

# The geographic impact of the pandemic on household spending

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# Executive summary

The past nine months have seen huge swings in households' spending, both in total and across various goods and services. In this briefing note, we analyse the geographical patterns of these changes. We compare the extent of the recovery from the first national lockdown in different parts of Great Britain, as well as the effects of the second English lockdown and the numerous other localised public health restrictions we have seen. We examine the implications of these changes for geographic inequalities. In addition, we provide the first analysis of the causal impact of public health restrictions in the UK on spending: we measure the effect of shutting hospitality and non-essential retail venues on spending on categories of goods and services, showing how consumers substitute to different items when these restrictions are imposed.

Our analysis uses anonymised user data from the Money Dashboard (MDB) budgeting app. These track transactions of app users in real time, allowing us to build a detailed picture of their spending patterns from before the crisis to the end of November. We combine this with a novel database of public health restrictions by local authority over time. We also use Google mobility data to track trends in footfall to different venues.

## Key findings

- 1 The biggest declines in spending when the crisis struck in the spring were seen in the South of England – and the South has had the weakest recovery since, with spending in November still 7% below pre-crisis (compared with 3% across the country as a whole). Scotland and Wales, by contrast, have recovered to roughly their pre-crisis levels.

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- 2 The big declines seen for the South are driven by London. Londoners' spending fell by around 40% in April and in November was still over 10% below its pre-crisis level. This is in part due to large falls in restaurant & recreation spending by Londoners. The picture is even starker when we compare footfall *in* London (rather than *by* Londoners) with other areas, thereby capturing the impacts of reductions in tourism and commuting. Even before the second English lockdown, inner London footfall in retail & recreation venues was more than 40% below pre-crisis – compared with 10–20% in outer London and the rest of the South. Over the same period, footfall at public transit stations had also fallen by more than half in inner London, versus 40% in outer London and 30% in the rest of the South. These patterns will put a strain on London businesses as well as councils and Transport for London.
- 3 Higher-paid areas and less-deprived areas have seen a larger fall in spending than others, with reduced spending in sectors most affected (such as restaurants) having the largest impacts on spending patterns of better-off individuals. These trends have gone some way to reducing geographic inequality in spending: in January the highest-paid third of areas had spending 26% above the lowest-paid third, while in November that gap had dropped to 14%. But since high-income households have saved more, these trends could reverse as the economy opens up and those savings are spent.
- 4 The first lockdown had an enormous impact, with total spending falling by about a third in April. By contrast, the second English lockdown has had much more modest effects: spending rose in England by 2% between October and November. While that was much weaker than the 10% rise seen in Scotland over the same period, it clearly suggests a much smaller effect than the first lockdown. Part of the reason for that is that the restrictions were less severe, but businesses and consumers also seem to have adapted: restaurant and clothing spending did both fall, but by far less than seen in April. This may reflect more restaurants providing takeaway services (or consumers using them more) and consumers more readily switching online for clothes purchases.

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5 When we examine the effects of specific public health restrictions, we find that shutting hospitality venues has quite small effects on total spending. While restaurant & recreation spending unsurprisingly does fall significantly, the decrease seems to be offset by increased spending on online retailers. But closing non-essential retail on top of that does cause a sizeable (5%) drop in total spending. It causes falls in clothing spending, transport spending and cash withdrawals, only partially offset by increased spending on groceries and (especially) online retailers. Since these retailers tend to only have a limited presence in the local area, the degree to which this substitution mitigates the effects of public health restrictions for local economies and high streets is likely to be modest.

# 1. Introduction

The COVID-19 pandemic has induced substantial changes in households' spending. Previous work (Davenport et al., 2020) has shown that the recovery in aggregate spending stalled around the end of July. But beyond these changes in the aggregate, there have also been substantial shifts in the patterns of spending, with expenditure on groceries, takeaways and online retailers elevated relative to 2019, and expenditure on restaurants, pubs & other recreation, holidays and transport depressed.

In this briefing note, we analyse how spending patterns have changed differently across the country. We look both at spending in the different regions and nations of Great Britain and at spending across different types of area (for example, more and less highly paid areas). Finally, we use the fact that public health restrictions have varied both across places and within places over time to estimate how these policies affect spending levels and spending patterns. These results help quantify one aspect of the economic cost of these policies, and also show how shutting down one form of economic activity can have spillovers to other forms.

We proceed as follows. Section 2 describes the data we use. Section 3 shows overall spending patterns and Section 4 analyses differences in spending between different geographical areas and between areas with different characteristics. Section 5 estimates the impact of public health restrictions on spending. Section 6 concludes.

## 2. Data

### The Money Dashboard budgeting app

The data we use come from the Money Dashboard (MDB) budgeting app. In earlier work (Bourquin et al., 2020), we provide a detailed description of these. Here we recap only the core aspects of the data relevant for this briefing note. The MDB data provide information on (anonymised) user finances from bank accounts, detailing each transaction (credits and debits) from all linked-in financial accounts (current accounts, credit cards and savings accounts). MDB uses an algorithm to categorise (or ‘tag’) transactions, into categories such as groceries, salary and fuel. The data also record exactly when transactions happen, meaning they can be located precisely relative to the timing of key developments in the crisis. We use this to build a rich dynamic picture of users’ finances over the crisis and relate that to where they live.

When a user signs up to MDB, they provide their age, gender and postcode, and can then link in their financial accounts, including current accounts, credit cards and savings accounts. They can do this for their own accounts as well as those of a partner – and indeed they generally have a strong incentive to do so, since the point of the app is to help with budgeting and financial management.

Our sample of users is comprised of those who meet the following conditions:

- All of the user’s current and credit card accounts have been updated in the MDB app in December 2020.
- The user is present in each month of 2020 and has at least £100 of debits leaving their accounts (excluding transfers) in all months, but we allow one month where debits can be below this level.
- Each of the user’s current or credit card accounts was used at least once in the six months prior to the period of analysis.
- The user’s registered postcode is in England, Wales or Scotland and they were between the ages of 18 and 65 in 2020.

This gives us a sample of around 12,100 users, which we use for our main graphical analysis. When analysing the effect of public health restrictions, we use a larger sample (19,500 users) who meet these conditions from the beginning of June 2020 onwards. When analysing differences from 2019, we use a smaller sample (6,900 users) who meet these restrictions in both 2019 and 2020, so we can make comparisons across years without changes being driven by a change in sample.

We categorise spending using the same spending categories as in Davenport et al. (2020), with one exception: any transaction that is identified as coming from an ‘online-only retailer’ (e.g. Amazon) is removed from any other spending category, and such transactions are grouped together. This means that, as far as possible, our measure of spending on, for example, clothing is from a merchant that has physical shops (though in general we cannot distinguish between a purchase in-store or online). We weight the data such that our sample matches the distribution of age groups and regions in the population. We measure spending up to the end of November 2020. All spending is inflated to October 2020 prices using ONS CPI subcomponent data as in Davenport et al. (2020).

### Google mobility data

The Google mobility data are publicly available and show how visits to and length of stay at different places have changed compared with a baseline. These ‘mobility trends’ are produced by Google using phone location data, and compare visits each day with the median visits for the same day of the week in January 2020.

We use trends data for the following categories of place:

- retail & recreation – places such as restaurants, cafes, shopping centres, theme parks, museums, libraries and cinemas;
- transit stations – places such as public transport hubs (e.g. underground, bus and train stations);
- grocery & pharmacy – places such as grocery markets, food warehouses, farmers’ markets, specialty food shops and pharmacies.

We use the data produced at the level of lower-tier local authorities (LAs) and present weighted means of the areas within each region or nation, where we weight LAs based on their resident population or their workday population.

A change to Google’s methodology means there is more often missing data between 17 August and 10 September, so trends over this period are not comparable with trends over earlier or later dates. This is highlighted on the figures, and the data relating to these weeks are excluded from the regression analysis in Section 5.

### Local authority characteristics

In Section 4, we analyse spending in lower-tier local authorities split by different characteristics. The data sources we use for this are as follows:

- Pay: median gross weekly pay for all employees in the year to 5 April 2018, from the ONS Annual Survey of Hours and Earnings.
- Employment: the employment rate for those aged 16–64 in 2019, from the ONS Annual Population Survey.
- Skills: the proportion of the population aged 16–64 with NVQ4+ (degree-equivalent) qualifications, from the ONS Annual Population Survey.
- Population density: mid-2019 population density from ONS Population Estimates.
- Deprivation: average deprivation score of Middle Super Output Areas in a local authority, from the 2019 English Indices of Deprivation (England only).

### Public health restrictions

We build a data set that summarises the public health restrictions in force in each local authority on each day this year. This data set records whether non-essential retail (e.g. clothes shops) was shut, whether hospitality venues (e.g. pubs, restaurants) were shut, and whether households were allowed to mix in hospitality venues and, if so, whether only outdoors or also indoors.<sup>1</sup> These restrictions build on one another in the sense that non-essential retail is only ever shut when

<sup>1</sup> We do not count the early closing of restaurants and pubs as ‘shutting’ hospitality venues, nor the requirement that pubs only serve alcohol to those eating a ‘substantial meal’ (as occurred in English Tier 3 areas during our sample period and, after our sample period, in English Tier 2 areas).

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hospitality is shut, and hospitality is only shut when household mixing in hospitality is also banned. This data set is available for download.<sup>2</sup>

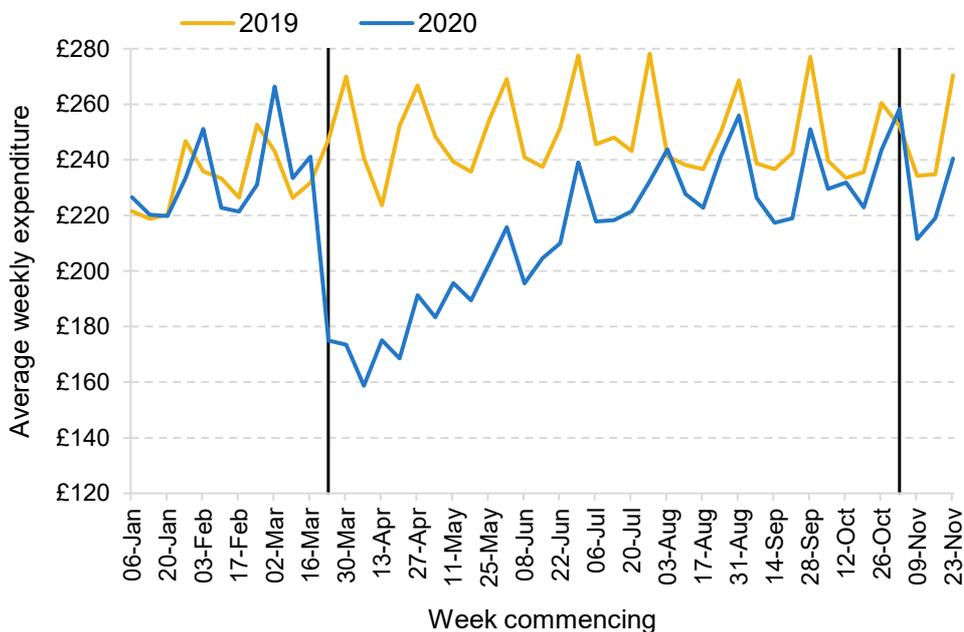
Early in the crisis, restrictions were not recorded in one place, and so we use a combination of news reports, the Wikipedia page on the timeline of the crisis in the nations of the UK, and government web pages, including some older versions accessed via the Internet Archive. For more recent periods, we use official government websites that state precisely what the restrictions have been in different areas. There may be some measurement error for the restrictions in place for a small number of (largely North Western) local authorities in the August to September period.

<sup>2</sup> [https://ifs.org.uk/uploads/BN313\\_local\\_restrictions.xlsx](https://ifs.org.uk/uploads/BN313_local_restrictions.xlsx).

