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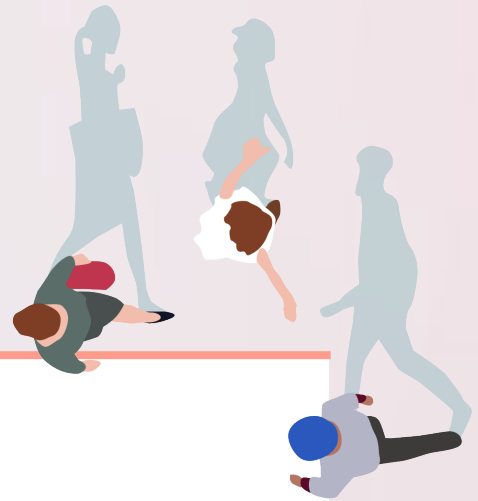
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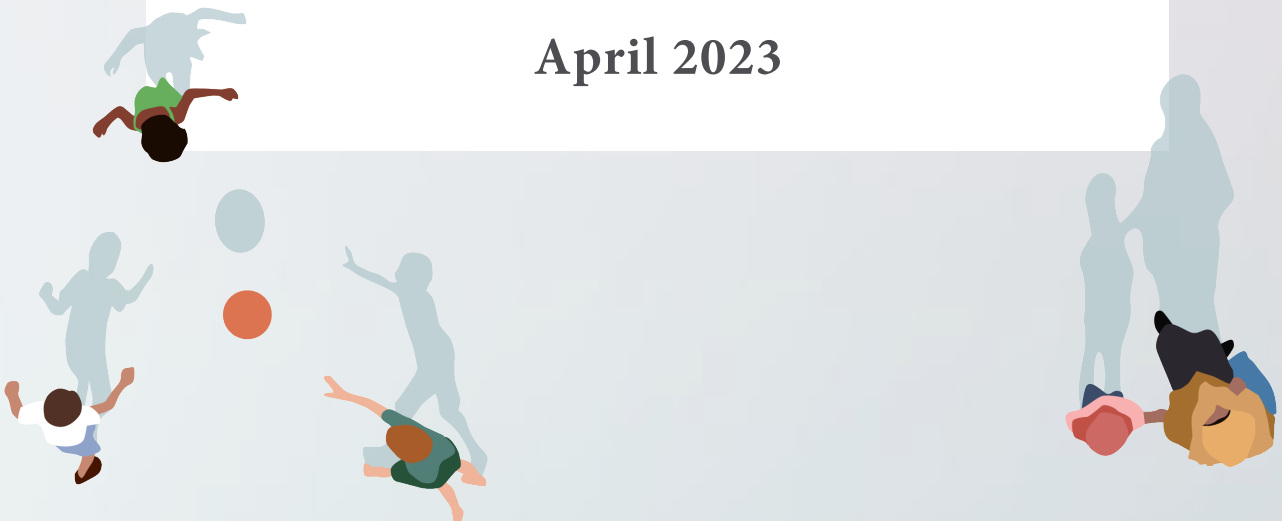


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IMPACT OF THE ADOPTION SUPPORT FUND ON THE MENTAL HEALTH OF ADOPTED CHILDREN

April 2023





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Our new single What Works centre will cover the full range of support for children and families from preventative approaches, early intervention and targeted support for those at risk of poor outcomes, through to support for children with a social worker, children in care and care leavers.

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Spark Grant Scheme

This research was funded as part of the WWCSG Spark Grant Scheme. The purpose of the scheme is to fund new and innovative research in children's social care, conducted by researchers who may struggle to secure funding through other routes, particularly Early Career Researchers (ECRs) and/or researchers from underrepresented, minoritised groups. This work is an important part of our mission to develop capacity within the research community and generate high-quality evidence in children's social care.

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Executive summary

Introduction

In England, up to 80,080 children were looked after by social care by 2020, and among them approximately half suffered from mental health problems. Evidence shows that looked-after children fare worse than their general population peers in a range of life chances and health outcomes. One potential way to improve the wellbeing of looked-after children is through adoption; however, the outcomes of adoption tend to be mixed. To address the needs of adoptive families, a key policy – the Adoption Support Fund (ASF) – was rolled out across all 152 local authorities in England from May 2015. The ASF aims to provide adoptive families with funding support to access mental health services. Empirically, however, little is known about whether the ASF policy helped improve the mental health of adopted children.

Objectives

This study aims to examine the impact of the ASF policy on the mental health of adopted children, using a quasi-experimental design. The key research question centres on whether the ASF policy generated positive mental health outcomes for adopted children affected by the policy.

Design

Data on adopted children is pooled from three data sets – the Longitudinal Study of Adoptive Parents, the Millennium Cohort Study and the UK Household Longitudinal Study. A difference-in-differences approach is employed to compare changes in mental health for a treatment group (adopted children) with similar changes for a control group (non-adopted children).

Findings

The results show that the ASF policy reduced adopted children's risks of having high Strengths and Difficulties Questionnaire (SDQ) scores (SDQ total scores ≥ 17) by approximately ten percentage points. The policy did not seem to generate significant impact on adopted children's mean SDQ total scores. We find no significant effect of the policy on externalising behaviour, including hyperactivity and conduct problems. There is no consistent evidence indicating that the ASF policy significantly improved specific internalising behaviour among adopted children.

