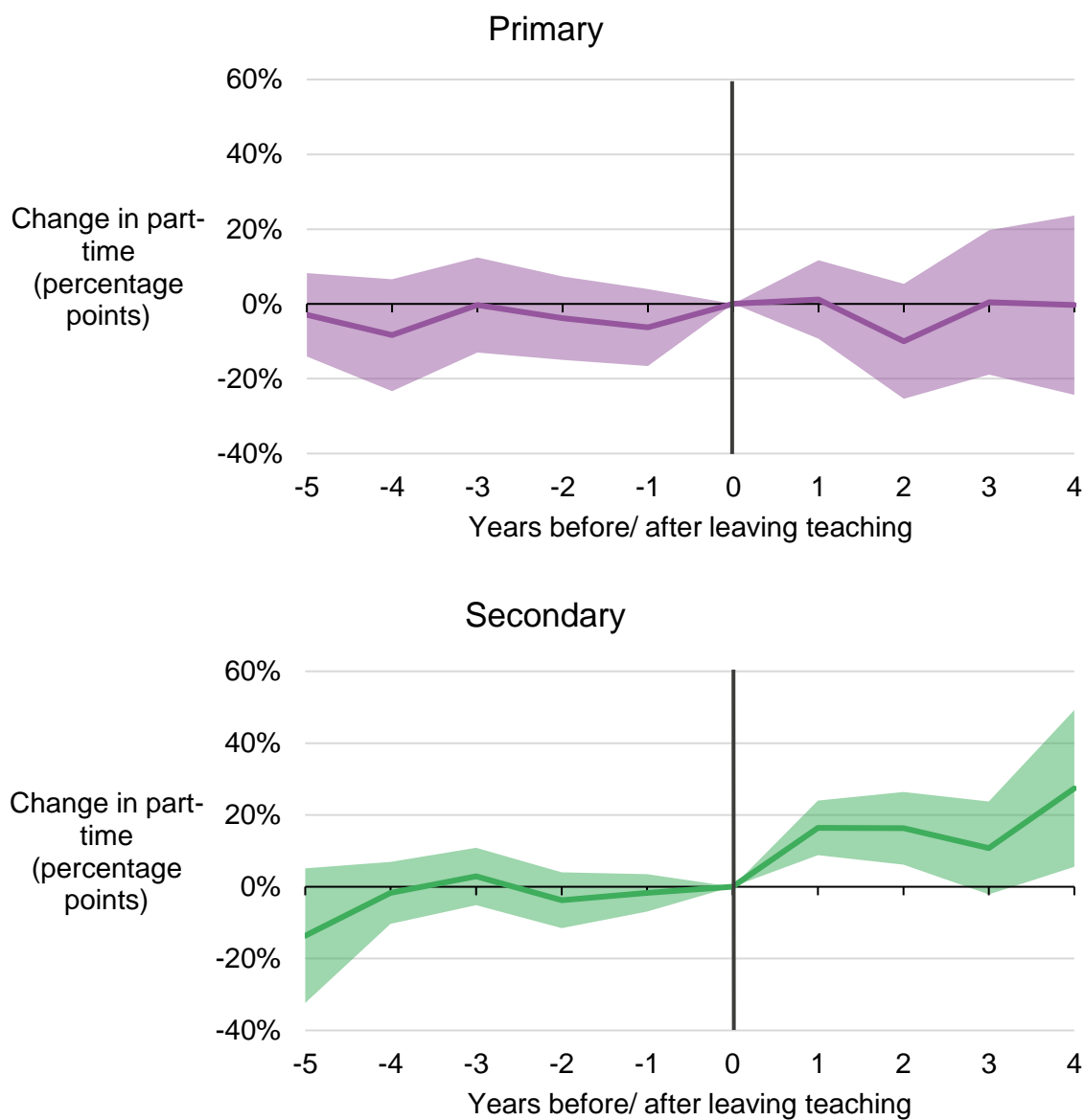
6.6 What happens after leaving?

We analyse what happens to the proportion of teachers working part-time after they leave teaching, using longitudinal USoc data. Overall, the proportion of teachers working part-time increases by ten percentage points after teachers leave. This suggests that some teachers are motivated to leave teaching by a desire for part-time working that is not being met in their current teaching job. It could also reflect a decision to leave that is unrelated to what might come after, and full-time work is not immediately available outside teaching. However, this interpretation is less likely to be the case given that the increase in the proportion of secondary teachers working part-time after leaving is sustained for at least four years.

Figure 32 shows this analysis broken down between primary and secondary teachers, where the data shows considerable differences. The percentage of secondary working part-time increases by 20 percentage points after they leave for another job, whereas there is no significant change in part-time working among primary teachers who leave. This shows that the overall ten percentage point change is driven entirely by teachers in the secondary sector.

These findings from USoc survey data reinforce our other findings, suggesting that the lack of part-time working opportunities in secondary schools mean that some teachers have to leave teaching in order to work part-time. The findings in section 6.2 suggest there is also some degree of unmet demand for part-time working among primary teachers as well, but the USoc data suggests that this is not driving some teachers to leave, unlike among secondary teachers.

Figure 32 A large number of secondary teachers move from full-time to part-time work after leaving teaching



Source: NFER analysis of Understanding Society data.

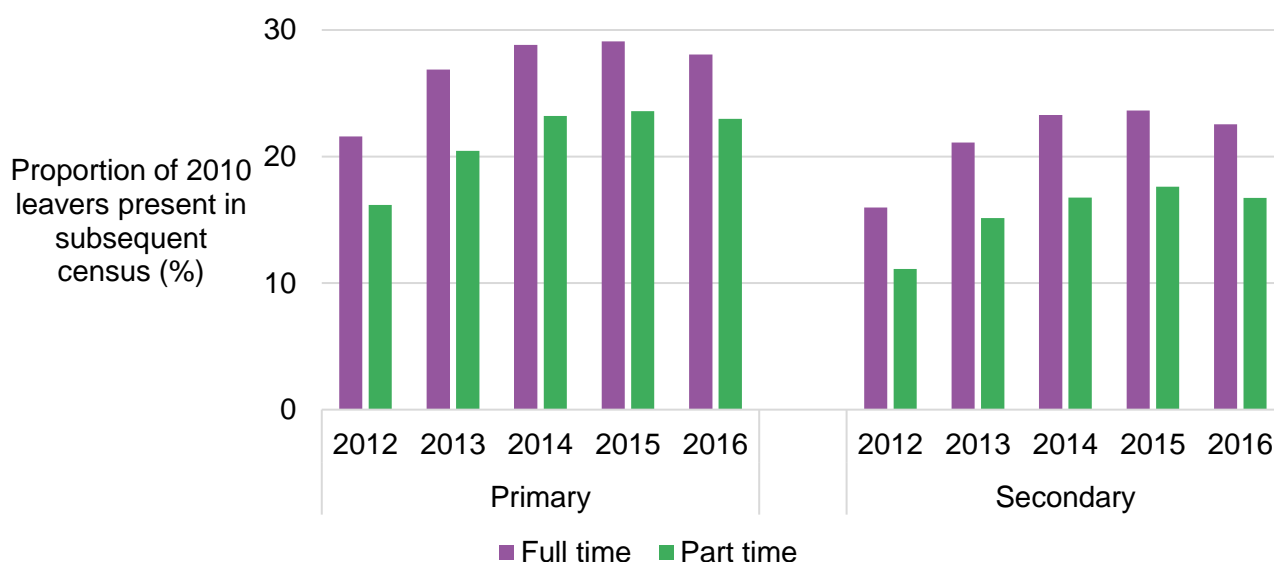
6.7 Returners

We use SWC data to explore the differences between full-time and part-time teachers who left teaching, in terms of their likelihood of returning to teaching and the experiences of those who do subsequently return.

We focus on the cohort of teachers who left teaching in the state-funded sector between the 2010 and 2011 censuses, and first analyse the proportion of them who are present in subsequent censuses, having returned to state-sector teaching.

Figure 33 shows that part-time teachers are less likely to return to teaching in the short-term, compared to full-time teachers who leave. This suggests that teachers who were working part-time when they left find it more difficult to return to the profession.

Figure 33 Part-time teachers who leave teaching are less likely to return to teaching than full-time leavers, in the short term



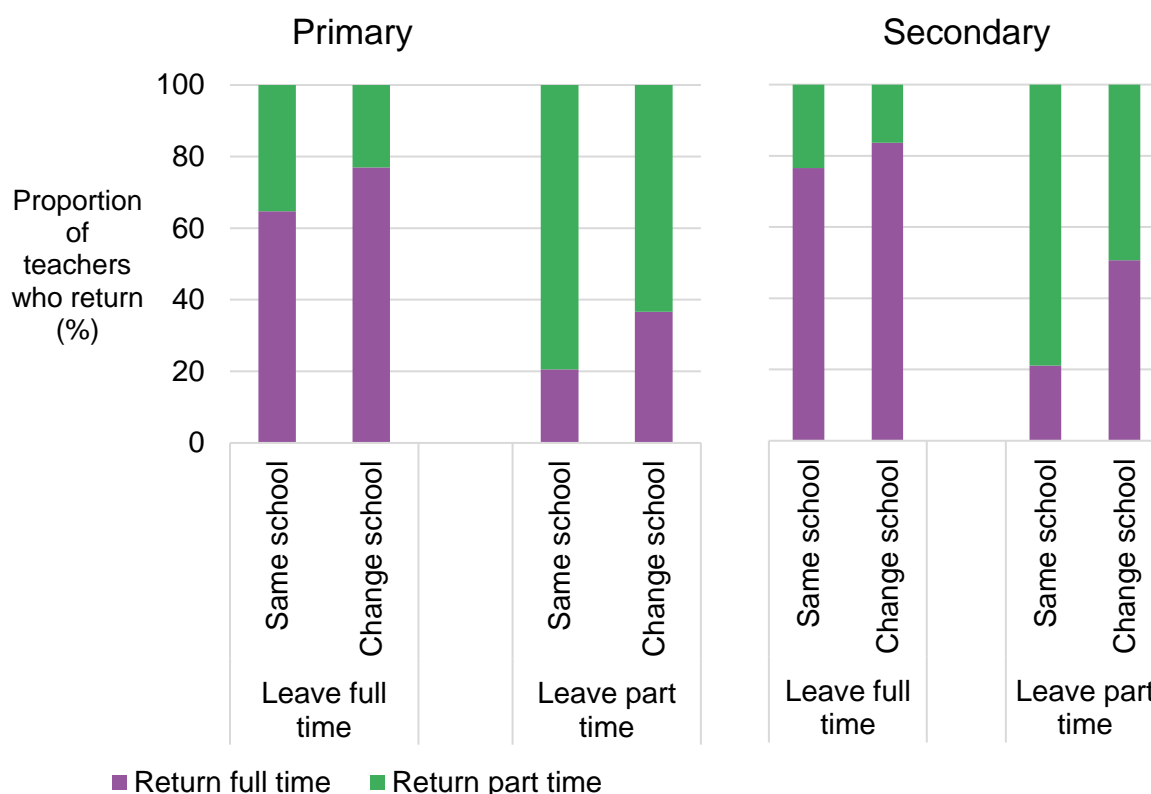
Source: NFER analysis of School Workforce Census data.

We use a regression model to check whether the difference in the likelihood of returning between full-time and part-time teachers remains after accounting for other differences in teacher characteristics (such as age, which is related to part-time status and the likelihood of returning). The regression analysis confirms that part-time primary teachers are two percentage points less likely to return to teaching in the short-term than full-time primary teachers, after accounting for age and other teacher characteristics. Among secondary teachers who left in 2010, part-time teachers are 1.5 percentage points less likely to return to teaching in the short-term than full-time teachers after accounting for other characteristics, but the difference is not statistically significant.

We also analyse data on the group of full-time and part-time teachers from this cohort who do return to explore the extent to which there are differences in the likelihood of returning to full-time or part-time roles. We split the analysis according to whether teachers return to the same school or a different school: 20 per cent of short-term returners return to the school that they left (see section 3).

Figure 34 shows the findings: a breakdown of the role they returned to, split by the role the teacher left, whether or not the teacher returned to the same school and school phase. Teachers who leave full-time and part-time roles are likely to have different preferences for the role they return to, so it is unsurprising that those who leave full-time roles are more likely to return full-time and those who leave part-time roles are more likely to return part-time.

Figure 34 Part-time teachers who leave and then return are more likely to return part-time if they return to the same school



Source: NFER analysis of School Workforce Census data.

The data reveals differences in the likelihood of returning to a part-time role, depending on whether the teacher is returning to the school they left or returning to a different school. Among full-time primary teachers, 35 per cent of those who return to the same school return part-time, whereas just 23 per cent of those who return to a different school return part-time. For part-time primary teachers, 79 per cent of those who return to the same school return part-time, whereas just 63 per

cent of those who return to a different school return part-time. The same pattern is evident for secondary teachers: full-time teachers who return to the same school are seven percentage points more likely to return part-time than those who return to a different school, and part-time teachers who return to the same school are 30 percentage points more likely to return part-time than those who return to a different school.

This could reflect different underlying preferences for part-time work between the group who return to the same school and those who return to a different school. However, it could also reflect schools' greater willingness to accommodate part-time working arrangements for teachers they know, compared to teachers they do not know.

In turn, this also suggests a wider implication for teachers who want to return to teaching in a part-time role: teachers who want to return part-time are likely to find it more difficult to secure a role. Consistent with this, recent NFER research identifies a lack of part-time and flexible working opportunities as one of the key barriers facing teachers who wanted to return to teaching (Buchanan *et al.*, 2018).

6.8 Implications for policy

Secondary schools are facing a particular teacher supply challenge over the next decade because of the projected increase in pupil numbers, higher teacher leaving rates and shortfalls in teacher trainees. The secondary school teacher stock also has a large cohort of teachers approaching their mid-thirties, which is when part-time employment tends to peak, and an increasing proportion of female teachers. Policy makers and stakeholders in the secondary school sector therefore need to urgently identify ways to help secondary schools to overcome a dual challenge: accommodating more part-time teaching and improving the retention rate of teachers who are employed part-time.

Accommodating more opportunities for part-time teaching may incentivise former teachers who left the profession to have families to return to work part-time, as well as encourage full-time teachers who want a part-time role to have one rather than leave the profession. Improving retention of part-time teachers will help to ensure that success in accommodating more part-time working for those who want it is sustained.

Identifying solutions to the challenge of providing more and better part-time working opportunities is likely to help secondary schools to deal with existing and future teacher supply challenges. NFER research has shown that the complexity of secondary school timetabling is perceived by senior leaders as the key reason why part-time teaching is more difficult to accommodate in secondary schools than in primary (Smith *et al.*, 2018). Further research identifying secondary schools that have successfully found solutions to accommodate part-time working, including overcoming the barriers presented by timetabling, and identifying best-practice, would provide a valuable resource for schools. While school leaders need to find ways of accommodating greater flexibility, teachers who would like part-time work also need to respect school leaders' challenge of ensuring the school is fully staffed at all times. For example, not all part-time teachers can work a four-day week with Fridays off. Teachers being flexible on what arrangements they are willing to accept, and perhaps proactively seeking job-share partners, would make the task of senior leaders who are open to accommodating flexible arrangements easier.

There is also no guarantee that efforts to improve the availability and suitability of part-time teaching opportunities will necessarily lead to a net improvement in overall teacher supply, especially in the short term. Making more part-time opportunities available inevitably means some full-time staff move to part-time roles, reducing schools' full-time equivalent (FTE) staffing and requiring more teachers to fill the gap.

However, our evidence shows that more and better part-time opportunities could potentially improve teacher supply by outweighing the FTE loss from staff moving to part-time roles, in three main ways. Improved part-time opportunities would help to:

1. retain full-time teachers who would have left without being able to go part-time
2. help to better retain existing part-time teachers, and
3. encourage more teachers who want to return to part-time roles to do so.

Over the longer term, teachers who would have left without being able to go part-time, may be more likely to return to work full-time in the future, after a period of part-time working. Keeping such teachers teaching could retain their expertise and reduce the risk of losing them from the profession permanently.

Some of the unmet demand for part-time working may represent full-time teachers wanting to reduce their workload. For example, teachers may prefer to teach three or four days a week with a day or two for marking and planning, which would otherwise be done at evenings and weekends, even if it involved reduced pay. Therefore, a strategy for improving opportunities for part-time working will be most effective alongside school leaders, Government and Ofsted working together to identify practical actions that can be taken to reduce teacher workload. Making the job of a full-time teacher more manageable for teachers with children or other caring responsibilities may help to improve retention of full-time staff who leave because of their high workload.

7 Teacher pay

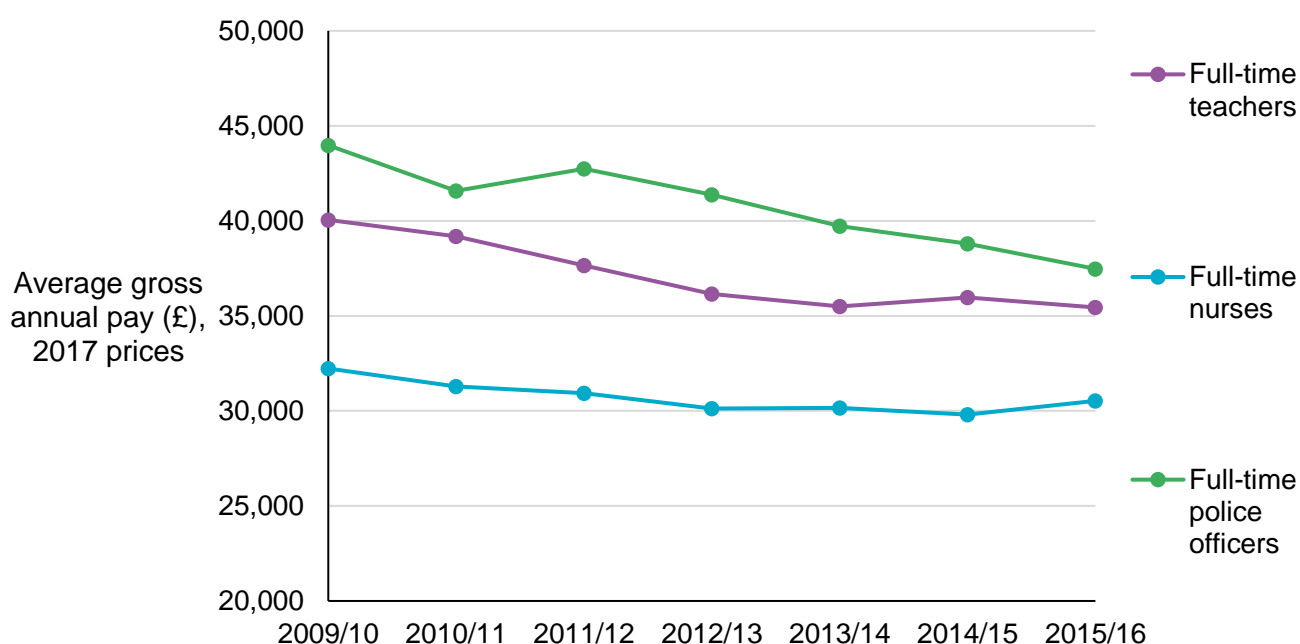
The United Kingdom has been through a period of financial austerity since 2010, during which the Government has sought to reduce public sector spending to decrease the size of the budget deficit. Between 2010 and 2017, public sector workers have faced a succession of pay freezes or below-average earnings pay increases, which has eroded their real-terms pay. Teacher pay has been somewhat deregulated in recent years, leaving more discretion for schools, although this has not led to much divergence in schools' pay policies (Sharp *et al.*, 2017). This is likely to have been affected by the period of public sector pay restraint, as well as a desire by headteachers to adopt similar policies to those of neighbouring schools. The section explores how important pay is as a factor for explaining teacher retention.

