



School availability and family wellbeing

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ISER Briefing Note October 2022

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The authors are grateful to the Nuffield Foundation for funding this work (grant WEL/FR-000022919). The Nuffield Foundation is an independent charitable trust with a mission to advance educational opportunity and social well-being. It funds research that informs social policy, primarily in Education, Welfare and Justice. It also provides opportunities for young people to develop skills and confidence in science and research. The Foundation is the founder and co-funder of the Nuffield Council on Bioethics, the Nuffield Family Justice Observatory and the Ada Lovelace Institute. Visit www.nuffieldfoundation.org. Fumagalli and Rabe gratefully acknowledge co-funding from the ESRC Research Centre on Micro-Social Change (ES/S012486/1).

Executive summary

Most developed nations provide free or highly subsidised education and care for children, supporting not only children’s development but also parents’ ability to work by providing childcare for several hours during the day. The pandemic led to the abrupt and unprecedented removal of this support for the vast majority of children and families, with schools and childcare facilities closed, often for long periods, in countries around the world (Alon et al., 2020; UNICEF, 2021). These closures have had significant consequences for children’s development (Betthäuser et al, 2022), but their effects on parents’ labour supply, and the wellbeing of both children and parents, have been understudied.

This report provides an overview of the results of a project exploring the consequences of school closures for family wellbeing. Our research design exploits variation in children’s access to school on the basis of government guidance which prioritised some year groups to return to school earlier than others in June/July 2020 and explores whether families whose children were prioritised to return had higher labour supply or better mental health than families whose children were less likely to be in school. We also compare some outcomes for parents of school vs. pre-school aged children in January/February 2021, when schools were closed but pre-school facilities were able to remain open.

Data

We use data from the main and COVID-19 surveys of *Understanding Society* (the UK Household Longitudinal Survey), and the Labour Force Survey. *Understanding Society* is a longitudinal, nationally representative, panel study which started in 2009 and annually interviews participating households (University of Essex, 2022). In response to the pandemic, *Understanding Society* set up the COVID-19 study, a longitudinal web-based survey comprising members of the main survey (University of Essex, 2021). Interviews took place monthly from April to July 2020 and bimonthly thereafter, with fieldwork taking place roughly in the last week of each month.

Understanding Society and its COVID-19 study collect information across a wide range of topics, including rich information about people’s background and behaviours. The main outcomes we use are parent mental health, measured using the General Health Questionnaire (GHQ), and child mental health, reported by parents using the Strengths and Difficulties Questionnaire (SDQ). We also explore whether the effects on parents’ mental health can be explained by social isolation (using an indicator of loneliness) and labour market outcomes (earnings and hours worked). Our estimating sample varies according to the outcome studied, and includes roughly 300-800 observations (for each month studied) for parent outcomes and 1900 observations for child mental health.

We complement our analysis of the impact of school availability on parents’ labour supply using the Labour Force Survey (LFS), which collects a wealth of labour market information from a nationally representative sample of UK households each quarter, following households for up to five quarters (Office for National Statistics, 2022). This provides information on a larger sample of families during the first period of school closures (in April/May 2020) and also enables us to consider the second period of school closures (in January/February 2021), when schools were closed but formal childcare settings were encouraged to remain opened.

We consider a range of outcomes in the LFS, including labour force participation, whether individuals are in work, and hours worked – including whether they worked fewer hours than usual, and whether the reason they worked fewer hours than usual was because of a lack of childcare.

Methods

The precise methods we use vary across datasets and outcomes, but all approaches compare changes in outcomes over time, across the pandemic, between individuals in families with differential access to education and care facilities at different points in time. This differential access was generated by government guidance concerning when schools and childcare facilities had to close and when they could reopen and to which children.

Schools and childcare facilities were closed to the vast majority of children in April and May 2020, during the first national lockdown, with childcare facilities reopening to all children – and schools reopening to some children – from 1 June 2020. Specifically, government guidance stated that children in school year groups Reception (age 4/5), Year 1 (age 5/6) and Year 6 (age 10/11) should be prioritised to return to school from 1 June 2020 (until the end of the summer term, around 20 July 2020, meaning that children in other primary and early secondary year groups were not prioritised to return during this time.

Parents’ outcomes

To investigate the impact of school availability on parents’ mental health – and the mechanisms through which these effects may have arisen, including labour supply and social isolation – we compare changes in outcomes over time, from April/May 2020,

when schools were closed to most children, to later in the pandemic, when schools were opened to some (June/July 2020) and then all children (from September 2020). We compare how mental health and other outcomes changed over this period for parents whose children in year groups Reception (R) to Year 7 (age 11/12) were all prioritised to return to school in June 2020 with those with at least one child in this age range who was not prioritised to return.¹

Children's outcomes

SDQ scores were not collected as part of the COVID-19 survey in April/May 2020, so to investigate the impact of school availability on children's social and emotional wellbeing, we compare changes in SDQ scores over time for the same children from the pre-pandemic period to July 2020, and explore how this differs for those in Reception, Year 1 and Year 6 – who were prioritised to return to school in June 2020 – and those in Years 2, 3, 4, 5 and 7, who were not.² This provides us with the effect of school closures on children's mental health. However, because of the ages at which SDQ scores were collected, our comparisons rely on children with different gaps between their pre-pandemic and 2020 observations, restricting the generalisability of these results.

Results

School availability and attendance

- 63% of children in priority year groups (Reception, Year 1 and Year 6) returned to school in June/July 2020, compared to 25% of children in non-priority groups (Years 2, 3, 4, 5 and 7). Therefore children in priority year groups were 38 percentage points more likely to have spent some time in school in June and July 2020 than children in non-priority year groups.
- Children who were more advantaged in terms of their parents' education, employment status and family income were more likely to have returned, and those from white British backgrounds were more likely to have attended school than those from other ethnic groups. These differences are primarily driven by parental choices, but constraints driven by the availability or otherwise of school provision also played a role.
- There were substantial regional differences, with children living in the north of England less likely to have returned to school. These differences were primarily driven by constraints (schools did not offer places) but were reinforced by parental choices.
- Concerns for the child's health was the main reason for parents not taking up the full amount of school they were offered, and this was most pronounced among non-white British families.

Parents' mental health

- Mothers and fathers with children aged 4-12 (in year groups R-7) reported worse mental health during the pandemic than a comparable sample of parents interviewed in the same months before the pandemic. Differences were larger for mothers than fathers.
- Compared to April/May 2020, when schools were closed for most children, average mental health was better in June 2020 for mothers whose children in year groups R-7 were all prioritised to return to school compared to mothers with at least one child in this age range who was not prioritised to return, whose mental health remained at a similar level to April/May 2020. For fathers it made no difference to their mental health whether or not their children were prioritised to return to school.
- The size of the mental health effect associated with all children being prioritised to return to school was, on average, a 1.5 point reduction in GHQ scores for mothers (with lower scores indicating better mental health). This represents two thirds of the size of the increase in GHQ scores experienced by mothers, on average, in June 2020 compared to pre-pandemic levels. We show that school closures and school reopening had symmetric effects, and this suggests school closures had a significant detrimental effect on mothers' mental health, similar in size to the deterioration in mental health experienced in the run-up to a divorce (Gardner and Oswald, 2006; Laporte and Windmeijer, 2005) or following a partner's job loss (Mendolia, 2014).

1 We also consider changes in labour supply in January/February 2021, when schools were closed to most children but pre-school facilities were encouraged to remain open compared to earlier years. Specifically, amongst families with at least one child in reception or the pre-school year, we compare changes in labour supply for parents whose children in this age range were all in the pre-school year vs. those with at least one child in reception.

2 We also compare changes between July 2020 and September 2020, for children in Reception, Year 1 and 6 vs. Years 2, 3, 4, 5 and 7, to explore whether lack of access to school in June/July 2020 had any lasting effects on their social and emotional wellbeing.

- The average number of hours worked per week fell by around 20-25% for both mothers and fathers between February 2020 and April 2020. Labour supply recovered somewhat in June 2020, when schools reopened, but did so similarly for mothers with more or fewer whose children in R-7 were all able to return to school compared to those with at least one child who could not, suggesting that school closures were not primarily responsible for these patterns.
- This could suggest that one of the reasons why mental health remained low for mothers whose children were less likely to be able to return to school during this period is because they had to fit in something close to their usual working hours on top of the additional childcare and homeschooling responsibilities that arose while schools were closed, which other evidence suggests they bore the brunt of (Andrew et al., 2021; Sevilla and Smith, 2020; Hupkau and Petrongolo, 2020; Benzeval et al. 2020; Zamarro and Prados, 2021; Wielgoszewska et al., 2021; Jessen et al., 2021). Loneliness also decreased relatively more for mothers whose children were all able to return to school in June 2020, suggesting that schools reopening may have helped to alleviate social isolation.
- We estimate the effect of being in a year group prioritised to return to school, but we know from our analysis of availability and attendance that not all children in these year groups were offered a place, and not all of those who were offered a place took it up. This means that the impact on parents' mental health of children *actually returning to school* is likely to be larger than we estimate.
- There do not appear to be any lasting implications of school closures for mothers' mental health: in July 2020, at the beginning of the school summer holiday, the effect is only about half as large as in June 2020 and can no longer be statistically distinguished from zero, and in September and November 2020 – when all year groups were able to attend school, it is no longer apparent at all.

Children's social and emotional wellbeing

- Children's social and emotional wellbeing, based on parental reports of behaviour, is lower during the pandemic than in comparable months in recent previous years. The scale of the fall is similar to the magnitude we observe for parents. While there is evidence of some recovery during summer 2020, wellbeing is still below its pre-pandemic level in September 2020.
- While the mental health of children in both priority and non-priority groups was lower in July 2020 than before the pandemic, our results provide suggestive evidence that children in non-priority year groups, who were more likely to be out of school in June/July 2020, had worse mental health than their peers in priority groups, and that their mental health may not have caught up with their peers' straight away, once all children were able to return to school in September 2020. We take this evidence as suggestive only, as data limitations mean we must rely on different intervals pre- to during pandemic for children of different ages.

Implications for policy and practice

The pandemic was an enormous shock to society and its short- and long-term consequences will remain of interest to researchers, policymakers and practitioners for years to come. Moreover, as the unusual circumstances experienced during the early part of the pandemic get further away, there is increasing interest in the broader policy insights that can be gained from the disruption it caused.

Our findings suggest policy recommendations in three broad areas:

- How to deal with the longer-lasting effects of school closures;
- What to do if school closures are considered again;
- Broader implications for policy in non-pandemic times.

Dealing with the longer-lasting effects of school closures

- **Remedial policies:** children from disadvantaged backgrounds and from the north of England in particular should be provided with greater support to enable them to catch-up on learning missed during the pandemic, to prevent the embedding of pandemic-related inequalities in school access.
- **School attendance** continues to be below pre-pandemic levels, which some evidence suggests is because state-sanctioned absences during the pandemic weakened the case for in-person schooling. Policymakers may therefore want to check that the inequalities in school take-up we identify do not persist, creating further inequalities in access to learning.
- **Mental health and wellbeing support** should be available for all children who need it, to ensure that any lingering effects of the pandemic do not prevent young people from achieving their potential in school. Effects might be particularly severe for those in exam or transition years in 2020/21 meaning those currently at university should not be neglected. While our results provide only tentative evidence on the potential for longer-term effects of school closures, the growing incidence of poor mental health, together with the strong links between mental health and young people's ability to engage effectively with learning, suggests that this kind of support, both inside and outside education settings, should be a priority.
- **Mothers' mental health** was substantially impacted by having children out of school, and this seems to have been greater for mothers in lower-earning households, highlighting their particular vulnerability to shocks. While mothers' mental health seems to have rebounded reasonably quickly from the relatively short period of school closures on average, we cannot rule out the possibility that some mothers (or indeed fathers) may experience ongoing mental health effects, or that average levels of mental health amongst parents of primary school-aged children may not still be worse than they were before the pandemic, suggesting that support will be needed for some groups.

What if school closures are on the table again?

- **Wider costs:** the case for potential future school or childcare closures should take into account the wider costs for families that we have identified, and any resulting increase in inequalities between individuals or places.
- **Keeping schools open safely:** steps should be taken now to maximise the chances that schools can stay open safely in the event of another wave of the COVID-19 pandemic, a future pandemic or other potential crisis.
- **Reassuring parents:** Consideration should also be given to how to reassure parents that they can send their children to school safely and how messaging can be targeted to families with the greatest reluctance to attend school, or whose decision not to send their children to school may have been a rational response to the increased risk their families may have faced in doing so, such as those from ethnic minority backgrounds.
- **School community:** When school/childcare interruptions or closures are unavoidable, support should be available for families – especially vulnerable families – for example by helping them to continue to feel part of the school community. This may help to mitigate some of the detrimental mental health effects for families.

Broader policy implications for non-pandemic times

- **State support for childcare:** effective childcare provision has long been considered vital in helping mothers to work and supporting family finances. Though the circumstances of the pandemic were unique, our findings indicate that childcare may also have a role in supporting mothers' basic mental health. This should be factored into future cost-benefit analyses

considering expansions or contractions of childcare availability or changes in price. It is also a relevant consideration when planning school opening times and in making the case for improving childcare provision during school holidays.

- **Gender roles:** our results contribute to a growing body of evidence about the strongly gendered effects of the pandemic and the roles played by mothers and fathers in unpaid household work more generally. Consideration should be given to the types of policy interventions that could be effective in encouraging a more even split of responsibilities between mothers and fathers, so that mothers are less likely to bear the full impact of breaks in childcare, or other shocks to the family. Such policies could include equal parenting leave entitlements for fathers and mothers, including non-transferrable parental leave for fathers, as well as promoting flexible working and family-friendly working cultures.

1 Introduction

Most developed nations provide free or highly subsidised education and care for children, supporting not only children's development but also parents' ability to work by providing childcare for several hours during the day. The COVID-19 pandemic led to a raft of previously unthinkable policies being implemented in short order, including the abrupt and unprecedented removal of access to in-person education and care support for the vast majority of children and families, with schools and childcare facilities closed, often for long periods, in countries around the world (Alon et al., 2020; UNICEF, 2021).

There were immediate concerns about the impact of school closures on children, both in terms of their learning and mental health (Burgess, 2020, Children's Society, 2021). Adults also experienced numerous and severe negative outcomes during the pandemic – including large deteriorations in adult mental health, especially amongst women and mothers in particular (Banks and Xu, 2020; Cheng et al., 2021; Etheridge and Spantig, 2022; Huebener et al., 2021). This is important because poor mental health is a major cause of disability, reduces economic activity and causes substantial public health costs (The Lancet Global Health, 2020). The mental health and well-being of parents is particularly significant because it spills over onto child well-being and development (Clark et al., 2019; Moroni et al., 2019; Johnston et al., 2013).

