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School closures and parents' mental health

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Executive summary

School closures have been one of the widest-spread and, in some countries, longest-lasting policy responses to the COVID-19 pandemic, having a profound impact on families. We know from our own previous research that school closures had a significant negative effect on children's behavioural and emotional difficulties, and that this effect persisted even once all children had returned to school.[1] We also know that adult mental health declined sharply in the early months of lockdown, more strongly for women than men. It is widely assumed that increased childcare and home-schooling responsibilities during school closures were partly to blame.

We investigate this proposition directly by estimating the effect of school closures on parental mental health. To isolate the causal effect of school closures we make use of the fact that, in England, certain school year groups (Reception, Year 1 and Year 6) were prioritised to return to school earlier than others after the first lockdown, from 1 June 2020. In other year groups attendance rates were much lower and often only vulnerable children and children of key workers were able to attend school. This allows us to assess whether parental mental health recovered more quickly for parents with children who were prioritised to return to school in the summer of 2020 compared to those who were not.

We use data from *Understanding Society*, the UK Household Longitudinal Study (UKHLS). Our main analysis uses data from the *Understanding Society* COVID-19 survey collected during the pandemic in April, May, June, July, September and November 2020. This enables us to compare the dynamics of mental health amongst parents with different experiences of school closures in the summer of 2020. Specifically, amongst a sample of parents with children aged 4-12, in year groups Reception to Year 7 in the 2019/20 academic year, we compare changes in parents' mental health between April/May 2020 and subsequent months during the pandemic for those with at least one child in this age range who was not prioritised to return to school with those whose similar-aged children were all prioritised to return according to government guidance.

Key findings

- Mothers and fathers with children aged 4-12 (in year groups Reception to Year 7) reported worse mental health in all months of 2020 than a comparable sample of parents interviewed in the same months before the pandemic. Differences were larger for mothers than fathers.
- Causal estimates show that compared to April/May 2020, when schools were closed for most children, mental health improved in June 2020 for mothers whose children were all prioritised to return to school compared to mothers with at least one child who was not prioritised to return to school, whose mental health remained at a similar level to April/May 2020. This suggests that school closures have a significant detrimental effect on mothers' mental health. In contrast, for fathers it made no difference to their mental health whether or not their children were prioritised to return to school in June 2020.
- The size of the difference for mothers is 1.5 GHQ points, which is around 12% of the GHQ score reported by mothers in the month of June in pre-pandemic years. This is equivalent to a mother moving from feeling a problem such as being unhappy or depressed 'no more than usual' to somewhere between 'rather more than usual' and 'much more than usual'. It represents around half of the total increase in GHQ scores experienced by mothers in June 2020, compared to pre-pandemic levels. In other words, school closures could be responsible for around half of the decline in mental health experienced by mothers during the pandemic.
- The mental health effect of school closures on mothers is short-lived: when estimated in July, at the beginning of the summer school holiday, the effect is only about half as large as in June and can no longer be statistically distinguished from zero, and in September and November it is no longer apparent at all. This is in stark contrast to the results for children from our previous research: the mental health effects for children were larger than for parents when we were first able to measure them (around 40% of a standard deviation for children at the end of July, and around 25% of a standard deviation for parents at the end of June). They also persisted even after all children were able to return to school: by the end of September, the gaps had not fallen relative to the levels measured in July, while the differences for mothers had disappeared by then.
- School closures had a greater detrimental effect on mental health among mothers with several children, rather than just

1 Blanden J., Crawford C., Fumagalli L. and Rabe B. (2021). *School closures and children's emotional and behavioural difficulties*. Institute for Social and Economic Research Briefing Note. https://www.iser.essex.ac.uk/files/projects/school-closures/SDQnote2021_final.pdf

one child, between the ages of 4 and 12. In larger families there is a higher likelihood of having several children at home, affected by school closures, which may place more demands on parents to the detriment of their mental health. However, we found little evidence that the effect of school closures varied systematically between mothers according to their ethnicity, income, partnership status, previous mental health and whether they ever worked from home before the pandemic.

- We examine some of the potential channels through which school closures may have negatively affected mothers' mental health, exploring changes in hours of work, earnings and self-reported loneliness. We find no evidence that mothers with at least one child not prioritised to return to school worked or earned less than mothers whose children were invited to go back to school in June 2020, relative to their levels in April/May 2020, which may already have been below their pre-pandemic levels. Instead, we find that mothers whose children were not prioritised to go back to school were more likely to report feeling lonely than mothers whose children were not prioritised to go back to school. This may be an important driver of their worsening mental health.

The impact of having children out of school on mothers' mental health is substantial, and an important hidden cost of lockdown. Fortunately, mothers' mental health seems to have bounced back quite quickly from the relatively short period of school closures whose effects we examine, at least on average. That is not to say that some mothers (or indeed fathers) may not experience ongoing and even severe 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. It is also important to bear in mind that our approach is only able to estimate the impact of the additional six weeks of school closures in June and early July 2020, not any potential cumulative effects of school closures throughout the pandemic, which may conceivably be larger or last longer. Unfortunately, however, it is not possible to separately identify any cumulative effects of school closures from the effects of other changes that affected all parents of school-aged children during the pandemic.

These findings of large but only temporary mental health effects of school closures for mothers contrast sharply with the large and persistent effects we previously found for children. We do not yet know whether the mental health effects of school closures for children may have persisted beyond September, or indeed to what extent the second round of national school closures earlier this year may have made things significantly worse. What does appear to be clear is that it is children rather than parents who are likely to need the most support to overcome the mental health challenges of the school closures they have experienced over the last 12 months.

1 Introduction

School closures have been one of the most discussed consequences of the COVID-19 pandemic. Most children have experienced school closures at some point during the pandemic: in England, schools were closed to all but vulnerable children and children of key workers from 23 March 2020 to 1 June 2020, and again from 4th January 2021 to 8 March 2021.

The consequences of school closures for children in terms of learning, development and wellbeing have been well documented, including in our own previous work on children's mental health.[2] However, school closures also have consequences for parents, as they give rise to additional childcare and home-schooling responsibilities, which leaves less time for work, leisure, and sleep, and increases stress and anxiety. This is likely to negatively affect parental mental health, potentially over and above the effect of the pandemic on adult mental health more generally.

This note examines the effects of school closures on parental mental health. To isolate the causal effects of school closures from other factors affecting mental health we compare parents who were expected to be affected differently by school closures. We set these within the context of changes in mental health that have been seen across the pandemic and also investigate some of the potential channels that might be driving these effects, namely work hours, earnings and loneliness.