Conclusions & implications

Our findings show that the ASF policy has generated some improvements in mental health for adopted children, in particular among adopted children at high risk of poor mental health. Meanwhile, we find no consistent evidence showing that the policy significantly improved specific internalising and externalising behaviour among adopted children. Our findings highlight the need to understand the effectiveness of specific therapeutic services provided



by the ASF and the need for complementary approaches that also address the broader social and economic wellbeing of adoptive families.



Introduction

Background

It is well established that the early life environment is crucial for child development (Fox, Levitt et al., 2010). Adverse caregiving environments, such as those involving instability and maltreatment, are associated with poor cognitive and behavioural outcomes (Doyle & Cicchetti, 2017; Halpern, Schuch et al., 2018; Teyhan, Boyd et al., 2019). In England, up to 80,080 children were in social care in 2020, often due to lack of parental capacity to meet children's needs (DfE, 2020). Approximately half of these children struggle with mental health needs, which persist into adolescence and early adulthood (Paine, Fahey et al., 2021). As a result, looked-after children (i.e. those in care) fare worse in adolescence and young adulthood than their non-adopted peers, in terms of social and health outcomes such as education (Sebba, Berridge et al., 2015), risky behaviours (Botchway, Quigley et al., 2014), criminal offending (Schofield, Biggart et al., 2015; Sariaslan, Kääriälä et al., 2022) and physical and mental health (Rushton, Grant et al., 2013; Memarzia, St Clair et al., 2015; Nadeem, Waterman et al., 2017; Rebbe, Nurius et al., 2017; Sonuga-Barke, Kennedy et al., 2017; Neil, Morciano et al., 2020).

A common assumption is that adoption improves the wellbeing of looked-after children, because it facilitates long-term stability, sense of belonging, supportive parenting and improved access to schooling and health services, which may promote recovery from adversities from the past (Palacios, Adroher et al., 2019; Finster & Norwalk, 2021). However, improved life circumstances do not necessarily translate into favourable mental wellbeing for children placed in adoptive families (Zill and Bramlett, 2014). Adoption transition, post-adoption adjustment and parenting are often a challenging process for many families (Nadeem, Waterman et al., 2017; Fawley-King, Trask et al., 2020). One survey of over 2600 adoptive parents from the UK found that 38% experienced significant challenges, 18% severe challenges and 3% a disruption following the adoption of a child (Adoption UK, 2019). A recent report, based on approximately 1000 adoptive families interviewed around late 2018 to early 2020, found that adoptive parents have worse emotional wellbeing than the general population, with 53% reporting negative impacts of adoptive parenting on family relationships (Burch, Backinsell et al., 2021). Poorly managed adoption transitions may worsen adopted children's emotional wellbeing, self-esteem, behavioural outcomes and relationship with adoptive parents (Neil, Morciano et al., 2020). Therefore, ongoing support to adoptive families is essential to improve adoption outcomes and avoid adoption breakdown (Palacios, Rolock et al., 2019).

Evidence suggests that parental stress regulation and caregiving commitment are associated with the mental health development of adopted children (Hornfeck, Bovenschen et al., 2019; Kernreiter, Klier et al., 2020). Likewise, evidence also suggests that quality parenting, which features warmth, responsiveness, understanding and involvement, can buffer parent-child conflicts (Kriebel & Wentzel, 2011) and reduce behavioural problems among adopted children (Harwood, Feng et al., 2013; Paine, Fahey et al., 2021). An important question is whether government policies that offer mental health support to adoptive parents and children are effective to improve outcomes. There is some promising



evidence from randomised controlled trials that interventions directed at improving mental wellbeing have positive effects on children in foster care (Mersky, Topitzes et al., 2015; Van Andel, Post et al., 2016). However, children from adopted families may differ from those in foster families, due to the transitory nature of foster care.

The Adoption Support Fund (ASF) in England

The ASF was a key policy rolled out across all 152 local authorities in England starting in May 2015. Before the national roll-out, a successful pilot study was carried out across ten local authorities, where 160 adoptive families were supported with over £1 million in funding; the ASF was subsequently made available to all adoptive families in England with over £19 million funding in the first year (DfE, 2015). The ASF aims to increase access to a wide range of therapeutic support, including therapeutic parenting, psychotherapy, creative therapies, filial therapy, therapeutic life-story work, therapeutic short break, further assessments and multi-disciplinary packages of support (King, Gieve et al., 2017). The ASF is administered through a central fund directly allocated to local authorities, which assesses individual needs and handles online applications (King, Gieve et al., 2019). The uptake of ASF has been high since its inception, with 31,000 families and 41,000 children having obtained access to ASF by August 2018, amounting to a cost of £88 million (Gieve, Hahne et al., 2019).