While the impact of the pandemic on mental health has been well documented, the role played by school and childcare closures in explaining these falls has been understudied. One plausible route through which school closures could have driven deteriorations in parents' mental health is that they significantly increased the time they spent on childcare and housework when schools were closed (Andrew et al., 2021; Sevilla and Smith, 2020; Hupkau and Petrongolo, 2020; Benzeval et al., 2020; Zamarro and Prados, 2021; Wielgoszewska et al., 2021; Jessen et al., 2021), with mothers increasing their time commitment more than fathers, even if they earned more. This potentially affected parents' ability to work and wider family wellbeing.

The pandemic was an enormous shock to society and its short- and long-term consequences will remain of interest to researchers, policymakers and practitioners for years to come. Moreover, as the unusual circumstances experienced during the early part of the pandemic get further away, there is increasing interest in the broader policy insights that can be gained from the disruption it caused. The pandemic has highlighted for many that schools are not just places that provide education, but also bring people together, and provide childcare and a social hub for families. It is for this reason that we may expect the impact of school closures on families to be profound and multidimensional.

In this report we look specifically at the impact of school availability on the outcomes of families in England using the UK Household Longitudinal Survey (UKHLS) and its COVID-19 study, and the UK Labour Force Survey (LFS). It is possible to distinguish the impact of school availability from other pandemic effects because government policy led to variation in school availability between families with similar aged pre-teen children during the pandemic. Specifically, following widespread school closures from late March 2020, certain year groups were prioritised for a return to school in June 2020 while other year groups were not.

We use longitudinal data for a range of outcomes before, during and after the first period of pandemic school closures to compare outcomes for families differentially affected by school closures. The main outcomes we are interested in are parents' mental health, parents' labour supply and child mental health. We also study the extent to which families were differentially affected by school closures.

Providing evidence on the effect of pandemic policies is important to inform any remedial action required to alleviate longer-term harm. Apart from informing pandemic mitigation, our evidence is also important when considering future unexpected school closures, including for example during strikes or extreme weather events. By disaggregating our findings by gender, we are also able to test whether the impact of childcare, specifically school availability, is gendered. Effective childcare provision has long been considered as vital for helping mothers work and supporting family finances, but our findings test if they also have a role in supporting mental health.

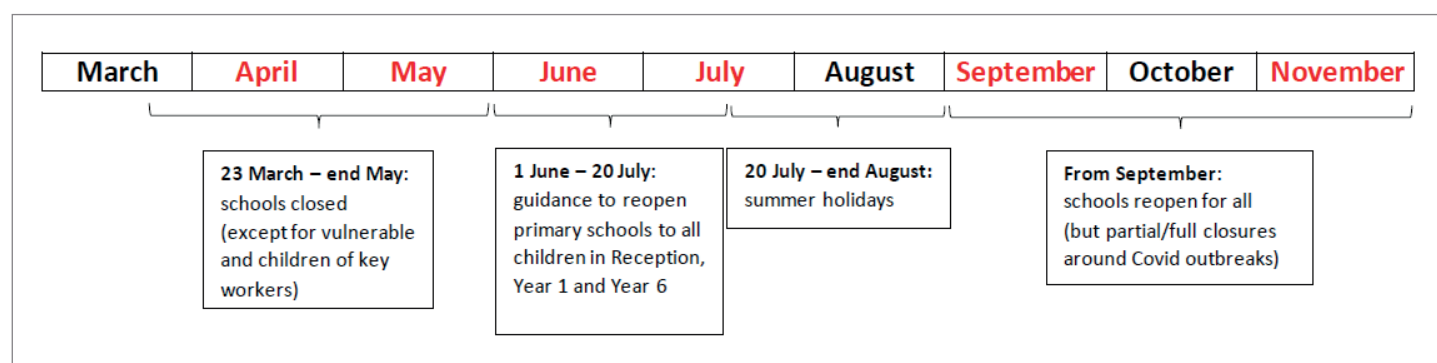
This report now proceeds as follows: Section 2 provides some background information relating to school closures during the pandemic; Section 3 discusses the data we use and the methods we adopt; Section 4 presents descriptive analysis of how access to school and attendance at school varied across children in different year groups and across different family types; Section 5 presents our analysis of the impact of school availability on parents' outcomes and Section 6 the results for children's social and emotional wellbeing. Section 7 concludes.

2 Background: school closures during the pandemic

The first cases of COVID-19 were confirmed in England on 31st January 2020. As cases increased and the death toll rose, the UK Government announced restrictions to reduce infection rates. On Wednesday 18th March 2020, it was announced that schools and pre-schools would close to most children at the end of the week. From Monday 23rd March 2020, only children of key workers and vulnerable children were allowed to attend school or nursery in person, with only 2.6% of the cohort attending, on average, during that initial lockdown (Department for Education, 2021). All other children had to remain at home, and school-aged children were provided with distance learning resources by their schools.

With schools and nurseries closed, the full responsibility of caring for and educating their children at home fell on parents. Parents spent about two hours every day home-schooling primary school children (Del Bono et al., 2021) and also spent considerable time on childcare and housework (Andrew et al., 2021). There was also a wider stay-at-home order in place.

Figure 1 Timeline of school closures in 2020



Notes Months with COVID-19 Study waves are highlighted in red. Data collection was in the last week of the month.

Figure 1 illustrates the timeline of school closures in 2020. Schools remained closed to most children between 23rd March 2020 and the end of May 2020. From 1st June 2020 until the end of the school year (around 20th July, with slight local variations), government guidelines recommended a full reopening of nurseries and pre-schools and a partial reopening of schools. This partial reopening of schools – which was deemed necessary to facilitate social distancing in classrooms – created the variation we use to study the effect of school availability on family outcomes. Government guidance suggested that primary schools in England should prioritise children enrolled in Reception (age 4/5), Year 1 (age 5/6) and Year 6 (age 10/11) to return to school for that roughly seven-week period, and that children in these year groups should be able to return full-time, or close to it. We refer to children in these year groups as the ‘priority group’.³

From the start of the next academic year (beginning in September 2020), schools reopened to all pupils as normal. Children were, however, assigned to ‘bubbles’ – groups of pupils deemed to be in close contact – which determined who needed to isolate in the event of a positive case of COVID-19. There was also the possibility of local lockdowns in some areas, which led to short-term school closures at times when local case rates were high. In both cases, children in all year groups were equally likely to be affected, thus we expect no difference, on average, in exposure to school closures from September 2020 onwards between children who were and were not prioritised to return to school at the end of the previous academic year. This enables us to use data from September onwards to explore the longer-term effect of exposure to school closures of differing lengths.

From early January to 8th March 2021 there was another period of closures which only applied to school-aged children (Reception year and above), with pre-schools and nurseries able to remain open. During this second national lockdown more children attended school due in part to a relaxation of the requirements for parents to be classified as a ‘key worker’. Department for Education statistics reveal that between 12 and 19% of children attended school during the Winter 2021 closure compared to 2.6% per day who attended in the Spring 2020 closure.⁴ During this second period of school closures, we are able to use Labour

³ Students in secondary school years 10 and 12 were also prioritised for a return to school, but only from 15th June and in many cases on a part-time basis only. We focus on younger children, not only because the guidelines regulated a more comprehensive return to school for these children, but also because younger children are likely to require more input from parents whilst at home.

⁴ Department for Education ‘Attendance in education and early years settings during the coronavirus (COVID-19) outbreak’. <https://explore-education-statistics.service.gov.uk/find-statistics/attendance-in-education-and-early-years-settings-during-the-coronavirus-COVID-19-outbreak/2020-week-25>

Force Survey data to for differences in parents' labour supply between those who were just old enough to go to school (those in reception) with those just a little younger (in the pre-school year).

Our analysis focuses on families in England, as the variation in priority to return to school by year group in Summer 2020 only occurred in England. There were variations in the timing of the return to schooling between nations in both Summer 2020 and March 2021 but we do not have sufficient observations for Scotland, Wales and Northern Ireland to make use of pupils living in other nations in our design.

3 Data

Understanding Society

Most of our analysis uses data from *Understanding Society*, the UK Household Longitudinal Study (UKHLS). The main *Understanding Society* study is a longitudinal, nationally representative, panel study which started in 2009 and annually interviews participating households (University of Essex, 2022). In response to the pandemic, *Understanding Society* set up the COVID-19 study (University of Essex, 2021). This longitudinal web-based survey comprises members of the *Understanding Society* main survey who, in April 2020, were 16 or older and were in households that had participated in at least one of the previous two waves.⁵ Members of the *Understanding Society* COVID-19 study were interviewed monthly from April to July 2020 and bimonthly thereafter, with fieldwork taking place roughly in the last week of each month.

Understanding Society and its COVID-19 study collect information across a wide range of topics from respondents, including rich information about people's background and behaviours.

The main outcomes we use are:

School availability and attendance

We use data collected retrospectively in the September wave of the *Understanding Society* COVID-19 study on whether children had been offered face-to-face schooling in June and July 2020 and whether they actually attended school, and for how many weeks, days per week and hours per day. From this information we create a binary measure of children having been offered/attended school and a continuous measure of the hours offered/attended during the half term of June/July 2020. At the same time parents whose children were offered schooling but did not attend all possible hours are asked why. Parents are allowed to list all reasons that applied.

Parental mental health

We use the General Health Questionnaire (GHQ), a measure of current mental health that has been extensively used in different settings, including in the investigation of the impact of COVID-19 (Banks and Xu, 2020; Etheridge and Spantig, 2022; Proto and Quintana-Domeque, 2021; Davillas and Jones, 2020). *Understanding Society* uses the GHQ-12 that consists of 12 questions, each assessing the severity of a mental problem using a 4-point scale. For example, one of the questions asked is: 'Have you recently felt you couldn't overcome your difficulties?' with answer options being Not at all/same as usual/rather more than usual/much more than usual, coded as 0, 1, 2 or 3 respectively. Other questions touch on topics including sleep, worrying, enjoying day-to-day activities and feeling unhappy/depressed (see Appendix 1 for question wording of the 12 components of the GHQ-12). The components of the GHQ are aggregated into a Likert score, obtained by summing scores across the 12 components of the GHQ to generate a total score ranging from 0 to 36, with higher scores indicating worse mental health.

Child mental wellbeing

We use the Strengths and Difficulties Questionnaire (SDQ) which is widely used to measure children's emotional and behavioural problems in psychological research (Goodman, 1997). The SDQ presents 25 statements describing children's behaviour and asks the respondent if the description is 'not true' (0 points), 'somewhat true' (1 point) or 'certainly true' (2 points). Five items are included for each of the following domains: conduct problems; emotional symptoms; hyperactivity; peer relationships and prosocial behaviour, and the score for each domain is the sum over the five items (see Appendix 2 for a list of the statements). The scores on the first four domains are added together to form a 'Total Difficulties' score.

Labour market outcomes

Our measures of labour supply in *Understanding Society* consist of hours worked and earnings. Hours worked relates to the week before the interview and includes people not in employment for whom we set the number of weekly hours worked to zero, including those on furlough. Our measure of earnings is net monthly individual earnings. We convert amounts reported in the *Understanding Society* COVID-19 survey by those in work to monthly earnings using information on the period for which earnings were reported.

We also consider self-reported loneliness as an outcome. Adults are asked 'In the last four weeks how often have you felt lonely?'. Those who report feeling lonely 'often' or 'some of the time' are coded as experiencing loneliness.

⁵ Response rates were 42.1% in the first wave (April) and reduced to 28.6% by November, the last wave we use (Institute for Social and Economic Research, 2021)

Samples

Our analysis of parental outcomes based on *Understanding Society* focuses on mothers and fathers in England who have at least one child living in their household who was in school years Reception to Year 7 (R-7 for short) in June or July 2020. This covers children from the first primary school year (age 4/5) to the first secondary school year (age 11/12).

For our main analysis of the impact of school availability on children's wellbeing, we restrict our sample to children aged 5-11 whose mother or female guardian reports on their behaviour in July 2020 (as they do in most cases). The main sample we use is based on combined data from the *Understanding Society* mainstage sample and the July COVID-19 study and contains observations for about 1,900 children.

In the mainstage UKHLS survey, parents were only asked to report SDQ for children aged either 5 or 8. The July COVID-19 survey was carried out in the last week of July, around the first week of the summer holidays. To avoid the possibility that mother reports of children's SDQ may vary depending on whether they are observed during or outside term-time, as well as at different times of the year, we restrict attention to children in the July 2020 COVID-19 sample for whom we also have a mother-reported measure of SDQ from the mainstage sample measured during the school summer holidays. Because the data on SDQ was only collected in the UKHLS for children aged 5 and 8, we observe their pre-pandemic SDQ measure between 1 and 3 years before July 2020, with a two-year gap on average, plus additional observations for some older children.

As the September 2020 data (when all children should be back at school) is collected for all children we are able to compare this with outcomes in July 2020 in a less restricted way.

Labour Force Survey

We complement our analysis of the impact of school availability on parents' labour supply in UK HLS using the Labour Force Survey, which collects a wealth of labour market information from a nationally representative sample of UK households each quarter, following households for up to five quarters (Office for National Statistics, 2022). This provides information on a larger sample of families during the first period of school closures (in April/May 2020), potentially enabling us to detect smaller effects. It also enables us to consider any labour supply implications of the second round of national school closures in January/February 2021, when schools were closed but formal childcare settings were encouraged to remain opened.

We consider a range of outcomes in the LFS, including labour force participation, whether individuals are in work, and hours worked – including whether they worked fewer hours than usual, and whether the reason they worked fewer hours than usual was because of a lack of childcare.

4 Methods

To estimate the effect of school closures on outcomes of parents and children we use the variation generated by the policy for some school year groups in England to be prioritised to return to school from 1 June until the end of the summer term 2020 while others were not (see timeline, Figure 1 above). This enables us to make comparisons in how outcomes of interest change over time for parents with children in the priority groups (Reception, Year 1 and Year 6) for a June 2020 return to school and those with children in the non-priority groups (Years 2, 3, 4, 5 and 7), or the children themselves.

Parent mental health: Our estimates compare changes in parents' mental health – and the mechanisms through which these effects may have arisen, including labour supply and social isolation – from April/May 2020, when most children were not able to attend school, to June 2020 and beyond, when some and then all children were able to return to school. The estimate for June measures the immediate impact of school reopening on the mental health of parents whose children in years R-7 were all prioritised to return to school compared to parents with at least one child in years R-7 not prioritised to return to school. Estimates for July and August (when all children were on school holidays) and September and beyond (when schools had reopened for all children) measure the longer-term impacts of that differential period of school availability (roughly seven weeks in June/July 2020).

The approach described above compares changes from a period in which schools were closed to most children to one in which schools were open for some children. It therefore provides an estimate of the impact of schools reopening on parents' outcomes. To interpret our results more generally as the effects of school availability, we need to check that school opening and closing effects are symmetric, i.e. similar in magnitude. To do this, we use the same variation in children's eligibility for school in June 2020, but instead of comparing parents' mental health with the situation in April/May 2020 when all children were out of school, we compare mental health with pre-pandemic data from the UKHLS mainstage interviews in 2017-2019 when all children were in school. We restrict the mainstage sample to observations collected between 1st June and 15th July of each year to ensure we compare the June COVID-19 2020 observations with observations in previous years from around the same time, and before the summer holidays. We do not use this as our main specification because we do not have consistent measures of all variables we are interested in across both surveys and restricting the mainstage sample to families who were surveyed within a six week period in June/July (to take account of seasonality) leads to a smaller sample size and lower precision of our estimates.

