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**Working Paper**

## Have Girls Been Left behind during the COVID-19 Pandemic? Gender Differences in Pandemic Effects on Children's Mental Wellbeing

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# Have Girls Been Left behind during the COVID-19 Pandemic? Gender Differences in Pandemic Effects on Children's Mental Wellbeing

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## ABSTRACT

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# Have Girls Been Left behind during the COVID-19 Pandemic? Gender Differences in Pandemic Effects on Children's Mental Wellbeing

Using data from the UK, we show that girls have been affected more than boys by the COVID-19 pandemic in terms of their mental wellbeing. These gender differences are more pronounced in lower-income families. Our results are consistent with previous findings of larger pandemic effects on mental health of women.

**JEL Classification:** I10, I31, J13

**Keywords:** COVID-19, pandemic, mental health, children

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## **1. Introduction**

The COVID-19 pandemic has impacted men and women differently. Gender gaps exist not only in the direct disease effects (Richardson et al. 2020) but also in the way lockdowns and the stress of home-schooling have affected mental health of individuals (Brooks et al 2020). There is a push for more research on the gendered experiences of the pandemic (Brady et al. 2021).

More gender-specific analysis is also required on the impact of the pandemic on children. On average, the pandemic led children's mental health to deteriorate (Blanden et al., 2021). Yet, it remains unclear if the effects are equally shared by boys and girls. Previous studies suggest that younger boys are more sensitive to adverse circumstances (Figlio et al., 2019). By contrast, older girls' greater pre-existing vulnerabilities in mental health may make them more sensitive compared to older boys (Davis et al., 2018). A health pandemic may involve experiences that make it different to other sources of disadvantage. Furthermore, gendered impacts may occur because of differences in parental time and money inputs (Del Bono et al. 2021).

In this paper, we ask: (1) Does the COVID-19 pandemic have a gendered impact on the mental wellbeing of children? and (2) Are the gendered impacts offset or exacerbated by the pre-existing circumstances? Understanding if the pandemic has differently affected girls' and boys' mental health and the potential buffers against such effects is important. First, it may undermine society's efforts to achieve gender equality. Second, children's mental health spills over to educational outcomes and longer-term wellbeing (Waite et al., 2021).

We contribute to two bodies of work. We add to the literature on the impacts of the COVID-19 pandemic on children's outcomes (e.g., Waite et al., 2021). Second, we contribute to the literature on the determinants of gender inequality in schooling and non-cognitive outcomes (e.g., Pope and Sydnor, 2010; Bertrand and Pan 2013).

## **2. Data and Methods**

Our analysis is based on the data from the UK Household Longitudinal Study (UKHLS), known as Understanding Society. As part of the study, approximately 40,000 households have been surveyed annually since 2009-10. Ten waves of data are currently available. In April 2020, all respondents of the UKHLS were invited to take part in a new COVID-19 survey, which includes questions on the impact of the pandemic. The participants who accepted the invitation have been surveyed once a month (every two months from July 2020).

As a measure of child mental wellbeing, we use the scores of the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a behavioural screening questionnaire for children, which includes 25 questions covering five areas: hyperactivity/inattention, emotional symptoms, conduct problems, peer relationship problems, and pro-social behaviour.<sup>1 2</sup> Answers to these questions (excluding those on prosocial behaviour) are summed to create a ‘total difficulties’ score ranging from 0 to 40. In every UKHLS wave, parents answer the SDQ for 5- and 8-year-old children. In every second wave, 10-15-year-old children self-complete the SDQ. In the COVID-19 survey, parents complete the SDQ for 5-11-year old children, and 10-15-year-old children self-complete the SDQ in selected waves.<sup>3</sup>

