Preventing Child Maltreatment: Beneficial Side Effects of Public Childcare*

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Abstract: We investigate the impact of public childcare provision on the incidence of severe child maltreatment. For identification, we exploit a government reform that expanded early childcare in Germany, generating large temporal and spatial variation in childcare coverage at the county level. Using high-quality administrative data covering all reported cases of child maltreatment in Germany by county and year, our results show that an increase in childcare slots by one percentage point in a county reduced child maltreatment cases leading to out-of-home placement by about 1%. Our findings suggest that the provision of universal public childcare may be more cost-effective that previously thought.

Keywords: Child maltreatment, child abuse and neglect, early childcare

JEL classification: J13, J12, I38

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1. Introduction

We study the effect of increasing childcare provision on the incidence of child maltreatment. We exploit a reform in Germany that led to substantial increases in childcare coverage in the 2000s, and follow a difference-in-differences approach that leverages the differential rollout of the policy across counties. Our results suggest that increases in childcare coverage lowered child maltreatment cases leading to child removal from the home. We explore potential mechanisms and provide suggestive evidence that childcare replaced lower-quality informal care and improved mothers' earnings and bargaining power.

Child maltreatment includes all forms of child abuse, including physical abuse, emotional mistreatment, sexual abuse, neglect, negligent treatment, and exploitation of children, which result in actual or potential harm to the child's health, survival, development, or dignity. Child maltreatment is a severe problem in many developed countries. The U.S. Department of Health and Human Services estimates approximately 683,000 victims, and the German statistical office reports about 130,000 suspected cases in 2015 alone (U.S. Department of Health and Human Services 2017; Statistisches Bundesamt, 2016). As child development is a cumulative process (Cunha et al. 2006; Cunha and Heckman 2007), child maltreatment (particularly at the beginning of life) leads to lifelong suffering for the affected children.[1]

Given the long-term nature of these problems, their associated costs are high. Beyond direct costs, such as those for childhood health care and child welfare, indirect costs of maltreatment may develop from lower employment rates, lower earnings and tax revenues, and increased

[1] Various studies show that child maltreatment has lifelong effects on physical and psychological development and health, as well as on social behavior and life satisfaction (Ammerman et al. 1986, Hildyard and Wolfe 2002, Springer et al. 2007). The effects of adverse environments at the start of life are cumulative because of self-productivities, dynamic complementarities, and sensitive periods in skill development (see Heckman and Masso 2014 or Thiel and Thomsen 2013 for a literature review).

crime rates.[2] For the U.S., Fang et al. (2012) and Wang and Holton (2007) estimate average lifetime costs of $210,012 (in 2010 dollars) per victim of nonfatal maltreatment, and aggregated costs of more than 100 billion dollars per year. For the UK, Conti et al. (2021) suggest costs of approximately 90,000£ per case of child maltreatment. These numbers illustrate that it is in society's best interest to reduce (and ideally eliminate) the incidence child maltreatment.

Research on preventing the maltreatment of young children indicates that certain targeted and intensive early childhood interventions can be successful. These interventions include intensive at-home consulting for disadvantaged families, with the goal of reducing abusive and neglectful parenting behaviors (Doyle & Aizer 2018, Levey et al. 2017, Howard and Brooks-Gunn 2009). However, obtaining access to families at risk and maintaining their participation is challenging for these in-home programs because families may not only feel stigmatized but also have to invest time and effort in participating (Hernandez et al. 2019 for the U.S. and Sandner 2019 for Germany).

In contrast to these targeted and intensive programs, universal public childcare supports a wide range of families and is less stigmatizing. Although public childcare does not directly focus on reducing child maltreatment, it may affect its incidence via changes in care quality, parental employment, the time that children spend with inadequate caregivers, and the behavior of potentially inadequate caregivers. Moreover, universal childcare reduces the burden of parents, whereas intensive prevention programs may be inconvenient and even intrusive.

Despite the strong relationship between childcare and several domains of families' lives, domains that may also affect adverse parenting, we are not aware of causal evidence on the extent to which subsidized childcare can reduce child maltreatment.

[2] E.g. Currie and Tekin (2012) have analyzed the increased incidence of crime due to child maltreatment. For other economic outcomes, see Currie and Spatz-Widom (2010).

This is the first study to investigate the effects of expanding public childcare for young children on child maltreatment in the home. Our measure for child maltreatment comes from unique high-quality administrative data covering all cases of maltreatment in Germany leading to out-of-home placement. For identification, we use a childcare expansion which resulted from a reform in West Germany that included a federal government commitment to provide childcare placements for all children below the age of three.[3] While in 2002 childcare covered under 3% of children, by 2015, the reform had initiated a 25 percentage-point increase in childcare availability in West Germany.

We exploit the variation in the speed and level of the expansion across counties and over time in 324 West German counties.[4] We follow a difference-in-differences approach (DiD), regressing child maltreatment cases on childcare coverage rates in each county, controlling for year and county fixed effects as well as a set of controls, including state-level trends. We also provide evidence supporting the exogeneity of the timing of the expansion.

Our results show that a one-percentage-point increase in the availability of childcare reduces maltreatment cases for children below age six by approximately 1%. This figure suggests that the expansion avoided about 12,000 maltreatment cases in our observation period of 2002-2015, compared with a scenario of no childcare expansion.

The increase in childcare facilities may have led to higher detection of child maltreatment cases (Fitzpatrick et al. 2020, Baron et al. 2020). Higher detection would have led to more (rather than fewer) cases in the official reporting statistics. This reporting effect would bias our coefficients towards positive values. We also collect data on the number of all reported cases of suspected child maltreatment (leading to a household becoming under surveillance by child

[3] The reform was introduced in 2005 in the so-called "child daycare expansion law", and further specified in 2008 in a second law called "law on support for children". The main objectives were to achieve equal opportunity, reduce social disparities, and provide better educational prospects for all children.

[4] Counties are also called "districts", or *Kreis* in German.

protection services). We find that the childcare expansion did not lead to changes in the number of cases under observation (which may be a combination of higher reporting and lower incidence).

We estimate additional specifications with leads and lags that allow us to show that counties with different childcare expansion trajectories were on parallel trends in child maltreatment rates before the policy change. Our results are robust to various alternative specifications and different subsamples. In addition, we conduct placebo tests by estimating models on older children, not affected by the childcare expansion. These placebo tests allow us to rule out the possibility that changes in local child protection services (CPS) in response to the childcare expansion may have influenced the incidence of maltreatment.[5]

Our results acquired particular relevance in 2020, when many countries closed childcare centers and schools in order to control the spread of covid-19. Our findings suggest that the closing of childcare centers may exacerbate parental neglect and abuse in vulnerable families, as well as possibly making those cases harder to detect.[6] The potential costs associated with the increase in child maltreatment should be taken into account in cost-benefit calculations of lockdown measures.

The rich administrative data on child maltreatment give us the opportunity to investigate the mechanisms behind the maltreatment reduction. First, we show that the childcare expansion increased female employment (as found before by Bauernschuster and Schlotter 2015), which likely increased maternal earnings and women's bargaining power in the household. Second, we find that the strongest reduction in maltreatment cases took place in two-parent households,

[5] In Germany, the CPS is called the youth welfare office (*Jugendamt*). The youth welfare office has similar responsibilities and duties as the CPS does in the U.S. or the U.K., such as supporting and monitoring families at risk, connecting to support services, and, as a final measure, removing maltreated children from the family.

[6] Baron et al. (2020) show that school closures in Florida in early 2020 led to lower reporting of child maltreatment cases.

while the childcare expansion had no effect in single-mother households. Third, our estimates show the strongest reductions for families who were already in contact with or under the observation of CPS. Finally, we find that the reduction comes from child protection cases that are initiated because of neglect and parental overburden, as well as abuse. These findings suggest that the substitution of inadequate childcare, likely in families at risk, constitutes the main channel for the reduction in child maltreatment cases.

Our setting is particularly suitable for this analysis for the following three reasons. First, the childcare expansion varied across German counties in both timing and magnitude, and we argue that this variation was exogenous to unobserved determinants of (changes in) the incidence of child maltreatment.[7] Thus, the daycare expansion provides a natural experiment enabling us to identify causal effects.

Second, childcare fees are means-tested, so that take-up is high among poor parents. Free childcare is provided for low-income and welfare-receiving families, who are at the highest risk of child maltreatment (McLoyd 1990, Paxson and Waldfogel 2002). In this respect, the German childcare provision is similar to the U.S. Head Start program, which is also free for low-income or welfare-receiving families (U.S. Department of Health and Human Services 2014).

Third, in Germany, the federal government is responsible for child protection legislation, so that states or counties cannot deviate from it by creating child protection legislation that correlates (intentionally or not) with childcare availability.

Our results answer three major and previously unanswered questions. First, they suggest that not only targeted interventions (e.g., home visiting programs) but also general public policies that substantially change the mode of care can prevent severe cases of maltreatment. In contrast

[7] Bauernschuster et al. (2016) study the impact of the German childcare expansion on fertility, while Felfe and Lalive (2018) analyze effects on child development. They both provide evidence that the variation in the expansion was quasi-exogenous.

to intensive programs, universal childcare does not stigmatize or overburden families at risk and therefore leads to a much higher take-up rate.

Our results strengthen support for the policies of those countries that offer publicly funded universal childcare programs (e.g., France, Germany, the Nordic countries, and the UK). Moreover, our findings can influence the discussion in the U.S., where no nationwide universal preschool or early childcare programs are available but where pre-K once again features in the political discourse. In April 2021, Biden unveiled his "American Families Plan", a large spending plan centered on childcare (and other elements of the "care economy") which called for devoting $200 billion for universal prekindergarten instruction. The plan aimed to "provide universal, high quality preschool to all three- and four-year-olds."