Child social and emotional wellbeing: Our estimates compare changes in emotional and behavioural difficulties among children who were not prioritised to return to school in June 2020 with changes among children of a similar age who were in year groups prioritised to return, where the changes are measured from before to during the pandemic. These results are therefore estimates of school closures and rely on the assumption that in the absence of school closures emotional and behavioural difficulties of children not in priority year groups would have developed in a similar way to those of other children. However, because our pre-pandemic data only includes SDQ for children aged 5 and 8, our comparisons rely on children with different gaps between their pre-pandemic and 2020 observations and for a limited subset of children, making these results less generalisable than those for parents.

Parents' labour supply from the LFS: We adopt a similar approach to that outlined above for parents' mental health in *Understanding Society* to explore the impact of school availability on parents' labour supply in the LFS. Specifically, we compare how labour supply changed over time, from April 2020, when schools were closed to most children, to later in the pandemic, when schools were opened to some (June/July 2020) and then all children (from September 2020), and how this differed for parents whose children in year groups R-7 were all prioritised to return to school in June 2020 with those with at least one child in this age range who was not prioritised to return to school in June 2020.

We also consider changes in labour supply between September 2020 (when schools had reopened to all children) and January/February 2021, when schools were closed to most children but pre-school facilities were encouraged to remain open. Specifically, amongst families with at least one child in reception or the pre-school year in academic year 2020-21, we compare changes in labour supply for parents whose children in this age range were all in the pre-school year vs. those with at least one child in reception. This provides an estimate of the impact of childcare facilities remaining open.

All approaches use ordinary least squares regression methods, accounting for a range of additional covariates, and clustering standard errors at the individual level. Because the weights provided in the data are not designed to make our specific sample of interest nationally representative, we focus on unweighted estimates, but have also undertaken robustness checks using weights which do not materially affect the conclusions reported here.

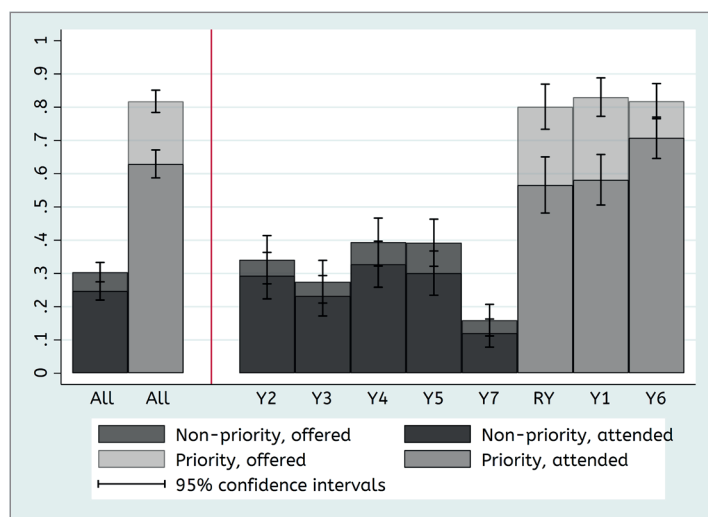
5 School offered and attended in June and July 2020

In this section we study school availability and attendance in June/July 2020 when schools reopened for some children. Not all schools complied with government guidance to open schools for priority year groups. Some offered school to more year groups than stipulated in the guidance and others to fewer or different year groups. These school-level decisions constrained parents' options. Within these constraints parents were free to make choices about sending their child to school, and some opted not to, for a variety of reasons. By examining the patterns of school being offered and taken up we can pinpoint how the costs of school closures in the pandemic were distributed. This may be relevant for future school closures, if other crises make these necessary

First, we look at overall availability and take up by year group. Figure 2 looks at the share of children who have been offered and have attended school in June/July. The left panel compares all children in non-priority year groups (first column on the left, darker greys) and all children in priority year groups (second column from the left, lighter greys). The right panel presents the same figures separately by year group. For each column in the graph, the lighter colours show the share of children who were invited to return to school at least once in June/July; the darker colour the share of students who attended school in June/July.

The left panel of Figure 2 shows that 30% of children in the non-priority group and 83% of children in the priority group were offered school in June/July. These shares vary by year group, from 15.9% to 39.4% in the non-priority group and from 80.6% and 81.8% in the priority group. Of those who were offered some school, a high proportion in the non-priority group attended (24.7%) whereas around three quarters attended in the priority group. The share of children who attended school ranges by year group from 12% to 32.7% in the non-priority group and from 56.6% and 70.8% in the priority group. It is notable that a higher share of those offered school in Year 6 attended, compared to children in Reception and Year 1.

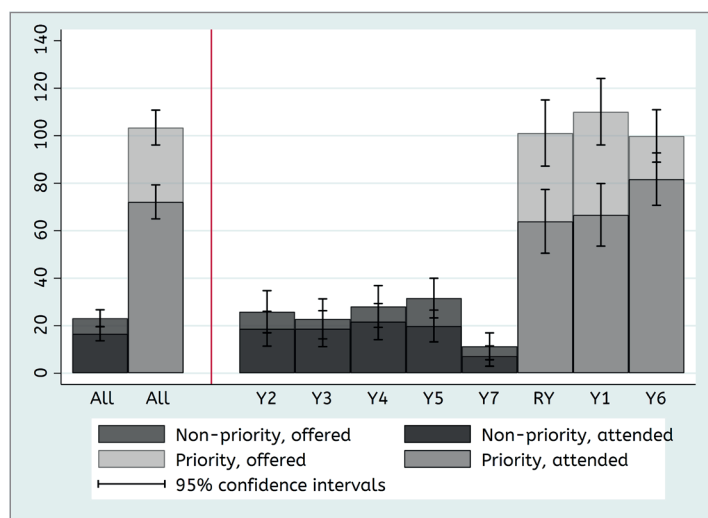
Figure 2 School availability and attendance by priority and non-priority group and year group



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 who report information in September 2020 about return to school in June/July 2020. Bars report share of children offered and attending school. 95% confidence intervals. Sample is 1,464.

We also have information on the number of hours of school children were offered and attended (including as zeroes those offered nothing/not attending at all). Figure 3 presents this information in a similar format to Figure 2. The number of hours attended mimics the patterns for the proportion of children attending. Notice that seven weeks at school is equal to about 210 hours. Children in the priority group received 72 hours of schooling in this time-period on average (including children who were offered none), compared to 16 hours for the non-priority group. Those in the priority group who were offered some schooling were offered 130 hours, and those who attended were at school for 121 hours in June and July 2020, almost all the hours offered. Anecdotal evidence suggested that many schools did not offer any places for the first week of the half term or restricted the days available during the week. This can partially account for why schools did not offer the full seven weeks.

Figure 3 School hours offered and attended by priority and non-priority group and year group



Notes Data from *Understanding Society* COVID-19 study. Bars report share of children offered and attending school. Sample: parents of children in school years Reception to Year 7 who report information in September 2020 about return to school in June/July 2020. 95% confidence intervals. Sample is 1,352.

Patterns by individual and family background

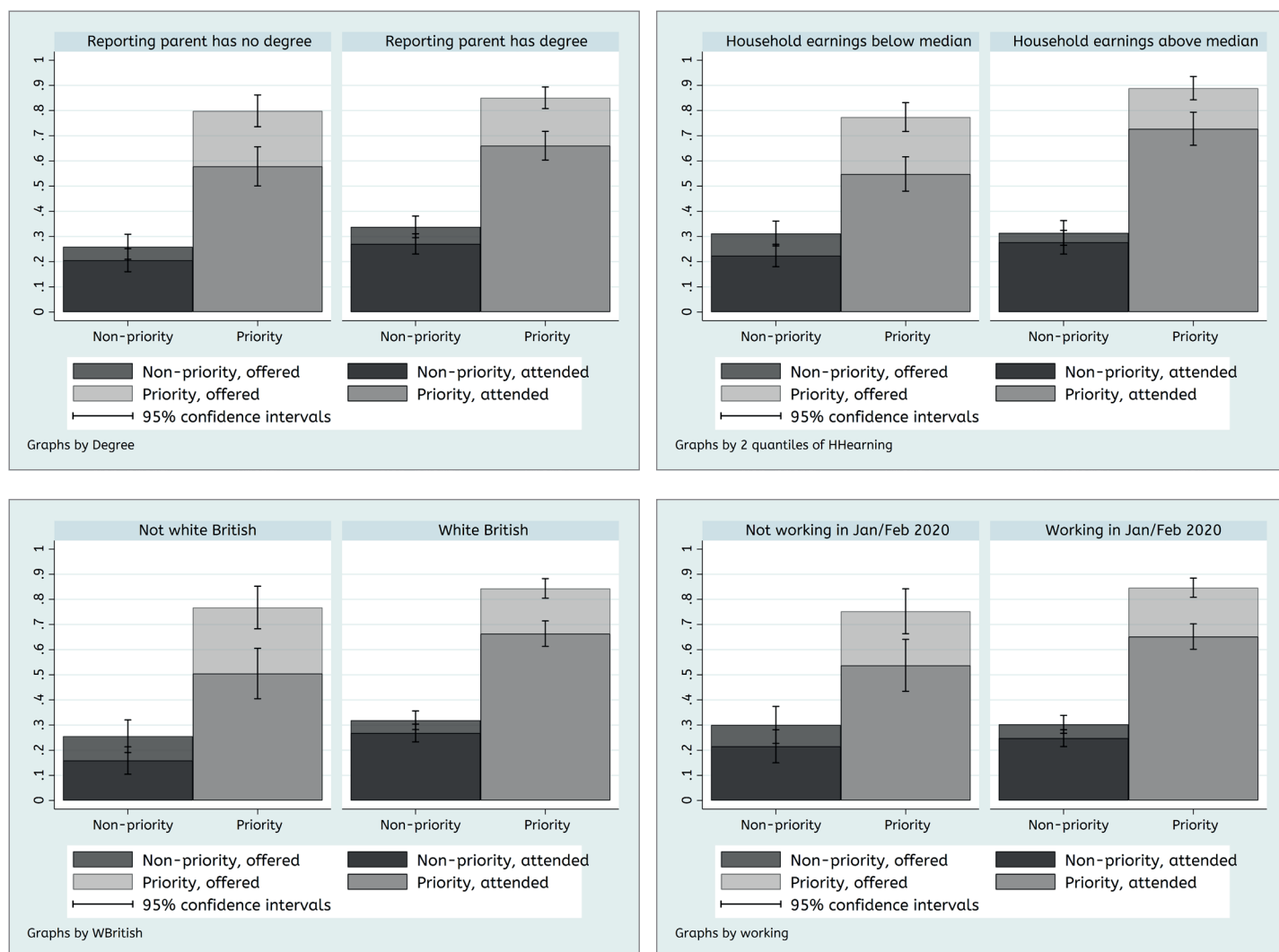
Next, we compare patterns of school availability and attendance across children from different backgrounds. We tested differences by parental education, partnership status, household earnings, ethnicity, parent work status pre-pandemic (working, working from home, working more or less than 20 hours a week), parent's pre-pandemic mental health, number of children in different age groups and region. For reasons of space, we show the results with the most striking differences between the groups.

Specifically, we compare school availability and attendance between parents with and without a degree (top left panel of Figure 4), in households with above vs. below median earnings (top right panel of Figure 4), between parents of white British vs. other ethnic origin (bottom left panel of Figure 4), between families with only one child in school year groups R-7 vs. more children in those year groups (bottom right panel of Figure 4) and by region (Figure 5). In each case we present differences for priority and non-priority groups separately.

The biggest differences in school availability and attendance by background characteristics were among children in the priority group. There are also differences in the non-priority groups but these are not statistically significant. The top left panel of Figure 4 shows that children in the priority group with more educated parents were both slightly more likely to have their children offered schooling (85% compared to 80%, but not statistically different) and are even more likely to return to school (66% compared to 57%, statistically different at 10% level).

The pattern of children in more advantaged families being more likely to be offered and to return to school is repeated when we look at household earnings (top right panel). 89% of children in the priority year groups with parents earning more than median household earnings in our sample were offered school, compared to 77% of those in the same year groups but with earnings below the median (difference statistically significant at the 5% level). The difference in attending rates was 73% v. 55% (again strongly statistically significant).

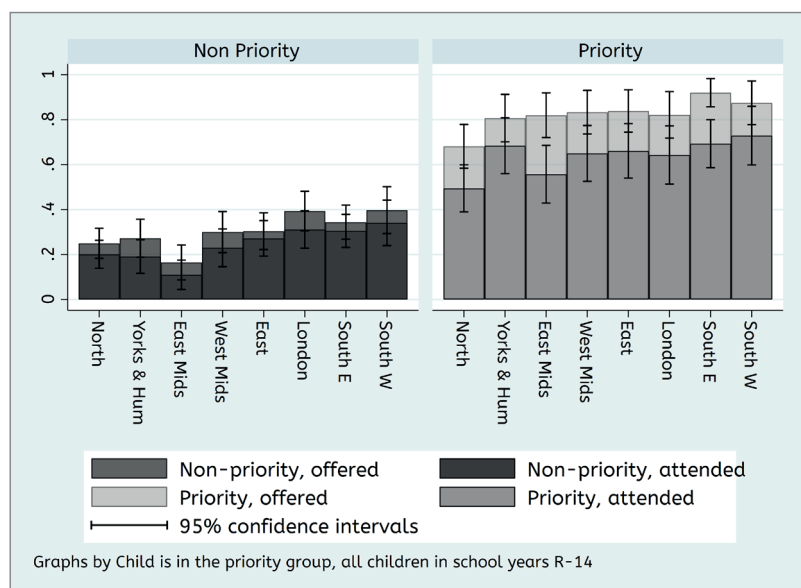
Figure 4 School availability and attendance by background characteristics



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 who report information in September 2020 about return to school in June/July 2020. Bars report share of children offered and attending school. 95% confidence intervals. Samples vary.

The bottom left panel of Figure 4 shows that White British children were also more likely to be both offered (84.4% v. 76.8%, significant at 10% level) and attend (66.4% v. 50.5%, significant at 1% level) than children of other ethnic backgrounds. In particular, there seemed to be a greater reluctance to send children back to school, if offered, from families of non-White British than White British background. Samples are too small to show graphs by more detailed ethnic group, but we explore this aspect further in regression models described later. Finally, the bottom right panel shows how availability and attendance patterns vary depending on the mother’s work status pre-pandemic. Our data suggests that children from families where the mother worked pre-pandemic are more likely to send their child back to school than where the mother did not work.

Figure 5 Attendance by priority and non-priority group and region



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 who report information in September 2020 about return to school in June/July 2020. Bars report share of children offered and attending school. 95% confidence intervals. North East and North West have been combined in this figure due to low cell counts. Sample = 1,464.