7.1 Comparing professions

7.1.1 Annual pay

Using data from the USoc survey, Figure 35 shows that full-time police officers have the highest annual earnings in 2015/16, which is £37,500 in 2017 prices, followed by teachers (£35,400) and nurses (£30,500). The data shows that the annual pay of full-time teachers, nurses and police officers, after adjusting for inflation, has declined over the period between 2009/10 and 2015/16, largely due to a series of pay freezes and below-inflation pay caps. Police officers have had a 15 per cent decrease in their pay over the period, followed by teachers (12 per cent) and nurses (five per cent).

Figure 35 Police officers have the highest average annual pay, followed by teachers and nurses



Source: NFER analysis of Understanding Society data.

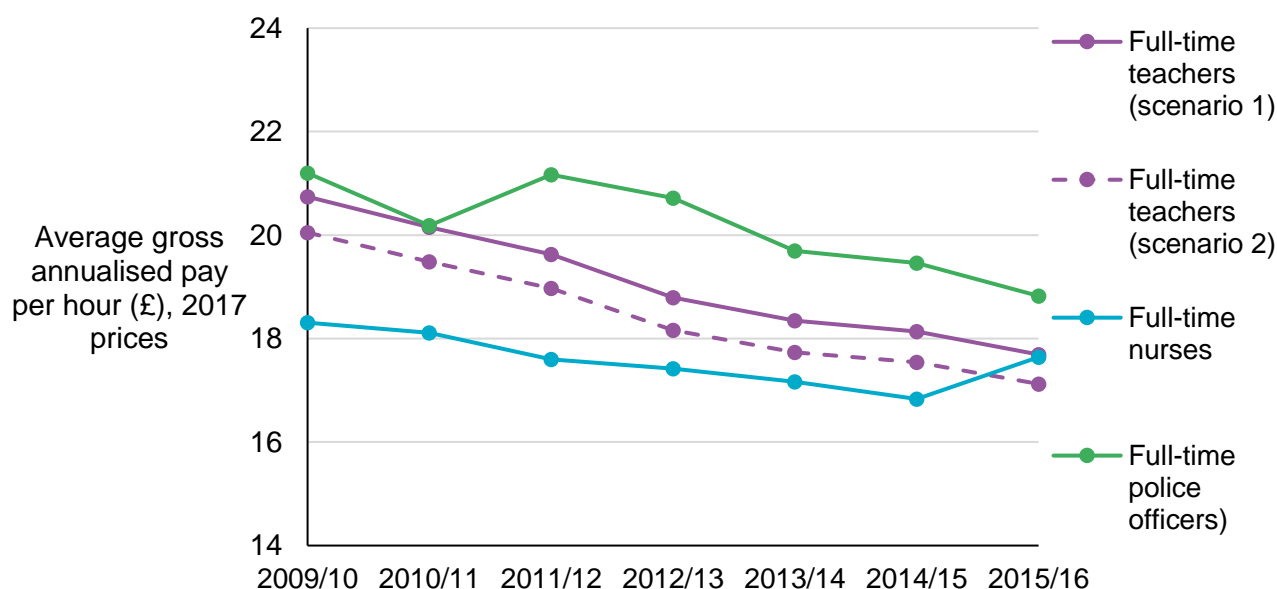
However, these comparisons do not account for changes in the composition of each workforce, which may also affect pay. After accounting for individuals' age and gender, the data shows that teachers earn around £6,000 per year more than nurses and around the same amount as police officers. This suggests that the raw difference in pay between teachers and police officers in Figure 35 is mostly driven by differences in workforce composition, i.e. a greater proportion of younger teachers means lower average teacher pay because of experience-based pay structures.

7.1.2 Pay per hour worked

However, does relative pay change when we take account for actual hours worked? Section 5 shows that teachers work the longest hours in term-time, and work more hours than nurses over a full year.

We calculate average annualised hourly wage levels, which take account of the estimated total number of hours worked by each profession each year. As we do not know from established sources how many hours teachers work during school holidays, we present two scenarios. Under our first scenario, where we assume teachers work the day before and after each term starts and ends, we find their real average hourly pay is £17.70 per hour in 2015/16 (see the solid purple line in Figure 36). This is about the same amount as nurses, but lower than police officers (£18.80 per hour). However, for the second scenario, where we assume teachers work three weeks during the school holidays, we estimate their real average hourly pay to be £17.10 per hour in 2015/16 (see dotted purple line in Figure 36). In this scenario, it would mean teachers work the most hours per year of the three professions and have the lowest real average hourly pay.

Figure 36 Teachers' average gross annualised pay per hour has fallen over time, due to falling real-terms pay and longer weekly working hours



Source: NFER analysis of Understanding Society data.

After accounting for individuals' age and gender, the USoc data shows that full-time teachers under scenario 1 earn £1.70 per hour more than nurses, when averaged across the period 2009/10 to 2015/16. Under scenario 2, teachers earn 90p per hour more than nurses. Both differences are statistically significant. After accounting for differences in the age and gender composition, teachers earn 30p per hour more than police officers under scenario 1, while police officers earn 55p per hour more than teachers under scenario 2. However, neither difference is statistically significant, suggesting that teachers' pay per hour is similar to police officers after accounting for differences in workforce composition. A greater proportion of teachers compared to police officers are in their 20s and early 30s, which partly explains why Figure 36 shows that teaching has a lower rate of average hourly pay than police officers during the period 2009/10 to 2015/16.

We also find that teachers' real average hourly pay has decreased by 15 per cent since 2009/10. Police officers had have an 11 per cent reduction over the same time period, while nurses' real average hourly pay has fallen by four per cent since 2009/10.

According to USoc data, nurses report they work on average 3.3 hours of overtime per week while police officers work on average 4.6 hours of overtime. In contrast, according to the school teachers' pay and conditions document 2017, "Teachers must work such reasonable additional hours as may be necessary to enable the effective discharge of their professional duties" (DfE, 2017i). There is no provision set out in this document for overtime payments to teachers.

While nurses and police officers may be paid for their overtime, our analysis shows that they do not get paid for all of the extra hours they work. Full-time police officers are most likely to be paid overtime, with nearly two-thirds of their extra hours being paid. Full-time nurses report that 42 per cent of the overtime hours they work are paid for. See Appendix B for more details about the assumptions behind these calculations.

7.1.3 Income satisfaction

Despite falling real-terms annual pay and an hourly pay rate that is lower than police in 2015/16, teachers have a relatively high level of income satisfaction. Four out of five (79 per cent) teachers in 2015/16 say they are satisfied with their income, higher than both nurses and police officers, though neither difference is statistically significant. Furthermore, after years of steadily falling income satisfaction among teachers, this has been increasing more recently and is now higher than at any point since it has been measured using USoc data. This increase may in part be due to teachers who said they were dissatisfied with their income in earlier waves having left the profession now, so they are no longer included. It may also be because teachers assess their absolute pay level rather than considering its decline in real-terms value or as an hourly rate.

After accounting for individuals' age, gender and number of children, teachers have a higher level of income satisfaction than police officers (statistically significant difference of 0.30 of a standard deviation¹⁵) and nurses (statistically significant difference of 0.16 of a standard deviation). This

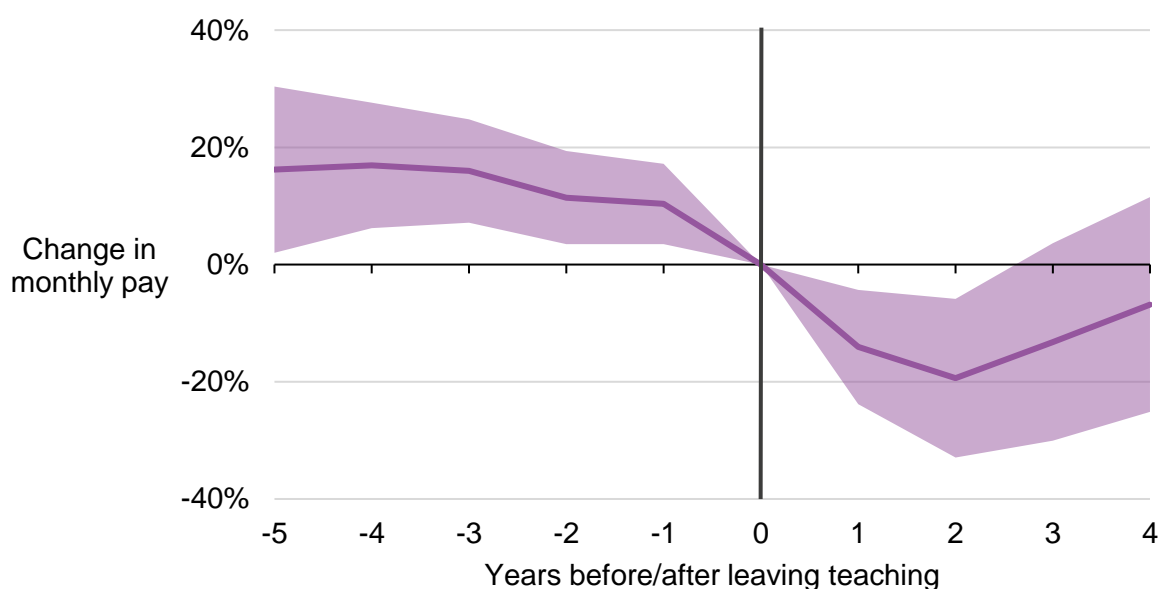
¹⁵ The standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

suggests that teachers are more satisfied with their income than individuals in other big public sector professions.

7.2 After leaving teaching

We use longitudinal USoc survey data to track what teachers are earning in their new job after they leave teaching in the state-funded sector. Figure 37 shows that immediately after leaving for a job outside the sector, after adjusting for inflation, teachers' pay is, on average 14 per cent lower than it was in the last year before they left teaching. Our analysis also shows that pay recovers slightly over the first four years after leaving, but not to the level it was at just before leaving. This suggests that most working-age teachers' decisions to leave the profession are not primarily motivated by the prospect of higher pay in the short- or medium-term.

Figure 37 The average pay of teachers who leave for another job is lower than their pay as a teacher



Source: NFER analysis of Understanding Society data.

We also explore what happens to the pay of nurses who leave the profession, to see whether this pattern is a general one among leavers or more specific to teachers. We could not analyse what happens to police officers after they leave because of small sample sizes. We find that nurses' pay falls by one per cent in their new job one year after leaving, a much smaller difference than for teachers, and a difference that is not statistically significant (see Appendix C). This suggests that the drop in pay experienced by teachers is not just a general tendency among all leavers, although this is only a comparison with one other profession. Since nurses earn less than teachers in annual terms, this may reflect nurses having more outside opportunities that are higher or similarly paid than teachers do. Also, since a smaller proportion of nurses leave the profession each year than teachers, it could be that the nurses who do leave are those with a better-paid outside option.

Consistent with the fall in pay, teachers' satisfaction with their income decreases after leaving, and we also find that teachers' assessment of their current financial situation worsens slightly after leaving (see Figures 59 and 60 in Appendix D). The pay of leavers had been falling before they left, which is likely to be due to the public sector pay freeze, and which may have also influenced their decision to leave.

While teachers' monthly pay falls after leaving, their hourly wage remains at a similar level after leaving (see Figure 58 in Appendix D). This is because these former teachers are working fewer hours per week on average compared to their last year in teaching (as shown in section 5), which is itself driven by teachers shifting from part-time to full-time work (as shown in section 6). This finding is largely consistent with previous NFER findings using LFS data, which compared leavers' wage growth with that of stayers (Worth, et al 2015).

7.3 Retention and local area wage levels

In our regression model that uses SWC data to predict the factors associated with the probability of teachers leaving the profession and moving school, we include the 70th percentile of pay in the local area (see Appendix A for exact definition). We include this to explore how teacher retention varies between areas with higher-paying and lower-paying job opportunities outside of teaching. Previous research has found a relationship between higher outside pay in the local area and higher rates of teachers leaving the profession (Allen *et al.*, 2016a).

We find a small association between outside wages and teacher retention, with a ten per cent increase in outside wages associated with a 0.23 percentage point higher probability of leaving the profession for both primary and secondary teachers. The association is statistically significant, but very small. This suggests that the pay of alternatives careers outside teaching is not a particularly important motivator for most teachers' decision to leave.

However, this association is an average across all teachers, whereas the responsiveness of teachers to outside pay is likely to differ between specific sub-groups of teachers. Allen *et al.*, (2016a) find a larger negative association between outside wages and the retention rates of recently qualified teachers in the first few years of entering the workforce. They also find a larger effect for early-career teachers in shortage subjects (e.g. maths and science teachers), where their specific outside option may have a higher average wage. Research by Sims (2018) uses evidence from randomised controlled trials in the United States to highlight the impact that bonuses for shortage teachers could have on teacher retention. He argues that retention payments targeted at this group could be less costly than the alternative of training new replacements.

7.4 Implications for policy

Despite falling real-terms annual pay and an hourly pay rate that is lower than police officers and in line with nurses, teachers have a high level of satisfaction with their income. Teachers who leave the profession see their pay fall and it does not recover over the next four years to the level it was in the last year before they left teaching. Teacher retention rates are, in general, fairly unresponsive to the level of pay in the local area, a proxy for the number and quality of available outside opportunities. Our findings therefore suggest that most working-age teachers' decisions to

leave the profession are not primarily motivated by the prospect of higher pay in the short- or medium-term.

However, the findings do not necessarily imply that increasing teachers' pay will have no impact on teacher retention. The research literature finds associations between relative wages and teachers' decisions to leave the profession (Hutchings, 2011). However, policy responses that aim to increase teacher retention need to consider pay alongside other factors affecting the trade-offs that teachers make, such as teachers' workload, working hours and job satisfaction. Our research finds that improved job satisfaction and better opportunities for part-time working are stronger motivating factors for teachers who leave the profession than pay. On its own, any pay increase that aims to convince this group of teachers to stay in teaching needs to be large enough to outweigh these other factors in their decision-making. Furthermore, any pay increase for all teachers would also apply to those who would have stayed in teaching anyway, so comes with a large deadweight cost if viewed purely from the perspective of the impact on retention.

The wider research evidence suggests that pay increases designed to improve teacher retention are likely to be best value for money when they are targeted at groups of teachers who are most responsive to pay differentials, such as early-career teachers and teachers of subjects with well-paid alternatives outside of teaching, e.g. science and maths (Hutchings, 2011; Sims, 2018). The Government's announced pay increase for 2018/19 of 3.5 per cent for teachers on the main pay scale and two per cent for teachers on the upper pay scale targets the increase at early-career teachers. This would seem to be a relatively effective use of scarce resources. However, the pay increases are not differentiated by subject. Recent research has argued that targeting pay increases or salary supplements at teachers of shortage subjects such as science and maths could have an impact on their relative undersupply (Sims, 2018; Sibiet, 2018).

8 Academies and multi-academy trusts

Following the large growth in the number of academy schools since 2010, the number of teachers working in academies has increased substantially between 2010 and 2016. Academies are schools directly funded and overseen by the Department for Education rather than by a local authority, and are run by an academy trust which employs the staff. In 2016, 69 per cent of secondary schools were academies while the proportion was still relatively low at 23 per cent at primary level (Gee and Wespieser, 2017). The most common type of academies in both phases are converter academies (maintained schools deemed to be high-performing that chose to become academies), rather than sponsored academies (underperforming schools whose running was taken over by a sponsor).

This section explores the relationship between academy status, and the mobility and retention of teaching staff. We analyse teacher movement between different schools within the same multi-academy trust (MAT) and how retention and turnover rates differ between different types of academies.

8.1 Staff deployment within MATs

8.1.1 Teacher mobility in MATs

Multi-academy trusts (MATs) are an important and growing feature of the school landscape in England. MATs are single organisational structures that have overarching responsibility for running a number of schools. The number of MATs grew from 419 in November 2011 to 1,353 in November 2017. The size of the largest MATs has also grown: the five largest MATs in November 2011 each had 13 or more schools, whereas the five largest MATs in November 2017 each had at least 43 schools.

Legally, MATs employ all staff in the schools within the trust. Therefore, in theory, the MAT structure enables leaders to take a more strategic and flexible approach to staff deployment than if the schools were grouped in a looser model of school-to-school collaboration. It gives leaders the opportunity to deploy staff to where they are most needed in the trust.

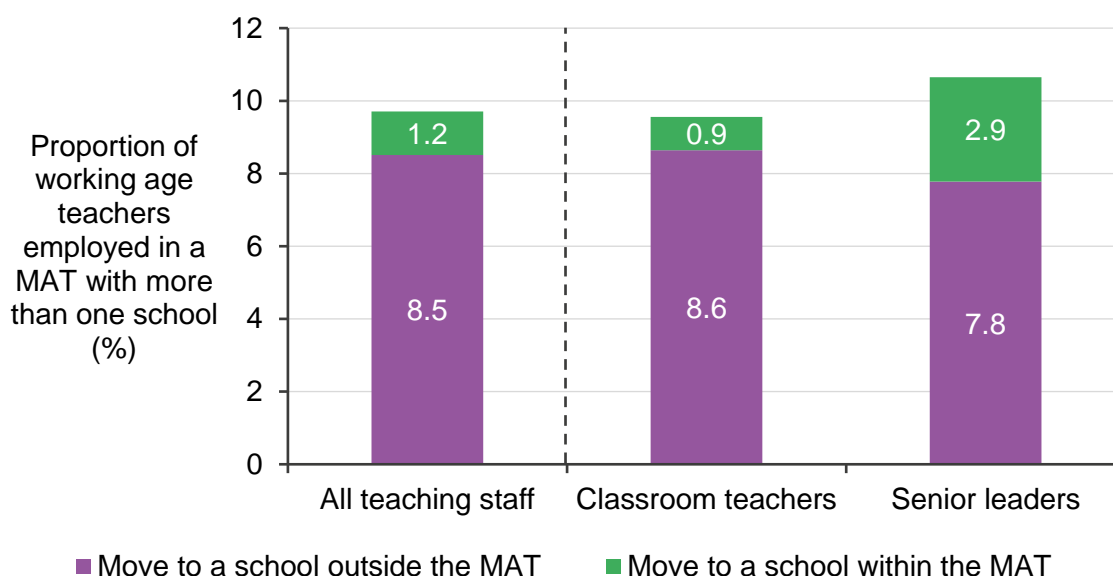
However, exactly how much influence leaders can realistically have on how staff are deployed will depend on the balance between centralisation and delegation within each MAT. It will also depend on the willingness of headteachers to allow staff to be deployed to different parts of the trust and the willingness of teachers themselves to be deployed elsewhere. Evidence from a Reform survey of MAT chief executives showed that while most MATs manage staff terms and conditions centrally, recruitment is delegated to individual schools within most MATs (Finch *et al.*, 2016). The survey also found that most forms of deploying staff between schools, such as permanent moves, secondments and staff cover, are commonly offered ‘sometimes’.