Several studies have already documented the negative impact of the COVID-19 pandemic on adults' mental health and wellbeing. For the UK, the data and measures used in this note have been used previously to suggest that mental health was 8.1% lower, on average, in April 2020 compared to the level that would have been expected in the absence of the pandemic.[3] What has been less clearly established is what role school closures – as distinct from other restrictions, such as social distancing or stay-at-home orders – may have played in shaping the patterns we see.

There are reasons to believe that school closures may be important drivers of mental health declines: there is consistent evidence that mental health fell more for women than men during the early part of the pandemic in the UK[4] and the US,[5] and that individuals with children experienced larger mental health declines than those without.[6] Strong negative mental health effects from school closures that fall disproportionately on mothers could explain these results, and indeed a recent study from Germany suggests that school and nursery closures may explain why, during the pandemic, wellbeing declined more for parents than for non-parents.[7]

The hypothesis that school closures are important for parental mental health is also consistent with the dynamics of mental health during the pandemic. A weekly survey of depression and anxiety symptoms in the UK shows that those living with children experienced particularly high levels of anxiety in the early part of the pandemic, but recovered more quickly than others in terms of both anxiety and depressive symptoms through to August, by which time early years childcare settings were open to all children, and schools had been opened to a wider group of children.[8] Similarly, analyses of the same data and measures as we use reveals that middle-aged women's wellbeing bounced back strongly between April and September[9] while an analysis of mental health dynamics[10] shows that, by October, the mental health of both women and parents of young children is more likely to have 'recovered' than other groups. School reopening is given as a possible explanation. It is worth noting, however, that none of these papers is able to isolate the role of school closures in explaining changes in parents' mental health, as we do here.

Our approach addresses the effect of school closures directly, by exploiting variation in access to school that arises from the prioritisation of certain year groups to return to school in June 2020. After closing schools to all except vulnerable children and children of key workers in March 2020, the UK Government announced that schools in England should prioritise the return of children in some year groups from 1 June 2020. For children aged 4 to 12, the guidance was for

2 Blanden J., Crawford C., Fumagalli L. and Rabe B. (2021), op. cit.

3 Banks J. and Xu X. (2020). 'The Mental Health Effects of the First Two Months of Lockdown During the COVID-19 Pandemic'. *Fiscal Studies*. 41(3): pp. 685-708.

4 Banks and Xu (2020) op. cit.; Etheridge, B. and Spantig, S. (2020). *The gender gap in mental well-being during the COVID-19 outbreak: Evidence from the UK*. ISER Working Paper Series 2020-08; Proto, E and C. Quintana-Domeque, 'COVID-19 and mental health deterioration by ethnicity and gender in the UK'. *PLoS ONE* 16(1): e0244419; Davillas, A. and Jones, A. (2020). *The COVID-19 pandemic and its impact on inequality of opportunity in psychological distress in the UK*. ISER Working Paper Series 2020-07; Pierce M., McManus S., Hope H., Hotopf M., Ford T., Hatch S., John A., Kontopantelis E., Webb R., Wessely S. and Abel K. (2021). 'Mental health responses to the COVID-19 pandemic: a latent class trajectory analysis using longitudinal UK data'. *The Lancet*. https://doi.org/10.1016/S2215-0366(21)00151-6

5 Adams-Prassl, A., Boneva, T. Golin, M. and C. Rauh, (2020). *The Impact of the Coronavirus Lockdown on Mental Health: Evidence from the US*. Working Papers 2020-030. Human Capital and Economic Opportunity Working Group.

6 Banks and Xu (2020), op. cit.; Etheridge and Spantig (2020), op. cit.

7 Huebener M., Waights S., Spiess C. K., Siegel N. A. and Wagner G. G. (2021). 'Parental well-being in times of COVID-19 in Germany'. *Review of the Economics of the Household*. 19: pp. 91-122.

8 Fancourt D., Steptoe A. and Bu F. (2021). 'Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: a longitudinal observational study'. *Lancet Psychiatry 2021*. 8: pp. 141-49.

9 Banks, J., Fancourt D. and Xue, X. (2021). 'Mental Health and the Covid Pandemic' in Helliwell J., Layard R., Sachs J. and De Neve J-E (eds.) *World Happiness Report 2021*. New York: Sustainable Development Solutions Network.

10 Pierce et al (2021), op. cit.

schools to prioritise year groups Reception, 1 and 6 whereas year groups 2, 3, 4, 5 and 7 were not prioritised. It is this variation over a roughly six-week period in June and early July 2020 that we exploit to identify the impact of school closures on parents' mental health.

Our study is closest to one that considers the impact of school closures from March to June 2020 in Japan.[11] Exploiting the fact that pre-schools remained open, the authors compared children just old enough to go to school with those just young enough to still be in preschool to understand what impact school closures had on a range of parent and child outcomes. Mothers affected by school closures reported more anxiety about their parenting, and were more likely to reply positively when asked if they "began to worry about how to raise my child more frequently". No evidence was found that having children at home led to increased marital tension. The authors are not, however, able to consider the effects on validated scales designed to capture mental health, as we do here.

There are several reasons why we might expect school closures to affect parents' mental health, and we are able to explore some of these hypotheses in our study. For example, parents with childcare or home-schooling responsibilities are likely to find it harder to work and might be more likely to lose their job or be put on furlough (either at their own request or their employer's). This could lead to a loss of earnings or a reduction in work hours, each of which could potentially negatively affect parents' mental health. Another possibility is that school closures take away the few opportunities parents may have had for social interaction during the pandemic - either on the school run itself, or by taking away leisure time that they would otherwise have spent interacting with friends - potentially leading to increased loneliness, which has been shown to be a strong predictor of mental wellbeing.[12] We investigate these hypotheses by exploring the extent to which school closures affected hours worked, net earnings and loneliness. Of course, there are also other potential mechanisms that we are not able to explore.

Although evidence on the employment impact of the pandemic across genders in the UK is ambiguous[13], evidence from time use studies shows women taking on more of the additional childcare burden that comes from school closures, even when they work.[14] This, coupled with the fact that loneliness and missing out on friendships has been shown to explain more of the decline in women's mental health than in men[15], suggests that we might expect the effects of school closures to be stronger for women. We explore the effects separately for mothers and fathers, as well as how they vary by other background characteristics, including ethnicity, family structure and work status.

This note now proceeds as follows: Section 2 describes our data and methods; Section 3 outlines how mental health has developed over the course of the pandemic, and how this compares to the same months in previous years; Section 4 presents our main estimates of the impact of school closures on parents' mental health; Section 5 shows how the effects differ for parents from different backgrounds, and Section 6 presents evidence on the routes through which school closures might be affecting parents' mental health; and Section 7 concludes.

