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1 Introduction

Wage growth in public sector occupations was frozen in 2010 and has been capped at one percent since 2013. However recent indications suggest that this pay cap may be lifted for workers in some sections of the public sector. This research explores the pay of public sector workers in specific occupations, namely nurses, police officers, secondary school teachers and firefighters.

1.1 Public Sector Pay in Context

The public sector wage bill is currently estimated to be approximately £181bn per year\(^1\), approximately one quarter of all government spending. Consequently even small increases in pay can result in substantial increases in government spending.

With this in mind, a public sector pay freeze was introduced in 2010 for all but the lowest paid workers for two years. In 2013 the freeze was replaced with the public sector pay cap, set at one percent. However between 2010 and 2017 prices, as measured by consumer price index inflation (CPIH), were rising meaning that many public sector workers were in fact facing a real terms pay cut.

Recent political pressure means that the pay cap may soon be lifted for some public sector workers. This is likely to be limited to specific public sector roles such as police officers and prison officers\(^2\). Whilst there is plenty of evidence concerning the declining real wages of public sector workers as a whole, the evidence regarding earnings and living standards is more limited when considering specific occupations. This research aims to fill this gap in the evidence.

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2 Data and Methodology

The data used for this research primarily comes from the Labour Force Survey (LFS). We also obtained information about the rate of inflation (CPIH) from the Office for National Statistics (ONS).

There are a number of possible sources of data for this analysis. The Annual Survey of Hours and Earnings (ASHE) is generally considered the most reliable dataset for calculating individual incomes, and contains the relevant Standard Occupational Classification (SOC) codes needed to identify specific public sector occupations required for this analysis. However, ASHE lacks detail on household composition, preventing minimum income standard (MIS) calculations at household level. Alternatively, the family resources survey (FRS) contains information on household composition and incomes, allowing MIS analysis to be conducted. However, the FRS does not include SOC codes to a suitable level of detail to enable the identification of the job types. Therefore the LFS was chosen for analysis on the basis it is the most reliable data source which contains information on individual income, job types and household composition.

There are limitations to using LFS data. The sample size is smaller than ASHE meaning estimates are less precise. Further, income is self-reported and may be prone to bias, particularly towards an underestimation of wages. These issues are important and should be taken into account when interpreting the results. Nevertheless, this analysis is focussed towards trends income over time, meaning that relative differences between time points are likely to be a reliable description of changes in income, even if the absolute level of income may be less accurate.

2.1 Labour Force Survey

We use a pooled sample of the Quarterly Labour Force Survey from the first quarter of 2010 to the end of the 2016. Quarters were pooled within years to ensure that a sufficient sample existed for each occupation. We consequently produced estimates for each year between 2010 and 2016. Please note that the Labour Force Survey samples repeated cross sections of the population, so is not following the same people over time.

2.2 Classifying occupations

Each of the four occupations considered: nurses, police officers, firefighters, and teachers, were identified using Standard Occupational Classification codes (SOC 2010)\(^3\). The table below explains each definition of the occupations we analyse.

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Table 2:1 Definitions of Public Sector Workers

<table>
<thead>
<tr>
<th>Occupation</th>
<th>SOC Code (2010)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>2231</td>
<td>Nurses</td>
</tr>
<tr>
<td>Police Officer</td>
<td>3312</td>
<td>Police Officers (Sergeant and below)</td>
</tr>
<tr>
<td>Firefighter</td>
<td>3313</td>
<td>Fire service officers (watch manager and below)</td>
</tr>
<tr>
<td>Teacher</td>
<td>2314</td>
<td>Secondary education teaching professionals</td>
</tr>
</tbody>
</table>

Please note, that base sizes for firefighters were small in the latter years of analysis. Estimates regarding these occupations in particular should be treated with caution. A table of the base sizes is reported in appendix table A.1.