We analyse the movement of teachers between different schools from one year to the next using seven years of SWC data. We identify teachers who move from one school in a MAT to another school in the same MAT, as distinct from those who move to another school in a different MAT or to a school that is not in a MAT. This analysis captures permanent moves and secondments from one school to another. However, as the SWC is an annual snapshot, it cannot capture more

informal between-school deployments of staff, such as staff cover, short-term loans or teaching in more than one school (each teacher record has information on their main contract in each year, which is based at a single school). We define classroom teachers and senior leaders based on the post they move into - i.e. senior leaders are those who move into a senior leadership post (headteachers, deputy headteachers and assistant headteachers), whether or not they were a senior leader in the post they left.

Figure 38 shows that around one per cent of classroom teachers working in a MAT move to another school in the same MAT each year, compared to around nine per cent per year moving to another school outside the MAT. This rises to three per cent of MAT staff who move into and between senior leadership posts in the same MAT, compared to nine per cent who move to a senior leadership role in another school outside the MAT per year.

Figure 38 Senior leaders within MATs are more likely than classroom teachers to make a permanent move to another school in the same MAT

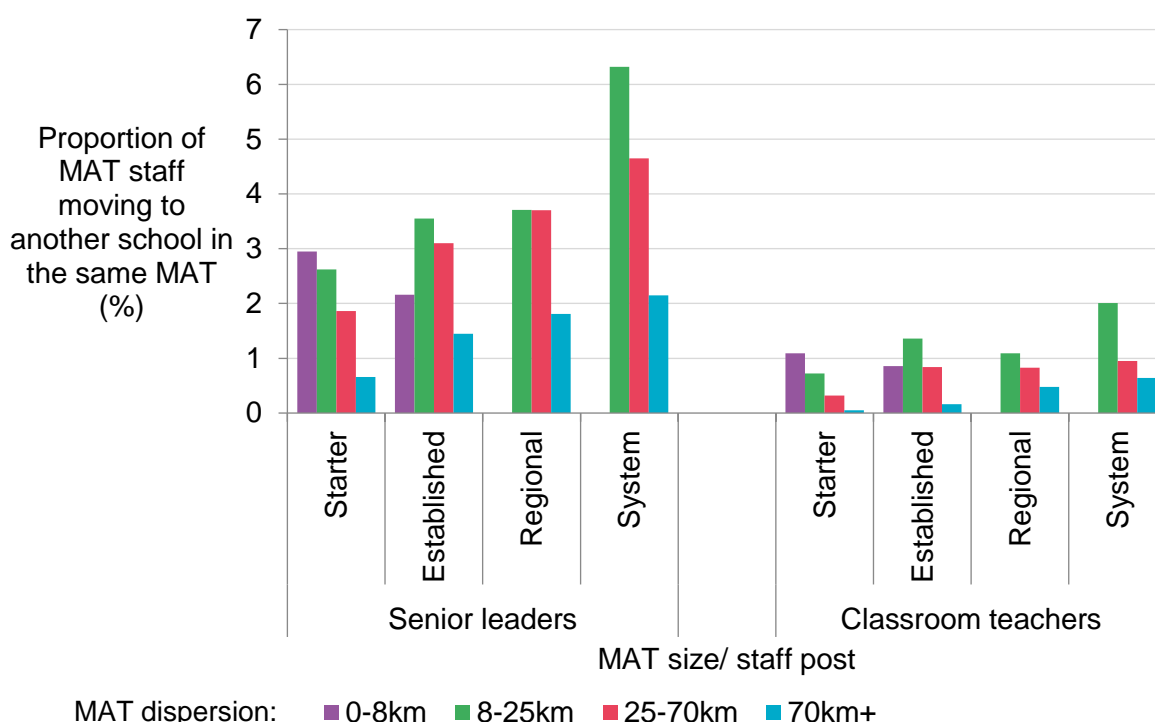


Source: NFER analysis of School Workforce Census data.

This indicates that staff deployment across MATs is concentrated among senior leaders, consistent with the Department for Education's good practice guidance for MATs, which recommends that MATs "grow and develop the next middle and senior leaders by deploying them across a group of schools, with the expectation of movement between schools within the trust" (DfE, 2016b). Classroom teachers appear to move less within a MAT than senior leaders, though this may be because they are deployed in more flexible ways that are not captured by the SWC. Overall, teacher churn in MATs (around ten per cent) is higher than the average for all schools, which is around seven per cent for both classroom teachers and senior leaders.

Our analysis also shows that the average proportion of all MAT staff that move to a different school in the same MAT is greater where the number of schools in the MAT is larger¹⁶. This is intuitive, as more schools means there are more opportunities for staff to move. Figure 39 shows this is the case for both classroom teachers and senior leaders.

Figure 39 Staff movement within MATs occurs most in larger MATs that are more geographically clustered



Source: NFER analysis of School Workforce Census data.

Distance matters as well as size. For MATs of a given size, the proportion of staff that move to a different school in the same MAT is lower where the schools are geographically further apart¹⁷. Again, this is intuitive as most teachers move to a local school when they move.

Larger MATs with geographically clustered schools have the greatest amount of internal school-to-school staff movement. The House of Commons Education Committee (GB, 2017) has argued that “regional structures which allow schools to share expertise and resources” are one of the characteristics of the most successful trusts, while the Department for Education has emphasised

¹⁶ We use the National Schools Commissioner’s four-tier system for classifying trusts according to their size. Starter trusts: MATs with between one and five academies (MATs with one school are treated separately from schools in SATs, because they have a distinct legal structure). Established trusts: MATs with between six and 15 academies. Regional trusts: MATs with between 16 and 30 academies. System trusts: MATs with over 30 academies.

¹⁷ We define dispersion (i.e. how far apart the MAT is spread) by the average straight-line distance between the grid reference of each school and the centre point (median grid reference) of all schools in the MAT.

the importance of “coherent geographical clusters” within MATs, which “can be created in national or regional trusts by creating smaller clusters within them” (DfE, 2016b).

A large, closely-clustered MAT structure might also enable more informal forms of cross-school staff sharing, such as staff cover and teachers teaching in more than one school. However, our analysis of the SWC can only capture the extent of permanent moves and secondments between different schools. Anecdotally, MAT leaders suggest that the structure enables more school-to-school collaboration among staff permanently based in different schools, particularly among classroom teachers, which may explain why we find senior leaders are more likely to make permanent moves between schools within MATs. Further research is needed to investigate the extent of informal staff-sharing in MATs.

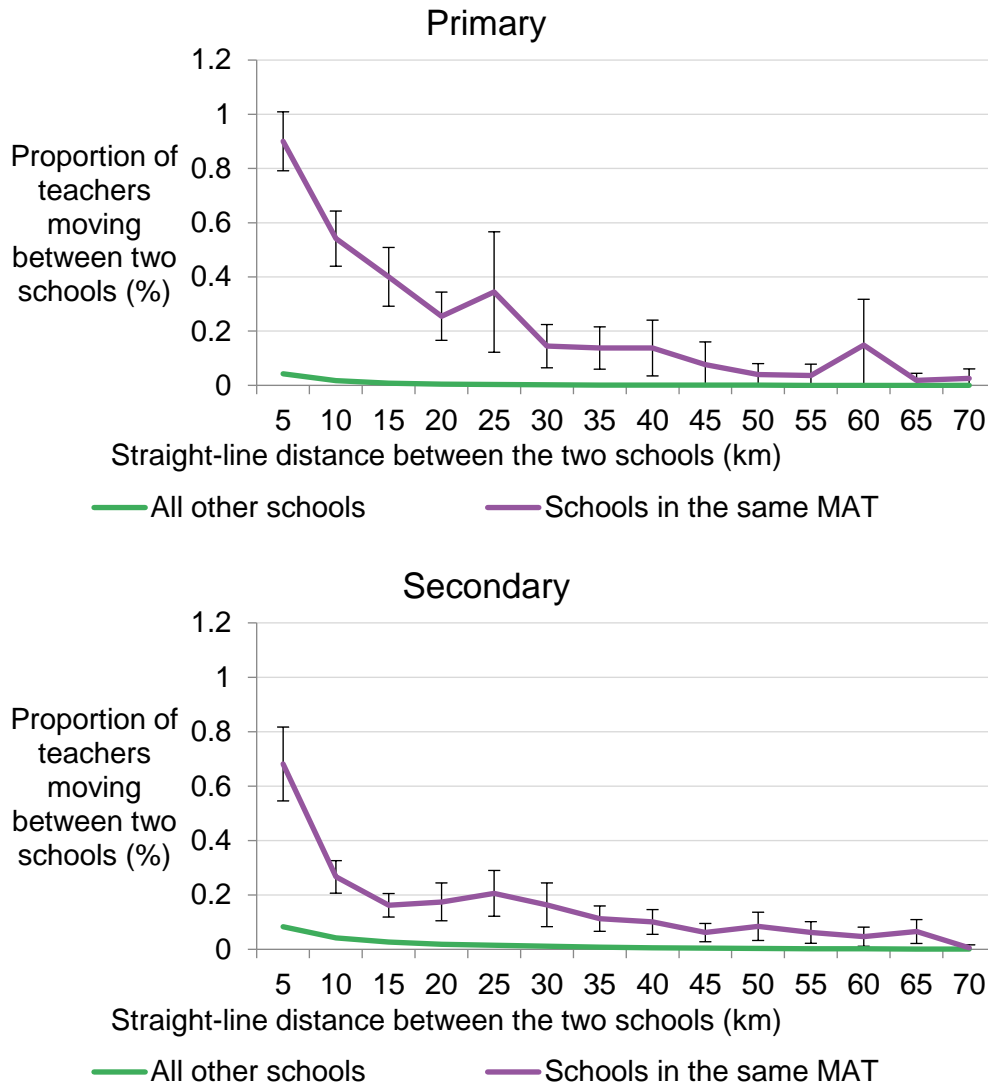
8.1.2 MAT staff mobility and local teacher labour markets

Schools within the same MAT tend to be clustered relatively close together geographically and most teachers that move school tend to move to a local school (DfE, 2017c). We might therefore expect some movement between schools in the same MAT simply because they are close to each other. Is the amount of staff movement within MATs that we find in our analysis higher than we might expect based on geography alone?

We check this by considering the extent of teacher movement between each school in the country and all other schools in the same phase within a 70 kilometre radius. Unsurprisingly, we find that the extent of staff movement between any two schools is higher when they are closer together. If we pick two secondary schools within five kilometres of each other at random then the probability of a teacher moving from one to the other is one in 1200. If the two schools are between five to ten kilometres apart, then the probability is lower: one in 2400. This is shown by the green line in Figure 40, which slopes downwards as the distance between schools increases.

However, if the two schools are in the same MAT and less than five kilometres apart then the probability is one in 150: around eight times higher than secondary schools that are not in the same MAT. In general, the amount of staff movement between two secondary schools within the same MAT is more than ten times higher than the level we might expect based purely on how far apart the schools are (purple line). This is important because it suggests that MATs have internal teacher labour markets that are somewhat distinct from surrounding schools.

Figure 40 Staff movement within MATs is greater than between schools in the local area



Note: black bars indicate 95 per cent confidence intervals.

Source: NFER analysis of School Workforce Census data.

Figure 40 shows that the same is true of primary schools, where the flows between schools in the same MAT are even larger in comparison to the local area. Among primary schools, the amount of staff movement between two primary schools within the same MAT is more than 150 times higher than the level we might expect based purely on how far apart the schools are.

Our analysis also confirms that the flow of senior leaders between schools in the same MAT are larger in comparison to the local area. The amount of senior leadership movement between two schools within the same MAT is 55 times higher for secondary schools and 250 times higher for primary schools.

What is causing greater staff movement within MATs? There are several possible explanations for this pattern, which could each contribute to explaining the findings. MAT leaders may take an active role in deploying staff to different schools within the MAT. Being responsible for a number of schools, they are better incentivised to take a strategic approach to deployment that sees staff moved to where they are most needed. This is likely to be particularly the case where a high-performing school supports an underperforming school: the Department for Education’s good practice guide recommends that MATs consider “how they deploy the capacity within their trust to work with the schools’ teachers and leaders to improve practice” (DfE, 2016b). Capacity-sharing in this context might well include a secondment or permanent move.

MAT leaders might also be keen to use the range of opportunities that exist across their MAT to develop the leadership pipeline from within. Former Education Secretary Nicky Morgan suggested that a model of flexible staff deployment would “give a clear path to career progression that will keep [teachers and leaders] engaged rather than looking for opportunities elsewhere” (Morgan, 2016).

Information about vacancies within a MAT is likely to be more easily available to staff within a MAT than to staff outside the MAT. A greater level of standardisation and consistency of approach (for example, in curriculum) may exist between schools in the same MAT, enabling a smoother transition if teachers move school. Teachers may also be familiar with the staff in other schools through school-to-school collaboration, such as curriculum planning or moderation. Part of the pattern may also be explained by the characteristics of teachers and schools within MATs that are associated with greater movement, e.g. young teachers, schools in urban areas.

8.1.3 MAT staff mobility and social mobility

A common concern among policymakers is how to get high-quality teachers into schools or areas of the country that are underperforming, which also tend to be where schools find it hardest to recruit and retain teachers. The Government put this issue at the heart of its 2016 White Paper, stating that “Educational excellence everywhere means improving recruitment and retention of new and experienced teachers in areas of greatest need” (DfE, 2016c). However, one of the main policies for overcoming regional staff deployment issues, the National Teacher Service, failed to recruit enough teachers (Hazell, 2016).

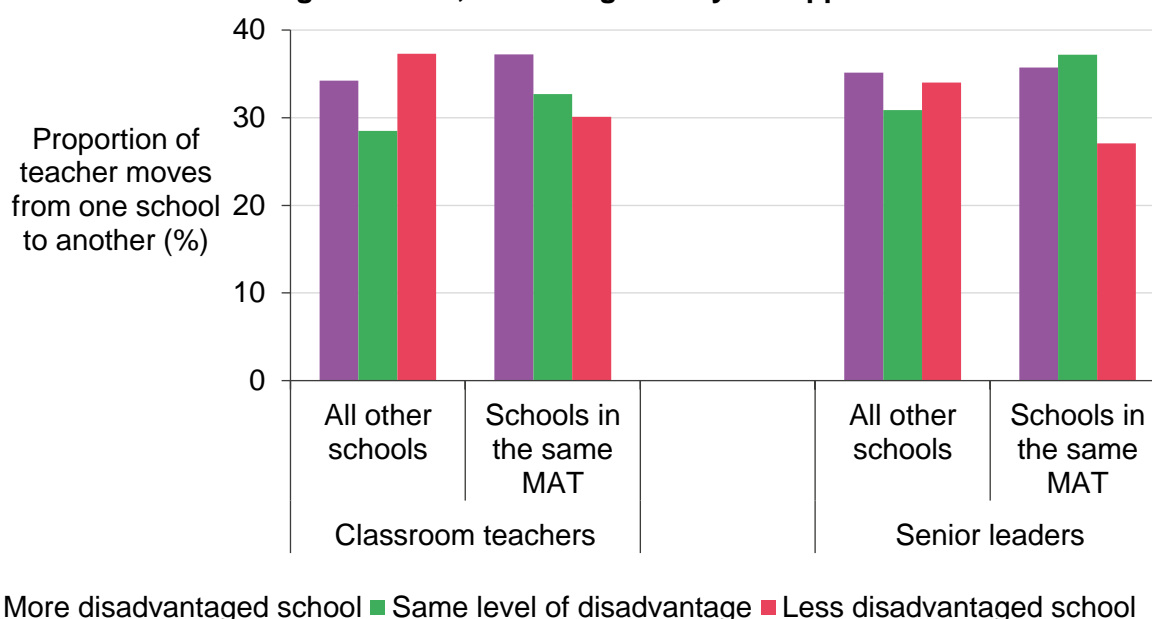
Given the flexibility and strategic oversight that MAT leaders have over staff deployment across their schools, MATs may offer an alternative and potentially effective mechanism for deploying staff to schools in challenging areas that struggle to recruit and retain staff. Our analysis has shown that MATs have internal teacher labour markets that are somewhat distinct from surrounding schools and which encourage mobility between schools. But do the internal labour markets within MATs promote staff deployment that is beneficial to the system?

Allen *et al.*, (2016b) find that schools with the most disadvantaged pupil intakes tend to have more inexperienced teachers, more unqualified teachers and higher staff turnover, suggesting that these schools face greater difficulties in hiring staff. We analyse how teacher movement affects schools

with different levels of intake disadvantage by comparing the free school meals (FSM) quintiles¹⁸ of the school a teacher left to the one the teacher joined. We split the analysis by classroom teachers and senior leaders, and by within-MAT moves and all other moves, to explore how MATs influence between-school movement.

Figure 41 shows that, in general, when classroom teachers move school, a greater proportion move to a school with a less disadvantaged intake (red bars) than a school with a more disadvantaged intake (purple bars). Movement is more balanced among all senior leaders, and is very slightly in favour of schools with more disadvantaged intakes. In contrast, when classroom teachers and senior leaders move from a school in a MAT to another school in the same MAT they are more likely to move to a school with a more disadvantaged intake than a school with a less disadvantaged intake. This suggests that the strategic approach that MATs can take towards workforce management might provide a mechanism for deploying staff to schools with more disadvantaged pupil intakes.

Figure 41 Staff movement in MATs is more likely to be to schools with more disadvantaged intakes, whereas generally the opposite is the case



Source: NFER analysis of School Workforce Census data.

Note: 'All other schools' includes all teacher moves that are in and out of maintained schools, in and out of single-academy trusts and moves that are out of MATs to a school that is not in the same MAT.

However, there are likely to be limits to this as a mechanism. The proportion of teachers moving within a MAT to a school with a less disadvantaged intake is still relatively high: 30 per cent for classroom teachers and 27 per cent for senior leaders. Although MAT leadership teams may be able to influence staff deployment to some degree, movement requires the willingness of teachers

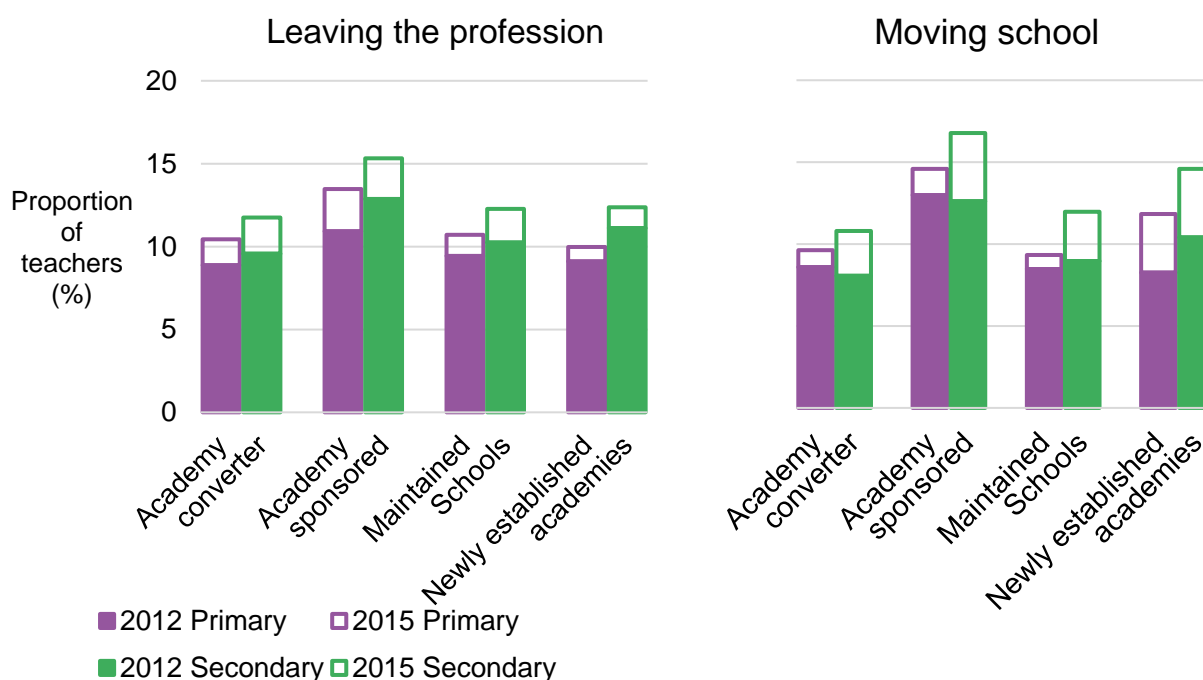
¹⁸ Five equally-sized groups of schools, split according to the proportion of pupils who are eligible for FSM, from the highest to the lowest.

and school heads. Also, as we have noted above, the geographical dispersion of the MAT influences how much movement there is between schools within a MAT. Schools with disadvantaged intakes that are in isolated areas may find it more difficult to benefit from being part of a MAT in terms of staff deployment.