Second, because maltreatment has strong detrimental effects on children's cognitive and non-cognitive development, our findings add to the more general discussion about the channels through which universal public childcare provision affects child development. The findings in the literature on the overall effects of universal public childcare on child development, particularly for children younger than three, are mixed. Baker et al. (2008) and Fort et al. (2019), among others, report negative average effects. In contrast, several recent studies show that public childcare is beneficial for children from families with lower socioeconomic status (Drange and Havnes 2019, Bitler et al. 2015, Peter et al. 2016, Kottelenberg and Lehrer 2017, Felfe and Lalive 2018).[8]

Since child maltreatment occurs more frequently in more disadvantaged families, our study presents a channel through which childcare may positively affect child development therein. Our results indicate that childcare utilization may have a positive impact on development, not only through the increased provision of stimulating nurseries or peers, as many scholars suggest

[8] Effects of daycare for children age 3 to 5 years are generally more positive; for older children as well, daycare is most beneficial for more disadvantaged children (e.g. Havnes and Mogstad, 2015, Cornelissen et al. 2018).

(Cornelissen et al. 2018, Felfe and Lalive 2018), but also through a reduction in inadequate parenting or insufficient informal care arrangements.

Third, our study contributes more broadly to the literature investigating how economic circumstances, public policies, and household composition affect child maltreatment. Starting with Paxson and Waldfogel's (2002) influential work, many studies reveal associations between economic hardship, absent fathers, working mothers, and child maltreatment (Berger et al. 2017, Berger and Waldfogel 2011, Raissian and Bullinger 2017, Slack et al. 2003). Two recent studies have used administrative data and small-area time variation for identification. Brown and DeCao (2018) find that high unemployment rates increase child neglect in the U.S. Lindo et al. (2018), using data from California, show that male layoffs increase child maltreatment, while the opposite is true for female layoffs. Our results contribute to these findings by showing that the provision of public childcare creates an opportunity to attenuate the consequences of economic hardship, unemployment, and inadequate care.

The remainder of the paper is organized as follows. Section 2 provides some theoretical considerations about the relationship between childcare expansion and child maltreatment. Section 3 describes the child welfare system in Germany and our child maltreatment measure. Section 4 describes the public childcare expansion reform in Germany. Section 5 presents the empirical analysis and the identification strategy. The main results are discussed in section 6, followed by an analysis of potential mechanisms in section 7. Section 8 concludes.

2. Theoretical considerations on potential mechanisms

The provision of public childcare aims primarily at improving equal opportunities for men and women in the labor market and at offering early childhood education. Although such care does not focus directly on improving parenting skills or reducing child maltreatment, it has the potential to reduce child maltreatment through various channels. Those channels include improvements in the quality of care (less exposure to inadequate caregivers), increases in

maternal employment (leading to higher household income and maternal bargaining power), reductions in parental stress, and improvements in parenting behaviors.

First, the provision of public childcare could reduce child maltreatment if it substitutes for lower-quality care, as the law sets high quality standards for public childcare in Germany[9] and children may spend less time with potentially inadequate caregivers. Alternative forms of care include maternal care, as well as the father of the child, nannies, or informal care (by other relatives, friends or neighbors),[10] and quality is heterogeneous for all of them.

It is unclear how substituting maternal (or other informal) home care time for center-based childcare would affect the quality of care on average, as the effect would be a function of the quality of maternal childcare time relative to the quality of the childcare center, which are both heterogeneous.[11] From previous literature, we might expect child maltreatment to decrease if the counterfactual involves childcare by potentially abusive men. Lindo et al. (2018) demonstrate that cases of maltreatment increase if men, as a main source of informal childcare, spend more time with children. If high-quality formal childcare is available, families will be less dependent on potentially inadequate informal care provided by family members and other insufficient care arrangements. The risk of child maltreatment may therefore decrease via a reduction in exposure to potential perpetrators.

As a second potential channel, the expansion of childcare may increase maternal employment outside the home. Given the low childcare fees in Germany, an expansion of maternal labor supply with an accompanied switch to formal care will likely increase household income for affected families. This possibly reduces parental stress and provides additional resources for the family, thus helping to avoid child maltreatment. Higher employment may

[9] The higher quality of formal childcare, compared with informal childcare, is documented by Datta Gupta and Simonsen (2010), Herbst (2013), and Gathmann and Sass (2018).
[10] Or, in the worst case, the child being left alone. Leaving a small child alone is a direct form of neglect.
[11] Previous research also suggests that childcare attendance may increase the quality of the time that parents spend with their children (Jessen et al. 2020).

also foster certain consistent behaviors, such as a routine daily schedule, and may extend the family's social network. These improved factors may spill over to maternal parenting and have a preventive effect on child maltreatment.

In the early 2000s, there was still a strong social norm against mothers with young children working in West Germany (Boelmann et al. 2021). By making childcare available for very young children, the reform may have eroded the social norm that mothers stay home full-time for several years after having a child. This may have positive psychological effects on mothers (Schmitz 2020), which could be a potential channel for changes in parental (maternal) behaviors.

Note, however, that Paxon and Waldfogel (2002) also discuss potential negative effects of maternal employment on parenting behaviors, such as possible job stress, more difficulty making ends meet due to work-related expenses, and less energy available for parenting at the day's end.

The expansion of maternal labor supply may also lead to changes in within-household bargaining. Recent research by Aizer (2010), Bobonis et al. (2013), or Anderberg et al. (2015) shows that increases in female relative to male wages, in public transfers, or in employment opportunities reduce domestic violence against women because of changes in household bargaining power. More childcare places may also improve the economic situation of women in relation to men and may therefore strengthen the bargaining situation of the mother. This strengthening may lead to separation from a potential male perpetrator, or to changes in the behavior of a potential male perpetrator. Both may not only reduce violence against women but also against children.

Some families switching from home care to childcare may not increase labor supply, as shown in international studies on labor supply elasticities concerning childcare availability (Baker et al. 2008 for the U.S.; Havnes and Mogstad 2015 for Norway; Bauernschuster and Schlotter 2015, Busse and Gathmann 2018, and Müller and Wrohlich 2019 for Germany). In

those cases, the provision of universal public care may allow additional leisure time for parents. Research on the origins of child maltreatment shows broad consensus that domestic violence against children is rarely a conscious criminal decision by the parents; instead, parental stress and overburden are frequent starting points, particularly in families with low socioeconomic status, low economic resources, and multiple children.[12] More parental leisure time may mitigate these burdens.

Finally, formal childcare can give all parents-at-risk the opportunity to interact with nursery staff. This interaction may provide parenting guidance and constitute a substantial source of support. It may reduce overburden, improve parenting skills, and, in turn, prevent maltreatment, via improving parenting quality.

Additionally, in allocating places in childcare, CPS may focus particularly on families at risk, be it to relieve their stress, to monitor them, or to obtain access to the families to connect them with other intensive early childhood interventions. Relatedly, families who are the subject of a child welfare investigation face the threat of child removal, and one way that parents can mitigate the risk of removal is to demonstrate that they are responsible caretakers.

In summary, access to childcare may improve the quality of care, may lead to better income prospects for the parents, may improve the bargaining power of mothers, may reduce overburden, may improve parenting skills, and it may give state authorities the possibility to monitor families at risk or to connect them with other support services.

[12] For example, McLoyd (1990) analyzes the effects of economic hardship on children and shows that "*poverty and economic loss diminish the capacity for supportive, consistent, and involved parenting and render parents more vulnerable to the debilitating effects of negative life events*" (p. 312). In addition, she notes, "*a major mediator of the link between economic hardship and parenting behavior is psychological distress deriving from an excess of negative life events, undesirable chronic conditions, and the absence and disruption of marital bonds*" (p. 312). For Germany, Deutsche Kinderhilfe (2014) comes to a similar conclusion.

3. Institutions and data: Child maltreatment

Measuring the incidence of child maltreatment cases is challenging because they usually take place in the private domain. The literature has relied on several proxies for child maltreatment. Some studies use self-reports from surveys (e.g., Berger et al. 2017), while more recent studies from the U.S. (e.g., Raissian und Bullinger 2017, Brown and DeCao 2018, Lindo et al. 2018) use administrative data from the CPS. Self-reported data may be subject to reliability problems. For Germany, Sierau et al. (2017), for example, show that parents who are part of a child protection case often do not report maltreatment in the context of psychological questions.

In our study, we use the number of child protection cases leading to child removal from the home as a proxy for severe cases of child maltreatment. Our data source is the German Child and Youth Welfare Statistics,[13] which contains all individual cases of child protection leading to out-of-home placement at the county level from 2002 to 2015. According to article 19 of the Convention on the Rights of the Child of the United Nations, "*states parties shall take all appropriate legislative, administrative, social and educational measures to protect the child from all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation, including sexual abuse, while in the care of parent(s), legal guardian(s) or any other person who has the care of the child.*" In line with the Convention, German law defines a child protection case as the temporary placement of a child with a suitable person or in an adequate location if the child's well-being is in danger.