The ASF may affect the mental health of adopted children and their families via several mechanisms. First, the ASF facilitates the treatment of diagnosed mental health disorders among adopted children through supporting access to mental health services. Such support may help adopted children to better deal with the challenges arising from early life adversity, thereby improving subsequent life course outcomes and health (Tan, 2009). Second, as a large-scale state fund that supports adoptive families, the ASF may help families to secure family membership in the general community and develop stable and continuous family relationships with a sense of identification, belonging and participation (Luckock, 2008). Targeted services such as therapeutic parenting training provided by ASF may also enhance parenting capacity to meet children's emotional and behavioural needs to promote secure parent-child attachment (Harlow, 2021; White, Rolock et al., 2021). Third, families supported by the ASF may also use financial resources to purchase other educational, medical, recreational and childcare services, which may promote children's mental wellbeing (Noonan, Burns et al., 2018). All of these factors may help mobilise commitment and enhance the capacities of adoptive parents to maximise life-chance opportunities and promote mental wellbeing for adoptive children.

Our study builds on a small number of studies that have investigated the impact of the ASF on the mental health of adopted children. One study on around 800 adoptive families shortly after the ASF policy implementation finds that adopted children had modest improvements in mental health after accessing the ASF about seven months later (King, Gieve et al., 2017). These positive changes sustained to another 18-month follow-up (Gieve, Hahne et al., 2019). A recent study also reports small improvements in mental health among adopted children accessing the ASF (Burch, Backinsell et al., 2022a). However, although some adopted children continued to see improvements in their mental health by the end of the ASF funding support, others experienced a decline in mental health over time (Burch, Backinsell et al., 2022b). Overall, it is not possible to draw firm conclusions from existing



studies on the impact of the ASF, because they did not incorporate a control group and therefore were unable to distinguish natural progression of mental health programmes from the impact of the intervention. We aim to improve on these studies by using a quasi-experimental design with a control group to assess the impact of the ASF on the mental health of adopted children.



Methods

Data and sample

We pool data from three surveys. Data on adopted children is drawn from the Longitudinal Study of Adoptive Parents (LSAP) (TIHR, 2017), a longitudinal survey of adoptive families and children who participated in a baseline survey in 2015 (before obtaining access to the ASF) and a follow-up survey in 2016–2017. Data for non-adopted children is from the Millennium Cohort Study (MCS) (UCL, 2018), a nationally representative and longitudinal study of children born in the UK around the turn of the millennium. We use MCS waves 4 to 7 (2008–2018) to have more comparable time points with the LSAP data. MCS wave 5 (2012) was excluded due to lack of information on parent-reported socioemotional outcomes for the children. We also complement the MCS data with the UK Household Longitudinal Study (UKHLS), by pooling data on non-adopted children from the annual child surveys (2011–2019) and biannual adolescent surveys (2009–2019).

We select our sample with the following criteria. First, we restrain the sample to children who were between age 3 and 17 years, and we retain adopted children from the LSAP ($n=788$) and non-adopted children from the MCS ($n=14,397$) and the UKHLS ($n=14,528$). Second, we keep those with complete information on Strengths and Difficulties Questionnaire (SDQ) scores and health covariates ($n=764$, LSAP; $n=14,156$, MCS; $n=13,032$, UKHLS). Third, we include those who participated in at least two surveys to assess longitudinal changes in children's outcomes ($n=458$, LSAP; $n=9938$, MCS; $n=6752$, UKHLS). We obtain a final sample of 17,148 children, with 458 adopted children from the LSAP and 16,690 non-adopted children from the MCS as well as the UKHLS.

Measurement

We measure children's mental health using the SDQ. The SDQ is a behavioural screening questionnaire designed to measure psychological adjustment in children aged 3 to 17 (Goodman, 1997; Goodman and Goodman, 2012). The questionnaire comprises 25 items, covering internalising problems (emotional symptoms and peer problems), externalising problems (hyperactivity and conduct problems) and pro-social behaviour. Each item includes three response categories: "not true" (= 1), "somewhat true" (= 2) and "certainly true" (= 3), and responses are scored so that higher scores indicate more problematic behaviours. A total difficulties score is calculated from the addition of the scores for the first four domains, excluding pro-social behaviour, which is considered conceptually different (Goodman, 1997). The total difficulty score varies between 0 and 40. We use the standardised SDQ score and sub-scores in our analysis, along with a dichotomous SDQ score using a cut-off score of 17 to indicate abnormal or problematic behaviour (Goodman, 1997). We control for a set of time-varying characteristics, including child's age (continuous), child's number of siblings (0, 1 or more), carer's age (continuous), carer's educational level (GCSE or less, A-level, university education or equivalent, overseas education or other), whether having a co-parent (0 for no, 1 for yes) and survey wave (categorical).



Empirical strategy

We implement a difference-in-differences (DiD) approach to investigate the impact of the ASF policy on adopted children's mental health. We define the treatment group as children from adoptive families, because they were "potentially" affected by the ASF policy. As a control group, we use children from non-adoptive families, which are ineligible for the ASF. Using "eligibility" for the ASF to define treatment status helps avoid potential endogeneity related to ASF "receipt" status. Our definition of treatment is strongly associated with the probability of receiving the ASF funds: among adoptive families with valid information on ASF receipt, 91% reported receiving the ASF funds. Children from treatment and control families differ along several characteristics, which precludes a direct comparison of their post-reform outcomes. A DiD approach aims to control for these underlying differences by comparing trends rather than levels in the observed outcomes. The DiD estimate is thus the difference in pre- vs post-policy changes in outcomes between the treatment and control groups. To define exposure to the ASF policy in the treatment group, we generate an interaction term between treatment status and time. We consider 2008–2015 as the pre-policy period and 2016–2019 as the post-policy period. We estimate individual fixed effects linear regression models using the following equation:

$$Y_{it} = \beta_0 + \beta_1 treatment_{it} + \beta_2 postreform_{it} + \beta_3 postreform_{it} * treatment_{it} + \beta_4 X_{it} + \varepsilon_{it}$$

where Y refers to the mental health for child i at time t , including a continuous SDQ score, a dichotomous SDQ score (score 17 as cut-off), continuous SDQ sub-scores (emotional symptoms, peer problems, hyperactivity and conduct problems). *Treatment* takes value 1 for adopted children with access to the ASF and value 0 for adopted children without access to the ASF. *postreform* is a dichotomous variable, with 1 denoting the post-policy period (2016–2019) and 0 the pre-policy period (2008–2015). The coefficient β_3 is the double difference computed at the mean value of the outcomes. X is a vector of time-variant individual (including the mother and child) and family characteristics, including child's age and number of siblings, carer's age and education, co-parenting status and survey wave.

The DiD approach relies on the parallel trends assumption – that is, the control group offers a good counterfactual of what the changes in outcomes would have been in the treatment group, had they not been exposed to the policy (Angrist & Pischke, 2009). To address the potential issues of selection and unobserved heterogeneity, we also carry out DiD analyses with propensity score matching (Rosenbaum & Rubin, 1983) as sensitivity analysis. This approach matches pre-treatment characteristics for the treatment and control groups to increase their comparability. We conduct two sets of matching analyses as sensitivity analyses. The first set aims to enhance the comparability of adopted children and non-adopted children, by matching some of their observable characteristics. The second set provides a more nuanced comparison between adopted children and a subgroup of adopted children not growing up in two-biological-parent families – that is, adopted children from lone-parent families. We focus on lone-mother families in particular, given this is the dominant type of lone-parent families in the surveys. The matching variables include child's age, number of siblings, carer's age, carer's education, co-parenting status and time. We use kernel matching estimator (Caliendo & Kopeinig, 2008) and retain observations falling



within the common support areas – that is, treated individuals for whom there is a comparison individual in the control group with a similar propensity score. Bootstrapping (200 repetitions) is employed to approximate standard errors, and the `diff` and `psmatch2` Stata commands are used for estimation (Leuven & Sianesi, 2003; Villa, 2019).

We acknowledge a slight shift of focus in the empirical strategy following the initial research protocol. In the protocol, we aimed to enhance the comparability between the treatment and control through a synthetic cohort approach and by comparing adopted children with access to the ASF with adopted children without access to the ASF. However, given data limitations (e.g. one pre-treatment wave for the LSAP surveys; limited information on ASF selection criteria), it seems more appropriate to assess the overall impact of the ASF by employing exogenous variations in ASF eligibility among adopted children and non-adopted children.

Statistical analyses were carried out using Stata MP (version 17.0). We report robust standard errors clustered at the individual level.



Findings

Descriptive results

Appendix Table A1 reports sample descriptive statistics. In both time periods, compared with non-adopted children (control group), adopted children (treatment group) reported higher SDQ total scores, higher problematic behaviour (SDQ total scores being 17 or above) and higher internalising problems (emotional symptoms and peer problems) and externalising problems (hyperactivity and conduct problems). In terms of trends, from before and after the policy, although non-adopted children experienced an increase in SDQ total scores, proportion of problematic behaviour and SDQ sub-scores before and after the policy, adopted children saw a decrease in these outcomes across time. The two groups also differ in characteristics such as their age, number of siblings, carer's age, carer's education and co-parenting status. These differences preclude any direct comparison of post-treatment outcomes and highlight the need for a difference-in-differences approach in the analysis.

In Figure 1, we present data comparing changes in SDQ total scores before and after the ASF separately for non-adopted children (control group) and adopted children (treatment group). This shows that the treatment group experienced a decrease in SDQ total scores after the policy, whereas the control group saw a small increase in SDQ total scores.

Figure 1. Children's SDQ total scores before and after the ASF policy, by treatment status, 2008–2019

