The cumulative impact on living standards of public spending changes

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Executive summary

Introduction and methodology

This report shows the projected distributional impact of changes in public spending on various protected groups in England, Scotland and Wales up to the tax year 2021/22. It also shows the combined impact of these changes and of tax and welfare reforms on the 'final income' of these groups (measured as net income plus the value of public services used by households). It accompanies our earlier report, 'The cumulative impact of tax and welfare reforms', which presented a cumulative impact assessment (CIA) of the changes to the tax and welfare (social security) systems since May 2010, including planned reforms (Reed and Portes, 2018, referred to as 'the previous CIA study' below).

Like the previous CIA study, this research uses the Landman Economics public spending microsimulation model. This combines data on trends in aggregate public spending, including published plans for future spending, with survey micro-data on the usage of public services by households. This enables us to estimate the distributional impacts of changes in public spending up to 2021/22 and to combine them with the tax and welfare results from the previous CIA study to produce an overall analysis of the impact of all reforms on final income. Changes in spending per head on each public service are compared with a baseline scenario where spending on services grows in line with inflation. The model therefore measures the distributional impact of increases or cuts in spending against that baseline.

Key findings

Overall and distributional impact of changes to public spending

- Overall public spending per head is forecast to fall by around 18% (just over £900) in England between 2010/11 and 2021/22, 5.5% (just under £300) in Wales and just over 1% (around £100) in Scotland. By 2021/22, overall spending per head will be 36% higher in Scotland than in England and 17% higher in Wales than in England.

- The differences between the countries are particularly acute for households with lower incomes. Cash losses for lower deciles are larger in England than Wales or Scotland due to the overall scale of cuts in spending being far greater in England.

- In England, losses are smallest (at around £900) for households with the highest incomes. Cuts to schools, transport and housing spending have the largest impact for poorer households.

- In Scotland, the largest losses from cuts (just over £450 per year) fall on some of the lowest income households (but not the lowest), but richer households have slightly larger losses than poorer ones. Cuts to schools, and to higher education (HE) and further education (FE) spending, are the main reasons for losses.

- In Wales, the impact of spending cuts fluctuates more by household income decile than in England or Scotland. Cuts to HE and FE spending have the largest impact of any single spending category.

- Differences between spending trends in the three countries are due to faster population growth in England compared with Scotland and Wales; different Scottish and Welsh Government spending priorities; and more generous funding in Scotland due to Scotland-specific income tax rises.

- The largest cuts are to higher education (HE) and further education (FE) spending (in England and Wales) and social housing spending (England) (which will have fallen by around 80% by 2021/22). Early years funding (England and Wales), transport and police funding (England) and HE/FE spending (Scotland), are all cut by between 30 and 50%. The largest spending increases in percentage terms are for early years and social housing (both in Scotland).

Impact by protected characteristic and household demographic type

- In both England and Scotland, Black households experience the largest overall spending cuts in cash terms, while White households (and Mixed ethnicity households in England) lose less than other ethnic groups. In Wales (and for Mixed ethnicity households in Scotland), the number of households containing ethnic minority adults in the data is too small for us to be able to analyse patterns of cuts by ethnicity.

- In England, households with more disabilities (measured by the number of functional disabilities recorded across all household members) suffer much larger losses (over £2,900 per year) than those with fewer disabilities, largely because of social care cuts. In Wales, the 'disability gradient' is much shallower, while in Scotland households with more disabilities fare slightly better than non-disabled households, due to increased spending on social care, health and social housing.

- Households where adults are aged under 55 on average experience larger losses from spending changes than older households. Households where adults are aged 18-24 on average experience the largest losses from tax, welfare and public spending changes as a percentage of final income.

- In England and Scotland, households with children suffer larger losses than those without children, mainly due to cuts to school spending. In England, multiple benefit unit (MBU) households[1] with children, couples with children, and lone parents, all lose between £5,500 and £3,600 depending on gender and household type. In Wales, losses for couples with children and lone parent households are smaller, due to boosts to school spending per household.

- In England, the overall impacts of spending changes for same-sex couples (whether male or female) were similar to those for mixed-sex couples without children. In Scotland and Wales, the number of same-sex couples in the data was too small to produce a reliable analysis.

- In Scotland, couples and MBU households with children fare worse than other groups. Lone parents experience much smaller average losses than other types of household with children, due to increases in social care, housing and early years spending. Households without children gain slightly on average.

- In England and Wales, single pensioners fare better on average than any other group.

Combined impact of tax and welfare reforms and other public spending changes on final income

- Poorer households lose more overall as a proportion of final income (i.e. net income plus the value of public services received) than richer ones. This regressive pattern is particularly pronounced for England, where the poorest two deciles suffer average losses of over 11%. This is compared with little or no impact in the top two deciles. In Scotland, the decile pattern is still regressive, but the differences between richer and poorer households are smaller, while Wales falls somewhere between the two.

- In England, Black and 'Other' ethnicity households experience average losses of around 9% to 9.5% of final income – around three times higher than those for White households and households where adults are from different ethnic groups. In Scotland, the largest losses are for Black households (around 6.5%); while White households lose just under 1%.

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[1] A benefit unit is defined by the Department for Work and Pensions as a single adult or an adult couple. MBU households are those where more than one benefit unit lives at the same address.

- In all three countries, households with more disabilities have larger losses as a percentage of final income. The impact is greater in England, where the households with the most disabilities suffer losses of 10.5% of final income, than in Scotland or Wales (4.5% to 5%).

- Households where adults are aged 18-24 on average experience a worse outcome than any other age group in all three countries.

- Lone parent households (who are predominantly female) lose more than any other demographic type in terms of final income in all three countries. In England, their losses are 18.7%, compared with 10.5% in Wales and 7.6% in Scotland. In England and Scotland, female lone parent households experience greater losses than male lone parent households.

- In all three countries, households with three or more children experience greater losses than those with fewer or no children, largely because of social care cuts and also the two-child limits to Housing Benefit, tax credits and Universal Credit introduced in 2017. The impact on this group is greatest in England.

Policy recommendations

Mitigating the negative impacts of public spending changes

We recommend that the UK, Scottish and Welsh Governments:

- Significantly mitigate the disproportionate negative impacts on poorer households and protected groups of changes to the tax and welfare system and cuts to spending on public services. This could be done (for example) by increasing the rates of means-tested benefits, tax credits and Universal Credit, and by increasing spending on in-kind public services such as health, social care, education and public housing.

- Take into account in the next UK Government's Spending Review and the spending plans of the Scottish and Welsh Governments, the likely impact on protected groups and the impacts for poorer households of further changes in spending.

- Require that the next UK Government's Spending Review, and the spending plans of the Scottish and Welsh Governments, are accompanied by an equality impact assessment. These should incorporate a CIA of the impact on protected groups, showing how distributional impacts vary across groups; analyse and explain any major disparities in outcomes that adversely impact protected groups;

and take into account the impacts for poorer households of further changes in spending.

- Publish a detailed explanation of the process by which they will ensure that the Spending Review and spending plans are fully compliant with the Public Sector Equality Duty; demonstrate that regressive measures are temporary, necessary, proportionate and non-discriminatory and do not undercut a core minimum level of protection and put in place any mitigating measures required to safeguard people's rights.

- Ensure that these analyses by each government are publicly accessible and subject to meaningful scrutiny by Parliament, the public and protected groups that may be adversely affected by the decisions.

Improving data for impact assessments of public spending changes

In order to improve the quality of data for CIAs on public spending, we recommend that the UK, Scottish and Welsh Governments:

- Make available more national, regional and local information on the usage of various public services, including on social care services; legal aid services; publicly funded recreational facilities (for example, museums and galleries, parks etc.); and fire services.

- Improve the quality of data on children's usage of health services in the Health Survey for England, Scottish Health Survey and Welsh Health Survey.

- Publish more detailed analysis where data are collected on protected characteristics and take steps to redress this omission where they are not. Where data are lacking for particular groups, e.g. people from ethnic minorities in Wales, increase, boost or pool samples as necessary.

Conclusions

These public spending changes took place against a background of a clear and overarching UK Government commitment to deficit reduction. Cuts in spending on the services, alongside reductions in benefits and tax credit spending, were a key component of the deficit reduction strategy, and would have been necessary to achieve deficit reduction in the absence of tax increases and/or greatly improved economic growth.

The different pattern of distributional impacts of spending cuts seen in Wales and Scotland, compared with England, shows that neither the overall scale of spending cuts in England, nor their precise impact on protected groups, was inevitable.

As our analysis of social security reforms in the previous CIA study showed, the UK Government's published impact assessments do not, in themselves, indicate that its obligations under international human rights treaties have been taken into account; nor do they indicate that the Government has paid sufficient regard to the Public Sector Equality Duty and the impact of reforms on disadvantaged groups.

1.   Introduction

This report shows the projected distributional impact of changes in public spending on protected groups in England, Scotland and Wales up to the 2021/22 tax year. It also shows the combined impact on the final income of these groups of public spending changes and of tax and welfare reforms.

The report is a companion to *The cumulative impact of tax and welfare reforms* (Reed and Portes, 2018), which presented a cumulative impact assessment (CIA) of the changes to the tax and welfare (social security) systems in England, Scotland and Wales since May 2010, including all reforms planned up to the 2021/22 tax year. It also builds on and extends earlier work carried out by, and for, the Commission between 2012 and 2015. This earlier work resulted in several publications, including: *Cumulative impact assessment* (Reed and Portes, 2014); *Making fair financial decisions: fair financial decision-making: 2014 progress report*; and *Future fair financial decision-making* (EHRC, 2012; 2014; 2015).

This report assesses the cumulative distributional impact of changes to other 'in-kind' public services – in particular health, social care, education, early years and pre-school services, public transport, housing, and policing. It therefore builds on and extends the Commission's earlier work which modelled the impact of changes to spending on public services between 2010 and 2015 (Reed and Portes, 2014). This report uses more recent data on public service usage and aggregate spending on public services, as well as published plans for public spending in England, Wales and Scotland, to show the projected distributional impact of changes in spending up to and including the 2021/22 tax year for each country separately.

The report is structured as follows. Chapter 2 explains the methodology behind the Landman Economics public spending model and how we model the distributional impact of changes to public expenditure, as well as the types of spending that are included. Chapter 3 presents some statistics on the overall size of changes to public spending in England, Scotland and Wales. Chapter 4 looks at the detailed distributional impact of the public spending changes on households in the three countries according to their position in the income distribution and a range of other characteristics such as ethnicity, disability, age and demographic type. Chapter 5

combines the results for the distributional impact of tax and welfare reforms since 2010 from Reed and Portes (2018) with the results from Chapter 4 of this report to show the overall impact of all reforms on final income (defined as net income plus the value of public services received by each household). Finally, Chapter 6 offers conclusions and policy recommendations which are supplementary and additional to those in Reed and Portes (2018).

2. Methodology

The Landman Economics public spending model combines data on trends in aggregate public spending (broken down into different spending categories) with survey micro-data on the usage of public services by households. This chapter gives an overview of both these types of data and the methods used to model the distributional impacts of public spending using the data sources. We also consider the strengths and weaknesses of the modelling methodology.

2.1   Aggregate spending data

Data sources

The model uses aggregate public spending data from four sources, as follows:

- Data on spending in the financial years 2010/11 to 2015/16 (inclusive) are supplied from HM Treasury's *Public expenditure statistical analyses* (PESA) publication (HMT, 2015; 2016; 2017). The particular tables used are Tables 10.5, 10.6 and 10.7, which show total identifiable expenditure on services by 'sub-function' per head of the population for England, Scotland and Wales respectively. The 'sub-function' classification is based on the United Nations' COFOG (Classifications of Functions of Government) definition and is explained in more detail below.

- Spending plans for England from 2016/17 to 2019/20 (inclusive) are taken from Table 1.12 of PESA, which shows total departmental expenditure by UK Government department. Departmental spending is mapped on to functional areas of spending. In most cases, this is a relatively straightforward exercise. This is because for the areas of spending covered in this report, funding for Scotland and Wales is devolved. It is covered by a combination of the UK Government's block grants to the Scottish and Welsh Governments, and the Scottish and Welsh Government's own revenue sources (e.g. Council Tax, and a component of the income tax system in Scotland from 2018/19 onwards). Therefore, the departmental allocations in PESA Table 1.12 mainly cover spending in England only for the categories of spending considered in this report.

- Spending plans for Scotland from 2016/17 to 2018/19 (inclusive) are taken from the Scottish Government's 2018/19 draft Budget documentation (Scottish Government, 2017).

- Spending plans for Wales from 2016/17 to 2019/20 (inclusive) are taken from the Welsh Government's 2018/19 draft Budget documentation (Welsh Government, 2017).

In addition to the spending data, population projections for the years 2016 to 2022 are supplied by the Office for National Statistics (ONS, 2017). This enables the adjustment of the spending plans for England, Scotland and Wales for 2016/17 and subsequent years to take account of changes in the relevant population in each country.

Choice of time frame

Although spending plans are not currently available for years beyond 2019/20 (or 2018/19 in the case of the Scottish Government), our estimate of the impact of spending cuts in each country extrapolates the trends as far as 2021/22. This enables us to produce estimates for the distributional impacts of changes in public spending up to 2021/22 which can be combined with the tax and welfare results from the previous report (Reed and Portes, 2018) to produce an overall analysis of the impact of all reforms on 'final income' (measured as net income *plus* the value of public services used by households). The extrapolation methodology is explained in Appendix A.

Some of the analysis in this report examines the impact of cuts across two different sub-periods: (1) 2010/11 to 2015/16 and (2) 2015/16 to 2021/22. The first of these sub-periods corresponds to the actual data on spending per head in Tables 10.5, 10.6 and 10.7 of the PESA data, while the second sub-period includes the period covered by the spending plans.[2] This classification has the benefit of mapping on to the time period classification used in Reed and Portes (2018). This used a three-period classification which corresponded to the three Parliaments since the 2010 general election: (a) 2010/11 to 2015/16, (b) 2015/16 to 2017/18 and (c) 2017/18 to 2021/22. This report uses a two-period classification rather than a three-period classification; we do not attempt to separate out the spending trends in periods (b) and (c), instead combining them into a single sub-period. This is for two reasons.

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[2] At the time of publishing this report, the 2016/17 and 2017/18 tax years are also historical rather than future spending, but the most recent PESA breakdown of spending for England, Scotland and Wales (HMT, 2017) only gives figures up to 2015/16. For the purposes of this report, it therefore makes more sense to put 2016/17 and 2017/18 in the second sub-period of the analysis.

First, following the June 2017 UK general election, the UK Government announced that the next Spending Review will take place in Autumn 2019. This means that at present, we do not have any detailed information on how spending plans for the post-2017 period differ from those announced in the 2015 Spending Review. Second, the Parliamentary terms and elections for the Scottish Government and the Welsh Assembly do not correspond with those for the Westminster Parliament. As far as spending in Wales and Scotland is concerned, it therefore makes more sense to divide spending data into historic and planned periods rather than using dividing lines based on UK general elections.

Services included in the model

Not all public services are included in the Landman Economics public spending model – only those which can be reasonably allocated to households based on survey data on service usage ('allocatable services'). The included services are as specified in Table 2.1 below.

Table 2.1. COFOG classifications of services and inclusion status in the Landman Economics public spending model

COFOG classification	Included in model	Not included
1. General public services	None	All
2. Defence	None	All
3. Public order and safety	3.1 Police services	3.2 Fire-protection services 3.3 Law courts 3.4 Prisons
4. Economic affairs	4.5 Transport	4.1 General 4.2 Agriculture, forestry, fishing and hunting 4.3 Fuel and energy 4.4 Mining, manufacturing and construction 4.6 Communication 4.7 Other industries
5. Environment protection	None	All
6. Housing and community amenities	6.1 Housing development	6.2 Community development 6.3 Water supply 6.4 Street lighting
7. Health	Medical services	Medical research Central and other health services
8. Recreation, culture and religion	None	All
9. Education	9.1 Pre-primary and primary education 9.2 Secondary education 9.3 Post-secondary non-tertiary education 9.4 Tertiary education	9.5 Education not definable by level 9.6 Subsidiary services to education
10. Social protection	Social service components of all sub-categories	Transfer payment components of all sub-categories*

Note: table omits R&D and n.e.c. (not elsewhere classified) components of all COFOG categories to save space. None of these are included in the model.

* Note that transfer payments – which are a key component of social protection spending – are included in the Landman Economics tax-transfer model used in Reed and Portes (2018) rather than the Landman Economics public spending model. In Chapter 5 of this report, we include the distributional impact of changes to transfer payments (and changes to the tax system) alongside the impact of changes to other public spending, to show the overall impacts of tax and spending policies.

Analysis of Table 5.2 of the PESA data shows that, across Great Britain as a whole, these 'allocatable services' accounted for around 75% of total public spending in the 2016/17 tax year when combined with the transfer spending payments included in the IPPR/Resolution/Landman Economics tax-transfer model used for the cumulative impact assessment of tax and welfare reforms in Reed and Portes (2018). The remaining 25% was composed of services such as defence and environmental protection, the benefits of which cannot be straightforwardly assigned to particular types of household.

The choice of baseline scenario

We have compared changes in spending per head and per household on each public service with a baseline scenario in which spending on each service rises in line with the GDP deflator. The GDP deflator is an index measure of growth in prices across the whole UK economy, including producer as well as consumer prices. Thus, the baseline scenario in this model is a scenario in which spending per head on public services stays constant in real terms. The model measures the distributional impact of increases – or cuts – in spending against that baseline.

It is important to note here that a baseline scenario where spending on public services stays constant in real terms is a much lower rate of growth than the long-run historical average over the last 70 years, which is for total public spending to rise roughly in line with GDP (with some short-term variations).[3] Most of the time, GDP grows faster than the GDP deflator, which means that the long-run tendency is for public spending to *increase* in real terms. For example, over the time period we are focusing on in this report, real GDP is forecast to grow by just over 20% between 2010/11 and 2021/22 (OBR, 2018). Measured against a baseline scenario where spending on services is constant as a share of GDP, our analysis would show large-scale cuts to most services. We have chosen the constant real-term spending benchmark for this analysis as it seems most consistent with our treatment of the baseline scenario for benefit levels and tax thresholds in the previous CIA study of the cumulative impact of tax and welfare reforms by Reed and Portes (2018), which assumed that benefit levels and tax thresholds were held constant in real terms in the baseline scenario.

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[3] Over the last 70 years, the table on 'Total government spending and receipts as % of GDP' produced by the Office for Budget Responsibility (OBR, 2018) shows that spending has always been between 35% and 45% of GDP over this period.

Of course, while the choice of baseline makes a large difference to the overall scale of cuts, it does not affect our key results, which are about the **differential**, or relative impacts of spending changes on different types of household.

2.2   Survey data on service use

The Landman Economics public spending model uses data from household surveys on individuals' use of various public services to establish the pattern of use of those services across the household income distribution and various protected characteristics. Previous analysis in 2014 (Reed and Portes 2014, Chapter 6) used data on service use for England only. In this report we have expanded the number of datasets used so that we have a full set of service use data for Scotland and Wales as well as England. The datasets used in the latest version of the public spending model for this report are as follows:

- The **Family Resources Survey** (which covers England, Scotland and Wales) for data on the use of education, early years, housing and social care services.
- The **National Travel Survey** (which covers England, Scotland and Wales) for data on the use of transport services.
- The **Health Survey for England** for data on the use of health services in England.
- The **Scottish Health Survey** for data on the use of health services in Scotland.
- The **Welsh Health Survey** for data on the use of health services in Wales.[4]
- The **Crime Survey for England and Wales** for data on the use of police services in England and Wales.
- The **Scottish Crime and Justice Survey** for data on the use of police services in Scotland.

Appendix A of this report provides full detail of the service use variables used in each of the seven different survey datasets in the Landman Economics public spending model.

The base dataset for the public spending model is the Family Resources Survey (FRS) (which is also the main dataset used for modelling the distributional impact of tax and welfare reforms in Reed and Portes, 2018). For the services that are covered

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[4] In 2017, the Welsh Health Survey was superseded by the National Survey of Wales (NSW) which collects data on a wider range of topics, including health and social care. However, we used the WHS data for this project as the first wave of NSW data had not been released at the time we were designing the public spending analysis for Wales.

by the FRS, the data on spending per head are apportioned according to the households using the service in the four-year pooled (2012/13 to 2015/16 inclusive) FRS dataset.

For transport, health and police services, which are not covered by the FRS, we estimate regressions of each service use variable against the observable characteristics of household members using the service based on each of the datasets that does cover these services. The regressions contain explanatory variables which are also present in the FRS dataset, and the probability of use of these services for each household in the FRS is estimated by using an out-of-sample prediction for the FRS data based on the regression coefficients from the other datasets. Appendix A gives full details of the regression specifications used.[5]

2.3 Strengths and weaknesses of the modelling methodology

Modelling the distributional impacts of changes in spending on public services that are received as services in kind rather than cash transfers is intrinsically a more difficult task than modelling the impact of changes to benefits, tax credits and Universal Credit. There are several reasons for this:

- It is necessary to decide how to value the service as it is not a cash transfer payment.
- No one micro-dataset in the UK has data on usage of all services. The model therefore needs to combine data from more than one dataset to give a comprehensive picture of the impact of changes to public spending (at least, public spending which can plausibly be allocated to particular households).

In our view, the methodology used in the Landman Economics public spending model has the following strengths (some of which are newly developed since our previous research for the Commission on the distributional impacts of public spending in 2013/14):

- Spending data for the period 2010/11 to 2015/16 are based on actual PESA per head spending information from Tables 10.5, 10.6 and 10.7, while the forecasts for years after 2015/16 are based on departmental spending plans (for England) and government spending plans (for Scotland and Wales)
- Service use is based on actual survey data on usage (from a number of micro-datasets).

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[5] Results from the public services regressions are available from the authors on request.

- The model distinguishes between spending on services in England, Scotland and Wales. Given that most of the areas of public spending featured in the model are devolved competencies of the Scottish Government (in Scotland) and the Welsh Government (in Wales) this is an important innovation.

The model has the following methodological issues and potential weaknesses:

- The model assumes that the distributional impact on service users of changes to spending on a given public service is equal to the change in spending per head on that public service. In other words, public services are valued by end users according to the amount being spent on the service. This ignores changes in the value of public services to the user that result from factors other than the amount spent. For example, in health the range of treatments available, or the way a given service is delivered, might have impacts on the quality of the service which are not necessarily driven by spending. An alternative approach would be to measure changes in public service quality using metrics that are more directly related to the end user experience of using the service (such as data on user satisfaction, or measures of service quality). However, this alternative approach is not possible in the UK because user satisfaction and/or service quality measures are not typically available in survey-based micro-data.

- Some services which could in principle be allocated to households are omitted from the model due to a lack of micro-data on service use (e.g. fire services, legal aid).

- For some services (notably social care and early years services in England), decisions about the precise mix and extent of services are made at local authority level. It is not possible to include local authority-level spending decisions in the model for two reasons. First, the FRS datasets do not contain local authority identifiers; and second, we do not have a database of spending categories and amounts at local authority level (which would be very time-consuming to construct).

- Absence of local authority data is also a problem for modelling the effects of population growth on spending per head: for example, we know that projected population growth in England is heavily concentrated in London and the south east, but our model only includes population projections for England as a whole.

- The model does not distinguish between current spending (i.e. day-to-day spending on running services such as the wages of public sector employees, administration costs and so on) and capital spending (i.e. investment in buildings and equipment), which may have very different time paths in terms of their impact on service users.

- With the exception of some analysis of aggregate spending 'per head' on services in Chapter 3, the results from the model are all presented at the household level. For the most part, it would be technically possible to use micro-data to model use of public services at the individual rather than the household level. However, there are two problems with this approach. First, there are conceptual problems concerning how to divide spending between individuals: for example, should the adult or the child be modelled as benefiting from childcare services? Second, some of the survey data on receipt of public services for children are not as detailed as for adults (particularly health, social care for disabled children, and transport) and this makes it difficult to produce accurate allocations of these services.

Despite the methodological issues, we are confident that the public spending model used in this report gives as accurate a picture of the distributional impacts of public spending changes as is possible given currently available data.

3. Trends in public spending per head and per household

3.1   Trends in overall spending per head

Figure 3.1 shows total public spending on allocatable services (see Table 2.1) per head of the population for England, Scotland and Wales from 2010/11 to 2021/22. The statistics for the period 2010/11 to 2015/16 are marked as 'outturn' data, using unbroken lines, as they are based on actual figures from the public expenditure statistical analyses (PESA). The figures from 2016/17 onwards are marked using dotted lines; they are projections from the spending plans data in PESA and in the Scottish and Welsh Governments' respective draft plans.

Figure 3.1 Total public spending per head on allocatable services in England, Wales and Scotland, real terms, 2010/11 to 2021/22
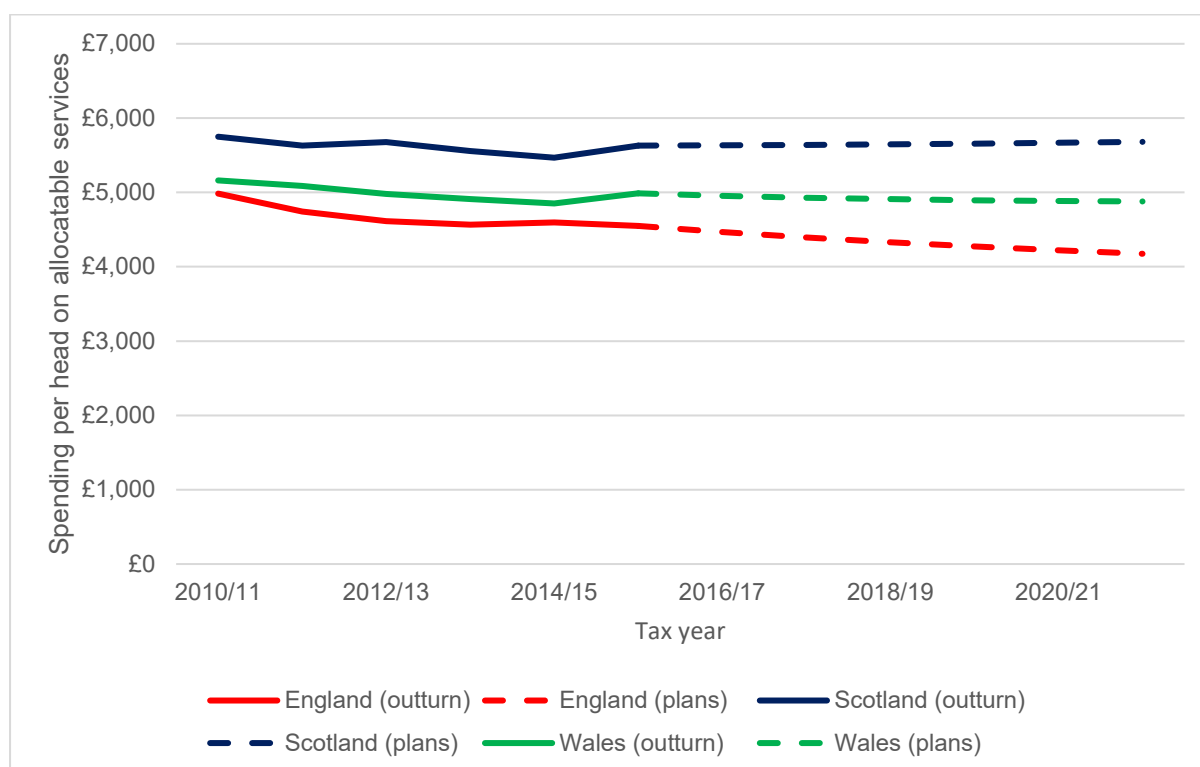
Source: Outturn data: HMT (2015; 2016; 2017). Plans data: HMT (2017), Scottish Government (2018), Welsh Government (2017).

Figure 3.1 shows that in 2010/11, spending per head on allocatable services was significantly higher in Scotland (at £5,750 per head) than in Wales (just over £5,150 per head) or England (just under £5,000 per head). Between 2010/11 and 2015/16, spending on allocatable services in Scotland fell below £5,500 per head in 2014/15, before recovering to £5,630 in 2015/16. Spending in Scotland is forecast to increase slightly to £5,680 per head by 2021/22. In Wales, spending per head fell to around £4,850 by 2014/15 before rebounding to just under £5,000 in 2015/16. Our projections suggest that spending per head in Wales will fall slightly from 2016/17 onwards, to around £4,880 by 2021/22. In England, spending per head on allocatable services fell by a greater amount between 2010/11 and 2015/16 than in Scotland or Wales, to around £4,550 by 2015/16. After 2015/16 our projections suggest that spending per head will continue to fall, to £4,175 by 2021/22. Overall, we forecast that spending per head on allocatable services in England will fall by around 18% in England between 2010/11 and 2021/22, compared with a fall of around 5.5% in Wales and a fall of just over 1% in Scotland.

It is important to establish what is driving the sharp fall in spending per head on allocatable services in England compared with Wales and Scotland. One important

difference between the three countries is population growth. Figure 3.2 shows overall growth in the population of England, Wales and Scotland between 2010 and 2021 using population data and projections from the Office for National Statistics (ONS, 2017). The data are indexed at a level of 100 in 2010, to control for the fact that the overall population size in England is much bigger than either Scotland or Wales.

Figure 3.2 shows that the population in England is projected to grow by around 8.5% between 2010 and 2021, compared with growth of around 4.5% in Scotland, and 4% in Wales. Thus, higher population growth in England accounts for some, but not all, of the difference in trends in spending per head between England on the one hand, and Wales and Scotland on the other; the faster population growth in England means that spending is being stretched increasingly thinly across an increased population.