### 3. Overall spending patterns

Before examining trends in spending across regions, we briefly outline what has happened to national spending over the course of 2020, relative to 2019. This was explored in depth in Davenport et al. (2020), and so here we just provide an update on what happened during October and November as restrictions around Britain tightened and England went into a national lockdown for most of November. For this analysis, we use the smaller sample we observe for 2019 and 2020, as described in Section 2.

**Figure 3.1. Total weekly spending**



Note: Black lines indicate the beginning of the UK-wide lockdown and the English lockdown.

Source: Authors' calculations using Money Dashboard data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure 3.1 shows how total weekly spending has evolved over 2020 and 2019. While spending continued to recover until around the start of August, the recovery has largely stalled since then and total spending in November remained about 3% below the same time in 2019 (and pre-crisis). Notably, spending in November – when the second English lockdown was in place – did not change dramatically, as it had during the first lockdown (the beginning of each lockdown is indicated by a black line).

Part of the reason for this is that Scotland and Wales were not in lockdown in November (in fact, Wales was exiting lockdown); as we show in Section 4, both nations saw a more positive trend in that month than England did. For example, spending in England increased by 2% between October and November, considerably weaker than the 10% growth seen in Scotland over the same period, even though some parts of Scotland were subject to tightening restrictions. But clearly the second lockdown had a far smaller effect than the first one, when spending fell by around a third. There are likely to be several reasons for this. First, there was probably a smaller effect on incomes – for example, the claimant count in November rose 2% on the month, compared with 69% in April. Second, there were already some restrictions in place, and so the marginal effect of the full lockdown was smaller. Third, in any case, the restrictions were weaker. And fourth, businesses and consumers have been able to partly adapt to these restrictions. Some evidence for this claim can be found by investigating the different categories of spending.

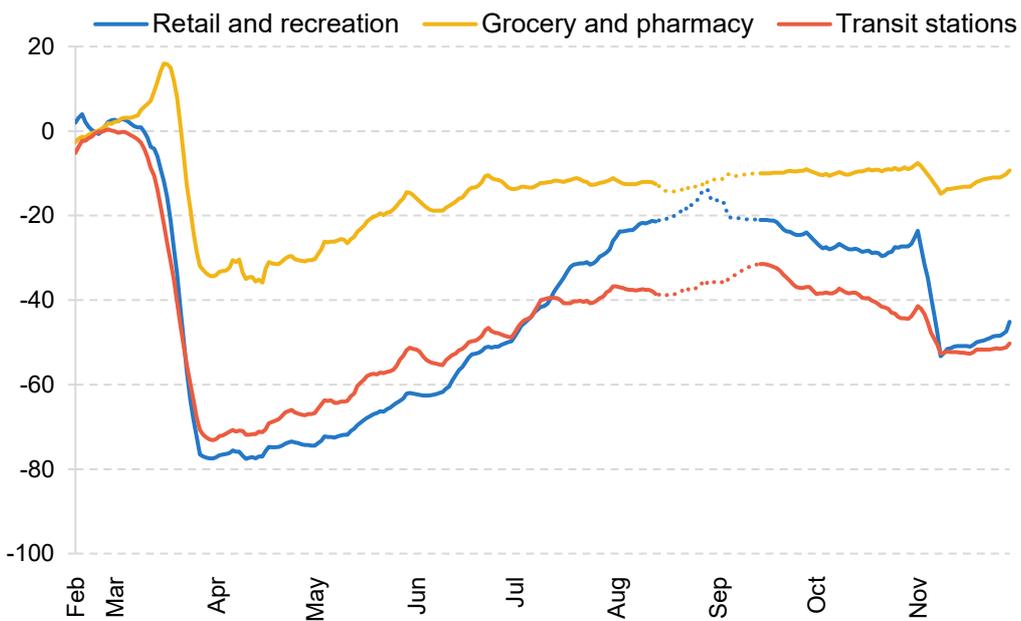
Despite the fairly muted change overall, there was a large drop-off in spending in the hospitality sector (examined in Figure A.1 in the appendix), and a fall in spending on clothing & appearance too (Figure A.2), which would be expected as businesses in these sectors were forced to close. But these falls were much smaller than those seen in April, as restaurants provided more takeaway services and consumers switched their clothes purchases online. There was also a large rise in spending on online-only retailers (Figure A.3).

Other sectors, such as groceries and takeaways, also saw some rise in spending during November (examined in Figures A.4 and A.5 in the appendix). Thus, to a significant extent, spending in closed-down sectors appears to have simply moved to other sectors during the second national lockdown, rather than disappearing. This suggests that the economy has begun the process of adapting to the pandemic, and that people's behaviour in response to lockdowns has changed relative to the

March–May period. We examine substitution to other categories of goods and services in response to public health restrictions more formally in Section 5.

We see the same difference between the two national lockdowns in the Google mobility data. As shown in Figure 3.2, footfall to ‘retail and recreation’ destinations fell by nearly 80 percentage points (ppts) relative to January 2020 during the first national lockdown in March, but only by 30ppts in the second English lockdown. However, this is still a substantially larger fall than is observed for consumer spending, illustrating again the importance of spending substitution – such as switching to online retailers – which can blunt the impact of restrictions on total expenditure.

**Figure 3.2. Index of mobility trends to different types of place (UK)**



Note: Seven-day rolling averages of Google mobility trends data, which measure percentage point change in visits and length of stay relative to a baseline in January 2020. Series is for the whole UK, including Northern Ireland. Missing data for many areas between 17 August and 10 September mean trends over this period are not comparable with trends in the rest of the year.

Source: Authors' calculations using Google mobility data downloaded on 8 December 2020.

## 4. Geographical patterns in spending

In this section, we analyse changes in aggregate consumer spending across different geographic areas. First, we look across the regions and nations of Britain. Second, we analyse spending between more local areas according not to where they are located but to their different characteristics, such as higher- and lower-paid areas. We examined the relationship between local COVID case prevalence and spending in Davenport et al. (2020).

It is worth flagging that the MDB data provide information on where in the country the spender lives, rather than where in the country they spend, though of course the two will be highly correlated – especially given the more limited movement of people at present relative to normal times. The location of the consumer is also more meaningful than the location of the spending for the now-large proportion of spending that is conducted online. In particular, online spending is likely to be a closer substitute for offline spending where the consumer lives, rather than where the online vendor is located; it is offline businesses where the consumer lives that are losing out on business they could otherwise have expected. However, not all offline spending takes place where people live – many people commute to and visit other areas for work, shopping and recreation. We therefore supplement our residence-based spending analysis with the Google mobility data described in Section 2, as these are more suited to measuring changes in activity in different physical locations, including the activity of commuters and visitors.

How trends in spending and activity vary geographically (and, as discussed in Section 5, in line with public health restrictions) has implications not only for the consumers and businesses directly affected, but also for other organisations with a stake in local economies, including councils. For example, councils have been tasked with targeting grants at businesses adversely affected by public health restrictions, and have long sought to support the vibrancy of high streets. Furthermore, councils' revenues also depend to some extent on local economic activity – via business rates receipts, and the amount raised via fees and charges for

a range of services they provide to businesses and consumers. Our analysis therefore provides useful information on how some key COVID-19-related policy and financial challenges for councils vary across the country.

For each of the spending analyses, we show an index of spending starting in January 2020 (and indexed to the January–February average). This allows us to look at proportional changes in spending over the course of the pandemic. However, it means that the overall trends are sensitive to seasonal patterns in spending – and this is particularly important because the two pre-crisis months (January and February) tend in any case to be low-spending months. To account for this, we apply a simple seasonal adjustment, using the sample we observe in 2019 and 2020 as described in Section 2. We compute average spending across the whole population for each month of 2019. We use the differences across months in 2019 as an indicator for seasonality, and subtract these differences when looking at 2020 spending. This adjustment does not change the differences *between* areas, but does ensure that overall spending patterns are not too affected by seasonality.

## Spending across regions and nations

We begin by analysing how spending has differed across broad geographies. Figure 4.1 shows trends in total consumer spending across three regions of England and in Wales and Scotland.<sup>3</sup>

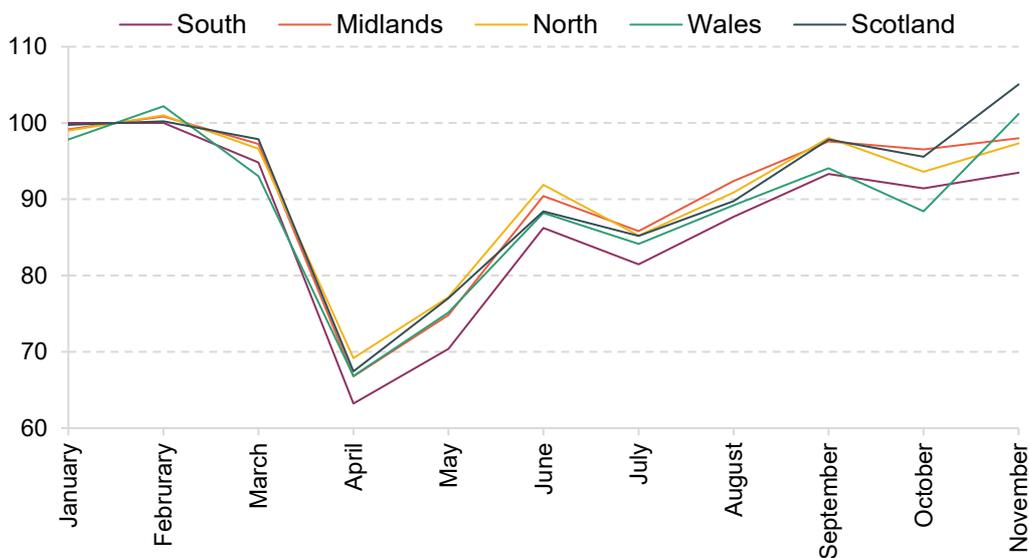
The basic pattern, of significant falls in spending in April followed by a slow recovery, is seen across all broad areas of Great Britain. But different areas have seen spending fall to different extents:

- Among the English regions, the South saw the largest decline in April (3–6ppts more than the other regions). By November, that gap relative to other regions has not closed. This is likely driven by the fact that the South is the highest-paid region and – as we show later – higher-paid areas have tended to see larger falls in spending.

<sup>3</sup> We exclude Northern Ireland because the sample of Northern Irish users is very small.

- Up to October, Scotland, the Midlands and the North of England saw similar paths to one another. But in November, the recovery stalled in England as the second lockdown was imposed, while Scotland saw a significant rise in spending.
- Spending in Wales rose in November, following the decline in October during the ‘circuit breaker’ lockdown, but over much of the crisis Wales has lagged behind all the other regions except the South of England.
- By November, spending in Scotland and Wales was roughly in line with pre-crisis spending, while spending in England remained below that level, especially in the South of England. Because, pre-crisis, the South had the highest level of spending and the North and the Midlands somewhat lower, these changes have served to slightly reduce the dispersion of spending between regions.

**Figure 4.1. Index of real consumer spending, by nation and region**

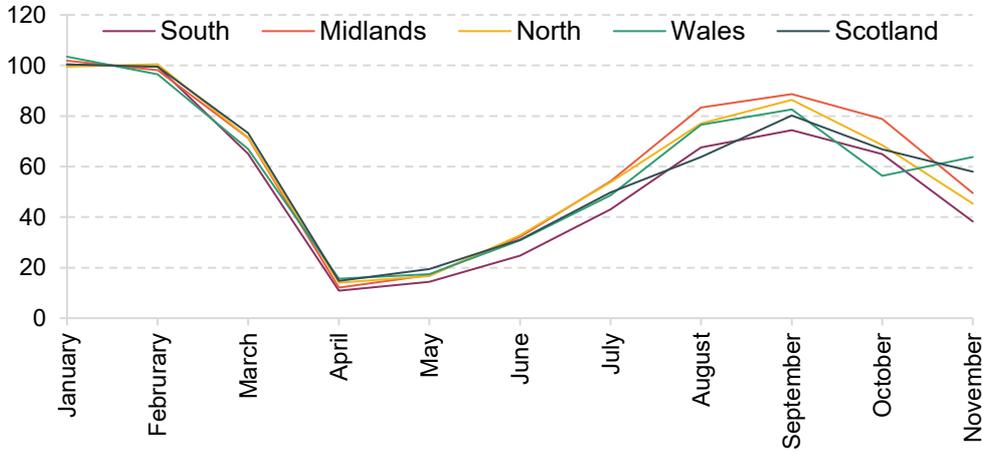


Source: Authors' calculations using MDB data downloaded on 11 December 2020.