There were stark regional differences in COVID-19 infection rates which were higher in the North and lower in the South, especially in the first wave of the pandemic. Figure 5 shows that there were also considerable regional differences in whether children were offered school in June/July 2020 and whether they opted to attend. Only 68% of children in eligible year groups were offered some schooling in the North, compared to 92% in the South East. This difference is likely in part driven by differences in infection rates which affected teacher availability, for example.

It is interesting that there are also regional differences in whether parents of children in the priority groups took up the offer of schooling. In Yorkshire and the Humber and the South West of England there was a higher propensity to attend school, if offered, whereas there was greater reluctance to send children to school in the East Midlands and the South East. In the regional analysis we also see significant differences in whether children from non-priority groups were offered school. Around 40% of children in non-priority groups were offered some school in London and the South West, whereas the proportion was less than half this number in the East Midlands.

Overall we see a pattern where those from ‘advantaged’ backgrounds are more likely to be offered and attend school but we have not so far been able to assess which aspect of advantage is more important. To shed light on this we run some multivariate regressions to tease out the importance of the different factors. We start with a simple analysis of attendance regressed on covariates before modelling the importance of covariates once we condition on children being offered a school place. We then run a similar analysis of the factors that determine being offered a school place.

These results (shown in Appendix 3) indicate that it is children from Asian and ‘Other’ backgrounds who are least likely to attend, and more aggregated analysis shows that those from non-white backgrounds were less likely to be offered a place overall. Those with higher earning parents were both more likely to be offered to attend. Those in the North East were less likely to attend than those in other areas and this is driven by them being less likely to be offered. Interestingly the children of parents with poor mental health were less likely to attend, but this is not statistically significant conditional on being offered a place. Parents who worked few hours (less than 20) were less likely to send their children back to school conditional on being offered a place.

Overall we see that a considerable proportion of parents chose not to send their children to school, even if they were offered the opportunity to do so. The September COVID-19 survey asks parents who did not send their child back for the full time they were offered about the reasons why. As can be seen in Table 1, the most frequent reason given is a concern for the health and safety of the child, followed by a concern for the health and safety of family members. Not having siblings at school was also a reason for 26% of parents.

Given the previous results indicating that non-White British children were less likely to take up offered places we disaggregate the reasons given by ethnicity. Results in the second and third columns of Table 1 indicate a particularly strong concern about the

health and safety of children and family members among those who are not White British, whereas siblings' school attendance was less important.

Table 1 Reasons child did not attend school for those who did not attend all that was offered

Reasons	All	Not white British	White British
Health and safety of child	.521	.654	.474
Health and safety of family members	.367	.364	.268
Health and safety of teachers	.126	.073	.145
Health of community	.150	.109	.165
Child was self-isolating	.024	.018	.026
Child was sick	.039	0	.053
Siblings not at school	.261	.145	.303
No transport	.039	.018	.046
Other	.314	.291	.322
Sample	207	55	152

Notes Data from *Understanding Society* COVID-19 study, September survey. Sample is children in Years R-6 who did not take up the hours of attendance they were offered by their school in June/ July 2020.

In summary, we see a pattern where children from 'advantaged' backgrounds were more likely to be offered and attend school than children from disadvantaged families. Whether families were offered school was outside their control and the marked regional patterns suggest that place-based disadvantage – which manifested, among other things, in different COVID-19 infection rates – played a significant role. The choices families made about sending their children to school also differed by background and were motivated by concerns about the health of children and family members. Given that infections transmitted more easily among communities living in densely populated areas and crowded housing, and there was a social gradient in morbidity from COVID-19, it is perhaps not surprising that disadvantaged families were more likely to reject the offer of attending school: the different patterns of attendance we see in different areas of the country and across different family types may have been an entirely rational response to the differing levels of risks in these school environments.

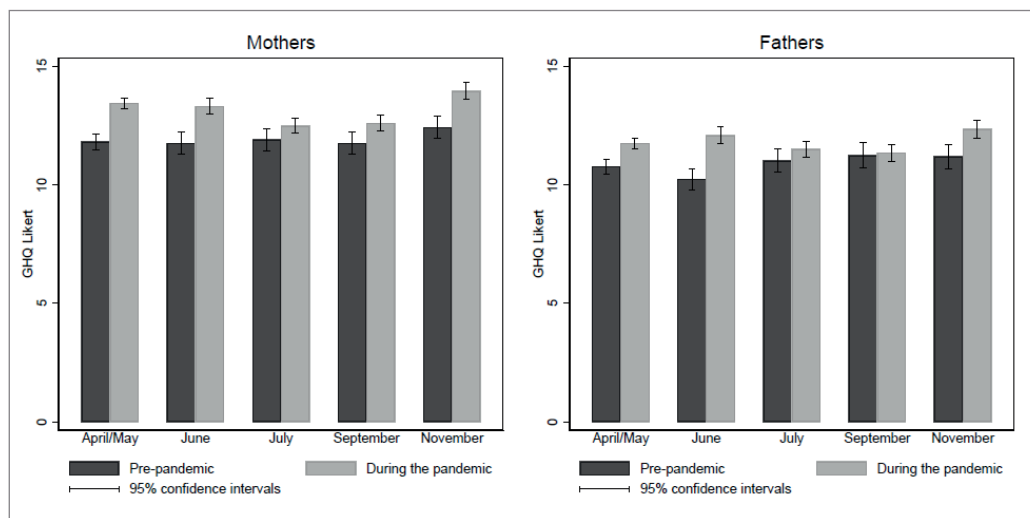
6 School availability and parents' outcomes

Parent mental health

It has been widely shown that adult mental health was lower during the pandemic compared to previous years (Banks and Xu 2020; Cheng et al 2021, Etheridge and Spantig, 2022; Huebener et al., 2021). Before considering the impact of school availability on parental mental health we examine overall patterns in GHQ before and during the pandemic, among our sample of mothers and fathers.

Figure 6 shows that mental health was worse (higher GHQ scores imply worse mental health) in all the pandemic months from April/May to November 2020 than in the same months pre-pandemic for both mothers and fathers, with gaps generally larger for mothers. We observe particularly large gaps in April/May and June, the months affected by school closures. It is also notable that the mental health of mothers and fathers worsens in November 2020, when national restrictions on certain activities were re-imposed, although schools (in general) remained open.

Figure 6 Parents' mental health before and during the pandemic, by months

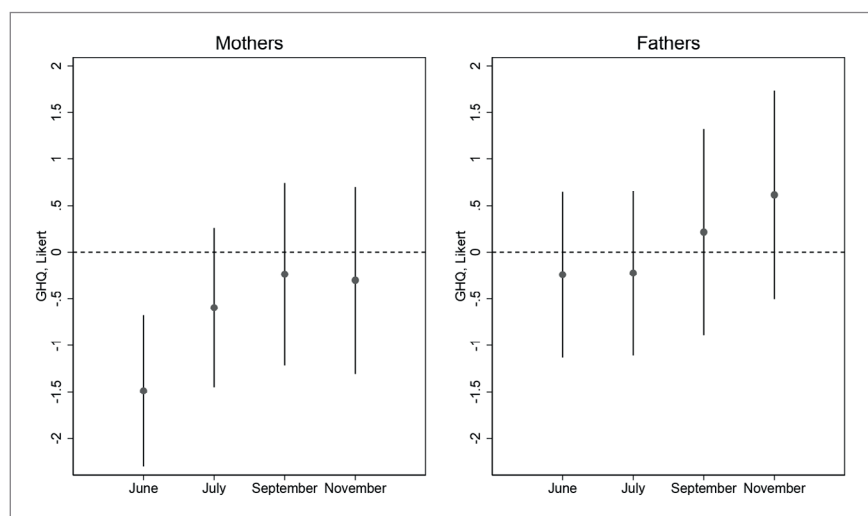


Notes *Understanding Society*: COVID-19 Study (waves 1-6), 2020 and *Understanding Society* Mainstage study, (waves 9 and 10, selected months) sample of parents of children in years R-7 living in England. Each calendar month contains a different sample.

To investigate the impact of school availability on mental health we focus on changes in GHQ scores over time, from April/May 2020, when schools were closed to most children, to later in the pandemic, when schools were open to some and then all children. We compare how mental health changed over this period for parents whose children in years R-7 were all prioritised to return to school in June 2020 with those with at least one child in this age range who was not prioritised to return to school.

Figure 7 illustrates the results of this comparison for mothers (in the left-hand panel) and fathers (in the right-hand panel). The circles show the average difference in GHQ scores between parents whose children in years R-7 were all prioritised to return to school in June 2020 and parents with at least one child in those year groups who was not prioritised to return. The lines surrounding the circles indicate how confident we are in these estimates: the further away the circles and the lines are from zero (indicated by the dashed horizontal line), the more confident we can be about the estimates.

Figure 7 Effects of school reopening on parents' mental health



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. 95% confidence intervals. Method: Difference-in-differences with standard errors clustered at the individual level, comparing to April/May 2020, controlling for interview date and presence of children younger than school age. Sample size: Mothers = 5,407; Fathers = 3,295.

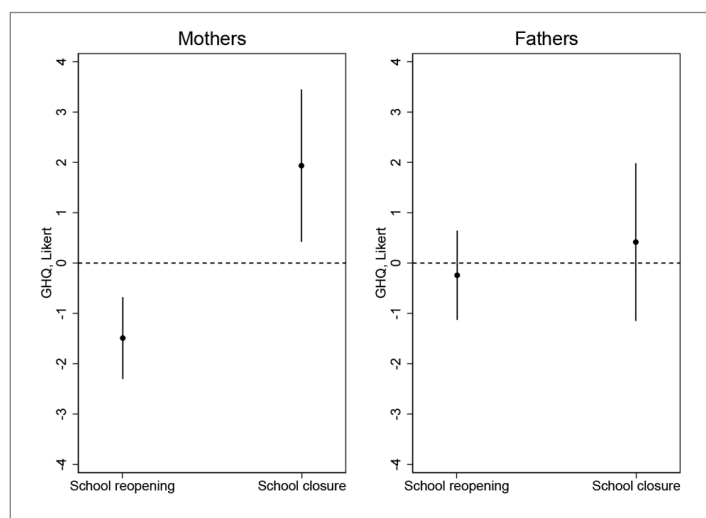
We find that schools reopening led to a 1.5 point decrease in mothers' GHQ score, with lower scores indicating better mental health. This effect is equivalent to a mother moving from feeling a problem such as being unhappy or depressed 'much more than usual' to somewhere between 'rather more than usual' and 'no more than usual'. It is about two thirds the size of the total increase in mental health problems experienced by mothers in June 2020, compared to pre-pandemic levels (as reported in Figure 6), and similar to the increase in GHQ scores experienced by women in the two years leading up to a divorce (Gardner and Oswald, 2006; Laporte and Windmeijer, 2005) and following a partner's job loss (Mendolia, 2014).

The beneficial effect of school reopening on mothers' mental health seen in June fades in July, when all children are at home for the school summer holidays and decreases further and become close to zero in September and November, when all year groups were back at school. This indicates that, once schools reopened to all children, the mental health of mothers whose children were not prioritised to return early quickly caught up with that of mothers whose children were prioritised to return in June/July 2020, suggesting that that relatively short differential period of school access did not have lasting effects on mothers' mental health.

The right-hand panel of Figure 7 shows that school availability did not affect fathers' mental health: all the lines cross zero, indicating we cannot be confident that any of the estimates differ from zero. This is in line with other evidence on the gendered mental health effects of the pandemic and could be explained by the unequal division of childcare and housework between mothers and fathers during this period (Andrew et al., 2020; Benzeval et al., 2020; Zamarro and Prados, 2021; Sevilla and Smith, 2020).

To check if these results are informative about the effects of school not being available (as well as of making school available again), we estimate the effect of school closures, making use of pre-pandemic data for June. Results in Figure 8 show a remarkable symmetry, where the school closure effects are of equal magnitude but opposite sign to the school reopening effects shown in Figure 7. This suggests that our estimates are informative about the effects of both school closures and school reopening. This finding allows us to infer that school closures are partly responsible for the drop in mental health shown in Figure 6.

Figure 8 Comparing the effects on parents' mental health of school reopening and school closure



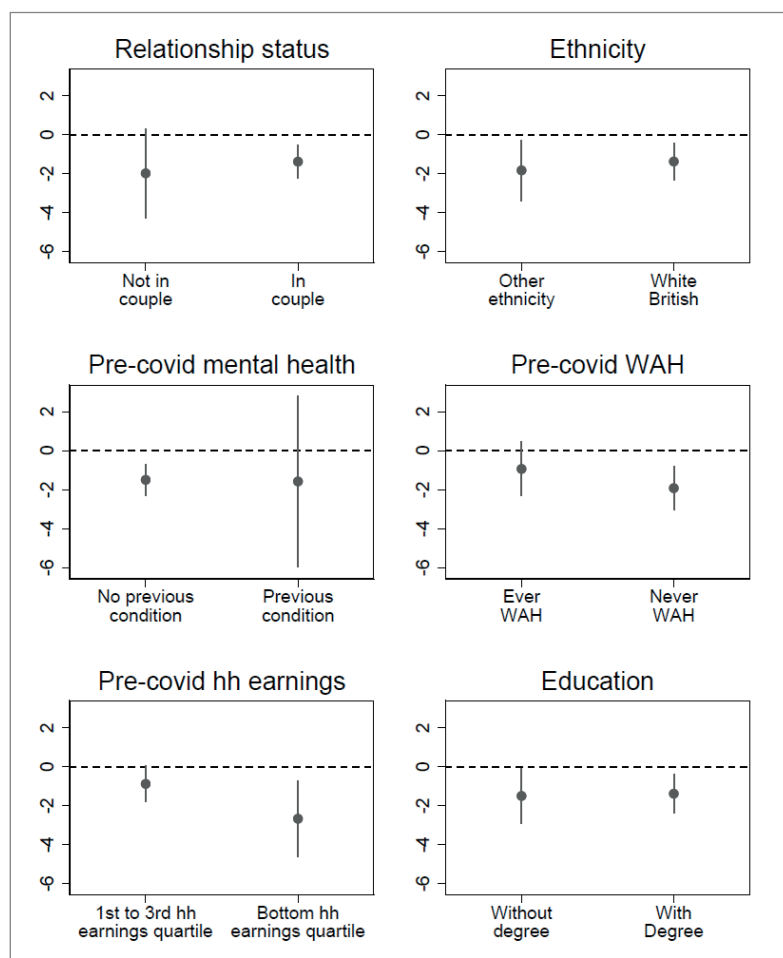
Notes Data from the *Understanding Society* Mainstage study (waves 1-11, data collected from June 1st to July 15th) and not during the summer holidays and *Understanding Society* COVID-19 study (June wave) for the effects of school closures, and from the *Understanding Society* COVID-19 study only (waves April to November) for the effects of school reopening. Sample: parents of children in school years Reception to Year 7 living in England. Standard errors clustered at the individual level and controls included for interview date and presence of children younger than school age. Sample size for the school reopening analysis: Mothers = 5,400; Fathers = 3,280. Sample size for the school closures analysis: Mothers = 4,731 ; Fathers = 3,042.