8.2 Leaving and moving rates

Figure 42 indicates that teachers working in sponsored academies are the most likely to leave the profession, while teachers working in local authority maintained schools and converter academies have very similar rates of leaving the profession. The same applies to the proportion of teachers moving school. However, these differences are unlikely to be due primarily to how academy status affects schools' staffing policies, and more to do with the context of sponsored academies as previously underperforming schools with other characteristics associated with higher staff turnover (such as lower Ofsted ratings, school performance and having a more disadvantaged pupil intake¹⁹).

Figure 42 Teachers working in sponsored academies have the highest probability of both leaving the profession and moving school



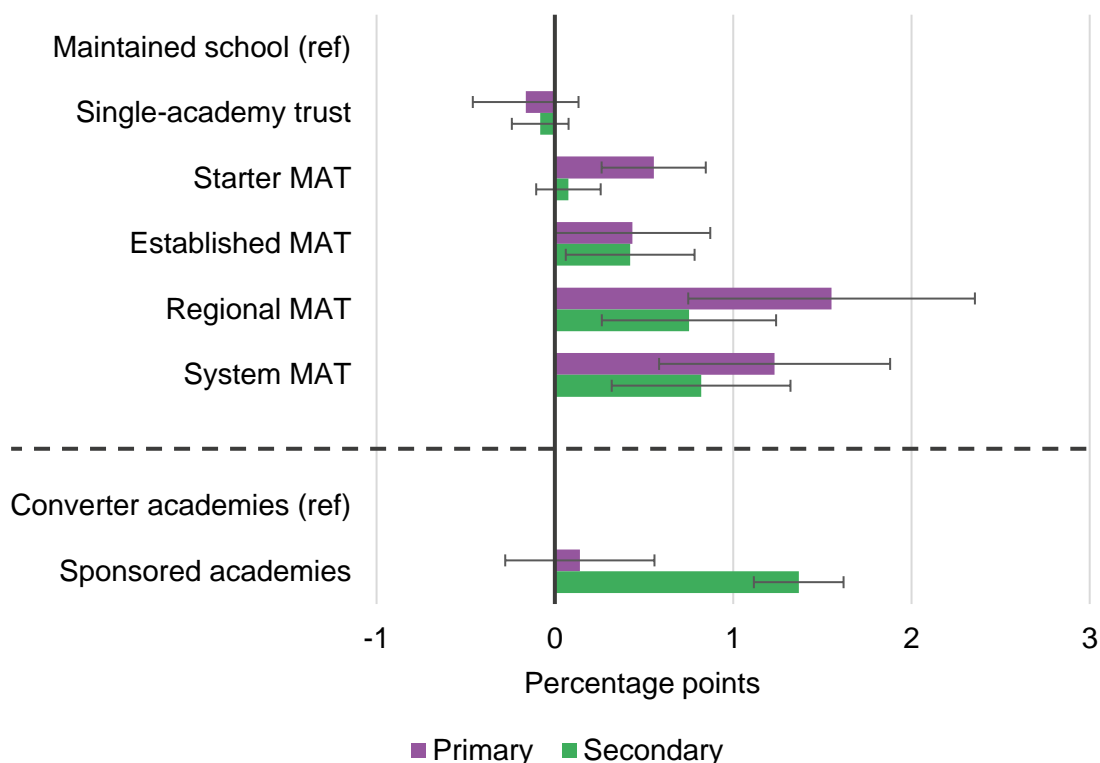
Note: Newly established academies include free schools, university technical colleges and studio schools.
Source: NFER analysis of School Workforce Census data.

Our regression models confirm that teachers in secondary sponsored academies have a higher probability of leaving the profession and moving school, after accounting for individual and other school characteristics. However, the difference between sponsored academies and other schools is smaller than the raw difference because these other factors explain a lot of the variation. Figure

¹⁹ A school's disadvantaged intake is measured using the quintile of the proportion of pupils eligible for FSM.

43 shows that the difference in the probability of leaving the profession between secondary sponsored academies and converter academies from the regression model is between one and two percentage points.

Figure 43 Secondary schools in larger MATs have slightly higher rates of leaving the profession



Source: NFER analysis of School Workforce Census data.

We further distinguish in our analysis between academies that exist as a single-academy trust (SAT) and those that belong to a multi-academy trust (MAT), and between MATs with different numbers of schools in them, using the National Schools Commissioner's four-tier system for classifying MATs according to their size.

Raw comparisons of leaving rates show that MATs tend to have a higher than average rate of teachers both leaving the profession and moving school when compared to SATs and LA maintained schools. However, MATs of all sizes, and particularly the largest MATs, are disproportionately comprised of sponsored academies.

Figure 43 shows the separate associations between MATs of different sizes and sponsored academy status and the probabilities of a teacher leaving the profession. The results suggest that MATs of all sizes have slightly higher rates of teachers leaving the profession compared to both SATs and LA maintained schools, after accounting for other factors such as the type of academy and Ofsted rating. However, some of these differences are uncertain due to wide confidence

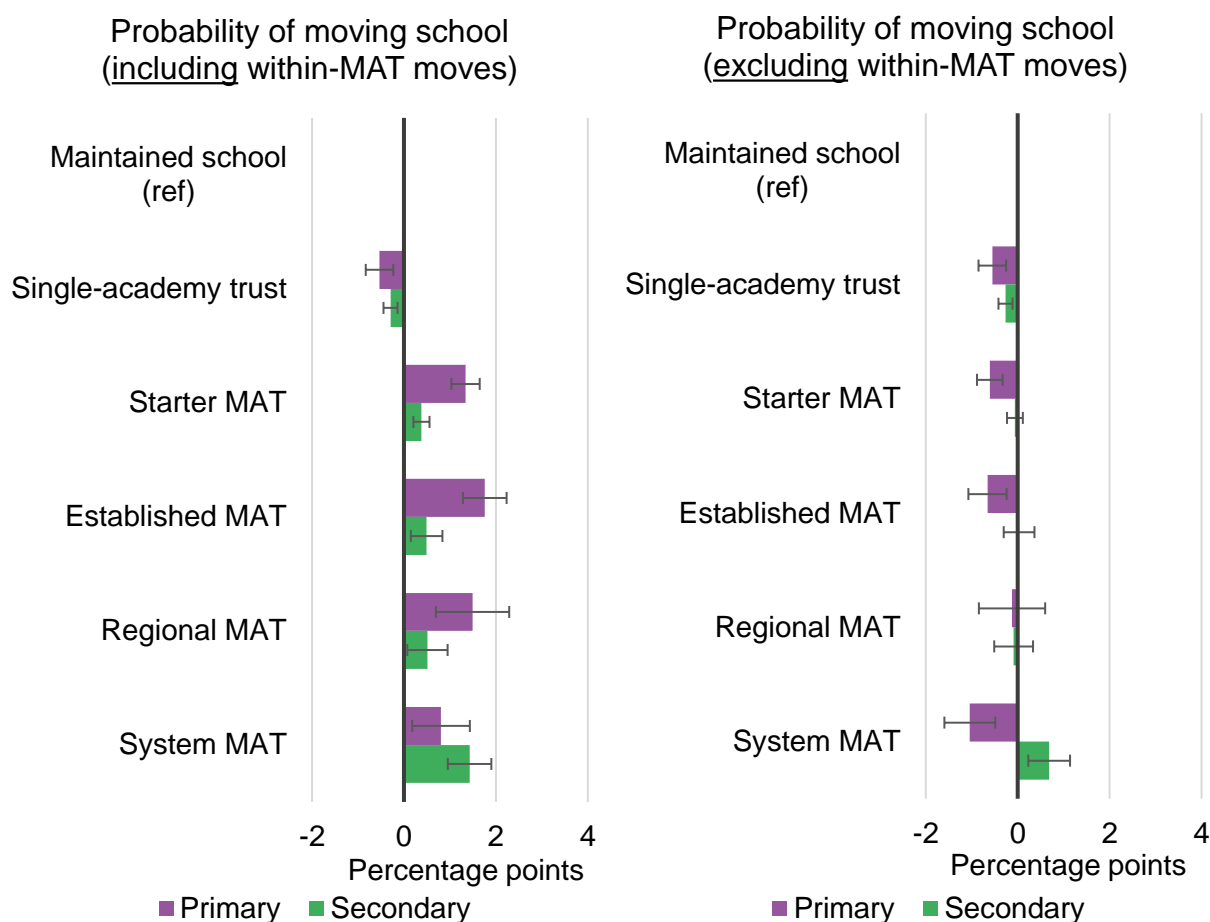
intervals. Primary schools in MATs of all sizes have slightly higher leaving rates than SATs and maintained schools, all of which are statistically significant. Secondary schools in Established, Regional and System MATs have slightly higher leaving rates, which are statistically significant.

One possible explanation of slightly higher rates of teachers leaving the profession in MATs is that staff movements from a school-based role to a role in a central team are not captured by the SWC. As only school data is collected, any such movement would not be recorded in the SWC and the teacher would therefore count as leaving the profession. However, with little information about the extent of staff flows from school- to central-based roles within MATs, it is impossible to know how much of the difference this might explain.

The left-hand side of Figure 44 shows the relationships between maintained schools, SATs and MATs of different sizes and the probability of moving school. Again, this accounts for the different association between moving school and sponsored / converter academies. This suggests that MATs have a higher proportion of teachers moving school compared to SATs and non-academies. However, it counts teachers who move from one school to another within a MAT as representing churn.

The right-hand side of Figure 44 shows the same relationships, but *excluding* teachers who move from one school in a MAT to another school in the same MAT. Comparing the left- and right-hand sides of Figure 44 demonstrates that within-MAT movement explains almost all of the difference in moving rates between MATs and other schools, after accounting for other characteristics.

Figure 44 Schools in larger MATs have higher moving rates than other schools, but the difference disappears if we exclude within-MAT staff movement



Source: NFER analysis of School Workforce Census data.

These findings show that schools in MATs have similar churn rates to other schools after accounting within-MAT movement. In fact, primary schools in Starter, Established and System MATs have significantly lower churn than other schools after excluding within-MAT movements. The only exception is secondary schools in system MATs, which do have a slightly higher rate of teachers moving to schools outside the MAT. These trusts may have different approaches to staff management that may be leading to increased rates of teacher turnover. For example, they may have stronger models of performance management and school improvement, and act quickly to remove teachers that they identify as underperforming.

8.3 Implications for policy

Our findings suggest that MAT leaders are making use of the opportunities to redeploy teachers and senior leaders to where they are most needed in their academy trust, which they are able to do as the legal employers of all staff in their schools. However, our findings also suggest there is little evidence to date that giving teachers and leaders the opportunity to move within a MAT has increased the ability of MATs to retain staff within their trust.

Former Education Secretary Nicky Morgan suggested that a model of flexible staff deployment would “give a clear path to career progression that will keep [teachers and leaders] engaged rather than looking for opportunities elsewhere” (Morgan, 2016). Taken together, Figures 40 and 41 suggest that MATs in fact have a slightly higher rate of teachers leaving the profession, and similar rates of teachers moving outside the MAT when compared to other schools, after accounting for differences in their characteristics. However, our analysis only covers staff movement over the period 2010-11 to 2015-16, a period during which MATs were growing and establishing. It will be important for future research to continue monitoring whether the MAT model can deliver better teacher retention than other school structures over the longer-term.

To help improve retention, MAT leaders should consider whether they can do more to promote to teachers the wider benefits of working in their trust. If teachers feel a greater connection to their schools rather than to their MAT, they might be less willing to consider managed career development moves within it. Raising the profile of the MAT among teachers and promoting career paths for teaching staff to develop and progress within the organisation might help to improve teacher retention in the MAT.

9 Ofsted ratings

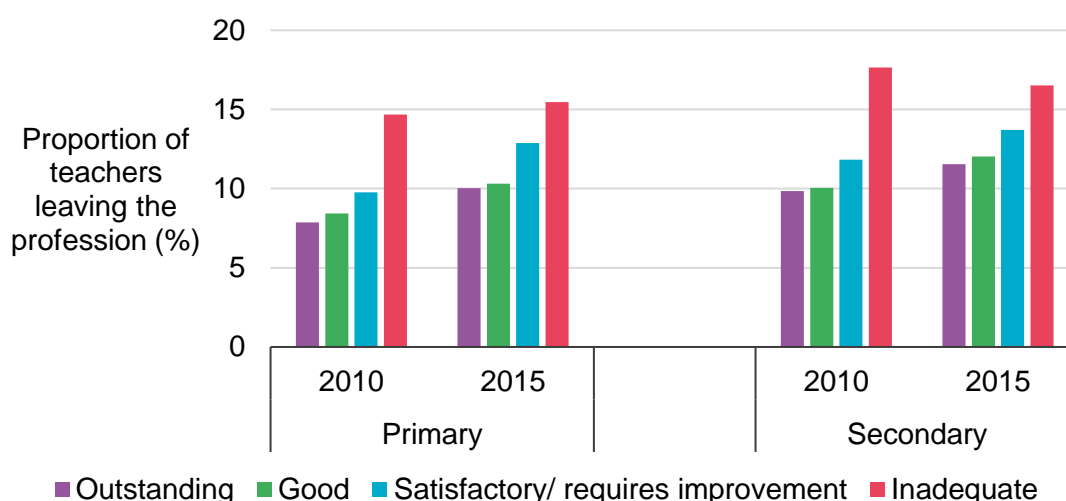
The most important school-level factor that is associated with leaving the profession and moving school is the school's Ofsted rating. We investigate the relationship between a school's current Ofsted rating and the probability of leaving the profession and moving school. We also investigate the association between changes in Ofsted rating and the probability of leaving the profession and moving school, to assess whether there are differences between schools that have been upgraded, downgraded or have maintained their rating.

Ofsted rating is a statistically significant predictor of the probability of leaving the profession and moving school, but in general school-level factors contribute a much smaller fraction of the overall variation explained by the model than teacher-level characteristics.

9.1 Leaving and moving rates

Figure 45 shows the percentage of teachers leaving the profession in 2010 and 2015 by the school's Ofsted rating and by phase. This shows the lower the Ofsted rating, the higher the proportion of teachers leaving the profession. The rate of leaving the profession is highest in schools rated as being Inadequate by Ofsted. The leaving rate has increased between 2010 and 2015 for all Ofsted ratings, except for secondary schools rated as being Inadequate, where it has fallen.

Figure 45 The lower the Ofsted rating, the higher the probability of leaving the profession

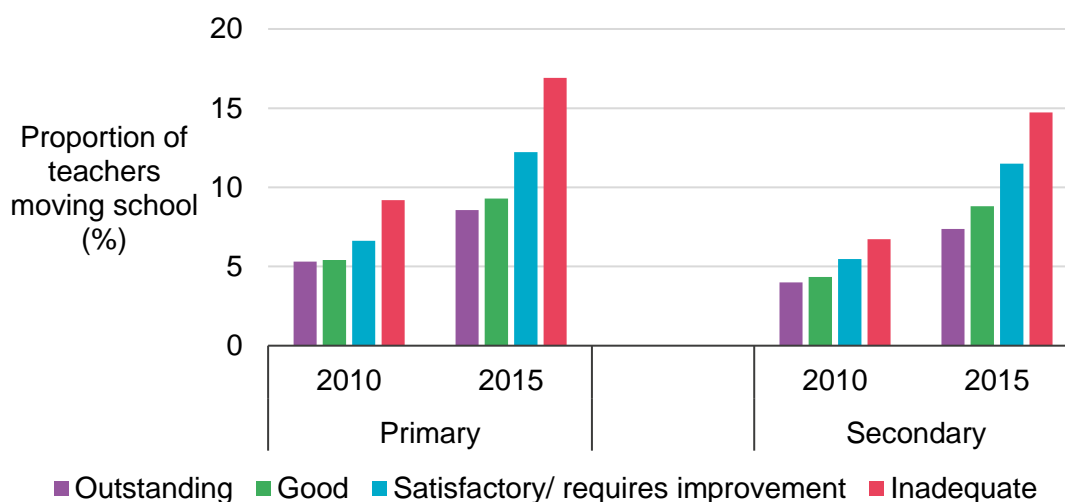


Source: NFER analysis of School Workforce Census data.

The Ofsted inspection framework was revised in 2012 and the Satisfactory rating was changed to Requires Improvement (RI). This shift in definition could explain why the retention rate for third-category schools became closer to that of Inadequate schools and less like that of Good schools between 2010 and 2015. The number of schools rated as being RI fell after 2012, while the

number of schools rated as being Good rose. That suggests that the composition of third-category schools has changed: the ‘better’ schools that were previously rated as being Satisfactory became Good, and the ‘worse’ schools that were previously rated as being Satisfactory became RI. This may explain why the leaving rate for schools rated as being Satisfactory / Requires Improvement has risen considerably for primary and secondary schools between 2010 and 2015.