Figure 3.2 Projected whole population growth in England, Scotland and Wales, 2010-2021
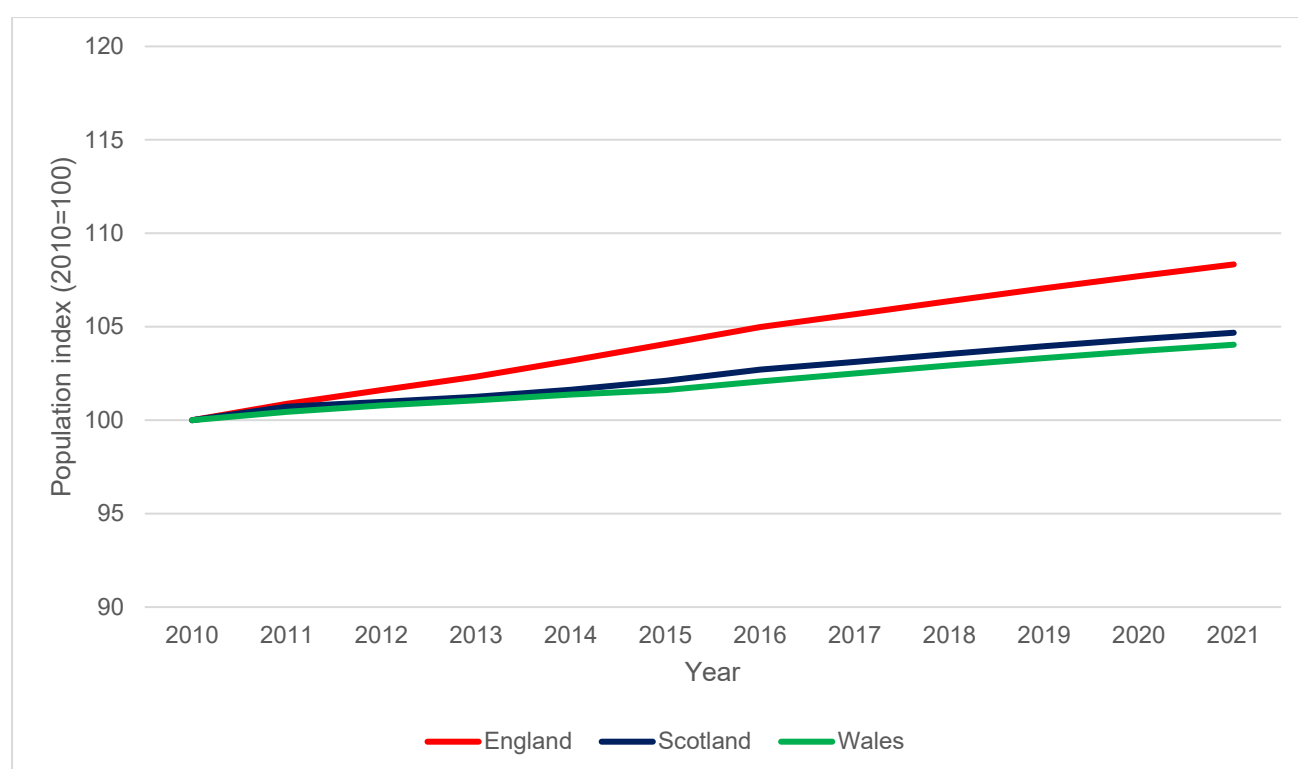
Source: ONS, 2017.

As well as differences in the rate of population growth, three other factors help account for larger reductions in spending per head in England compared with Scotland and Wales:

- Population growth in some of the age groups who receive the most public spending per head is higher in England relative to Scotland and Wales. For

example, population growth for children aged 5 to 9 by 2021 is forecast to be 10 percentage points higher in England relative to Scotland and Wales than across the population as a whole. The trends for 10-14 and 15-19-year-olds are similar. This is shown in detail in Appendix B, which presents trends in population growth broken down by 5-year age bands for children (0-4, 5-9, 10-14 and 15-19) along with trends for 20-64-year-old adults, and adults aged 65 and over. Given that spending on schools is a large proportion of total allocatable public spending (more than one-quarter, according to Figure 3.6 below) this helps drive a reduction in per-head spending in England compared with Scotland and Wales.

- Scottish and Welsh government funding decisions have prioritised particular allocatable services. For example, both the Scottish and Welsh Governments have invested more in housing than the funding settlements for England between 2010/11 and 2021/22. This is shown in more detail in Section 3.2 below.

- Income tax increases in Scotland from 2018/19 onwards have helped reduce the scale of spending cuts in these areas in Scotland (see Chapter 6 of Reed and Portes, 2018, for more details on how these are comprised).

3.2   Trends in spending per household on each public service

The remaining statistics in this chapter analyse spending per household rather than per head of the population, as this is the level of analysis that we use in Chapters 4 and 5. Figures 3.3, 3.4 and 3.5 show changes in spending per household in cash terms across the 2010-15 and 2015-22 time periods for each public service for England, Scotland and Wales respectively. In each case changes in spending are broken down into historic changes (labelled 2010/11-2015/16) and planned changes (labelled 2015/16-2021/22). Note that the vertical axis for Figure 3.3 is to the same scale as Figures 3.4 and 3.5 but because the total changes in spending per household are bigger for England than Scotland, Figure 3.3 is a taller graph than Figure 3.4 or 3.5.

Figure 3.3 shows that with the exception of health (where the projected real-term increase in spending per household between 2010/11 and 2021/22 totals just over £300 per year), we project cuts in every area of public services in England. The biggest cuts are for schools (around £475 per household) and transport (just over £400 per household), while the smallest cuts are for early years services (£40 per household). Overall, the total cuts for England sum to just over £1,450 per household of the population in real terms. This comprises around £875 of cuts in the 2010/11 to 2015/16 period and just under £600 in the 2015/16 to 2021/22 period.

Figure 3.3 Changes in spending per household, cash terms, 2010/11-2015/16 and 2015/16-2021/22: England
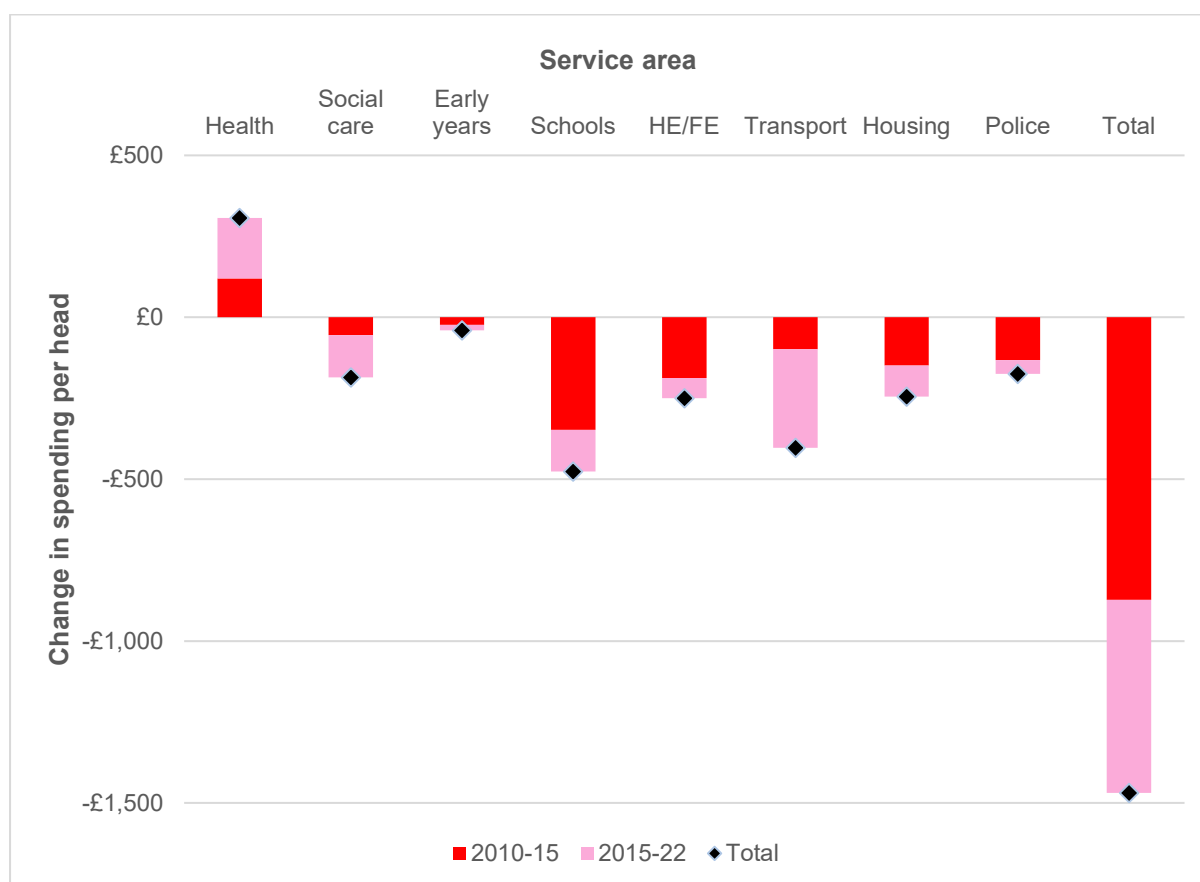
Source: authors' analysis of HMT (2015; 2016; 2017).

Looking at the equivalent results for Scotland in Figure 3.4, four of the eight service areas show increases in real terms per household expenditure between 2010/11 and 2021/22; health, social care, early years services and housing. The largest increase is for health (just over £250 per household). Schools, higher and further education, transport and police services show decreases in real-term spending, with the largest per household decrease for schools (just under £400). Total spending falls by around £200 per household although in the period after 2015/16, spending is forecast to increase slightly (by just over £50 per household).

Figure 3.4 Changes in spending per household, cash terms, 2010/11-2015/16 and 2015/16-2021/22: Scotland
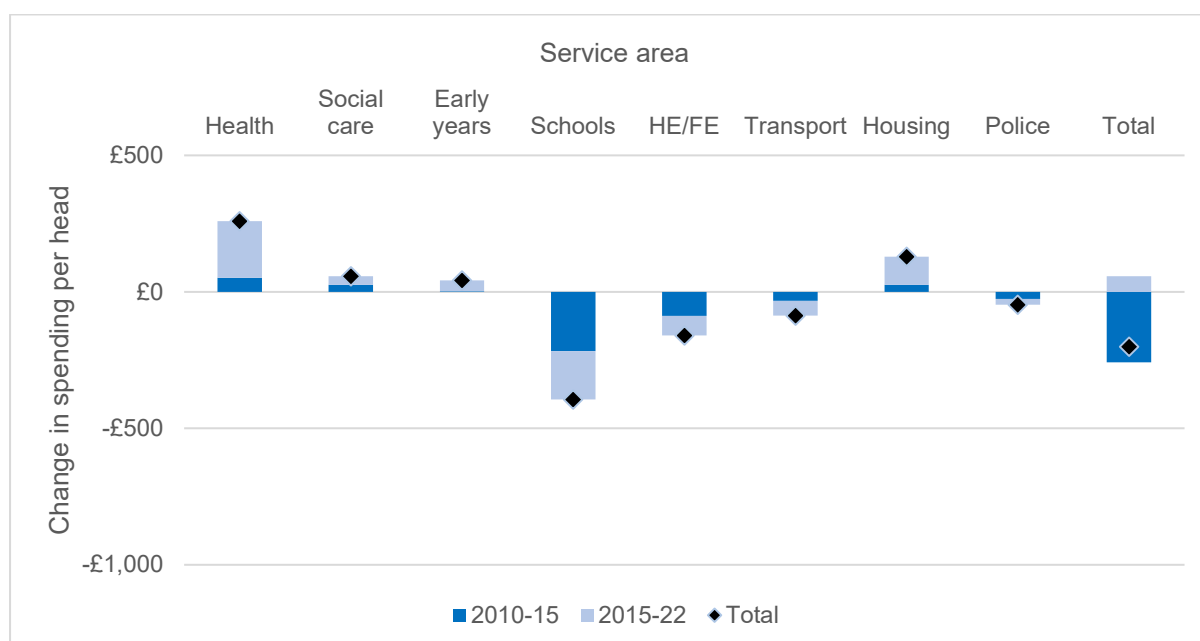
Source: authors' analysis of HMT (2015; 2016; 2017), Scottish Government (2017).

Finally in this section, Figure 3.5 shows changes in spending per household for Wales. There is more of a contrast for Wales in the patterns of forecast spending between 2015/16 and 2021/22, compared with historic changes in spending between 2010/11 and 2015/16, than there is for England or Scotland. For social care, schools and housing, real-term per household expenditure increases between 2010/11 and 2015/16 but falls after that, whereas for healthcare, the opposite is true. Taking the period 2010/11 to 2021/22 as a whole, spending per household rises for health and schools, is almost unchanged for early years and housing, and falls for social care, higher and further education, transport and police services. The total reduction in spending per household is around £470 over the whole period.

Figure 3.5 Changes in spending per household, cash terms, 2010/11-2015/16 and 2015/16-2021/22: Wales
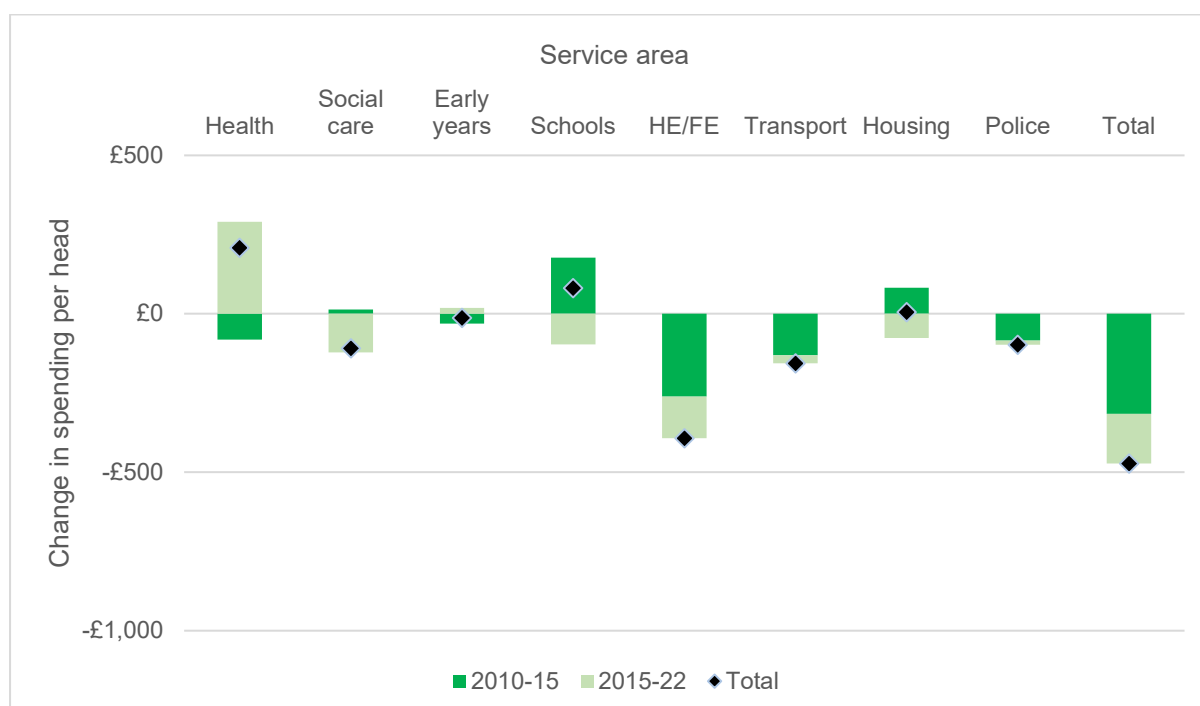
Source: authors' analysis of HMT (2015; 2016; 2017), Welsh Government (2017).

As well as looking at the changes per household in spending on services in cash terms, it is also instructive to look at the percentage changes. This is because overall spending per household in some areas of public services (such as health and schools) is a lot bigger than other areas (such as early years, housing and police services). Figures 3.6, 3.7 and 3.8 show this graphically in the form of pie charts showing average spending per household on each area of allocatable public services for England, Scotland and Wales respectively in 2010/11 (uprated to the 2021/22 price level).

Figure 3.6 shows that health spending alone accounted for more than two-fifths of total spending in England and Scotland in 2010/11 (and almost half of total spending in Wales). Spending on schools accounted for around one-quarter of spending in each country, and social care for almost one-tenth. Together, these three services accounted for 79% of total spending in England, 78% in Wales and 75% in Scotland. The next biggest category, transport, accounted for only 8% of total spending in England and Wales (but was slightly higher in Scotland, at 10% of total spending).

Figure 3.6 Spending per household on allocatable public services, England, 2010/11 baseline allocations at 2021/22 price level
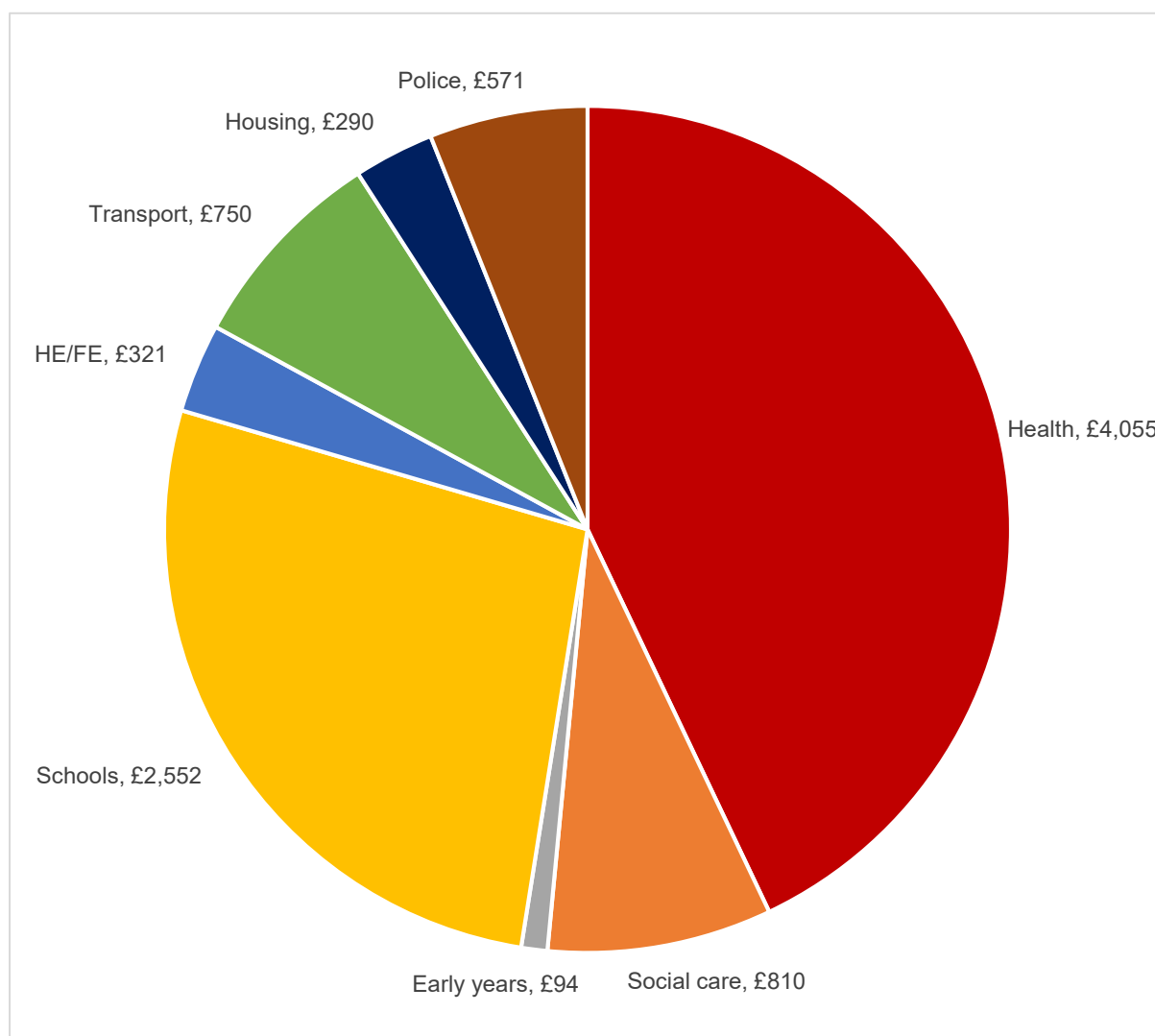
Source: authors' analysis of HMT (2015).

Figure 3.7 Spending per household on allocatable public services, Scotland, 2010/11 baseline allocations at 2021/22 price level
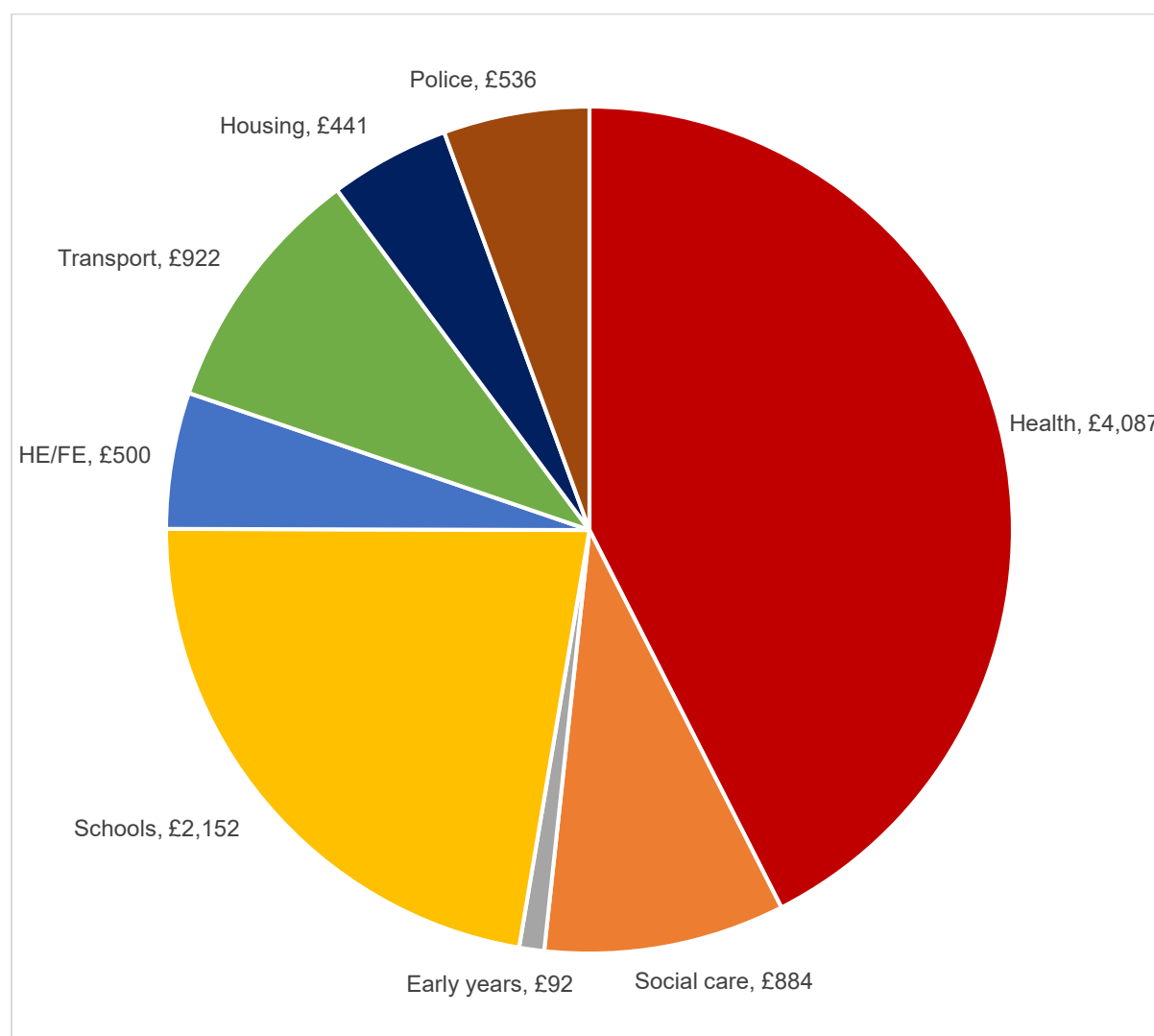
Source: authors' analysis of HMT (2015).

Figure 3.8 Spending per household on allocatable public services, Wales, 2010/11 baseline allocations at 2021/22 price level
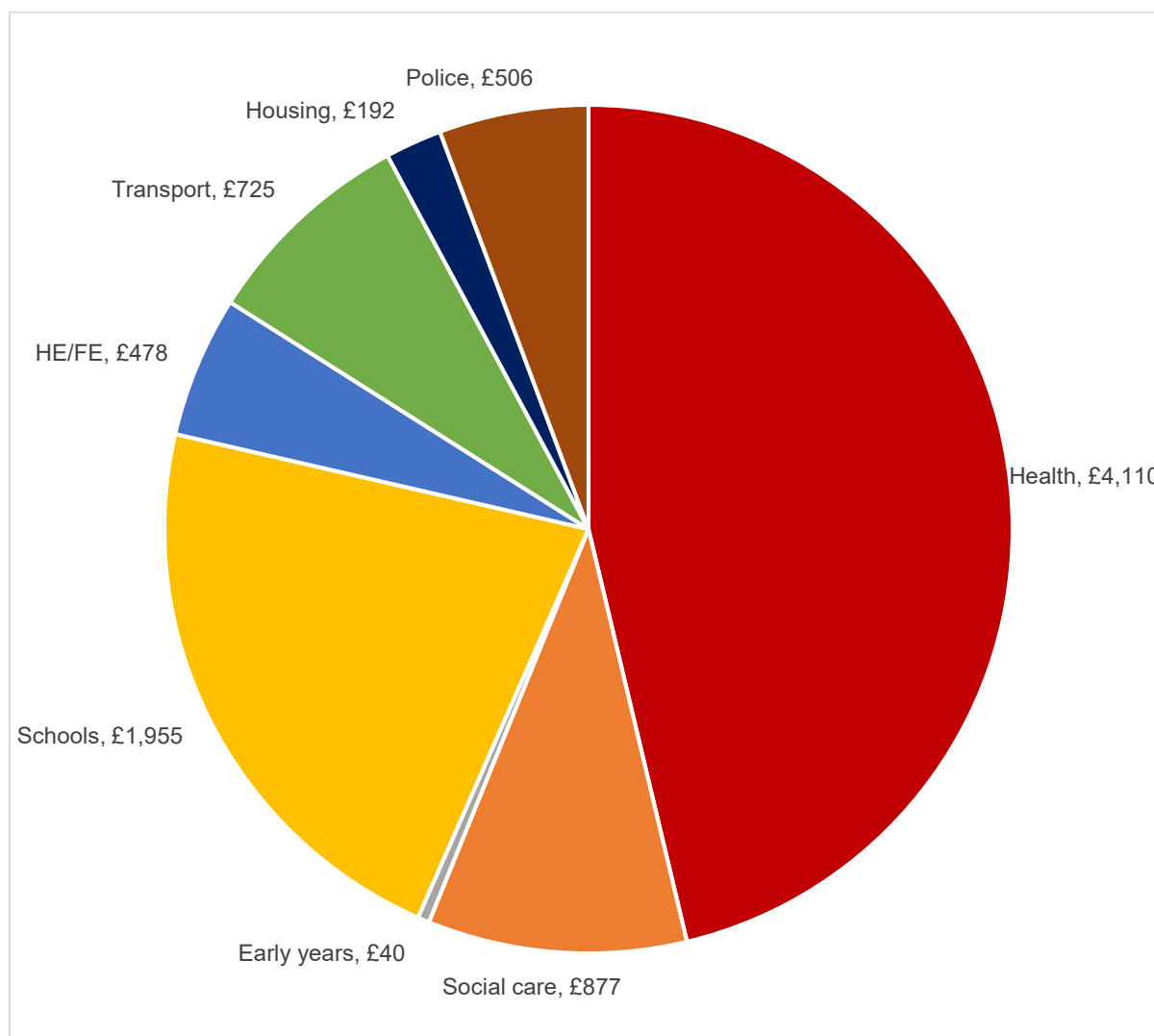
Source: authors' analysis of HMT (2015).

Figure 3.9 shows percentage changes in spending on each service for England, Scotland and Wales. The main findings are as follows:

- There are modest per-head increases in health spending in each country, of between 5% and 8%.

- Social care funding increases slightly in Scotland but falls in England and Wales; the fall is largest in England, at 23%. It is worth noting that the figure for England takes account of increased funding from Council Tax being allowed to increase above inflation from 2016/17 onwards – without that, the fall for England would be even bigger.

- Early years funding increases significantly in Scotland (by around 46%) but falls significantly in England and Wales.

- Schools funding increases slightly in Wales but falls in England and Scotland by almost 20%.

- HE and FE funding experiences some of the largest cuts of any service in percentage terms in Wales (82%) and England (78%), and smaller (but still substantial) cuts in Scotland.

- Transport funding experiences cuts in all three countries, with the largest cuts being for England (around 54%).

- Funding for social housing increases substantially in Scotland (and to a lesser degree in Wales) but is cut severely in England (by around 84%).

- Police funding is cut in all three countries but most extensively in England (by over 30%).

- Overall, England sees the largest scale per household cuts in spending at around 18%, followed by Wales (5.5%) and finally Scotland (1%).

Figure 3.9 Percentage changes in spending per household on each public service, England, Scotland and Wales, 2010/11 to 2021/22
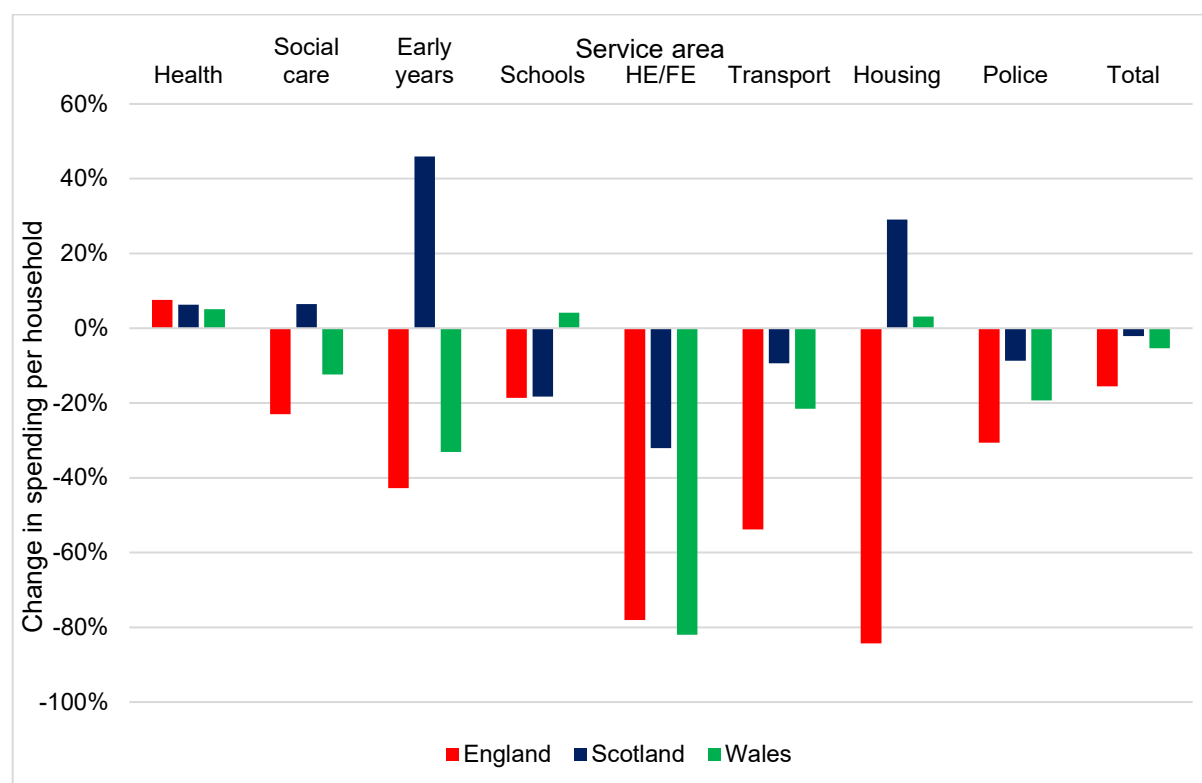
Source: authors' analysis of HMT (2015; 2016; 2017), Scottish Government (2017), Welsh Government (2017).