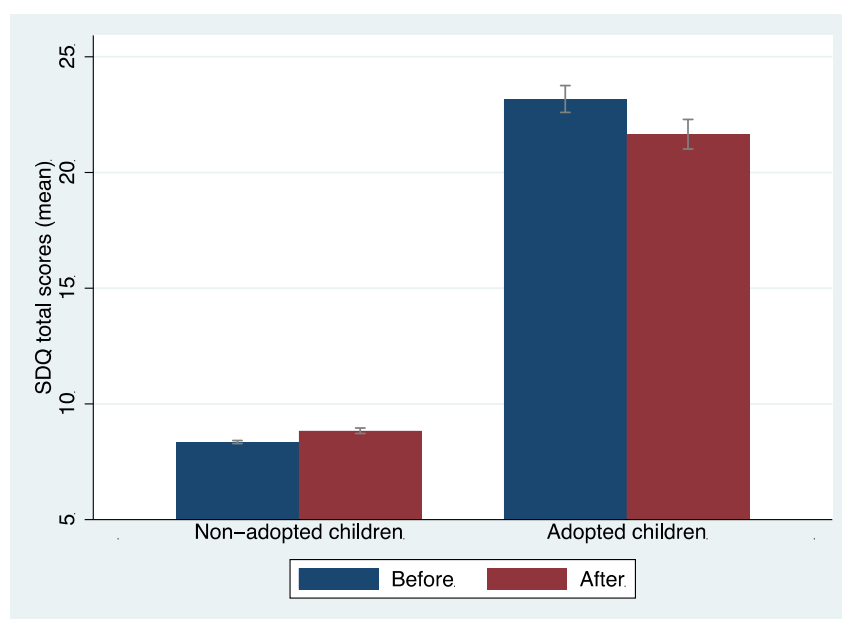
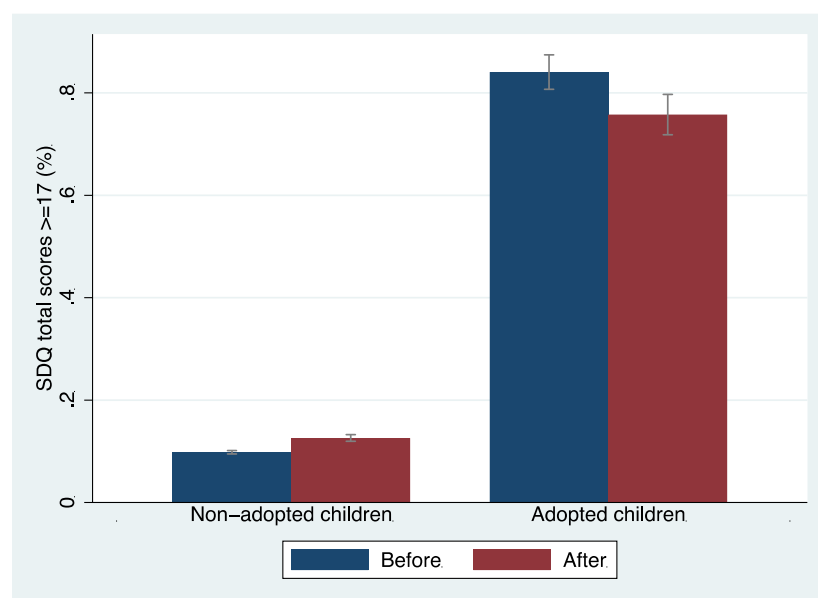


Figure 2 shows the proportions of problematic behaviour before and after the policy for both treatment and control groups. Similar to Figure 1, the results in Figure 2 also indicate a small increase in the proportions of problematic behaviour among non-adopted children from the pre-policy to the post-policy period. Adopted children, however, saw a decrease in the



proportion of problematic behaviour after the policy. Overall, these results provide descriptive evidence suggesting small improvements in mental health among adopted children benefiting from the ASF policy.

Figure 2. Proportions of problematic behaviour before and after the ASF policy, by treatment status, 2008–2019



Results from simple DiD analysis

Table 1 shows results from simple DiD estimates. We report the impact of the ASF policy on adopted children's SDQ total scores (standardised), a dichotomous measure capturing high risks of poor mental health (SDQ total scores ≥ 17) and SDQ sub-scores including internalising behaviour (emotional symptoms and peer pressure) and externalising behaviour (hyperactivity and conduct problems).

Specifically, column 1 in Table 1 reports no significant impact of the ASF on SDQ total scores: although we observe a decrease of 0.030 (95% confidence interval (CI): -0.125 to 0.063) of a standard deviation in SDQ total scores among adopted children after the ASF policy, the coefficient is not statistically significant. Column 2 indicates that the ASF policy significantly decreased the probability of having problematic behaviour among adopted children by ten percentage points (95% CI: -0.140 to -0.052). Columns 3 to 6 show that the impacts of the ASF policy on SDQ sub-component scores are less clear: although the policy significantly reduced emotional symptoms by 0.125 (95% CI: -0.229 to -0.021) of a standard deviation, it did not have a significant impact on peer problems, hyperactivity or conduct problems (a fuller table with covariates' coefficients is in Appendix Table A2).

We also investigate heterogeneity by incorporating interactions between the DiD parameters and child's age, child's gender, carers' education and co-parenting status. We find no significant differences of the policy impact along these dimensions (Appendix Table A3).



Table 1. Impact of ASF on children's SDQ scores, 2008–2019

	(1) SDQ total scores	(2) SDQ total scores ≥ 17	(3) Emotional symptoms	(4) Peer problems	(5) Hyper- activity	(6) Conduct Problems
Diff-in-diff estimate: pre–post ASF reform	-0.031 (-0.125 to 0.063)	-0.096*** (-0.140 to -0.052)	-0.125* (-0.229 to -0.021)	-0.002 (-0.096 to 0.092)	-0.003 (-0.100 to 0.093)	0.067 (-0.029 to 0.163)
Number of persons	17,148	17,148	17,148	17,148	17,148	17,148
Number of observations	41,410	41,410	41,410	41,410	41,410	41,410

Notes: stars represent statistical significance: * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. Coefficients are reported, and 95% confidence intervals are included in brackets. Covariates are controlled, including children's age, children's number of siblings, carers' age, carers' education, whether having a co-parent and survey wave.