Figure 46 The lower the Ofsted rating, the higher the probability of moving school



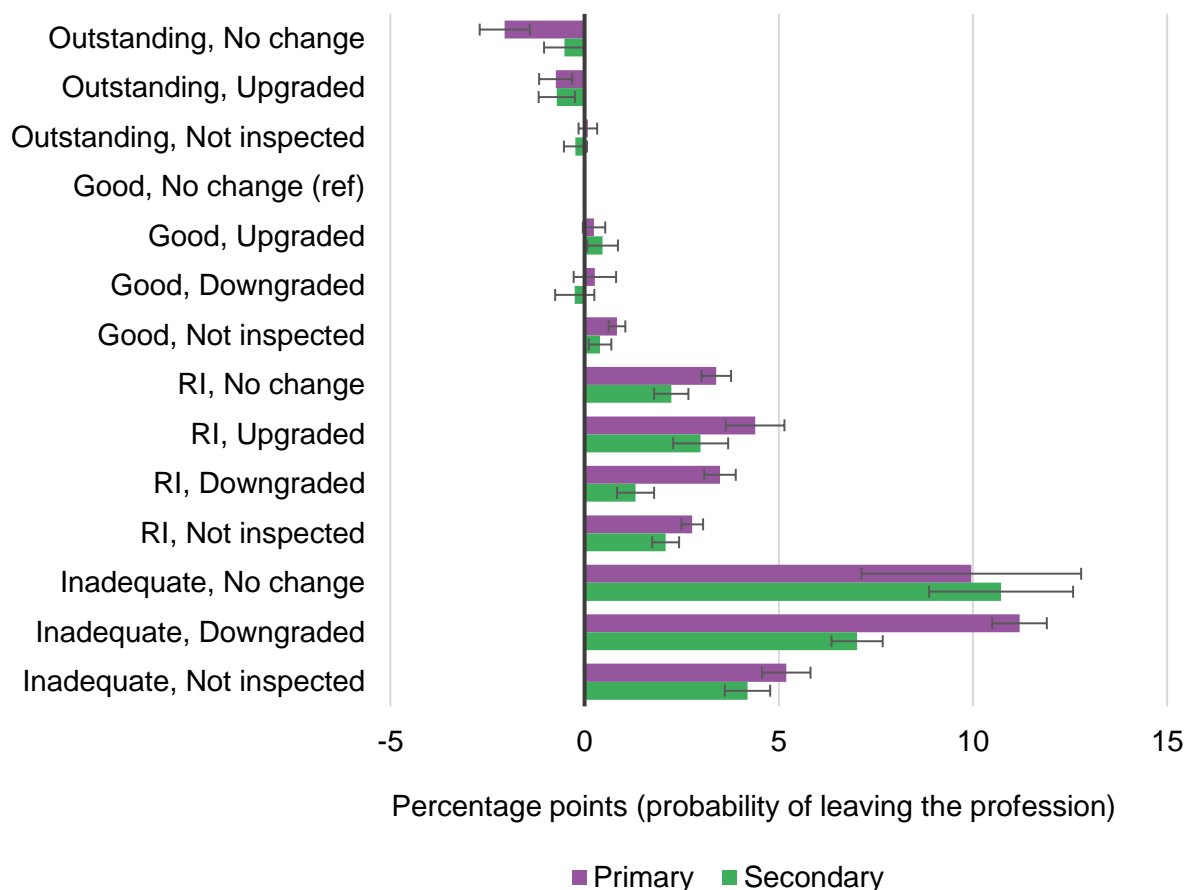
Source: NFER analysis of School Workforce Census data.

Figure 46 reports equivalent results for the probability of moving school. Again, lower Ofsted ratings are associated with higher proportions of teachers moving to different schools at both primary and secondary level, with a particularly high rate for schools rated Inadequate by Ofsted. Taken together, these patterns show that inadequate schools have much higher rates of staff turnover than other schools.

We also examine what impact a change in Ofsted rating has on teacher turnover in the following year. Our analysis shows that schools that are downgraded have the highest proportion of teachers both leaving the profession and moving school.

In our regression models that predict the probability of leaving the profession and moving school, we include interactions between the current Ofsted rating and how that rating differs to the previous inspection rating. In addition to the three ‘upgraded’, ‘downgraded’ and ‘no change’ categories, we also include a group for all schools that have not been inspected in the previous year. Figure 47 shows the model estimates for the effect of each combination of Ofsted rating and how it has changed, on the probability of teachers leaving the profession.

Figure 47 Teachers in schools rated as being Inadequate by Ofsted are the most likely to leave the profession



Source: NFER analysis of School Workforce Census data.

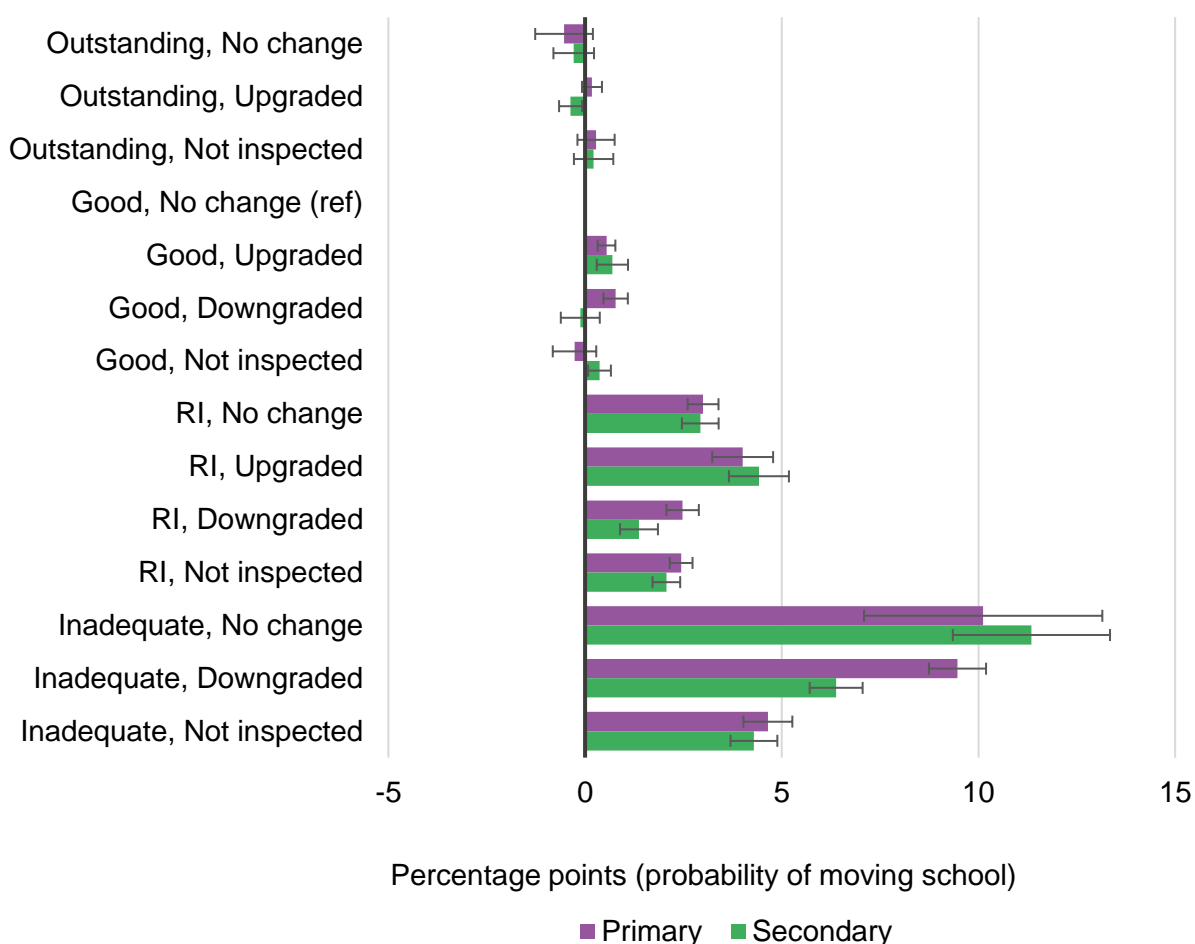
Consistent with the descriptive statistics, the group with the next highest probability of leaving are teachers in schools rated as Requires Improvement (RI). Teachers working in RI schools that have been upgraded from Inadequate are slightly more likely to leave the profession than teachers working in the rest of RI schools. However, the confidence intervals are close to overlapping, which suggests most of these differences could be due to chance. There are no important differences in the leaving rate between Good and Outstanding schools.

Overall, changes in Ofsted rating with respect to the previous inspection rating seem to play a relatively marginal role when compared to the effect of the Ofsted rating itself. However, being rated as Inadequate (whether downgraded or re-graded) does seem to have a greater negative association with retention in the short-term compared to having previously been rated Inadequate and not recently inspected. This suggests that there is an immediate impact of being downgraded to, or re-graded as, Inadequate on the probability of a teacher leaving the profession. These results are consistent with research by Sims (2016), who finds that the immediate impact of being

downgraded to Inadequate is a 3.4 percentage point increase in a school's teacher turnover, while there is no change for schools upgraded to Outstanding.

Figure 48 shows the relationship between Ofsted rating and the probability of moving school. The situation is similar to the relationship between Ofsted rating and the probability of teachers leaving the profession with the higher rates of moving school being in lower-rated schools. In the primary sector, schools that have been downgraded to, and re-graded as, Inadequate have the highest moving rates compared to Good schools. For the secondary sector, schools that have been re-graded as Inadequate (i.e. not changed following re-inspection) have the highest leaving rate compared to Good schools, and schools downgraded to Inadequate have the second-highest.

Figure 48 Teachers in schools rated as being Inadequate by Ofsted are also the most likely to move school



Source: NFER analysis of School Workforce Census data.

Among RI schools, the proportion of teachers moving school is higher for those that have been upgraded compared to those that have been downgraded, or seen no change. This might seem counterintuitive as an upgrade should be seen as a positive outcome compared to a downgrade.

However, this could be a lagged effect of having previously been rated Inadequate, which suggests the association between being rated Inadequate and staff turnover is complex, and one that extends beyond the immediate effect of being downgraded.

Our regression model is not able to determine whether the choice of moving is taken by the teacher or by the school. It is likely that the mobility associated with different Ofsted ratings is driven by different factors. For instance, the high mobility among teachers in Inadequate schools could be teacher-driven or motivated by the school, or a combination of both. Dissatisfied teachers may wish to move to better-performing schools, while leaders of schools that are rated Inadequate will be under pressure to replace poorly performing teachers. In the case of Inadequate schools that have been upgraded to RI, the higher mobility might be a consequence of the fact that teachers with experience of delivering school improvement have an advantage in the market compared to teachers working in schools that were Good and have been downgraded to RI.

Ofsted ratings explain around four and two per cent of the variation explained by the model predicting the probability of leaving the profession, for primary and secondary teachers respectively. Ofsted ratings account for considerably more of the explained variation in the probability of moving school (around nine and seven percent for primary and secondary teachers respectively). Ofsted rating is the most important school-level factor for explaining variation in moving school and also contributes to explaining differences in the probability of teachers leaving the profession.

It is not known from the available data how effective the teachers working in Inadequate schools who leave the profession are. Some may be weaker teachers who possibly find they are better suited to jobs in other professions. However, some may be very effective teachers, but have had some of their motivation sapped from working hard to turn an Inadequate school around, perhaps with little support from their school leaders. Steps should be taken to identify and offer support to these good-quality teachers, perhaps by offering financial reward or recognition to them, or offering to move them to a less challenging school after a fixed period, to help retain them in the profession.

10 London's teacher labour market

In September 2016, the Department for Education published a local analysis of the teacher workforce, summarising measures of teacher recruitment and retention by English region (DfE, 2016a). London stands out from the analysis as being different to the other regions, having higher than average rates of: teachers leaving the profession, proportions of unqualified teachers and proportion of schools with vacancies or temporary staff. However, the analysis was unable to establish whether this was unique to London, or whether these patterns were replicated in large cities across the country. This is because, in the Department for Education analysis, large English cities such as Manchester and Birmingham are contained within large regions (North West and West Midlands, respectively), which also contain other cities, towns and rural areas.

Our analysis addresses this question directly by considering differences in retention rates by travel-to-work areas (TTWAs). We also explore the extent of flows between TTWAs to see how teacher movement affects different areas and how it changes the composition of teachers in those areas. TTWAs are geographical areas developed by the Office for National Statistics (ONS) using census data, which constitute areas where most people both live and work (ONS, 2016). They can therefore be seen as relatively self-contained labour market areas and useful for comparing London with large cities. We categorise TTWAs into five area types for our analysis, which are summarised in Table 1.

Table 1 Definition of travel-to-work area groups

TTWA group	Definition	Example TTWAs
London	London TTWA	London
Large urban areas	Working population: >300,000 (excl. London)	Manchester, Birmingham, Slough and Heathrow, Reading
Medium sized areas	Working population: 150,000-300,000	Coventry, Oxford, Southend, Crewe, Tunbridge Wells
Small, non-coastal areas	Working population: <150,000 and not coastal	Doncaster, Mansfield, Gloucester, Buxton, Hexham
Small, coastal areas	Working population: <150,000 and is coastal	Blackpool, Eastbourne, Chichester, Bridport, Whitby

10.1 Leaving and moving rates

Figure 49 shows the proportion of teachers leaving the profession in the five different categories and confirms that the leaving rate in London is considerably higher than the overall average over the period between 2010 and 2014 of around ten per cent. The data also shows that this is not the case in other large cities, which have teacher leaving rates slightly below the national average. This suggests there is something unique about London that makes the teacher supply challenge particularly acute. This may be due to there being more and better alternative opportunities and careers available to people with degrees living in the capital compared to larger cities, or may be linked to higher housing costs.

Figure 49 London has a higher rate of teachers leaving the profession than other areas

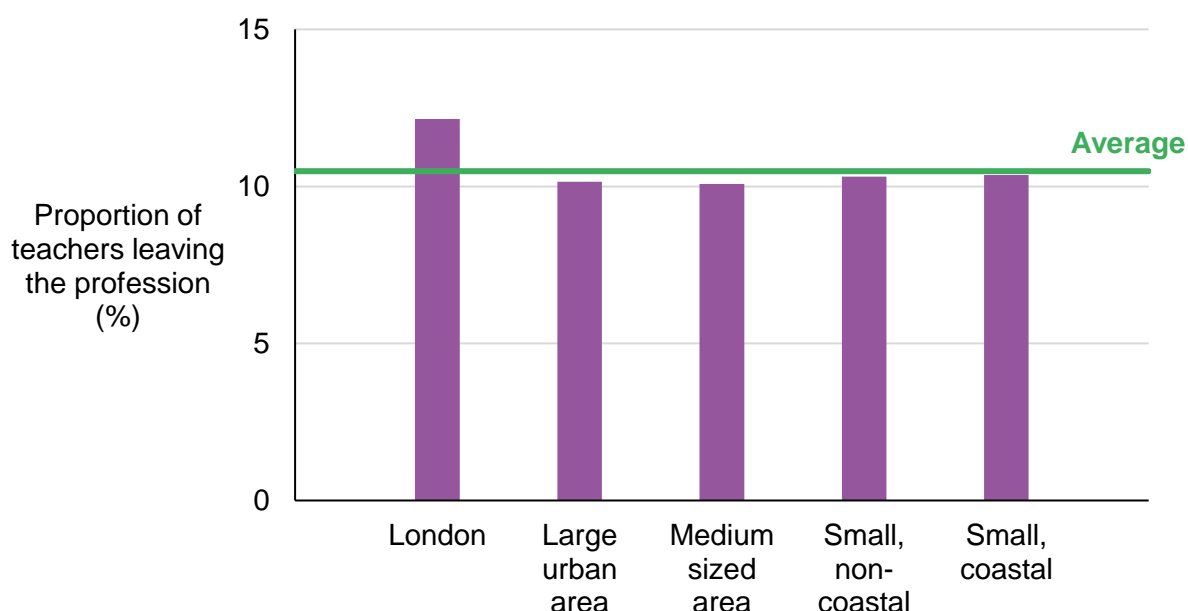
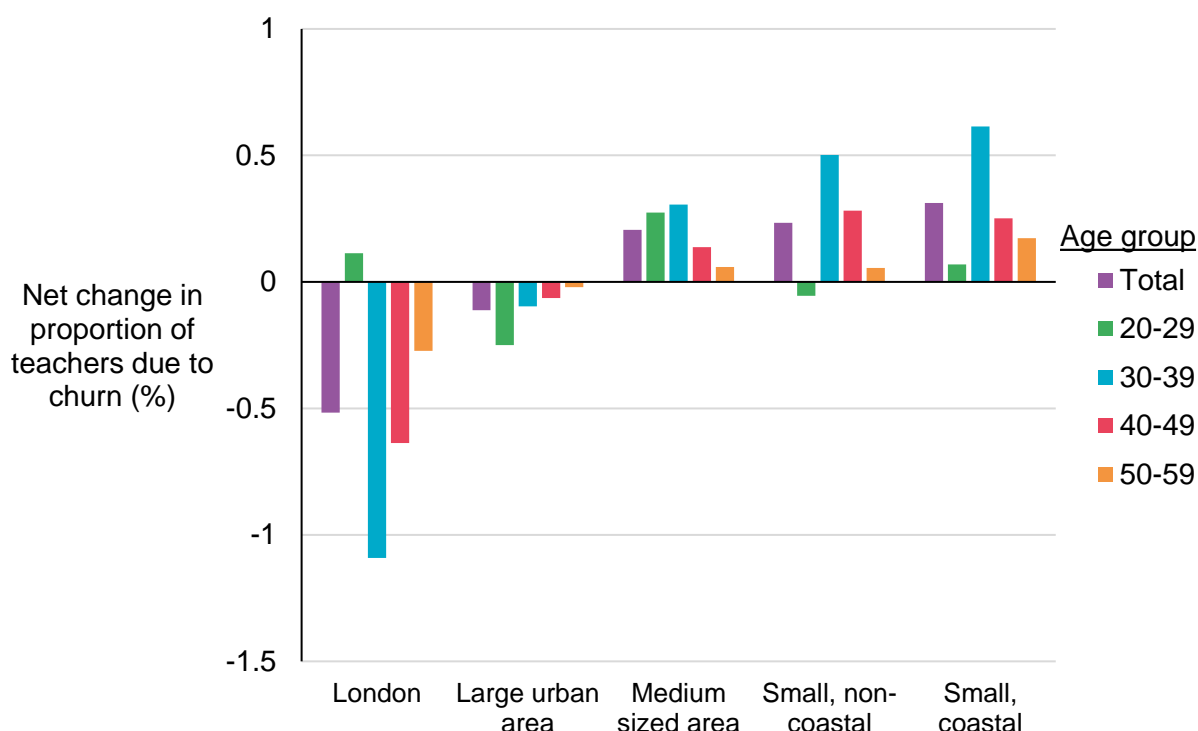


Figure 50 shows the net change in the proportion of teachers in an area is due to teachers moving school. It measures the difference between the proportion of teachers who move school and enter the TTWA, and the proportion of teachers who move school and leave the area. The purple bars show the overall rates and the other bars show the net change for different age groups.

Overall, London loses 0.5 per cent of its workforce each year from teachers moving to other schools, after accounting for teachers moving to a school in London from a school outside London. Again, this is not the case in other large cities, where the net movement is more balanced. Small and medium-sized areas are the biggest destinations, each gaining around 0.2 per cent of teachers per year. These net changes are relatively modest, and do not capture other types of geographical movement, such as teachers leaving one area and returning after a break to a school in another area.

Figure 50 Teachers aged in their 30s and 40s tend to move out of London



The age breakdown shows considerable variation around the average. London schools lose just over one per cent of teachers in their 30s each year and 0.6 per cent of teachers in their 40s, while having a small net gain of teachers in their twenties.

These findings support the claim made by Lucy Heller, Chief Executive of London-based ARK Schools, in evidence to the Greater London Authority (London Assembly, 2016). She noted that:

ARK are getting the young teachers who are prepared to come and live like sardines in flat shares and tiny spaces. We can keep those, and they come drawn by the magnet that is London. Our problem is retention.

Heller explicitly linked this phenomenon to ‘the larger problem about London housing’, which is likely to be an important reason why the effect is London-specific, rather than more widespread across large cities. Recent NFER research on London’s teacher labour market highlights a strong correlation between areas with high housing costs and high leaving rates of young teachers (Worth *et al.*, 2018).