Table 1: Means and Standard Deviations of Key Variables

	5-8 year-old children	10-15 year-old children
Child’s SDQ scores:		
Total Difficulties (0-40)	8.54 (5.88)	10.71 (5.78)
Emotional Symptoms (0-10)	1.79 (2.00)	2.91 (2.30)
Hyperactivity/Inattention (0-10)	3.69 (2.60)	3.92 (2.35)
Conduct Problems (0-10)	1.68 (1.62)	2.06 (1.76)
Peer Relationship Problems (0-10)	1.39 (1.67)	1.82 (1.68)
Prosocial Behaviour (0-10)	8.37 (1.81)	7.74 (1.81)
Child female	0.49 (0.50)	0.50 (0.50)
Child’s age	6.61 (1.45)	12.60 (1.68)
Child’s ethnicity: White	-	0.74 (0.44)
Mother’s ethnicity: White	0.54 (0.45)	0.60 (0.49)
Mother’s age at child’s birth	30.59 (5.88)	29.77 (5.79)
Mother’s education: Degree/ Other HE qualification	0.49 (0.36)	0.42 (0.35)
Mother’s education: A levels	0.20 (0.40)	0.18 (0.38)
Mother’s education: GCSE	0.22 (0.41)	0.24 (0.43)
Mother’s education: Other or no qualification	0.09 (0.20)	0.16 (0.27)
COVID-19 wave	0.12 (0.32)	0.12 (0.32)
Observations	11,295	21,331

Notes: Child’s ethnicity is unavailable for 5-8-year-old children in the data. HE stands for higher education. GCSE stands for General Certificate of Secondary Education.

We use all waves of the regular and the COVID-19 survey available to-date (as of July 2021). Excluding observations with missing information, the sample of older children (10-15 years)

<sup>1</sup> See Online Appendix A for the questionnaire.

<sup>2</sup> See Goodman (1997) for a detailed analysis of SDQ.

<sup>3</sup> Parents completed the SDQ in July and September 2020, and March 2021, and children in July and November 2020, and March 2021.

includes over 21,000 observations, and the sample of younger children (5-8 years<sup>4</sup>) includes over 11,000 observations. Table 1 presents the descriptive statistics of both samples.

To analyse whether the COVID-19 pandemic affected boys' and girls' mental wellbeing differently, we estimate difference-in-difference (DID) models. The child's SDQ scores are regressed on an indicator for whether the child is female, an indicator for the COVID-19 waves, and the interaction of these two variables. The coefficients on the interaction term show the gender-differences in the effect of the pandemic on child mental wellbeing. We control for the child's age and ethnicity (mother's ethnicity for younger children), the mother's age-at-birth and education, and wave fixed-effects.

To attribute estimated gender differences to the COVID-19 pandemic, we assume that girls' and boys' mental wellbeing would have evolved in the same way in the absence of the pandemic (parallel trends assumption). To test the validity of this assumption, we include gender-specific linear trends in the DID models. We also assume that the sample composition of girls and boys remains the same over-time, except for any changes in the observed variables. As a robustness check, we include child fixed-effects in the DID models.