In Germany, the CPS is organized at the county level and is in charge of initiating child protection cases. The local youth office (or CPS) is obliged by law to "*carry out investigations to determine whether a child is endangered*", and to "*emergency placement of children and adolescents*" (Witte et al. 2016). An initial report to CPS can be made by anybody, typically:

[13] *Deutsche Kinder- und Jugendhilfe Statistik.* In particular, RDC of the Federal Statistical Office and Statistical Offices of the Federal States, *"Statistik der vorläufigen Schutzmaßnahmen" DOI: 10.21242/22523.*

family members, neighbors, the police, or professionals working with children, such as healthcare workers and teachers. When a report is made, local CPS make a first assessment, which can lead to dismissing the case, putting the family under observation, or immediate emergency placement. A child is removed from the home if the situation in a family (which is often already under the observation of the local CPS) is assessed to be critical for the child. Families under observation receive regular (weekly) visits by the CPS. The CPS worker can decide whether a persistent danger to the child's well-being exists. If so, the CPS places the child outside the family.[14] Such cases can end with the child returning to the family, either with no obligations or with some obligations, most likely a weekly social worker visit or, in extreme cases, a long-term foster care placement, or adoption (see Petermann et al. 2014 for details on legal regulation).

In 2012, there were 85,287 reports of suspected child maltreatment cases in Germany as a whole (all ages), out of which 6,022 (7%) resulted in a child protection case with child removal.[15] Between 2012 and 2015, child protection cases fluctuated between 7.0 and 7.8% of all reports, with no clear trend.

We believe that our measure of child maltreatment is a reliable proxy for the incidence of (severe cases of) child maltreatment in the home, for several reasons. First, in each reported child protection case (leading to out-of-home placement), an official authority decided that the well-being of the child was in danger. Therefore, if a child protection case is initiated, serious danger to the child (rather than a potential danger) exists. Second, under-reporting is likely to be lower for serious cases. It is also less likely that the detection rate differs a lot by county. Third, the rules for child protection cases in Germany are defined at the federal level in the

[14] A family judge becomes involved only if parents disagree with the initiation of a child protection case.
[15] *Statistisches Bundesamt (Destatis),* 2020.

German Social Code Book.[16] This law defines the precise situations in which the well-being of the child is in danger. Therefore (in contrast to the U.S.) changes in the number of cases between counties should reflect a relationship to the total number of child maltreatment cases, and not to changes in the definition of child maltreatment.

For each child protection case, the data include the age of the protected child (categorized into seven age groups).[17] In addition to the age of the child, the year, and the county, the data provide the reason for the child removal, the household situation, and the person or institution who reported the case. Data availability is very good: Only one state (Schleswig-Holstein, a small northern state) does not provide data on child protection cases in 2002. In subsequent years, very few counties have missing entries. Overall, our analysis focuses on a final sample of 4,497 county-year cells from 11 German federal states.

< Table 1 about here >

Table 1 gives an overview of the number and type of cases in our analysis sample. Overall, 48,234 child protection cases were initiated for children under age 6 from 2002 to 2015. (For total numbers per year see Appendix Table 1.) The most frequent reasons were overburden of the parents (37%) and child neglect (32%).[18] The most frequent household situation is single parent households (42%), followed by two-parent families (33%), a biological parent with a new partner (12%), and other household arrangements (13%). The local CPS reported most of the cases (66%). Parents who seek help by themselves (11%) and police (11%) are the second most frequent reporting sources. Nurseries account for only a small number of reports (1%).

[16] *Sozialgesetzbuch.*

[17] The seven age groups are: below 3, 3 to below 6, 6 to below 9, 9 to below 12, 12 to below 14, 14 to below 16, and 16 to below 18 years.

[18] The reported reasons are not mutually exclusive and multiple assignments are possible but rarely the case. In the analysis, we impose the following ordering: overburden < neglect < abuse, and use the reason with the highest rank. "Overburden" includes cases where the parents are unable to care for their children properly, for instance due to substance abuse or mental illness.

< Figure 1 about here >

The maps in Figure 1 show the development of child protection cases per 1,000 children (our main dependent variable) based on our data over time. The variation in reported incidence rates across counties is considerable. Moreover, we observe an increase in reported cases over time (see Appendix Table 2 for details). The overall increase in reporting may reflect a number of causes, including better overall awareness of child well-being[19] (Witt et al. 2017) and prominent cases of child abuse in Germany (and worldwide) in the mid-2000s that received major media attention.[20] The overall report rate from nurseries is very low (see Table 1), which suggests that increased reports by nurseries due to higher exposure to public childcare is likely not the main cause for the increase in child maltreatment cases.

In addition to our main measure of child maltreatment, we also employ data on all households under surveillance by child protection services due to suspected child maltreatment. In the period of analysis (2002-2015), CPS started surveillance of almost 200,000 households with children under 6 (see Appendix Table 3).[21] Some of these surveillance cases result in child removal (but not all removals were preceded by CPS surveillance).[22]

[19] Corporal punishment of children by parents became illegal in Germany in the year 2000.

[20] For example, in 2010, revelations of abuse scandals in the Roman Catholic Church and in educational institutions triggered a public debate about child maltreatment and generated a range of measures focused on prevention. This debate might have raised awareness about child maltreatment and increased the number of reported cases (e.g., Rassenhofer et al. 2015; Witt et al. 2017).

[21] *Deutsche Kinder- und Jugendhilfe Statistik*. In particular, RDC of the Federal Statistical Office and Statistical Offices of the Federal States, *"Statistik der sozialpädagogischen Familienhilfe"* DOI: 10.21242/22513 for 2002-2006, and *"Statistik der erzieherischen Hilfe, der Eingliederungshilfe für seelisch Behinderte und der Hilfe für junge Volljährige "* DOI: 10.21242/22517 for 2007 to 2015.

[22] When a risky household situation involving children is detected or a suspected case of child maltreatment is reported, the CPS evaluates the case and makes an assessment, which can lead to direct removal of the child, surveillance, or dismissal of the case. "Surveillance" involves a plan of action with a time frame, which includes regular visits to the household. Surveillance ends either with the successful completion of the plan of action, with some deviation from the plan, or with adoption. A child may be (temporarily) removed from the home during surveillance, in which case the household will typically remain under surveillance by CPS.

An important limitation is that we do not have information on cases of child maltreatment in childcare centers. It is conceivable that there may be some substitution from home to outside-the-home maltreatment, and we cannot estimate the effects of childcare on total maltreatment, which would be the outcome of interest. We suspect that maltreatment cases in childcare centers are rare, given the existing quality controls and the high qualification requirements for workers. However, it's important to acknowledge that we can only extract direct conclusions about child maltreatment in the home.

4. Institutions and Data: The German childcare expansion

To identify the effect of public childcare provision on child maltreatment, we use Germany's expansion of childcare places for children under the age of three. This expansion began in 2005, when the German federal government committed to creating 230,000 additional early childcare places in West Germany by 2010.[23] While Germany had introduced laws that mandated the provision of universal public childcare for children between ages three and six in 1996, for children under age three, daycare opportunities in the Western federal states hardly existed until 2005.[24] The most common mode of care for children under the age of three was home care, usually by mothers (and other relatives), while private daycare centers and nannies were very rare (Hank et al. 2004). According to the German Socio-Economic Panel, only 28% of women with children under the age of three were in employment in 2004, and only about 2% used nannies as a childcare arrangement (37% used informal childcare by relatives or friends).

[23] East Germany experienced a much smaller expansion of public childcare provision during the years under analysis because it already had high childcare levels as a legacy of the former German Democratic Republic. Additionally, numerous changes to the boundaries of East German counties over the years would hamper the empirical analysis. Therefore, our analysis only includes West German counties.

[24] Although laws mandating childcare places for children between 3 and 6 years of age were not introduced until 1996, the provision of daycare spaces was already far higher for this age group at that time. Schmitz et al. (2017) report a coverage rate of 78% in 1994, which increased to 93% in 2016.

In 2007, a summit of the federal government, the federal states, and the counties reinforced the aim of the 2005 mandate and set the target of a 35% coverage rate by 2013. Finally, the law on support for children,[25] enacted in December 2008, gave every parent with a child aged one to three the right to a place in early childcare by August 2013 – and, if no place was available, the parent could enforce a legal claim for reimbursement. In essence, the reform included a federal government mandate that all counties in each state had to expand public childcare substantially to meet legal rights to guaranteed childcare places for all preschool children aged one to three by August 2013.

We use administrative data from the Statistical Offices of the German Laender[26] to obtain information on childcare coverage for children under age three at the county level. These data are available for 2002 and then annually for 2006 to 2015. No administrative data on public childcare provision at the county level are available for the years 2003, 2004 and 2005.[27] Figure 2 shows the county-level coverage rates for all years from 2002 and 2006 to 2015. Our main explanatory variable, which we call "childcare coverage rate", is the number of childcare slots for children under 3 years of age in a county and year, per 1,000 children in the relevant age range. Note that this measure includes publicly subsidized childcare, including both public and private childcare centers.

While in 2002 the childcare coverage rate was consistently below 5% across virtually all West German counties, in 2015 almost all counties exceeded 20% coverage, with an average of 28% (and therefore still below the target rate of 35%). The maps also show considerable variation in the expansion across counties, even within the same state. Bauernschuster et al.

[25] *Kinderförderungsgesetz.*
[26] *Statistische Landesämter.*
[27] In the empirical analysis, we impute childcare coverage in 2003-05 via linear interpolation between 2002 and 2006. This imputation should be quite innocuous since the real expansion began after 2005.

(2016) note that two-thirds of the variation in childcare coverage is attributable to variation within states, while one-third is attributable to differences between them.