3.3   Summary of findings

In summary, the main findings from our analysis of trends in spending per head and per household in England, Scotland and Wales are as follows.

- The overall fall in spending per head of the population on the services covered by our public spending model is forecast to be larger in England than in Wales, and larger in Wales than in Scotland. Overall, we forecast that spending per head on allocatable services in England will fall by around 18% in England between 2010/11 and 2021/22 compared with a fall of around 5.5% in Wales and a fall of just over 1% in Scotland.

- In 2010, spending on the services covered by our public spending model was higher in Scotland than in Wales, and higher in Wales than England. The larger cuts in spending for England and Wales compared with Scotland means that the discrepancy in spending per head between Scotland and England and Wales is forecast to increase between 2010/11 and 2021/22. By 2021/22, overall spending

per head on modelled services will be 36% higher in Scotland than in England and 17% higher in Wales than in England.

- The differences between spending trends in England, Scotland and Wales are due to a number of factors including: faster population growth in England compared with Scotland and Wales (both overall and especially for school-age children); different spending priorities for the Scottish and Welsh governments compared with the Westminster government (which sets the overall spending envelope for England); and more generous funding in Scotland due to Scotland-specific income tax rises.

- Total spending on modelled public services per household is forecast to fall by almost £1,500 per household in England compared with just under £500 per household in Wales and around £200 per household in Scotland.

- In percentage terms, the largest forecast cuts to public services between 2010/11 and 2021/22 are to higher and further education spending (in England and Wales) and social housing spending in England, all of which are cut by around 80%. Early years funding in England and Wales, transport and police funding in England, and HE/FE funding in Scotland, are all cut by between 30% and 50%.

- The largest percentage increases in spending are for early years in Scotland (just under 50%) and social housing in Scotland (around 30%).

4. The distributional impact of changes to public spending

This chapter presents the results from our distributional analysis of the impact of changes to public spending at the household level. The analysis uses pooled data from the Family Resources Survey (FRS) combined with data from other micro-datasets as specified in Section 2.2 above (more details of the model data are provided in Appendix A). All results are shown separately for England, Scotland and Wales.

4.1 Impacts by household income decile

Figure 4.1 shows the impact of public spending changes, valued in cash terms, for households in England classified by net income decile (the same classifications that are used in Figure 4.1 of Reed and Portes (2018)). Households are ranked by net income in the baseline scenario and the net income distribution is divided into 10 equally sized segments, known as deciles.

The results show that changes to spending have a negative impact on each decile for all services except for health, where the impacts are positive, reflecting the increases in health spending seen in Figure 3.3. Changes in health spending have a slightly larger impact for households in the lowest seven deciles of the income distribution (gains equivalent to between £320 and £350 in each case), with smaller impacts in the top three deciles (less than £300 in each case). Cuts to social care spending lead to average losses of between £230 and £250 in deciles 2 through 7, with smaller losses below and above this; in deciles 9 and 10, the losses are negligible. Cuts to early years spending have a relatively small impact across all deciles, with the largest impacts in deciles 2 and 3 (average losses of around £70 in each case). Cuts to schools spending have the largest average negative impact across all deciles of any of the spending areas, with the largest losses in deciles 2 through 4, all of which lose more than £600 worth of spending on average. The highest losses are in decile 2 (around £870), while the lowest average losses are in

decile 10 (£185). Cuts to higher and further education have the largest impact in the bottom two deciles (averaging just under £500 in decile 1 and just under £340 in decile 2). This reflects the fact that higher education students who do not live with their parents are more likely than those who live in the parental home to be located at the bottom of the income distribution.

Cuts to transport spending have the second largest average negative impact across all deciles of any of the spending areas. This is the only area of spending where the cash impact of cuts is larger for richer households than for poorer and middle-income households, with the largest average cash losses in decile 10 (£460) compared with less than £400 in deciles 2 through 6, and £405 in the lowest decile. This distributional pattern arises because the overall transport effects are a combination of three parts of the transport budget: rail services (which are used more by richer households than poorer households), bus services (which are used more by poorer households than richer households), and roads (which are used slightly more by richer households than poorer households).

Reductions in spending on social housing have a much larger impact for households lower down the income distribution than for richer households. The average cash-equivalent losses for households in the bottom four deciles are more than £200 in each case, while losses in the top two deciles are negligible. This is because very few social housing tenants in England are high-income households.

Finally, cuts to police spending have a fairly even impact across the income distribution; the largest average losses are in decile 1 (just under £490) and the smallest average losses are in decile 4 (just under £410) but the range of difference in the results across deciles is smaller here than for most of the other service areas.

The black line shows the total impact of changes to public spending for households in England by income decile, summing across all service areas. The largest average losses from the spending changes are in decile 2 (total losses of over £2,200), followed by decile 1 (almost £2,000). The smallest total losses are in decile 10 (just over £900).

Figure 4.1 Average impact of public spending changes in cash terms by household income decile, England, 2010/11-2021/22
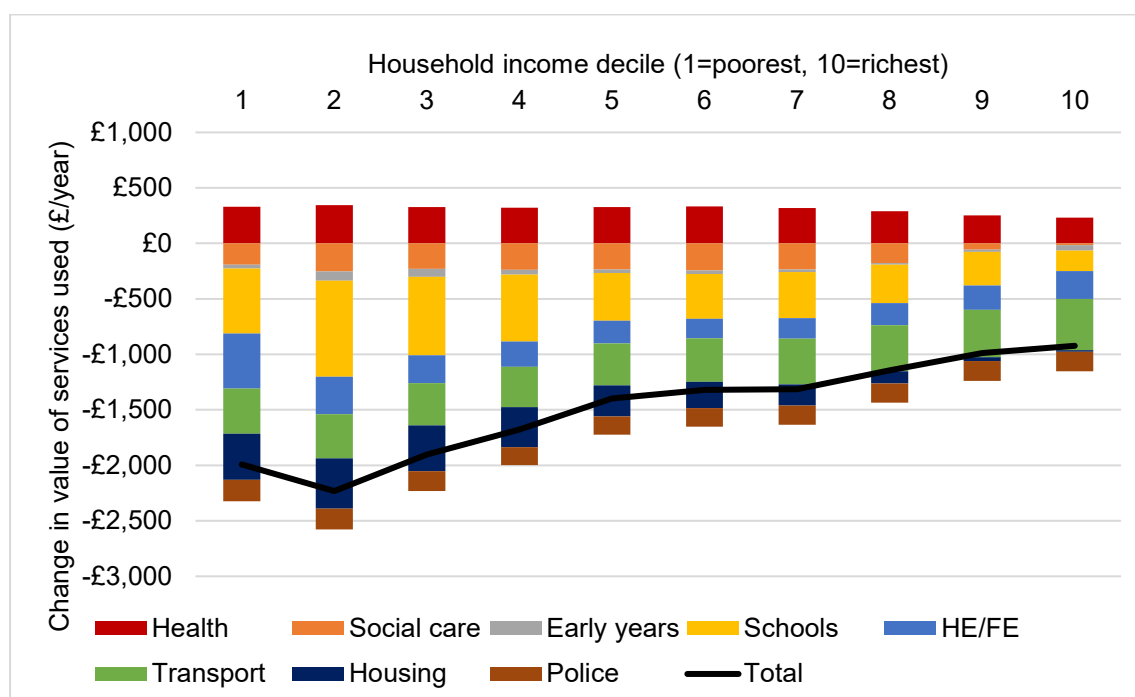
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.2 shows the same distributional analysis as Figure 4.1 (by household net income decile), but for households in Scotland rather than England. The first thing to note from Figure 4.2 is that the overall impact of the spending changes is much smaller for Scotland than for England. This reflects the patterns shown in Figure 3.4 above, with a much smaller overall reduction in spending per household in Scotland than in England between 2010/11 and 2021/22. The pattern of total losses across the deciles is also very different in Scotland compared with England; with the exception of decile 2 (which has the largest total losses at just over £450, driven mainly by cuts to schools spending), the largest average losses are in the top half of the income distribution (with households in decile 10 losing just under £290 on average). While cuts to spending on schools, higher and further education, transport and policing have a negative impact on households across the income distribution, increases in spending on health, social care, early years services and housing have a positive impact on households. For households in deciles 4 and 5, the increases in spending on some services almost completely offset the losses from other services; households in these deciles lose only around £50 on average.

For the most part, the relative size of impacts of the spending changes for poorer households compared with richer households is similar to that shown for England in

Figure 4.1 for each service area. This is because the pattern of service use by decile is similar for households in Scotland and England. For healthcare and policing, the distributional impacts are fairly even across the income distribution, whereas for housing, schools and social care, poorer households tend to use these services more than richer households (except that households in decile 1 are less likely to have school-age children). Higher and further education service use is particularly high in the bottom two deciles, reflecting the low incomes of many student households. Conversely, transport use is skewed towards richer households.

Figure 4.2 Average impact of public spending changes in cash terms by household income decile, Scotland, 2010/11-2021/22

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.3 shows the distributional impacts by household income decile for households in Wales. The shape of the 'total' impact line across the deciles in Wales is more similar to Scotland than it is to England, although average losses from the spending changes are larger in Wales than in Scotland (around £470 in Wales compared with £200 in Scotland). As with Scotland, total average losses from spending changes are greatest for households in decile 2 (losing an average of just over £700 in this case), while households in the top decile are the second largest average losers (just over £600). However, the composition of these losses is very different. Whereas cuts to school spending was the main driver of losses in decile 2

in Scotland, in Wales schools spending is forecast to increase in real terms, leading to slight gains, particularly for households in deciles 2 and 3.

The main driver of losses for households in decile 2 in Wales is cuts to higher and further education spending, which leads to average losses of just over £650 for households in decile 2, and just over £500 in decile 10. Interestingly, there is a smaller proportion of students in households in the lowest decile in Wales compared with Scotland or England; average losses from cuts to HE and FE in the lowest decile are only around half those for decile 2.

Cuts to transport spending have a more even distributional impact for households in Wales than for Scotland or England, with no obvious skew in service use towards the richest households. As in England and Scotland, the impact of changes to police spending is reasonably even across households and the impact of changes to social care spending (cuts in this case) is larger for low income households than richer households. Increases in health spending have a slightly larger average impact for households in deciles 2 to 5 than for households in other deciles. For the other spending areas, the distributional impact of changes to spending is fairly negligible.

Figure 4.3 Average impact of public spending changes in cash terms by household income decile, Wales, 2010/11-2021/22
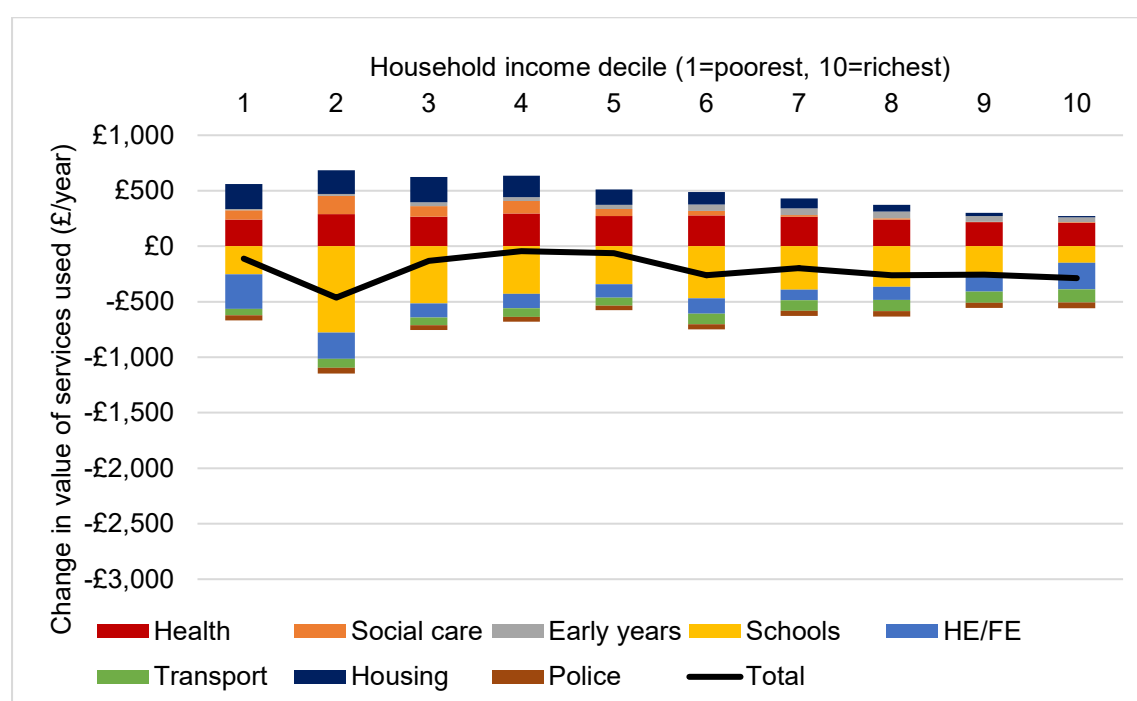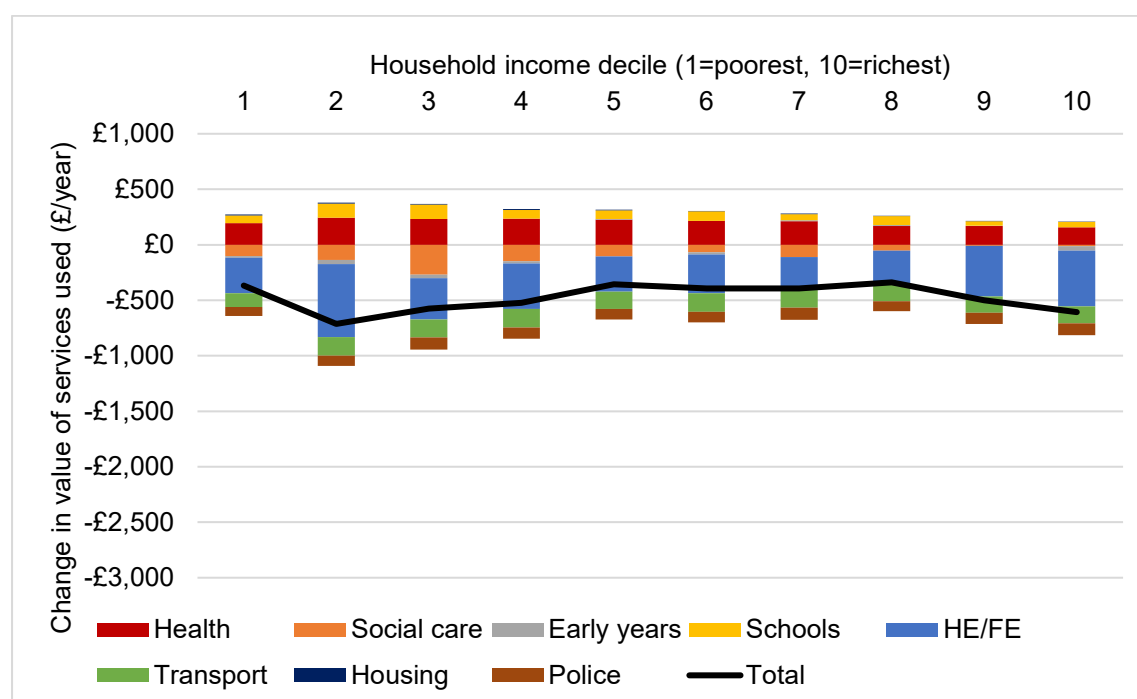

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.4 shows the total impact of public spending changes by decile for England, Scotland and Wales on the same graph. This figure shows very clearly the greater extent of cuts in England compared with Scotland and Wales, particularly for households further down the income distribution.

Figure 4.4 Average impact of public spending changes in cash terms by household income decile, England, Scotland and Wales, 2010/11-2021/22
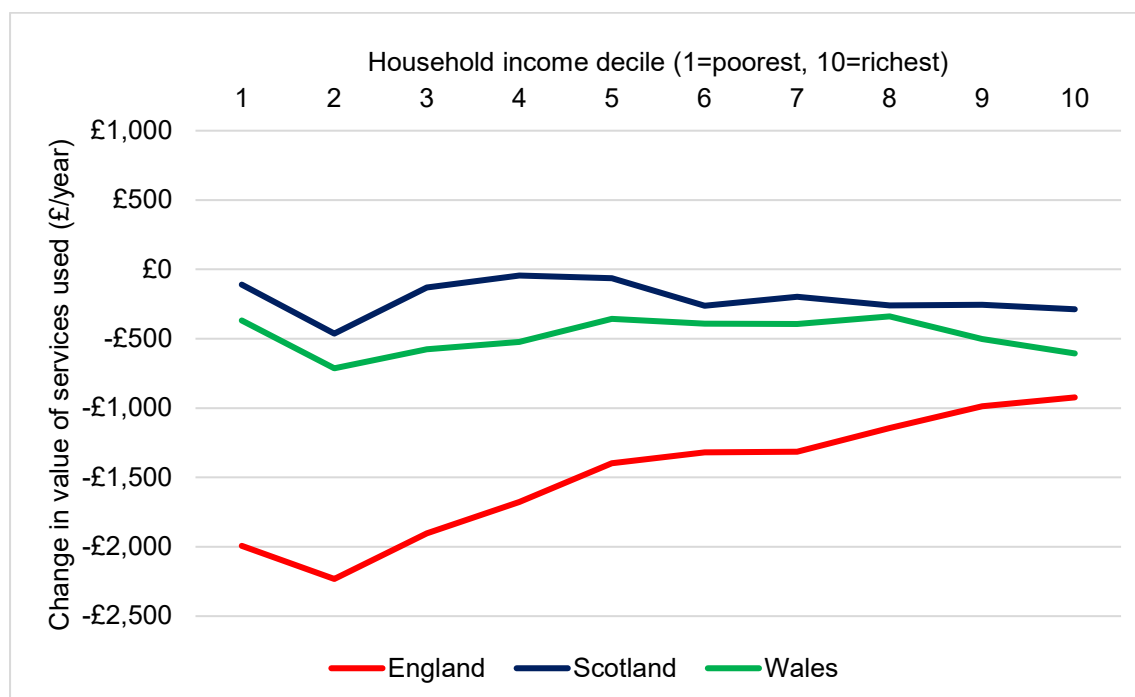
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

4.2   Impacts by household ethnicity

Ethnicity is a protected characteristic under the Equality Act 2010. In this report, as with our analysis of the impact of tax and welfare reforms in Reed and Portes (2018), we present a distributional analysis with households classified according to the ethnicity of adults in the household. The classification used is based on the ETHGR3 variable in the FRS, which classifies adults into one of the following ethnic categories:

- White (including England/Welsh/Scottish/Northern Irish/British, Irish, Gypsy or Irish Traveller, and any other White background).

- Mixed or Multiple ethnic groups (including White and Black Caribbean, White and Black African, White and Asian and any other Mixed/Multiple ethnic background).

- Asian (including Indian, Pakistani, Bangladeshi, Chinese and any other Asian background).

- Black (including Black British, African, Caribbean and any other Black/African/Caribbean background).

- Other (including Arab, and any other ethnic group not specified in the other categories).

Because the ethnicity variable is an adult-level variable and this chapter features household-level analysis, a sixth category must be introduced for households with one or more adults where the adults are of differing ethnicities. Figures 4.5 and 4.6 therefore feature a six-way household ethnicity breakdown. Where all the adults in a household are the same ethnicity (for example, Black), the household is placed in the relevant category (in the same example, 'Black').

Note that some of the analysis of the impacts of tax and welfare measures in Reed and Portes (2018) used a more disaggregated ethnicity breakdown based on the FRS's INDETH variable, which breaks the 'Asian' category down into five subcategories (Indian, Pakistani, Bangladeshi, Chinese and Other Asian). We have not used the more disaggregated breakdown in this report because it is not featured in any of the other survey datasets used for data on transport, health or police service use. Also, the sample size for households in ethnic categories other than 'White' for the ethnicity variable in the Welsh FRS sample was too small for reliable analysis to be performed. Therefore, we do not present an ethnicity breakdown for Wales in this section. In the Scottish FRS sample, the 'Mixed' ethnicity category contains only 13 households which is not enough to derive statistically significant results and so the results for Scotland are presented with this category omitted.

Figure 4.5 shows the average impact of public spending changes by household ethnicity for England.

Figure 4.5 Average impact of public spending changes in cash terms by household ethnicity, England, 2010/11-2021/22
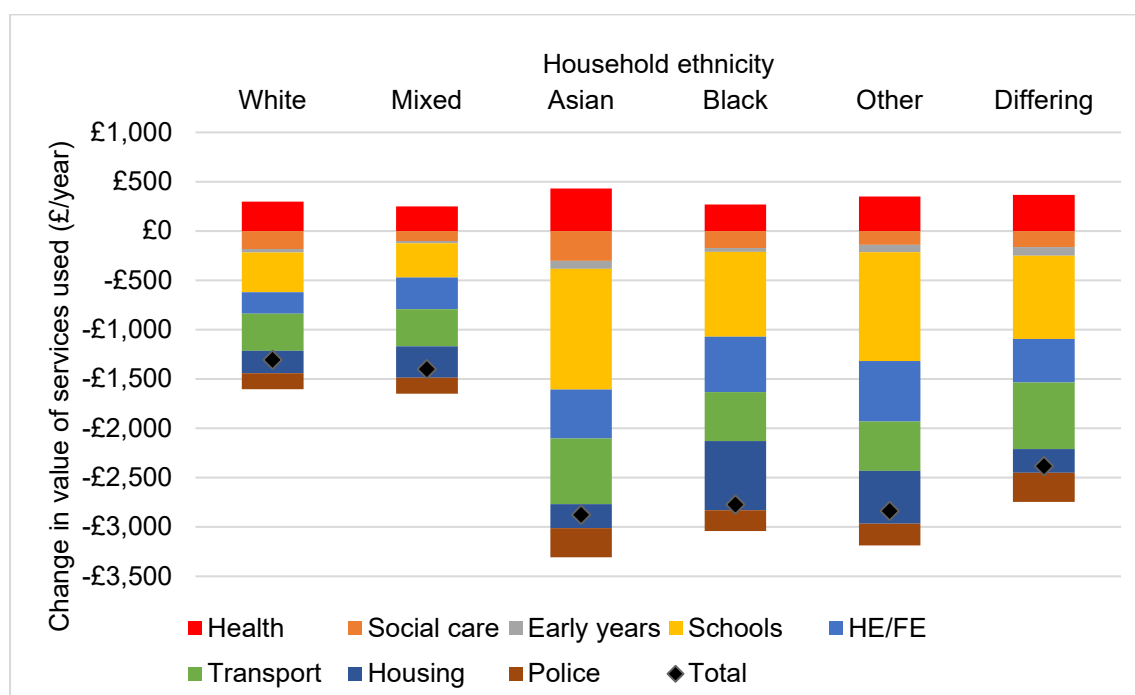
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The analysis shows the smallest overall distributional impacts for White and Mixed households (average total losses of between £1,300 and £1,400 in each case) and larger impacts for Asian, Black and Other ethnicity households (average total losses of between £2,750 and £2,900 in each case). Multi-adult households with adults of differing ethnicities lose approximately £2,400 from the spending changes on average. The largest negative impacts for Asian, Black, Other and Differing households arise from schools spending, mainly because households in these ethnicity groups have larger numbers of school-age children than other ethnicity groups. Transport cuts also have a particularly large impact for Asian and Differing households, while housing cuts have a particularly large impact for Black and Other households because these categories have a higher proportion of social tenants than other ethnicities.

Social care has a particularly large negative impact for Asian households, while higher and further education has the largest negative impact for Black and Other households. Increases in health spending have a particularly large impact for Asian households (gains of over £400 per year), and the smallest positive impact for Mixed and Black households (gains of less than £300 per year).

Figure 4.6 shows the distributional impact of public spending changes by household ethnicity for households in Scotland.

Figure 4.6 Average impact of public spending changes in cash terms by household ethnicity, Scotland, 2010/11-2021/22
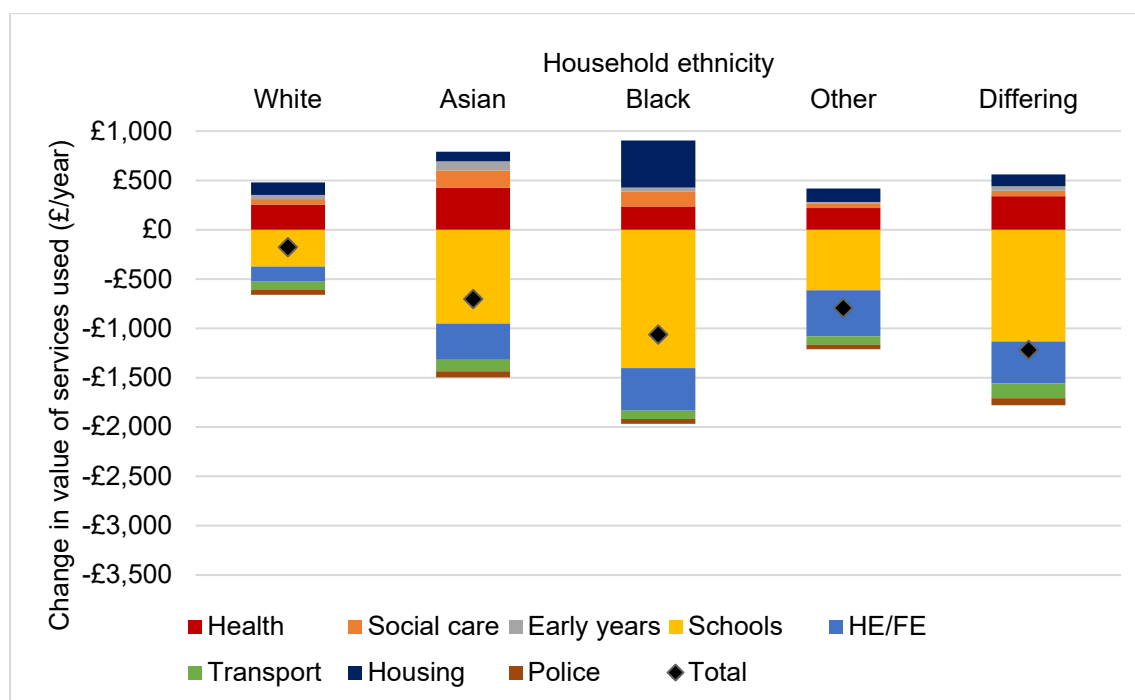
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

As with England, total losses for White households are smaller than for the other household types. White households lose less than £200 each from the reforms on average. The largest losers by household ethnicity in Scotland are multi-adult households with adults of differing ethnicities (average losses of just over £1,200) and Black households (average losses of just over £1,050). Total average losses for Asian and Other ethnicity households are in the mid-range, at around £700 to £800. The sample size is too small for results for Mixed ethnicity households to be presented.

As in the case of England, Asian, Black, Other and Differing ethnicity households lose more from cuts to schools funding than White households. Losses from cuts to higher and further education are in the region of £300 to £400 for all ethnicities except for White households where the figure is smaller (around £150). Asian households benefit more from increased health funding than other groups, while Black households benefit more from increased spending on social housing than

other groups. Both Asian and Black households benefit more from increased social care spending than other household ethnicity groups.

4.3   Impacts by gender and household demographic type

Figures 4.7, 4.8 and 4.9 present analysis of the distributional impact of the public spending changes in each country by household demographic type, classified according to the gender of adults in each household. Given that this report does not analyse the distributional effects of public spending changes at the individual level, it is necessary to analyse gender impacts at the household level. The household demographic classification divides households into one of seventeen categories based on the presence or absence of children in the household, the number of adults in the household, the gender of the adults, and, in households with only one 'benefit unit', their single or couple status. The full classification is as follows:

1. Single men with no children
2. Single women with no children
3. Male lone parents
4. Female lone parents
5. Mixed-sex couples with no children
6. Mixed-sex couples with children
7. Male same sex couples (with and without children)
8. Female same sex couples (with and without children)
9. Men-only multiple benefit unit (MBU) households with no children[6]
10. Women-only MBU households with no children
11. Mixed-sex MBU households with no children
12. Men-only MBU households with children
13. Women-only MBU households with children
14. Mixed-sex MBU households with children
15. Single male pensioners
16. Single female pensioners
17. Couple pensioners.

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[6] A benefit unit is defined by the Department for Work and Pensions as a single adult or an adult couple. MBU households are those where more than one benefit unit lives at the same address.

For England, the full 17-way classification can be used, but for Scotland and Wales, some simplification is necessary due to small sample sizes for some of the groups.

Figure 4.7 shows the distributional impact of the public spending changes by household demographic type for England. Because there are too many categories to display in one graph the results are displayed in two panels, with the upper panel showing categories 1 to 8 and the lower panel showing categories 9 to 17. The main losers from the changes are the six categories of households with children. Women-only MBU households with children lose the most (around £5,500 on average), followed by men-only MBU households with children (£4,700), couples with children (£4,700) and mixed-sex MBU households with children (around £4,350). Male lone parent households lose around £3,900 on average, while female lone parents lose just over £3,600. Mixed-sex couples with children lose just over £3,800.

The service cuts that drive this result are mainly schools spending and (especially in the cases of lone parents and MBU households with children) higher and further education spending. For lone parents and women-only MBU households with children, cuts to spending on social housing are also an important component of the distributional impact (averaging just under £800 per household for female lone parents). For MBU households with children, cuts to transport have a negative impact of between £600 and £850 per household, depending on the gender composition of the MBU.

For households without children, the largest negative impact is for mixed-sex MBU households without children with total average losses of just under £1,500 per year. Women-only MBU households without children lose just under £1,300 per year while men-only MBU households without children lose just over £1,150. The largest single component of these losses arises from transport cuts which average between £600 and £900 depending on the gender composition of the MBU. The next largest losses are for couple pensioners (averaging just under £900 in total). These are mainly driven by cuts to transport (around £375 per household) and social care spending (just over £450 per household). Female single pensioners lose slightly more than male single pensioners overall (around £530 compared with £430), largely because cuts to social care have a bigger impact for female single pensioners than male single pensioners. This is because there is a higher proportion of adults aged over 80 in the female single pensioner group than the male single pensioner group, and the over-80s are more likely to require social care services than younger pensioners.

The overall impact of cuts looks similar for male and female same-sex couples with average losses of just under £800 for the former group and just under £700 for the latter group. For mixed-sex couples with no children average losses are just under

£700. Finally, single (working-age) men with no children lose just under £700 on average compared with losses of just under £550 for single women with no children. The difference between these two groups mainly reflects greater losses from HE and FE for single men without children.