### **3. Results**

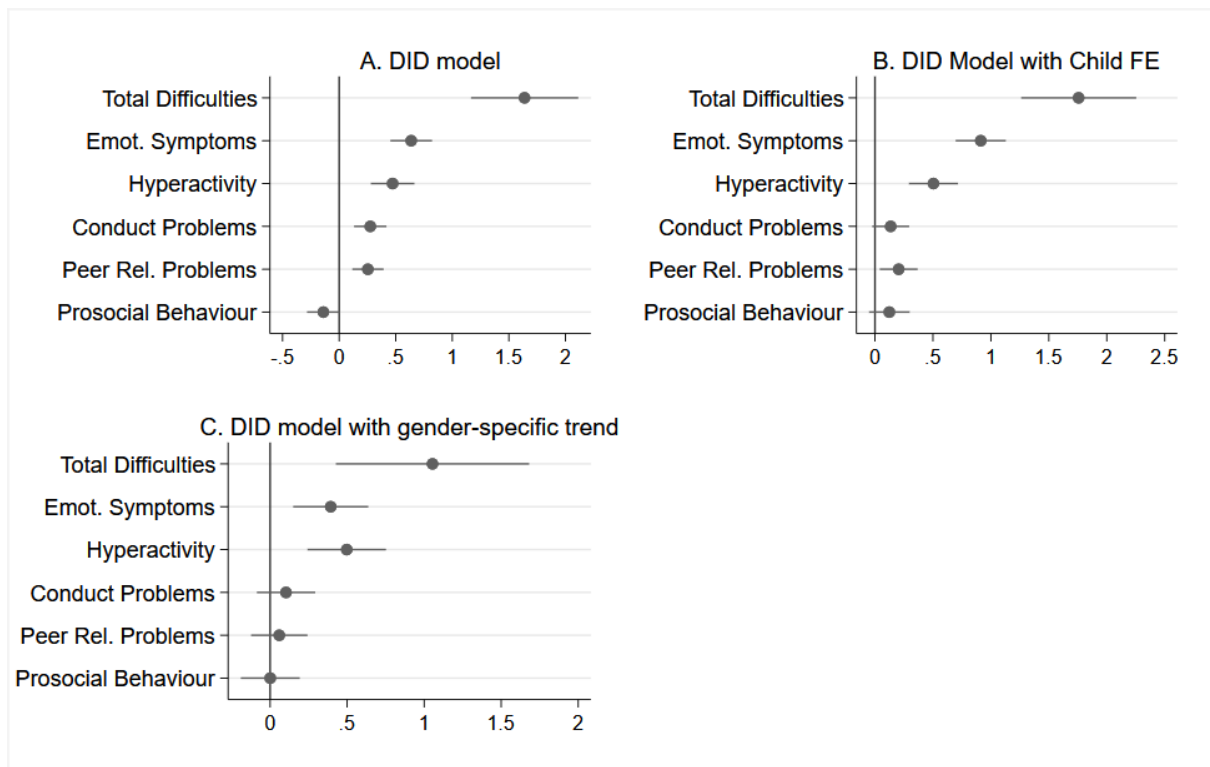
Graph A of Figure 1 presents the estimates of the DID model for older children. We find that girls' mental wellbeing during the COVID-19 pandemic (relative to pre-pandemic years) declined more than boys' mental wellbeing. Girls' total emotional and behavioural difficulties increased by 1.639 points more compared to boys (corresponding to 29% of a standard deviation). This difference is statistically significant at the 1% level. Before the pandemic, there was no difference in total difficulties by gender. During the pandemic, total difficulties increased among girls, but not among boys. We observe a larger increase among girls compared to boys across all domains of the SDQ (emotional symptoms, hyperactivity, conduct problems, peer problems, and a larger decrease in prosocial behaviour). Conduct problems decreased among both boys and girls during the pandemic, but more so among boys; and prosocial behaviour increased more among boys than among girls.

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<sup>4</sup> We restrict the age range of younger children to 5-8, to avoid an overlap between samples and to keep the range the same before and after the start of the pandemic.

The main results remain robust to the inclusion of child fixed-effects (graph B) and gender-specific linear trends (graph C). The increase in total difficulties is 1.757 point higher among girls than among boys in the fixed-effects model, and 1.054 point higher in the model with gender-specific trends. Gender differences in specific SDQ domains largely persist, although some differences become statistically insignificant once gender-specific trends are included. This is unsurprising, since they absorb a large portion of gender-specific evolution of SDQ scores. Consistently, Online

Figure 1: Gender Differences in Pandemic Effects on SDQ Scores of 10-15-Year-Old children