< Figure 2 about here >

Figure 2 also shows that there was a shift to the right in the entire distribution of childcare coverage. However, there was no convergence between counties (see also Bauernschuster et al. 2016). Instead, the standard deviation of coverage rates steadily increased from 2002 to 2015 (see Appendix Table 4 for details), likely due to different expansion patterns across counties (some expanded slowly, others rapidly). Some counties gradually increased childcare over time, some started off strongly but came to a halt, and still others were delayed by a few years but later drastically increased their coverage. Overall, we observe many different types of expansion patterns across counties, resulting in strong regional variation.

Bauernschuster et al. (2016) and Felfe and Lalive (2018) explain in detail that this variation resulted from the process of opening up new childcare centers, a process that involves different decisions by municipality, county, and state authorities. Municipality and county authorities were responsible for assessing local demand for childcare, with demographic and economic factors (e.g., current cohort sizes and labor market conditions) entering those projections. State authorities had to approve nonprofit organizations' proposals to set up new childcare centers.

This administrative process was susceptible to problems that varied substantially across counties (Hüsken 2011). These problems included varying routines and levels of knowledge about the complex (co-)funding system (with subsidies from the federal government, the state, and the municipality), construction land shortages, various building regulations for childcare centers, shortages of qualified childcare workers, delays in approval, and rejections of noncompliant applications.

As a result, the increase in childcare places differed at the county level due to both well-defined predictors of local childcare demand, as well as idiosyncratic shocks to the local supply

of new childcare places, resulting from lengthy and intricate administrative processes and rules (Felfe and Lalive 2018). These shocks, which are arguably orthogonal to expected changes in cases of child maltreatment, provide the basis for our identification strategy.

Childcare centers are subject to strict quality regulations, including for opening hours, group size, staff-child ratios, and staff qualifications. Centers are required to remain open for at least four hours a day, five days per week. Groups within these centers can have up to 10 children and must be supervised by at least one certified education specialist and one (or two) assistants. The educational degree required for group leaders in a care center requires two years of certified vocational training (in the German apprenticeship system) and at least two years of experience at a care center. During the period under study, the ratio of children to staff was approximately 3 to 1 (Felfe and Lalive 2018).

Childcare for children under age three is highly subsidized in Germany. In 2006, public subsidies covered 79% of total operating costs, with another 7% of funding coming from private organizations. Parents had to bear only 14% of total costs. Parental fees are regressive according to family size and progressive according to family income (i.e. means-tested), and they range from 0 to 600 euros per month (Bauernschuster et al. 2016). In almost all communities, childcare is free for families who receive welfare benefits. Even though individual childcare centers have wide discretion in selecting from the pool of applicants (with no centralized admissions procedure), families on welfare are on a priority list for receiving a place in childcare in municipality-owned centers. The waiving of fees for welfare-dependent families and the preferred placement allocation they receive are both independent of employment status.

5. Empirical approach

5.1 Main specification

To identify the effects of universal public childcare provision on child protection cases, we estimate a generalized difference-in-differences (DiD) model that uses the local childcare

coverage rate as a continuous treatment variable, exploiting the large variation (generated by the expansion) in available childcare places across counties and within counties over time, in a two-way fixed effects regression. A similar empirical approach has been followed in studies examining the effects of childcare expansions on child development or fertility (e.g. Berlinski et al. 2009, Havnes and Mogstad 2011, Bauernschuster et al. 2016). This type of model estimates the treatment effect of interest under the standard "common trends" assumption, provided that the treatment effect is constant across groups and over time (de Chaisemartin and D'Haultfoeuille 2020, Goodman-Bacon 2020).

The generalized DiD model can be specified as follows:

$$y_{ct} = \theta\, Childcare\_coverage_{ct} + \boldsymbol{X'}_{ct}\beta + \alpha_t + \delta_c + \varepsilon_{ct}, \qquad (1)$$

where y_{ct} is the logarithm of the number of child protection cases per 1,000 children in county *c* at time *t*, and $Childcare\_coverage_{ct}$ denotes the childcare coverage rate in county *c* at time *t*, i.e., a continuous variable. α_t and δ_c are year- and county-fixed effects.[28] $\boldsymbol{X'}_{ct}$ comprises a set of time-varying county factors that may affect the incidence of child protection cases. Finally, ε_{ct} is the i.i.d. error term. We estimate the model by (weighted) fixed-effects panel regressions. Weights are the county-year population of the analyzed age group. All standard errors are clustered at the county level.

The focus of our analysis is on child protection cases in the age groups 0 to 3 and 3 to 6. Although the childcare expansion focuses on children below three, we choose children under six as our main group of interest for three reasons. First, enrollment in childcare is often based on cut-off dates and not on birth dates. One popular cut-off date is September 1st. Children born before a cut-off date attend early childcare until the cut-off date, although they may have already turned three. Moreover, attending childcare before age 3 may have delayed effects on child

[28] To accommodate for county-year cells with zero child protection cases (about 15%), we add one case to each cell.

protection cases, if access to childcare prevents child removal some months down the line. Finally, there may be spillover effects on older siblings.

5.2 Validity of our identification strategy

Since our main specification controls for county fixed effects, our identification strategy does not require that the public childcare expansion be orthogonal to time-constant county characteristics. However, we need to worry about time-varying county characteristics that may correlate with both the childcare expansion and child protection cases.[29]

One concern relates to other policies supporting families that may coincide in their timing with the childcare expansion. However, the vast majority of such policies are implemented at the federal or state level, not the county.[30] Some German states implemented additional payments for families, abolished childcare fees, or implemented policies, such as home visiting programs, to support disadvantaged families during the relevant period (e.g. Busse and Gathmann 2018, NZFH 2011). To control for confounding effects coming from such state-level policies, we estimate specifications with state trends or state-year fixed effects as robustness checks (see section 6.2).

We still need to worry about time-varying factors across counties within a state. We test directly for the correlation between childcare coverage and a set of economic and demographic variables at the county level (see section 6.1), and we also include them as controls in the regressions. Previous literature has found effects of local labor market conditions on child

[29] Several other studies analyzing different outcomes have provided evidence that the German childcare expansion was exogenous to time-varying county characteristics (Felfe and Lalive 2018 and Bauernschuster et al. 2016 for the expansion for ages 0 to below 3 years, Cornelissen et al. 2018 for the childcare expansion for children aged 3 to below 6 years).

[30] For example, in 2007, the federal government enacted a major parental leave reform. Since the new parental leave system was introduced (at the national level) at the beginning of the expansion of early childcare (in 2007), the effects of increased access to childcare that we document should be interpreted in the context of this new system. In other words, we document the effects of local increases in the supply of early childcare, given the new parental leave regulations, which were common across all counties.

maltreatment (Lindo et al. 2018, Brown and De Cao 2020), thus we explore the correlation between local employment and unemployment rates and childcare coverage. Child maltreatment cases are more common in low-income households; thus, we consider proxies for educational attainment as well as the share of immigrants in the local population. We also control for changes in the age composition of the county population.

Our identifying assumption is that, conditional on county fixed-effects and our set of time-varying county factors, there are no further unobserved characteristics of a county that vary over time and are correlated with public childcare provision and changes in child maltreatment.[31] We run regressions both with and without our set of county-specific time-varying covariates to investigate the robustness of the estimated effects.

One possible remaining concern is that childcare expansion changes the organizational structure or the available resources of a local CPS. Either could lead to a situation in which the number of child protection cases declines because the child protection service initiates fewer cases, even though the rate of parents who mistreat their children remains the same. To address this concern, we use a placebo group of older children who should also be affected by organizational or resource changes in the CPS, as these offices do not organizationally separate older from younger children. This group, however, should not directly respond to the childcare expansion.

We conduct these placebo estimations using the number of child protection cases for the group of children aged 12 to 18 as the dependent variable in equation 1 (section 6.2). With this placebo estimation, we can test whether the CPS changed its procedure in response to the childcare expansion, or whether other time variant characteristics changed together with the

[31] Borusyak and Jaravel (2018) warn that this type of "static" specification with unit and time fixed effects weights long-run effects negatively. This would imply that our estimated coefficient of interest would overstate the magnitude of the "average" treatment effect, if its magnitude declines quickly over time. We address this issue in our dynamic specification with leads and lags (section 6.2).

expansion. As the CPS is responsible for all children under 18, if one of the aspects would be true, we should also see a reduction in this older age group. No reduction, on the contrary, can be interpreted as evidence supporting the validity of our approach.[32]

Much less of an issue for the question at hand are the responses that parents may use to avoid detection, e.g., child perpetrators may move to counties with fewer childcare facilities to avoid protection cases. This behavior is unlikely because parents use childcare voluntarily, and perpetrating parents would have easier ways of avoiding detection than moving.[33]

In the same sense, we can exclude anticipation effects of childcare expansion with respect to child maltreatment behavior. Anticipation effects would imply a change in child maltreatment behavior before more public childcare places become available, e.g., a parental move made before more childcare spaces become available.

As an additional validity check, we estimate variations of equation (1) that include leads and lags of the childcare expansion variable (section 6.2).[34] If the childcare expansion causally leads to fewer child maltreatment cases, we expect significant coefficients for contemporaneous and possibly also for lagged childcare coverage. The leads of childcare coverage (future increases)

[32] As shown in Appendix Table 2, child protection cases are more common for ages 12 to below 18 years than for ages 0 to below 6 years. The research design is thus powered to detect impacts for older children.

[33] Several previous studies have addressed directly the effect of childcare expansions in Germany on parental mobility, and their results credibly rule out any major selective migration effects (Felfe and Lalive 2013, 2018, Bauernschuster et al. 2016, Cornelissen et al. 2018).