11 Takaku R. and Yokoyama I. (2021). 'What the COVID-19 School Closure Left in Its Wake: Evidence from a Regression Discontinuity Analysis in Japan'. *Journal of Public Economics*. https://doi.org/10.1016/j.jpubeco.2020.104364

12 Etheridge and Spantig (2020), op cit. and Cacioppo J., Cacioppo S., Capitanio J. and Cole S. (2015). 'The Neuroendocrinology of Social Isolation'. *Annual Review of Psychology*. 66: 733–767.

13 Andrew A., Cattan S., Costa-Dias M., Farquharson C., Krutikova S., Phimister A. and Sevilla A. (2020). *How are mothers and fathers balancing work and family under lockdown?* IFS Briefing Note No. 290, find that mothers are more likely to become unemployed or go on furlough than fathers, while Hupkau C. and Petrongolo B. (2020) *Work, Care and Gender during the COVID-19 Crisis*. IZA Discussion Paper No. 13762, find no differences across genders generally.

14 Andrew et al (2020) op. cit.; Hupkau and Petrongolo (2020), op. cit.; Benzeval M., Borkowska M., Burton J., Crossley T. F., Fumagalli L., Jäckle A., Rabe B. and Read B. (2020). *Understanding Society COVID-19 Survey April Briefing Note: Home schooling. Understanding Society* Working Paper No 12/2020. ISER, University of Essex

15 Etheridge and Spantig (2020), op. cit.

2 Methods and data

As outlined above, our aim in this note is two-fold: first, to explore the dynamic effects of the pandemic on parents' mental health; second, to isolate the causal effect of school closures on parents' mental health. We use data from *Understanding Society*, the UK Household Longitudinal Study (UKHLS) to answer both questions, although they each require slightly different samples and methods, which we describe in turn below.

Changes in parents' mental health over time

The first part of the note (Section 3) compares parents' mental health before and during the COVID-19 pandemic, to provide context for the magnitude of the changes in mental health that we see as a result of school closures. The pre-pandemic data come from waves 9 and 10 of the *Understanding Society* mainstage sample, collected in the years 2017-2019.[16] Data for the period of the pandemic come from the *Understanding Society* COVID-19 study, collected in April, May, June, July, September and November 2020.[17]

All adult participants of the COVID-19 study were asked to fill in the General Health Questionnaire (GHQ) at each wave. Details of what the GHQ entails are given below. The *Understanding Society* mainstage sample also collects GHQ at every wave and we choose the two most recent waves collected before the pandemic to ensure that our results are not affected by longer-term trends in mental health.

To describe pre-pandemic levels of GHQ we restrict the sample to respondents interviewed in the calendar month that matches the COVID-19 month of interview. This has the aim of making pre and post pandemic data comparable, as mental health is known to vary seasonally.[18] We select households in England and restrict our sample to mothers and fathers (or female and male guardians) who have at least one child in year groups Reception to Year 7, aged between 4 and 12, living in their household to match the subsequent analysis of school closures.

Effects of school closures on parents' mental health

The second part of the note (Sections 4, 5 and 6) focuses on the effect of school closures on parents' mental health. For this analysis, we use data from the *Understanding Society* COVID-19 study only, for the months April, May, June, July, September and November 2020. As described above, after the first national lockdown from March 2020 some school year groups in England were prioritised to return to school from 1 June until the end of the summer term 2020 (mid July). Specifically, primary schools were encouraged to invite children in Reception, Year 1 and Year 6 to return, while attendance in other year groups (we include children in Years 2, 3, 4 and 5 in primary schools and Year 7, the first year of secondary school, in this note) was more likely to be limited to vulnerable children and children of key workers.[19]

We select from each wave of the survey a sample of mothers and fathers (or female and male guardians) in England with at least one child in year groups Reception to Year 7, aged between 4 and 12, living in their household. We split this sample into two groups: those with at least one child in a year group that was not prioritised to return to school in the second half of the summer term 2020 (i.e. at least one child in Years 2, 3, 4, 5 or 7) and those whose similarly-aged children were all prioritised to return to school (i.e. were all in Reception, Year 1 or Year 6). We choose to split the sample in this way on the basis that parents will continue to need to devote time to childcare and home schooling if any of their children in this age range remain at home during this period. This pressure may differ if all of their children remain at home, so we additionally explore whether our results vary in these circumstances.

To estimate the causal effect of school closures on parents' mental health, we use a 'difference-in-differences' approach, comparing changes over time in the mental health of parents in our two groups. This enables us to account for any time-invariant ways in which parents or children differ across these two groups. We additionally control for the date on which parents were interviewed and for the presence of younger children in the family, which may change over time with the birth of new babies, for example. We do not account for time-varying characteristics such as the family's experience of financial difficulties that might plausibly have been affected

16 *Understanding Society: Waves 1-10, 2009-2019 and Harmonised BHPS: Waves 1-18, 1991-2009* [data collection]. 13th Edition. UK Data Service. SN: 6614, http://doi.org/10.5255/UKDA-SN-6614-14. UKHLS, waves 1-10.

17 University of Essex, Institute for Social and Economic Research (2021). *Understanding Society: COVID-19 Study, 2020. [data collection]. 7th Edition*. UK Data Service. SN: 8644, http://doi.org/10.5255/UKDA-SN-8644-7. Waves 1-6 and 2019 mainstage extract.

18 Banks and Xu (2020), op. cit.

19 Students in secondary school Years 10 and 12 were also prioritised for a return to school, but only from 15 June and in many cases on a part-time basis only. This, together with the fact that more parental input into learning and childcare is likely to be required for children in primary school than secondary school, explains our focus on children between Reception and Year 7.

by school closures. For example, parents might have lost their jobs, been furloughed or experienced reductions in hours of work or income as a result of the challenges they faced in juggling work and home-schooling. To the extent that these changes are part of the effects of school closures, we would not want to remove such effects by including these variables in our analysis.[20] We explore the extent to which these factors may be indicative of the mechanisms behind our results in Section 6.

We measure the change in parents' mental health from April and May 2020, when most children were not able to attend school, and see how this change differs between our two groups of parents in June, July, September and November.[21] Our sample varies by survey month, but in each month consists of roughly 600-800 mothers and 300-500 fathers with at least one child that was not prioritised to return to school in June 2020, compared to 200-300 mothers and 100-200 fathers whose similar-aged children were all prioritised to return to school.