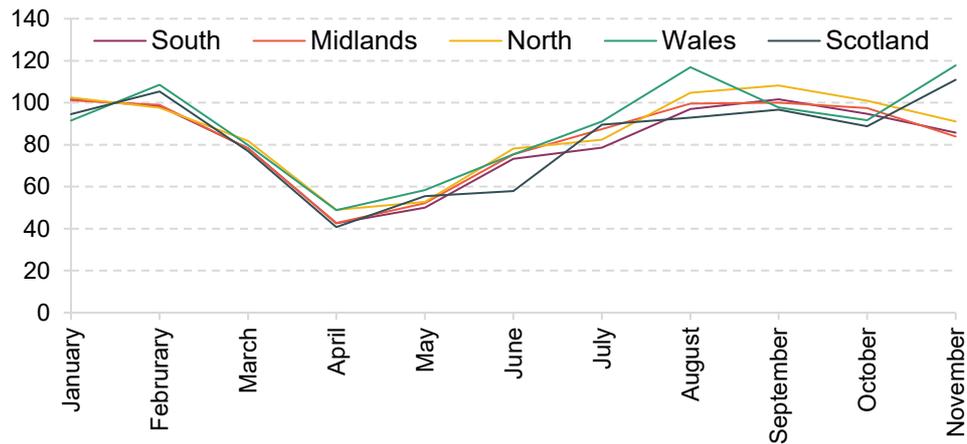
Figure 4.2 shows three specific categories of spending – restaurants, pubs & other recreation; clothing & appearance; and online retailers. Here we see the impact of public health restrictions: spending on restaurants, pubs & other recreation fell in Wales in October during the ‘circuit breaker’ lockdown, and in England during the second English lockdown in November. That lockdown came at the same time as significant increases in online spending in England, while Wales (with fewer restrictions in November) saw a decline in online spending. We also see the gap

Figure 4.2. Index of real spending, by nation and region: specific spending categories

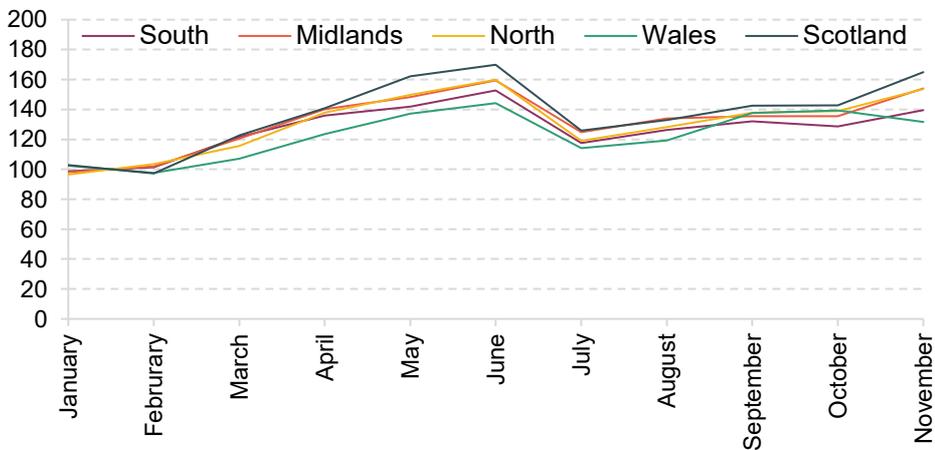
Restaurants, pubs & other recreation



Clothing & appearance

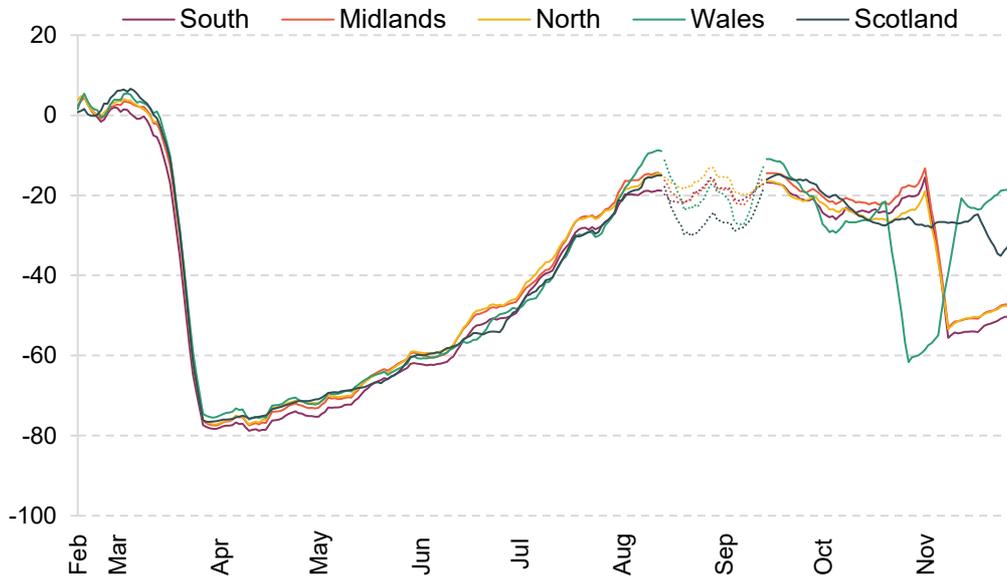


Online retailers



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

**Figure 4.3. Index of mobility trends to retail and recreation places, by nation and region**



Note: Seven-day rolling averages of Google mobility trends data, which measure percentage point change in visits and length of stay relative to a baseline in January 2020. Nation and region figures are means of mobility trends for lower-tier local authority areas, weighted by mid-2019 resident population. Missing data for many areas between 17 August and 10 September mean trends over this period are not comparable with trends in the rest of the year.

Source: Authors' calculations using Google mobility data downloaded on 8 December 2020.

between the North and other parts of England shrinking in October and November for the non-online categories, as many parts of the North *already* had significant restrictions, thus lessening the marginal impact of the full lockdown.

These patterns can also be observed in the Google mobility data. As shown in Figure 4.3, footfall to 'retail and recreation' destinations (which include non-essential retailers such as clothing stores) fell in mid October in Wales during the 'circuit breaker' lockdown, and later in England.<sup>4</sup> The declines in footfall were

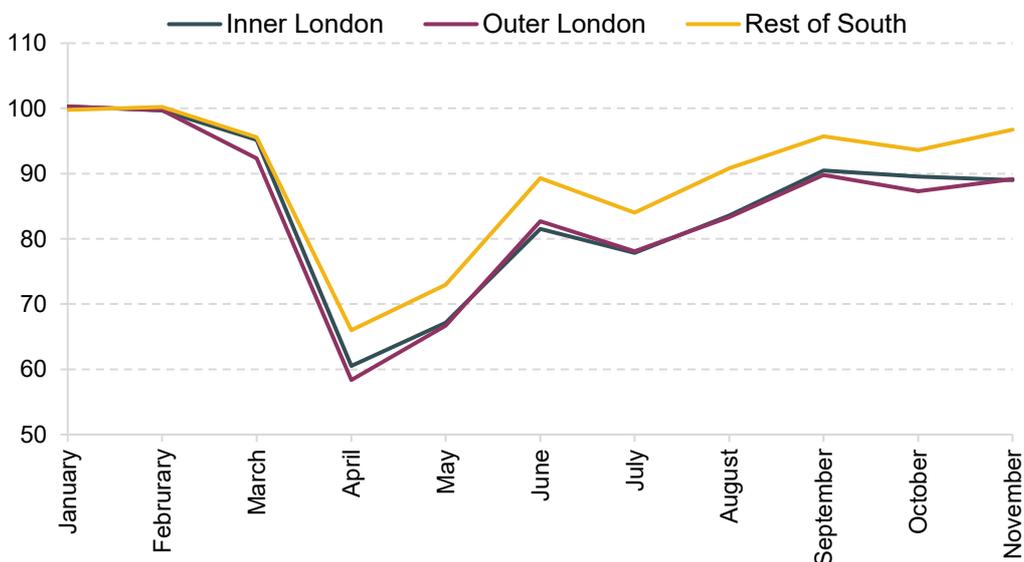
<sup>4</sup> Earlier in the year, the Google mobility data show smaller but still notable impacts of the different times at which non-essential retailers could reopen: first in England on 15 June; then in Wales on 22 June; and finally in Scotland on 29 June. They also show that whereas footfall was higher in the North of England than in the South for most of the year, this pattern was reversed in the second half of October when COVID-19 case rates were higher and restrictions on restaurants and pubs were tighter in areas such as Greater Manchester, Lancashire, Merseyside and South Yorkshire.

larger than the declines in spending on either restaurants & recreation or clothing & appearance, likely reflecting a shift in spending towards online and other delivery or collection services.

One concern might be that the picture for the South is being driven by London. We turn to that question now, but it is worth first re-emphasising that our data relate to where the MDB user lives, not where they spend the money. This is particularly important in London, where commuting into inner London from outer London or indeed the rest of the South is common.

It turns out that the patterns for the South *are* essentially driven by London. This can be seen in Figure 4.4, which splits total spending in the South into inner and outer London and the rest of the South. The ‘rest of South’ line looks very similar to the ‘Midlands’ line in Figure 4.1. But the two lines for London show larger declines in spending: in April expenditure was around 40% below pre-crisis levels and the gap relative to the rest of the South has not changed much since (at around 6ppts). Inner and outer London have seen similar patterns in spending, and by November remained over 10% below where they were before the crisis.

**Figure 4.4. Index of real consumer spending in the South of England**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

Again we can look at specific spending categories. Figure 4.5 shows spending by Londoners for restaurants, pubs & other recreation; public transport; and driving. Restaurant & recreation spending fell by similar amounts across the South, but the recovery has been stronger for people living in outer London than inner, and stronger for people living in the rest of the South than outer London. Even during August – when restaurant spending was subsidised by the Eat Out to Help Out scheme – spending by Londoners on restaurants, pubs & other recreation was 40% below where it was pre-crisis.

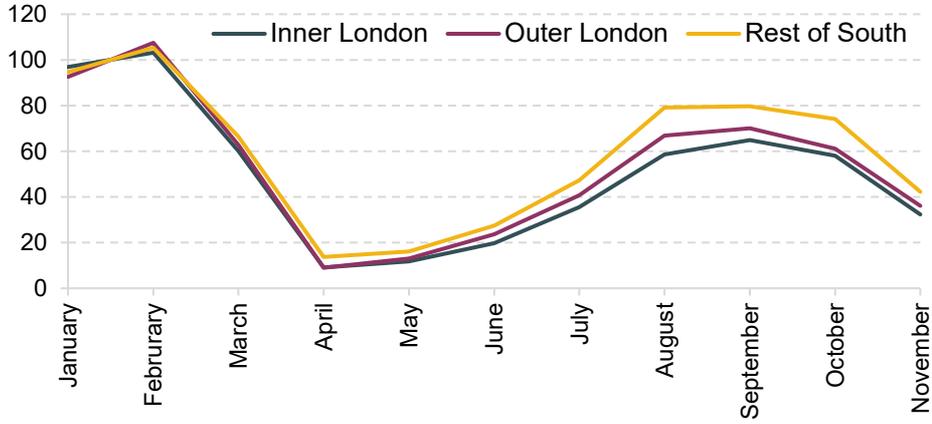
Spending by people living in inner London has, however, shown a considerably stronger recovery for both public transport and driving, with the latter being above its pre-crisis level in July to October. The greater recovery in public transport spending may reflect the lack of alternative transport options for many inner Londoners. Note that inner Londoners' spending on driving was, unsurprisingly, very low to start with, so relatively small absolute changes can cause quite large proportional changes.