[34] We estimate the following equation (following Schmidheiny and Siegloch 2020):

$$y_{ct} = \sum_{\tau=-3}^{3} \theta_\tau \, Childcare\_expansion_{c\tau} + X'_{ct}\beta + \alpha_t + \delta_c + \varepsilon_{ct} \quad (2)$$

The (binned) treatment is the expansion in childcare slots in each county c in year t, defined as follows:

$$Childcare\_expansion_{c\tau} = \begin{cases} Childcare\_coverage_{ct} - Childcare\_coverage_{ct(0)} & if\ \tau = -3 \\ \Delta Childcare\_coverage_{ct} & if\ -3 < \tau < 3 \\ Childcare\_coverage_{cT} - Childcare\_coverage_{ct} & if\ \tau = 3 \end{cases} \quad (3)$$

Where the initial period, $t(0)$, is 2002, and the last period, T, is 2017. The first lead is used for normalization (omitted), while the rest of leads and lags capture the dynamics of the effect of childcare coverage on child maltreatment.

should not predict current changes in child maltreatment. This check is in the spirit of testing for common pre-trends in difference-in-differences analyses.

Finally, there are reasons to interpret our results as lower-bound estimates of the underlying effects. Because child maltreatment is likely subject to significant under-reporting (even with a comprehensive administrative framework, such as the one we use), the expansion of childcare places may induce a higher probability of detection, in parallel to the potential negative effects on incidence. A higher probability of detection in treated counties would therefore bias our coefficients towards zero (or positive values). We test for this possibility by estimating equation (1) using cases under surveillance by child protection services (instead of child removal cases) as our dependent variable. A positive θ coefficient would suggest that public childcare expansions increase reporting of suspected maltreatment cases.

6. Empirical results

6.1 The correlates of childcare expansion across counties

Before turning to our main results, we analyze the correlates of the childcare expansion across counties. We regress the childcare coverage rate on economic and sociodemographic characteristics of each county, with a focus on those that may have affected the expansion and that may also relate to the incidence of child maltreatment. The results are shown in Table 2. In the first column we do not include county or year fixed-effects, while the second column shows the results when we include both sets of fixed-effects.

Brown and De Cao (2020) find that county unemployment rates (in the US) affect child maltreatment (with unemployment increasing child neglect). We find that high unemployment is associated with lower childcare coverage in the county. The association remains when we control for county and year fixed effects. If increases in childcare coverage go together with lower unemployment, this may bias our coefficient of interest upwards. Thus, the local unemployment rate is an important control.

Lindo et al. (2018) also find that male and female employment have different effects on child abuse and neglect, with higher male employment reducing maltreatment. We thus control separately for male and female employment rates in the county. We find that childcare coverage is higher in counties with higher female employment (column 1).[35] However, this association becomes smaller and insignificant after controlling for county and year fixed effects. Male employment is not significantly associated with the childcare expansion in column (1), but the association becomes negative and significant after county and year fixed effects.

Low socio-economic status of the family is a strong predictor of child maltreatment (Paxon and Waldfogel 2002). We thus include proxies for the socio-economic composition of the county. We find that counties with a high share of immigrants and high-school dropouts have lower childcare coverage rates. However, these coefficients become close to zero and insignificant after the county fixed effects are controlled for.

Finally, we find no strong association between the age composition of the population and child care coverage rates, after fixed effects.

Once we include the country and year fixed effects (column 2), only two out of our eight covariates remain significant at the 95% confidence level. We include these controls in our main regressions (section 6.2) and evaluate how their inclusion affects the coefficient of interest.

< Table 2 about here >

6.2 Specifications with leads and lags

We find that the expansion of childcare coverage across counties is correlated with some economic variables (unemployment rates and male employment rates). We next estimate a

[35] The female employment rate is potentially a "bad control" since it could be affected by childcare availability. We test for this possibility explicitly in section 7.

specification with multiple leads and lags,[36] in the spirit of an event-study, to evaluate the plausibility of the "common trends" assumption. The specification follows Schmidheiny and Siegloch (2020),[37] and we include a set of three leads and three lags for childcare expansion in the county.[38] The results are displayed in Figure 3.

< Figure 3 about here >

The coefficients on the leads are very small and statistically indistinguishable from zero. This supports our identifying assumption, as we find no evidence of pre-existing differential trends that correlate with the treatment. We find large and (close to) significant coefficients in years one to three following the expansion, which suggests persistent effects of childcare availability, that appear in our child maltreatment data with a delay of one year.[39]

6.3 The effect of childcare expansion on child maltreatment

Table 3 presents our main estimation results (equation 1) for different age groups. Panel A shows the results for children aged 0 to under 6 and for children aged 12 to under 18 years. Panel B separates children 0 to 6, into a younger group 0 to 3 and the older group of 3 to 6. The coefficients reported can be interpreted as the effect of a one-percentage point increase in childcare coverage on the log of child protection cases per 1,000 children. Column 1 shows the results without controlling for time-varying county characteristics, while Column 2 additionally includes economic conditions, and Column 3 also controls for sociodemographic county characteristics.

[36] See equation (2).
[37] Schmidheiny and Sielgloch (2020) discuss how to produce event-study-type results when the treatment variable is continuous, as is our case.
[38] In order to increase the number of periods included in this specification, we extend our data set with information on childcare coverage up to 2017.
[39] The magnitude of the estimated effects does not appear to decline much after several lags. This partly assuages the concerns raised by Borusyak and Jaravel (2018) regarding the underweighting of long-term effects in the "static" specification.

< Table 3 about here >

The estimation results in Panel A, Column 1 show that an increase in childcare slots by one percentage point significantly reduces cases of child maltreatment by 1.02%. The results in Columns 2 and 3 are very similar in size and significance (about 0.9), confirming that the main finding is robust to controlling for time-varying county characteristics.

Columns 4, 5, and 6 of Panel A present the corresponding results for children aged 12 to 18. For this older age group, the coefficients are insignificant and close to zero. This is the case regardless of whether we include time-varying county characteristics. These results thus confirm that childcare expansion had no effect on children and families who were not in the age range affected by the expansion. This finding suggests that the local CPS did not change their behavior in response (or in parallel) to the childcare expansion, as it is unlikely that those changes would be limited to small children.

Panel B of Table 3 shows that the effects are present for both children in the age group 0 to under 3 and in the age group 3 to under 6. As mentioned earlier, this could be due to a combination of some three-year-olds being treated, some delay in the effects, and/or spillover effects between siblings. The magnitude of the coefficients is larger for the 0 to 3 age group, as expected (1.15 versus 0.83). Again, the results are robust to controlling for time-varying county characteristics.

To investigate the robustness of our main results presented in Table 3, we estimate a number of additional model specifications, shown in Table 4. Column (1) replicates our baseline results from Table 3. In column (2), we use the number of cases per 1,000 children as the dependent variable, instead of the log. The results show that a one-percentage-point increase in childcare significantly reduces child maltreatment by 0.03 cases per 1,000 children. The results are thus not overly sensitive to counties with zero cases or the distributional form of the dependent variable.

< Table 4 about here >

Second, we estimate a set of unweighted specifications (column 3). The estimated coefficients become larger in magnitude and remain statistically significant. Third, although in Germany legislation for child protection comes from the federal level, we consider state-specific trends and state-year fixed effects as an additional robustness test (columns 4 and 5). We do so because law changes and institutions at the state level may affect child maltreatment cases and coincide with childcare expansion or utilization of specific groups. For example, some German states introduced targeted programs to prevent child maltreatment in certain years. The coefficient of interest remains essentially unchanged.

Overall, the main empirical results are robust to different specifications: A one percentage-point increase in childcare places leads to a reduction of about 1% in cases per 1,000 children. A back-of-the-envelope calculation shows that the effect sizes are meaningful: From 2002 to 2015, in West Germany childcare slots increased by 25 percentage points; this expansion implies that in 2015, about 25% fewer cases occurred in comparison to a situation in which the childcare supply had remained at the same level as 2002. Adding up the avoided cases in each year between 2002 and 2015 (see Appendix I for the total number of cases for each year) implies that about 12,000 more severe child maltreatment cases would have occurred if childcare supply had remained at the same level as 2002.

7. Mechanisms

In this section, we attempt to identify the core mechanisms by which childcare expansion may reduce child maltreatment cases. As explained in section 2, childcare expansion may affect child maltreatment through various channels. First, it may give better income prospects to parents if their labor supply increases. Second, formal childcare may improve the quality of care as well as reduce time in inadequate care. Third, it may improve the bargaining position of mothers. Fourth, it may reduce overburden if parents' leisure time increases, and finally, it may

give state authorities the opportunity to monitor families at risk, which may change the behavior of potential perpetrators. We also consider the possibility that the reduction in child removal cases may be driven by childcare expansion somehow reducing the number of families under observation by CPS.

7.1 Descriptive evidence from SOEP

We first show some descriptive statistics on childcare utilization by household characteristics, to illustrate the types of families more affected by the increase in childcare coverage. Appendix Table 5 shows the fraction of households using formal childcare in 2005, 2010 and 2015, using data from the German Socio-Economic Panel Study (SOEP). The sample includes all households with children under age 3.