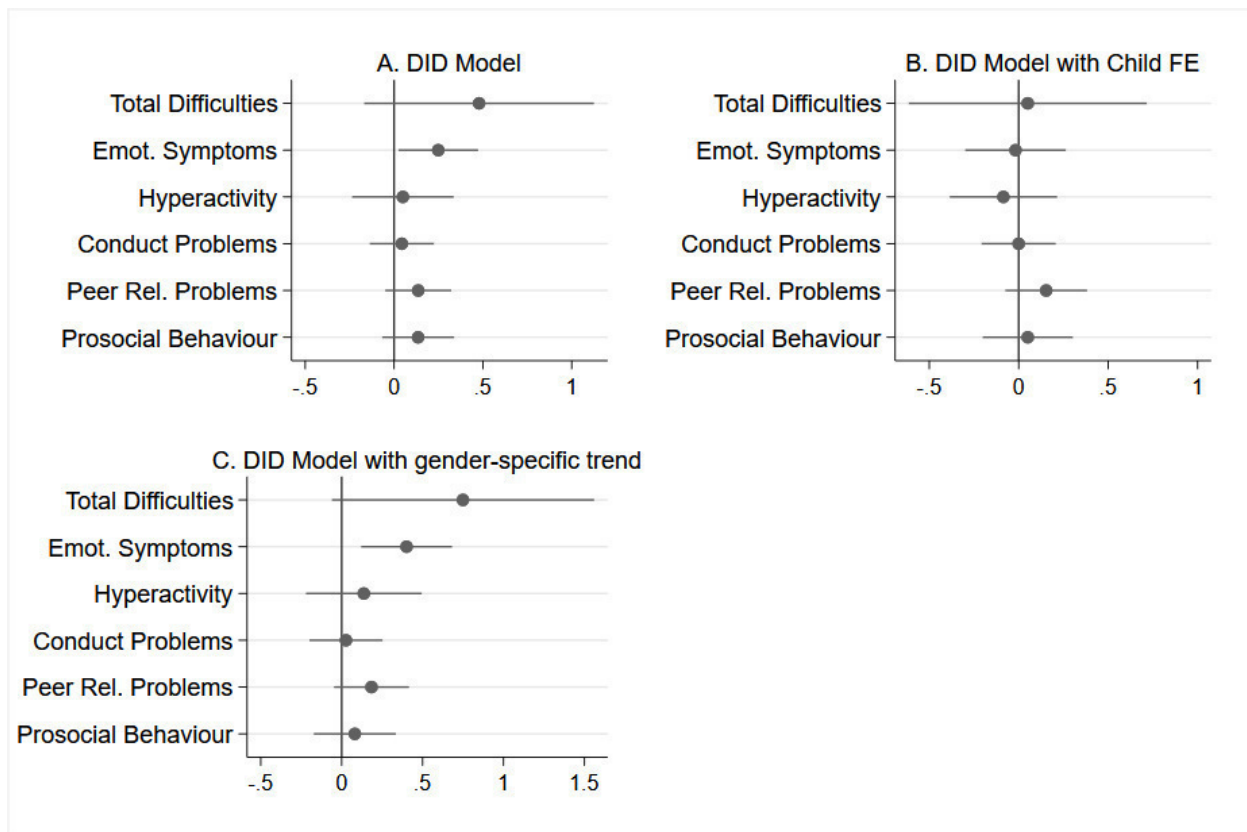
Notes: The figure presents the coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Sample size is 21,331 observations.

Appendix Table B.1 shows a larger increase in overall life dissatisfaction among older girls than among boys during the pandemic. Girls also experienced a larger increase in dissatisfaction with school, friends, family, and appearance, compared to boys.

As to younger children (Figure 2), girls are also found to experience a larger increase in total difficulties than boys in the baseline DID model (mainly driven by emotional symptoms), but these gender differences are not statistically significant or consistent across model specifications.



Figure 2: Gender Differences in Pandemic Effects on SDQ Scores of 5-8-Year-Old Children

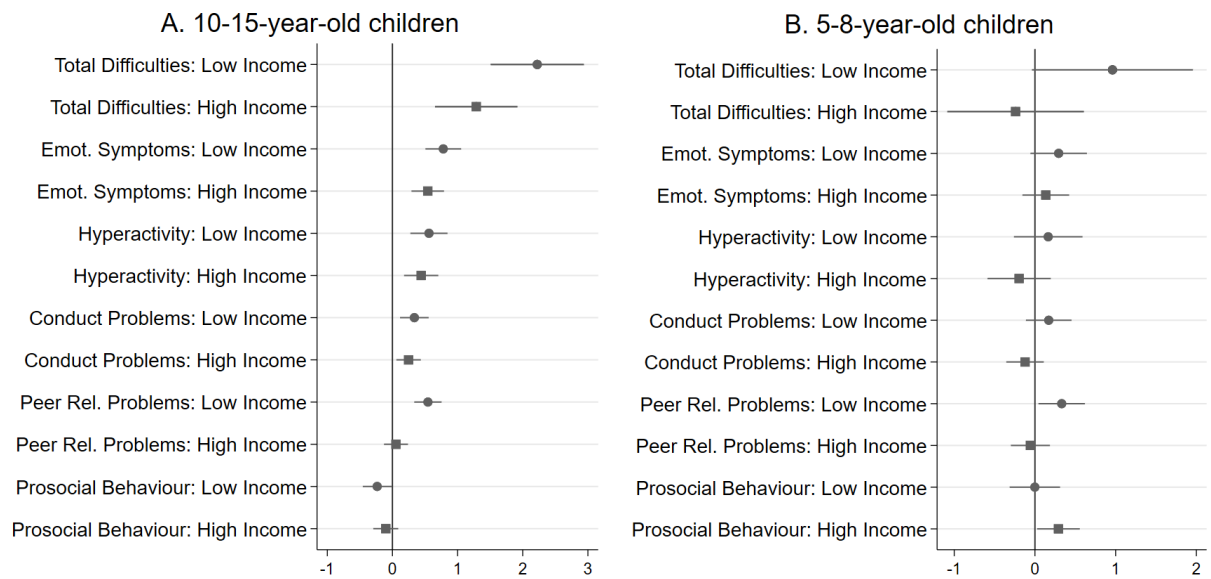


Notes: The graphs present the coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Sample size is 11,295 observations.