However, Google mobility data, which record footfall to different types of locations, tell a somewhat different story. For example, during the summer, while footfall to retail and recreation destinations was about 10–20% below pre-crisis levels in outer London and the rest of the South, in inner London it was more than 40% below (see Figure A.11 in the appendix). Thus, while spending on restaurants & recreation has followed similar trends for people living in inner and outer London, footfall to recreation (and retail) destinations in inner London remains much lower than usual relative to outer London and the rest of the South. Similarly, Figure A.12 shows that footfall at public transit stations has declined by more in inner London than outer, and more in outer London than the rest of the South. Thus, while inner Londoners have seen a smaller decline than others in terms of their public transport spending, the reverse is true for *overall public transport use* in inner London.

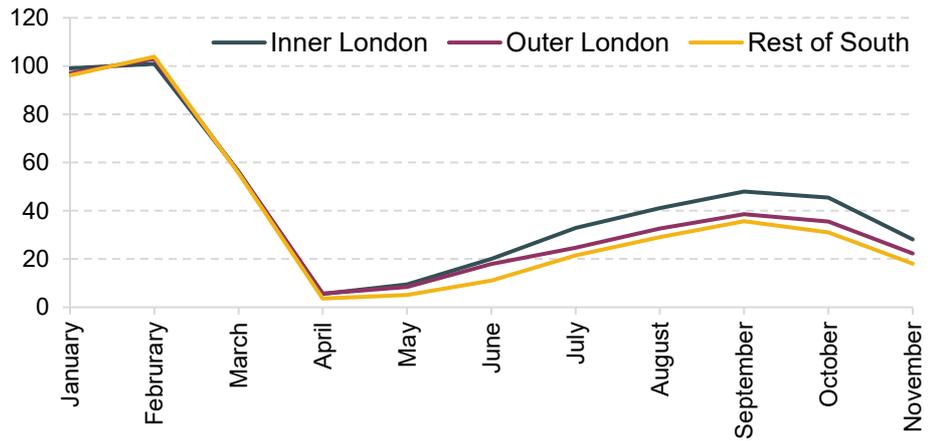
Both of these differences are presumably explained by a fall in people commuting to and visiting central London. And, as discussed before, it is total footfall and sales – from commuters and visitors as well as residents – that will ultimately matter for businesses, as well as other important stakeholders in the local economy such as councils and transport operators, such as TfL. In this regard, there may be particular challenges for businesses and other stakeholders in inner London (and potentially other urban centres).

**Figure 4.5. Index of real spending in the South of England: specific spending categories**

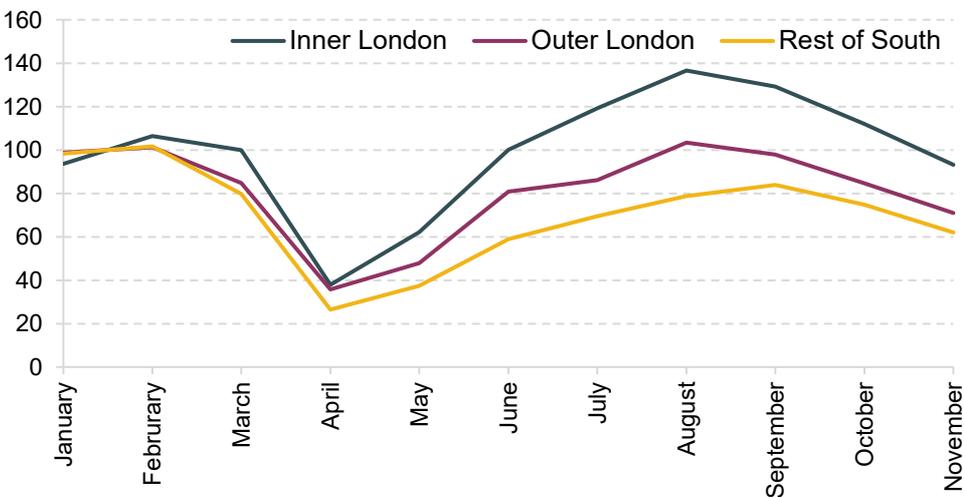
**Restaurants, pubs & other recreation**



**Public transport**



**Driving**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

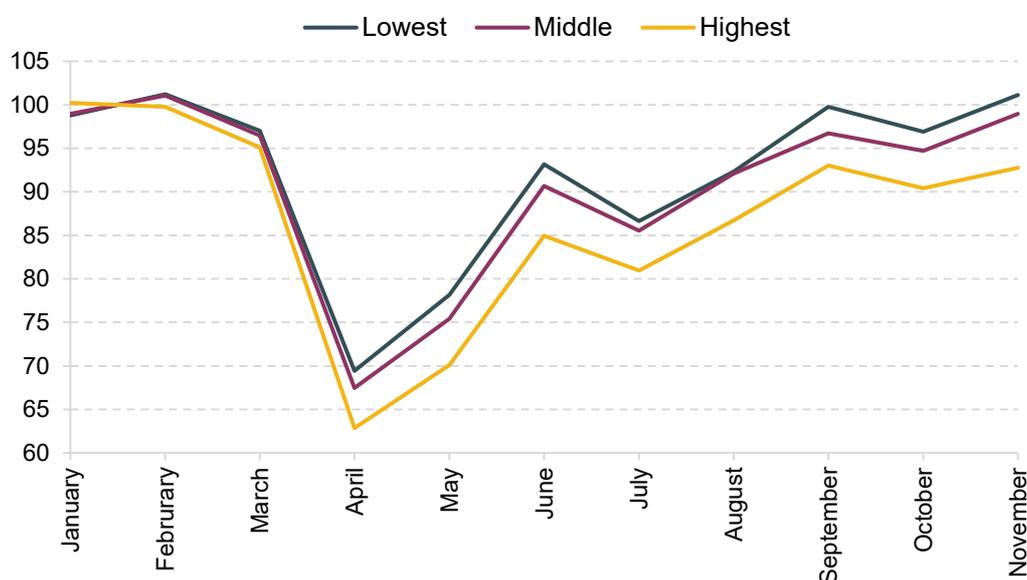
These results show some fairly significant differences in the paths that different regions have taken, but London really stands out as seeing a larger decline in spending than other areas. We also see that public health restrictions appear to have important implications for spending. This occurs fairly mechanically for, for example, closing restaurants and pubs, or closing retail – as evidenced by the patterns that England, Wales and Scotland have seen in recent months lining up with different timings in lockdown. But we also see that such restrictions encourage substitution to spending elsewhere, such as online retailers. We will analyse the effect of such restrictions in more detail in Section 5.

### Spending across areas with different characteristics

Having seen how total spending has varied across different regions and nations, we now look at how trends have varied at a more local level, grouping areas according to their (pre-crisis) characteristics. This helps us shed more light on the impacts of the crisis on geographic inequality, and what sorts of areas have seen faster or slower recoveries. We discuss reasons why these sorts of patterns might emerge, but we cannot unpick these factors completely: areas that differ in terms of, for example, pay are also likely to differ in a host of other dimensions, both in terms of their characteristics before the crisis and in terms of their experience of it.

We group local authorities into three groups (‘terciles’) based on their level of some characteristic, such as pay (the characteristics we use are described precisely in Section 2). We then collect together all users who live in each of the three groups of local authorities, and track spending patterns separately for the three groups.

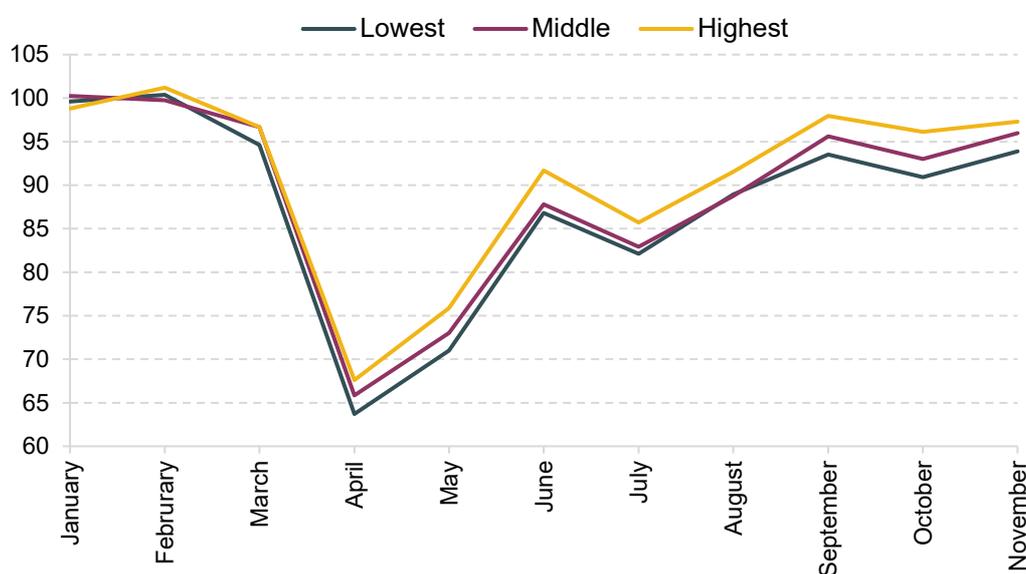
We begin by analysing total spending according to proxies of how well off different local authorities are, starting with local (pre-crisis) pay, in Figure 4.6. In Figures A.8 and A.9 in the appendix, we show the equivalent graphs splitting local authorities by employment and by the share of the population with a degree. Average pay and degree prevalence are strongly correlated with one another and so they tell similar stories. Employment varies less across local authorities and so there is no clear pattern.

**Figure 4.6. Index of real consumer spending, by terciles of local authority pay**

Source: Authors' calculations using MDB data downloaded on 11 December 2020.

Spending among those living in areas with higher pay declined more sharply during the first lockdown, with the top third seeing spending fall by over 35%, about 5–6ppts more than the middle and lowest thirds. That gap is sizeable: it is about the same size as that seen between the South and the North of England in the same period, and it has remained steady or even widened over the ensuing months. By November, spending in the highest-paid local authorities stood 7% below where it was pre-crisis, while in the lowest-paid it was roughly in line with pre-crisis spending (a little smaller than the 12ppts gap seen between the South and Scotland in November). This is consistent with what has happened at the individual (as opposed to area) level, as documented in previous research (Davenport et al., 2020): higher-income individuals have cut spending considerably more than lower-income ones – in part because of large declines in areas that were shut down or significantly affected by the pandemic (e.g. restaurants). This effect was again at play in November: when the second English lockdown came into force, the gap between the highest- and lowest-paid areas' recoveries widened slightly. The gap between high- and low-paid areas is partly, but not entirely, driven by London. If we exclude London, the gap between the top and bottom thirds in November drops from 8ppts to 6ppts.