Overall, only 7% of households reported that their child attended formal childcare in 2005. This fraction surpassed 28% in 2015. The increase in utilization was more pronounced among single-parent families, reaching almost 67% in 2015 (versus 28% for two-parent households). In 2005, welfare recipients and immigrant households (families with lower socio-economic status on average) were slightly underrepresented in childcare participation. Their utilization, however, increased strongly over time. By 2015, 24% of welfare-receiving households made use of formal daycare, only slightly below the 29% of non-welfare recipients. Utilization was 26% among immigrant households, close to the 30% in native families. We also find that more than 20% of households where the father was unemployed used formal childcare in 2015.

This descriptive evidence thus suggests that lower SES households (single parents, welfare recipients, and immigrants) were strongly affected by the increase in public childcare provision between 2005 and 2015 in Germany.

7.2 Maternal labor force participation

We next analyze in more detail the potential effect of the childcare expansion on female employment rates, to examine the extent to which better income prospects of the parents is a plausible channel for our findings. The regression results are presented in Table 5 (first column). We estimate equation (1), where the dependent variable is now the female employment rate in a county and year, and the main explanatory variable is the childcare coverage rate. The results suggest that increases in childcare availability led to significantly higher female employment rates in the county. Bauernschuster and Schlotter (2015) and Müller and Wrohlich (2020) also find positive effects of childcare reform on mothers' labor supply.

Figure 4 shows the results from a dynamic specification with three leads and three lags.[40] Our estimates suggest that the effects of the reform on female employment were persistent. Thus, affected families likely increased their labor income, on average. Higher maternal earnings may also increase women's bargaining power within the household.

A recent study by Schmitz (2020) suggests that the childcare expansion in Germany improved maternal subjective well-being, in part via the increase in labor supply, which may in turn have affected parenting behaviors. Jessen et al. (2020) also find that childcare attendance reduces the quantity but not the quality of the time that parents spend with their children.

The employment elasticity that we document is however smaller than one, suggesting that not all mothers who accessed childcare expanded their labor supply. Moreover, we still find effects on child maltreatment cases after controlling for female employment rates in the county, so that this does not seem to be the only mechanism.

< Table 5 and Figure 4 about here >

The potential improvement in women's bargaining position (driven by higher earnings) may lead to increased separation from potential male perpetrators. To investigate this channel, we

[40] We estimate equation (2).

study the effects of the reform on family stability. The second column of Table 5 shows the results of estimating the effect of childcare expansion on divorce rates at the county level. We find a coefficient that is very close to zero and statistically insignificant, and thus conclude that the reform had no detectable effect on marital stability.[41]

7.3 Heterogeneous effects

To examine the remaining potential channels, Table 6 presents the effects of childcare expansion separately for different characteristics of maltreatment cases, for children aged 0 to 6 (the results for age group 0 to 3 are presented in Appendix Table 6). ***Panel A*** analyses which of the four main ***reporting sources*** (CPS, police, parents or nursery) reacted most strongly to the childcare expansion. If the CPS reports a maltreatment case that leads to out-of-home placement, the CPS had usually observed the family before. This surveillance takes place because the families possess risk factors for maltreatment, such as less serious incidences of maltreatment, adverse parenting, or a problematic household structure (e.g. teenage parenthood). Families under observation of the CPS often also show low labor market attachment; 39% of these families received welfare benefits in 2018 (Destatis, 2019).

The cases that do not come from CPS are emergency situations that need to be resolved more quickly. The police report a case if officers can confirm an indication expressed by neighbors or other people. Parents report a case mostly if they feel that they can no longer cope with their situation. The last group of reports come from nurseries. Although nurseries do not often report cases, this reporting source may increase in counties where more children attend childcare.

< Table 6 about here >

The estimation results indicate that (non-emergency) cases reported by the CPS decrease most strongly (1.09% by a one-percentage-point childcare increase), while we do not observe

[41] We were unable to perform a parallel analysis of separations among unmarried couples, due to a lack of official statistics and insufficient sample size in survey data.

a significant reduction in any other reporting source. This finding suggests that maltreatment in families at risk, which are already under observation of the CPS, reacts most to the childcare expansion. For these families, childcare appears to stabilize a critical situation, which might have ended in a serious maltreatment case without access to childcare. Nurseries do not report more cases in regions with larger expansions.

Panel B may help to explain why families at risk – who are often welfare recipients – react most to the childcare expansion. We consider three main ***family situations*** (single parent, both parents, and single with partner)[42] in which maltreatment cases occur. While the childcare expansion has no significant effect on single-parent households, cases of maltreatment decrease significantly in households where an adult male is present (both in two-parent households and in those where the mother lives with a new partner).[43] The coefficient is largest for children living in two-parent households.

A potential explanation why the effect may be concentrated in households with a male adult relates to recent work by Lindo et al. (2018). They show that most of the perpetrators in child maltreatment cases are men. They find that the female-male ratio in abuse cases is 1:4 considering the reduced time that men spend with children, and that male unemployment increases the risk of child maltreatment. These findings lead to a potential explanation for why childcare plays a dominant role in reducing maltreatment cases in two-parent households. Because we find the strongest reduction in families already under observation of the CPS, in which the father is often unemployed or irregularly employed, more available childcare strongly reduces the time a child spends with a potential male perpetrator.

[42] In Germany, the mother heads more than 90% of all single-parent households with children (BMFSFJ, 2017, p. 12). "Single with partner" means a biological parent (most likely the mother) with a new partner.

[43] In their overview on family stability, Brown et al. (2016) show that cohabiting unions are much less stable than marriages, even when children are present. Related to that there is a growing literature showing that family instability has a causal effect on children's development, see, e.g., Lee and McLanahan (2015).

From this argumentation, also the answer follows why childcare expansion has only small effects on (mostly female-headed) single-parent households. In single mother households, childcare mostly substitutes maternal care. Indeed, Bauernschuster and Schlotter (2015) find that the effects of childcare expansion on maternal labor supply are stronger for single mothers. It appears that this substitution has only small effects on child maltreatment. An alternative explanation for the small effects for single parents might be lower childcare utilization by single parents than by two-parent families. However, Appendix Table 5 shows that single parents are in fact more likely to use childcare compared with two-parent families, thus allowing us to rule out this explanation.

Panel C of Table 6 presents the estimation results on which ***reasons for a maltreatment case*** (neglect, abuse, and overburden) are most affected by the childcare expansion. "Neglect" indicates that parents are caring for their child insufficiently, whereas "abuse" indicates that parents are harming the child. In contrast, "overburden" indicates that severe problems of the parents, such as drug addiction or mental illness, which require that the child not remain with the parents, are the main reason for the out-of-home placement. We find a strong decrease in all three, with the largest magnitude coming from "overburden", followed by "neglect". These findings indicate that the additional free time a family may get due to using childcare does not reduce the severe problems facing the parents. The reduction in abuse and neglect also points to the direction in which inadequate care is reduced.

Panel D shows that the expansion affects maltreatment cases of ***girls*** somewhat more than boys. Nevertheless, the effects are significant for both genders, and not significantly different from each other. ***Panel E*** shows that the reduction in maltreatment cases comes from urban counties (the coefficient is essentially zero in rural ones).

Finally, in ***Panel F*** we split maltreatment cases leading to child removal by the length of time that the child spends away from home (which can range from very short to permanent

placement in foster care), as proxy for the severity of the case. We find that childcare expansion led to a reduction in child maltreatment cases both short and long, thus including the most severe cases.

Overall, our results suggest that childcare access likely generates a shift away from lower quality care (given that effects are driven by households already under surveillance), and this lower quality care could have been maternal care (given that this was a predominant form of care prior to the policy), care from a male partner (given that existing literature suggests this to be a source of maltreatment), or other informal care (which was also a predominant form of care beforehand).

7.4 Childcare expansion and cases *under surveillance*

In addition to cases of child maltreatment leading to child removal, we also observe the number of households that are under observation by CPS, due to risk factors or suspected maltreatment. We estimate equation (1) using the log of the number of cases under surveillance (per 1,000 children) as the dependent variable. Childcare expansion may increase the number of cases if it increases reporting (by nursery staff or other parents), or if some cases that would have ended up in child removal remain under observation instead. On the other hand, childcare may lead to fewer cases via the same channels as severe maltreatment, but also if CPS becomes less active in monitoring families as they "delegate" observation of families to childcare centers.

Our results for cases under observation by CPS are presented in Appendix Table 7. Panel A uses the stock of families under observation, while Panel B studies the inflow (the number of households that become under observation in a given year). Our results suggest that the expansion of childcare did not have a significant effect on the number of households under surveillance by CPS.[44] The coefficients for the relevant age groups are mostly positive but never

[44] We also find no significant effects of childcare coverage on total outflows from surveillance by CPS (not reported).

statistically different from zero. This suggests that the reduction in severe cases of maltreatment that we find cannot be attributed to fewer families being under the radar or CPS.

We also estimate a specification with leads and lags (see Appendix Figure 1).[45] These results suggest that the expansion in childcare slots may have increased reporting in the short-term (since the coefficient on the contemporaneous increase is positive and significant), but the effects are short-lived.

Our analysis in this section shows that the childcare expansion increased female employment. Thus, higher household income and/or improved female bargaining power appear to be a potential channel behind the reduction in child maltreatment. Additionally, the characteristics of the maltreatment cases suggest that reduced time in inadequate care with a potential male perpetrator, probably in families at risk, may constitute another channel through which childcare reduces maltreatment. Other explanations, such as stronger monitoring by the CPS or more leisure time, appear to contribute to a smaller extent since if these were the main channels, the expansion should also affect single-mother families. We also find that the childcare expansion did not have an effect on the number of families under surveillance by CPS, which indicates that our results are not driven by differential selection into observation by CPS.