The comparison with April and May 2020 means that our estimates in this part of the note do not tell us anything about how the pandemic per se affected parents' mental health – which will be covered in Section 3 – but rather whether the evolution of parents' mental health during the pandemic differs for those likely to be facing different childcare and home-schooling responsibilities in the summer of 2020 as a result of different exposure to school closures. Depending on the trajectories of mental health across the pandemic, in some months this might mean that we are measuring a relative worsening of mental health between April/May and the month of interest that is greater for one group than the other; in other months, it might mean that we are measuring a relative improvement of mental health between April/May and the month of interest that is occurring more rapidly in one group than another. It is the difference between the two changes that we are interested in and which will provide our estimate of the impact of school closures on parents' mental health.

If school closures worsen parents' mental health, we would expect to see higher GHQ scores in June amongst parents with children who were not prioritised to return to school compared to those with children who were. We can then see how parents' mental health progressed over the following six months, and how it differs between parents with different exposure to school closures over the roughly six-week period in June/July 2020. Because all children were able to return to school in September, the comparisons we make in the following months tell us about any lasting impacts of this relatively short period of differential access to school on parents' mental health.

These comparisons will tell us the causal effect of school closures – that is, the effect of government guidance that schools should prioritise reopening to some children and not others – on parents' mental health in different months under the assumption that in the absence of this guidance the mental health of parents in our two groups would have developed in a similar way.

Our estimates may not provide a good guide to what we might expect to be the mental health implications of the most recent round of school closures in England affecting all children. This is because over the six-week period we consider parents were given a choice about whether to send their child into school or not. It is possible that parents who stood to gain most from sending their children to school did so, in which case our results may overstate the mental health effect that we might expect to see during a time when almost all children had to stay at home.

20 It is possible that the omission of such characteristics may potentially bias our results if parents whose children were differentially affected by school closures were also differentially affected by labour market shocks, independently of their children's experiences of school closures.

21 We chose to do this rather than comparing to a pre-pandemic baseline, as in the first part of the note, because the pre-pandemic information is observed a different number of months before the pandemic for different parents and because, if we only wanted to compare those observed in the same months pre-pandemic and during the pandemic, it would have significantly reduced the size of our sample.

The General Health Questionnaire measures

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 four-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.[22]

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)

22 Goodchild M. E. and Duncan-Jones P. 'Chronicity and the General Health Questionnaire'. *British Journal of Psychiatry*. 1985; 146: pp. 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.

3 Parents' mental health over time

Figures 1 and 2 show average GHQ scores for mothers and fathers respectively with at least one child aged 4-12 (in year groups Reception to Year 7) observed in different months. The first bar in each month shows the average GHQ-12 score in the years before the pandemic. The second and third bars show average GHQ scores of an equivalent sample of mothers or fathers during the pandemic, where the second bar is for parents whose children were prioritised to return to school in June 2020 and the third bar for those who had at least one child not prioritised to return to school.[23] The bars show the average GHQ score for each group and the lines mark the range of values that 95% of mothers or fathers in the sample have. Where such lines of adjacent bars overlap we cannot be certain the averages are different from each other.

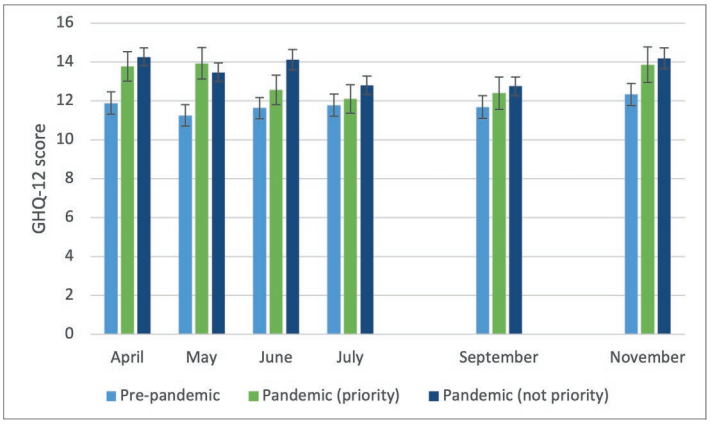
Looking first at the pre-pandemic period for mothers in Figure 1, mothers' average GHQ score is around 11.5 in April. GHQ scores vary across the year, with average scores lowest (mental health strongest) in June (with an average GHQ score of 11.1) and average scores highest (mental health weakest) in November (with an average GHQ score of 11.8).

Comparing the pre-pandemic GHQ scores to those reported during the pandemic, it is clear that mothers' mental health has worsened in both the priority and non-priority group. In every month, the average score during the pandemic for both groups is higher than in the same month before the pandemic, although the gap varies over time. In particular, there are large mental health differences in April, May and November, all of which were months where some form of national lockdown was imposed in England, and relatively smaller differences in July and September, the months in our sample when the fewest restrictions were in place.

The differences in GHQ before and during the pandemic are large in April, May and November, whereas the differences between priority and non-priority groups are not meaningful, as indicated by the overlapping lines. Average GHQ scores are at least two points higher in April and May 2020 than in equivalent months before the pandemic, and slightly less in November. This is around 20% of the pre-pandemic level of mental health. It is equivalent to a parent moving from feeling a problem such as being unhappy or depressed 'no more than usual' to 'much more than usual', or alternatively to changing their report for two items from 'no more than usual' to 'rather more than usual'.

The month of June, in which some children were prioritised to return to school in the year 2020, is the only month in Figure 1 in which the mental health of mothers during the pandemic differs according to whether their children faced further school closures. The mental health of mothers with children in the

Figure 1 Change in GHQ: pre-pandemic vs. during pandemic, by month



Notes Data from *Understanding Society* mainstage and *Understanding Society* COVID-19 study. Sample: mothers of children in school years Reception to Year 7 living in England. The bars mark average GHQ scores for mothers in different months before the pandemic and an equivalent sample of mothers observed during the pandemic, grouped into whether they had at least child not in a priority group to return to school in June 2020, or not. The black lines indicate 95% standard errors. Number of observations ranges between 383 and 444 before, and 753 and 1,159 during the pandemic, depending on the month.