**Figure 4.7. Index of real consumer spending, by terciles of local authority deprivation**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

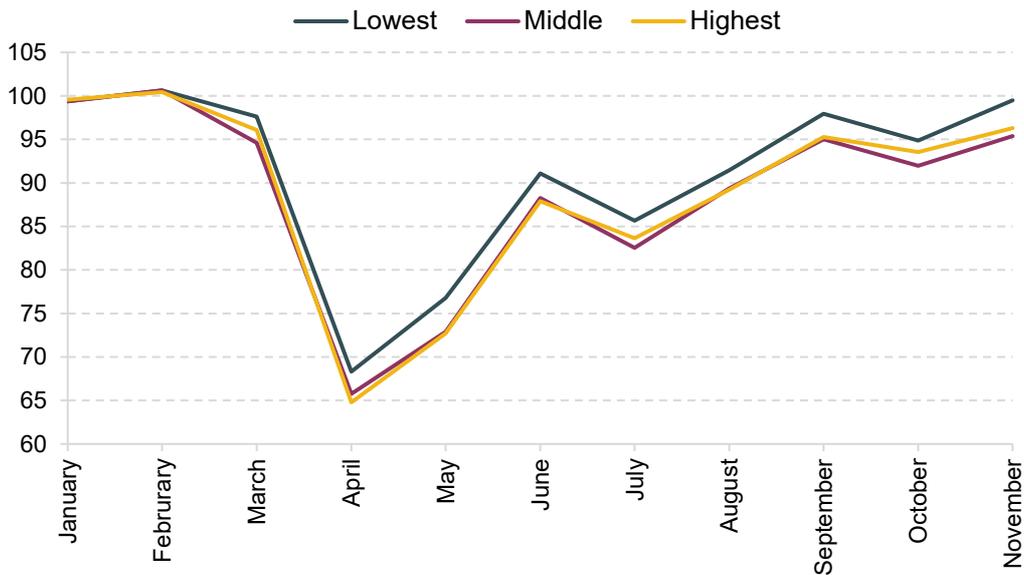
Figure 4.7 shows how changes in spending have played out across local authorities with differing levels of deprivation. This looks fairly similar to pay (though the size of the gaps is a bit smaller): the least-deprived areas have seen the greatest decline in spending, consistent with them tending to be more highly paid and have higher levels of employment. Taken together, this suggests that the broad short-term impact of the pandemic has been to shrink geographic disparities in the level of local economic activity. For example, the highest-paid areas had spending 26% above that of the lowest-paid areas in January; by November, that gap had fallen to 14%.

Of course, this is only the first part of the story. Expected future rises in unemployment could be shared differently across different areas, with implications for spending. And the other side of the coin to lower spending is higher saving; if high-income households end up spending down those savings as the economy opens up, that will cause some of these patterns to reverse.

Figure 4.8 shows how spending patterns have changed across areas of differing population density. Since February, less densely populated areas have seen smaller declines in spending and more of a recovery (again, these differences are not quite as big as those seen between local authorities with differing levels of pay). This is

consistent with the public health restrictions: dense urban areas have more restaurants and other recreation venues, which were shut down. In addition, the greater population density may make people more reticent to go to shops and other venues even when they are able to do so.

**Figure 4.8. Index of real consumer spending, by terciles of local authority population density**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

## 5. The impact of public health restrictions on spending

The most salient policy decisions that the governments of the UK have taken since March have been to impose a wide variety of restrictions on economic activity, including ordering various businesses to temporarily close entirely. Naturally, any complete evaluation of such measures will be crucially dependent upon their efficacy in restraining the spread of the virus. But here we analyse the economic effects, and in particular the impact of restrictions on spending.

Such restrictions might affect spending in several ways. First, there is the direct effect on what is bought and sold: if restaurants are closed, restaurant expenditure declines. Second, there may be ‘negative spillovers’ on categories of spending that are complementary to those prohibited (e.g. if people need to drive or take public transport to go to restaurants, their closure could reduce spending on those items) or that simply get cut back in light of falling incomes. Third, there could be ‘positive spillovers’ on goods that are substitutes for restricted ones: people could respond to the closure of restaurants by switching to takeaways or buying more groceries. The granular nature of our spending data allows us to speak to all three of these effects.

Our approach is as follows. We take the larger sample of MDB users who we observe since June (see Section 2). For every individual, we use the public health restrictions data set described in Section 2 to measure restrictions on hospitality and non-essential retail in their area at the time of each observation. We define four different policy settings, in increasing order of strictness:

- no restrictions;
- bans on households mixing indoors in hospitality venues or hospitality venues having to close from late afternoon<sup>5</sup> (labelled as ‘hospitality restricted’);<sup>6</sup>
- hospitality venues shut;
- hospitality and non-essential retail shut.

We are able to define policy settings in this relatively simple way because of the way restrictions were actually imposed: it has never been the case, for example, that non-essential retail has been shut while hospitality remained open.

We then essentially compare the evolution of spending between individuals who see different changes in public health restrictions in their local area. This is of course all against the backdrop of other, national, public health restrictions (e.g. the rule of six), and indeed the general context of a severe pandemic in which some voluntary social distancing would be happening anyway, all of which would have implications for spending and could help shape the impacts of any additional measures. It is worth emphasising that we are only analysing the effect of restrictions since June, so not including the original lockdown. As discussed above, the first lockdown likely had larger effects than subsequent restrictions, in part because businesses had not had time to adapt to operating under pandemic conditions. Excluding the first lockdown means that our results are more informative for thinking about future restrictions.<sup>7</sup>

For the more technically minded, the analysis we run consists of the following fixed effects panel regression:

$$y_{it} = \alpha \text{NoHospMix}_{it} + \beta \text{HospShut}_{it} + \gamma \text{HNERShut}_{it} + \tau_t + \theta_i + \epsilon_{it}$$

<sup>5</sup> In Scottish tier 3 areas, last admissions to restaurants are at 5pm. We count this as a ‘restriction’.

<sup>6</sup> Because there is some variation in the content of the precise restrictions that we categorise together (e.g. no household mixing at all, household mixing allowed outside only, early closing), our estimates are implicitly averages of the effects of these different policy settings.

<sup>7</sup> Moreover, because the first lockdown affected the whole country at the same time, we would not be able to apply our approach of comparing individuals living under different restrictions at the same time.

where  $y_{it}$  is spending on some good or service by individual  $i$  in week  $t$ , and  $NoHospMix_{it}$ ,  $HospShut_{it}$ , and  $HNERShut_{it}$  are dummy variables related to the policy settings described above (respectively, no household mixing inside hospitality venues; hospitality shut; and hospitality and non-essential retail shut). These three dummy variables are mutually exclusive.  $\tau_t$  is a week fixed effect and  $\theta_i$  an individual fixed effect. Standard errors are clustered at the individual level.

We look at effects on total spending and various categories within it. It is worth noting up front that MDB's tagging of 'takeaway' spending is primarily focused on large delivery companies such as Deliveroo. Spending on takeaways from individual restaurants that do not use such firms would typically be categorised as restaurant spending. This means that we are likely to understate the effect of restrictions on takeaways.

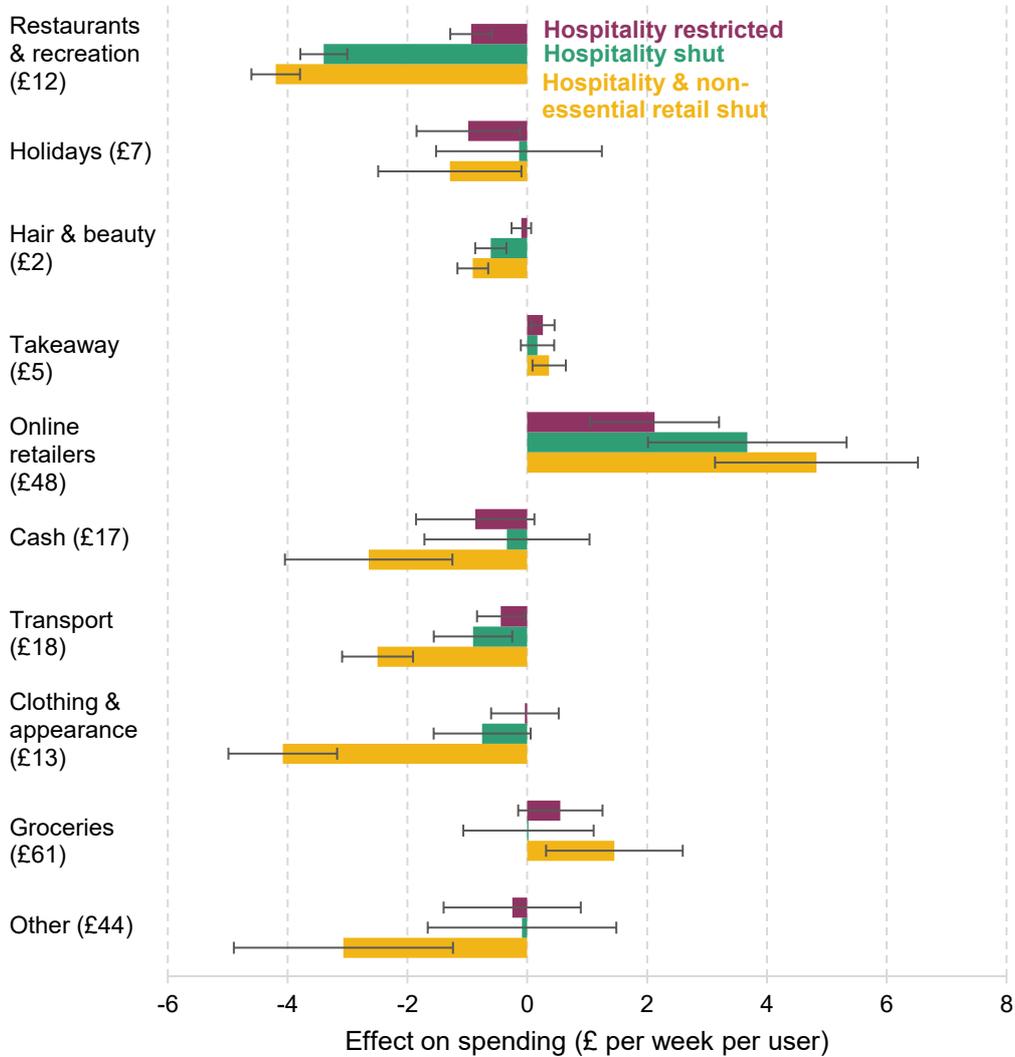
When we look at total spending, restrictions on or closing of hospitality appears to have approximately no impact – suggesting that the mechanical reduction in spending on hospitality that this causes is largely offset by increases in spending on other things (as examined further below). Closing non-essential retail on top of that, however, reduces total spending by about £12 per user per week – equivalent to 5% of average spending over the June–November period and statistically significant at the 1% level.<sup>8</sup>

But these aggregate changes mask substantial differences across spending categories. These are summarised in Figure 5.1. The coloured bars show the estimated effect of public health restrictions – relative to none of these restrictions<sup>9</sup> – on weekly spending per user, and the whiskers show 95% statistical confidence intervals. The number in parentheses next to each category of spending shows average spending on that category per week per user over June–November.

<sup>8</sup> Having log spending as an outcome, rather than level spending, implies a 5% decline in spending as a result of closing non-essential retail and hospitality.

<sup>9</sup> It is worth re-emphasising that these estimates are the effects relative to none of these particular restrictions on hospitality and non-essential retail but *with* other restrictions such as the rule of six.

**Figure 5.1. Effect of public health restrictions on spending (average spending per user per week, June–November 2020, in parentheses)**



Note: The coloured bars show the estimated effect of public health restrictions – relative to no restrictions – on weekly spending per user, and the whiskers show 95% statistical confidence intervals. The number in parentheses next to each category of spending shows average spending on that category per week per user over June–November.

Source: Authors' calculations using MDB data downloaded on 11 December 2020.