8. Conclusions

We investigate the effects of public childcare provision on child maltreatment cases leading to child removal. For identification, we use an exogenous expansion of childcare places for children below age three in Germany. Our results suggest that the provision of childcare places reduced the number of child protection cases in a meaningful and significant way. We thus show that a large-scale public policy, even one that does not directly aim at preventing child

[45] We report the results of estimating equation (2).

maltreatment, can have beneficial side effects. This finding is both new and important, given that some scholars and child welfare organizations argue that only very intensive and focused interventions can prevent tragic incidences of child maltreatment.

For example, the charity Prevent Child Abuse America argues that home visiting, early childhood education, and parent education are the most effective interventions to prevent child neglect. They also advocate for mental health services for parents, ensuring access to affordable, quality health care for all children, and increasing efforts to alleviate social problems such as poverty, but Prevent Child Abuse America does not mention public childcare provision as an effective preventive policy.[46]

Our results further show that maltreatment reduction is strongest in families at risk of maltreatment, and those where a male adult is present. These findings strengthen the argument for further expanding publicly provided childcare and subsidizing access for low-income groups, who are at the highest risk of child maltreatment. However, because we find no effects for single-parent households, more intensive programs appear to remain important for preventing child maltreatment in these households.[47]

Finally, our results provide further legitimation for publicly provided childcare, as they show beneficial side effects of this policy. These side effects are fiscally relevant since child maltreatment not only causes extreme hardship for the victims, but also lead to enormous long-run fiscal costs for societies due to increased need for special education, impaired health, and higher welfare payments.

[46] See http://preventchildabuse.org/resource/preventing-child-neglect/ for details.
[47] Home visiting programs are the most prominent intensive early childhood intervention for preventing child abuse and neglect. These programs are expanding in both Europe and the U.S. (e.g., U.S. Department of Health and Human Services, 2015, Robling et al. 2016, Sandner et al. 2018).

For a back-of-the-envelope cost-benefit analysis, we assume societal costs of 90,000£ (111,600 US-$) per child maltreatment case. Conti et al. (2019) estimate these costs for the UK, which are lower than the costs calculated by Fang et al. (2012) for the U.S. but probably more comparable to Germany. Because our results show that the childcare expansion prevented about 12,000 cases of serious maltreatment, the expansion generated savings for German society of about $1.3 billion over the observation period.[48] These savings represent 38% of total federal investments in childcare expansion until 2015, which amounted to $3.64 billion (3.28 billion Euro). Therefore, preventing child maltreatment adds a substantial amount to other expected positive fiscal benefits of public childcare provision, such as tax revenues and social security contributions due to higher female employment and a better-educated workforce in the long-run.

[48] This estimate implicitly assumes that the decline in cases that we observe at ages 0 to <6 is persistent over time, in the sense that it is not compensated by increases at later ages. Our analysis of the dynamics of cases at older ages (not shown) suggests that this is in fact the case.

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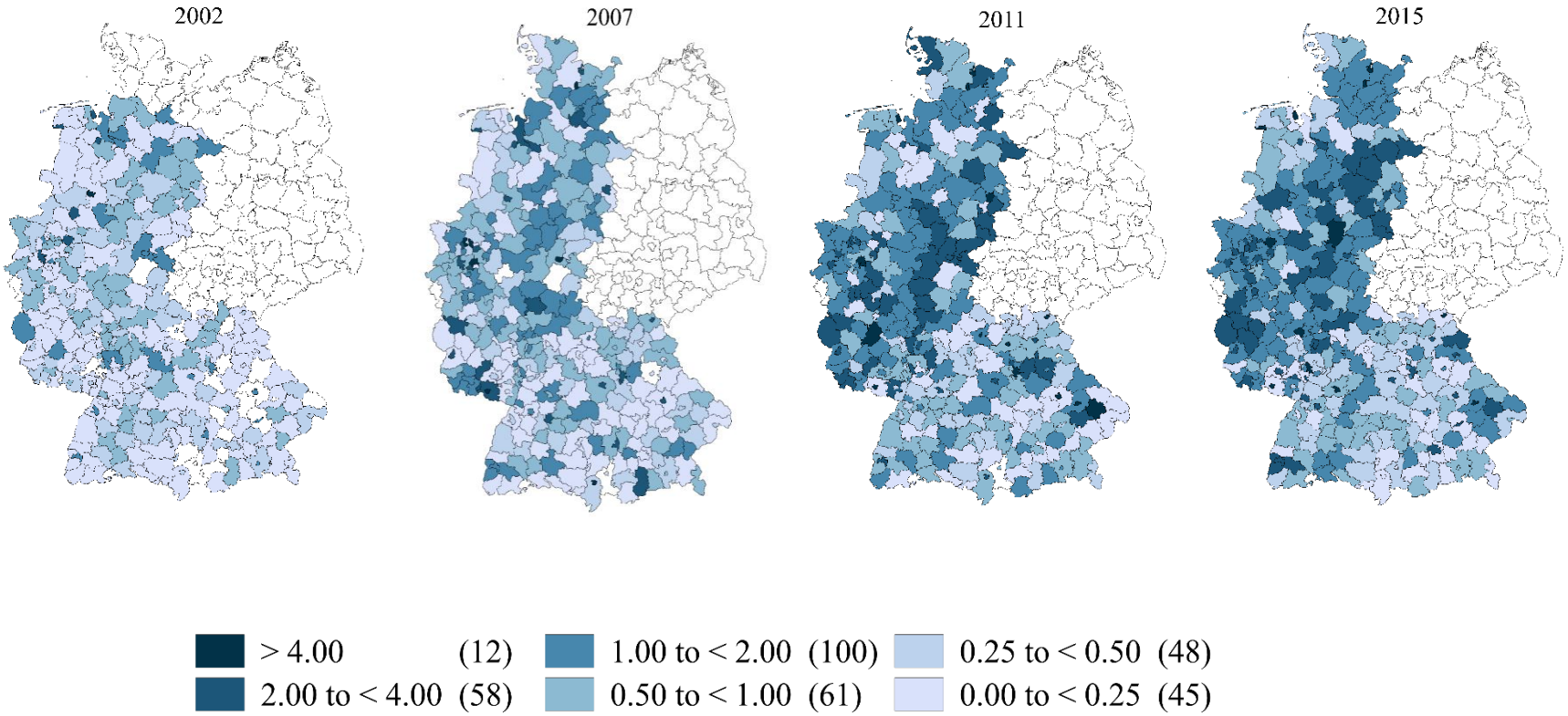
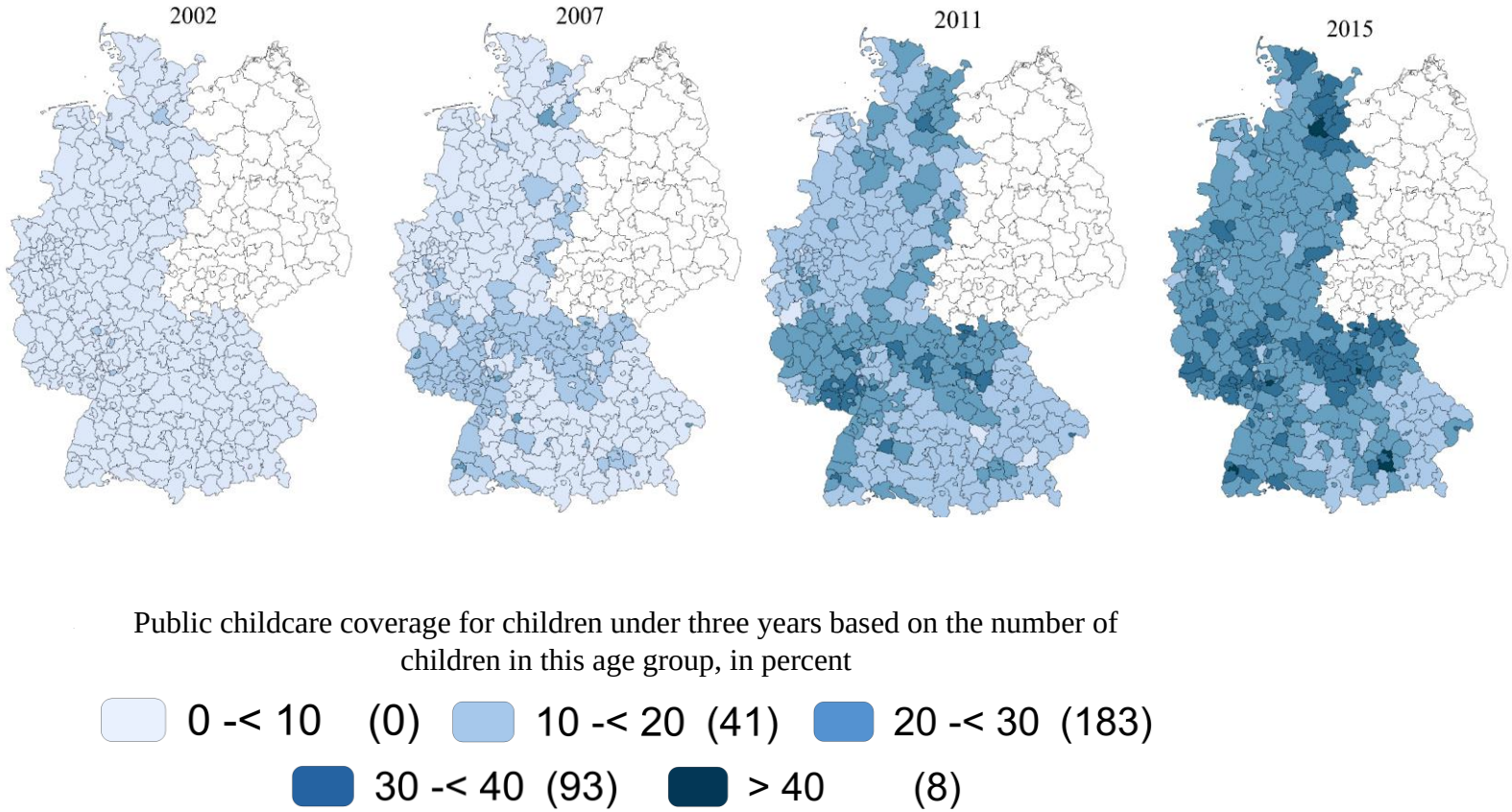
Figure 1: Child protection cases per 1,000 children by county in West Germany between 2002 and 2015.