Sensitivity analysis: DiD analysis on matched samples

Following the simple DiD analysis, we carry out another two sets of DiD analyses, by matching adopted children with non-adopted children overall and with non-adopted children from lone-mother families, respectively. Matching appears to be effective in removing differences in observable characteristics between treatment and control groups. For instance, after matching adopted children with non-adopted children overall, the median bias for the matched sample is around 10.7, which is smaller than 20 – the informal criterion for evaluating the size of bias (Rosenbaum and Rubin, 1983); matching also reduces biases by 81.4% (Appendix Table A4, Panel A). When matching adopted children with non-adopted children from lone-mother families, the reduction of bias is as large as 92.1% (Appendix Table A4, Panel B). Matching in both cases also removes any exploratory power of the covariates in the model, as indicated by a pseudo-R-squared that is close to zero (Appendix Table A4, Panels A and B).

Table 2 reports the impact of the ASF on children's SDQ scores for a matched sample of adopted children and non-adopted children overall. The results in columns (1) and (2) are similar to those reported in Table 1: although the ASF had no significant impact on SDQ total scores, it led to approximately a ten-percentage-point reduction (95% CI: -0.154 to -0.041) in the probability of having problematic behaviour (SDQ total scores ≥ 17). In terms of SDQ sub-scores, Table 2 columns (3) to (6) find no significant impact of the policy on either internalising behaviour (emotional symptoms and peer problems) or externalising behaviour (hyperactivity and conduct problems). This slightly differs from the simple DiD analysis in Table 1, where the ASF appears to have a significant effect in reducing emotional symptoms.



Table 2. Impact of ASF on children's SDQ scores, 2008–2019, matching adopted children with non-adopted children overall

	(1) SDQ total scores	(2) SDQ total scores ≥17	(3) Emotional symptoms	(4) Peer problems	(5) Hyper- activity	(6) Conduct problems
Diff-in-diff estimate:	-0.093	-0.098***	-0.141	-0.100	-0.058	-0.020
pre–post ASF reform	(-0.237 to	(-0.154 to	(-0.287 to	(-0.250 to	(-0.216 to	(-0.185 to
X treatment status	0.050)	-0.041)	0.006)	0.050)	0.101)	0.144)
Number of persons	16,243	16,243	16,243	16,243	16,243	16,243
Number of observations	38,262	38,262	38,262	38,262	38,262	38,262

Notes: stars represent statistical significance: * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. Coefficients are reported and 95% confidence intervals are included in brackets. Matching variables include children's age, carers' age, whether having sibling(s), carers' education and time. Balancing property is achieved.

Table 3 shows DiD estimates based on a matched sample of adopted children with non-adopted children from lone-mother families. We find that the policy impact on SDQ total scores remained statistically insignificant, whereas it reduced the probability of having higher SDQ scores (SDQ total scores ≥ 17) by 14 percentage points. These results are in line with those reported in Tables 2 and 3, although the magnitude of the policy effect is larger. The analysis also suggests a decrease in peer problems by 0.340 of a standard deviation (95% CI: -0.662 to 0.018), although it had no significant impact on emotional symptoms, hyperactivity or conduct problems. These findings are consistent with those in the simple DiD analysis, although the impact of the ASF varies on the specific components: in simple DiD analysis the ASF appears to reduce emotional symptoms significantly, whereas this matched DiD analysis reports significant reductions in peer problems.

Table 3. Impact of ASF on children's SDQ scores, 2008–2019, matching adopted children with non-adopted children from lone-mother families

	(1) SDQ total scores	(2) SDQ total scores ≥17	(3) Emotional symptoms	(4) Peer problems	(5) Hyper- activity	(6) Conduct problems
Diff-in-diff estimate:	-0.365	-0.142**	-0.225	-0.340*	-0.359	-0.156
pre–post ASF reform	(-0.753	(-0.241 to	(-0.631 to	(-0.662 to	(-0.742 to	(-0.733 to
X treatment status	to 0.006)	-0.043)	0.181)	-0.018)	0.024)	0.420)
Number of persons	3997	3997	3997	3997	3997	3997
Number of observations	7307	7307	7307	7307	7307	7307

Notes: stars represent statistical significance: * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. Coefficients are reported and 95% confidence intervals are included in brackets. Matching variables include children's age, carers' age, carers' education, whether having a co-parent and time. Balancing property is achieved.



Limitations

Our study has three main limitations. First, we have limited information on pre-adoption circumstances of the adopted children and trends in SDQ scores before implementation of the policy. To increase the comparability between the treatment and control groups, we carry out sensitivity analyses by matching adopted children and non-adopted children. Although results from the matched sample are in line with the main analyses, it remains possible that non-adopted children might not be a good counterfactual for adopted children's trends in mental health, given their different background characteristics. To further address this concern, we also match adopted children with non-adopted children from lone-mother families, because the latter group of children were also not consistently exposed to a two-biological-parent environment.

Second, we had little information on the family circumstances of adoptive families. This limits our capacity to unpack the potential mechanisms through which the ASF policy may have influenced the mental health of adopted children.