2.3 Minimum Income Standards

The minimum income standard (MIS) was developed by the Centre for Research in Social Policy at Loughborough University for the Joseph Rowntree Foundation. MIS is based on research into what members of the public think households need in order to meet a minimum socially acceptable standard of living.

‘A minimum standard of living in the UK today includes more than just, food, clothes and shelter. It is about having what you need in order to have the opportunities and choices necessary to participate in society.’

MIS is calculated for four different household types: couple households (two adults and two children), single parent households (one adult and one child), pensioner households (two adults, both retired) and single adult households (one adult). We were not concerned about retirees in this analysis, and estimates about the proportion of households not meeting the MIS were therefore an aggregation of the three other household types.

Minimum Income Standards (MIS) are calculated every year by the Centre for Research in Social Policy with the latest estimates published earlier this year. We took their estimates about the MIS before housing costs for each year between 2010 and 2016, detailed in the table below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Couple household (2 adults, 2 children), £</th>
<th>Single Parent household (1 adult, 1 child), £</th>
<th>Single Adult household (1 adult only), £</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>578</td>
<td>359</td>
<td>277</td>
</tr>
<tr>
<td>2011</td>
<td>587</td>
<td>365</td>
<td>281</td>
</tr>
<tr>
<td>2012</td>
<td>578</td>
<td>359</td>
<td>277</td>
</tr>
<tr>
<td>2013</td>
<td>598</td>
<td>371</td>
<td>286</td>
</tr>
<tr>
<td>2014</td>
<td>616</td>
<td>383</td>
<td>295</td>
</tr>
<tr>
<td>2015</td>
<td>634</td>
<td>394</td>
<td>301</td>
</tr>
<tr>
<td>2016</td>
<td>673</td>
<td>418</td>
<td>322</td>
</tr>
</tbody>
</table>

Estimates about the proportion of households failing to meet the minimum income standard could be overestimated if income is not equivalised to full time earnings. We therefore derived the weekly earnings of all household members by taking their wage and assuming that they work 37.5 hours a week. This adds some uncertainty to our estimates, but ensures that we do not consider someone to be failing to meet the minimum income standard simply because they are not working full time.

Limitations using LFS and MIS analysis:

Our approach of using LFS data and comparing to MIS presents several drawbacks:

- Household income was based on the assumption that all adults in the household work full time (37.5 hours a week). In reality, many workers may work more (or less) hours than this, particularly in some public sector occupations. A sensitivity analysis using actual hours was conducted and found that some occupations, such as policing, were substantially less likely to be in households below the MIS threshold when actual hours were used.
- The analysis takes no account of benefit receipt, which is generally higher for low income households. As a result it is likely that we overestimate the proportion of households below MIS.
3 Results from the Labour Force Survey

The results of the Labour Force Survey analysis are detailed below. The analysis considered nominal wage growth and price rises, real wages and annual earnings and the proportion of households whose earned income was insufficient to meet the minimum income standard.

3.1 Nominal wage growth and prices

Nominal wage growth is how much wages have risen without controlling for inflation. Figure 3.1 shows the percentage change in nominal wages over time and the changes in prices, measured by consumer price index (CPIH) inflation.

Figure 3.1 Nominal wage growth and CPIH Inflation, 2011-2016

Nominal wage growth varied greatly by occupation. Over the period considered, nominal wages for police officers fell over time, to approximately 2.8 per cent less than in 2010\(^5\). Wages for teachers and nurses appeared to be more stable, rising by approximately 1.5 per cent in nominal terms between 2010 and 2016.

Consumer price index (CPIH) inflation was greater than wage growth for most of the time period. In 2015 police officers and nurses did experience wage growth higher than

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\(^5\) This may be a consequence of the implementation of the Windsor pay review, which reduced starting salary for new recruits to a minimum of £19,000 for some candidates.
price inflation, but this was small and would not make up the shortfall from declining spending power in the rest of the period.

3.2 Changes in real wages and annual earnings

Real wage growth is how much wages have grown when we adjust for inflation. It helps us look at wage growth in terms of the goods and services the wage can buy.