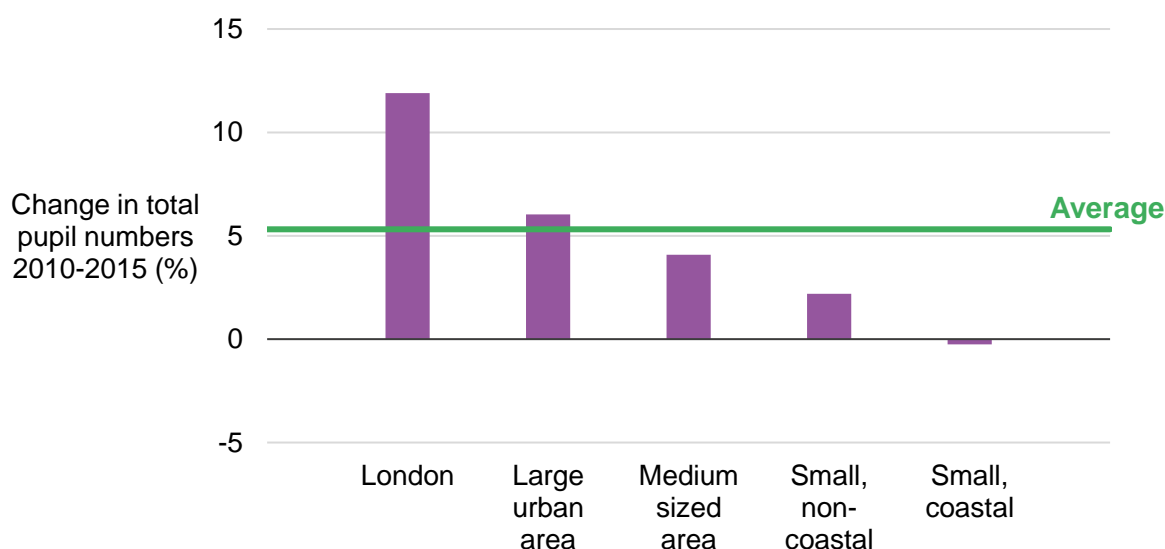
This movement of teachers out of London may represent more than just a reduction in the number of teachers in London. A disproportionate shift of mid-career teachers out of London schools may also put particular pressure on the senior leadership pipeline in London. NFER research on London’s teacher labour market shows that, as a result, early-career teachers are accelerated into middle leadership positions more quickly in London than they are in other areas, due to a lack of more experienced teachers to fill the roles. While these opportunities for quick progression can

initially attract teachers to London, it may leave teachers feeling underqualified and therefore overwhelmed by their extra responsibilities.

10.2 Differences in pupil growth

The high rates of London teachers leaving the profession and moving to schools in other areas are despite London having seen the largest increase in teacher demand in recent years. Figure 51 shows that the greatest increase in pupil numbers between 2010 and 2016 has been in London, while small, isolated areas saw very little growth. Small coastal areas have actually experienced a small decrease in overall pupil numbers. Forecasts published by the Department for Education show that the secondary school population in London is expected to grow by 23 per cent between 2016 and 2023, compared to 18 per cent in the rest of England (Education Funding Agency and Education and Skills Foundation, 2017).

Figure 51 London has seen the fastest growth in pupil numbers



This analysis suggests a paradox: the proportion of teachers leaving has been highest in an area that has the greatest need for additional teachers. Geographical teacher dynamics open up additional supply gaps in London that need filling each year, but may also be helping to close supply gaps in more isolated areas. Analysis by the National Audit Office found that the number of trainees per 100,000 pupils was higher than average in London, suggesting at least one route by which London fills such gaps (NAO, 2016).

10.3 Implications for policy

Our analysis suggests there is something unique about London that makes the teacher supply challenge particularly acute. London has considerably more teachers leaving the profession compared to other areas, including other large cities. It also suffers from greater churn of teachers moving to schools outside of London, particularly experienced teachers aged in their 30s and 40s. Small and medium-sized areas, rather than other cities, are the biggest destinations for teachers

who move out of London. The high cost of living is the main barrier to longer-term retention of teachers in London. Policy makers should look at how policy interventions, such as housing subsidies, could help to retain teachers in high-cost areas.

Further research exploring the geographical flows of trainees into the teacher workforce, and how teachers move during their careers, would help us to understand the detailed dynamic picture within different areas. It would also aid the development of policy solutions that are most relevant for particular areas, such as London. Analysis at more detailed geographical levels, such as individual TTWAs, may also reveal diversity within the TTWA groups that we have identified: the flow of teachers out of London and around the school system may have quite different effects in, for example, Eastbourne than in Blackpool.

Our analysis shows the teacher labour market is a dynamic system in which small, isolated areas, which may have fewer interactions with teacher training providers, tend to benefit from teacher flows out of London. Therefore, any local policy solutions would also need to consider the knock-on effects they might have on other areas. For example, any policy interventions aimed at improving teacher retention in London schools may have negative implications for the supply of teachers to smaller, more isolated, areas through labour market dynamics. Those supply gaps may then need to be filled in other ways.

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Appendix A Regression methodology

Variables included in regression models

This section describes in detail the regression models we have estimated using SWC data to predict the probability of teachers leaving the profession and moving school, and the variables included in these models. Both models have dichotomous (“yes/no”) variables as a dependent variable, so all of our regression analysis has been estimated using logistic regression models.

We report an exhaustive list of the variables included in the baseline model and how each has been computed.

Year	In all regressions, we have included a categorical variable that captures year-fixed effects. The reference year is 2010 and hence the coefficient associated with a given year measures the change in the proportion of teachers leaving the profession (or moving school) compared to 2010, conditional on changes in all the other factors in the model.
<u>Teacher characteristics</u>	
Gender	Dummy variable that takes value 1 if the teacher is a man and 0 if the teacher is a woman. This variable appears in the model on its own as well as interacted with other variables. We will specify when a variable is interacted with gender in what follows.
Number of years of experience	This variable details the number of years since the first appearance of an individual as a teacher in the state sector. This is a proxy measure for the number of years spent in the teaching profession. Indeed, teachers that started their careers in the private sector will have a value that is lower than their actual years of experience as our variable counts the years starting from the first appearance in the state sector. On the other hand, in the case of returners (i.e. individuals that leave and then return to teach in the state sector) we are not able to account for the interruption. Hence, these individuals will have a number of years of experience that is higher than the actual figure. This may introduce some bias into our estimates, but we judge that the approximation is not likely to introduce large biases into our estimates. The potential bias is further mitigated by the fact that we group the number of years of experience into categories defined as follows: less than 1 year of experience, 1 year of experience (i.e. at least one year, and up to two years), 2 years of experience, 3 years of experience, 4 to 5 years of experience, 6 to 10 years of experience (used as a reference group), 11 to 15 years of experience, 16 to 20 years of experience, 21 to 30 years of experience, more than 30 years of experience. Note that we are using a finer classification for

	teachers that recently entered the profession because we expect more differences in leaving and moving rates at the beginning of teaching careers. Despite being included in the regression, in the report we do not present the coefficients estimated for teachers with more than 30 years of experience due to the small sample size.
Age	The age of teachers is included in the regressions as a categorical variable that classifies teachers in the following age bands: Under 20, 20 to 24, 25 to 29, 30 to 34, 35 to 39 (reference category), 40 to 44, 45 to 49, 50 to 54, 55 to 59 and Over 60. Despite being included in the regressions, in the report we did not include the coefficients for teachers' age less than 20 due to the very small sample size. Finally, we exclude teachers' age over the normal retirement age of 60 from our retention analysis.
Qualified teacher status	This is a dummy variable that takes value 1 if the teacher is a qualified teacher and 0 otherwise.
Part-time	In all models, we include a dummy variable that records whether a teacher is working full-time or part-time. To distinguish between part-time and full-time teachers, we use the definition adopted by the SWC that identifies a teacher as full-time if she works more than 32.5 directed hours per week. In our regressions, we include this variable as an interaction with gender to estimate separate part-time coefficients for men and women.
Ethnicity	This is a categorical variable that groups teachers according to their ethnic group as follows: White (reference category), Asian, Black and mixed/Other.
Role	This variable distinguishes between classroom teachers (reference category), headteachers, deputy/assistant headteachers and advisory teachers/lead practitioners.
Subject taught	We have classified teachers according to the subject they mainly teach into six subject groups: English, maths, science, humanities, MFL and non-EBacc (reference category). To classify individuals, we have applied the following rule: to be classified as an English teacher, for instance, a teacher needs to teach at least 10 hours a week of English and at least 50 per cent of her total time needs to be spent teaching English. The non-EBacc group is a residual category. It includes mostly teachers of non-EBacc subjects, but also teachers that do not satisfy one of the above mentioned criteria are classified as belonging to this group. This

	variable is interacted with gender in order to have separate estimates for men and women.
<u>School characteristics</u>	
Number of pupils	Headcount of pupils in the school in which the teacher is employed.
Proportion of FSM pupils	This is a categorical variable that measures the proportion of pupils eligible for FSM in the school in which the teacher is employed. Starting from the proportion of pupils eligible for FSM in each of the schools included in the SWC, we have computed five percentiles each containing 20 per cent of the distribution. The first percentile includes schools that have the lowest proportion of FSM pupils, while the fifth includes schools that have the highest proportion of pupils that are eligible for FSM. In the regression we use the first quintile as a reference category.
Ofsted rating and change in Ofsted rating with respect to the previous year	<p>In the baseline models, we include a set of interactions between the Ofsted rating of the school the teacher is working at and its change with respect to the previous year. Ofsted ratings are those main inspection ratings used by Ofsted (Inadequate, Satisfactory/Requires Improvement, Good and Outstanding). The Ofsted inspection framework was revised in 2012 and the Satisfactory rating was changed to Requires Improvement (RI), but we treat them in our analysis as the same category.</p> <p>With regard to changes in Ofsted rating with respect to the previous period, we have proceeded as follows. First, we have identified schools that were not inspected in the previous year. Given that we are interested in the immediate effect of a change in Ofsted rating in the year after it occurs, we have included all the above mentioned schools in a group labelled 'Not inspected'. For the remaining schools that were inspected by Ofsted in the previous period, we have distinguished between schools that were upgraded, schools that were downgraded and schools that had their previous rating confirmed. Interacting the current Ofsted rating with the four categories just mentioned we ended up with the following 14 groups of schools:</p> <ul style="list-style-type: none"> • Outstanding schools that were upgraded with respect to the previous year, maintained the same rating as the previous year and that were not inspected in the previous year. • Good schools that were upgraded with respect to the previous year, maintained the same rating as the previous year, were downgraded with respect to the previous year, and that were not inspected in the previous year.

	<ul style="list-style-type: none"> RI schools that were upgraded with respect to the previous year, maintained the same rating as the previous year, were downgraded with respect to the previous year and that were not inspected in the previous year. Inadequate schools that were downgraded with respect to the previous year, that maintained the same rating as the previous year, and that were not inspected in the previous year. <p>Good schools that maintained the same rating as the previous year were the reference group. Despite having four categories of Ofsted rating and of changes in Ofsted rating, we end up with only 14 interactions (rather than 16). This is due to the fact that it is not possible for a school classified Outstanding to have been downgraded and similarly impossible for an Inadequate school to have been upgraded.</p>
School type	This is a categorical variable that specifies the type of school the teacher is teaching in. In the baseline model, schools are classified into four groups: converter academies, sponsored academies, newly established academies (e.g. free schools, university technical colleges and studio schools) and local authority maintained schools (residual category and reference group).
<u>Local area characteristics</u>	
Average pay in the local area	This variable measures the logarithm of the hourly earnings of individuals in the 70th percentile of earnings, taking the values from local authorities within a radius of 30 km from the school where the teacher is working. This follows the approach of <i>Allen et al</i> (2016a), who chose the definition on the basis of the 70 th percentile being a good match to teachers and . In the model this variable is interacted with gender as men and women might be differently affected by outside wages.
Unemployment rate in the local area	This variable measures the local unemployment rate, taking the values from local authorities within a radius of 30 km from the school where the teacher works. For the same reason mentioned for pay in the surrounding labour market, the unemployment rate is estimated separately for men and women.
Pay spine area	This variable distinguishes teachers that are working in different pay areas, to control for the effect of being on a higher pay scale alongside local pay rates. The classification is: teachers working in inner London, teachers working in outer London, teachers working in London fringe and

	a residual category that gathers together teachers working in the rest of England.
<u>Additional variables</u> We have estimated some further models that, on top of the covariates listed above, also include the following variables:	
Type of contract	This variable distinguishes whether a teacher is employed on a permanent contract (reference category), a temporary contract or another type of contract (residual category). We chose not to include this specific variable in the baseline models because being on a temporary contract is an obvious driver of mobility, which might interact with, and change the interpretation of, the effect of other variables. Despite having a high level of prediction in terms of R^2 , the inclusion of this variable does not affect most of the coefficients we have estimated in the baseline regressions, except for experience (as temporary contracts tend to be used to employ NQTs and early-career teachers).
Multi-academy trusts and size of MAT	To investigate the relationship between being in a MAT and teachers' mobility, we have estimated a regression that includes a categorical variable that distinguishes academies belonging to a MAT from academies that are SATs. To further explore this, we have estimated regressions that further distinguish academies according to the size of MATs, specifically using David Carter's four-tier categorisation. The categories we use are: local authority maintained schools, SATs, Starter MATs (1-5 schools), Established MATs (6-15 schools), Regional MATs (16-30 schools) and System MATs (more than 30 schools).

Predictive importance of explanatory variables

In this section, we present the methodology used to compute the importance of each coefficient in explaining the variability in the data, as well as the resulting variables' ranking by predictive importance. Starting from our baseline regressions that included all the controls listed in the section above, we removed one set of variables (e.g. all the age groups) at a time. The proportion of variation explained by a coefficient is computed as the percentage decrease in the pseudo- R^2 when we move from the full model to the model that does not include the set of variables we are investigating.

For each of the variable sets included in the baseline model and for each of the four regressions we have estimated, Tables 2 and 3 show the percentage reduction in the pseudo- R^2 when the relevant variable is removed from the model. The predictors are listed from the most predictive to the least predictive. Note that, as well as including the change in pseudo- R^2 that follows the exclusion of age and experience one at a time, we have also included the variation in pseudo- R^2 in

the tables when these two variable sets are removed simultaneously. We do so because the two are highly correlated. The drop in pseudo- R^2 that results from the simultaneous exclusion of age and experience is higher than the sum of the reductions that result from excluding age and experience in turn. This suggests that in the absence of one, the other is helping to explain additional residual variance that it wouldn't otherwise.

Table 2 **Percentage change in pseudo- R^2 resulting from exclusion of each variable from the baseline regression predicting the probability of leaving the profession**

	Primary		Secondary
Age and experience	-83.9	Age and experience	-78.8
Age	-47.6	Age	-42.5
Experience	-6.0	Experience	-8.9
Ofsted	-3.6	Full-time	-5.6
Full-time	-3.5	Ofsted	-2.3
Post	-1.9	QTS	-1.6
QTS	-0.9	Gender	-0.8
Gender	-0.7	School type	-0.3
N of pupils	-0.3	Subject	-0.3
Pay Area	-0.3	N of pupils	-0.2
Ethnicity	-0.2	Ethnicity	-0.1
FSM	-0.1	FSM	-0.1
LA unemployment	-0.1	Pay area	-0.1
LA pay	0.1	LA pay	0.0
School type	0.0	LA unemployment	0.0
		Post	0.0

Table 3 Percentage change in pseudo-R2 resulting from exclusion of each variable from the baseline regression predicting the probability of moving school

	Primary		Secondary
Age and experience	-38.3	Age and experience	-42.7
Experience	-9.3	Experience	-11.7
Ofsted	-8.8	Ofsted	-6.6
Gender	-4.8	Subject	-5.8
Age	-4.8	Age	-2.1
N of pupils	-2.1	School type	-1.2
QTS	-1.3	Gender	-1.2
FSM	-1.3	FSM	-1.4
Post	-1.1	LA pay	-1.2
School type	-0.8	Pay area	-0.7
Full-time	-0.8	N of pupils	-0.5
LA pay	-0.8	Ethnicity	-0.2
LA unemployment	-0.5	QTS	-0.5
Pay area	-0.5	Full-time	-0.2
Ethnicity	0.0	Post	-0.2
		LA unemployment	0.0

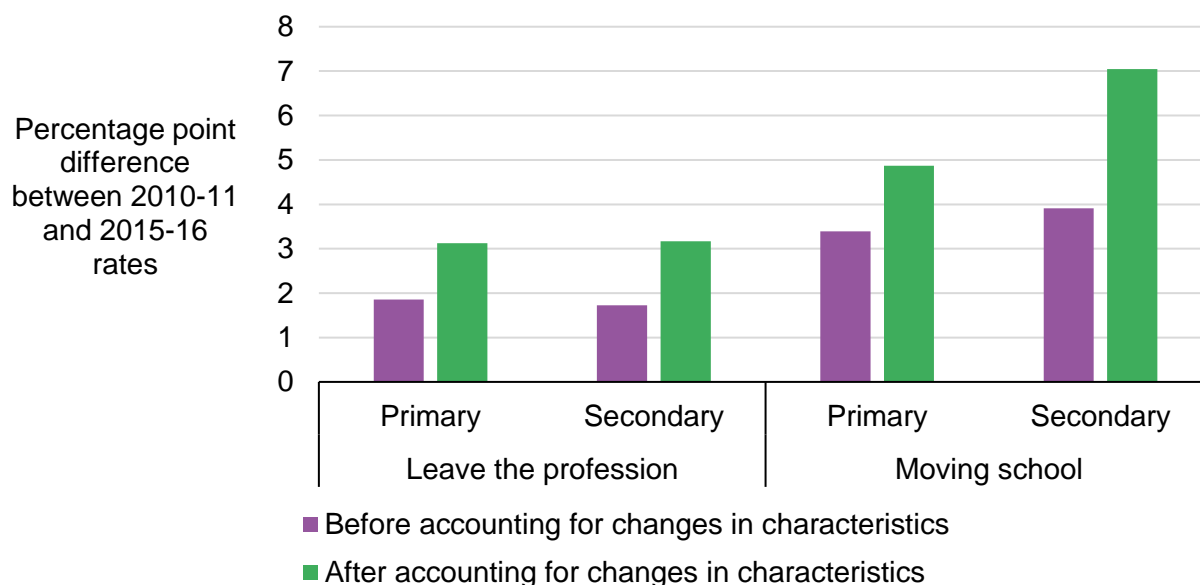
Model findings on change over time

Figure 4 in the section 3 shows that the rates of teachers leaving the profession and particularly of teachers moving school have increased over time. Some of this may be due to changes in the composition of teacher or school characteristics: that is, if the prevalence of a teacher or school characteristic associated with higher leaving or moving rates increases over time then that may help to explain why the overall rate has increased over time. For example, teachers aged over 50 tend to have higher rates of leaving the profession and moving school: if the proportion of the workforce that is over 50 has changed, as it has, that could help to explain the change over time. Our regression model takes account of changes in the composition of teacher and school characteristics over time, and estimates the change in the rates of leaving the profession and moving school over time that are not explained by those changes.

Figure 52 shows the extent to which the rates of teachers leaving the profession and moving school have changed between 2010-11 and 2015-16. The purple bars show the difference *without*

taking account of any changes in characteristics: that is, the overall rate of primary teachers leaving the profession has risen by two percentage points. The green bars show the difference between 2010-11 and 2015-16 estimated from our regression models, *after* taking account of changes in the distribution of teacher and school characteristics.

Figure 52 Changes in teacher and school characteristics do not explain why leaving and churn rates have risen over time



If the teacher and school factors that we included in our models help to explain why the leaving and churn rates have risen over time, then we would expect the ‘year effects’ estimated by the regression model, i.e. after accounting for changes in characteristics, to be closer to zero. However, the findings from our regression models suggest that changes in the composition of teacher or school characteristics do not explain rising leaving and churn rates over time. In fact, the leaving and churn rates have risen by *more* than the changes in teacher and school characteristics would predict.