Next we explore whether the effects on mothers' mental health vary by background characteristics. All the characteristics we consider are measured pre-COVID-19 so that they cannot be an outcome of the pandemic. Figure 9 explores variation on the basis of whether the mother had a partner (top left panel); her ethnic group (White British vs. other ethnic group, top right panel); had a pre-existing emotional, nervous or psychiatric problem (middle left panel); ever worked at home (middle right panel); lived in a household in the lowest household earnings quartile (bottom left panel); had a university degree (bottom right panel).

As above, the circles mark the estimated effect, and the lines around the circles indicate how certain we can be about the estimate. Where these lines cross the dashed zero line the estimated effect cannot be distinguished from zero. Where the lines for the two characteristics within each panel overlap we cannot be certain that the mental health effect differs by the background characteristic in question.

The effect on mothers' mental health of having all children in school years R-7 and below in the priority group does not vary strongly by the characteristics we consider, suggesting either that mothers were mostly similarly affected by school availability or that our sample size is too small to confidently detect any differences that do exist. The estimated effects are slightly larger for mothers from the lowest household earnings quartile (compared to more affluent mothers), providing suggestive evidence that the mental health effects of school closures may have been more marked for lower-income families.

Figure 9 Mothers' mental health effect in June 2020 by background



Notes The figure displays estimates based on interacting the priority group treatment effect with mothers' pre-pandemic background characteristics, showing the total effects and 95% confidence intervals of having all children in the family prioritised to return to school in June/July of 2020 on mothers' GHQ Likert scores in June 2020 by the background characteristic shown in each panel. Standard errors clustered at the individual level, and controls are included for interview date and presence of children younger than school age in the household. N relationship status=2,948; N ethnicity=2,936; N mental health=2,941; N ever worked from home=2,395; N earnings quartiles=2,601, N education=2,898.

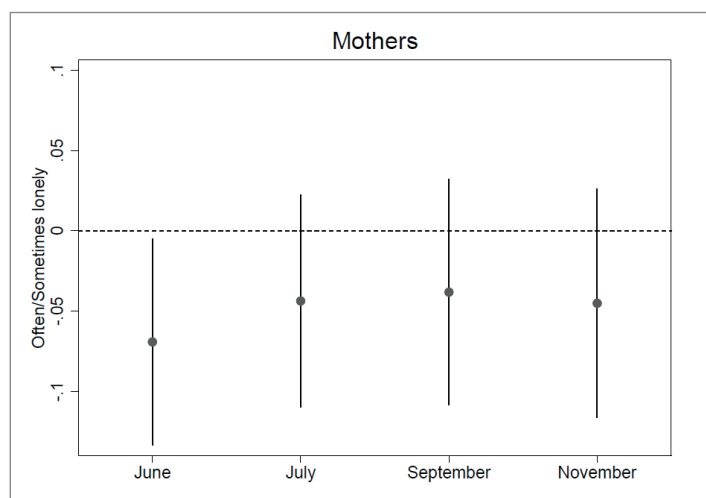
Mechanisms

Loneliness

Foliano et al. (2021) and Etheridge and Spantig (2022) suggest that during the pandemic both women and men spent less social time with people outside the household, but that this loss was particularly salient for women, as they derive more enjoyment than men from social interactions (e.g. Hamermesh, 2020; Gimenez-Nadal and Molina, 2020). To investigate social isolation as a possible mechanism for the mental health effects found above we use self-reported loneliness as an outcome.

Figure 10 shows that mothers whose children in year groups R-7 were all prioritised to return to school in June/July 2020 have a six percentage point lower probability of having felt lonely often or some of the time in the four weeks before the June 2020 interview (taking place in the last week of June) than mothers with at least one child in year groups R-7 who was not prioritised to return to school. This is a 16% decrease in the probability of having felt lonely often or some of the time compared to the pre-pandemic average of 38% of mothers.

Figure 10 Effect of school reopening on mothers' loneliness, over time



Notes The figure displays estimates showing the total effects and 95% confidence intervals of having all children in the family prioritised to return to school in June/July of 2020 on mothers' loneliness over time. Difference-in-difference estimates with standard errors clustered at the individual level, controlling for interview date and presence of children younger than school age in the household. Sample of mothers of children in school years R-7 living in England (N=5,629).

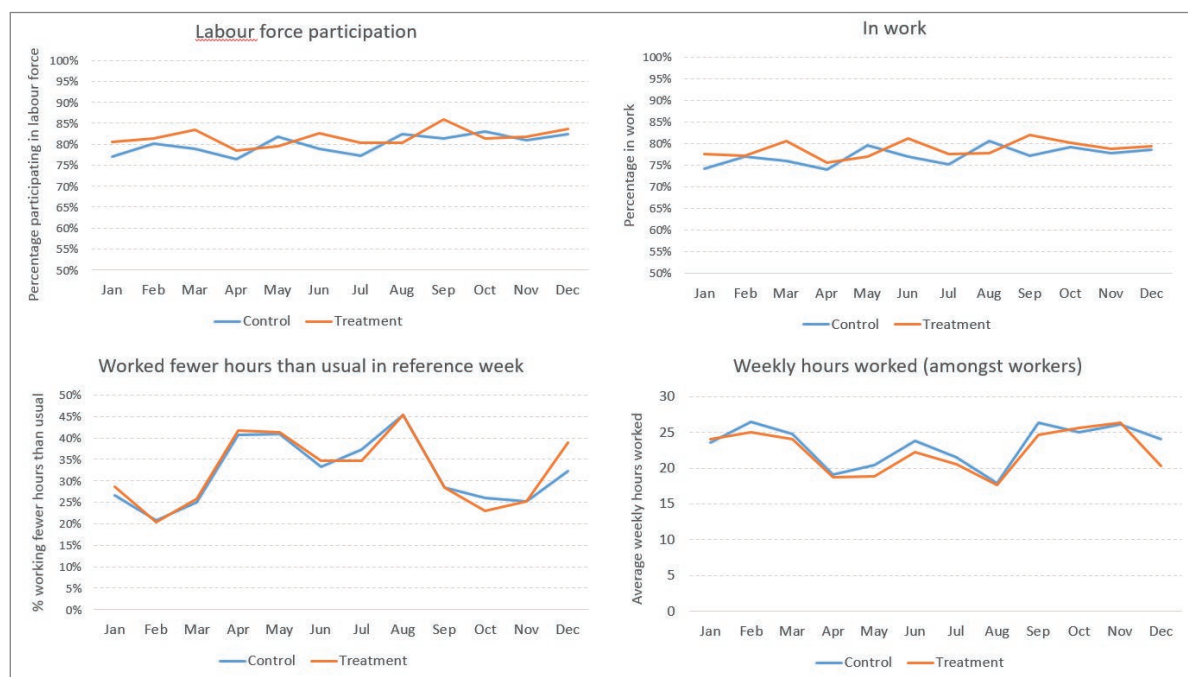
Labour market outcomes

Another possible explanation for the mental health effects we find is that school availability negatively affected mothers' labour supply through the additional childcare burden. The contribution of school availability to the changing patterns of labour supply we see across the pandemic is also interesting in its own right.

Figure 11 uses data from the Labour Force Survey to illustrate how mothers' labour supply changed across the months of 2020, from before any pandemic-restrictions were imposed and across the different phases of restrictions that were in place. It shows, in the top panel, the percentage of mothers participating in the labour force (left-hand side) and the percentage in work (right-hand side), and in the bottom panel, the percentage of mothers working fewer hours than usual (left-hand side), and average weekly hours worked (right-hand side). These average figures are presented separately for mothers whose children in R-7 were all prioritised to return to school in June/July 2020 (treatment group) and those with at least one child in R-7 who was not prioritised to return to school (control group). The same picture for fathers can be found in Appendix 4.

Figure 11 shows relatively little change in the percentage of mothers participating in the labour force or in work in different months of 2020, perhaps because of the Coronavirus Job Retention 'furlough' Scheme which protected jobs at a time when demand in some sectors was extremely low. There is more evidence of variation in hours, with a reduction of around five hours per week (20%), on average, in the number of hours worked, and the percentage of mothers reporting working fewer hours than usual roughly doubling between February and April 2020, from around 20% to more than 40%. These patterns were relatively similar for the treatment and control group and were partially reversed by June 2020.

Figure 11 How mothers' labour supply changed across pandemic

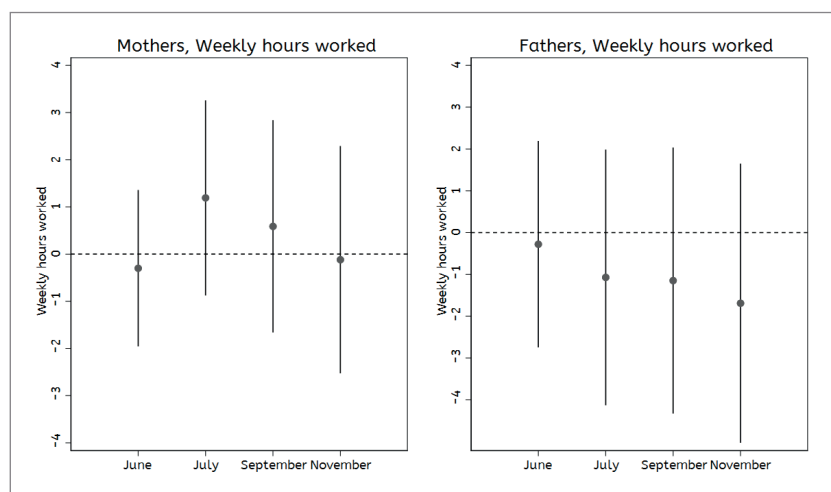


Notes Uses data from the Quarterly UK Labour Force Survey 2020. Sample of mothers with at least one child who was in school years Reception to Year 7 in the academic year 2019-20, observed between January 2020 and December 2020. Figure plots the average labour market outcomes of mothers observed in each month of 2020, separately for those whose children in school years R-7 were all prioritised to return to school in June 2020 (treatment group) and those with at least one child in school years R-7 not prioritised to return (control group).

To explore whether these patterns contribute to the estimated effects of school availability on mothers' mental health, we repeat the modelling approach used to generate the estimates in Figure 7 but for hours worked and earnings in *Understanding Society*, and labour force participation, whether individuals are in work, and hours worked – including whether they worked fewer hours than usual, and whether the reason they worked fewer hours than usual was because of a lack of childcare – in the Labour Force Survey.

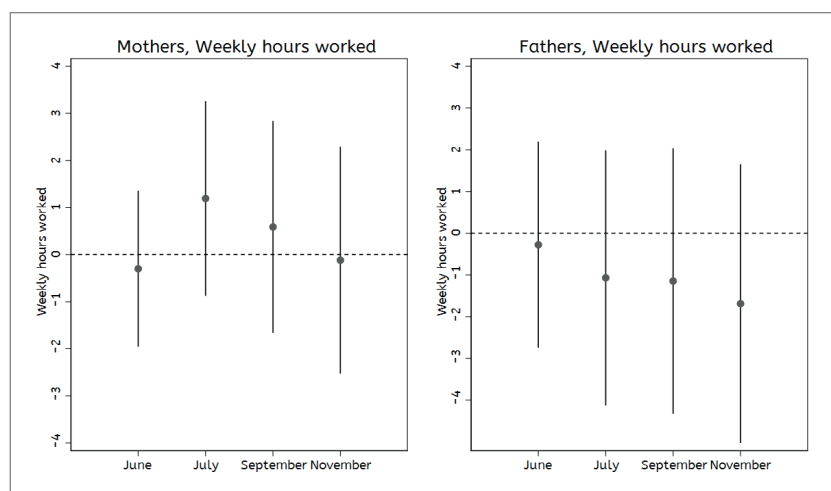
Figure 12 presents estimates of the effect of school availability on weekly hours worked for mothers (left-hand panel) and fathers (right-hand panel). Figure 13 repeats the same analysis for net monthly earnings. Estimates should be interpreted in the same way as for Figure 7. While Figure 11 shows that mothers' labour supply did fall in April/May 2020, when schools were closed, and rise again in June 2020, when schools reopened, Figure 12 confirms that it did not do so differentially for mothers whose children in R-7 were all prioritised to return to school in June 2020 vs. those with at least one child not prioritised to return. Mirroring this, there was no effect on the net monthly earnings of mothers or fathers in this time-period either (Figure 13).

Figure 12 Effect of school availability on weekly hours worked in *Understanding Society*



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. 95% confidence intervals. Method: Difference-in-differences with standard errors clustered at the individual level, controlling for Interview date and presence of children younger than school age. Sample size: mothers = 5,569; fathers = 3,391.

Figure 13 Effect of school availability on net monthly earnings in *Understanding Society*



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. 95% confidence intervals. Method: Difference-in-differences with standard errors clustered at the individual level, controlling for Interview date and presence of children younger than school age. Sample size: mothers = 4069, fathers = 2824.

Figures 14-16 present supplementary analysis of the impact of school availability on parents' labour supply using the Labour Force Survey. Figures 14 and 15 show the effects on a variety of different measures of parents' labour supply in June and July 2020 respectively, separately for mothers (left-hand panel) and fathers (right-hand panel). Specifically, they present, from left to right, differences in labour force participation, whether parents were in work, whether the parent worked fewer hours than usual in the reference week (the week before the interview), and whether the reason the parent worked fewer hours than usual was because of a lack of childcare. June and July 2020 is the time period during which the children of parents in our treatment group were prioritised to return to school, while at least one of the children of parents in our control group were not.

If labour supply was significantly detrimentally affected by school closures, then we would expect to see positive effects on labour force participation and work status, and negative effects on working fewer hours than usual, and childcare being the reason for this, during these months. In line with the descriptive analysis in Figure 11 and the results from *Understanding Society*, however, Figures 14 and 15 show no significant improvements in the relative labour supply of parents in our treatment group in either month.

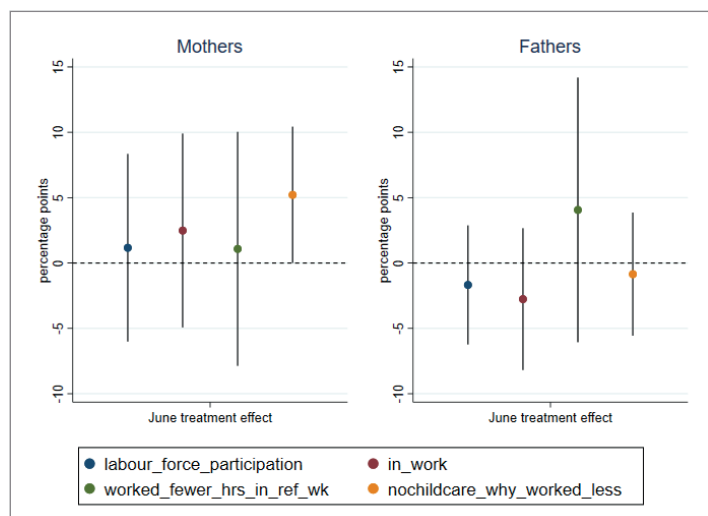
Figure 16 presents month-by-month estimates of the impact of school availability in June/July 2020 on total hours worked in the reference week in the Labour Force Survey, again showing no statistically significant differences between parents in our treatment and control group.