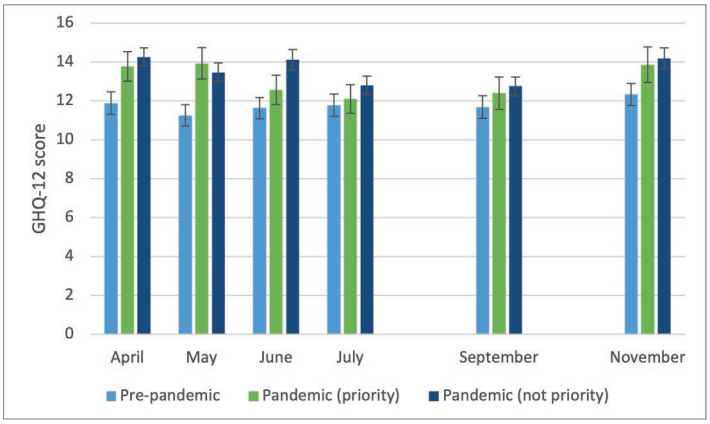
23 The gaps between the first and second and third bars will not capture the causal effect of the pandemic on wellbeing if there are underlying trends at work. This is discussed extensively in Banks and Xu (2020), although it is likely to generate less bias among parents than among younger individuals whose wellbeing was declining prior to the pandemic.

priority groups improved markedly compared to the previous months (GHQ scores dropped) and in June 2020 was no longer different to pre-pandemic levels. In contrast, the GHQ scores of mothers with at least one child not in a priority year group stayed high, at roughly 1.5 points above pre-pandemic levels. These raw differences provide indicative evidence that school closures play an important part in explaining the mental health declines of women during the pandemic, and we will explore this further in the next section.

Figure 2 shows equivalent figures for fathers. Similarly to mothers, fathers' GHQ scores are higher (mental health is worse) during compared to before the pandemic in each month, regardless of whether their children were prioritised for school or not. As with mothers, the differences seems to be slightly bigger in April, May and November, and slightly smaller in July and September, although the overlapping lines indicate that the differences are not always meaningful. They are also slightly smaller in magnitude than for mothers, with a difference roughly between 1 and 1.5 GHQ points.

The striking difference between the patterns observed for mothers and fathers is in June. While during the pandemic there was a notable difference in the mental health of mothers whose children were and were not prioritised to return to school that month, this is not the case for fathers. The overlapping lines indicate that school closures made little difference to fathers' mental health.

Figure 2 Overall change in GHQ for fathers: pre-pandemic vs. during pandemic, by month



Notes Data from *Understanding Society* mainstage and *Understanding Society* COVID-19 study. Sample: fathers of children in school years Reception to Year 7 living in England. The bars mark average GHQ scores for fathers in different months before the pandemic and an equivalent sample of mothers observed during the pandemic, grouped into whether they had at least child not in a priority group to return to school in June 2020, or not. The black lines indicate 95% standard errors. Number of observations ranges between 258 and 308 before, and 455 and 698 during the pandemic, depending on the month.

3 Estimated effect of school closures on parents' mental health

The raw differences in GHQ scores described above provide an indication of the overall change in mental health amongst parents of children aged 4-12 (in Reception to Year 7) over time and the possible contribution of school closures to this. In this section we formally estimate the extent to which school closures during the pandemic may be responsible for some of the reported worsening of parents' mental health.

Overall effect

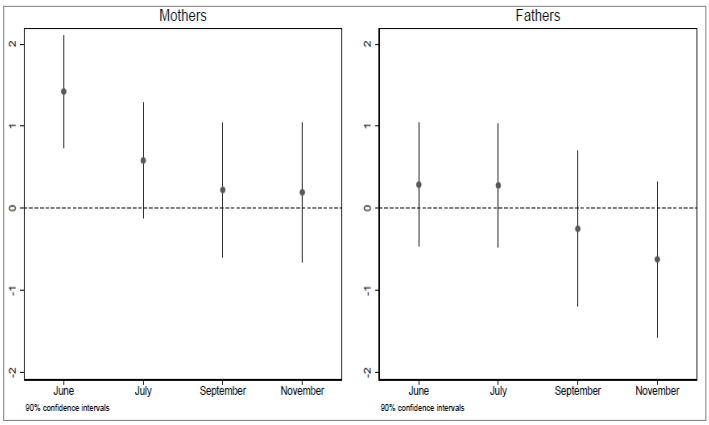
As described above, we focus on changes in GHQ scores over time, and how they differ between parents with at least one child in Years 2, 3, 4, 5 or 7 (who were not prioritised to return to school in June 2020) and parents whose children aged 4-12 were all in Reception, Year 1 or Year 6 (who were prioritised to return to school in June 2020).

Figure 3 illustrates the results of this modelling 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 with at least one child who was not prioritised to return to school in June 2020 and parents whose children aged 4-12 were all prioritised to return to school. (We refer to these differences, colloquially, as the effects of school closures in the discussion that follows.) The lines surrounding the circles indicate how confident we are in these estimates: the further away they are from zero (indicated by the dashed horizontal line), the more confident we can be about the estimates.

The figure suggests that mothers who were exposed to longer school closures had GHQ scores in June 2020 that were, on average, around 1.5 points higher than mothers with similar aged children who were exposed to shorter school closures during the summer term of 2020. The estimated effect of additional school closures on GHQ scores is equivalent to around 12% of the average pre-pandemic GHQ score for mothers in June. Alternatively, it is equivalent to a parent moving from feeling a problem such as being unhappy or depressed 'no more than usual' to somewhere between 'rather more than usual' and 'much more than usual'. The estimated effect is about half the size of the total increase in mental health problems experienced by mothers in June 2020, compared to pre-pandemic levels.

After June, we see the gap in mothers' mental health falling (and becoming statistically indistinguishable from zero, indicated by the vertical line surrounding the circle crossing the horizontal dashed line indicating zero) in July, and falling further and becoming very close to zero in September and November. This suggests that the effects of school closures on mothers' mental health are temporary. The mental health of mothers with at least one child at home in June and early July 2020 is reported to be significantly worse than that of other mothers during the period in which they have additional childcare and home-schooling responsibilities because

Figure 3 Change in parents' GHQ over time: effect of having at least one child in school Year 7 and below not prioritised to return to school, by gender



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. The circles mark the point estimate of the effect of school closures on total GHQ scores. The black lines indicate 90% 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 = 5,436; Fathers = 3,307.

they continue to be affected by school closures, but these differences disappear relatively quickly thereafter.