This analysis therefore suggests that there has been substantial increases in the leaving and churn rates of teachers between 2010-11 and 2015-16 that are *not* explained by changes in the composition of the workforce and schools. Instead, other changes over time that are not measured in our data are likely to be driving the increase in the rate of teachers leaving the profession and moving school.

Workload for teachers and senior leaders in primary and secondary schools may have increased since 2010 due to the implementation of the revised 2014 National Curriculum, and the introduction of other policy changes. Higher rates of teachers moving school could reflect schools competing more intensely for staff as shortages begin to open up due to consecutive years of below-target recruitment of new teacher trainees.

Appendix B Understanding Society data

Definition of professions in Understanding Society

Our analysis sample of teachers includes individuals whose main job was teaching in the English state school sector in at least one of the seven waves of data available. Our definition closely follows the one we used in our analysis of LFS data in the *Should I Stay or Should I Go?* report, considering the industry each individual work in, their occupation, their country of work, and whether they work in the public or private sector (Worth *et al.*, 2015). We define our sample of teachers as teachers employed in England's state-funded schools (consistent with the SWC) using the definitions in the Table 4.

We took a similar approach to define nurses and police officers, also set out in the table.

Table 4 Definitions of teaching, nursing and policing samples

	Teachers	Nurses	Police officers
Industry	<ul style="list-style-type: none"> • Primary education • General secondary education 	<ul style="list-style-type: none"> • Hospital activities • Medical nursing home activities • General medical practice activities • Specialists medical practice activities • Other human health activities • Residential nursing care facilities 	<ul style="list-style-type: none"> • Public order and safety activities
Occupation	<ul style="list-style-type: none"> • Primary and nursery education teaching professionals • Secondary education teaching professionals • Special needs education teaching professionals • Senior professionals of educational establishments 	<ul style="list-style-type: none"> • Nurses 	<ul style="list-style-type: none"> • Police officers (inspectors and above) • Police officers (sergeant and below)
Sector	Public	Public	Public
Country of Work	England	England	England

Representativeness of the Understanding Society teacher sample

Table 5 Representativeness of Understanding Society teacher sample compared to teachers in the School Workforce Census

	School Workforce Census	Understanding Society (USoc)	USoc 95% confidence interval (-/+)
Male	25	28	1.6
Female	75	72	1.6
Age 20-29	23	17	1.4
Age 30-39	32	29	1.6
Age 40-49	24	25	1.5
Age 50-59	18	24	1.5
Age 60 plus	3	6	0.8
Primary	50	45	1.7
Secondary	50	55	1.7
Rate of leaving the profession	10.4	14.1	1.4
Full-time	78	84	1.3
Part-time ²⁰	22	16	1.3
North East	5	6	0.9
North West	13	14	1.2
Yorkshire and the Humber	10	9	1.0
East Midlands	8	9	0.9
West Midlands	11	10	1.1
East of England	11	13	1.2
London	16	14	1.4
South East	16	18	1.4
South West	10	8	0.9

Note: This includes both full-time and part-time teachers, whereas many of the figures reported in the main report focus on full-time only.

Data used for longitudinal analysis of outcomes before and after leaving

All the outcomes we analyse before and after leaving teaching are summarised in Table 6. In order to standardise the outcome measures for Likert scale outcomes, these measures are treated as continuous and presented in standardised terms i.e. divided by the variable's overall standard deviation. Pay data has been adjusted using the monthly consumer price index (CPI) to be in constant 2017 prices. We use the natural logarithm of pay, wages and working hours to measure the percentage change relative to the year just before leaving (and also to reduce the skewness of the data).

²⁰ USoc defines part-time working slightly differently to the SWC. USoc defines it as people working fewer than 30 hours in a typical week, whereas SWC is part-time status as contracted. The USoc sample appears to underrepresent part-time teachers and this is likely to be due to some part-time teachers working more than 30 hours a week and being coded as full-time.

Table 6 Outcome measures used for longitudinal analysis

Outcome measure	Change	Notes
Gross monthly pay	Percentage change (natural log)	Adjusted for inflation using CPI
Weekly working hours	Percentage change (natural log)	Includes paid & unpaid overtime
Wage rate	Percentage change (natural log)	Gross monthly pay divided by (4 * total weekly working hours). CPI-adjusted
Job satisfaction	7-point Likert scale	
Income satisfaction	7-point Likert scale	
Leisure time satisfaction	7-point Likert scale	
Overall life satisfaction	7-point Likert scale	
Current financial situation	5-point Likert scale	
Future financial situation	5-point Likert scale	
Subjective well-being (GHQ)	36-point scale derived from 12 Likert items	
Part-time	Percentage point change	FT = 0; PT = 1

Table 7 presents the sample sizes of leavers we have available for analysis at different time points. The total number of leavers is shown as well as the number of leavers who are employed, given that the focus of our analysis is on employment outcomes such as pay, working hours and job satisfaction. The outcomes for teachers four and five years after they left teaching have not been presented in the report because the sample sizes are too small to give reliable estimates.

Table 7 Sample sizes for longitudinal analysis

Years before/after leaving	Number of leavers	Number of leavers in employment
-5	27	27
-4	87	87
-3	138	138
-2	209	209
-1	271	271
0 – Just before leaving	597	597
1 – first year after leaving	453	277
2	277	155
3	183	91
4	136	66
5	82	33
6	32	9

Contracted hours and leave entitlements for the three professions

Teachers

Teachers have a different type of contract to nurses and police officers. According to the School teachers' pay and conditions document 2017, a teacher employed full-time must be available for work for 195 days, of which:

- a) 190 days must be days on which the teacher may be required to teach pupils and perform other duties;
- b) 5 days must be days on which the teacher may only be required to perform other duties; and those 195 days must be specified by the employer or, if the employer so directs, by the headteacher.

The School teachers' pay and conditions document 2017 also says that:

- a teacher employed full-time must be available to perform such duties at such times and such places as may be specified by the headteacher for 1265 hours, those hours to be allocated reasonably throughout those days in the school year on which the teacher is required to be available for work;
- all teachers who participate in the teaching of pupils are entitled to reasonable periods of Planning, Preparation and Assessment (PPA) time as part of their 1265 hours to enable the discharge of the professional responsibilities of teaching and assessment.
- in addition to the hours a teacher is required to be available for work as set out above, a teacher must work such reasonable additional hours as may be necessary to enable the effective discharge of their professional duties, including in particular planning and preparing courses and lessons; and assessing, monitoring, recording and reporting on the learning needs, progress and achievements of assigned pupils.

School governors and headteachers should also ensure that they adhere to the working limits set out in the Working Time regulations 1998.

The School teachers' pay and conditions document 2017 does not specify any official leave entitlement for teachers. There are 13 weeks per year when schools are closed to pupils and teachers are expected to take their holidays during these periods. However we do not know from any official sources how much time teachers work during the time when schools are closed to pupils.

Nurses

According to the Royal College of Nursing website (RCN, 2018), the standard full-time working week for NHS staff is 37.5 hours. All NHS staff in pay bands 1–7 are eligible for overtime payments if they work more than 37.5 hours a week. Senior staff in pay bands 8 and 9 are not entitled to overtime payments. Nurses can request time off in lieu instead of overtime payments if they wish.

The number of days' annual leave and national holidays that nurses are entitled to is dependent on how long they have worked in the NHS. Any previous periods of continuous service in the NHS are also taken into account. Nurses receive:

- 35 days a year for first 5 years of service
- 37 days a year after 5 years' service and
- 41 days a year after 10 years' service

Police officers

According to the Police Federation Reference Guide (PFEW, 2018), the normal daily period of duty (including an interval for refreshment of 45 minutes) is eight hours for police constables and sergeants. Where variable shift arrangements apply, they should provide for hours of duty equivalent to those of a member with a normal daily period of duty of eight hours, including an interval for refreshment of 45 minutes, and who receives a day's leave on each public holiday and two rest days per week. This is equivalent to a working week of 36.25 hours. Constables and sergeants may potentially be paid overtime payments when certain conditions apply. Inspectors and chief inspectors are not entitled to overtime allowances.

The number of days' annual leave that police officers are entitled to are as follows:

Years of relevant service	Days of Annual Leave
Less than 2	22
2 or more	25
5 or more	25
10 or more	27
15 or more	28
20 or more	30

Police officers also are entitled to public holidays, but if they are scheduled to work, they receive time off in lieu.

Assumptions made to compare the three professions

As teachers have a different sort of contract to nurses and police officers, this makes comparisons between the professions difficult. As noted, full-time teachers' should be available for work for 195 days or 39 weeks a year. They are paid an annual salary, which covers periods when the school is closed to pupils.

As teachers' pay and conditions set out what they are required to do annually, we have annualised the weekly hours and monthly pay of nurses and police officers to aid comparison. To do this, we have used USoc to calculate the average number of hours worked per week including overtime (where this applies) in each year for each profession. We have then assumed the following number of working weeks per year for each profession.

Teachers: We know that full-time teachers are expected to work for 1265 hours over 195 days, which is 39 weeks. However, we do not know from any established sources how many hours/days teachers work in school holidays, so we have presented two scenarios.

- (a) The first scenario assumes teachers will work the day before term starts and the day after the term ends, but do not work beyond that during school holidays. This equates to teachers working 40.2 weeks per year.
- (b) The second scenario assumes teachers work three weeks during the school holidays, which equates to working 42 weeks per year.

Nurses: As shown in Figure 10 of this report, the age distribution for nurses is skewed towards older nurses, but we not know from the data whether they have been in the profession all of their working lives. While many nurses are likely to have been in the profession for at least 10 years, we have been conservative and assumed they receive on average 37 days of annual leave and public holidays a year. This means they work 44.6 weeks per year.

Police officers: As shown In Figure 10 of this report, the age distribution for police officers is also skewed towards older age groups. We know that many police officers join the profession in their early 20s or before, then stay. For this reason, we have assumed police officers have on average 27 days off per year plus eight public holidays (though these may be taken at other times), which is equivalent to working 45 weeks per year.

To calculate the number of hours worked per year for nurses and police officers, we have multiplied their average weekly hours worked including overtime as reported in USoc by the number of weeks worked per year. For teachers, we have multiplied their average total weekly hours worked as reported in USoc by the 39 weeks teachers must be available for work. For the first scenario we present, for the six additional working days (the day before and day after each term starts/finishes) we have assumed teachers work shorter working days of 7.5 hours per day. This is in line with what teachers report in USoc as their normal working hours, which we have interpreted as the time they are actually in school working. We have also assumed teachers work the same number of hours per day for the three weeks worked during school holidays used in the second scenario.

To calculate annual earnings for each profession, we have multiplied the gross average monthly pay from USoc by 12 months. This includes any overtime pay that nurses and police officers receive for their additional hours worked.

Appendix C Outcomes of nurses before and after leaving

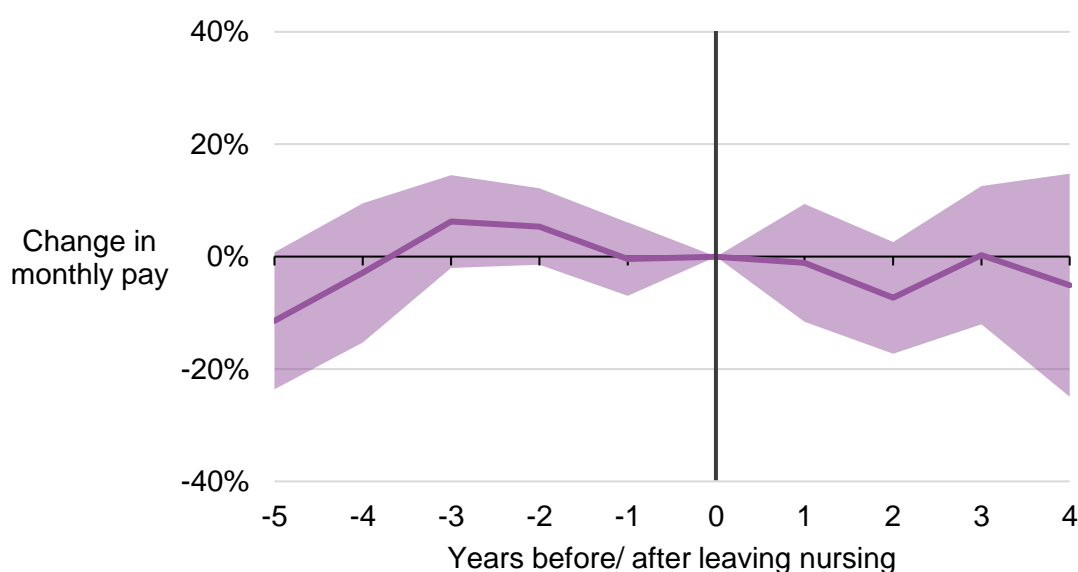
Our analysis of the outcomes of teachers before and after they leave the profession, reported in sections 5, 6 and 7, provide useful insight into what might be motivating teachers to leave. The analysis shows that teachers' monthly pay falls by around 14 per cent after leaving (Figure 37), which is driven by a reduction in working hours (Figure 23), which, in turn, is driven by teachers moving from full-time to part-time working (Figure 32). It also shows that the job satisfaction of teachers who leave increases in their new job (Figure 26).

But are these patterns typical of leavers of every profession, or are they specific to teachers? We use USoc data to analyse the same outcomes for nurses who leave the profession. The sample size of police officers who leave the profession in USoc is too small to undertake this analysis.

Our analysis shows that the changes experienced by nurses who leave the nursing profession are different from those experienced by teachers, which suggests that our results for teachers are picking up characteristics that are specific to the teaching profession. However, while a comparison with one other profession is indicative as to whether the changes we see among teachers are general or specific, it is not a comprehensive assessment of whether there are commonalities with leavers more generally.

Figure 53 shows that the monthly pay of nurses who leave the profession is similar in their new job. This is a much smaller difference than for teachers, and a difference that is not statistically significant. However, it also suggests that, on average, nurses are not moving into higher-paid jobs after they leave.

Figure 53 The average pay of nurses who leave for another job is similar to their pay as a nurse



Source: NFER analysis of Understanding Society data.

Figure 54 shows that the job satisfaction of nurses who leave the profession increases in their new job, but the increase for nurses is not as large as that for teachers. The job satisfaction of nurses had also not been falling in the years before they left, suggesting that other factors played more of a role in their decision to leave. It suggests that the prospect of improved job satisfaction outside of nursing may have been a significant pull factor for nurses who left, but not as large a factor as among teachers.

Figure 54 Nurses who leave are more satisfied in their new job

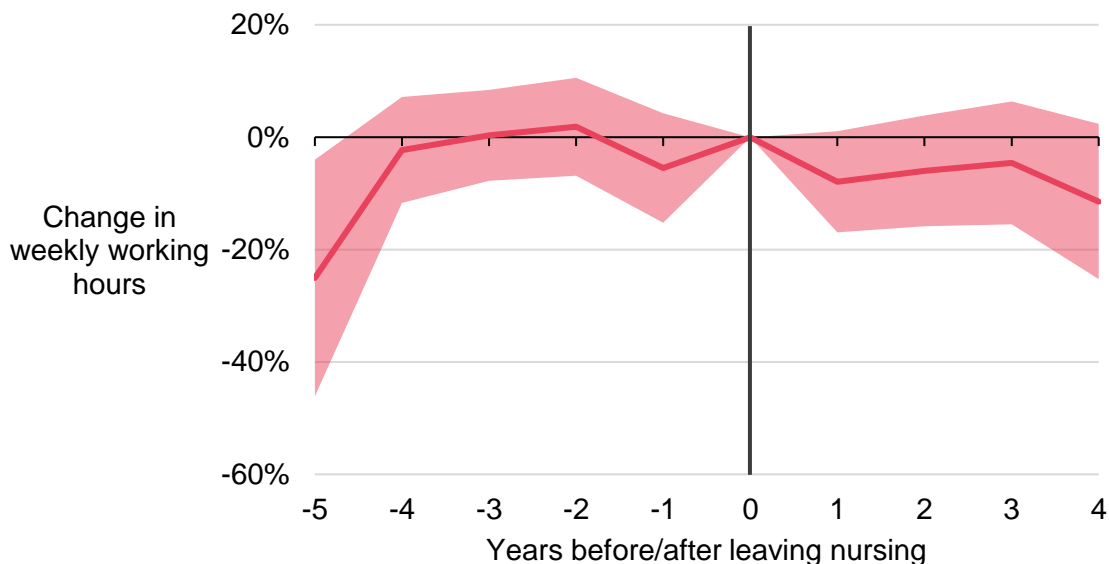


Note: the standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

Source: NFER analysis of Understanding Society data.

Figure 55 shows that the working hours of nurses who leave nursing fall by around eight per cent in their first year in their new job, although this difference is not statistically significant. This is a similar magnitude of change to teachers in the first year, but it remains at a similar level over time, whereas the teachers' working hours steadily decrease with more years outside of the profession.

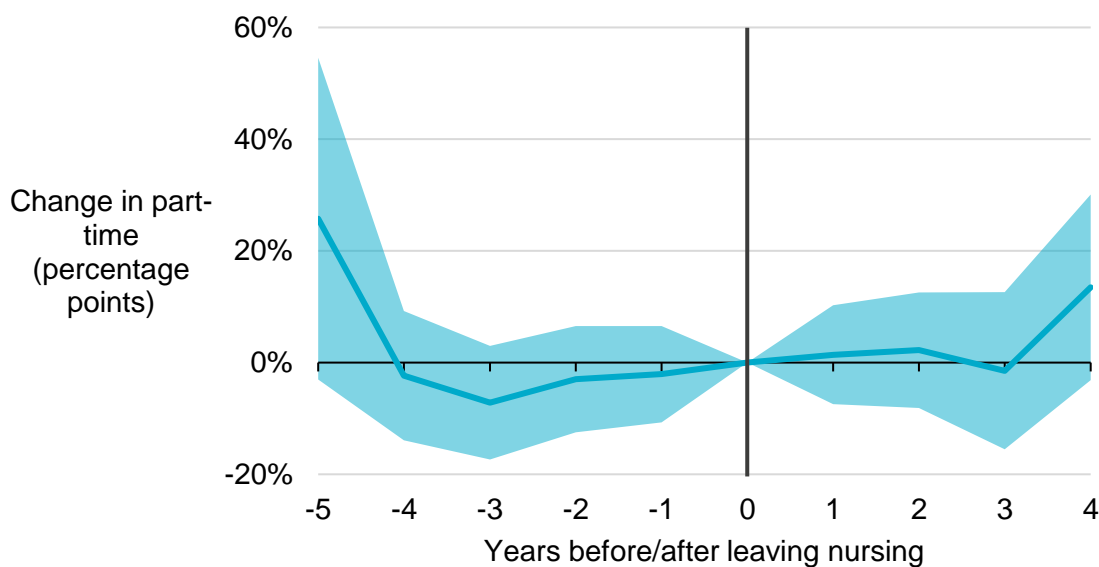
Figure 55 Nurses' working hours fall slightly after leaving, among nurses who leave



Source: NFER analysis of Understanding Society data.

Figure 56 shows that the proportion of nurses working part-time is similar before and after leaving the profession. Figure 28 suggests there is likely to be some unmet demand for part-time working among nurses, but this suggests that, unlike for secondary school teachers, this unmet demand is not strong enough to be a significant driver in nurses' decisions to leave the profession.