We also explored differences in labour supply between parents exposed to school closures in January/February 2021, again finding no statistically significant differences between parents in our treatment vs. control group. (In this example, the treatment group were those whose children aged 3-6 were all in the pre-school year – for whom childcare/pre-school facilities were able to remain open – and the control group were parents with at least one child of this age in reception, for whom schools were closed.) Results can be found in Appendix 5.

While these results may seem surprising, they could be explained by the fact that mothers whose children were not able to return to school may simply have had to fit in something close to their usual working hours on top of the additional childcare and homeschooling responsibilities associated with school closures. It is also plausible that some mothers whose children were prioritised to return to school may have decided not to increase their labour supply during the short period of differential school availability in June/July 2020, in the knowledge that they might then struggle to access childcare during the school holidays. It is worth noting, however, that this is less likely to be an explanation for the lack of statistically significant differences we find between the labour supply of parents with and without access to school/childcare during the January/February 2021 period of school closures, when this would have been less of an issue.

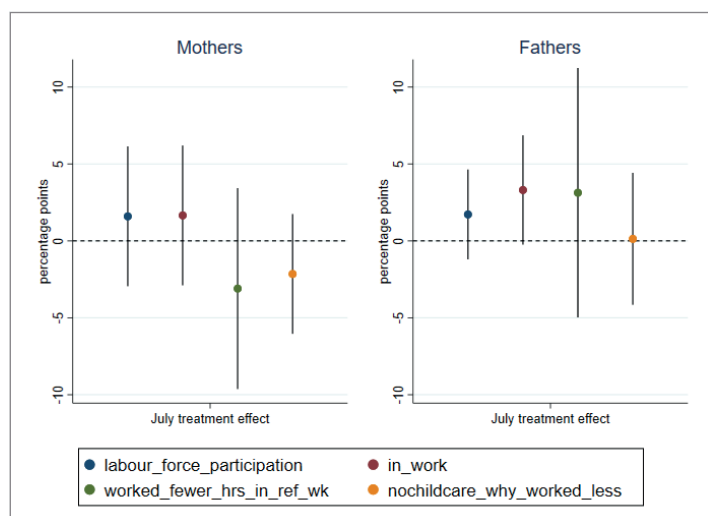
Overall, these results suggest that the impact of school availability on mothers' mental health may be driven by social rather than economic factors. Notice, however, that we are not able to examine the specific role of home schooling and the stress and time pressures this creates for mental health, especially when potentially combined with unchanging work commitments.

Figure 14 Effect of school availability on parents' labour supply in June 2020 (LFS)



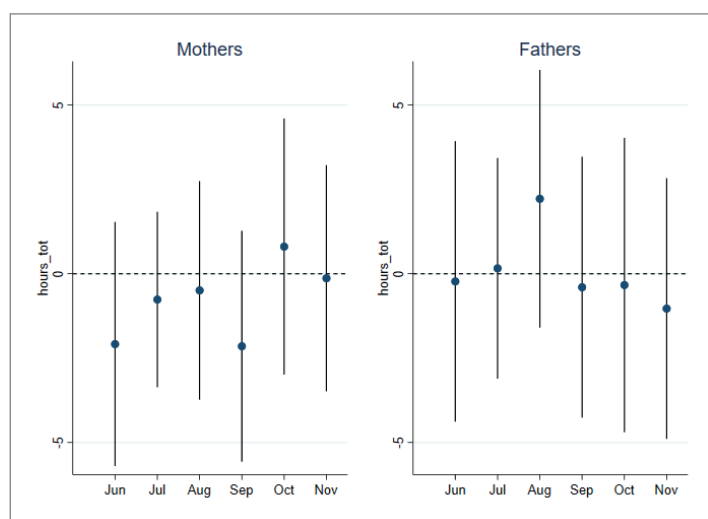
Notes Uses data from the Quarterly UK Labour Force Survey 2020. Sample of parents with at least one child who was in school years Reception to Year 7 in the academic year 2019-20, observed between January 2020 and December 2020. Figure shows the coefficients and 95% confidence intervals of estimates of the effect of having all children in school years R-7 prioritised to return to school in June 2020 (treatment group) relative to having at least one child in school years R-7 not prioritised to return (control group). Each coefficient estimate comes from a different event study regression, estimated using OLS, which includes a binary indicator for being in the treatment group, a set of binary indicators for month of interview (relative to April 2020), and a set of interaction terms between the two, which are the source of the reported estimates. The regressions also include dummy variables for the number of children aged 0-1, 2-4, 5-9 and 10-15, ethnicity, being an immigrant, whether the parent has a partner, whether the highest qualification of the parent was below A-levels or equivalent, region, and continuous linear measures of age of youngest child and date of interview. Standard errors clustered at individual level.

Figure 15 Effect of school availability on parents' labour supply in July 2020 (LFS)



Notes See notes to Figure 14.

Figure 16 Effect of school availability on hours worked (June to November 2020, LFS)



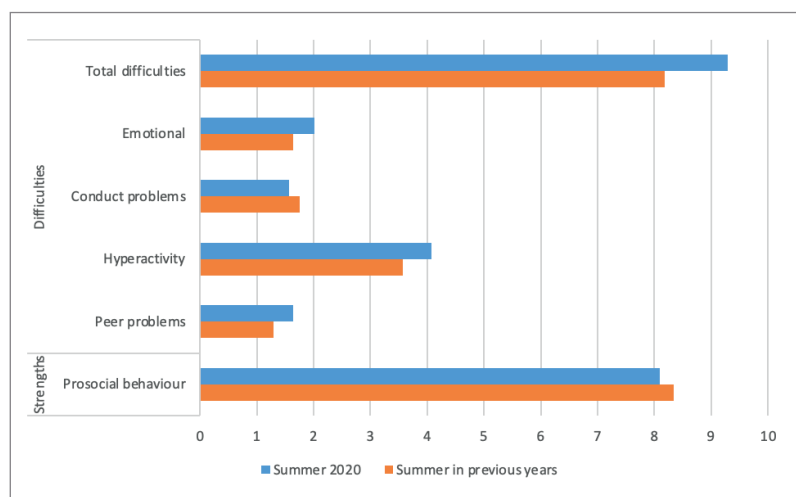
Notes Uses data from the Quarterly UK Labour Force Survey 2020. Sample of parents with at least one child who was in school years Reception to Year 7 in the academic year 2019-20, observed between January 2020 and December 2020. Figure shows the coefficients and 95% confidence intervals of estimates of the effect of having all children in school years R-7 prioritised to return to school in June 2020 (treatment group) relative to having at least one child in school years R-7 not prioritised to return (control group) in different months of 2020. The coefficient estimates for each parent come from the same event study regression, estimated using OLS, which includes a binary indicator for being in the treatment group, a set of binary indicators for month of interview (relative to April 2020), and a set of interaction terms between the two, which are the source of the reported estimates. The regressions also include dummy variables for the number of children aged 0-1, 2-4, 5-9 and 10-15, ethnicity, being an immigrant, whether the parent has a partner, whether the highest qualification of the parent was below A-levels or equivalent, region, and continuous linear measures of age of youngest child and date of interview. Standard errors clustered at individual level.

7 Children's social and emotional wellbeing

Another reason why mothers' mental health could have been detrimentally affected by school closures is if their children's mental health was adversely affected, and again, this outcome is also of interest in its own right. Our analysis of children's wellbeing relies on *Understanding Society* and, as we did with parents, we begin by looking at children's SDQ scores before and during the pandemic, to get an overall sense of the changes in wellbeing seen over this period. Specifically, we compare SDQ scores for children aged 5 and 8 in the school summer holidays in years before the pandemic and in July 2020.⁶

Figure 17 shows some large differences in children's social and emotional wellbeing during compared to before the pandemic, similar in magnitude to the impacts of the pandemic on adults. With the exception of conduct problems, mothers reported that their children exhibited more emotional and behavioural difficulties during the pandemic compared to before. Looking at the total difficulties score suggests an increase of about 1 point, which is equivalent to around 14% of the pre-pandemic average level of difficulties reported, or to a child newly exhibiting a particular negative behaviour some of the time. The domain contributing the most to this increase was a rise in hyperactivity.

Figure 17 Overall change in SDQ: summer 2020 vs. previous summers



Notes Data from *Understanding Society* and COVID-19 study. Sample: Children living in England, aged 5 or 8, whose mother or female carer took part in the survey in the last week of July 2020 or in the summer holidays in pre-pandemic years. The figure compares the mean SDQ scores and mean total difficulties observed in the last week of July 2020 and in the summer holidays of pre-pandemic years. Number of observations ranges between 305 and 818, depending on the outcome.

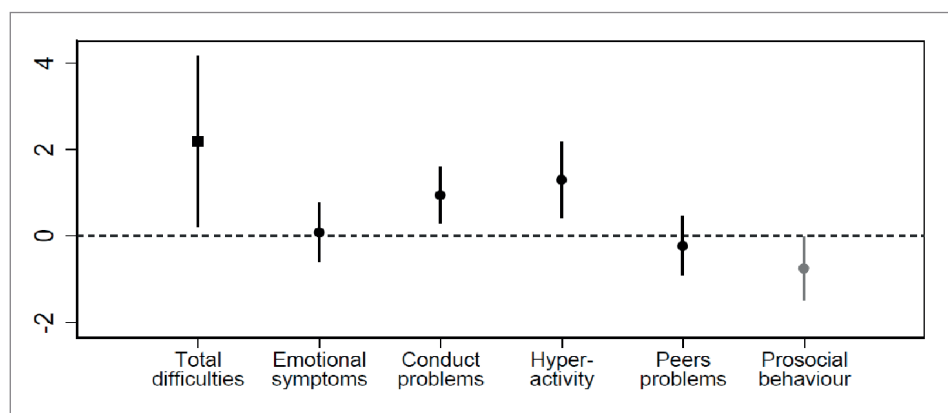
Figure 18 shows results from regression models that compare changes over time for the same roughly 1900 children from the pre-pandemic period to July 2020. We include controls for factors observed in our data that may change over time and which may also matter for children's wellbeing, such as families' experiences of financial difficulties. The squares and circles show the average difference in the indicators of emotional and behavioural difficulties reported by parents of children with access to less vs. more school during the summer term of 2020. The lines surrounding these shapes indicate how confident we are in these estimates: the further away these lines are from zero (the dashed line), the more confident we can be about the estimates.

In terms of overall difficulties, this figure suggests that not being prioritised to return to school during the summer term increased the SDQ total difficulty score by around two points, on average, compared to children who were prioritised to return to school during the summer term. This is equivalent to around 27% of the average pre-pandemic level of difficulties, or to a child newly exhibiting a particular negative behaviour very often, or to newly exhibiting two negative behaviours some of the time.

Figure 18 also shows that the effect on total difficulties of not being prioritised to return to school seems to be driven by increases in hyperactivity and conduct problems. This may at least partly be a result of the fact that it is harder for parents to observe all aspects of the behaviours comprising peer problems and prosocial behaviour during the pandemic, given that many of the components of these domains relate to relationships with other children, with whom there has been less interaction during the pandemic.

⁶ Note that this is a slightly restricted sample compared to the sample for our main analysis, as it restricts attention to those aged 5 and 8 in the July COVID-19 survey. It also compares the outcomes of different children (of the same age) in the pre-pandemic vs. pandemic periods, rather than following the same children over time.

Figure 18 Effect of school closures on children’s social and emotional wellbeing



Notes Data from *Understanding Society* and COVID-19 study. Sample: Children living in England, aged 5 to 11, whose mother or female carer took part in the survey in the last week or July 2020 or in the summer holidays in pre-pandemic years. The squares and circles mark the point estimate of the effect of school closure on SDQ scores and total difficulties. The black lines indicate 90% confidence intervals. The estimates were obtained using child fixed effects methods controlling for: child age, child age squared, year fixed effects, house ownership, mother’s age, if mother reports a good financial situation, if the child lives in London. Number of observations ranges between 1903 and 1912, depending on the outcome.

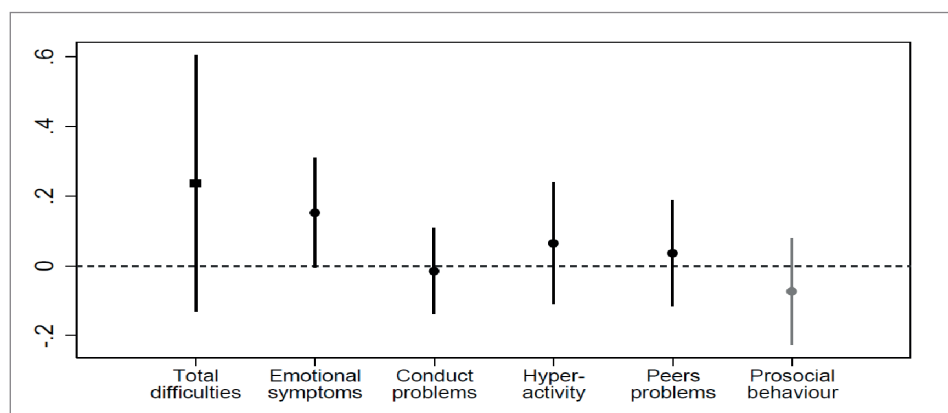
These results suggest that prolonged school closures are likely to be detrimental to children’s behavioural and emotional difficulties. An important follow-up question is to ask how quickly these effects disappear once schools reopen. If the greater difficulties identified among children who have missed out on more schooling are eliminated once schools reopen, then that may suggest that the effects of school closures on children’s wellbeing are largely transitory, as appeared to be the case for mothers, at least on average. If on the other hand, the differences persist, this suggests there may be longer-term implications of school closures for children’s wellbeing.

We address this question by comparing changes in SDQ scores between July 2020 and September 2020 for children aged 5-11 who were or were not in a year group prioritised for return to school during the summer term. This allows us to identify whether, about a month after all children had the opportunity to return to school, differences in SDQ scores between these two groups remained similar or had fallen.

These results based on just under 2000 children are shown in Figure 19. This shows the gap in SDQ scores between children with access to more vs. less schooling during the summer term measured in July compared to the same gap in September. For example, the first marker from the left shows that the gap in total difficulties is slightly higher in July compared to September, but this difference is very small (note the difference in scale here compared to Figure 18). The fact that the black line crosses zero suggests we cannot tell with sufficient certainty that this difference is different from zero. The markers indicating the results for the other SDQ measures show qualitatively similar results.

This suggests that there may still be some differences in emotional and behavioural difficulties between children who were and were not prioritised to return to school during the summer term around one month after all children could return to school in September. It is worth emphasising again, however, that data limitations mean that these results are likely to be less robust than those for parents: because our pre-pandemic data only includes SDQ for children aged 5 and 8, our comparisons rely on children with different gaps between their pre-pandemic and 2020 observations and for a limited subset of children, making these results less generalisable than those for parents.