Figure 4.7 Average impact of public spending changes in cash terms by gender and household demographic type, England, 2010/11-2021/22
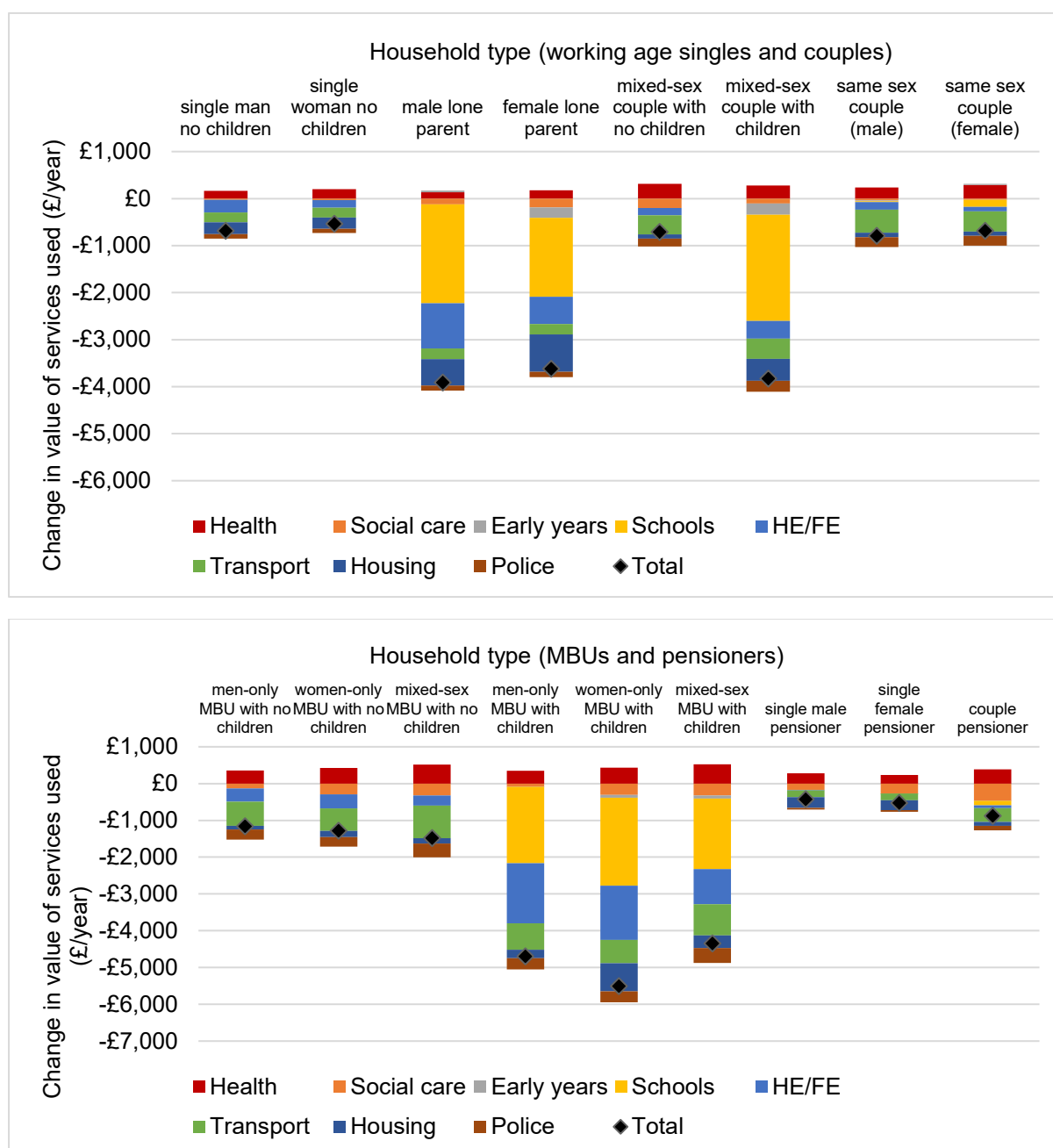
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.8 shows the breakdown of distributional impacts of the spending cuts by household demographic type and gender for Scotland. In these results, same-sex couples have been omitted due to the sample size being too small, while MBU households with children have been combined into a single group because the sample size of men-only MBU households with children was too small. The largest total average negative impacts are for MBU households with children (averaging around £2,600) and mixed-sex couples with children (averaging just over £1,450), and as for England, cuts to spending on schools are an important determinant of these overall distributional patterns. The negative impact for female lone parents is much smaller than for other households with children, at less than £100 on average. This is partly because cuts to schools spending have a smaller average impact for lone parent households compared with other households with children, but also because increased spending on housing and social care services for children and families leads to larger gains for female lone parent households than any other demographic group, as they are more likely to be in receipt of social housing and family care services. By contrast, the average losses for male lone parent households are larger, at just under £750 per year; this is partly because male lone parent households experience greater losses than female lone parents from FE and HE, but also because male lone parents are less likely to use social care services, health services or public housing than female lone parents, and so gain less from the real-term spending increases in these service categories in Scotland.

For four of the other nine household demographic types – single men and women without children, mixed-sex couples without children, couple pensioners, women-only MBU households without children and mixed-sex MBU households without children – there are modest total average gains of up to £160 from the spending changes. Men-only MBU households without children lose just under £200 from the spending changes on average, largely due to losses from HE and FE spending and transport cuts which are not balanced out by gains from increased health and housing spending Finally, single pensioners experience slightly larger gains on average, of between £300 and £340 (with slightly higher gains for female single pensioners). This is driven mainly by increases in health and social housing spending.

Figure 4.8 Average impact of public spending changes in cash terms by gender and household demographic type, Scotland, 2010/11-2021/22

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.9 shows the breakdown of distributional impacts of the spending cuts by household demographic type for Wales.

Figure 4.9 Average impact of public spending changes in cash terms by gender and household demographic type, Wales, 2010/11-2021/22
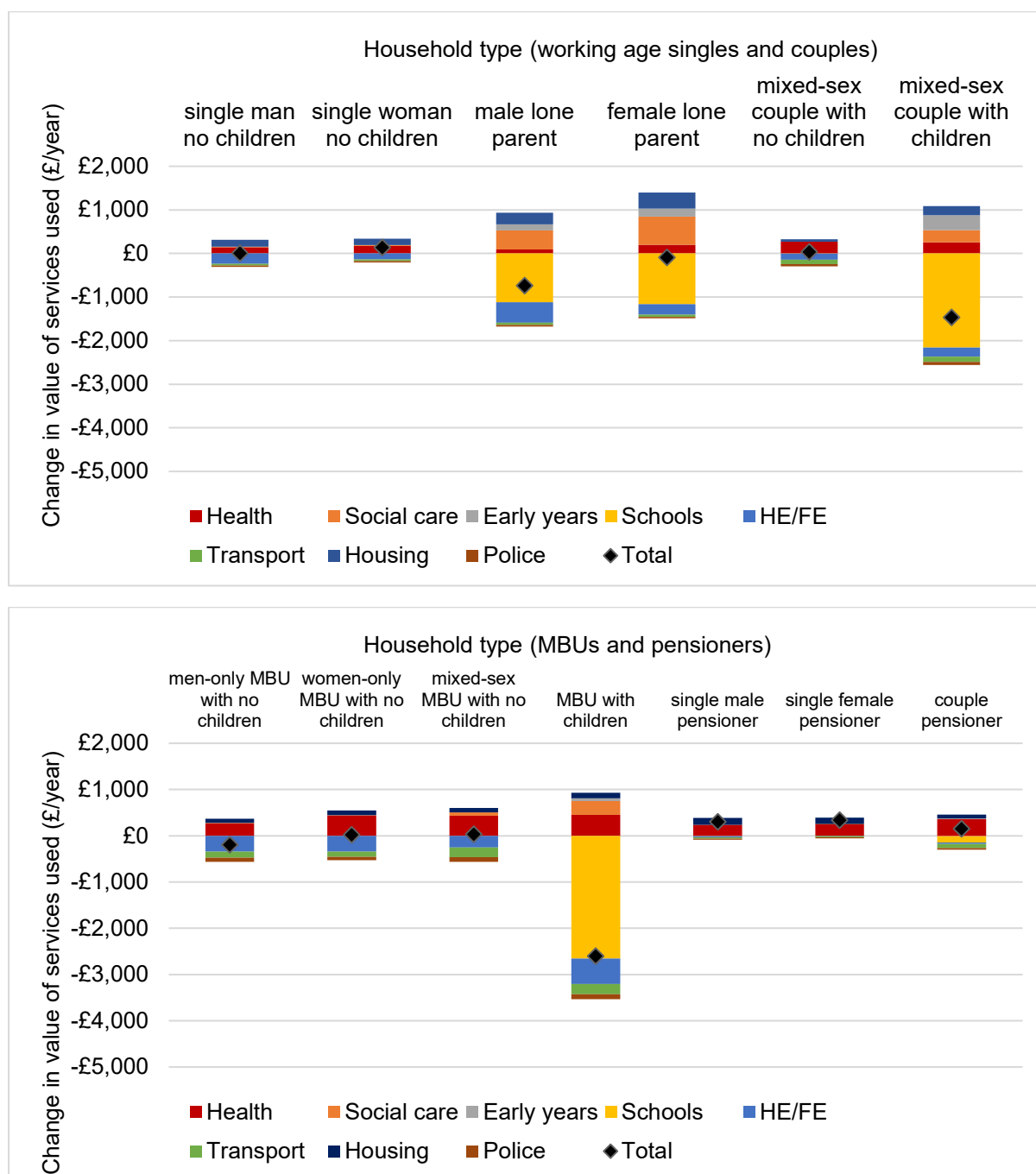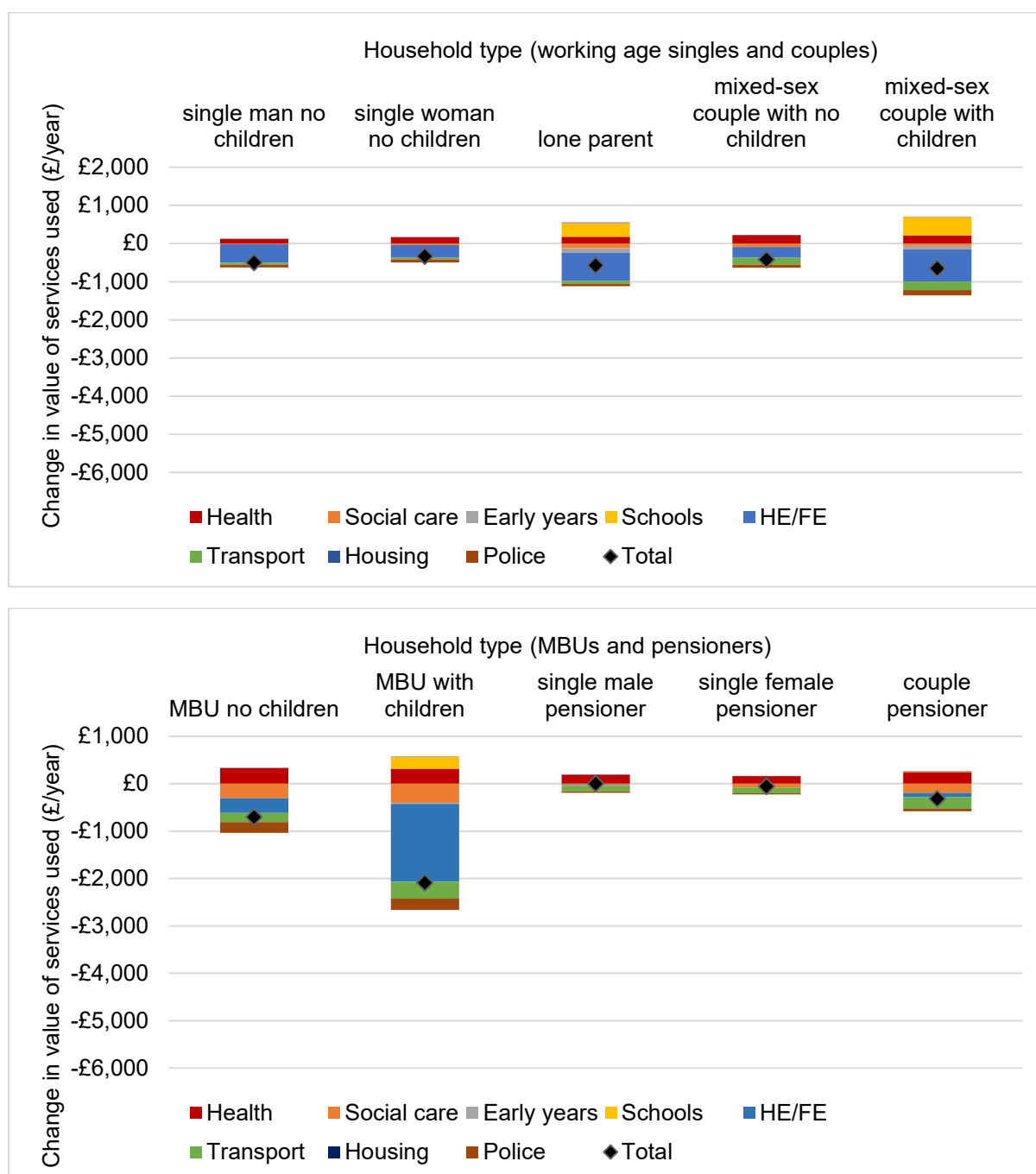

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Due to small sample sizes, male and female lone parents are combined into a single group for Wales; similarly, MBU households with children are shown as a single group. As with Scotland, there are too few same-sex couples in the FRS sample to present statistically reliable results. The pattern of overall losses for Wales looks somewhat different here from England or Scotland. This is because schools funding

is forecast to increase (which reduces losses for lone parents and mixed-sex couples with children in particular), while relatively large cuts are forecast for higher and further education funding. The upshot of this is that the largest total average losses are for MBU households with children (averaging just under £2,100 per year), while lone parents (average losses of just over £550) and couples with children (average losses of £650) experience smaller losses. As in England and Scotland, single pensioners experience the best average outcomes from the spending changes (roughly zero impact for single male pensioners and losses of just over £50 for female single pensioners, compared with £500 for single men without children, around £330 for single women without children, and around £320 for couple pensioners). Cuts to social care spending and transport spending help contribute to relatively large-scale losses for MBU households with children, and (to a lesser extent) MBU households without children. Couples without children lose an average of just over £400, mainly as a result of cuts to HE and FE spending, and also the cuts to transport.

4.4   Impacts by number of children in household

Our analysis of the impact of changes to taxes and transfer payments since 2010 (Reed and Portes, 2018) found that average losses for households with three or more children were far worse than for households with two or fewer children. This is partially due to reforms which limit means-tested support through the Housing Benefit, tax credits and Universal Credit to two children only for many claimants from 2017 onwards. This section analyses the impacts of the changes in spending according to the number of children in each household. Figure 4.10 shows the results for households in England, Figure 4.11 for Scotland and Figure 4.12 for Wales.

Figure 4.10 shows that in England, households with three or more children are considerably worse off as a result of the spending changes (total average losses of over £5,200 per year) than households with one or two children (total average losses of between £3,200 and £3,400). Households with no children lose much less on average (total losses of just under £750). The main factors explaining the larger-scale losses for households with three or more children are cuts to schools spending and social housing. Households with three or more children have larger numbers of children in state schools than other households and are more likely to be in social housing than other households.

Figure 4.10 Average impact of public spending changes in cash terms by number of children in household, England, 2010/11-2021/22
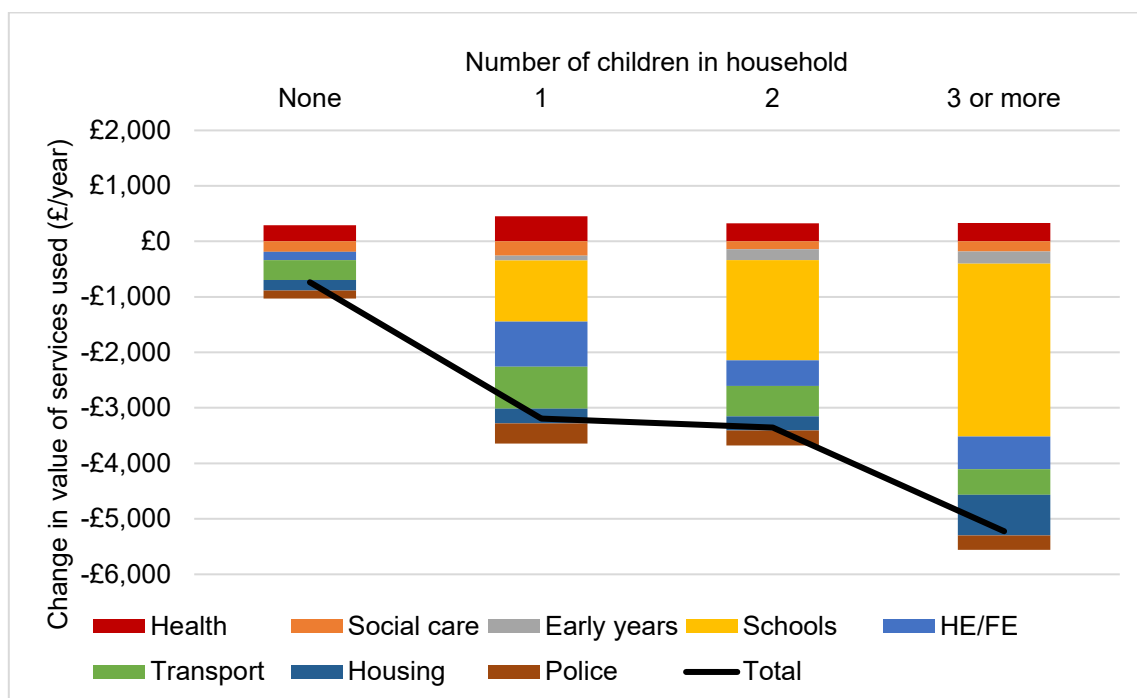
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.11 shows that, as for households in England, households in Scotland with three or more children experience larger average losses from the spending changes (total average losses of just under £2,400) compared with households with one or two children (total average losses of between £1,400 and £1,700). Households without children are modest net gainers from the spending changes on average (around £130). As for England, cuts to schools spending are the largest single determinant of the pattern of distributional effects.

Figure 4.11 Average impact of public spending changes in cash terms by number of children in household, Scotland, 2010/11-2021/22

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.12 shows a different pattern of total distributional impacts by number of children in the households in Wales than for England or Scotland. In Wales, households with one child lose out more on average (total losses of just under £1,500) than households with three or more children (total average losses of just under £1,200) or households with two children (total average losses of just over £550). Households with no children experience the smallest average losses (just under £350). One reason that households with three children do better overall than households with one child in Wales is that school spending is forecast to increase, which partially offsets losses for households with three or more children from cuts to higher and further education spending. Households with one child, and those with three or more children also lose out more from cuts to HE and FE spending than households with two children, leading to a complex overall pattern of losses.
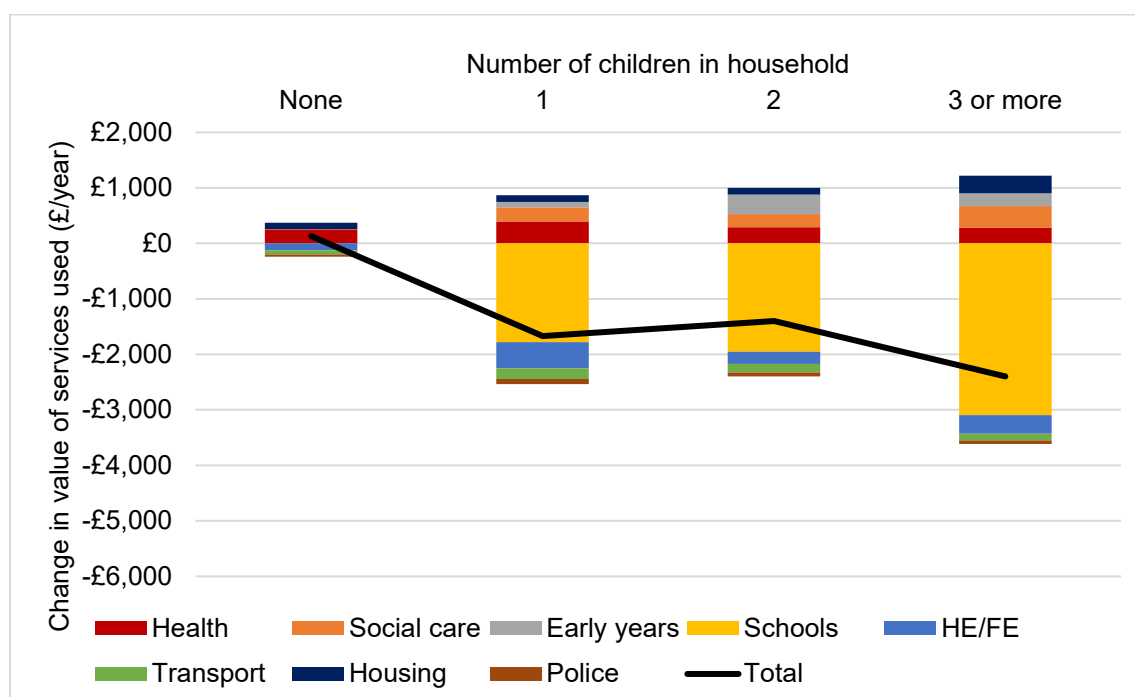
Figure 4.12 Average impact of public spending changes in cash terms by number of children in household, Wales, 2010/11-2021/22
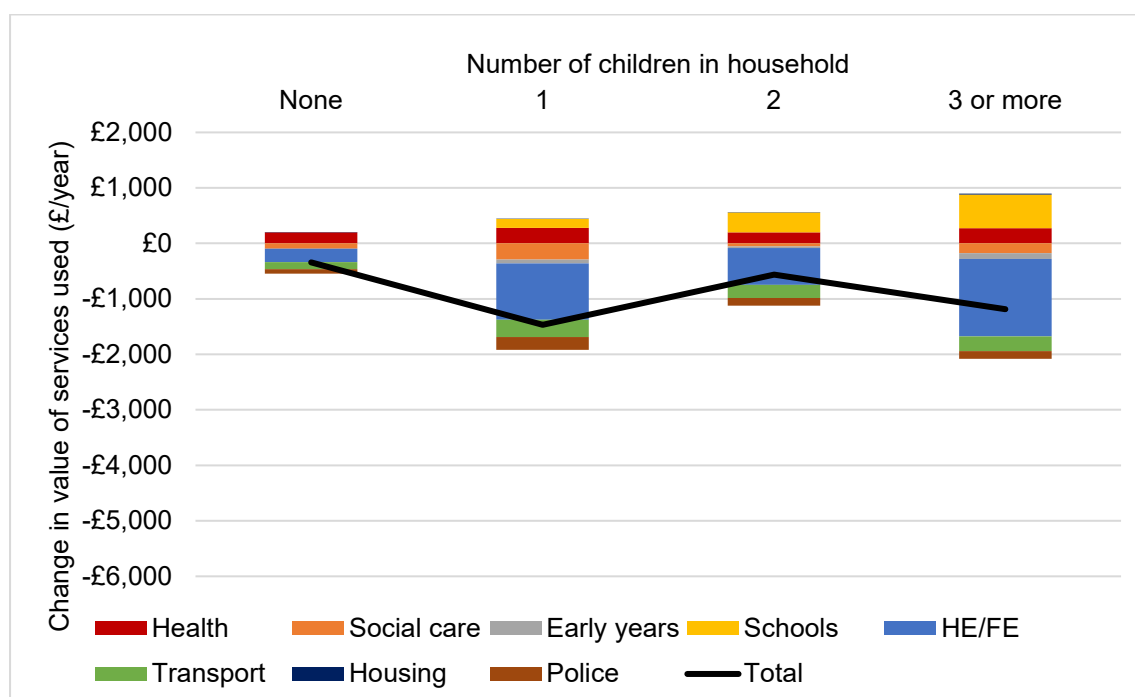
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

4.5   Impacts by household disability 'score'

This section looks at the impact of public spending changes according to the extent of disability in each household. In our earlier analysis of the distributional impact of tax and welfare reforms (Reed and Portes, 2018), we used two different measures of disability at the household level:

- A nine-way classification based on the presence or absence of disabled adults in the household, and whether the household has children or not (and if so, whether there are any disabled children in the household).

- A measure based on the number of functional disabilities recorded across all household members (the disability 'score').

This section reports results for the disability 'score' measure only. This is because the measure based on disability status of adults and children in the FRS households does not capture use of healthcare and social care services by disabled children particularly well, and so probably understates the extent to which households with disabled children are affected by spending changes.

Figure 4.13 shows the distributional impacts of public spending changes by disability score for households in England. There is a fairly clear relationship between average overall losses from the public spending changes, and household disability score; the higher the household's disability score, the larger their average losses. Total average losses range from around £1,370 for households with no disabilities to just under £1,800 for households with five disabilities. For households with six or more disabilities, average total losses are in excess of £2,900.

This pattern of larger average losses for more disabled households is driven by three main factors. First, and most important, households with a higher disability score lose out more from the cuts to social care spending than households with a lower disability score. For households with a disability score of 6 or more, average losses from the social care cuts are over £1,200, compared with less than £50 for households with no disabilities. Second, the cuts to housing services have a larger impact for households with a higher disability score. Finally, the impact of cuts to schools spending is larger for households with a disability score of 6 or more than for other households (although it is smaller for households with disability scores of 3, 4 or 5 than it is for households with a score of 2 or lower). Set against this, increases in health spending have a larger positive impact for households with a higher disability score but this is not enough by itself to reverse the negative gradient shown overall in Figure 4.13.

Figure 4.13 Average impact of public spending changes in cash terms by household disability 'score', England, 2010/11-2021/22
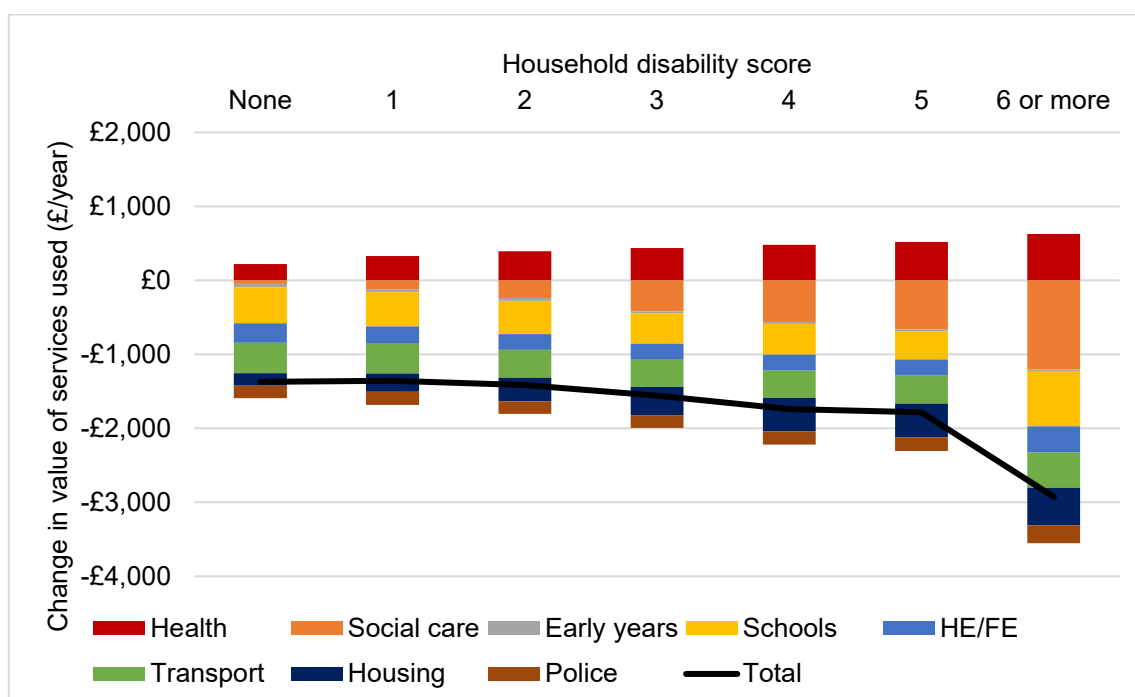
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.14 shows the analysis by household disability score for Scotland, which shows a very different pattern from England. Here, households with a higher disability score do slightly better from the public spending changes (up to and including a disability score of 4). Households with no functional disabilities lose an average of just under £350 from the spending changes, while households with a disability score of 4 gain just over £250 on average. Households with a disability score of 5 lose around £30 from the changes on average, while households with a score of 6 or more gain just under £100. The main difference between England and Scotland which drives this pattern of results is that social care and social housing spending is forecast to increase in Scotland. This reinforces the impact of increasing health spending and leads to a positive relationship between disability score and the impact of spending changes up to a score of 4. For households with a score above 4, the impact of cuts to schools spending partially counteracts the impact of increased health, social care and housing spending.

Figure 4.14 Average impact of public spending changes in cash terms by household disability 'score', Scotland, 2010/11-2021/22
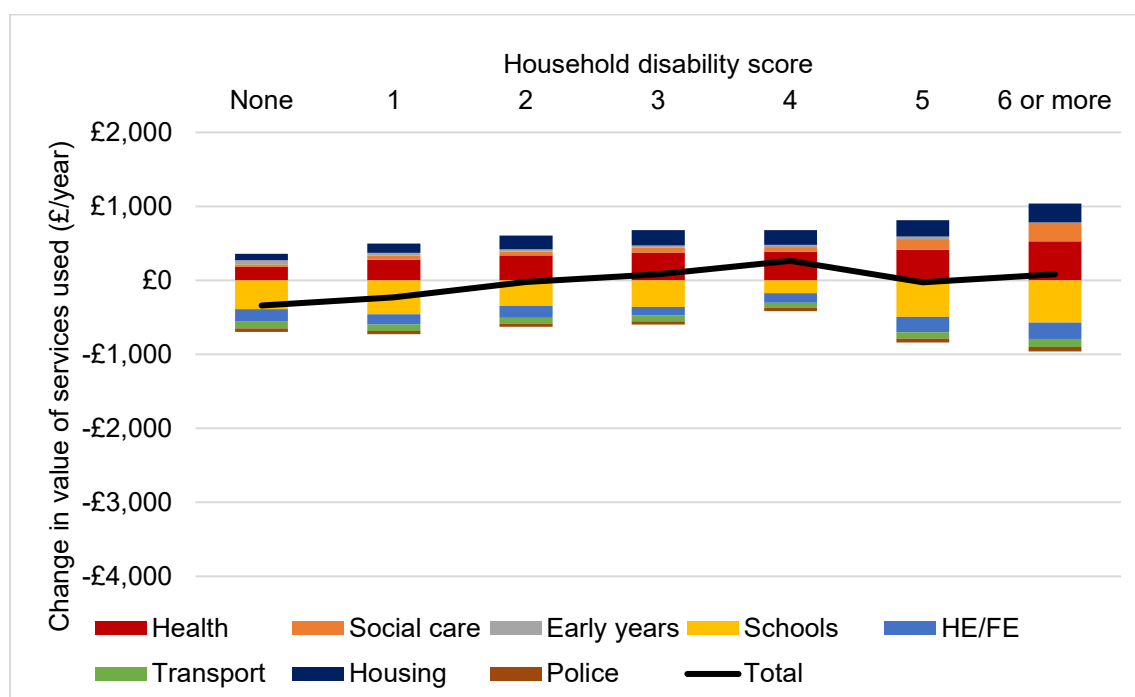
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.15 shows the results for households in Wales by disability score. There is a slight negative relationship between total losses and disability score, but it is not as pronounced as for England. It is also rather uneven; households with a disability score of 5 experience average losses of just over £950 compared with losses of just under £450 for households with no disabilities, but households with a disability score of 6 or more experience average losses of less than £800. The main driver of the negative relationship between total losses and disability score is cuts to social care spending, while the spending category which leads to an unevenness in the patterns is higher and further education spending, which has a particularly big negative impact for households with a disability score of 5, but a much smaller impact for households with a score of 3 or 4.