Graph A of Figure 3 shows larger gender differences in pandemic effects on the mental wellbeing of older children from lower-income<sup>5</sup> families, although both income groups are affected. Girls from lower-income families experienced a 2.222 point (39% of a standard deviation) higher increase in total difficulties compared to boys during the COVID-19 pandemic. In higher-income families, the gender difference is 1.285 points (23% of a standard deviation). Graph B of Figure 3 shows statistically significant gender differences in total difficulties among younger children from lower-income families only (by 0.961 points or 16% of a standard deviation). In the triple difference model, the interactions between pandemic, female, and lower-income indicators are statistically significant at the 10% level in both age groups (Online Appendix Table B.3). The differences in the results by income are most salient in peer problems in both age groups. Pre-pandemic mental health does not mitigate gender differences in pandemic effects among older children, as shown in Online Appendix Tables B.2 and B.3.

<sup>5</sup> Lower (higher)-income families are those with incomes below (above) the median before the pandemic.

Figure 3: Gender Differences in Pandemic Effects on SDQ: Heterogeneity by Household Income



Notes: The graphs present the coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals.

#### 4. Conclusions

We find that emotional and behavioural difficulties increased more among older girls than boys during the COVID-19 pandemic relative to the pre-pandemic years. The results on life satisfaction are consistent. We find gender differences in pandemic effects on children's mental wellbeing among all income groups, although these differences are more salient in lower-income families. We also do not find any protective effects of pre-pandemic mental health. The findings are qualitatively similar for younger children, but less statistically significant and robust. Our results suggest that the COVID-19 pandemic affected the mental wellbeing of girls more than boys, especially those from lower-income families.

#### References

Bertrand, M. & Pan, J. (2013). The trouble with boys: Social influences and the gender gap in disruptive behaviour. *American Economic Journal: Applied Economics*, 5(1), 32-64.

Blanden, J., Crawford C., Fumagalli, L., & Rabe, B. (2021). School closures and children's emotional and behavioural difficulties. ISER Report March 2021.

<https://www.iser.essex.ac.uk/research/publications/536633>

Brady, E., Nielsen, M.W., Andersen, J.P., & Oertelt-Prigione S. (2021). Lack of consideration of sex and gender in COVID-19 clinical studies. *Nature Communications* 12, 4015.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920.

Davis, J., Vizard, T., Forbes, N., Pearce, N., Nafilyan, V., Merad, S., ... Goodman, A. (2019). Mental health of children and young people in England 2017: Predictors of mental disorders. NHS Digital. London.

<https://files.digital.nhs.uk/85/7FFC57/MHCYP%202017%20Predictors.pdf>

Del Bono, E., Fumagalli, L., Holford A., & Rabe, B. (2021) Coping with school closures: the changing responses of schools, parents and children during COVID-19. ISER Report July 2021.

<https://www.iser.essex.ac.uk/files/news/2021/little-inequality-homeschool/coping-with-school-closures.pdf>

Figlio, D., Karbownik, K., Roth, J. & Wasserman, M. (2019). Family disadvantage and the gender gap in behavioural and educational outcomes. *American Economic Journal: Applied Economics*, 11(3), 338-81.

Goodman, R. (1997) The strengths and difficulties questionnaire: a research note. *Journal of Child Psychology and Psychiatry* 38, 581–586.

Pope, D. G., & Sydnor, J. R. (2010). Geographic variation in the gender differences in test scores. *Journal of Economic Perspectives*, 24(2), 95-108.

Richardson, S., Hirsch, J.S., Narasimhan, M., Crawford, J.M., McGinn, T., Davidson, K.W., ... Cookingham, J. (2020). Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. *JAMA*, 323(20), 2052-2059.

Waite, P., Pearcey, S., Shum, A., Raw, J.A., Patalay, P., & Creswell, C. (2021). How did the mental health symptoms of children and adolescents change over early lockdown during the COVID-19 pandemic in the UK? *JCPP Advances*, 1(1), e12009.