Figure 19 Effect of not being prioritised for return to school in July, compared with September

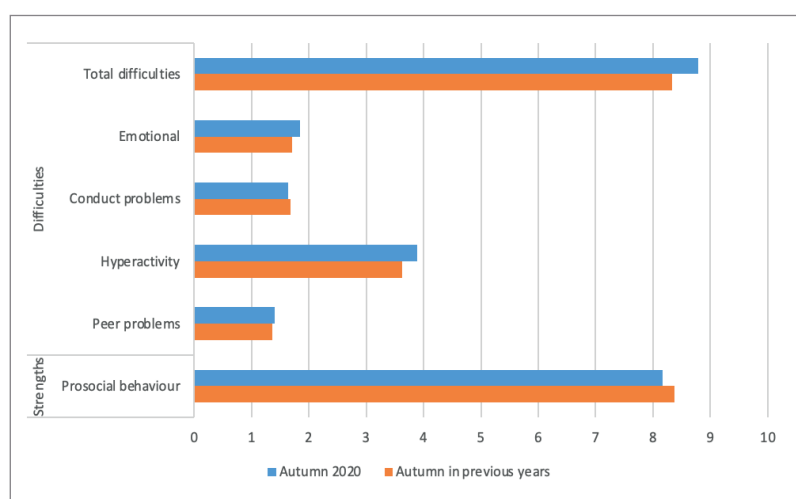


Notes Data from COVID-19 study. Sample: Children living in England, aged 5 to 11, whose mother or female carer took part in the survey in the last week of July 2020 and in the last week of September 2020. The squares and circles mark the point estimate of the effect of school closure on SDQ scores and total SDQ. The black lines indicate 90% confidence intervals. The estimates were obtained using child fixed effects methods controlling for: child age, child age squared, year fixed effects, house ownership, mother's age, if the child lives in London. Number of observations ranges between 1,974 and 1,976, depending on the outcome.

Figure 20 rounds off this section by exploring whether the overall level of children's social and emotional wellbeing was lower in September than in previous autumns, and draws some parallels with the levels seen in July in Figure 17. Specifically, it compares SDQ scores for children aged 5 and 8 whose mothers were interviewed during the last week in September 2020, around a month after all children had been invited to return to school, and in September/October in previous years.

Here we see again that reported difficulties are higher, and prosocial behaviour lower, during the pandemic compared to before, but these differences are smaller in magnitude than they were between summer 2020 and previous summers (shown in Figure 17). The difference in July was around one point and in September it was around half a point. The fact that children's emotional and behavioural wellbeing was higher in September 2020 than in July 2020 may be related to the fact that all children had returned to school by then, but it is worth emphasising that it is still lower than the pre-pandemic period overall.

Figure 20 Overall change in SDQ: autumn 2020 vs. previous autumns



Notes Data from *Understanding Society* and COVID-19 study. Sample: Children living in England, aged 5 or 8, whose mother or female carer took part in the survey in the last week of September 2020 or in the autumn months (September/October and not in the summer holidays) in pre-pandemic years. The figure compares the mean SDQ scores and mean total difficulties observed in the last week of September 2020 and in the autumn months (September/October and not in the school holidays) of pre-pandemic years. Number of observations ranges between 235 and 1304, depending on the outcome.

8 Conclusions

Our findings suggest policy recommendations in three broad areas:

- How to deal with the longer-lasting effects of school closures;
- What to do if school closures are considered again;
- Broader implications about the importance of policy in non-pandemic times.

Dealing with the longer-lasting effects of school closures

- **Remedial policies:** children from disadvantaged backgrounds and from the north of England in particular should be provided with greater support to enable them to catch-up on learning missed during the pandemic, to prevent the embedding of pandemic-related inequalities in school access.
- **School attendance** continues to be below pre-pandemic levels, which some evidence suggests is because state-sanctioned absences during the pandemic weakened the case for in-person schooling. Policymakers may therefore want to check that the inequalities in school take-up we identify do not persist, creating further inequalities in access to learning.
- **Mental health and wellbeing support** should be available for all children who need it, to ensure that any lingering effects of the pandemic do not prevent young people from achieving their potential in school. Effects might be particularly severe for those in exam or transition years in 2020/21 meaning those currently at university should not be neglected. While our results provide only tentative evidence on the potential for longer-term effects of school closures, the growing incidence of poor mental health, together with the strong links between mental health and young people's ability to engage effectively with learning, suggests that this kind of support, both inside and outside education settings, should be a priority.
- **Mothers' mental health** was substantially impacted by having children out of school, and this seems to have been greater for mothers in lower-earning households, highlighting their particular vulnerability to shocks. While mothers' mental health seems to have rebounded reasonably quickly from the relatively short period of school closures on average, we cannot rule out the possibility that some mothers (or indeed fathers) may experience ongoing mental health effects, or that average levels of mental health amongst parents of primary school-aged children may not still be worse than they were before the pandemic, suggesting that support will be needed for some groups.

What if school closures are on the table again?

- **Wider costs:** the case for potential future school or childcare closures should take into account the wider costs for families that we have identified, and any resulting increase in inequalities between individuals or places.
- **Keeping schools open safely:** steps should be taken now to maximise the chances that schools can stay open safely in the event of another wave of the COVID-19 pandemic, a future pandemic or other potential crisis.
- **Reassuring parents:** Consideration should also be given to how to reassure parents that they can send their children to school safely and how messaging can be targeted to families with the greatest reluctance to attend school, or whose decision not to send their children to school may have been a rational response to the increased risk their families may have faced in doing so, such as those from ethnic minority backgrounds.
- **School community:** When school/childcare interruptions or closures are unavoidable, support should be available for families – especially vulnerable families – for example by helping them to continue to feel part of the school community. This may help to mitigate some of the detrimental mental health effects for families.

Broader policy implications for non-pandemic times

- **State support for childcare:** effective childcare provision has long been considered vital in helping mothers to work and supporting family finances. Though the circumstances of the pandemic were unique, our findings indicate that childcare may also have a role in supporting mothers' basic mental health. This should be factored into future cost-benefit analyses considering expansions or contractions of childcare availability or changes in price. It is also a relevant consideration when planning school opening times and in making the case for improving childcare provision during school holidays.
- **Gender roles:** our results contribute to a growing body of evidence about the strongly gendered effects of the pandemic and the roles played by mothers and fathers in unpaid household work more generally. Consideration should be given to the types

of policy interventions that could be effective in encouraging a more even split of responsibilities between mothers and fathers, so that mothers are less likely to bear the full impact of breaks in childcare, or other shocks to the family. Such policies could include equal parenting leave entitlements for fathers and mothers, including non-transferable parental leave for fathers, as well as promoting flexible working and family-friendly working cultures.

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Appendix 1

The General Health Questionnaire (GHQ) is a measure of current mental health that has been extensively used in different settings. The short version (GHQ-12) consists of 12 questions, each assessing the severity of a mental problem using a 4-point scale (coded from 0 to 3). The questions and answer categories are listed below. The score is used to generate a total score ranging from 0 to 36, with higher scores indicating worse mental health. We also show results for the 'Caseness' scale, derived from the same GHQ-12 questionnaire, which collapses the 12 dimensions of the GHQ into binary indicators that count the number of components with a score of 2 or above. This can be interpreted as the number of problems reported and is a score between 0 and 12.7

Have you recently...

- 1** Been able to concentrate on what you're doing?
(Better than usual / Same as usual / Less than usual / Much less than usual)
- 2** Lost much sleep over worry?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 3** Felt you were playing a useful part in things?
(More so than usual / Same as usual / Less so than usual / Much less than usual)
- 4** Felt capable of making decisions about things?
(More so than usual / Same as usual / Less so than usual / Much less than usual)
- 5** Felt constantly under strain?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 6** Felt you couldn't overcome your difficulties?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 7** Been able to enjoy your normal day-to-day activities?
(More so than usual / Same as usual / Less so than usual / Much less than usual)
- 8** Been able to face up to your problems?
(More so than usual / Same as usual / Less so than usual / Much less than usual)
- 9** Been feeling unhappy and depressed?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 10** Been losing confidence in yourself?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 11** Been thinking of yourself as a worthless person?
(Not at all / No more than usual / Rather more than usual / Much more than usual)
- 12** Been feeling reasonably happy, all things considered?
(More so than usual / Same as usual / Less so than usual / Much less than usual)

7 Goodchild ME, Duncan-Jones P. 'Chronicity and the General Health Questionnaire'. *British Journal of Psychiatry*. 1985; 146, 55-61. The Caseness indicators are also used to create a measure of psychological distress, defined as a Caseness of 4 or higher across the 12 dimensions.

Appendix 2

Statements in the Strength and Difficulties Questionnaire

Conduct problems	Often has temper tantrums or hot tempers <i>Generally obedient, usually does what adults request</i> Often fights with other children or bullies them Often lies or cheats Steals from home, school or elsewhere.
Emotional symptoms	Often complains of headaches, stomach-ache or sickness Many worries, often seems worried Often unhappy, down-hearted or tearful Nervous or clingy in new situations, easily loses confidence Many fears, easily scared
Hyperactivity	Restless, overactive, cannot stay still for long Constantly fidgeting or squirming Easily distracted, concentration wanders <i>Thinks things out before acting</i> <i>Sees tasks through to the end, good attention span</i>
Peer relationships	Rather solitary, tends to play alone <i>Has at least one good friend</i> <i>Generally liked by other children</i> Picked on or bullied by other children Gets on better with adults than with other children.
Prosocial behaviour	Considerate of other people's feelings Shares readily with other children (treats, toys, pencils, etc.) Helpful if someone is hurt, upset or feeling ill Kind to younger children Often volunteers to help others (parents, teachers, other children)

Note Items in *italics* are reverse coded to derive the SDQ score.

Appendix 3

Regressions of school attendance and availability

Table A3.1 Regression analysis of factors determining attendance and being offered a place.

	(1)	(2)	(3)	(4)	(5)
	Attended school	Attended school	Attended school	Offered school	Offered school
Offered schooling		0.789***			
		(0.0151)			
In eligible year group		0.399***		0.519***	
			(0.0248)		(0.0242)
Parent has degree	0.0433	0.000614	0.0367	0.0541*	0.0456
	(0.0314)	(0.0182)	(0.0288)	(0.0324)	(0.0281)
Parent in couple	-0.0486	-0.00778	-0.0717*	-0.0517	-0.0818**
	(0.0464)	(0.0269)	(0.0426)	(0.0479)	(0.0415)
White British	0.144***	0.0840***	0.138***	0.0765**	0.0685**
	(0.0374)	(0.0217)	(0.0343)	(0.0386)	(0.0335)
Ln(household earning)	0.0644***	0.0416***	0.0791***	0.0290	0.0480**
	(0.0245)	(0.0142)	(0.0225)	(0.0253)	(0.0219)
North West	0.230***	0.0433	0.153**	0.237***	0.136**
	(0.0762)	(0.0443)	(0.0701)	(0.0787)	(0.0683)
Yorks and Humber	0.248***	0.0489	0.196***	0.253***	0.185***
	(0.0775)	(0.0451)	(0.0712)	(0.0801)	(0.0694)
East Midlands	0.166**	0.00355	0.0916	0.206**	0.109
	(0.0782)	(0.0454)	(0.0719)	(0.0808)	(0.0701)
West Midlands	0.275***	0.0387	0.205***	0.300***	0.209***
	(0.0780)	(0.0455)	(0.0718)	(0.0806)	(0.0700)
East of England	0.264***	0.0595	0.215***	0.260***	0.196***
	(0.0764)	(0.0444)	(0.0702)	(0.0789)	(0.0684)
London	0.322***	0.0552	0.278***	0.338***	0.281***
	(0.0790)	(0.0461)	(0.0726)	(0.0816)	(0.0708)
South East	0.296***	0.0463	0.248***	0.316***	0.254***
	(0.0752)	(0.0439)	(0.0691)	(0.0777)	(0.0674)
South West	0.351***	0.0841*	0.294***	0.338***	0.264***
	(0.0797)	(0.0465)	(0.0732)	(0.0823)	(0.0714)
Parent poor mental health	-0.121*	-0.0547	-0.107*	-0.0839	-0.0664
	(0.0624)	(0.0362)	(0.0573)	(0.0645)	(0.0559)
Parent did not work from home	0.00131	0.0133	0.0133	-0.0152	0.000340
	(0.0328)	(0.0190)	(0.0301)	(0.0339)	(0.0294)
Degree missing	0.0324	0.0966	-0.0211	-0.0813	-0.151*
	(0.102)	(0.0589)	(0.0933)	(0.105)	(0.0910)
Couple missing	-0.0524	-0.245	-0.0654	0.244	0.227
	(0.363)	(0.210)	(0.333)	(0.375)	(0.325)
White British missing	-0.142	0.0988	-0.0762	-0.305	-0.220
	(0.199)	(0.116)	(0.183)	(0.206)	(0.178)

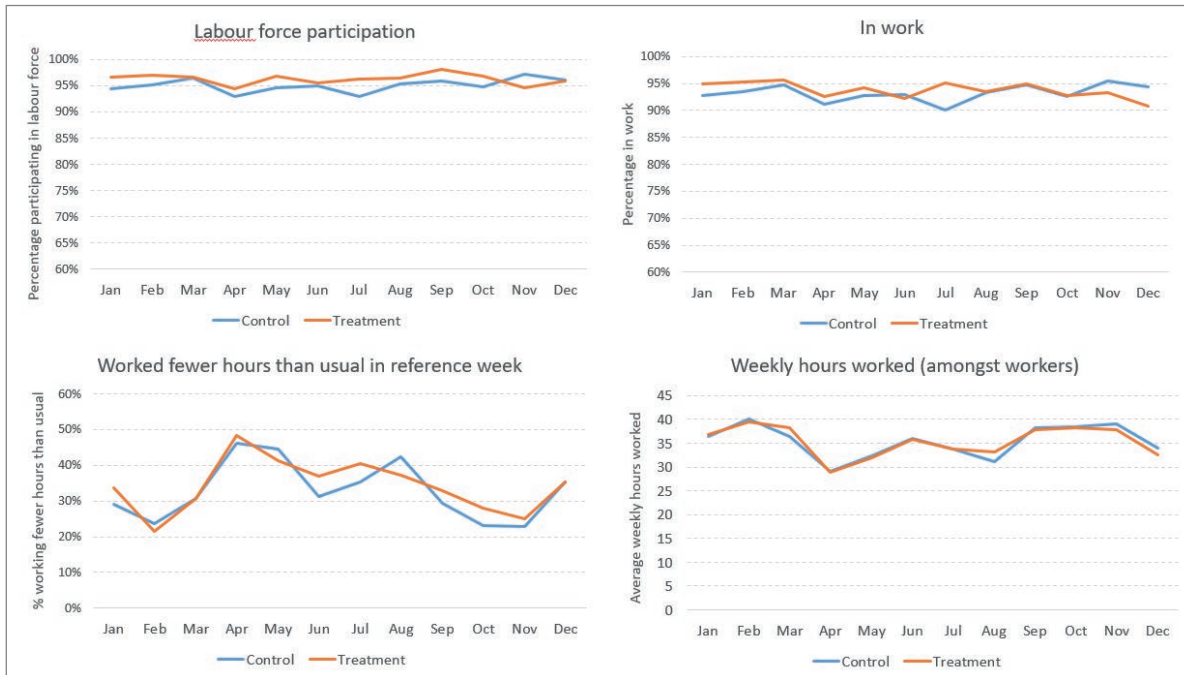
	(1)	(2)	(3)	(4)	(5)
	Attended school	Attended school	Attended school	Offered school	Offered school
Earnings missing	-0.0587 (0.0428)	-0.0164 (0.0248)	-0.0509 (0.0393)	-0.0537 (0.0442)	-0.0435 (0.0383)
Mental health missing	0.263 (0.279)	0.136 (0.162)	0.256 (0.256)	0.161 (0.288)	0.152 (0.250)
WFH missing	0.0178 (0.0438)	0.0179 (0.0254)	0.0136 (0.0402)	-2.59e-05 (0.0453)	-0.00557 (0.0392)
Constant	-0.470** (0.199)	-0.443*** (0.115)	-0.650*** (0.183)	-0.0338 (0.206)	-0.268 (0.179)
Observations	1,405	1,405	1,405	1,405	1,405
R-squared	0.044	0.679	0.194	0.032	0.274

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Base case is living in the North East, with a reporting parent who did not have a degree, was not in a couple, had more than one child in years R-7, was not white british, had good mental health and lower than median household earnings.