Third, we use eligibility for the ASF policy to define treatment status, instead of the actual take-up of the ASF, because the latter may be endogenous to characteristics correlated with child outcomes. Therefore, our results reflect the impact of the ASF policy, rather than the impact of receiving the ASF funding on child outcomes.



Discussion

We examine the impact of a policy that offers adoptive families funding support to access mental health services on the mental health of the adoptive child. Our results indicate that the ASF policy led to a significant reduction in the probability of having high SDQ scores (SDQ total scores ≥ 17) by approximately 10 percentage points. The policy did not seem to generate a significant impact on adopted children's mean SDQ total scores.

The policy impacts on specific internalising behaviour were less clear: although we observe significant reductions in emotional symptoms in the simple DiD analysis, this effect becomes statistically insignificant in the sensitivity analysis using propensity score matching. This inconsistency in simple DiD and matched DiD results is also observed for peer problem outcome. The ASF has no significant impact on either hyperactivity or conduct problems across all models. We conclude that there is no consistent evidence indicating that the ASF policy significantly improved specific internalising or externalising behaviour among adopted children. Using a quasi-experimental design that incorporates a control group, our study adds to an existing literature suggesting that the ASF is associated with improvements in the mental health of adopted children (King, Gieve et al., 2017; Burch, Backinsell et al., 2022).



Conclusions

Adoption supportive policies aim to improve the wellbeing of adoptive families, but their impact on the mental health of adopted children has not been well established. We evaluate a policy in the UK that offers adoptive families funding support to access mental health services. Although the policy did not generate a significant impact on the mental health of adopted children on average, we find compelling improvements in the mental health among adopted children who were at high risks of poor mental health. We find no significant effect of the policy on externalising behaviour, including hyperactivity and conduct problems. There is no consistent evidence indicating that the ASF policy significantly improved specific internalising behaviour among adopted children.

Recommendations & implications

Our results suggest that the ASF policy led to some improvements in the mental health of adopted children, particularly among adopted children at high risks of poor mental health. Meanwhile, we find no consistent evidence showing that the policy significantly improved specific internalising and externalising behaviour among adopted children. One potential reason that might account for the improvement in adopted children's mental health might be their increased access to mental health services provided by the ASF (Burch, Backinsell et al., 2022a; Burch, Backinsell et al., 2022b). Further research is needed to identify the effectiveness of specific types of therapeutic interventions on adopted children's mental health.

In-depth interviews with adoptive families, service providers and local authority staff also highlight the importance of understanding various therapeutic interventions targeted to adoptive families (King, Gieve et al., 2017; Gieve, Hahne et al., 2019). Our findings on the limited mental health improvements among adopted children on average also highlight the need of complementary approaches that do not only offer therapeutic services to adopted families but complement these with interventions that address the broader social and economic wellbeing of adoptive families.



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Appendices

Appendix Table A1. Descriptive statistics, by treatment status and time

	Before		After	
	Non-adopted children	Adopted children	Non-adopted children	Adopted children
Child's SDQ total scores	8.35	23.2***	8.84	21.7***
Child's SDQ scores (score 17 or above=1) (%)	9.82	84.1***	12.6	75.8***
Child's SDQ sub-scores: emotional symptoms	1.98	5.50***	2.42	4.99***
Child's SDQ sub-scores: peer problems	1.49	4.53***	1.71	4.36***
Child's SDQ sub-scores: hyperactivity	3.33	7.59***	3.20	7.19***
Child's SDQ sub-scores: conduct problems	1.55	5.56***	1.52	5.12***
Child's age	10.4	9.75***	13.3	10.4***
Child having at least one sibling (%)	87.6	68.3***	84.6	68.3***
Care's age	39.9	47.5***	43.7	48.1***
Carer's education		***		***
No more than GCSE or equivalent (%)	30.6	15.7	29.6	15.7
A-level or equivalent (%)	13.1	14.6	6.30	14.6
University education or equivalent (%)	43.3	65.3	54.2	65.3
Overseas or other (%)	13.1	4.37	10.1	4.37
Having a co-parent (%)	76.1	85.4***	75.5	87.3***
Number of persons	16,147	458	8012	458
Number of observations	30,531	458	9963	458

Notes: stars represent statistical significance: *p < 0.05. **p < 0.01. ***p < 0.001.

Appendix Table A2. Impact of ASF on children's SDQ scores, 2008–2019 (coefficients for covariates are reported)

	(1) SDQ total scores	(2) SDQ total scores >=17	(3) Emotional symptoms	(4) Peer problems	(5) Hyper- activity	(6) Conduct problems
Diff-in-diff estimate:	-0.031	-0.096***	-0.125*	-0.002	-0.003	0.067
pre-post ASF reform	(-0.125 to	(-0.140 to	(-0.229 to	(-0.096 to	(-0.100	(-0.029 to
X treatment status	0.063)	-0.052)	-0.021)	0.092)	to 0.093)	0.163)
Treatment	-	-	-	-	-	-
Time	-0.863*	-0.103	-0.481	-0.592	-0.740*	-0.896*
	(-1.546 to	(-0.361 to	(-1.218 to	(-1.318 to	(-1.468	(-1.600 to
	-0.180)	0.154)	0.256)	0.134)	to-0.012)	-0.192)