Meanwhile, for fathers, the estimates are never statistically distinguishable from zero: in other words, it does not appear that school closures had a significant effect on fathers' mental health. This could be explained by the findings of other studies that mothers have, on average, taken on more childcare and home schooling than fathers while schools were closed.[24]

We also probe whether results are similar for families who have all, rather than any, children in the household who were not prioritised to return to school in June 2020. Results are shown in the Appendix. We again find that mothers' – but not fathers' – mental health was negatively affected, and this was again in June 2020 only.[25]

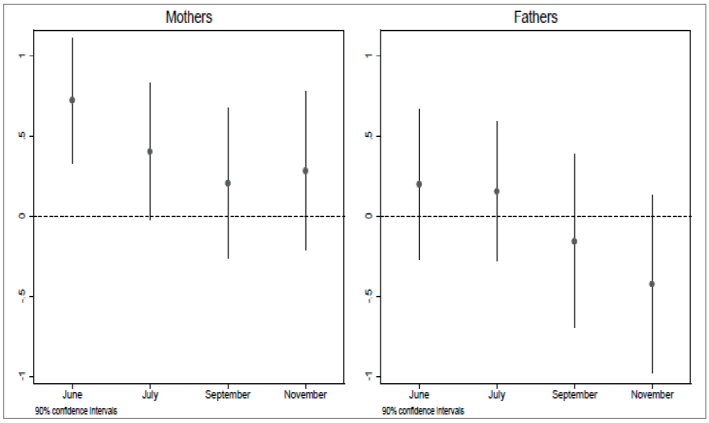
Our main estimates focus on the impact of having at least one child not prioritised to return to school by the government guidance regarding school reopening. But we might anticipate that much of the effect of the guidance is driven by its effects on the likelihood of children actually attending school. We know that not all schools followed the guidance: some additionally opened to non-prioritised year groups, while others did not open straightaway to all prioritised year groups, or not on a full-time basis. We also know that not all parents whose schools allowed their children to return actually took up those places. This suggests that the mental health impact on mothers of children actually attending school – as opposed to being prioritised in government guidance – could be much larger than our estimate.

Caseness scale

As explained above, responses to the General Health Questionnaire (GHQ-12) can also be used to create a 'Caseness' scale which counts the number of problems reported by an individual that are occurring 'rather more than usual' or 'much more than usual'. This score ranges from 0 to 12 and focuses more on mental health difficulties than the GHQ score.

Figure 4 presents results based on the same modelling as before, but using the Caseness scale as the outcome. The findings are very similar to those based on the GHQ score shown in Figure 3. Mothers whose children were not prioritised to return to school in June 2020 reported having 0.75 more mental health problems at that time than mothers whose children were prioritised to return. This compares to an average Caseness score of 3.2 among all mothers of children in that age range in June 2020. The figure again shows that

Figure 4 Change in parents' GHQ Caseness over time: effect of having at least one child in school Year 7 and below not prioritised to return to school, by gender



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. The circles mark the point estimate of the effect of school closures on total GHQ scores. The black lines indicate 90% 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 = 5,436; Fathers = 3,307.

24 Benzeval M., Borkowska M., Burton J., Crossley T. F., Fumagalli L., Jäckle A., Rabe, B. and Read, B. (2020), op. cit.; Andrew A., Cattan S., Costa-Dias M., Farquharson C., Kraftman S., Krutikova S., Phimister A. and Sevilla A. (2020), op. cit.

25 We also show in the Appendix results of models where we add parent-level fixed effects which evaluate the within-parent changes in GHQ scores. Results are similar to those presented here.

the impact on mothers' mental health is temporary: the gap in mental health problems is falling from July onwards and can no longer be distinguished from zero (the lines surrounding the circular maker cross the dashed zero line).

In line with our previous findings on fathers' mental health, we find that there is no difference in mental health problems between fathers whose children were not prioritised to return to school, compared to those that were.

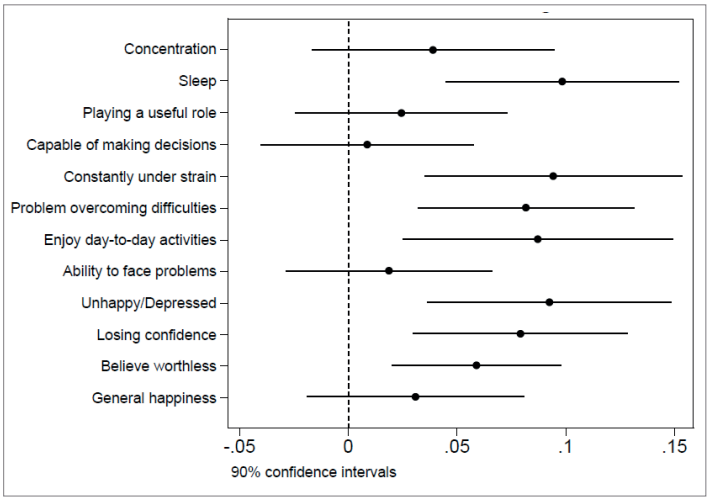
Overall, the continuous GHQ score and the Caseness scale show similar effects of school closures on overall wellbeing and the existence of mental health problems for mothers and no effect for fathers.

Domain analysis

We saw above that overall mental health in June 2020 was relatively worse amongst mothers with at least one child in Reception to Year 7 that was not prioritised to return to school in the summer of 2020 compared to mothers whose children in that age range were all prioritised to return.

Figure 5 repeats this analysis separately for each of the 12 questions that comprise the GHQ-12. It shows that mothers with at least one child who was not prioritised to return to school last summer are more likely to report losing more sleep to worry; to feel constantly under strain; to feel like they can't overcome their difficulties; to feel unhappy or depressed; to feel that they are losing confidence in themselves and to be thinking of themselves as a worthless person. They are also less likely to report that they are able to enjoy their normal day-to-day activities. This suggests that school closures affect a wide variety of different domains of mental health, rather than loading exclusively on one or two aspects. This could suggest that the effects are different for different women or that there are a number of ways in which school closures affect mental health for the same individuals. To shed light on these issues, the next section (Section 5) explores the extent to which the overall effects differ for different groups of women, while Section 6 explores some of the routes through which school closures might affect mothers' mental health.

Figure 5 Change in likelihood of mothers reporting a recent worsening of different perceptions and emotions in June 2020: effect of having at least one child in school Year 7 and below not prioritised to return to school



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in school years Reception to Year 7 living in England. The circles mark the point estimate of the effect of school closures on the likelihood that mothers report a recent worsening of their mental health in terms of each domain. The black lines indicate 90% 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: 5,436.