Figure 3.2 shows the change in real wages over time for each of our occupations of interest. All of the occupations experienced declines in real wages over time. On average, teachers earned the most in 2010, but experienced the biggest decline in their income over the period.

Figure 3.2 Median real wages of public sector workers 2010-2016

The changes in annual earnings for these professions are displayed in Figure 3.3 below. Whilst these are a mirror image of Figure 3.2, it is sometimes easier to comprehend changes in terms of annual earnings. Firefighters, already among the lowest paid, experienced a decline in their earnings of approximately £2100 over the period. Teachers experienced the largest decline in real annual earnings over the period, at approximately £4000.
Minimum income standards

As discussed in the data and methodology chapter, to estimate the proportion of households that do not earn enough each week to participate in society, we equivalised weekly household earnings so that all adults in work were considered to be working full-time. Whilst this potentially adds uncertainty to our estimates, it means that we do not consider households to be below the minimum income standard simply because they do not work full time.

The minimum income standards were only calculated for four household types, as discussed in the data and methodology chapter. As a result of selecting only specific types of households, the base sizes for specific occupations are too small to conduct robust analysis for some of the professions, particularly in the more recent years. The results for the remaining occupations: Nurses, Police Officers, and Teachers are displayed in Figure 3.4, whilst base sizes for minimum income standards calculations are reported in appendix table A.2.

In 2010 over a quarter of nurses (27.3%) were living in households where weekly wages were insufficient to meet the minimum income standard. Whilst this proportion was highest among households with nurses, there were also significant proportions of police officers (22.4%) and teachers (16.0%) whose household earnings were insufficient in 2010. This indicates that living standards were already an issue for public sector workers in specific occupations prior to the implementation of the public sector pay cap.

Between 2010 and 2013, the proportion of households with earnings below the MIS threshold appeared relatively stable for all three occupations considered, but there was a sharp upturn between 2013 and 2016 with a large increase in the number of households with insufficient earned income to participate in society. Over four in ten (40.8%) nurses lived in households where earnings are below the minimum income
standard in 2016. Over a third (33.9%) of police officers and three in ten teachers (29.9%) also lived in households with insufficient weekly earnings.

**Figure 3.4 Proportion (%) of households whose earnings are below the Minimum Income Standard**

The rising proportion of households with earnings that do not meet the minimum income standards for individuals and families in front line public sector occupations such as nursing and policing is a cause for concern. It is important to stress that our analysis focuses specifically on earned income, in order to reflect on the relationship between public sector pay and living standards. It does not take account of income from benefits and tax credits, which would make significant difference for many households.

### 3.4 Returning to 2010 standards of living

Nominal wages have risen since 2010, but below the rate of inflation. To return to the 2010 standard of living, substantial increases in wages would be required. **Error! Reference source not found.** and Figure 3.5 shows the nominal wages and annual incomes in 2010 and 2016 and the required wages and salaries to return to the standard of living of 2010, adjusting for inflation. The exact pay rates are shown in appendix table A.3.

To return to 2010 standards of living, police officers would require an average pay rise of approximately £3800, or 5.9%. Teachers would require a large pay rise in cash terms, of about £4400.

Firefighters appear to fare particularly badly. Already among the lowest earners out of the occupations we considered, they require a pay rise of £3800 or 9.2%. Only teachers require a greater pay rise to return to the 2010 level of income, but they have on average a much higher salary.
Pay rises of such scale are highly unlikely due to financial and political pressures, but it further highlights the extent to which living standards of public sector workers have been squeezed over the past seven years.

Figure 3.5 Annual earnings in 2016 (£000s) and earnings required to return to the 2010 level adjusting for CPIH inflation
4 Conclusions

In 2010 a pay freeze was introduced on all public sector workers, which was subsequently raised to a 1% cap on pay rises. Prior research has focused on the decline in real wages of public sector workers as a whole and the changes to the public-private sector pay gap, as opposed to focusing on individual occupations. This research adds to the evidence base by exploring the changes in specific earnings and living standards over the period between 2010 and 2016.