Child age	0.084** (0.026 to 0.142)	0.011 (-0.011 to 0.033)	0.061 (-0.001 to 0.123)	0.051 (-0.008 to 0.110)	0.062 (-0.001 to 0.125)	0.071* (0.012 to 0.130)
Child having sibling(s)	-0.031 (-0.076 to 0.014)	-0.002 (-0.018 to 0.014)	-0.028 (-0.080 to 0.024)	-0.051 (-0.105 to 0.002)	-0.053* (-0.101 to -0.004)	0.074** (0.025 to 0.123)
Carers' age	0.024 (-0.002 to 0.050)	0.008 (-0.001 to 0.017)	0.017 (-0.015 to 0.048)	0.022 (-0.013 to 0.057)	0.015 (-0.010 to 0.040)	0.016 (-0.013 to 0.045)
Carers' education (reference= university education)						
A-level or equivalent	-0.006 (-0.071 to 0.059)	-0.020 (-0.043 to 0.003)	-0.007 (-0.082 to 0.068)	-0.029 (-0.105 to 0.046)	-0.018 (-0.083 to 0.048)	0.036 (-0.033 to 0.105)
No more than GCSE or equivalent	-0.041 (-0.103 to 0.021)	-0.025* (-0.047 to -0.002)	-0.049 (-0.121 to 0.022)	-0.036 (-0.107 to 0.036)	-0.041 (-0.102 to 0.020)	-0.007 (-0.075 to 0.061)
Overseas or other	-0.007 (-0.101 to 0.086)	-0.031 (-0.066 to 0.005)	-0.036 (-0.139 to 0.068)	-0.014 (-0.120 to 0.092)	-0.040 (-0.134 to 0.054)	0.049 (-0.049 to 0.148)
Having a co-parent	-0.067*** (-0.107 to -0.028)	-0.019* (-0.035 to -0.003)	-0.089*** (-0.136 to -0.042)	-0.060* (-0.106 to -0.014)	-0.030 (-0.069 to 0.010)	-0.013 (-0.057 to 0.030)
Survey year controlled	yes	yes	yes	yes	yes	yes
Number of persons	17,148	17,148	17,148	17,148	17,148	17,148
Number of observations	41,410	41,410	41,410	41,410	41,410	41,410

Notes: stars represent statistical significance: *p < 0.05. **p < 0.01. ***p < 0.001. Coefficients are reported and 95% confidence intervals are included in brackets.

Appendix Table A3. Impact of ASF on children's SDQ, by child's age and gender, carers' education and co-parenting status, 2008–2019

	(1)	(2)
	SDQ total scores (standardised)	SDQ total scores ≥ 17
Diff-in-diff estimate: pre–post ASF reform X treatment status X child's age	-0.019 (-0.040 to 0.003)	0.002 (-0.010 to 0.015)
Diff-in-diff estimate: pre–post ASF reform X treatment status X child's age	0.162 (-0.080 to 0.405)	-0.120 (-0.257 to 0.016)
Diff-in-diff estimate: pre–post ASF reform X treatment status X child's age	0.084** (0.026 to 0.142)	0.011 (-0.011 to 0.033)
Diff-in-diff estimate: pre–post ASF reform X treatment status X child's gender	0.052 (-0.098 to 0.201)	0.018 (-0.058 to 0.095)



Diff-in-diff estimate: pre–post ASF reform X treatment status	-0.031 (-0.160 to 0.098)	-0.107** (-0.171 to -0.043)
Child's gender (boys=1)	-	-
Diff-in-diff estimate: pre–post ASF reform X treatment status X carer's education	-0.076 (-0.257 to 0.105)	-0.076 (-0.171 to 0.019)
Diff-in-diff estimate: pre–post ASF reform X treatment status	0.030 (-0.140 to 0.200)	-0.036 (-0.123 to 0.052)
Carer's education (A-level or above =1)	0.007 (-0.086 to 0.100)	0.031 (-0.005 to 0.066)
Diff-in-diff estimate: pre–post ASF reform X treatment status X co-parenting status	-0.068 (-0.262 to 0.125)	0.010 (-0.115 to 0.136)
Diff-in-diff estimate: pre–post ASF reform X treatment status	0.029 (-0.155 to 0.213)	-0.105 (-0.227 to 0.016)
Co-parenting status (having a co-parent =1)	-0.067** (-0.107 to -0.027)	-0.019* (-0.035 to -0.003)
Number of persons	17,148	17,148
Number of observations	41,410	41,410

Notes: stars represent statistical significance: *p < 0.05. **p < 0.01. ***p < 0.001. Coefficients are reported and 95% confidence intervals are included in brackets. Covariates are controlled, including children's age, children's number of siblings, carers' age, carers' education, whether having a co-parent and survey wave.

Appendix Table A4. Comparison of the unmatched and matched samples

	Pseudo R2		Median bias		Reduction in bias
	Unmatched	Matched	Unmatched	Matched	
Panel A (adopted vs non-adopted children)	0.255	0.021	57.4	10.7	81.4%
Panel B (adopted vs non-adopted children from lone-mother families)	0.610	0.003	68.1	5.4	92.1%

Matching variables include children's age, carers' age, having sibling(s), carers' education, whether having a co-parent and time. Balancing property is achieved.



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