Figure 4.15 Average impact of public spending changes in cash terms by household disability 'score', Wales, 2010/11-2021/22
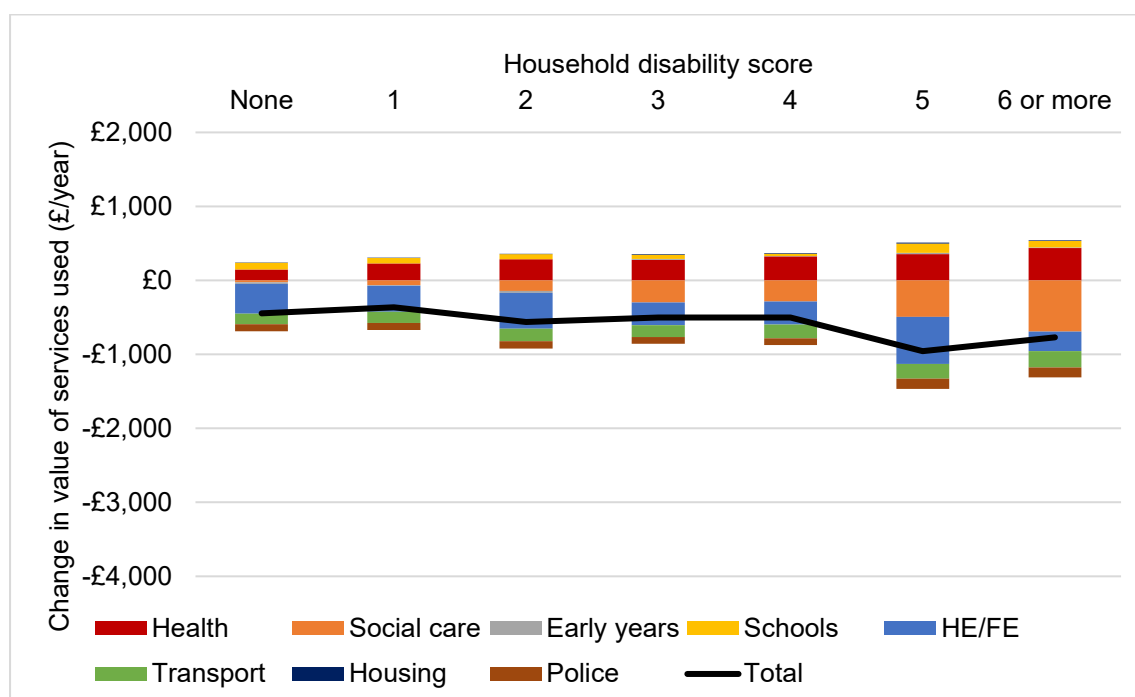
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

4.6   Impacts by average age of adults in household

Finally in this chapter, we examine the distributional impact of the public spending changes according to the average age of adults in each household. Figure 4.16 shows the impacts by age group for households in England, while Figures 4.17 and 4.18 show the same analysis for Scotland and Wales respectively.

The results for England show a clear dividing line between younger and older age groups. Average total losses for the four youngest age groups (18-24, 25-34, 35-44 and 45-54) are substantially larger than for the three oldest age groups (55-64, 65-74 and 75 and over). In the former case, total average losses range from just under £1,700 (for the 18-24 age group) to £2,550 (for the 35-44 age group). In the latter case, losses range from just under £600 (for the 65-74 age group) to £720 (for the 55-64 age group).

In the four younger age groups, the losses are driven by four main factors. First, cuts to schools spending have a big negative impact for average ages between 25 and 44, and especially for the 35-44 age group (whose average losses from cuts to schools spending are £1,150). This is due to households in these age groups being

more likely to include school-age children than households in other age groups. Second, cuts to higher and further education spending have big negative impacts for all four groups but especially for the 18-24 age group (average losses of just under £750). This reflects the fact that HE and FE students are disproportionately concentrated in households in these average age groups, and especially in the 18-24 age group. Third, cuts to spending on transport have a larger impact for the four youngest age groups than for the older age groups. Finally, cuts to police spending have a larger impact for younger age groups (reflecting the fact that younger adults are more likely to be victims of a crime than older adults).

Figure 4.16 Average impact of public spending changes in cash terms by average age of adults in household, England, 2010/11-2021/22
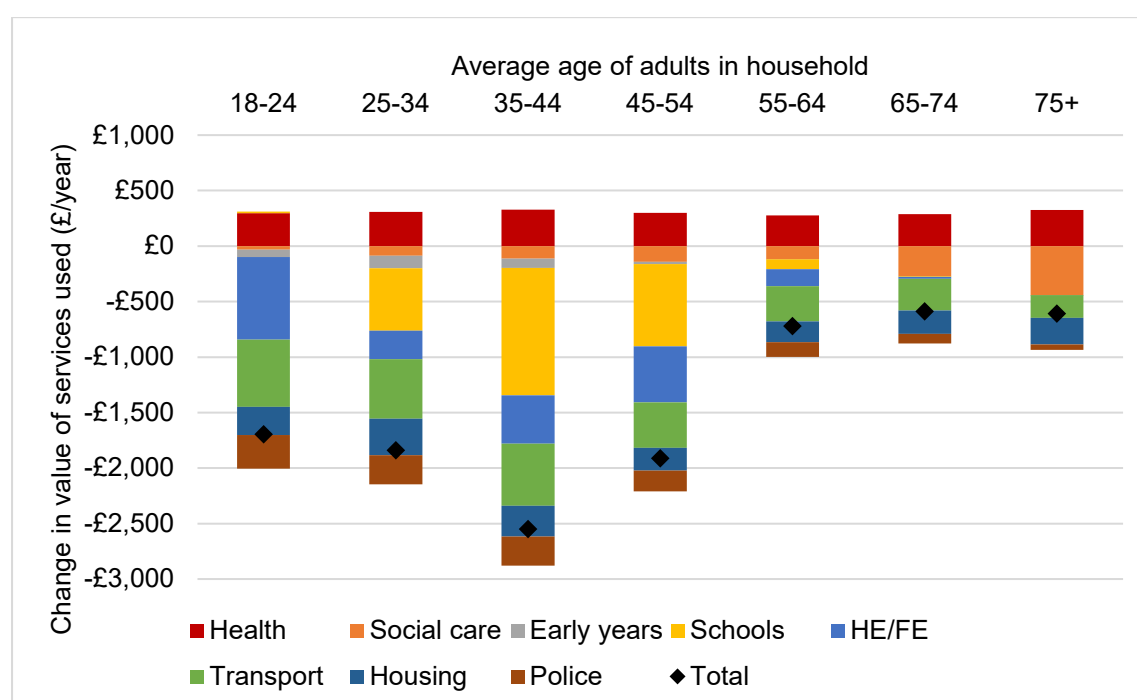
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 4.17 shows that in Scotland, the largest negative impacts of the spending changes by age group are for households with average age 35-44 (average total losses of just over £900) and households with average age 45-54 (average total losses of just over £750). This result is largely driven by cuts to spending on schools. Households with average age 18-24 and 25-34 experience smaller total losses of between £150 and 200 on average, while the three oldest age groups experience average gains of between £100 and £350 on average. The results for the older age groups are driven by increases to spending on health and housing, which are more than offset by cuts to schools and HE and FE spending (plus smaller cuts to

transport and police spending) for the two youngest age groups, but not for households with average age 55 or older.

Figure 4.17 Average impact of public spending changes in cash terms by average age of adults in household, Scotland, 2010/11-2021/22

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The distributional results by average age of adults in households in Wales show that the largest losses are for age groups 18-24, 35-44 and 45-54, with average losses in the region of £800 to £900. These losses are driven mainly by cuts to higher and further education spending, with smaller negative impacts from cuts to social care, early years, transport and police spending. Average losses for households aged 25-34 are smaller at just over £350, mainly because the impact of HE and FE spending cuts is smaller for this group than for the 18-24, 35-44 or 45-54 age groups. While increases to schools spending have a positive impact for the 25-34 and 35-44 age groups in particular, this is not enough to offset the losses from other spending categories. Average losses for the 55-64 age group are just over £450, due mainly to cuts to HE and FE, transport and police spending. Finally, the two oldest age groups experience smaller average losses in the region of £100 to £150, mainly because their losses from HE and FE spending cuts are negligible. Increases to health spending offset most (but not quite all) of the losses from cuts to social care and transport spending for these oldest age groups.

Figure 4.18 Average impact of public spending changes in cash terms by average age of adults in household, Wales, 2010/11-2021/22
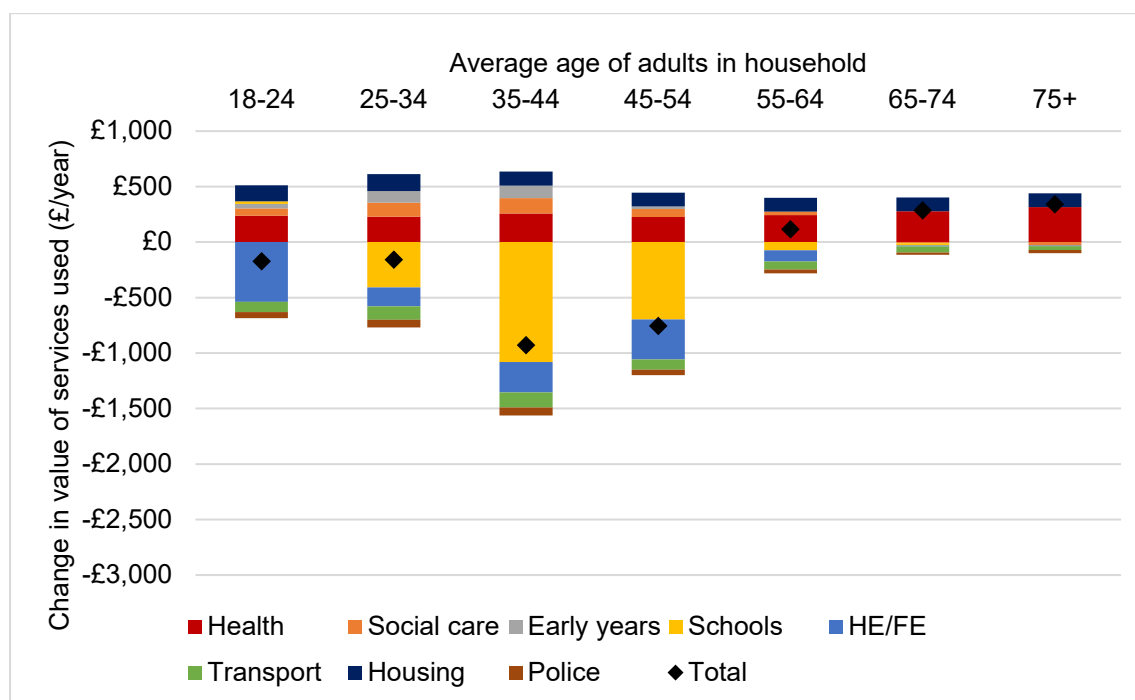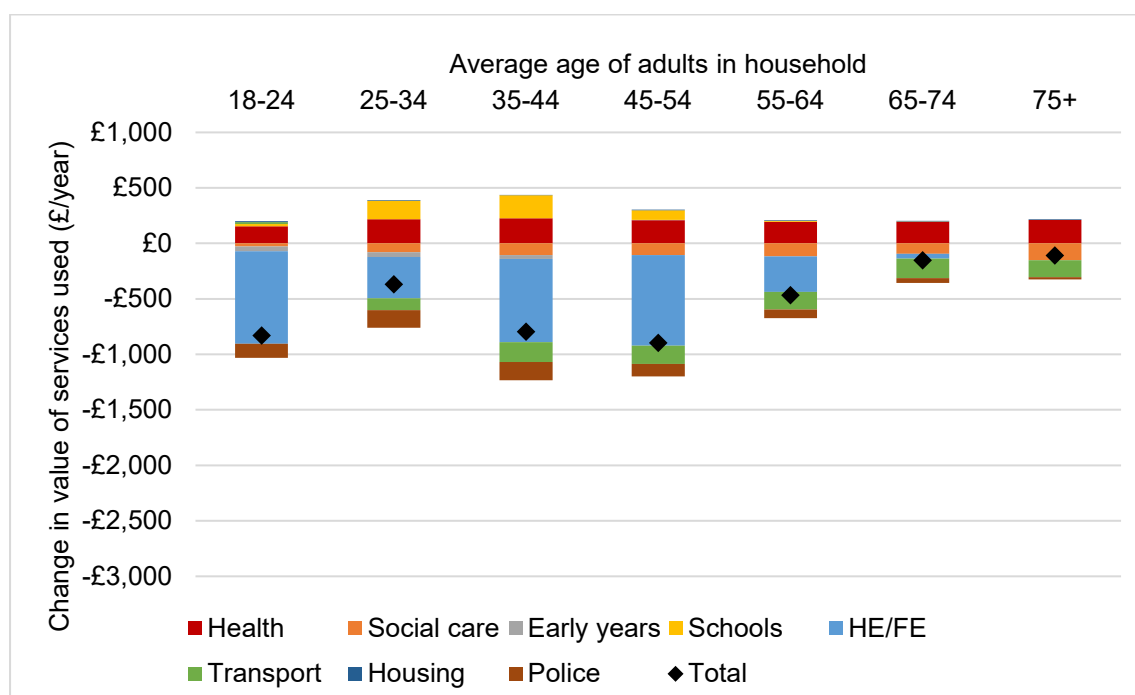

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

4.7   Summary of findings

- In summary, the main findings from analysis of the distributional impacts of public spending changes in England, Scotland and Wales are as follows: By **household income decile**, the total cash-equivalent average annual losses from spending cuts are largest for households in England in decile 2 – the second-poorest decile – at around £2,200 per household. Losses are smallest for decile 10 – the richest decile – at around £900 per household. Cuts to schools, transport and housing spending have the largest impact for poorer households.

- In Scotland, decile 2 experiences the largest losses from cuts (just over £450 per year) but apart from this, losses for richer households are slightly larger than for poorer households. Cuts to schools spending are the largest single driver of losses.

- The impact of spending cuts in Wales by household income decile is more uneven than for England or Scotland. Further education spending cuts have the largest impact of any single spending category, with households in decile 2 experiencing the biggest cash-equivalent average annual losses (just over £700 per household).

- In England, the largest negative impacts of public spending cuts by **ethnicity** are for Asian, Black and Other ethnicity households, with average losses of between £2,750 and £2,900 per household. Schools spending is the largest single driver of these losses.

- In Scotland, Black households and households with adults of differing ethnicities experiencing the largest average losses (around £1,050 and £1,200 per year respectively).

- White households lose less on average from the spending changes than other ethnic groups in both England and Scotland. In England, Mixed ethnicity households also lose less than average ethnic groups.

- Analysis of the spending changes by **gender and household demographic type** shows that in England, households with children lose a lot more, on average, than childless households – average losses are over £5,500 per household for women-only MBU households with children. The losses are mainly driven by cuts to schools and HE/FE spending, plus (for lone parent households and women-only MBU households with children in particular) cuts to social housing spending. The smallest losses are for single pensioners, with women doing slightly worse than men on average. In England – the only country where the sample of same-sex couples was large enough to analyse reliably – overall losses for male and female same-sex couples were similar to those for mixed-sex couples without children.

- In Scotland, couples and MBU households with children fare worse than other groups, with average cash-equivalent losses of around £1,500 and £2,600 per year respectively. Lone parents – and especially female lone parents – experience much smaller average losses than other types of household with children, due to increases in social care, housing and early years spending. Households without children gain slightly on average from the spending changes.

- In Wales, MBU households with children fare worse than other groups (average losses of over £2,000 per household) due mainly to cuts to higher and further education spending. Lone parents and couples with children experience much smaller losses than MBU households with children (average losses of between £500 and £700) due to increases in schools spending in particular. Single pensioners do better on average than any other group, with average losses of less than £50 for women, and approximately zero impact for men.

- Analysis by **number of children in the household** shows that in England and Scotland, households with three or more children do substantially worse on average than households with one or two children – mainly due to reductions in

spending on schools. However, in Wales, average losses for households with three or more children are slightly smaller than for households with one child.

- There are very different patterns of distributional impact by **household disability score** in each of the three countries. In England, there is a strong negative gradient whereby households with more disabilities fare worse on average, largely because of the impact of social care cuts. Households with a disability score of 6 or more lose over £2,900 per year on average from the spending changes – over twice as much as households with disability scores of 2 or less. In Wales, there is a much shallower negative gradient, and in Scotland, a positive gradient – households with a disability score of 6 or more gain just over £100 on average from the changes compared with losses of just over £300 for households with no disabilities. This pattern is driven by increases in social care, health and social housing spending in Scotland.

- Analysis by the **average age of adults in the household** shows that in England and Scotland, households with an average age of less than 55 do worse than households with an average age of 55 or over. This is driven mainly by the fact that younger households make more use of schools and HE/FE spending than older households. In Wales, households with average adult ages of 18-24, 35-44 and 55-64 fare worse than other households, with losses in the region of £800 to £900 per year. This pattern is mainly driven by substantial cuts to higher and further education spending.

5. The combined impact of tax and welfare reforms and other public spending changes on final income

This chapter combines the distributional results from our earlier report on *The cumulative impact of tax and welfare reforms* (Reed and Portes, 2018) with the distributional impacts of public spending changes shown in Chapter 3. The breakdown categories used in the sections in this chapter correspond exactly to those in Chapter 3. Each figure is a stacked column graph showing the impact of four sets of measures, as follows:

- Tax and welfare reforms introduced during the 2010-15 Coalition Government.
- Tax and welfare reforms introduced by the Conservative Governments in 2015-17 and from June 2017 onwards (including all reforms scheduled to take effect by the 2021/22 tax year).
- Changes to public spending (other than benefits, tax credits and Universal Credit (UC)) between 2010/11 and 2015/16 (inclusive).
- Changes to public spending (other than benefits, tax credits and UC) after 2015/16 (including forecast spending changes up to 2021/22).

The distributional impacts are shown as a percentage of 'final income', which is defined for each household as equal to net income in the baseline scenario *plus* the value of allocatable services (see Table 2.1) received in the baseline scenario. This is approximately equivalent to the definition of final income in the Office for National Statistics publication, *The effects of taxes and benefits on UK household income* (ONS, 2018). Once again, results are shown for England, Scotland and Wales separately.

5.1   Combined impacts by household income decile

Figure 5.1 shows the combined impact of tax and welfare reforms and changes to public spending as a percentage of final income by household net income decile for England, while Figure 5.2 does the same for Scotland, and Figure 5.3 for Wales.

Figure 5.1 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household net income decile, England
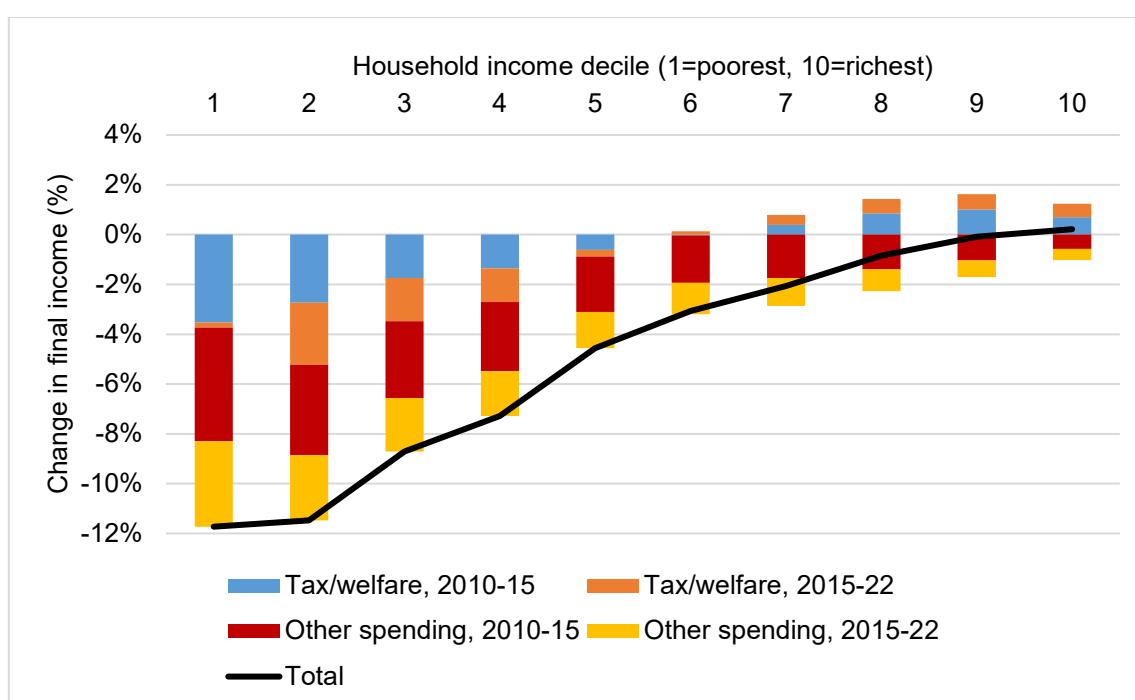
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The main difference between the three graphs is that the overall distributional impacts look much more regressive for England than for Scotland or Wales. This is driven by the fact that the cuts to non-welfare spending are much bigger, in percentage terms, for England. Households in the lowest two deciles in England in Figure 5.1 are subject to average total net losses of around 11.5% of final income, compared with losses of only 0.1% for households in decile 9, and very slight gains (0.2%) in the top income decile. The spending cuts modelled in Chapter 4 have a larger negative impact on final income than the tax and welfare reforms for households in the bottom half of the income distribution. For households in the top half of the income distribution, tax and welfare reforms have a positive impact on final income, while public spending changes have a negative impact. Also, the changes to other public spending between 2010/11 and 2015/16 have a larger

negative impact in each decile than the changes to public spending between 2015/16 and 2021/22.

The results for Scotland in Figure 5.2 show a roughly similar impact to England for tax and welfare reforms by income decile, but the pattern of impacts of other spending changes is completely different. Other spending changes between 2010/11 and 2015/16 have a small negative impact on final income, while spending changes after 2015/16 have a small positive impact. Overall, the negative impacts are largest for households in net income decile 2 (average losses of 5% of final income), while deciles 1, 3 and 4 also experience losses greater than 2%. The top four deciles see slight average gains in total (between 0 and 1%).

Figure 5.2 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household net income decile, Scotland

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The results for Wales in Figure 5.3 are more similar to Scotland than to England, although more negative in the lower deciles than for Scotland. As with Scotland, decile 2 shows the largest average total losses (at 6.7%). Decile 3 shows the second largest average loss (4.9%). The top four deciles are slight average gainers from the reforms. Other spending changes between 2010/11 and 2015/16 result in losses across all household income deciles, while changes to spending after 2015/16 result

in slight gains for deciles 8 and 9, and losses for other deciles (with the percentage size of the losses increasing towards the bottom of the income distribution). In Wales, the introduction of Universal Credit has a larger positive impact on the average incomes of households in the bottom decile than in England and Scotland – this is reflected in the positive value of the 'tax/welfare 2015-22' component for decile 1 in Figure 5.3.

Figure 5.3 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household net income decile, Wales
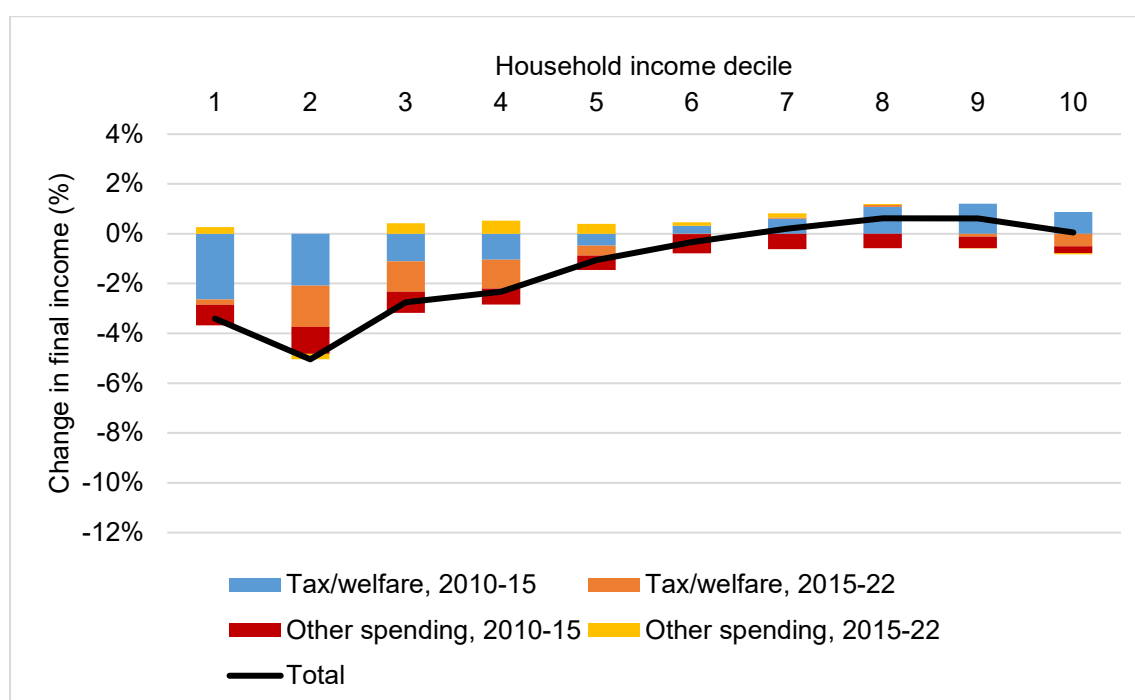

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

5.2   Combined impacts by household ethnicity

Figure 5.4 shows the combined impacts of tax/welfare reforms and other spending changes by household ethnicity for England, while Figure 5.5 does the same for Scotland (as with Chapter 4, we are unable to present results by household ethnicity for Wales because the sample size for ethnic minority households in Wales is too small). The results for England show that average total losses for Black and Other ethnicity households are between 9% and 9.5% of final income. Asian households are the next largest losers with average losses of around 7.5%, followed by Mixed

ethnicity households with average losses of 5.5%. White households and multi-adult households with adults of differing ethnicities experience the smallest total losses, at around 3%. The losses from other public spending changes reinforce the pattern of losses from tax and welfare reforms, with larger losses from other public spending changes for groups whose losses from the tax and welfare reforms are also more substantial. White households lose very little on average from the tax and welfare reforms, while Differing ethnicity households are slight gainers from tax and welfare changes. For these groups, all their net average losses arise as a result of the cuts to spending on other services.

Figure 5.4 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household ethnicity, England
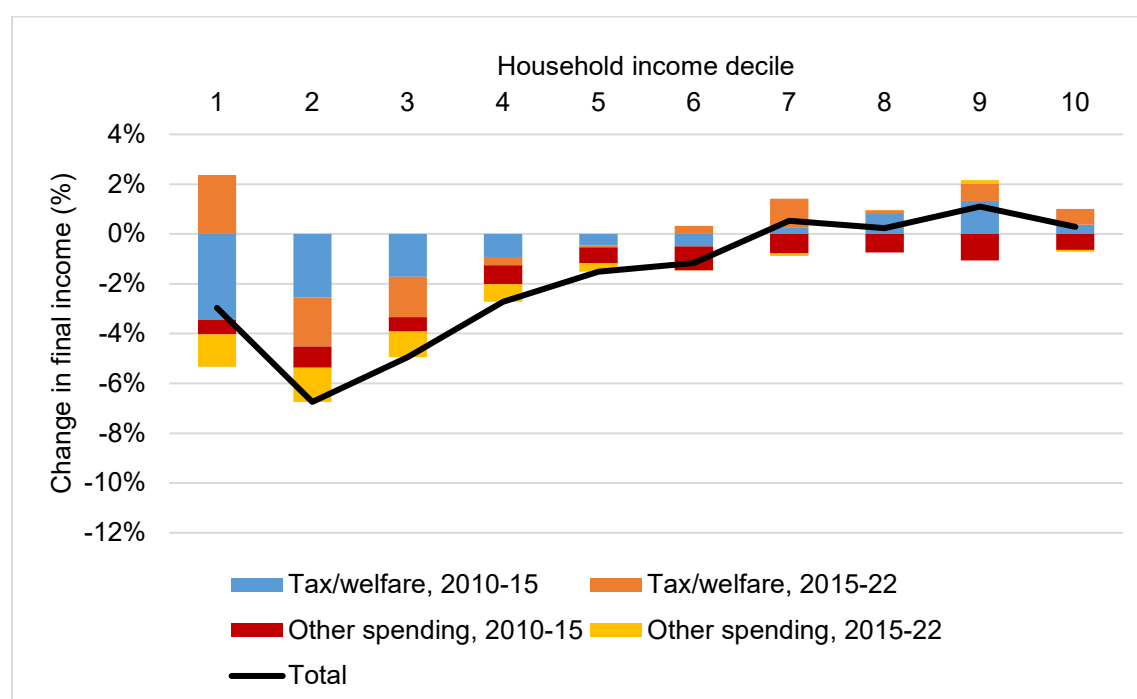

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The results for Scotland show the largest average losses for Black households (at around 6.5%). Asian households and multi-adult households with adults of differing ethnicities lose just under 3% of final income on average, while Other ethnicity households lose around 1.5% and White households lose 0.7%. Other spending changes between 2010/11 and 2015/16 have a negative impact for every group of between 0.6 and 1.4%, with spending changes after 2015/16 having a smaller negative impact (and for White households, a very slight positive impact). Most of the

variation in the overall distributional impacts by ethnicity is due to differences in the impact of the tax and welfare reforms.