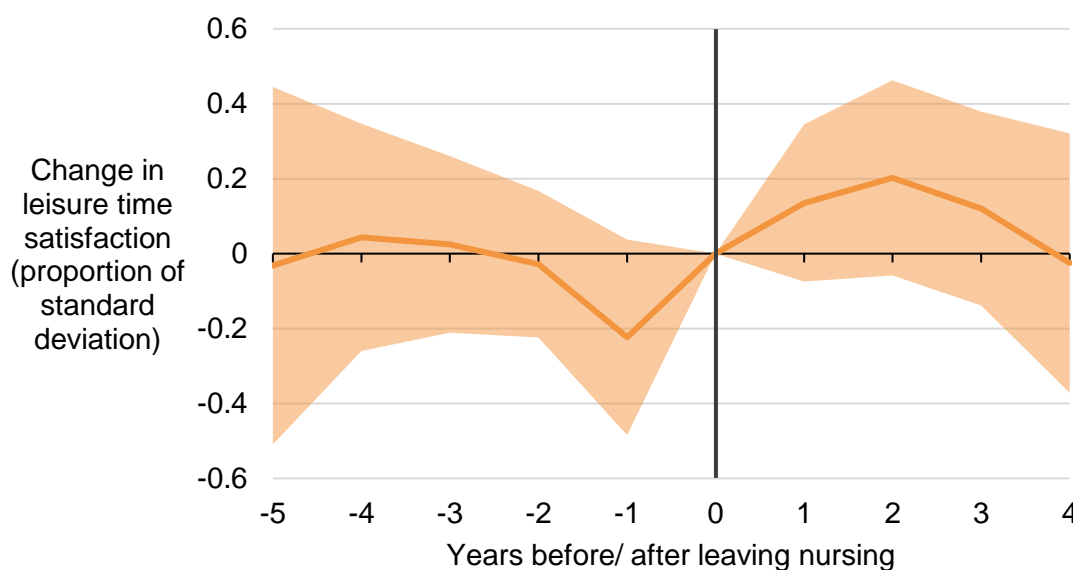
Figure 56 XXX



Source: NFER analysis of Understanding Society data.

Figure 57 shows that the leisure time satisfaction of nurses who leave nursing increases by 0.14 of a standard deviation in the first year in their new job, although this difference is not statistically significant. This is a smaller change than among teachers, suggesting that leisure time satisfaction is less of a driver for leaving behaviour among nurses.

Figure 57 Leisure time satisfaction rises slightly after leaving among nurses who leave



Note: the standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

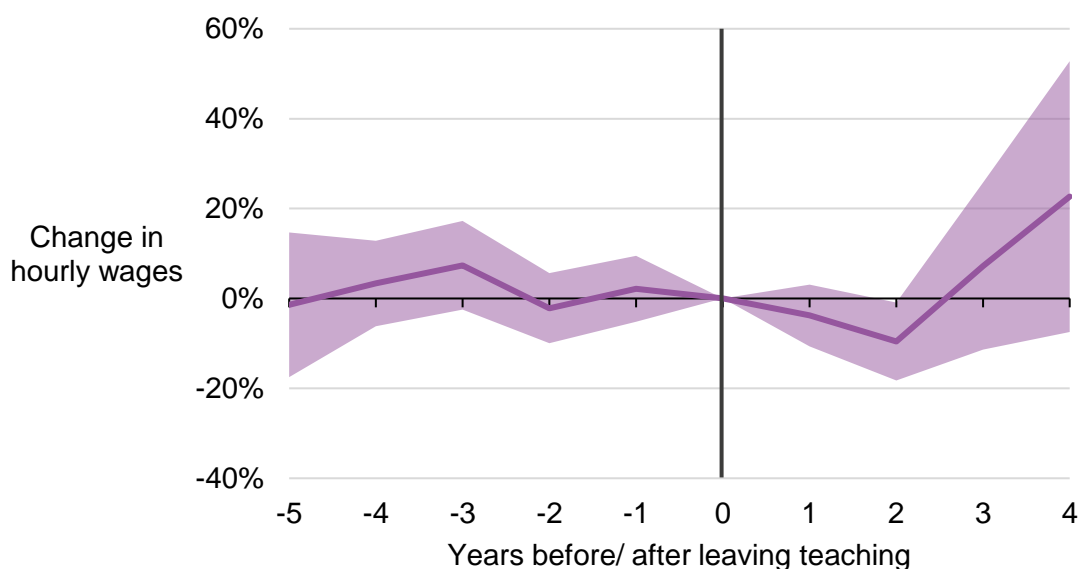
Source: NFER analysis of Understanding Society data.

Taken together, the changes in outcomes among nurses suggest that the factors influencing nurses to leave the profession are different than teachers. Pay is likely to be a more influential for nurses than for teachers, although, on average, nurses do not enter higher-paid jobs after they leave. Changes in working hours and part-time work are less influential among nurses than among teachers. The prospect of improved job satisfaction is influential for nurses as it is for teachers, although the magnitude of the difference is smaller, suggesting it is a less of a factor for nurses.

Appendix D Other outcomes for teachers before and after leaving

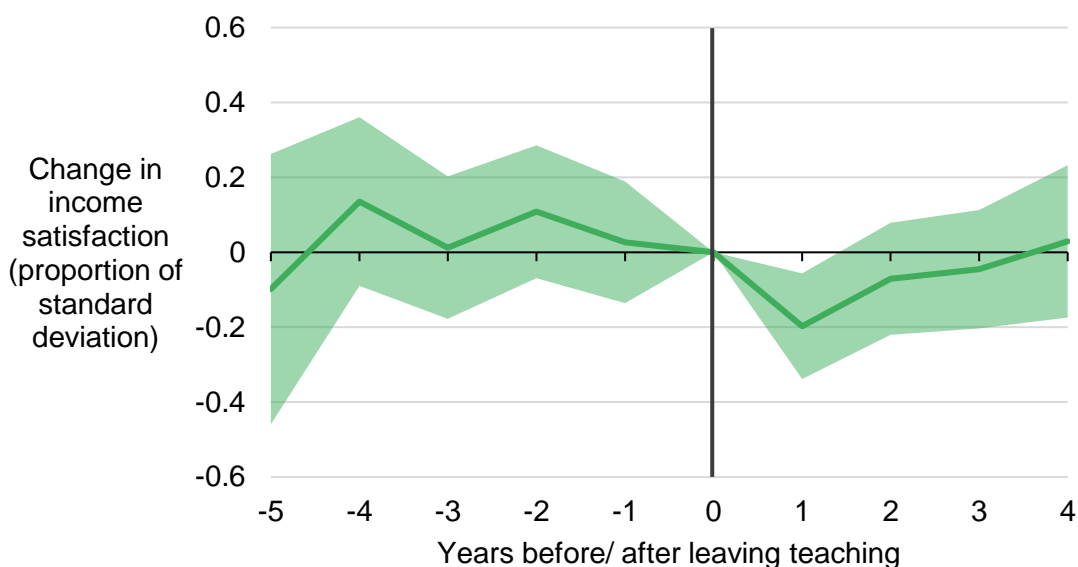
This section presents the results from our analysis of the changes in outcomes for teachers who leave the profession, for a range of additional outcomes not reported in the main body of the report. These outcomes include hourly wages, income satisfaction, overall life satisfaction, current financial situation, future financial situation and subjective well-being (as measured by the General Health Questionnaire).

Figure 58 Teachers' hourly wages remain at a similar level after leaving



Source: NFER analysis of Understanding Society data.

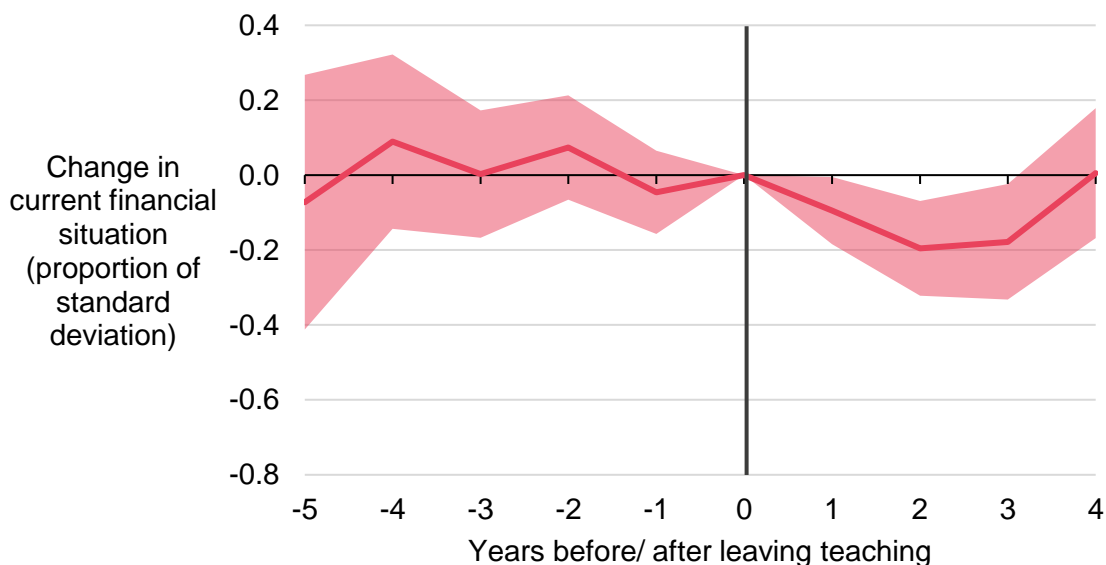
Figure 59 Teachers' income satisfaction falls slightly after leaving, but subsequently recovers to its former level



Note: the standard deviation is a measure of how spread out the data is. Dividing the differences by the standard deviation gives a more standardised measure, summarising how large the difference is relative to the general spread of the data.

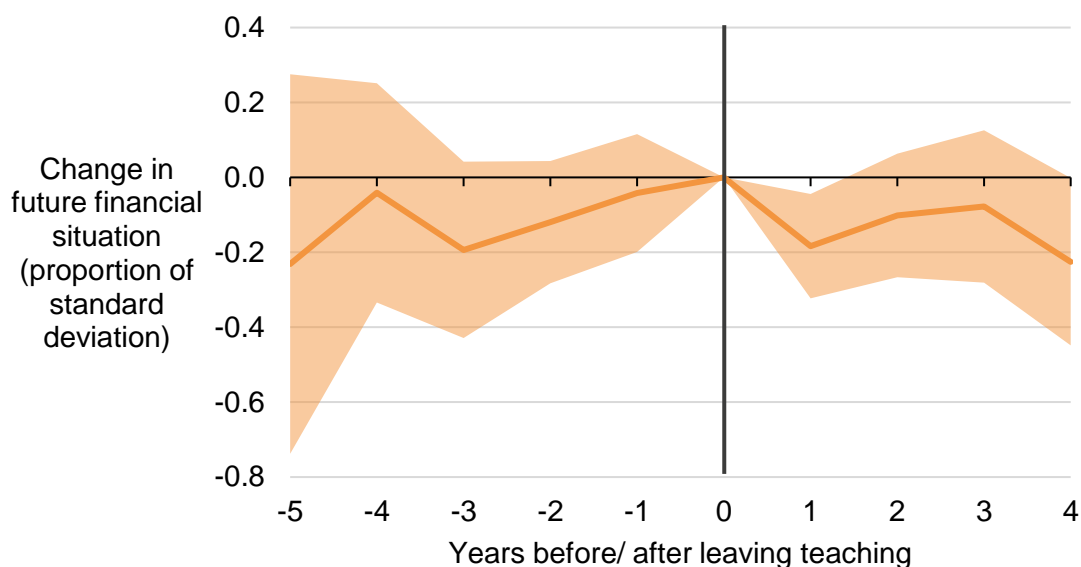
Source: NFER analysis of Understanding Society data.

Figure 60 Teachers' current financial situation worsens slightly after leaving, but subsequently recovers to its former level



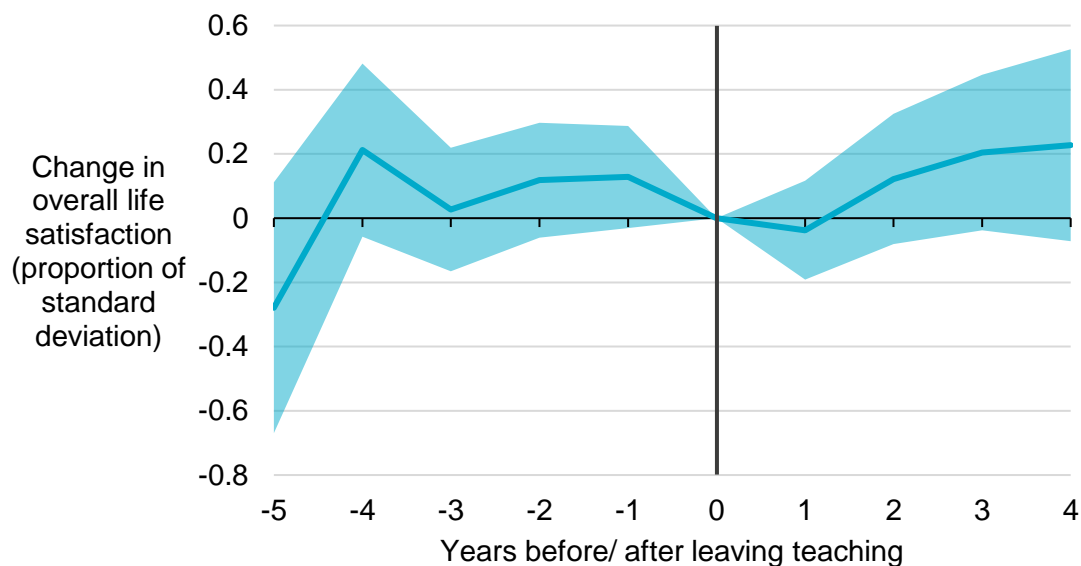
Source: NFER analysis of Understanding Society data.

Figure 61 Teachers' future financial situation worsens slightly after leaving, but subsequently recovers to its former level



Source: NFER analysis of Understanding Society data.

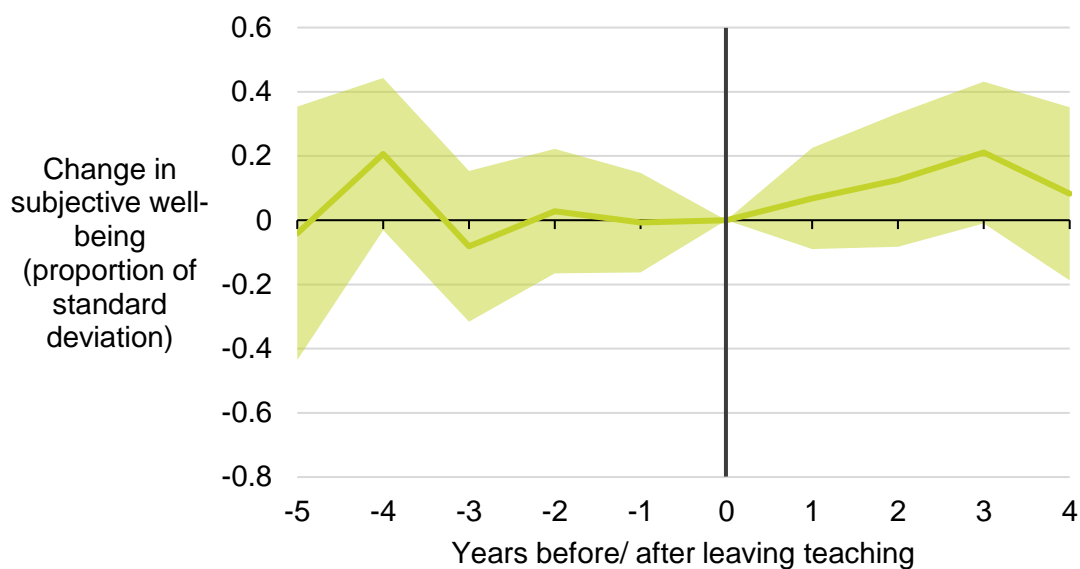
Figure 62 Teachers' overall life satisfaction increases slightly several years after leaving, but the difference is not statistically significant



Note: for consistency with the analysis above, analysis excludes leavers who are not employed.

Source: NFER analysis of Understanding Society data.

Figure 63 Teachers' subjective well-being increases steadily in the years after leaving, but the difference is not statistically significant



Note: for consistency with the analysis above, analysis excludes leavers who are not employed.
Source: NFER analysis of Understanding Society data.

Appendix E Stakeholder interview sample

To help interpret the findings from the secondary data analysis, and to understand the nature of retention issues faced by other public sector professions, in-depth qualitative interviews were carried out with stakeholders in the following influential organisations in the nursing and policing sectors:

- College of Policing
- Department of Health
- Health Education England
- NHS England
- NHS Improvement
- Police Workforce Coordination Committee
- Royal College of Nursing.

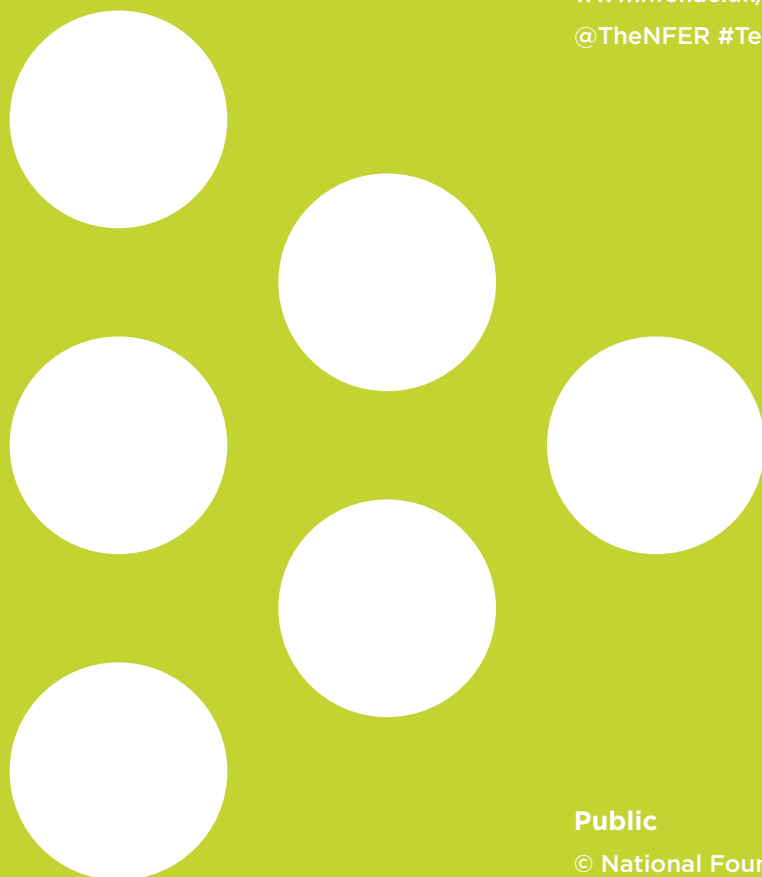
Interviews took place between December 2017 and January 2018 and each lasted approximately one hour. Interviews were semi-structured and question themes included: workforce supply challenges in their sector; why people join and leave the professions; and strategies employed to address any workforce challenges and to boost recruitment and retention.

Evidence for excellence in education

More information on NFER's research into the recruitment, development and retention of teachers and school leaders is available at:

www.nfer.ac.uk/school-workforce

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NFER ref. NUFS

ISBN. 978-1-911039-82-2