In broad terms, restrictions on household mixing in hospitality venues have fairly limited effects on any spending category, even on restaurant & recreation spending (though we do detect a statistically significant negative effect). This could be because other social distancing regulations on hospitality venues mean they have more demand than they can fill even before the restrictions on household mixing come in.<sup>10</sup>

Closure of hospitality venues does of course have a considerably larger direct impact, reducing spending on restaurants & recreation by about a quarter. That it does not fall to zero is the result of a combination of several factors. Some venues, such as cafes, were (at least sometimes) allowed to stay open even when restaurants and pubs were closed. Some users may travel to other local authorities which are not under the same restrictions, or have moved since they registered for MDB and so no longer live in the same local authority. And some restaurants delivered or provided takeaway food (in some cases starting to do this when they had not done so before, which means we would not always classify this spending as takeaways).

There is a small negative effect on clothing & appearance expenditure (significant only at the 10% level), probably driven by the closing of hospitality resulting in fewer people visiting areas where retail shops and restaurants are co-located (this interpretation is consistent with the Google mobility data, as described below). There is also a small decline in hair & beauty spending. Spillover effects may be at work here if such spending is complementary to hospitality expenditure (again possibly by the venues being near one another), but policy is also relevant, as hairdressers have largely been closed at the same time as hospitality. There appears to be a significant positive effect on online retailers from closing hospitality, however, perhaps as households choose to use their disposable income elsewhere. This helps to explain why the closure does not appear to have much impact on overall spending. It is worth noting that while consumer spending is kept roughly constant, the geographical distribution of that spending can change: the online

<sup>10</sup> This explanation makes more sense if restaurant prices do not change in the short run in response to the social distancing regulations.

retailers that the user buys from do not necessarily produce their goods nearby, so this substitution implies a reduction in spending in the user's local economy.

Closing non-essential retail has, unsurprisingly, bigger effects still. The direct effects on cash withdrawals and spending on clothing & appearance are large (equivalent to 16% and 32% of June–November average spending respectively). Again we see a positive effect on online retailers, where spending increases by nearly £5 per user per week (10% of the average) relative to no restrictions on retail or hospitality as households use such retailers as an alternative for the now-closed physical ones. It also appears that grocery spending is a substitute for the goods and services that have been restricted, with a modest positive effect (£1.50 per user per week, 2% of the average), while there is a significant negative impact on transport (£2.50 per user per week, 14% of the average) as households no longer travel to go to shops or other venues. Again we see a small negative effect on hair & beauty, with contemporaneous changes in the rules around hairdressers likely causing some of this effect.

We complement these results by using a variant of the above approach on the Google mobility data to analyse the effect of restrictions on people's movements.<sup>11</sup> These data offer a different perspective in that they specifically show physical visits to venues, and so – unlike the spending data – ordering online from a firm with a physical presence is not captured. The results are summarised in Figure A.13 in the appendix. The coloured bars show the estimated effect of public health restrictions on mobility trends in an area, and the whiskers show 95% statistical confidence intervals.

<sup>11</sup> Specifically, we replace  $y_{it}$  with the log of the seven-day average of footfall in a particular category of place in area  $i$  in week  $t$ ; and we replace  $\theta_i$  with an area fixed effect. Changes to Google's methodology mean there are problems with missing data in some weeks. We exclude these four weeks in August and September from our analysis, although including these does not change our results materially. We include the weeks from 8 June to 16 August, and from 14 September to 29 November.

Public health restrictions have a substantial effect on visits to retail and recreation places. This is seen for all three policy settings we examine, but largest for the closure of hospitality and non-essential retail, when footfall falls by over 40%. Visits to public transit stations – places such as bus and train stations – are also lower when areas face stricter restrictions, with the shutting of non-essential retail and hospitality leading to a 16% decline. This is consistent with Figure 5.1, which showed a shift away from spending on transport when non-essential retail was closed. A smaller negative impact is seen on visits to grocery and pharmacy places.

In addition, we find that the anticipation of incoming restrictions increases spending.<sup>12</sup> In the week prior to hospitality being shut, total spending increases by £6 per user, and in the week prior to hospitality and non-essential retail being shut, it increases by £20 per user – equivalent to 9% of average spending. We also examined whether responses were larger for demographic subgroups. Results here are somewhat noisy but it appears that younger consumers respond more sharply than older ones, in terms of total spending, to hospitality and non-essential retail being closed. No significant differences are seen between rural and urban areas. When we compare better-off and less well-off households (measured using their pre-crisis spending<sup>13</sup>), we find that, proportionally, less well-off households saw a larger decline in spending than better-off ones in response to the restrictions (though the reverse is true in terms of the *level* of spending decline). The greater effect for better-off households comes, in a significant part, from their spending on online retailers responding strongly to restrictions; by contrast, the spending of households with the lowest level of pre-crisis spending on online retailers on average does not change at all.

These results highlight how public health restrictions can have effects, not just on those sectors actually closed, but on others too. Because consumers can to some extent switch their spending to alternatives, the effects on their welfare are somewhat mitigated. But the firms that they switch their spending to are often online retailers who may not hire many workers or buy many goods locally – so the

<sup>12</sup> For this analysis, we amend the above regression by including dummies indicating that a restriction is in place in week  $t + 1$  but not in week  $t$ .

<sup>13</sup> For this analysis, we use the sample who we observe for all of 2020, so that we can measure their pre-crisis spending.

mitigation for the local economy will be more modest. In addition, negative spillovers onto transport exacerbate the effect of restrictions on spending. That consumers increase their expenditure immediately prior to new restrictions coming in undermines some of the public health benefits of such restrictions (though of course it also goes some way to offsetting the economic consequences too).

## 6. Conclusions

The past nine months have seen huge swings in spending, both in total and across various goods and services. The first lockdown had an enormous effect, with spending falling by roughly a third. By contrast, the effect of the second English lockdown on spending has been much more modest. This partly relates to the restrictions being less severe, but also reflects the fact that businesses and consumers have adjusted to them, with consumers switching more of their spending online and businesses finding ways to operate within the restrictions. Total spending remains somewhat depressed relative to the same time last year, with particularly big falls in transport, restaurants & recreation and cash withdrawals: undoing the decline in any one of these three would be sufficient to return total expenditure to around where it was at the end of 2019.

The patterns of spending seen over the crisis have played out differently over different parts of the country. Londoners have clearly cut their spending by more than those who live elsewhere, while by November spending in Scotland and Wales had recovered to roughly its pre-crisis level.

Some of these differences are related to the existing characteristics of those areas: those who live in less densely populated areas have cut their spending by less than those in more densely populated ones; and bigger spending cuts have been seen among those who live in better-paid, less-deprived areas, consistent with what we see when we compare higher- and lower-income households. This has gone some way to reducing inequality in spending, though since higher-income households have saved more during the pandemic (Davenport et al., 2020), we might see that trend reverse in the future when they come to spend down those savings.

But some of the differences are connected to policy. Shutting hospitality unsurprisingly reduces spending on hospitality but does not seem to have a particularly big effect on overall spending, because consumers substitute to spending on other items such as online retailers. Closing non-essential retail as well, however, does have a significant effect on total spending. As well as the falls in spending on restaurants, clothing and cash transactions, we also see transport

spending – a complement of non-essential retail expenditure – negatively affected. The increase in spending on groceries and (particularly) online retailers goes some way to compensating these falls, but still leaves overall spending down.

This sort of substituting to online retailers goes some way to mitigating the cost of these public health restrictions to consumers and the economy as a whole. But since such online retailers will have a more limited presence in the local area than the physical venues that have been closed – and which, even when open, are generally seeing lower sales – the degree of mitigation for most local economies, and especially local high streets, is likely to be more modest.

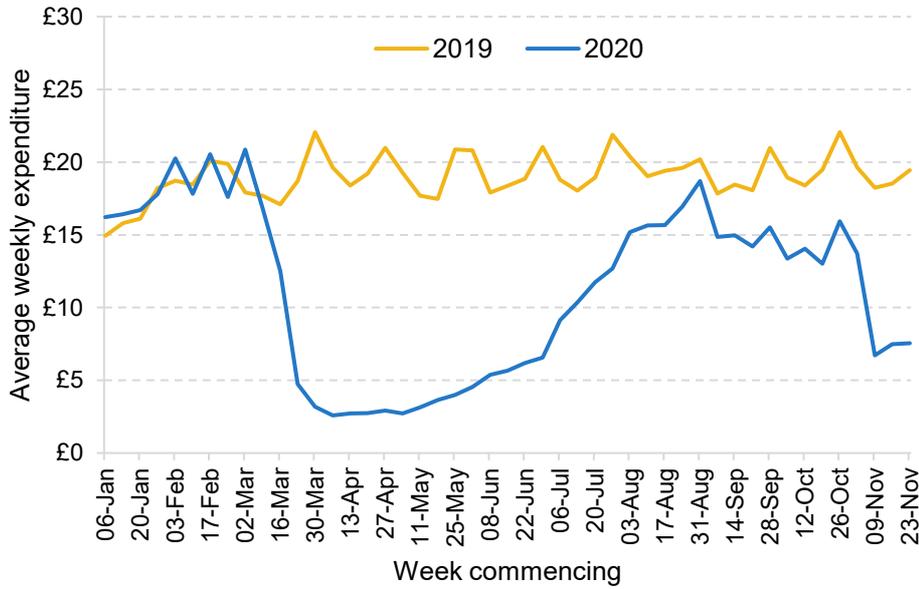
Comparison of spending data with Google mobility data on footfall illustrates this. The latter show large falls in visits to physical retail and recreation destinations during November's English lockdown, even as overall consumer spending remained relatively robust. Footfall data also suggest that the crisis is affecting residents' spending and businesses' sales in different places in different ways. For example, while spending by residents of inner and outer London has followed broadly the same trend, footfall to retail and recreation destinations and transport hubs has been much lower relative to normal in inner London. This presumably reflects a large fall in the number of commuters and visitors to central London – groups which would usually provide a large share of the customer base of many businesses in this area.

If such changes in how and where consumers are spending their money prove to be persistent, there could be significant impacts on economic performance and employment opportunities (especially for younger, female and lower-education workers) in various parts of the country. Future research should therefore continue to track how consumer behaviour evolves, and consider the implications for different population groups and places. Such trends will matter not only for the consumers, businesses and workers directly affected, but also for other stakeholders in local economies. Councils, for example, have long sought to support the vibrancy of high streets, a task that has been and may continue to be even more challenging but also more important than prior to the COVID-19 crisis, especially in areas traditionally reliant on commuters. Furthermore, councils' revenues also depend to some extent on local economic activity – via business rates receipts, and the amount raised via fees and charges for a range of services they provide to businesses and consumers. Again, these sources of revenue may be at greater risk in certain locales. Such issues will need to be considered in the multi-year Spending Review planned

for 2021, as well as in a review of how funding is distributed between English councils – which has been postponed amidst the crisis, but cannot be shelved indefinitely.