Figure 5.5 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household ethnicity, Scotland
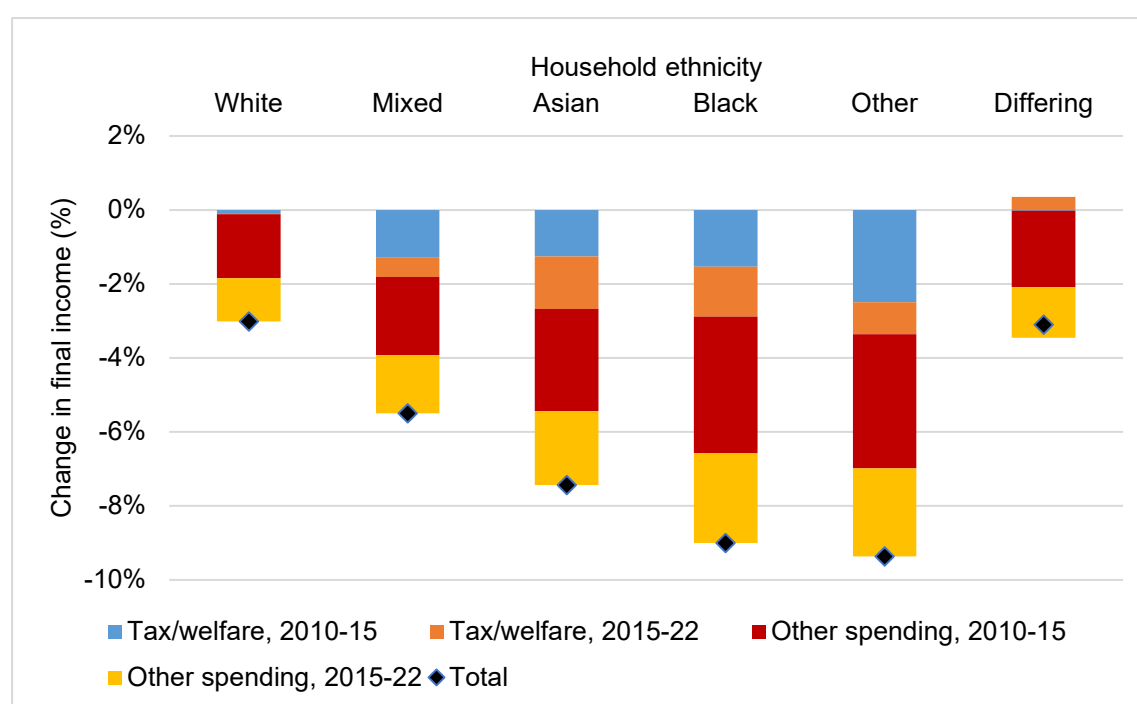

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

5.3 Combined impacts by gender and household demographic type

Figures 5.6, 5.7 and 5.8 show the combined impacts of the tax and welfare reforms and the other public spending changes by gender and household demographic type for England, Scotland and Wales respectively.

Figure 5.6 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by gender and household demographic type, England
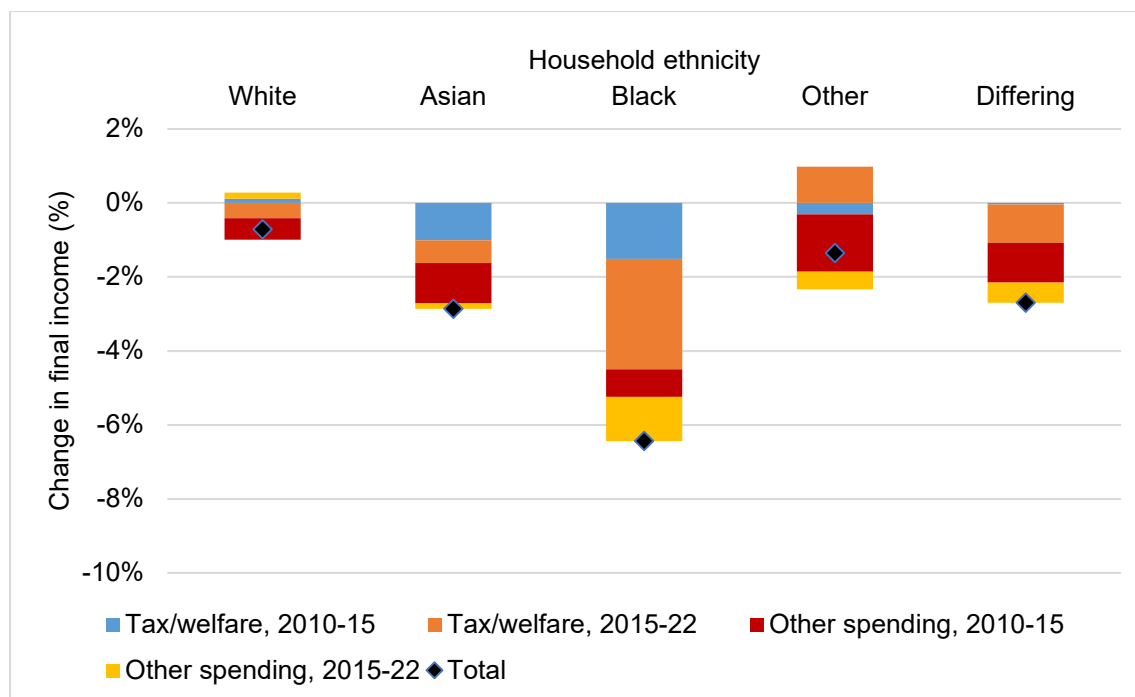

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The results for England in Figure 5.6 show that female lone parents are at a particularly severe disadvantage; they are the largest average losers from the tax

and welfare reforms, *and* from the other public spending changes. Average total losses for female lone parent households amount to over 19% of final income – by far the largest losses of any demographic group. For male lone parents, average losses are smaller (although still substantial) at just under 14% of final income; the smaller losses for male lone parents compared with female lone parents are entirely driven by smaller losses from the tax and welfare reforms in 2010-15 and 2015-22. Lone parent households overall lose 18.7%. MBU households with children where all the adults in the household are female are the second-largest losers from the combined set of reforms, with losses averaging 16% of final income.

Couples with children (average total losses of around 9%) and MBU households with children (losses of 7.3%) are also substantial losers. Single adults without children lose between 3 and 4% of final income on average. Female single pensioners lose slightly more than male single pensioners (losses of 4.4% compared with 2.7%) due mainly to larger losses from the 2010-15 tax and welfare reforms, and slightly larger losses from the spending cuts. Couple pensioners and men-only and women-only MBU households without children lose less than 2% on average, while mixed-sex MBU households without children, mixed-sex couple households without children and same-sex couples gain slightly from the combined reforms.

The results for Scotland in Figure 5.7 show that female lone parent households are the largest average losers in total but their losses are much smaller than for lone parents in England, at around 7.8% of final income. Most of the difference is explained by the fact that the impact of other spending changes for female lone parent households in Scotland is negligible. Male lone parents lose just under 5% on average (lone parent households overall lose 7.6%), while mixed-sex couples with children lose just over 5% and MBU households with children lose around 3.5%. For these groups, changes in public spending, especially between 2010/11 and 2015/16, have a larger negative impact than for lone parents, but the impact of the tax and welfare reforms is much smaller. Male and female single pensioners, women-only MBU households with no children and male and female single adults with no children experience very small average losses (less than 1% of final income in each case), while mixed-sex couples with no children, men-only MBU households with no children, mixed-sex MBU households with no children and couple pensioners gain slightly (by up to 2%).

Figure 5.7 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by gender and household demographic type, Scotland
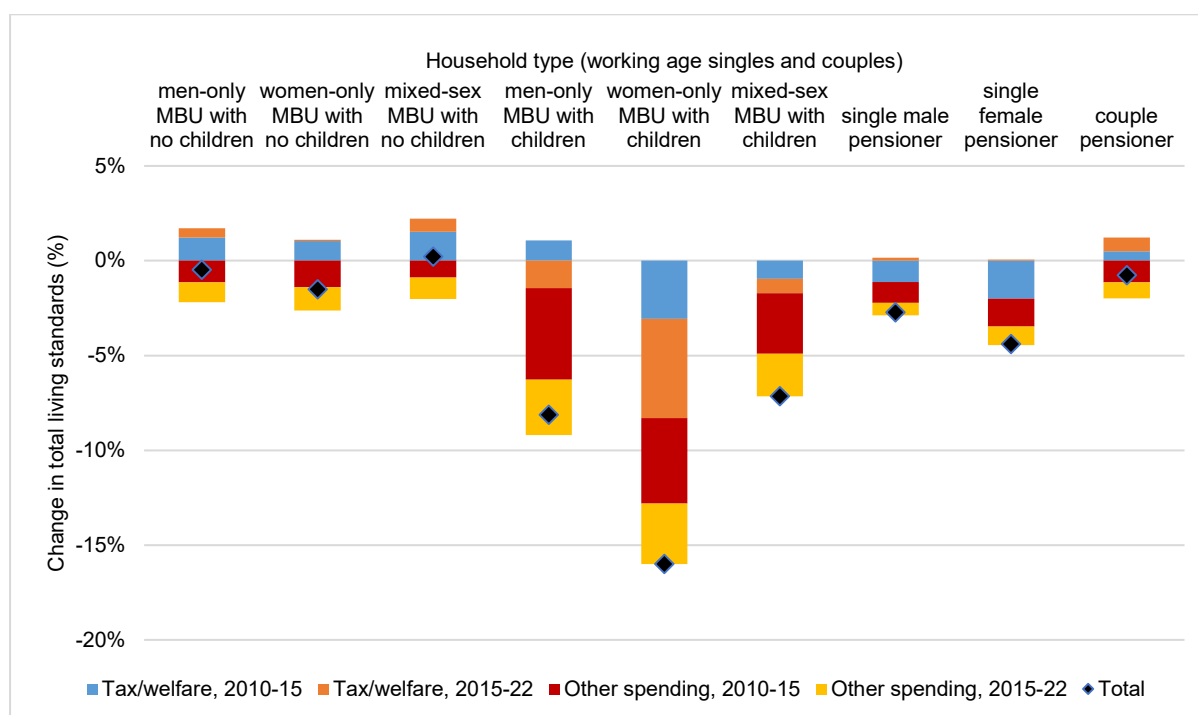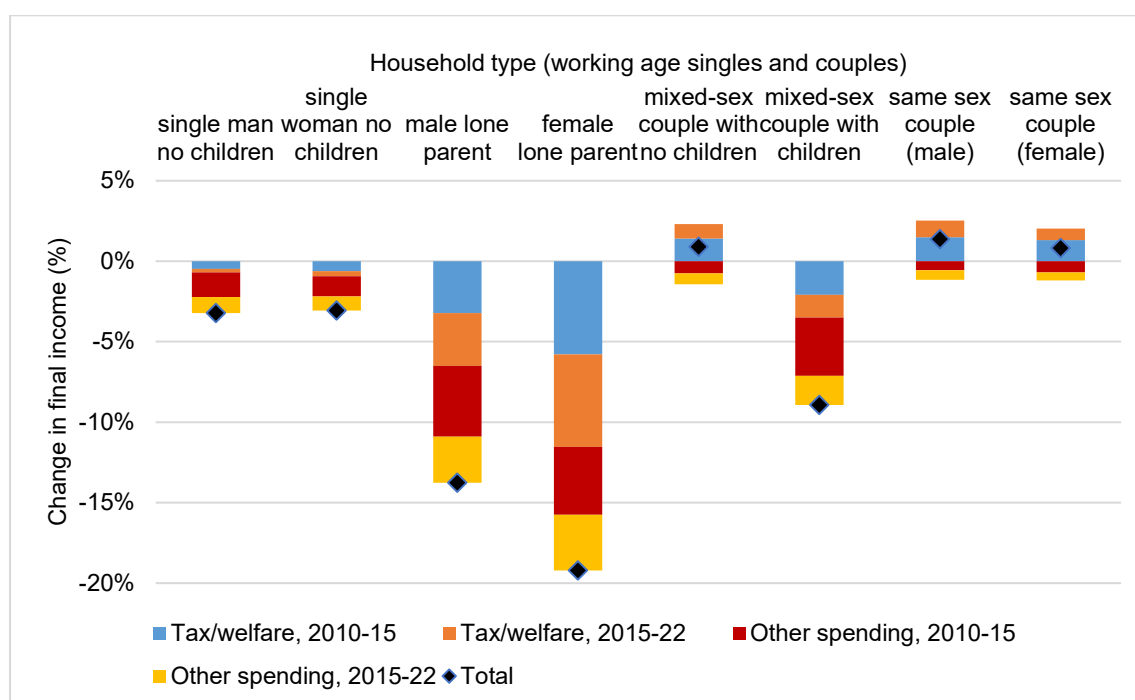

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.
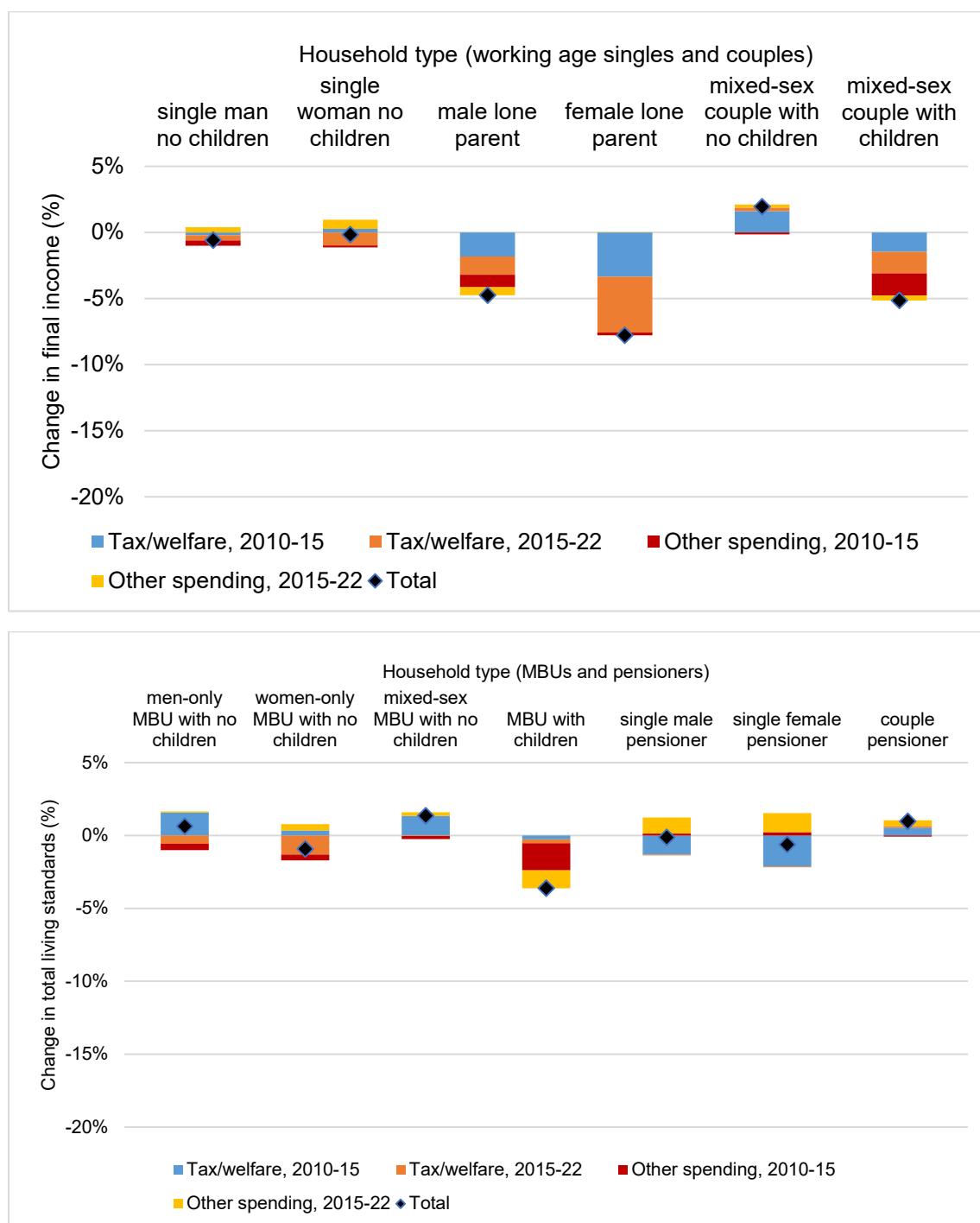
Figure 5.8 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by gender and household demographic type, Wales
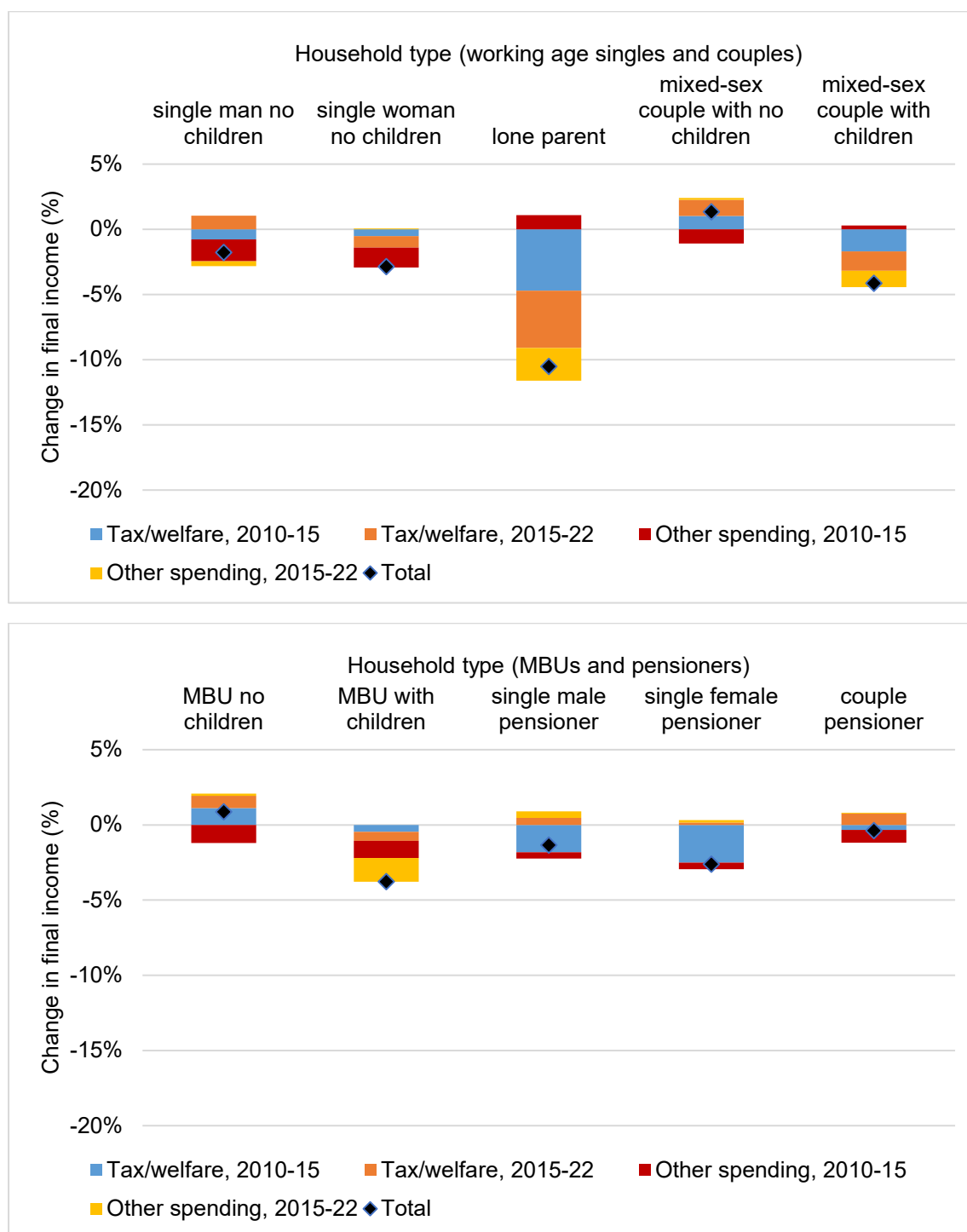
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The results for Wales in Figure 5.8 show that, as with England and Scotland, lone parent households are the group who lose most on average from the total package

of tax and spending reforms. Average losses for lone parent households in Wales are 10.5% of final income, which is larger than average losses for this group in Scotland but smaller than average losses in England. Most of the losses for lone parent households occur due to tax and welfare reforms, with spending changes between 2015/16 and 2021/22 also having a negative impact, while spending changes between 2010/11 and 2015/16 have a small positive impact.

Couples with children and MBU households with children experience total losses averaging around 4% – tax and welfare reforms make a larger contribution to total impacts for the former group than the latter. Working-age single men with no children and single male pensioners lose between 1% and 2% of final income on average, while working-age single women without children and female single pensioners lose between 2% and 3%. Couple pensioners lose less than 0.5% of final income. Mixed-sex couples and MBU households with no children are modest net gainers overall on average.

5.4   Combined impacts by number of children in household

Figures 5.9, 5.10 and 5.11 show the combined impact of the tax and welfare reforms and other spending changes according to the number of children in each household, for England, Scotland and Wales respectively. Comparing the three graphs, there is a clear negative relationship between total losses (as a percentage of living standards) and number of children for all three countries. However, the size of total average losses for households with three or more children is much larger in England (average losses of around 13%) than Scotland (average losses of just under 8%) or Wales (average losses of just under 7%). Losses are also smaller for households with one or two children in Scotland and Wales than in England. This result arises largely because the changes to other public spending have a larger negative impact for households with children in England than in Scotland or Wales. Households with no children are net gainers from the total package of reforms in Scotland, and are approximately no better or worse off in total in Wales, but lose an average of around 1% of final income in England.

Figure 5.9 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by number of children in household, England
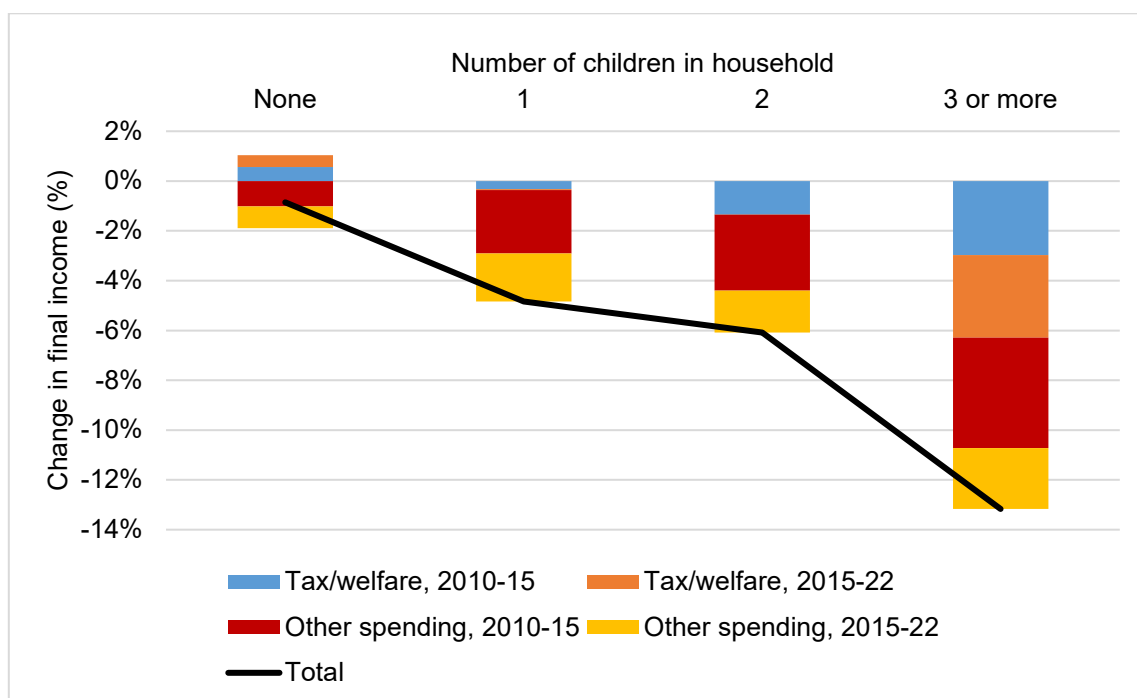
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 5.10 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by number of children in household, Scotland
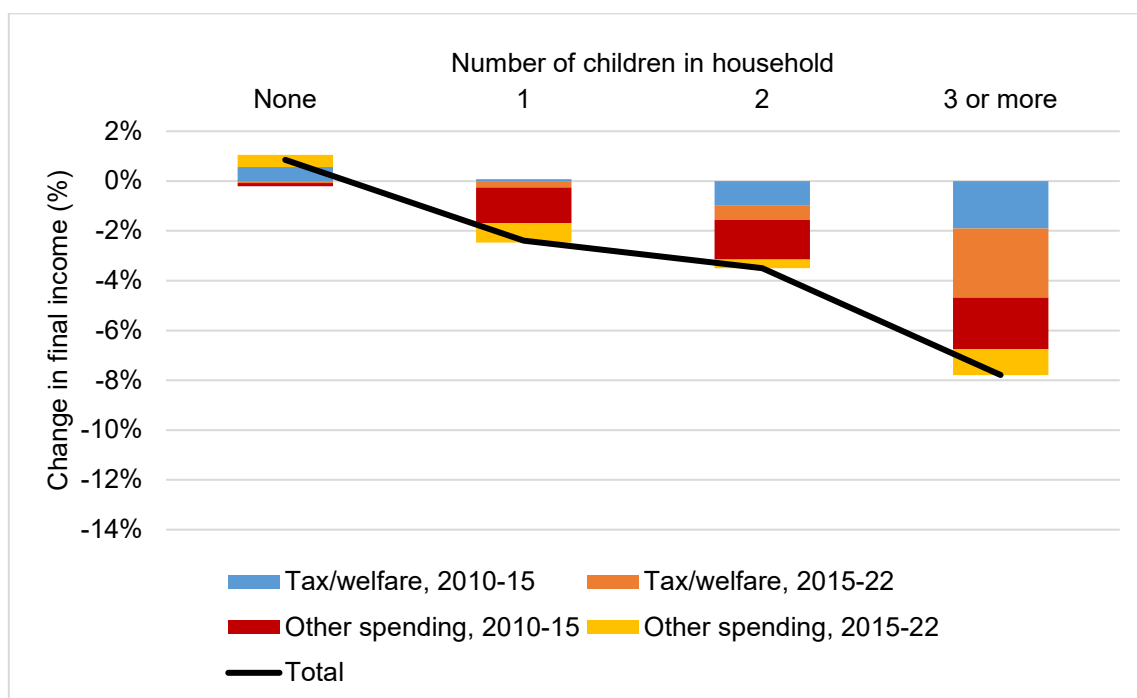
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 5.11 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by number of children in household, Wales

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

5.5 Combined impacts by household disability 'score'

Figures 5.12, 5.13 and 5.14 show the combined impacts of tax and welfare reforms and other public spending changes using the household disability 'score' measure. The results for England in Figure 5.12 show a clear gradient whereby households with a higher disability score lose a larger percentage of final income on average as a result of the combined reforms. Total average losses range from around 2% of final income for households with no functional disabilities, to 6.5% for households with a disability score of 3, up to around 10.5% for households with a disability score of 6 or more. While the distributional impact of the tax and welfare reforms is much more negative for households with a higher disability score than for households with a lower score, the distributional impact of other public spending changes is more even; households with high disability scores do lose larger amounts from the spending changes than less disabled households, but the differences are not as stark.

Figure 5.12 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household disability 'score', England

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 5.13 shows that households with a higher disability score in Scotland lose more than less disabled households, but the differences in combined impacts by level of disability are not as pronounced as for England. Households with a disability score of 6 or more lose 4.5% of final income on average, compared with 1% for households with a disability score of 1, and approximately zero impact for non-disabled households. The patterns of distributional impacts of spending changes look very different for Scotland compared with England; spending changes over the 2010/11 to 2015/16 period have a larger negative impact for disabled households than non-disabled households, while changes between 2015/16 and 2021/22 have a small negative impact for non-disabled households, but a positive impact for disabled households (with the largest gains for households with a disability score of 3 or 4).