Although there was some nominal wage growth between 2010 and 2016, this was almost entirely outstripped by rising prices. As a consequence, real earnings have fallen for the public sector workers investigated here. The largest falls have been experienced by teachers, who were approximately £4000 worse off in 2016 compared with 2010. Firefighters, already among the lowest paid, experienced a fall in annual income of roughly £2100.

Living standards have deteriorated for many public sector workers in the last seven years. Whilst pay was already inadequate for many in 2010, the situation has worsened with over four in ten nurses now living in households that do not meet the minimum income standard on the basis of their earned income alone.

A return to the public sector income of 2010 would require significant financial investment, with required pay rises of between 5% and 12% for the occupations we consider. Financial and political pressures make this an unlikely outcome in the near future, but it illustrates further the squeeze in living standards experienced by some public sector workers since 2010.

To conclude, the last seven years have seen earnings decline in every occupation this analysis considers. If the cap remains in place and inflation continues to exceed one per cent, living standards may fall further.
Appendix A. Tables

### Appendix table A:1 Base sizes by occupation – main analysis 2010-2016

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>1098</td>
<td>1169</td>
<td>1137</td>
<td>1164</td>
<td>1143</td>
<td>1121</td>
<td>1124</td>
</tr>
<tr>
<td>Police Officer</td>
<td>359</td>
<td>340</td>
<td>297</td>
<td>274</td>
<td>294</td>
<td>289</td>
<td>284</td>
</tr>
<tr>
<td>Firefighter</td>
<td>81</td>
<td>81</td>
<td>73</td>
<td>65</td>
<td>69</td>
<td>60</td>
<td>51</td>
</tr>
<tr>
<td>Teacher</td>
<td>941</td>
<td>769</td>
<td>775</td>
<td>791</td>
<td>786</td>
<td>774</td>
<td>719</td>
</tr>
</tbody>
</table>

*Note: Base size refers to the number of individuals in these occupations*

### Appendix table A:2 Base sizes by occupation – MIS analysis 2010-2016

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>249</td>
<td>266</td>
<td>280</td>
<td>308</td>
<td>279</td>
<td>279</td>
<td>191</td>
</tr>
<tr>
<td>Police Officer</td>
<td>107</td>
<td>108</td>
<td>80</td>
<td>67</td>
<td>78</td>
<td>75</td>
<td>59</td>
</tr>
<tr>
<td>Firefighter</td>
<td>27</td>
<td>33</td>
<td>22</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Teacher</td>
<td>225</td>
<td>207</td>
<td>186</td>
<td>173</td>
<td>193</td>
<td>208</td>
<td>134</td>
</tr>
</tbody>
</table>

*Note: Base size refers to the number of households containing at least one person from one of these occupations. Only household types included in the MIS calculations are including (2 parent and 2 children, 1 parent and 1 child, 1 adult only). As base sizes are low for firefighters they not included in minimum income standard analysis.*

### Appendix table A:3 Salary increases required to return to 2010 standards of living

<table>
<thead>
<tr>
<th></th>
<th>Median Nominal Annual Income</th>
<th>CPIH adjusted median salary required to reach 2010 income</th>
<th>Pay rise required to reach 2010 income – CPIH Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>27,982</td>
<td>2010 (£)</td>
<td>29,848</td>
</tr>
<tr>
<td>Police Officer</td>
<td>31,183</td>
<td>2016 (£)</td>
<td>33,746</td>
</tr>
<tr>
<td>Firefighter</td>
<td>25,025</td>
<td>2010 (£)</td>
<td>25,797</td>
</tr>
<tr>
<td>Teacher</td>
<td>36,341</td>
<td>2016 (£)</td>
<td>36,024</td>
</tr>
</tbody>
</table>