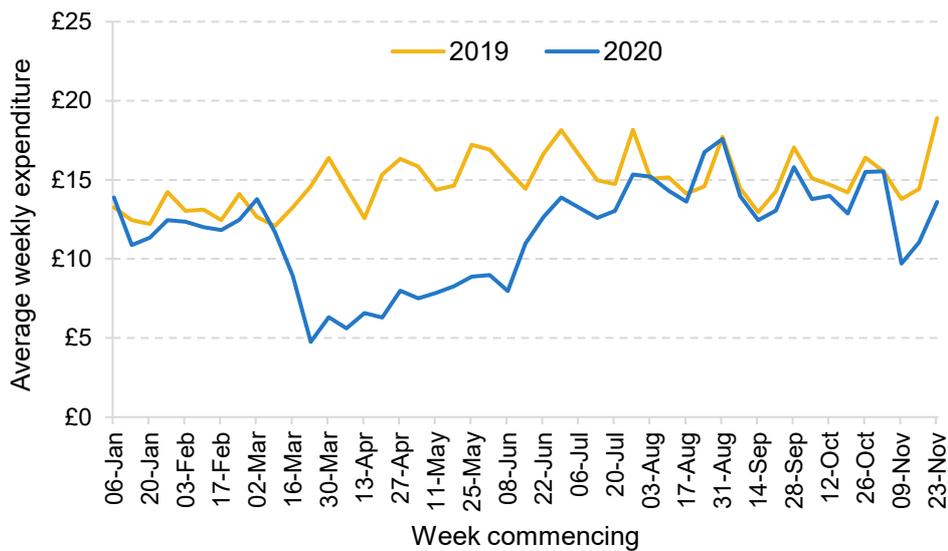
# Appendix

Figure A.1. Spending on hospitality



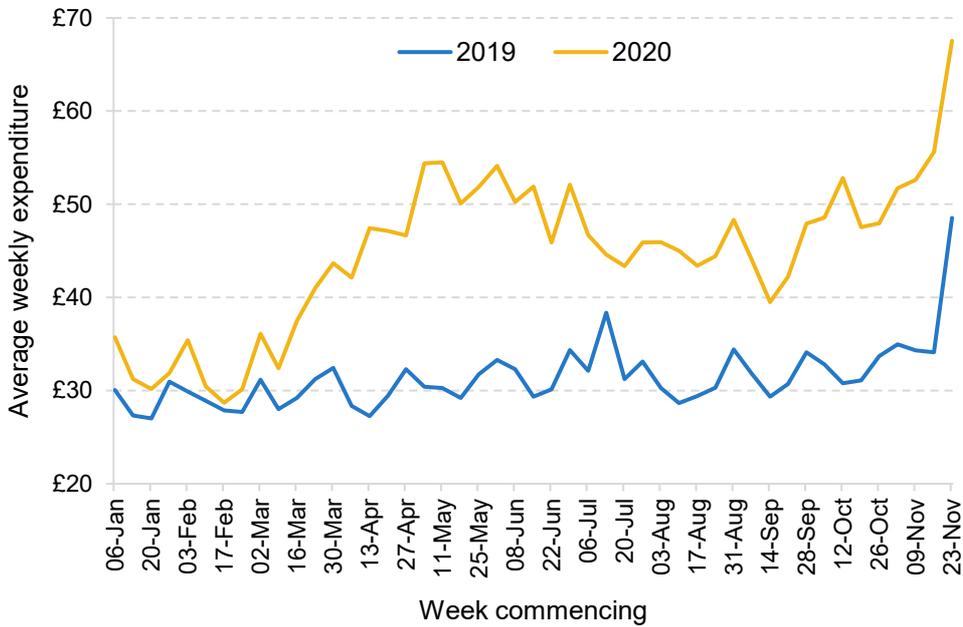
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.2. Spending on clothing & appearance



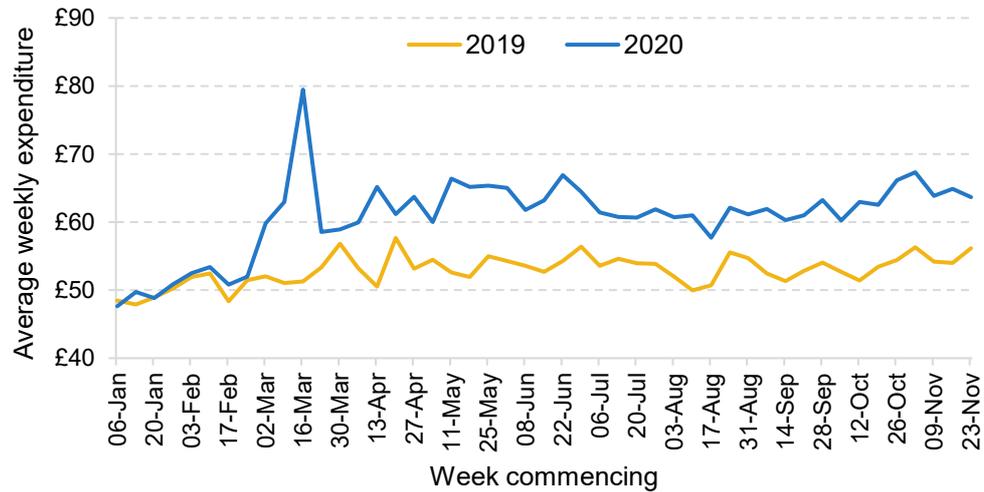
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.3. Spending on online retailers



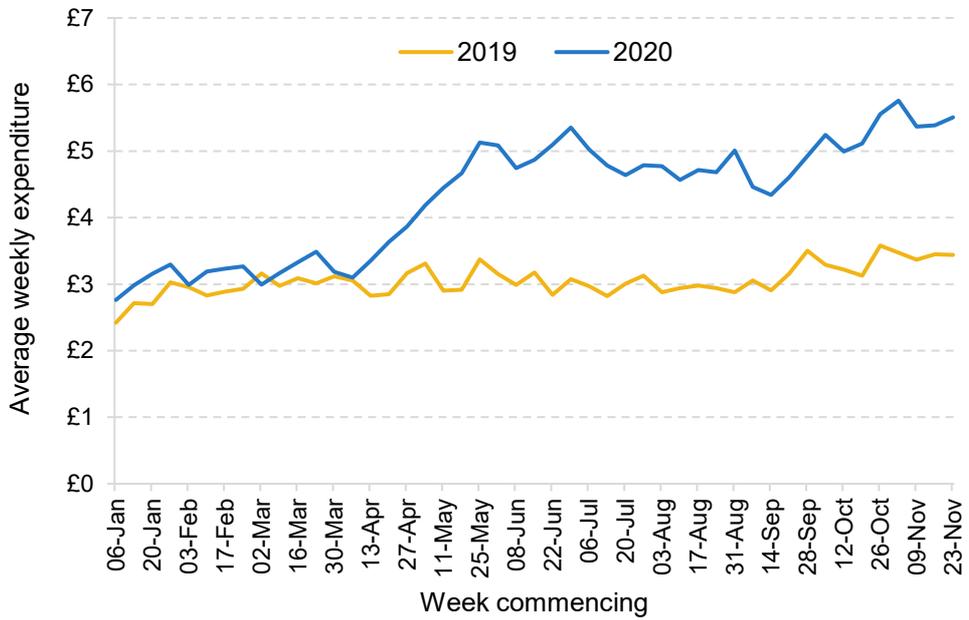
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.4. Spending on groceries



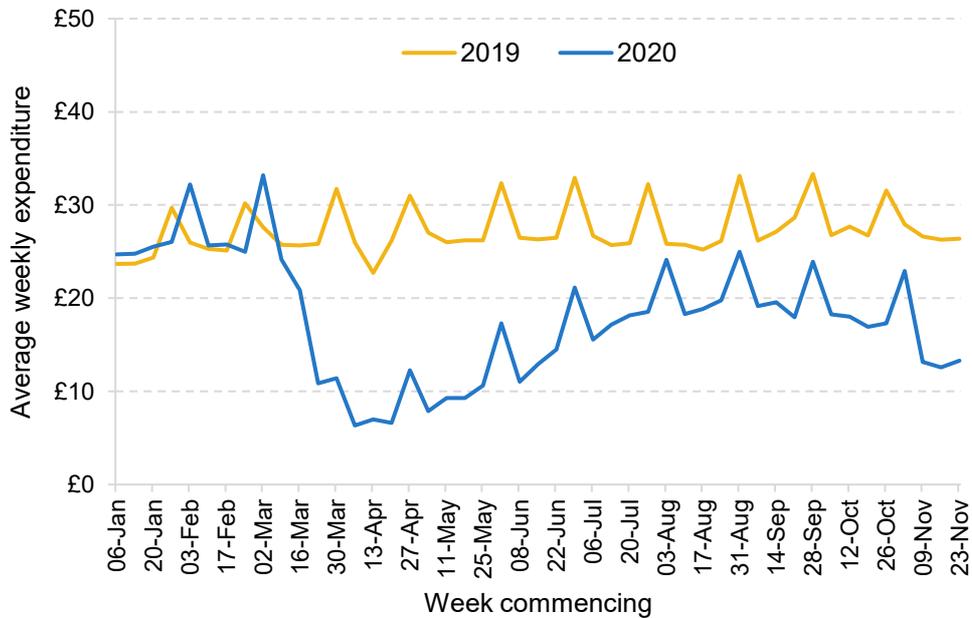
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.5. Spending on takeaways



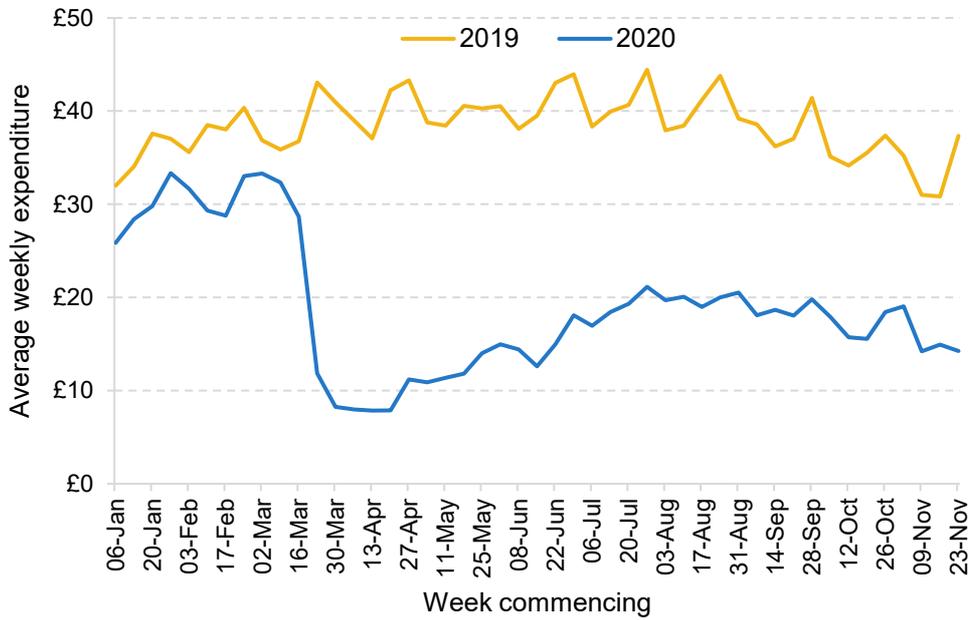
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.6. Spending on transport



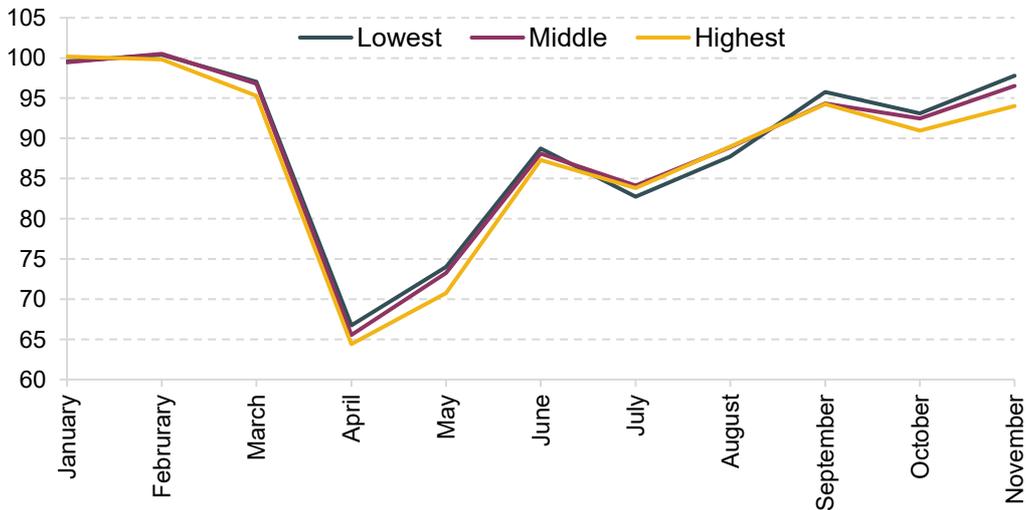
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.7. Cash withdrawals