Figure 5.13 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household disability 'score', Scotland
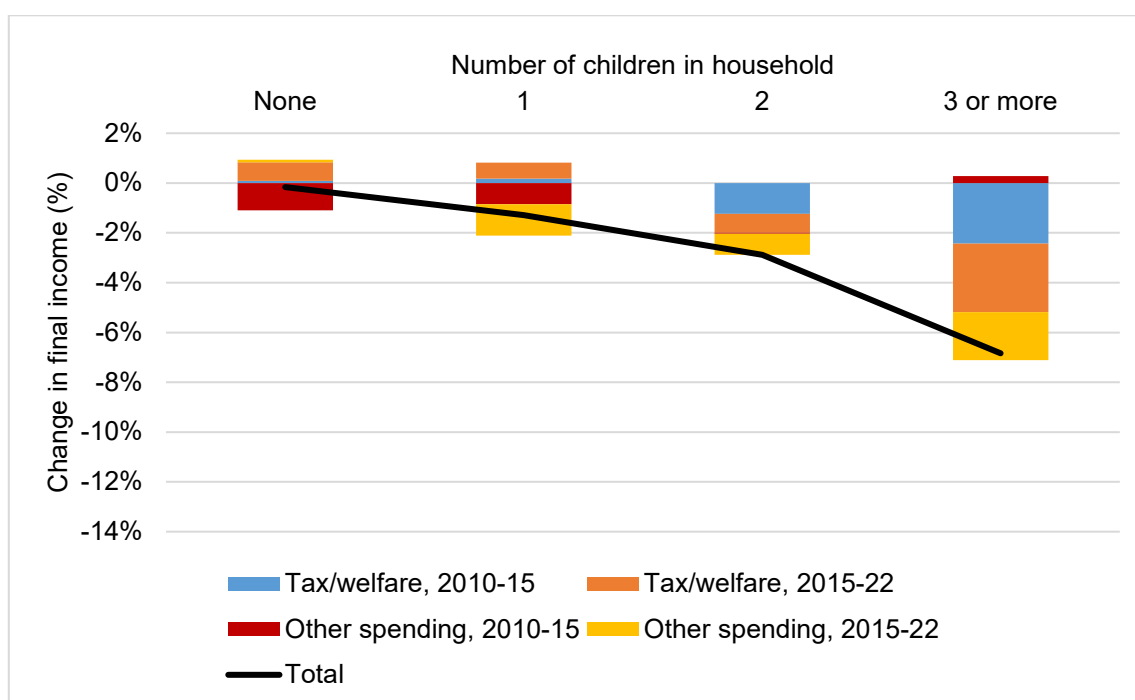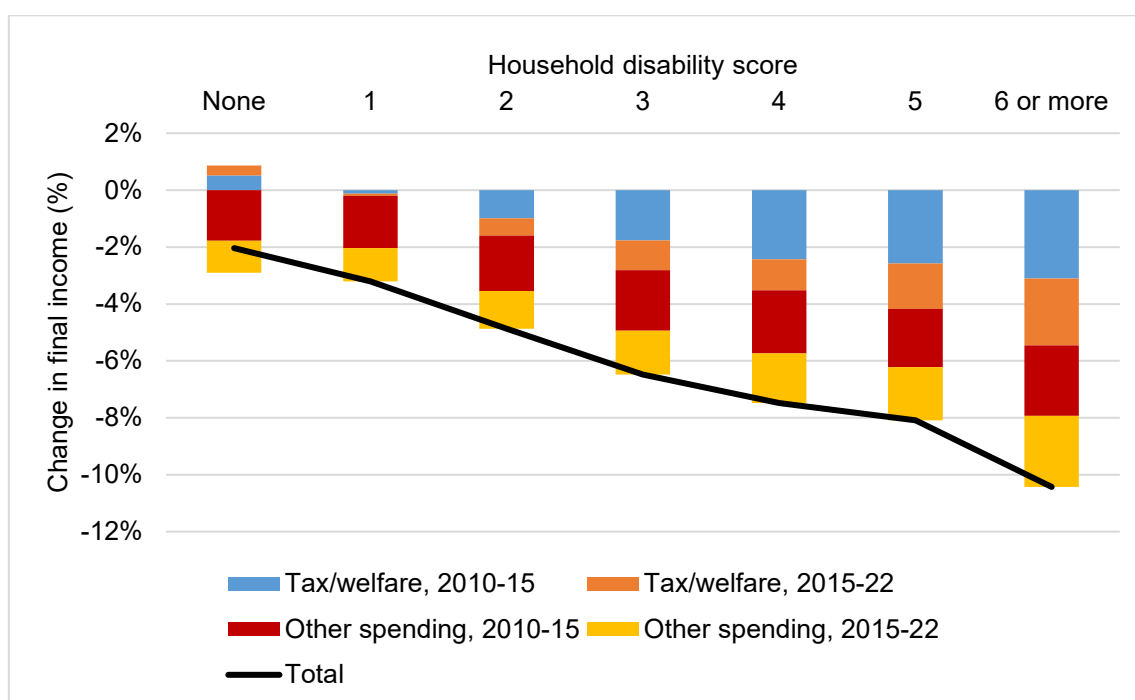

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

The results for Wales show that the overall negative impacts of the tax/welfare reforms and public spending changes are larger for households with a disability score of 2 or greater than they are for non-disabled households and households with a disability score of 1. The overall impact of the reforms for non-disabled households is approximately zero on average, with spending cuts almost exactly balancing gains from the tax and welfare reform packages. Households with a disability score of 1 lose just under 2% of final income on average from the changes, with the tax and welfare reforms and the other spending changes contributing roughly equally to the overall result. Households with disability scores of 2, 3, and 4 lose around 4% of final income on average, with the tax and welfare reforms playing a larger role than the other spending cuts. For households with a disability score of 6 or more, total losses are just under 5%, while for households with a disability score of 5, total losses are smaller (3%), due mainly to a positive impact of the tax and welfare reforms after 2015 on this group.
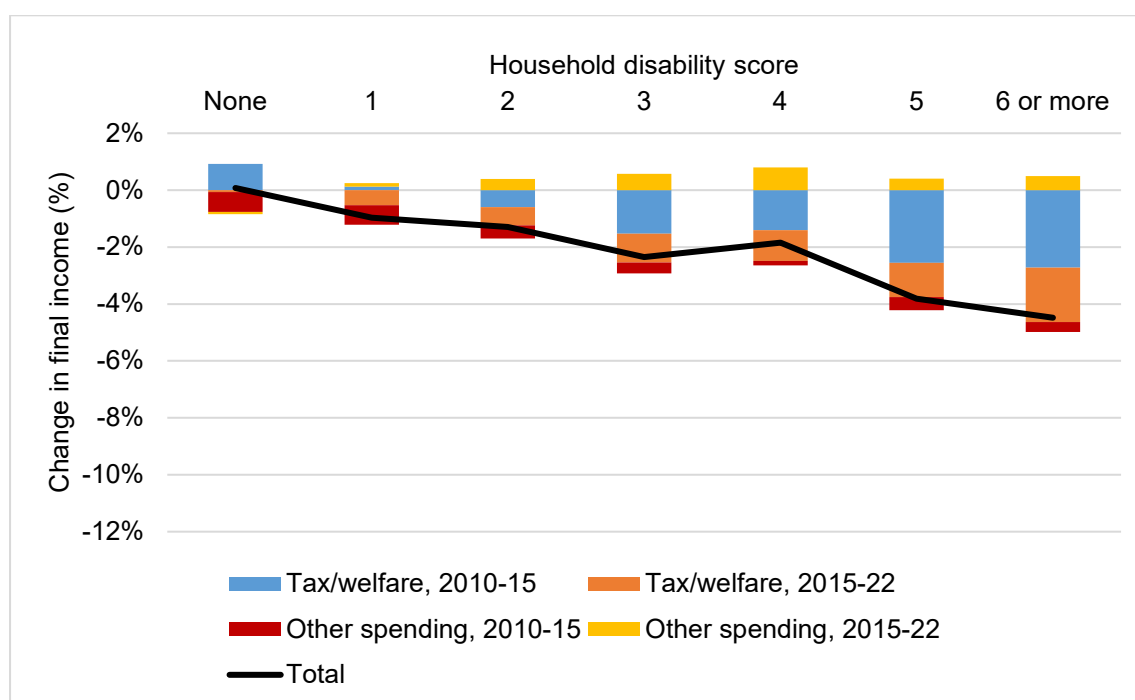
Figure 5.14 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by household disability 'score', Wales

Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

5.6   Combined impacts by average age of adults in household

Finally in this chapter, Figures 5.15, 5.16 and 5.17 show the combined impacts of tax and welfare reforms and other public spending changes by the average age of adults in the household. The results show that households where the average age of adults is 18-24 experience the largest combined losses in England, Wales and Scotland. Their losses are largest in Wales (averaging just over 8.5% of final income), and smallest in Scotland (averaging less than 3% of final income); in England, their losses average just under 7%.

The age groups with the smallest combined losses in England are households with average age 55-64 (average losses of 1.5%) and 65-74 (average losses of 1.6%). In Scotland, both of these age groups experience slight net gains from the combined reforms, as do households with average age 25-34. In Wales, households aged 25-24, 35-44, 55-64 and 65-74 do best on average from the reforms, with average losses of between 0.8 and 1.5 per cent. Households with average age 35-44 are the

second most negatively affected group in England and Scotland, whereas in Wales, the oldest age group (75 and over) are the second most negatively affected group.

In Wales, the changes to other spending have a much more negative impact for the 18-24 age group than the other age groups, whereas in England, households with average ages up to 54 experience larger negative impacts from the spending changes than households with average ages 55 and over. In Scotland, the largest negative impact from the spending changes taken in isolation is for the 35-44 and 45-54 age groups, while households with average age 55 and over see a positive impact on final income from the spending changes.
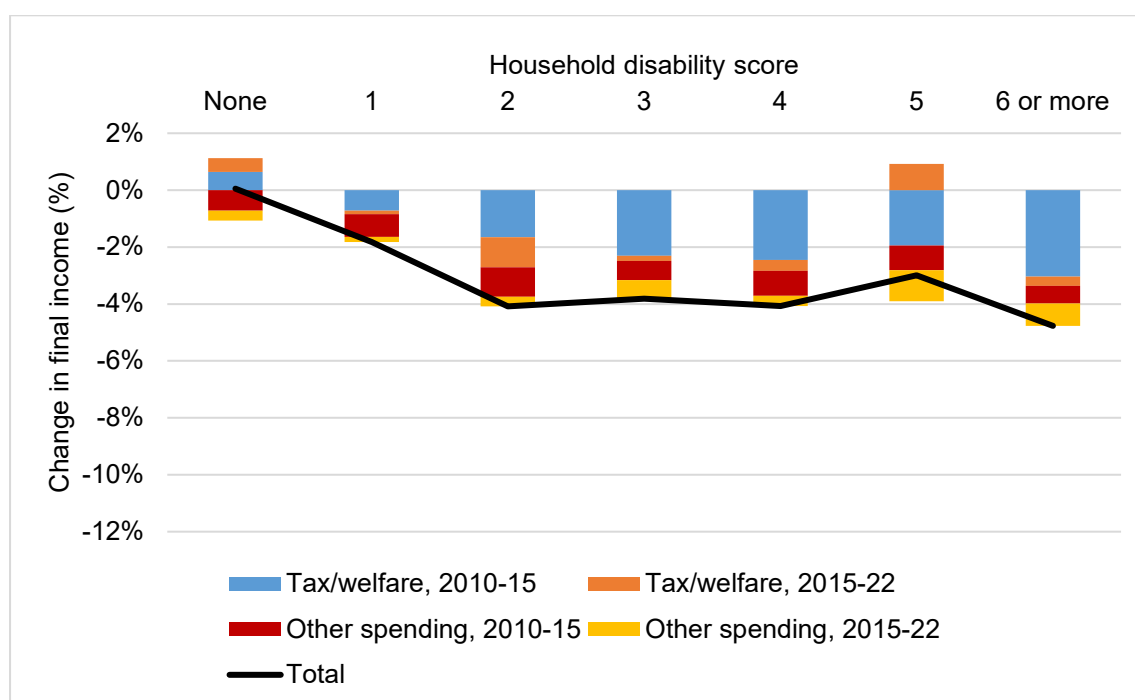
Figure 5.15 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by average age of adults in household, England
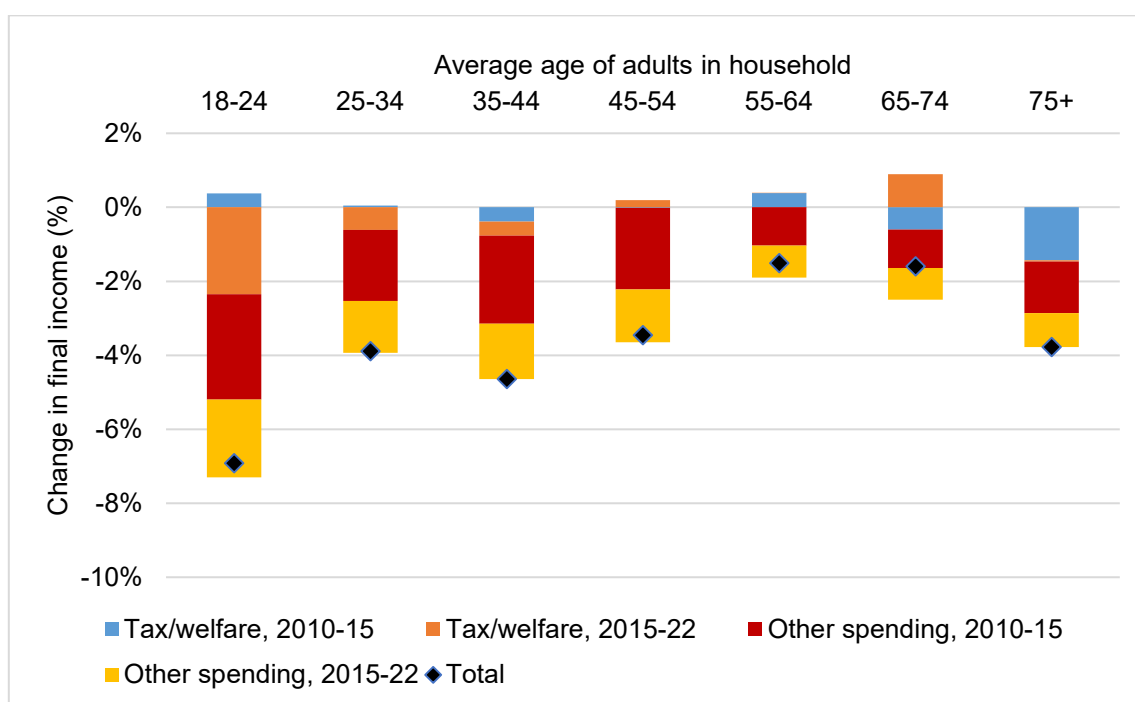
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 5.16 Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by average age of adults in household, Scotland
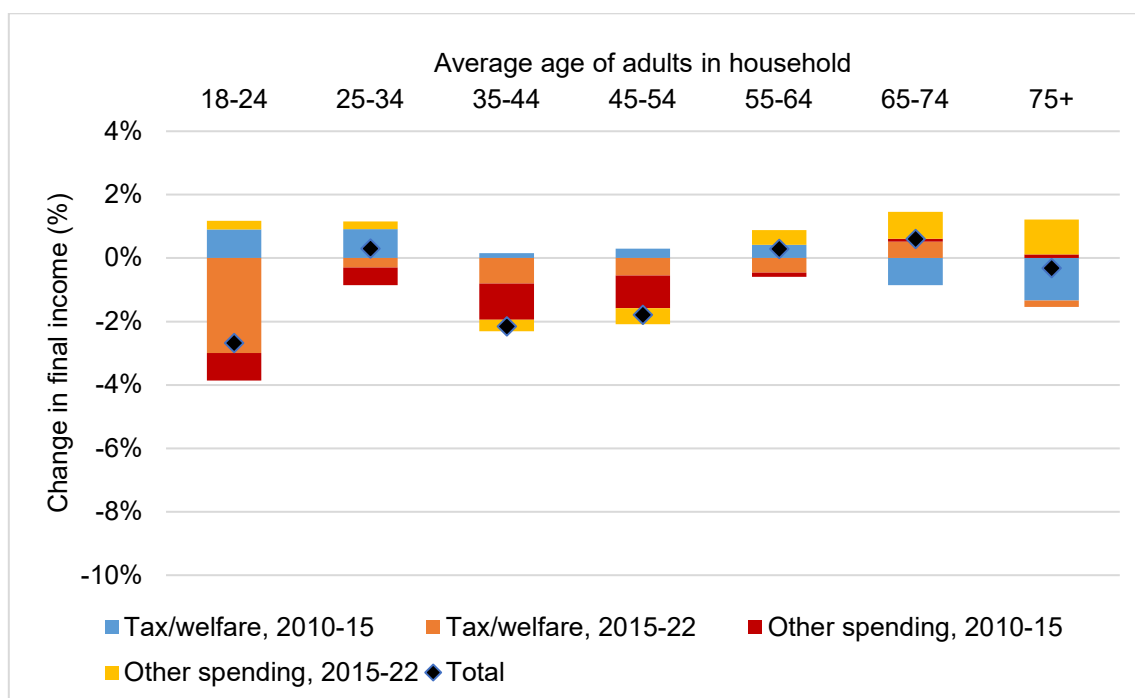
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

Figure 5.17   Combined impact of tax/welfare reforms and public spending changes as a percentage of final income by average age of adults in household, Wales
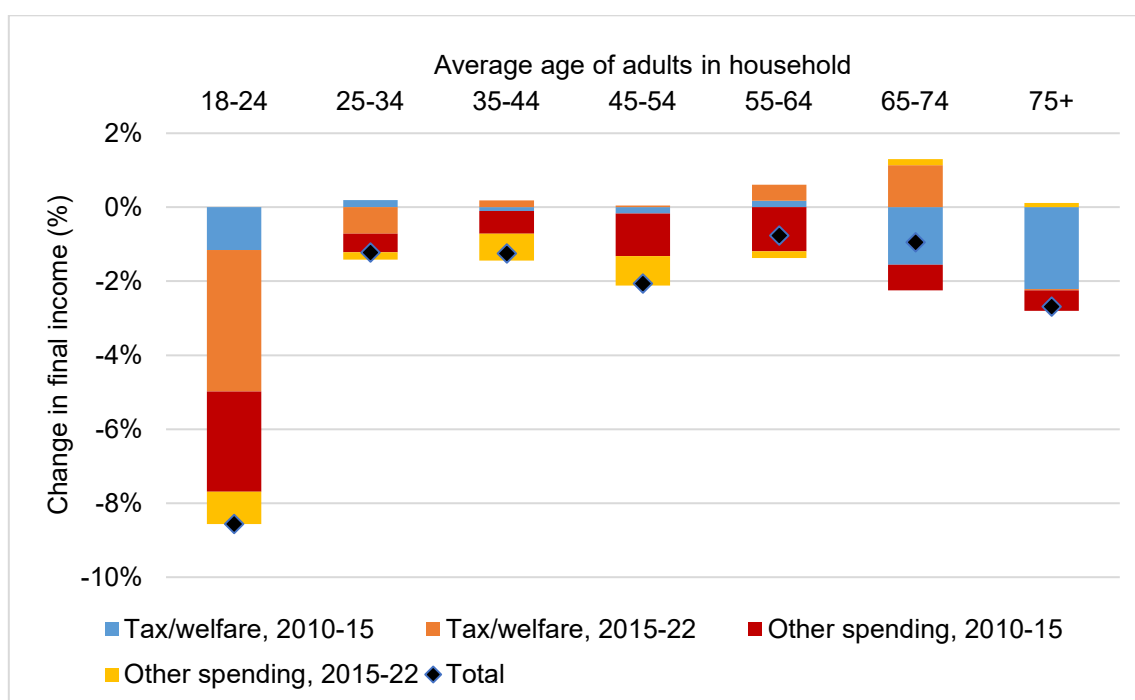
Source: Results from Landman Economics public spending model using pooled FRS data for 2012/13 to 2015/16 inclusive and other data as specified in Appendix A.

5.7   Summary of findings

The results from our analysis of the combined impact of tax and welfare reforms and public spending changes on final income can be summarised as follows:

- Analysis by household income decile shows regressive impacts for each country, where poorer households lose more from the total package of changes (as a percentage of final income) than richer households. This regressive pattern is particularly pronounced for England, where the poorest two deciles suffer average losses of over 11% of final income compared with an impact of approximately zero in the top two deciles. In Scotland, the decile pattern is still regressive, but much shallower; the bottom two deciles lose between 4 and 5% of final income on average, compared with slight gains for the top four deciles. For Wales, the degree of regressivity is somewhere in between England and Scotland; the largest average losses are for decile 2 (around 7%), while the top four deciles experience slight gains on average.

- In England, the spending cuts modelled in Chapter 4 have a bigger negative impact on final income than the tax and welfare reforms for households in the bottom half of the income distribution.

- In England, the results by ethnicity show that Black and Other ethnicity households experience average losses of around 9% to 9.5% of final income – around three times higher than average losses for White households and households with adults of differing ethnicities. In Scotland, the largest losses are for Black households (around 6.5% on average); while White households lose just under 1%.

- Lone parent households (and especially female lone parent households) are the largest average losers from combined tax, welfare and public spending reforms by demographic type in England and Scotland. In England, average losses for female lone parents are over 19%, compared with 7.8% in Scotland (average losses for male lone parents are 14% in England and 4.8% in Scotland). Lone parent households overall lose 18.7% in England and 7.6% in Scotland. In Wales, average losses for the combined lone parents' category are10.5%. Couples with children lose around 9% of final income on average in England, with losses of between 4% and 5% in Scotland and Wales. MBU households without children and couple households without children gain slightly from the combined reforms in all three countries.

- In all three countries, there is a negative relationship between number of children and overall average losses in percentage terms. However, average losses for households with three or more children are much larger in England (13%) than for Scotland or Wales (between 7% and 8%).

- In all three countries, there is a negative gradient by household disability score, where more disabled households have larger losses as a percentage of final income. However, the negative gradient is much steeper in England than in Wales or Scotland. Households with a disability score of 6 or more suffer average losses of 10.5% of final income in England compared with between 4.5% and 5% in Scotland and Wales.

- Analysis by average age of adults in each household shows that the group with average ages 18-24 experience the worst average outcomes in all three countries, with losses of 8.5% of total income in Wales, around 7% in England and around 3% in Scotland. Households with average adult ages of 55-64 and 65-74 experience the smallest average losses by age group in Wales and England, and slight gains in Scotland.

6. Conclusions and policy recommendations

6.1   Introduction

The final chapter of this report reviews the main findings from our analysis of the cumulative impact of changes to public spending in England, Scotland and Wales, and the implications of these changes for protected groups in England, Scotland and Wales. We then present a set of policy recommendations. These are divided into two main areas:

- Mitigating the negative impact of cuts to spending on particular services
- Improving the data used for cumulative impact assessment (CIA) of spending changes.

These recommendations should be read alongside the recommendations previously made in Chapter 10 of Reed and Portes (2018).

6.2   Conclusions

Substantial real-term cuts to public spending – whether measured per head, or per household – have already taken place in England and, to a lesser extent, Wales, with smaller cuts in Scotland. Based on data from HM Treasury's *Public expenditure statistical analyses* (PESA) and the Scottish and Welsh Government's spending plans, we forecast that spending per head on services covered by the Landman Economics public spending model will fall by around 18% in England between 2010/11 and 2021/22, compared with a fall of 5.5% in Wales and just over 1% in Scotland. By 2021/22, overall spending per head on modelled services will be 36% higher in Scotland than in England and 17% higher in Wales than in England. The discrepancy between England and Scotland, in particular, has increased significantly since 2010/11.

Measured in cash terms on a per household basis, total spending on modelled public services per household is forecast to fall by almost £1,500 per household in England by 2021/22 compared with just under £500 per household in Wales and around £200 per household in Scotland. The differences between spending trends in England, Scotland and Wales are due to a number of factors including: faster population growth in England compared with Scotland and Wales; different spending priorities for the Scottish and Welsh Governments compared with the UK Government; and more generous funding in Scotland due to Scotland-specific income tax rises.

Overall, the impact of changes to public spending is regressive by household income decile, with households in decile 2 (the second poorest decile) losing more than any other decile in cash terms in England, Scotland and Wales. Cash losses for lower deciles are larger in England than Wales or Scotland due to the overall scale of cuts in spending being far greater in England.

When cuts to public spending are combined with the changes to the tax and welfare system presented in Reed and Portes (2018) and the combined impacts are shown as a percentage of 'final income' (net income plus the value of public services used), the overall impacts of combined reforms are regressive, with poorer households losing more than richer households. This is especially the case in England, where the poorest two deciles suffer average losses of over 11% of final income compared with an impact of approximately zero in the top two deciles.

The changes in spending have a disproportionately negative impact on households when analysed according to several protected groups, in particular lone parent households, young adults, households containing disabled people and certain ethnic groups. But there is considerable variation between England, Wales and Scotland in the impacts by protected group. Our main findings are that:

- Black households experience the biggest overall spending cuts in cash terms in England and Scotland. A lack of data on ethnicity means that it is not possible to compare Wales with England or Scotland.

- In England and Scotland, households with children suffer larger losses from the spending cuts than households without children; this finding is mainly driven by cuts to schools spending. In Wales, losses for couples with children and lone parent households are smaller due to boosts to school spending per household.

- Lone parent households are the largest average losers of any demographic type from combined tax, welfare and public spending reforms in all three countries. In England, their average losses are 18.7%, compared with 10.5% in Wales and 7.6% in Scotland. Female lone parents experience greater losses than male lone parents in England and Scotland, largely because they are more negatively

affected by the tax and welfare reforms. In Wales, the sample of male lone parents is too small to analyse separately.

- In all three countries, there is a negative relationship between number of children and combined losses from tax, welfare and public spending changes. Average losses for households with three or more children are much larger in England (13% of final income) than in Scotland or Wales (between 7 and 8%).

- In England, households with a high disability score suffer much larger losses as a result of the spending cuts than households with fewer disabilities, largely because of social care cuts. In Wales, the 'disability gradient' is much shallower, while in Scotland households with more disabilities fare slightly better than non-disabled households.

- Younger households (with average age of adults in the household under 55) experience larger losses from the changes in spending than do older households (with average age of adults 55 or over). Households with average adult age 18-24 experience the largest losses from tax, welfare and public spending changes as a percentage of final income out of any age group.

As with the tax and welfare reforms analysed in Reed and Portes (2018), these reforms took place against a background of a clear and overarching UK Government commitment to deficit reduction. Cuts in spending on the services included in the modelling in this report – alongside reductions in benefits and tax credit spending – were a key component of the deficit reduction strategy, and would have been necessary to achieve deficit reduction in the absence of tax increases and/or greatly improved economic growth. However, it does not follow that the spending cuts implemented in England or Wales (and to a lesser degree in Scotland) were inevitable, nor was the impact on disadvantaged groups that has emerged.

This adverse impact on the living standards, access to social care and health care and other rights of certain groups is in contravention of the non-discrimination principle the UK committed to respect under international human rights law. Moreover, the UK is a State Party to the International Covenant on Economic, Social and Cultural Rights (ICESCR), which includes the state obligation to allocate the maximum resources available to the protection and implementation of human rights (ICESCR Art. 2(1)), including the right to public services such as health care and education. This Government duty has very important implications for decisions on budgets and public spending. It requires the Government to demonstrate that it has made every effort to mobilise, allocate and spend budget resources to fulfil people's rights (UN Committee on the Rights of the Child, 2016). The UN Committee on Economic, Social and Cultural Rights has observed that public services must be of

sufficient quality and coverage to ensure an adequate standard of living; moreover, any reductions (driven, for example, by wider economic policy considerations) should be temporary, necessary and proportionate and uphold a minimum essential level of all human rights (Office of the High Commissioner for Human Rights, 2016). As with our analysis of social security reforms in Reed and Portes (2018), the UK Government's published impact assessments do not, in themselves, indicate that these obligations have been taken into account; nor do they indicate that the Government has paid sufficient regard to the Public Sector Equality Duty (PSED) and the impact of reforms on disadvantaged groups.

The different pattern of distributional impacts of spending cuts seen in Wales and Scotland, compared with England, shows that neither the overall scale of spending cuts in England, nor their precise impact on protected groups, was inevitable. The results for Scotland, in particular, show that it has been possible to make spending choices which result in better outcomes for disadvantaged groups (defined in terms of low income, or across some, though not all, of the Equality Act 2010 protected characteristics) in Scotland than has been the case in England. This does not seem to be because Scotland is more likely to use equality impact assessments of spending changes than England or Wales. Rather, Scotland has had different spending priorities from England since 2010 and the Scottish Government's approach has had a positive impact on outcomes for households in disadvantaged groups across several protected characteristics.

As explained in Reed and Portes (2018), the UK Government's response to the recommendations made in the Commission's previous report *Future fair financial decision making* (EHRC, 2015) has been disappointing. Despite high-level commitments to ensuring that equality considerations are properly taken into account in financial decisions, and some indication that progress has been made internally on data quality and availability issues, there is little concrete evidence that the specific recommendations have been properly considered or acted upon. The published Impact on Equalities Analysis and the distributional analysis to accompany the 2015 Spending Review (HM Treasury, 2015) (at the time of writing, still the most recent set of overall public spending plans that the UK Government has produced) do not appear to represent any significant progress from comparable documents produced in 2010.

6.3 Policy recommendations

Mitigating the negative impacts of public spending changes

We recommend that the UK, Scottish and Welsh Governments:

- Significantly mitigate the disproportionate negative impacts on poorer households and protected groups of changes to the tax and welfare system and cuts to spending on public services. This could be done (for example) by increasing the rates of means-tested benefits, tax credits and Universal Credit, and by increasing spending on in-kind public services such as health, social care, education and public housing.

- Take into account in the next UK Government's Spending Review and the spending plans of the Scottish and Welsh Governments, the likely impact on protected groups and the impacts for poorer households of further changes in spending.

- Require that the next UK Government's Spending Review, and the spending plans of the Scottish and Welsh Governments, are accompanied by an equality impact assessment (EIA). The EIAs should incorporate a CIA of the impact on protected groups, showing how distributional impacts vary across groups; analyse and explain any major disparities in outcomes that adversely impact protected groups; and take into account the impacts for poorer households of further changes in spending.

- Publish a detailed explanation of the process by which they will ensure that the Spending Review and spending plans are fully compliant with the Public Sector Equality Duty; demonstrate that regressive measures are temporary, necessary, proportionate and non-discriminatory and do not undercut a core minimum level of protection and put in place any mitigating measures required to safeguard people's rights.

- Ensure that these analyses by each government are publicly accessible and subject to meaningful scrutiny by Parliament, the public and protected groups that may be adversely affected by the decisions.

Improving data for impact assessments of public spending changes

In order to improve the quality of data for CIAs on public spending, we recommend that the UK, Scottish and Welsh Governments:

- Make available more national, regional and local information on the usage of various public services, including on social care services; legal aid services; publicly funded recreational facilities (for example, museums and galleries, parks etc.); and fire services.

- Improve the quality of data on children's usage of health services in the Health Survey for England, Scottish Health Survey and Welsh Health Survey.

- Publish more detailed analysis where data are collected on protected characteristics and take steps to redress this omission where they are not. Where data are lacking for particular groups, e.g. people from ethnic minorities in Wales, increase, boost or pool samples as necessary.

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Appendix A: Detailed methodology for the Landman Economics public spending model

Survey variables used

Table A.1 below uses the subset of COFOG classifications for which services are included in the public spending model (see Table 2.1 in the main report for the full set of COFOG classifications). For each classification, the table lists the variable used as a measure of service use in the public spending model, and which of the survey datasets it is contained in.