5 Differences in mothers' mental health by background

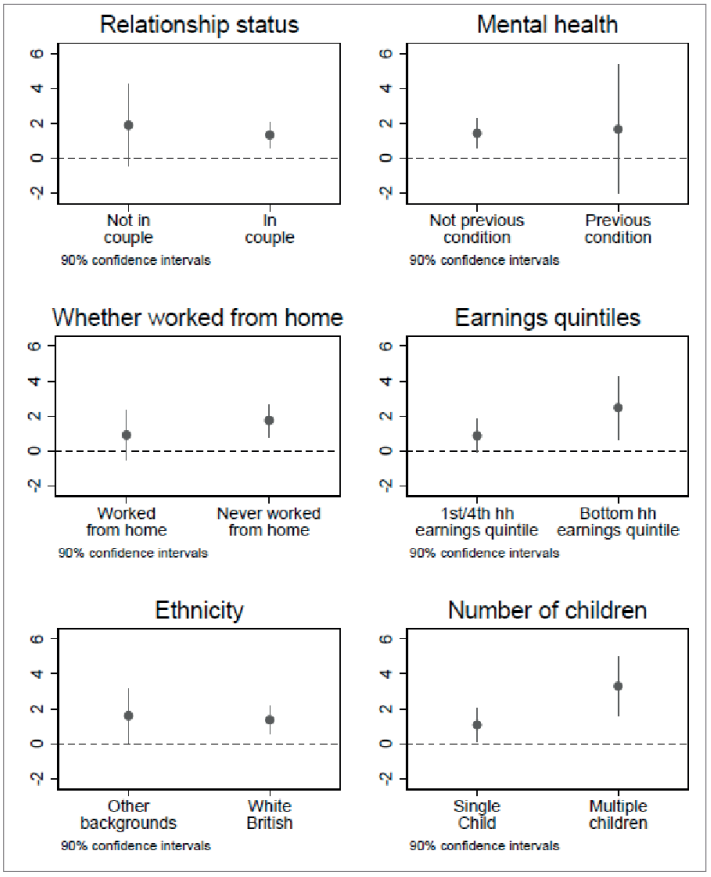
We find that mothers with at least one child in Year groups 7 and below who was not prioritised to return to school had GHQ scores that were, on average, around 1.5 points higher in June 2020 than mothers whose children in that age range were all prioritised to return to school. In this section we explore whether these effects on mothers' mental health vary by background characteristics. The characteristics we consider are relationship status (whether or not the mother lives in a couple), pre-existing mental health conditions (whether the mother has one or not), whether or not the mother ever worked at home pre-pandemic, whether or not the mother lives in a household in the lowest household earnings quintile, ethnicity (White British or Other background) and by the number of children in school years Reception to 7 (one child vs. more than one child).

Figure 6 compares the results for each of these groups. 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 on mothers differs by the background characteristic in question.

This is in fact the case for most characteristics: the mental health effects are very similar by relationship status, by whether the mother had a pre-existing mental health condition, and by ethnicity. The mental health effects of school closures seem to be slightly more detrimental for working mothers who never worked from home pre-pandemic than for those that did, but these differences are not statistically significantly different from each other. It also seems that mental health worsens more for mothers from the lowest household earnings quintile than for more affluent mothers, but these differences are again not statistically significantly different from each other, so we cannot be sure that it is not only due to chance that they look different in our sample.

The only characteristic for which there seems to be a clear difference in terms of the mental health implications of school closures is between mothers with just one vs. more than one child between Reception and Year 7. The GHQ scores of mothers with more than one child in this age range worsen by around 3.3 points, on average, around three times larger than the effect on mothers with just one child of around 1.1 points. This is likely to be because among larger families those who are still affected by school closures in June and July 2020 will probably have more than one child at home, which may place more demands on parents (mothers here), which in turn seems to have a more detrimental effect on their mental health.

Figure 6 Change in mothers' GHQ in June 2020: effect of having at least one child in school Year 7 and below not prioritised to return to school, by background



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in year groups R-7 living in England. The circles mark the point estimate of the effect of school closures on total GHQ scores. The black lines indicate 90% 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 and interactions of the main effect with the background characteristic shown in each figure. The figure shows the total effect for each group. Sample sizes, from left to right and from top to bottom: 2,982, 2,969, 2,418, 2,583, 2,970 and 2982.

6 Channels

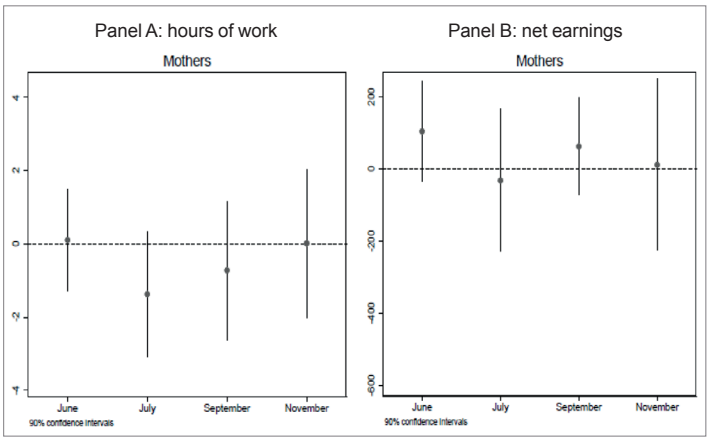
As outlined in the introduction, there are various channels through which school closures might plausibly affect mothers' mental health. In this section we explore three possible channels: hours of work, earnings and loneliness. We estimate the same difference-in-difference models as before, comparing changes over time between mothers who are more vs. less exposed to school closures, but instead of GHQ scores, our outcomes are total hours worked (in employment or self-employment, and set to zero if not working) (Figure 7, Panel A), net monthly individual earnings (Figure 7, Panel B) and self-reported loneliness (Figure 8).[26]

Figure 7 shows that we find no evidence of differences in working hours or earnings between mothers with differential exposure to school closures in the summer of 2020 in June or beyond. This suggests that the mental health effects of longer school closures that we identify are not driven by changes in total work hours or job losses, although that does not rule out that they are related to the challenges of juggling work and childcare and home-schooling responsibilities or financial difficulties explicitly. For example, it is possible that working the same number of hours at unusual times (e.g. in the evenings or at weekends) could be driving some of the changes we see, but we do not observe rich enough information in our data to explore this possibility further.

Figure 8 shows the effect of school closures on mothers' self-reported loneliness. Here we find that mothers with at least one child not in a priority year group to return to school were six percentage points more likely to report having felt lonely often or some of the time in June 2020 than mothers whose children were all in priority year groups. Before the pandemic, the average loneliness score in June was 0.38 (38% of mothers felt lonely often or some of the time), so the effect corresponds to 16% of pre-pandemic levels of loneliness. Given the relationship between loneliness and mental health, these results suggest that loneliness might be one of the routes through school closures detrimentally affect mothers' mental health.