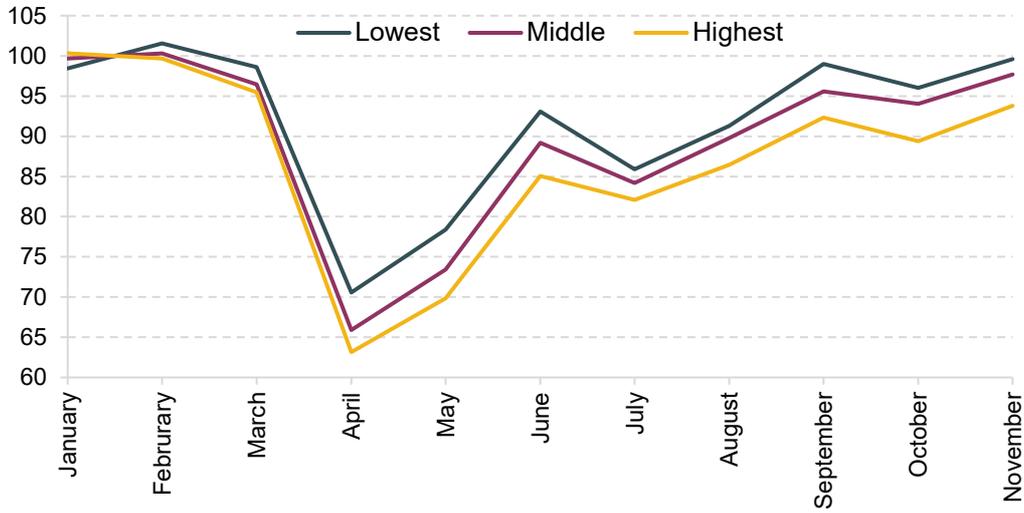
Source: Authors' calculations using MDB data downloaded on 11 December 2020. Prices are in October 2020 terms.

Figure A.8. Index of real consumer spending, by terciles of employment



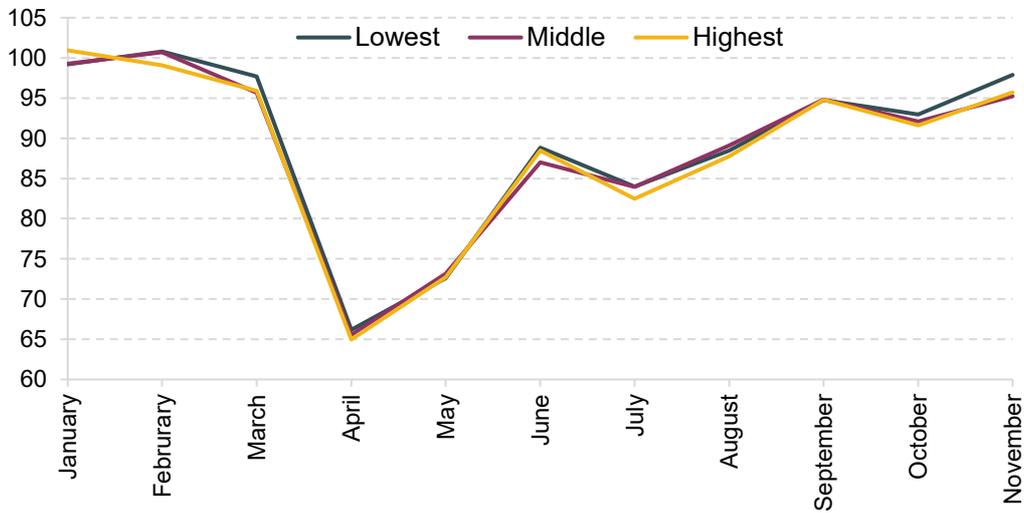
Source: Authors' calculations using MDB data downloaded on 11 December 2020.

**Figure A.9. Index of real consumer spending, by terciles of share of population with a degree**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

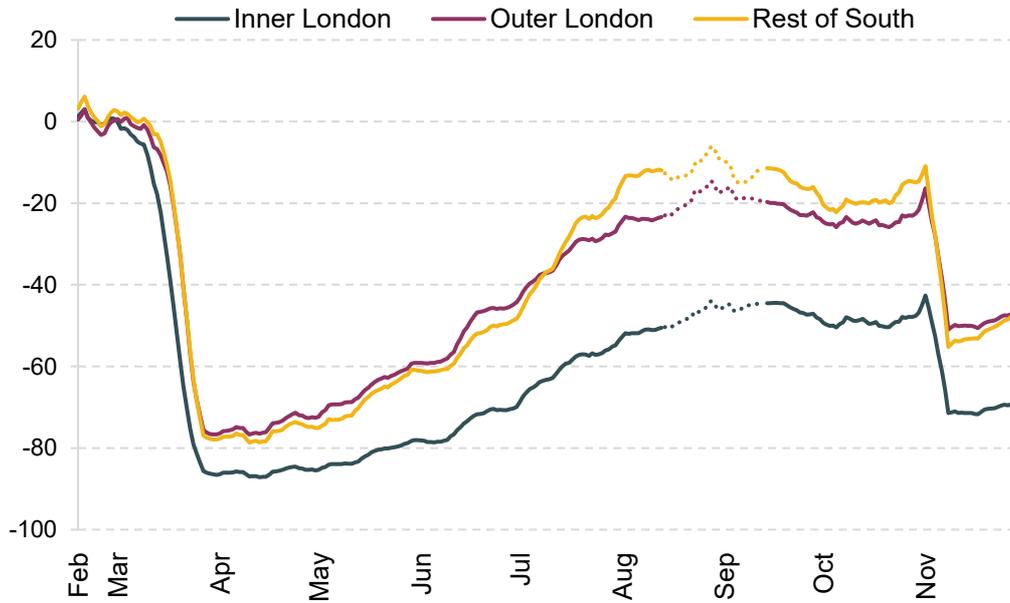
**Figure A.10. Index of real consumer spending, by terciles of vacancies**



Source: Authors' calculations using MDB data downloaded on 11 December 2020.

## Google mobility data

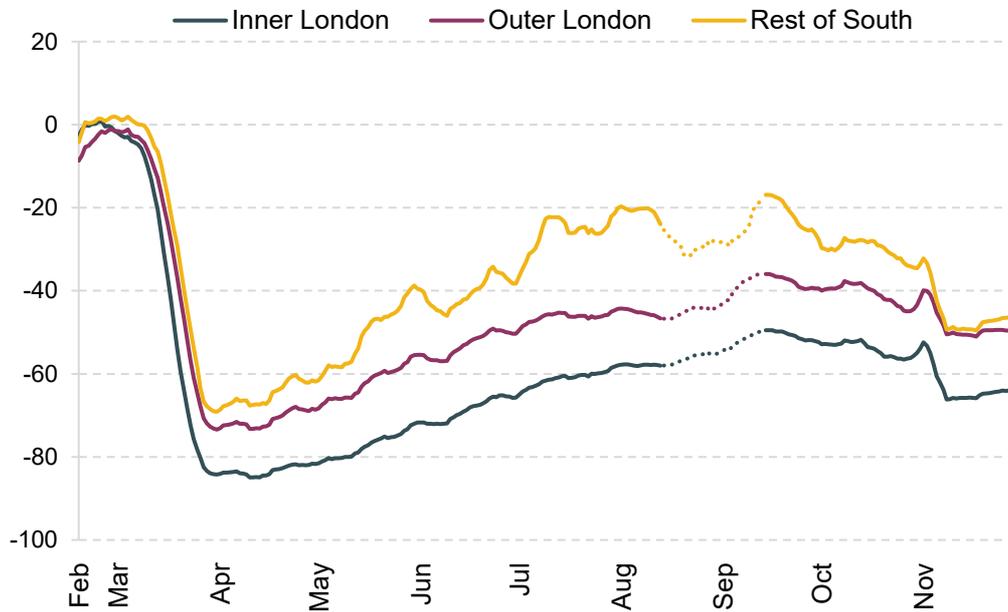
Figure A.11. Index of mobility trends to retail and recreation places, by regions in the South of England



Note: Seven-day rolling averages of Google mobility trends data, which measure percentage point change in visits and length of stay relative to a baseline in January 2020. Region figures are means of mobility trends for lower-tier local authority areas, weighted by workday population from the 2011 census. Missing data for many areas between 17 August and 10 September mean trends over this period are not comparable with trends in the rest of the year.

Source: Authors' calculations using Google mobility data downloaded on 8 December 2020.

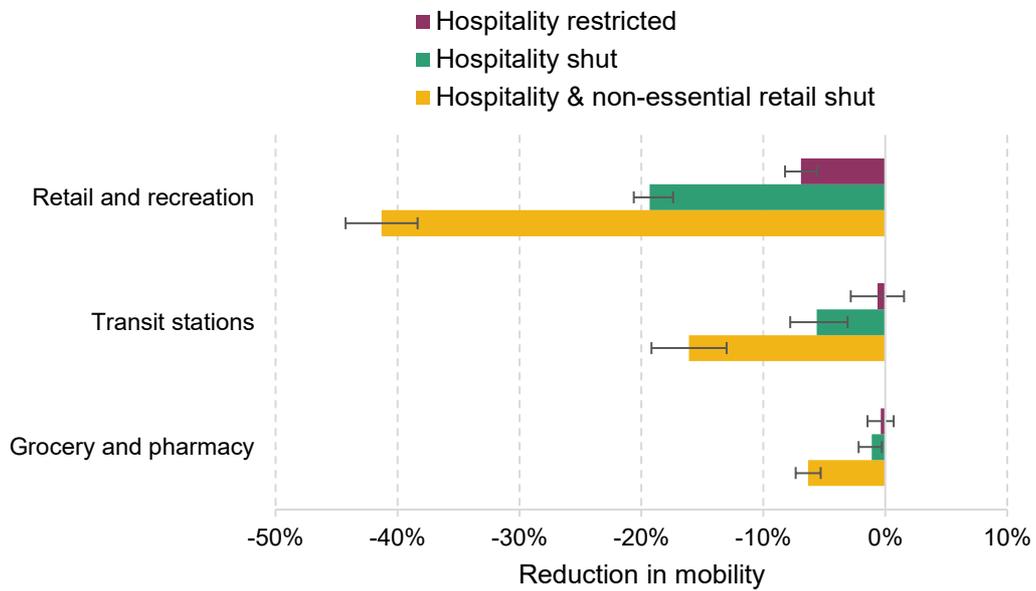
**Figure A.12. Index of mobility trends to public transit stations, by regions in the South of England**



Note: Seven-day rolling averages of Google mobility trends data, which measure percentage point change in visits and length of stay relative to a baseline in January 2020. Region figures are means of mobility trends for lower-tier local authority areas, weighted by workday population from the 2011 census. Missing data for many areas between 17 August and 10 September mean trends over this period are not comparable with trends in the rest of the year.

Source: Authors' calculations using Google mobility data downloaded on 8 December 2020.

**Figure A.13. Effect of public health restrictions on mobility trends for different categories of place**



Note: The coloured bars show the estimated effect of public health restrictions on mobility trends in an area, and the whiskers show 95% statistical confidence intervals.

Source: Authors' calculations using Google mobility data downloaded on 8 December 2020.

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Bourquin, P., Delestre, I., Joyce, R., Rasul, I. and Waters, T. (2020), 'The effects of coronavirus on household finances and financial distress', IFS Briefing Note BN298, <https://www.ifs.org.uk/publications/14908>.

Davenport, A., Joyce, R., Rasul, I. and Waters, T. (2020), 'Spending and saving during the COVID-19 crisis: evidence from bank account data', IFS Briefing Note BN308, <https://www.ifs.org.uk/publications/15146>.