Table A.1 Service use variables in the public spending model

COFOG classification	Service category	England	Wales	Scotland
3.1 Police services		CSEW: VICTIM (whether victim of crime or not)	CSEW: VICTIM (whether victim of crime or not)	SCJS: VICFLAG (whether victim of crime or not)
4.5 Transport	Bus use	NTS: ORDBUSFREQ (frequency of bus use)	NTS: ORDBUSFREQ (frequency of bus use)	NTS: ORDBUSFREQ (frequency of bus use)
	Train use	NTS: TRAINFREQ (frequency of train use)	NTS: TRAINFREQ (frequency of train use)	NTS: TRAINFREQ (frequency of train use)
	Road use	NTS: PRIVCAR (frequency of trips by car)	NTS: PRIVCAR (frequency of trips by car)	NTS: PRIVCAR (frequency of trips by car)
6.1 Housing development	Social housing	FRS: TENTYP2 (tenure type)	FRS: TENTYP2 (tenure type)	FRS: TENTYP2 (tenure type)
7 Health	GP visits	HSE: NDCTK12 (number of times talked to GP – last 12 months)	WHS:GPFREQ (number of times talked to GP – last 2 weeks)	SHS: NUMYEAR (number of times talked to GP)
	Hospital outpatient	HSE: OUTNPA, OUTNPA (number of outpatient visits last 12 months)	WHS: OUTPAT (outpatient in last 12 months yes/no)	SHS: OUTPAT (outpatient in last 12 months yes/no)
	Hospital inpatient	HSE: INPATNO (number of inpatient visits last 12 months)	WHS: INPAT (inpatient in last 12 months yes/no)	SHS: INPAT (inpatient in last 12 months yes/no)
9.1 Pre-primary and primary education	Free childcare	FRS: see 'modelling free childcare offer' subsection below	FRS: see 'modelling free childcare offer' subsection below	FRS: see 'modelling free childcare offer' subsection below
	State primary school	FRS child record: TYPEED=2, or (TYPEED2=3 and AGE<11)	FRS child record: TYPEED=2, or (TYPEED2=3 and AGE<11)	FRS child record: TYPEED=2, or (TYPEED2=3 and AGE<11)
9.2 Secondary education	State secondary school	FRS child record: TYPEED2=5, or (TYPEED2=3 and AGE>=11)	FRS child record: TYPEED2=5, or (TYPEED2=3 and AGE>=11)	FRS child record: TYPEED2=5, or (TYPEED2=3 and AGE>=11)
School-level education	Free school meals	FRS: SMLIT For extension of free school meals to all pupils in school years 1 and 2 see 'modelling universal free school meals' subsection below	FRS: SMLIT For extension of free school meals to all pupils in school years 1 and 2 see 'modelling universal free school meals' subsection below	FRS: SMLIT For extension of free school meals to all pupils in school years 1 and 2 see 'modelling universal free school meals' subsection below

COFOG classification	Service category	England	Wales	Scotland
9.3 Post-secondary non-tertiary education	Further education	FRS child and adult records: TYPEED2=7	FRS child and adult records: TYPEED2=7	FRS child and adult records: TYPEED2=7
9.4 Tertiary education	Higher education	FRS: (1) students in extchild record (2) students in adult record: TYPEED2=9, EDTYP=2, 4, 6 or 8	FRS: (1) students in extchild record (2) students in adult record: TYPEED2=9, EDTYP=2, 4, 6 or 8	FRS: (1) students in extchild record (2) students in adult record: TYPEED2=9, EDTYP=2, 4, 6 or 8
10 Social protection	Social care services	FRS: see 'modelling social care receipt and funding' subsection below	FRS: see 'modelling social care receipt and funding' subsection below	FRS: see 'modelling social care receipt and funding' subsection below

Key to datasets:
FRS – Family Resources Survey   CSEW – Crime Survey of England and Wales
SCJS – Scottish Crime and Justice Survey   NTS – National Travel Survey
HSE – Health Survey for England   SHS – Scottish Health Survey
WHS – Welsh Health Survey

Additional notes on modelling services using the FRS

Free childcare for 3- and 4-year-olds, and disadvantaged 2-year-olds

The baseline scenarios include 15 hours' free childcare per week per child for families with children aged 3 and 4. Two additional items of childcare expenditure are modelled in England, Scotland and Wales:

1. The introduction of an additional 15 hours of entitlement per week per child (making 30 hours in total) for families with children aged 3 and 4. This has been available from September 2016 in England, and will be available in Wales by 2019 and in Scotland by 2020. In England, all families where both parents (or the parent in the case of a lone parent family) are in work and earning at least £120 per week (but less than £100,000 per year) are eligible. Similar eligibility conditions apply in Scotland and Wales.

2. 15 hours' free childcare per week per child for disadvantaged families with children aged 2 (the qualifying criteria are given at https://www.nao.org.uk/wp-content/uploads/2016/03/Entitlement-to-free-early-education-and-childcare-Summary.pdf for families in England, https://www.mygov.scot/childcare-costs-help/funded-early-learning-and-childcare/ for families in Scotland and https://gov.wales/topics/people-and-communities/people/children-and-young-

people/parenting-support-guidance/help/flyingstart/?skip=1&lang=en for families in Wales.

The allocation of free childcare to families with 3- and 4-year-old children, and disadvantaged families with 2-year-old children, is modelled using the information on family gross incomes and eligibility for the relevant benefits and tax credits in the FRS. For means-tested benefits and tax credits (and Universal Credits), eligibility is calculated using the Landman Economics tax-transfer model (TTM).

Modelling universal free school meals in Years 1 and 2

Free school meals for all children in Years 1 and 2 of state primary schools were introduced in England from September 2014 and in Scotland from January 2015. The impact of this reform is modelled by extending it to all children in state primary schools aged 7 or under in the FRS. The FRS already includes a variable (SMLIT) for take-up of free school meals for older children and this is used to assign free school meals to pupils in Years 1 and 2 in England and Scotland in the baseline scenario (and to older children in the baseline and reform scenarios). In Wales, universal free school meals have not been introduced for children in Year 1 and 2; instead, all state school children remain on the means-tested entitlements.

Pupil Premium, Pupil Deprivation Grant and Pupil Equity Fund

The Pupil Premium (introduced in England in 2011), the Pupil Deprivation Grant (introduced in Wales in 2012) and the Pupil Equity Fund (introduced in Scotland in 2017) distribute part of the education spending budget to schools using a formula based on the number of pupils receiving Free School Meals in each school. In our model, the SMLIT variable in the FRS is used to assign pupil premium spending to qualifying children in England, Scotland and Wales.

Modelling social care receipt and funding

Public funding of social care is subject to needs-testing (whereby social care recipients have to meet certain conditions of need before being awarded public funding) and means-testing (whereby the incomes and assets of social care claimants are taken into account when deciding whether the state will fund a package of care). The exact rules differ between England, Wales and Scotland and between domiciliary care (care received in the recipients' own home) and residential care (care received in a care home). Briefly, the current means-testing rules for each country for *domiciliary* care are as follows:

- In England, state-funded domiciliary care is only available to recipients with assets below £23,350. Between £14,250 and £23,350 there is a sliding scale of eligibility with recipients with assets below £14,250 receiving full support with care costs (conditional on meeting the other criteria). For homeowners, the value of a recipient's house is not taken into consideration in the asset needs-test. Care recipients' income is also taken into account when determining eligibility for public funding and the need for any co-payments towards the costs of care.

- In Wales, the general structure of the assets and income means-tests is similar to England but slightly more generous (for example, full support for care costs is available to recipients with assets below £24,000, not including house value).

- In Scotland, domiciliary care is not means-tested on income or assets.

The means-testing rules for *residential* care are as follows:

- In England, Wales and Scotland the value of assets (*including* the value of the home, for homeowners) is taken into account in the asset means-test. The maximum permissible value of assets to be able to receive full state funding for residential care is £14,250 in England, £16,250 in Scotland and £30,000 for Wales. A sliding scale for eligibility operates in England and Scotland up to a maximum of £23,250 in England and £26,250 in Scotland.

- An income means-test also operates in England and Wales (but not in Scotland).

The means-tests for domiciliary and residential care are modelled in the FRS using information on personal income and assets (including value of home where appropriate) for each survey member. For residential care there is the additional complication that we do not observe any FRS sample members in care homes because the FRS sampling frame does not include residential care homes. Therefore, an alternative strategy for allocating public spending on residential care is used, which uses a regression for sample members in the English Longitudinal Survey of Ageing (ELSA) which predicts the probability of ELSA members moving into residential care in future waves conditional on age and other characteristics in Wave 1. The predicted probabilities of moving into residential care from the ELSA regression are used to make an out-of-sample prediction for FRS sample members of their probability of moving into residential care, and these probabilities are used to allocate public funding for residential social care across the FRS sample (combined with the results of the residential care means-tests in each country).

For domiciliary care, the needs-test is simulated by using information on the number of hours of care received by each adult individual in the FRS sample and allocating a greater proportion of care to sample members with greater care requirements.

Regression specifications

Table A.2 below shows the regression specifications for the variables used in datasets other than the FRS. The set coefficients from each of these regressions is used to calculate a predicted probability of receiving each type of service based on the characteristics of FRS sample members, via a process known as 'out of sample prediction'. Full regression results are available from the authors on request.

It should be noted that, in order to provide maximum flexibility in the specification of service use between countries, where a dataset covers more than one country, the regressions are estimated separately for each country. So for example, the regression for police services is estimated separately for England and Wales.

Different types of regression specification are used according to the specification of the dependent variable:

- logit (binary)
- negative binomial (number of uses of service in a fixed time period, e.g. 12 months)
- interval regression (banded data).

Table A.2   Regression specifications for non-FRS service use variables in the public spending model

Service	Dataset	Dependent variable	Control variables	Regression type
Police services: England and Wales	CSEW 2015-16	Whether victim of crime in last 12 months	Gender Family type Age (x gender) Ethnicity Labour market status Health-limiting condition Housing tenure Region (in England regression)	Logit
Police services: Scotland	SCJS	Whether victim of crime in last 12 months	Gender Family type Age (x gender) Labour market status Housing tenure Region (in England regression)	Logit

Service	Dataset	Dependent variable	Control variables	Regression type
Transport: England, Scotland, Wales	NTS 2010-16*	(1) Frequency of bus use (2) Frequency of train use (3) Number of car journeys	Gender Family type Number of children in household Age (x gender) Labour market status Household net income quintile Region (in England regression)	(1), (2), (3): Interval regression
Health: England	HSE 2013-14**	(1) Number of GP visits in last 12 months (2) umber of hospital outpatient visits in last 12 months (3) Number of hospital inpatient visits in last 12 months	Gender Family type Age (x gender) Age of youngest child Ethnicity Labour market status Health-limiting condition DLA/PIP/Attendance Allowance receipt Household net income quintile Housing tenure	(1): Interval regression (2), (3): negative binomial
Health: Scotland	SHS 2015	(1) Number of GP visits in last 12 months (2) Whether hospital outpatient in last 12 months (3) Whether hospital inpatient in last 12 months	Gender Family type Age (x gender) Age of youngest child Ethnicity Labour market status Health-limiting condition Household net income quintile Housing tenure	(1): Negative binomial (2), (3): logit
Health: Wales	WHS 2015	(1) Number of GP visits in last 2 weeks (2) Whether hospital outpatient in last 12 months (3) Whether hospital inpatient in last 12 months	Gender Age (x gender) Number of children in household Age of youngest child Socio-economic classification Highest qualification Labour market status Health-limiting condition Housing tenure	(1): Negative binomial (2), (3): logit

Notes:

* Prior to and including the 2012 wave, the NTS survey collected data for England, Wales and Scotland, but from 2013 onwards it became an England-only survey. Therefore, the transport regressions for Scotland use data for 2010-12 only whereas the transport regression for England uses 2010-16 data.

** The HSE sample for 2013-14 was used because the HSE for 2015 does not include a household identifier variable to enable the adult interview dataset to be combined with the child interview dataset. This makes it impossible to construct variables for family type or age of youngest child using the HSE 2015 dataset.

Usage and extrapolation of public spending plans in England, Scotland and Wales

The public spending model uses data from spending plans for England, Scotland and Wales as follows:

- In England, Table 1.12 of HM Treasury (2017) shows UK Government departmental spending plans up to and including 2019-20. For the spending categories used in the Landman Economics public spending model, the relevant UK Government departments are responsible for spending in England only (for example the Department of Health and Social Care spending plans are for the NHS in England, because health spending in Scotland and Wales is a devolved competency).
- In Scotland, the 2018-19 draft budget (Scottish Government 2018) shows Scottish Government spending plans up to and including 2018-19.
- In Wales, the 2018-19 budget (Welsh Government 2017) shows Welsh Government spending plans up to and including 2019-20.

Note that the modelling in this report only includes spending plans published up to and including the end of January 2018 because that was when the current version of the Landman Economics public spending model was finalised. This means that subsequent publications such as PESA 2018 (published in July 2018) or the Welsh Government's supplementary 2018-19 Budget (published in June 2018) are not included. The model also does not include the announcement of additional NHS spending by the UK Prime Minister in June 2018 – partly because the announcement was made too late to be included in the modelling, but also because details of the precise timing of the increase, and how it is to be funded (either by tax rises, cuts to spending or additional borrowing) have not yet been announced.

Because the spending plans used in the report are only available up to 2019/20 (in the case of England and Wales) and 2018/19 (in the case of Scotland), it is necessary to extrapolate trends in public spending out to 2021/22 (which is the tax year used for the results shown in this report. The extrapolation assumes that the trend in spending in each functional category between 2015/16 and the final year of the public spending plans for each country is maintained. So for example, for schools in England, PESA 2017 suggests a real-term cut in spending per household (allowing for growth in the school-age population) of £86 between 2015/16 and 2019-20. We extrapolate this spending cut for a further two years to produce an overall

real-term cut in schools spending per household of £128 between 2015/16 and 2021/22 (this is the figure used in Figure 3.3).

Sample size and model robustness

The results from the Landman Economics public spending model are more robust for England than for Scotland or Wales because a much larger number of households in England are surveyed in the FRS than households in Scotland and Wales, This means that the results for Wales and Scotland based on FRS data are subject to a larger degree of uncertainty than for the England results.

This discrepancy in sample sizes also applies to the NTS data used for the transport spending results, and the Welsh part of the CSEW data used for the police spending results. For other spending categories where the results for Scotland and/or Wales are based on a dedicated country-specific survey – the SHS for the Scottish health spending results, the WHS for the Welsh health spending results, and the SCJS for the Scottish police spending results – the sample sizes are broadly comparable with the equivalent English survey and the results for Scotland and Wales are no less robust than for England.
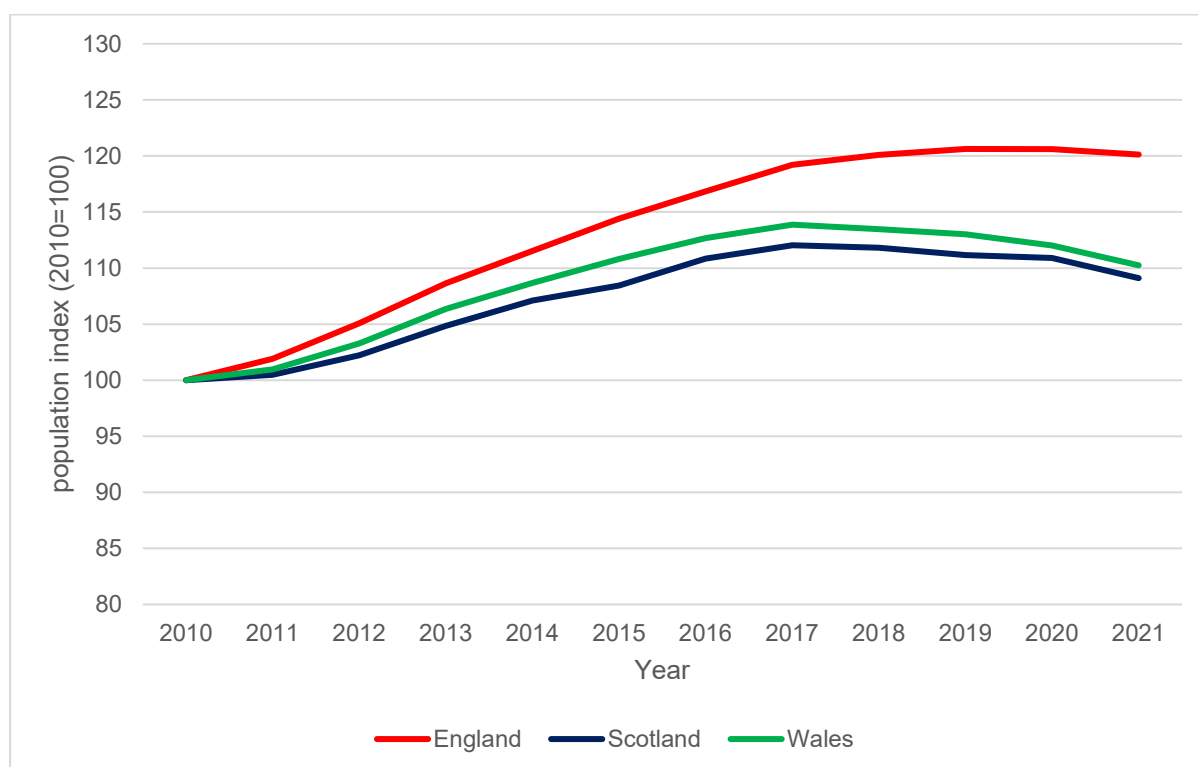
Appendix B. Population trends broken down into 5-year age bands

Figure B.1   0-4 year olds: Projected population growth in England, Scotland and Wales, 2010-2021
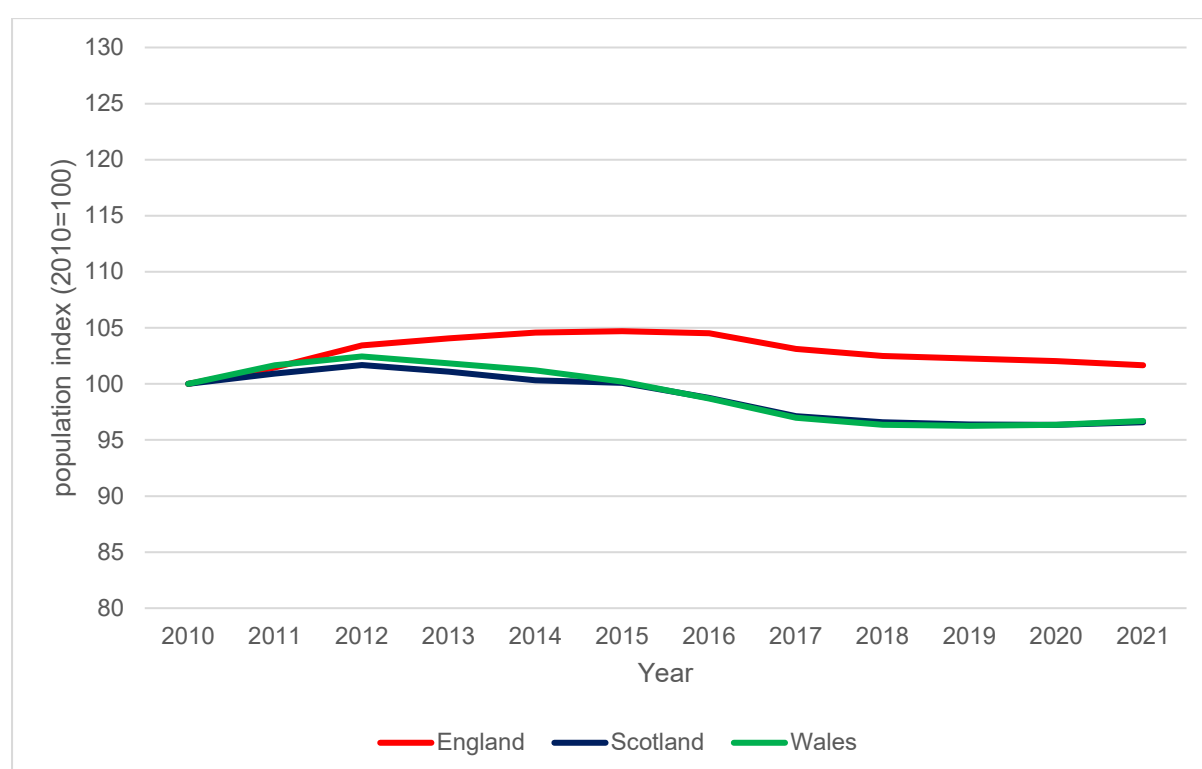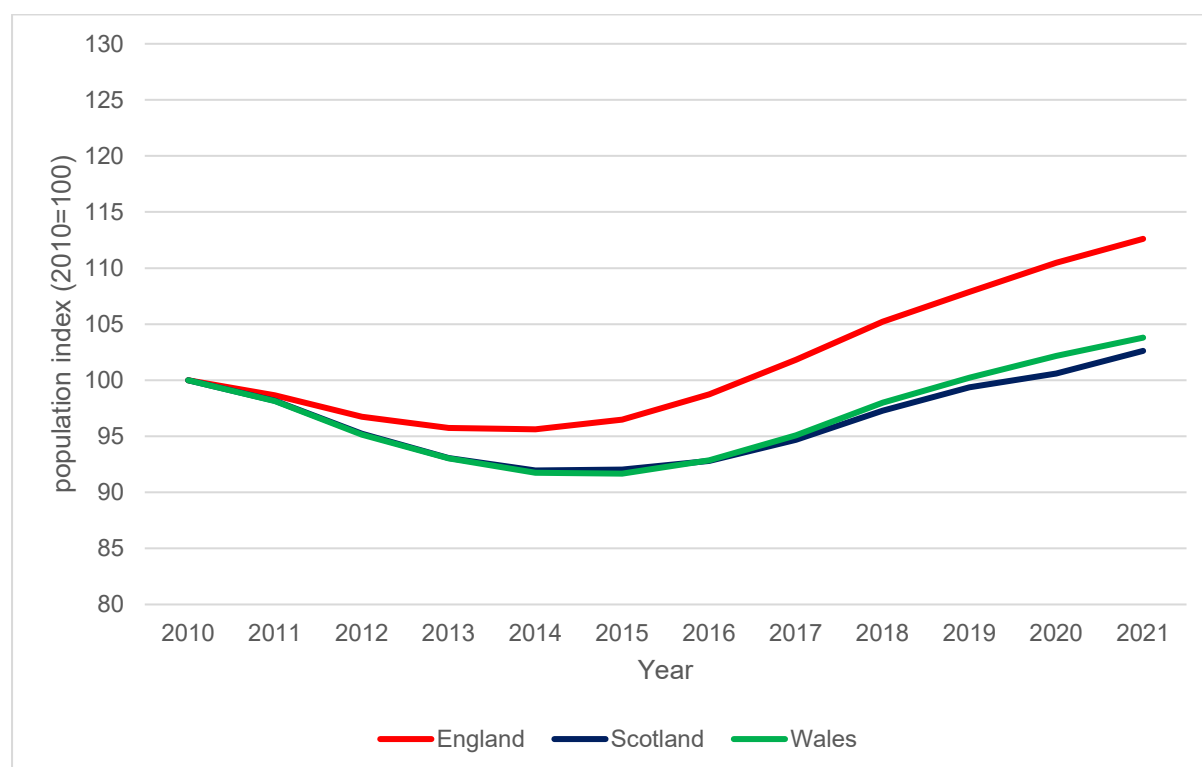

Source: ONS, 2017.

Figure B.2   5-9 year olds: Projected population growth in England, Scotland and Wales, 2010-2021
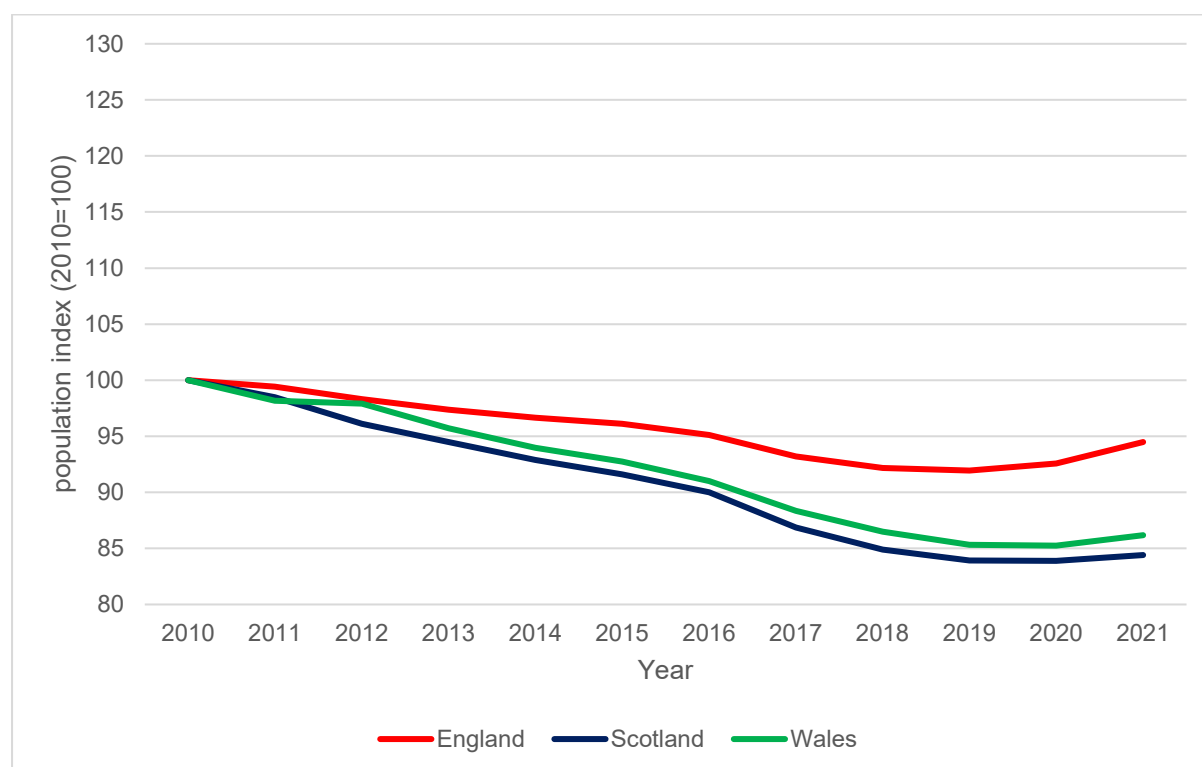

Source: ONS, 2017.

Figure B.3 10-14 year olds: Projected population growth in England, Scotland and Wales, 2010-2021

Source: ONS 2017.

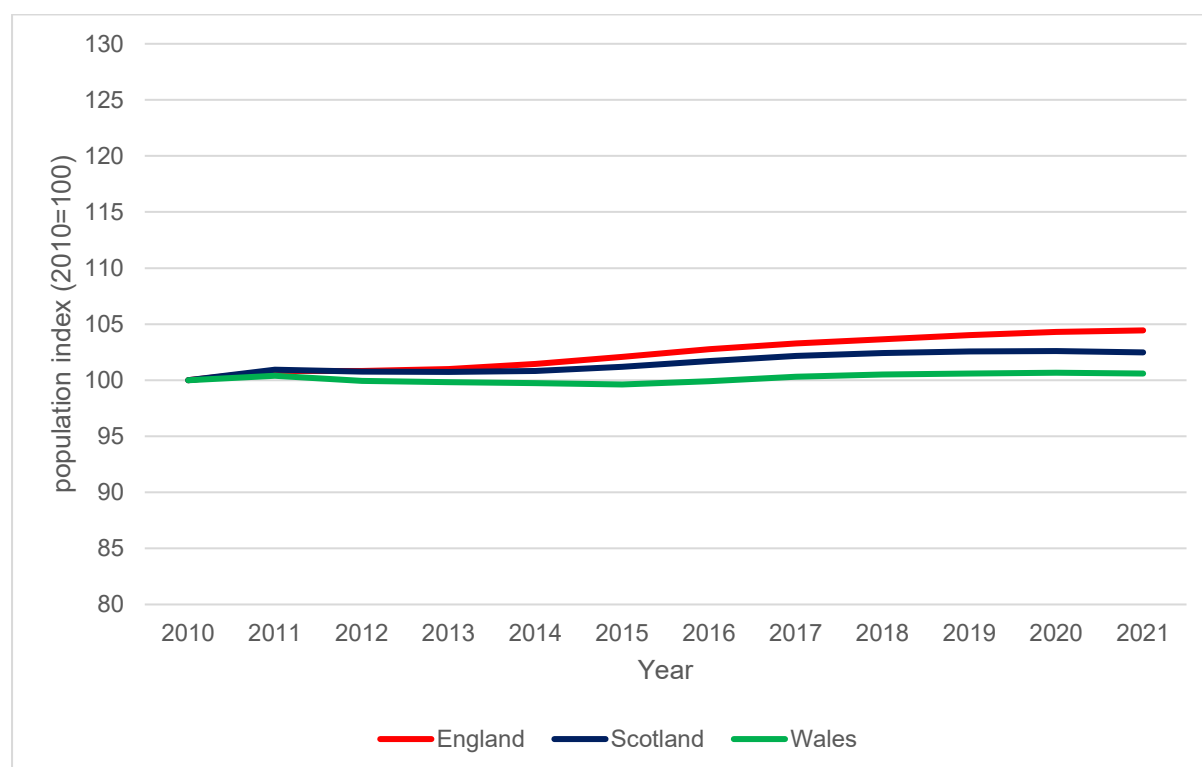**Figure B.4 15-19 year olds: Projected population growth in England, Scotland and Wales, 2010-2021**
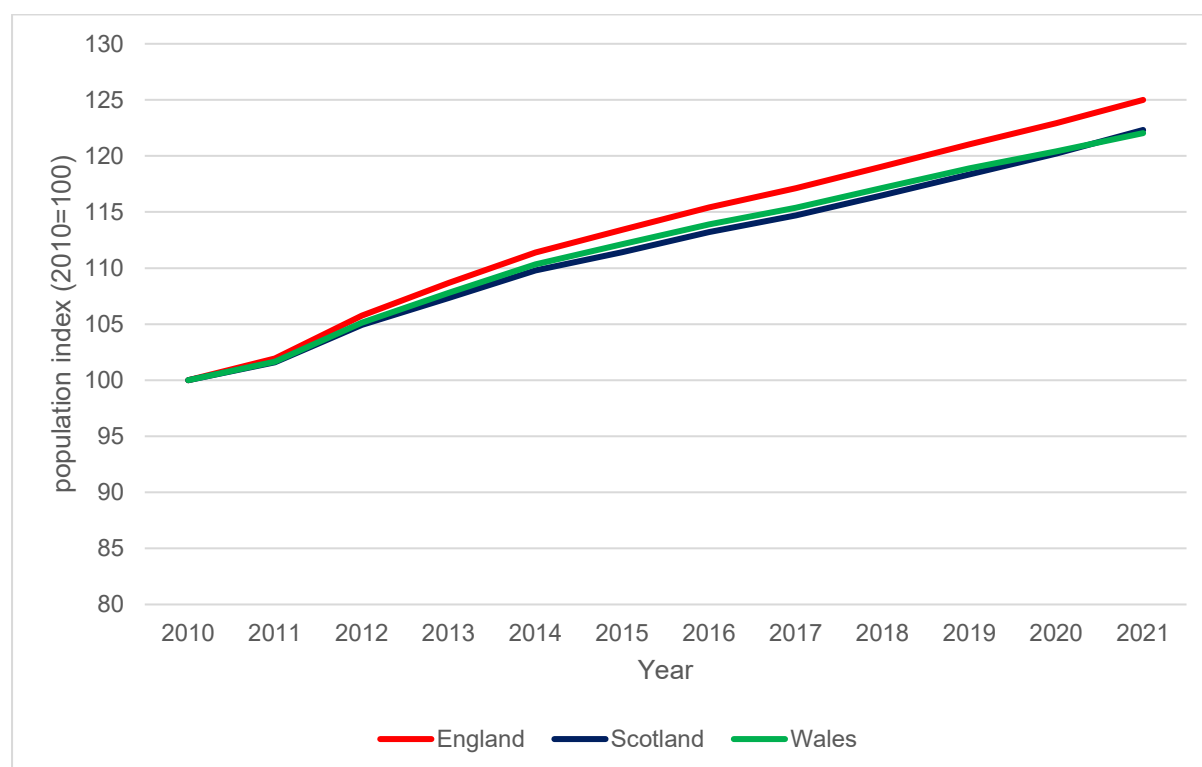

Source: ONS, 2017.

Figure B.5 20-64 year olds: Projected population growth in England, Scotland and Wales, 2010-2021

Source: ONS, 2017.

Figure B.6   65+ year olds: Projected population growth in England, Scotland and Wales, 2010-2021

Source: ONS, 2017.

Contacts

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