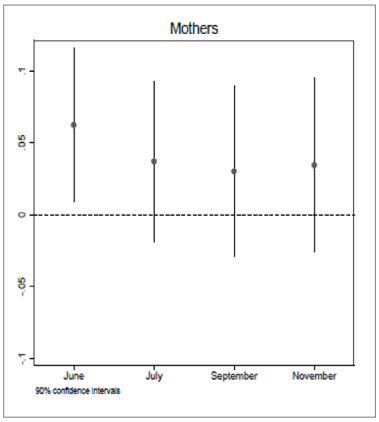
In summary, our results suggest that the six-week period of school closures in the summer of 2020 do not appear to have made much difference to the work circumstances of mothers, at least not that we can measure in our data: it had no discernible effect on total hours worked or net earnings, although this does not preclude the possibility that there are other channels through which school closures could plausibly have affected work experiences or family income and in turn detrimentally affected mental health. Based on the channels we have been able to explore, the mental health toll of school closures seems instead to be driven by social factors such as loneliness. This is in line with previous evidence that has

Figure 7 Change in mothers' work hours and net earnings over time: effect of having at least one child in school Year 7 and below not prioritised to return to school



Notes Data from *Understanding Society* COVID-19 study. Sample: mothers of children in year groups R-7 living in England. The circles mark the point estimate of the effect of school closures on hours worked for employed and unemployed respondents (panel A) and monthly net earnings (panel B). The black lines indicate 90% 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: 4,533.

Figure 8 Change in mothers' loneliness over time: effect of having at least one child in school Year 7 and below not prioritised to return to school



Notes Data from *Understanding Society* COVID-19 study. Sample: mothers of children in year groups R-7 living in England. The circles mark the point estimate of the effect of school closures on the probability of reporting feeling lonely often or some of the time. The black lines indicate 90% 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: 5,676

26 Loneliness is derived from a question, 'In the last four weeks, how often did you feel lonely?', where responses are: hardly ever or never; some of the time; often.

suggested that the greater negative effect of the pandemic on the mental health of women compared to men is largely explained by higher self-reported loneliness as a result of the loss of their more extensive social life.[27]

27 Etheridge and Spantig (2020) op. cit.

7 Conclusion

This note has provided new evidence on the impact of the pandemic on parents' mental health, focusing on the role that school closures have played in generating these effects. Comparing changes in self-reported mental health for parents whose children were all prioritised to return to school with those who had at least one child not prioritised showed that mothers who were more likely to have children at home in June reported worse mental health than mothers whose children were more likely to be in school, while fathers were not affected.

Our results suggest that these negative effects for mothers may have been driven, at least in part, by an increase in loneliness; conversely we find no evidence that school closures led to changes in total working hours or earnings, although that does not preclude there being other changes to working hours, conditions or other sources of household income that might plausibly have negatively affected mothers' mental health as a direct result of school closures.

We find that the average mental health impact of an additional six weeks of school closures is short-lived and disappears by the summer holidays. This means that for mothers who may have been struggling during the most recent national lockdown, the return to school of all children on 8 March 2021 will hopefully already have alleviated some of the difficulties they may have been facing during this roughly eight-week period.

That is not to say that some mothers (or indeed fathers) may not experience ongoing and possibly severe 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. (Figures 1 and 2 suggest that they were worse throughout 2020 and may continue to be so now.) It is also important to bear in mind that our approach is only able to estimate the impact of the additional six weeks of school closures in June and early July 2020, not any potential cumulative effects of school closures throughout the pandemic, which may conceivably last.

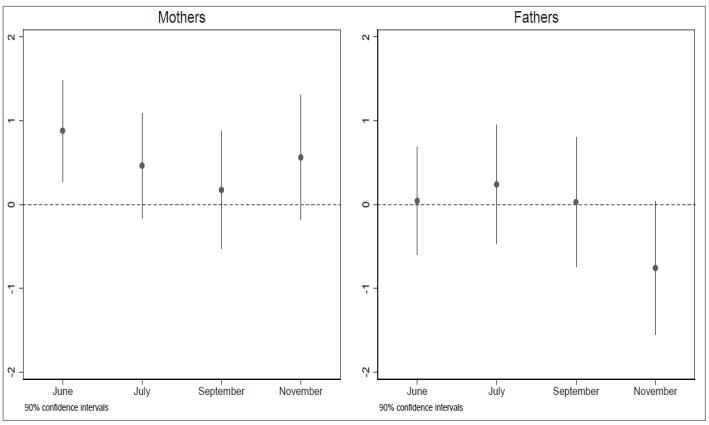
The finding that the mental health effects of school closures are only temporary for mothers contrasts with the findings presented in our earlier briefing note which used the Strengths and Difficulties Questionnaire (SDQ) to estimate the impact on children's behavioural and emotional difficulties of the same six-week period of school closures last summer.[28] The mental health effects for children were larger than for parents when we were first able to measure them (around 40% of a standard deviation for children at the end of July, and around 25% of a standard deviation for parents at the end of June). Children who were not prioritised to return continued to exhibit significantly more behavioural and emotional difficulties in September than their peers who had been prioritised to return to school earlier. This is in stark contrast to the results for mothers which have disappeared by the end of September.

We do not yet know whether the mental health effects of school closures for children may have persisted beyond September, or indeed to what extent the second round of national school closures earlier this year may have made things significantly worse. What does appear to be clear is that it is children rather than parents who may need the most support to overcome the mental health challenges of the school closures they have experienced over the last 12 months.

28 Blanden J., Crawford C., Fumagalli L. and Rabe B. (2021), op. cit.

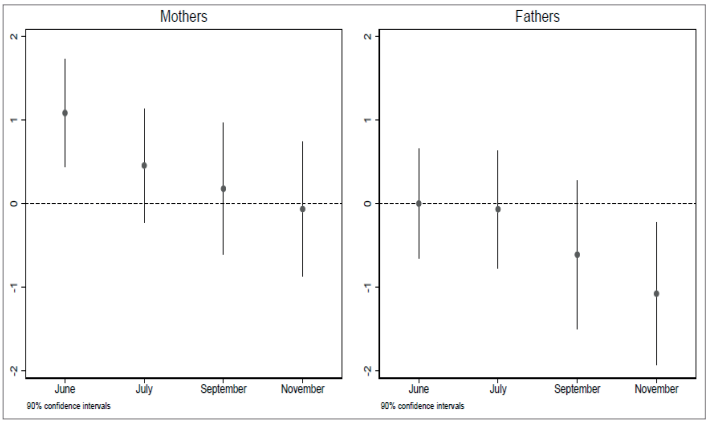
Appendix

Figure A1 Change in parents' GHQ over time: effect of all children in Years R-7 not being prioritised to return to school, by gender



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in Year groups R-7 living in England. The circles mark the point estimate of the effect of school closures on total GHQ scores. The black lines indicate 90% 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 = 5,436; Fathers = 3,307.

Figure A2 Change in parents' GHQ over time within parent (using individual fixed effects): effect of having at least one child in Years R-7 not prioritised to return to school, by gender



Notes Data from *Understanding Society* COVID-19 study. Sample: parents of children in Year groups R-7 living in England. The circles mark the point estimate of the effect of school closures on total GHQ scores. The black lines indicate 90% 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 = 5,436; Fathers = 3,307.