Appendix 4

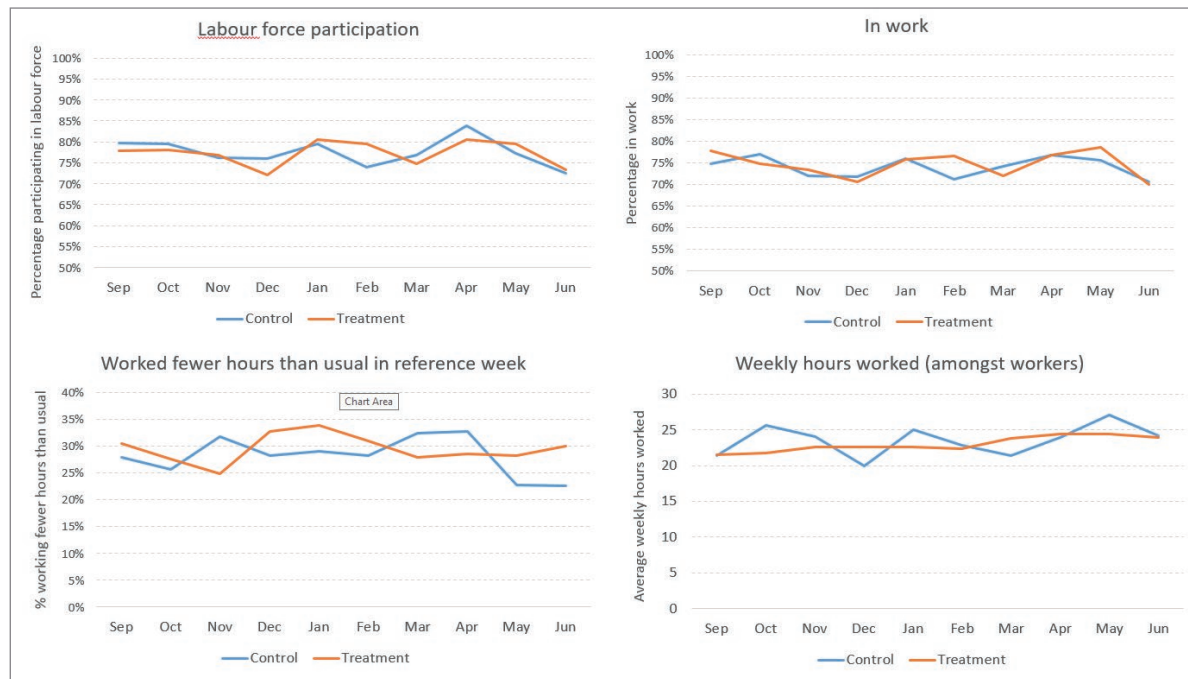
Figure A4.1 How fathers' labour supply changed across the pandemic



Notes Uses data from the Quarterly UK Labour Force Survey 2020. Sample of fathers with at least one child who was in school years Reception to Year 7 in the academic year 2019-20, observed between January 2020 and December 2020. Figure plots the average labour market outcomes of mothers observed in each month of 2020, separately for those whose children in school years R-7 were all prioritised to return to school in June 2020 (treatment group) and those with at least one child in school years R-7 not prioritised to return (control group).

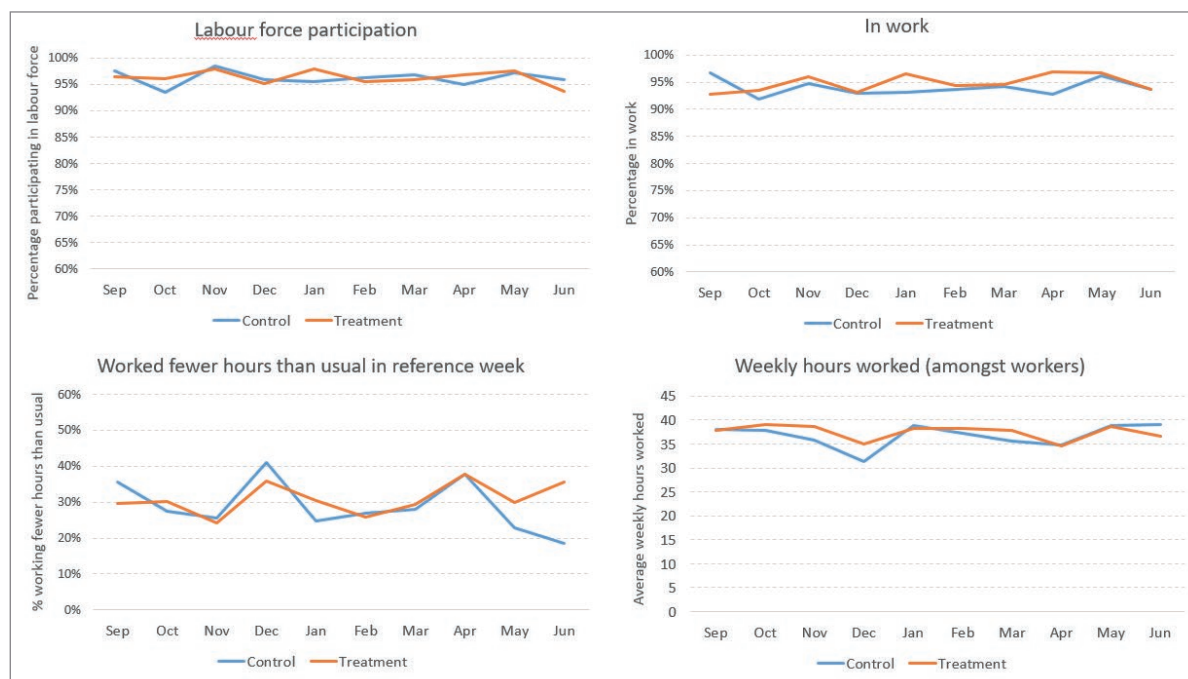
Appendix 5

Figure A5.1 How mothers' labour supply changed later in the pandemic



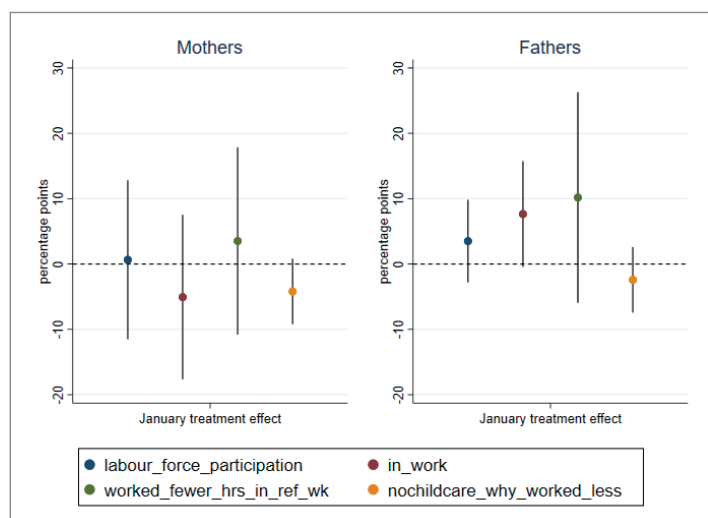
Notes Uses data from the Quarterly UK Labour Force Survey 2020 and 2021. Sample of mothers with at least one child who was in the pre-school year (the academic year prior to the reception year) or in reception (first school year) in the academic year 2020-21, observed between September 2020 and June 2021. Figure plots the average labour market outcomes of mothers observed in each month, separately for those whose children in pre-school or reception were all in the pre-school year (treatment group) and those with at least one child in reception (control group).

Figure A5.2 How fathers' labour supply changed later in the pandemic



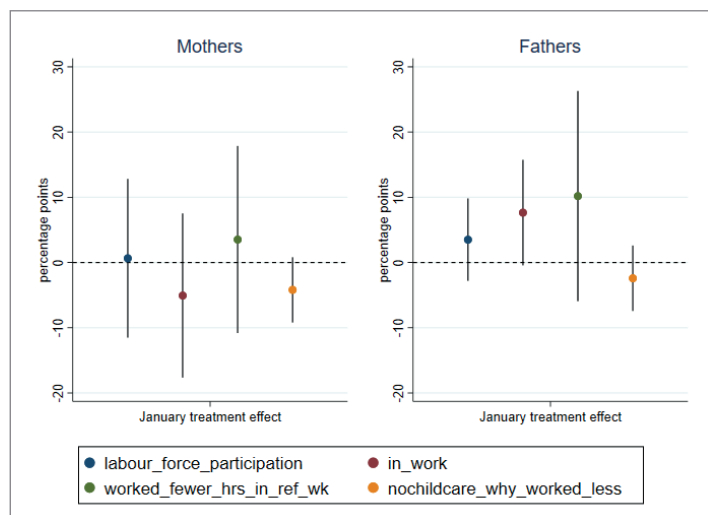
Notes Uses data from the Quarterly UK Labour Force Survey 2020 and 2021. Sample of fathers with at least one child who was in the pre-school year (the academic year prior to the reception year) or in reception (first school year) in the academic year 2020-21, observed between September 2020 and June 2021. Figure plots the average labour market outcomes of mothers observed in each month, separately for those whose children in pre-school or reception were all in the pre-school year (treatment group) and those with at least one child in reception (control group).

Figure A5.3 Effect of childcare availability on parents' labour supply in January 2021, LFS



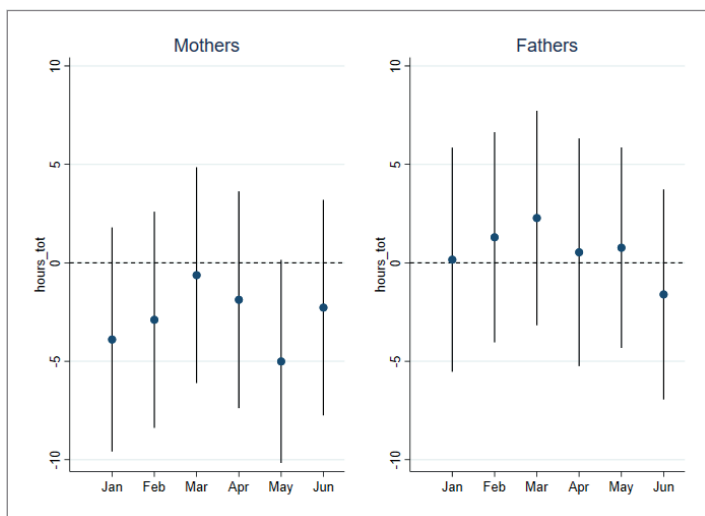
Notes Uses data from the Quarterly UK Labour Force Survey 2020 and 2021. Sample of parents with at least one child who was in the pre-school year (the academic year prior to the reception year) or in reception (first school year) in the academic year 2020-21, observed between September 2020 and June 2021. (The question about lack of childcare being the reason for working less in the reference week is not available in Q3 2020, so the sample for this outcome includes September 2020 and then January to June 2021.) Figure shows the coefficients and 95% confidence intervals of estimates of the effect of having all children in the pre-school year (treatment group) relative to having at least one child in reception (control group) in January 2021. Each coefficient estimate comes from a different event study regression, estimated using OLS, which includes a binary indicator for being in the treatment group, a set of binary indicators for month of interview (relative to September 2020), and a set of interaction terms between the two, which are the source of the reported estimates. The regressions also include dummy variables for the number of children aged 0-1, 2-4, 5-9 and 10-15, ethnicity, being an immigrant, whether the parent has a partner, whether the highest qualification of the parent was below A-levels or equivalent, region, and continuous linear measures of age of youngest child and date of interview. Standard errors clustered at individual level.

Figure A5.4 Effect of childcare availability on parents' labour supply in February 2021, LFS



Notes Uses data from the Quarterly UK Labour Force Survey 2020 and 2021. Sample of parents with at least one child who was in the pre-school year (the academic year prior to the reception year) or in reception (first school year) in the academic year 2020-21, observed between September 2020 and June 2021. (The question about lack of childcare being the reason for working less in the reference week is not available in Q3 2020, so the sample for this outcome includes September 2020 and then January to June 2021.) Figure shows the coefficients and 95% confidence intervals of estimates of the effect of having all children in the pre-school year (treatment group) relative to having at least one child in reception (control group) in February 2021. Each coefficient estimate comes from a different event study regression, estimated using OLS, which includes a binary indicator for being in the treatment group, a set of binary indicators for month of interview (relative to September 2020), and a set of interaction terms between the two, which are the source of the reported estimates. The regressions also include dummy variables for the number of children aged 0-1, 2-4, 5-9 and 10-15, ethnicity, being an immigrant, whether the parent has a partner, whether the highest qualification of the parent was below A-levels or equivalent, region, and continuous linear measures of age of youngest child and date of interview. Standard errors clustered at individual level.

Figure A5.5 Effect of school availability on hours worked in January/February 2021, LFS



Notes Uses data from the Quarterly UK Labour Force Survey 2020 and 2021. Sample of parents with at least one child who was in the pre-school year (the academic year prior to the reception year) or in reception (first school year) in the academic year 2020-21, observed between September 2020 and June 2021. Figure shows the coefficients and 95% confidence intervals of estimates of the effect of having all children in the pre-school year (treatment group) relative to having at least one child in reception (control group) in February 2021 in different months between January and June 2021. The coefficient estimates for each parent come from the same event study regression, estimated using OLS, which includes a binary indicator for being in the treatment group, a set of binary indicators for month of interview (relative to September 2020), and a set of interaction terms between the two, which are the source of the reported estimates. The regressions also include dummy variables for the number of children aged 0-1, 2-4, 5-9 and 10-15, ethnicity, being an immigrant, whether the parent has a partner, whether the highest qualification of the parent was below A-levels or equivalent, region, and continuous linear measures of age of youngest child and date of interview. Standard errors clustered at individual level.