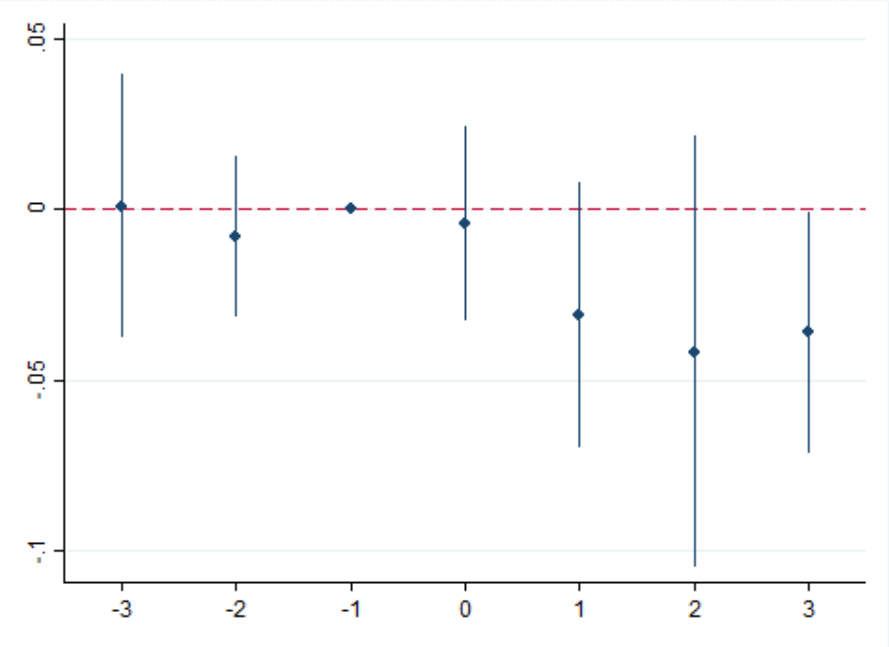
Notes: Data provided by the German Child and Youth Welfare Statistic on individual cases of child protection in a particular year on the county level of children under six years of age (per 1,000 children). Numbers in brackets refer to number of counties in each class in 2015. Calculations by the authors.

Figure 2: Childcare expansion by county in West Germany between 2002 and 2015.



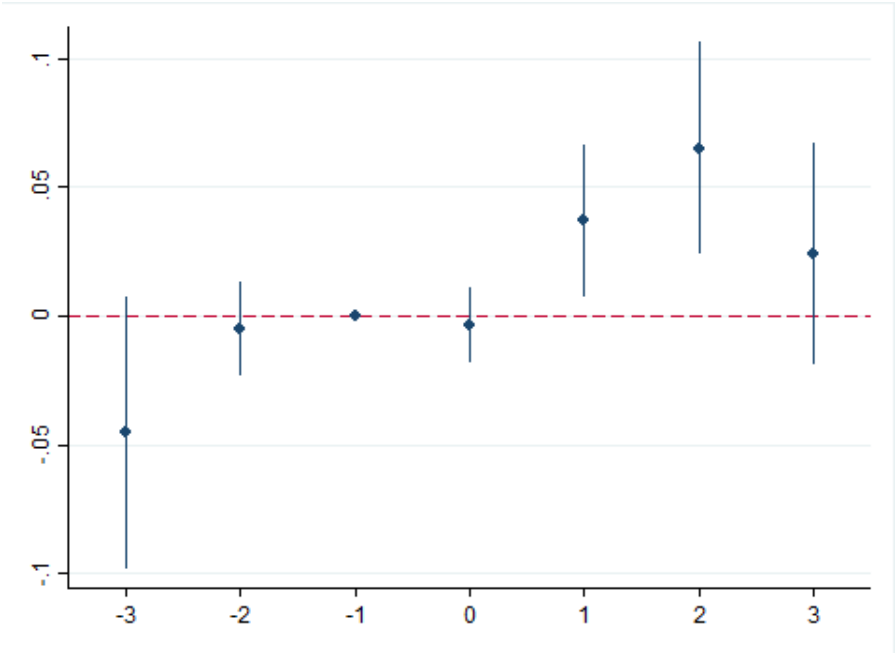
Notes: Data provided by the Statistical Offices of the German Laender on public childcare coverage for children under the age of three. Numbers in brackets refer to number of counties in each class in 2015. Calculations by the authors.

Figure 3. The effect of childcare expansion on child maltreatment: Leads and lags



Note: The figure displays coefficients and their 95% confidence intervals from a regression where the dependent variable is the number of child maltreatment cases per 1,000 children in a county, and the main explanatory variable is the year-to-year change in the childcare coverage rate, as well as its lags and leads (following Schmidheiny and Siegloch 2020) (the first lead is omitted the last lead and lag are binned). We also control for year and county fixed-effects. We use data on child maltreatment for years 2002 to 2015, and on childcare coverage for years 2002 to 2017. All observations are weighted by the county population of the age group (0 to under 6 years). Data are provided by the German child and youth welfare statistic. Standard errors are clustered at the county level.

Figure 4. The effect of childcare expansion on female employment rates: Leads and lags



Note: The figure displays coefficients and their 95% confidence intervals from a regression where the dependent variable is the female employment rate in a county, and the main explanatory variable is the year-to-year change in the childcare coverage rate, as well as its lags and leads (following Schmidheiny and Siegloch 2020) (the first lead is omitted the last lead and lag are binned). We also control for year and county fixed-effects. We use data on female employment for years 2002 to 2015, and on childcare coverage for years 2002 to 2017. All observations are weighted by the county population of the age group (0 to under 6 years). Standard errors are clustered at the county level.

Table 1. Descriptive statistics, cases of severe child maltreatment

Age group	(1) 0 to <6	(2) 0 to <3	(3) 3 to <6	(4) 6 to <12	(5) 12 to <18
Gender					
Male	0.53	0.53	0.55	0.54	0.40
Reason for the case					
Overburden of parents	0.37	0.40	0.33	0.34	0.37
Neglect	0.32	0.32	0.33	0.21	0.05
Abuse (incl.sexual)	0.11	0.09	0.13	0.20	0.12
Other	0.20	0.19	0.22	0.26	0.46
Living arrangements before the case					
Single parent	0.42	0.39	0.46	0.42	0.25
Both parents	0.33	0.34	0.30	0.27	0.28
Single parent with partner	0.12	0.09	0.15	0.2	0.18
Relatives, foster family, other	0.13	0.15	0.09	0.11	0.28
Case suggested by					
Youth Office	0.66	0.68	0.63	0.52	0.25
Parents	0.11	0.10	0.12	0.14	0.12
Police	0.11	0.09	0.13	0.14	0.21
Nursery/teacher	0.01	0.01	0.02	0.04	0.02
Medical system, relatives, other	0.11	0.12	0.09	0.17	0.40
Number of cases	48,234	29,447	18,787	41,176	226,099

Note: Cases of child maltreatment leading to child removal from the home (fraction in each category). Data provided by the German child and youth welfare statistic for the years 2002 to 2015.

Table 2. County correlates of childcare coverage rates

	(1) Childcare coverage 0 to <3	(2) Childcare coverage 0 to <3
Unemployment rate	-0.328**	-0.684***
	(0.147)	(0.135)
Female employment rate	0.590***	0.274
	(0.103)	(0.170)
Male employment rate	0.0862	-0.282**
	(0.0744)	(0.118)
Share of foreign population	-0.234***	-0.191
	(0.0768)	(0.133)
Share of school graduates	4.162**	0.854
	(2.055)	(1.230)
Share of school dropouts	-62.62***	1.172
	(7.927)	(4.001)
Share of population ages 0-6	-0.963	-0.528
	(0.618)	(0.509)
Share of population 6-18	-3.567***	0.231
	(0.322)	(0.376)
Observations	4,497	4,497
County fixed-effects	No	Yes
Year fixed-effects	No	Yes
Sample	2002-15	2002-15

Notes: The table reports coefficients from regressions of the childcare coverage rate on county characteristics. Each column reports the results from a different regression, where the dependent variable is always the childcare rate. We report the *p*-value for the hypothesis that the county characteristics are jointly equal to zero. All coefficients on shares refer to 1-percentage-point changes in these shares. The last 3 columns drop county-year observations with 0 or missing +cases of child maltreatment. Standard errors clustered at the county level are reported in parentheses. Statistical significance indicated by stars (* p<0.1, ** p<0.05, *** p<0.01).

Table 3. Effects of universal public childcare provision on child protection cases (log cases per 1,000 children)

Panel A	**Age 0 to <6**			**Age 12 to <18**		
	(1)	(2)	(3)	(4)	(5)	(6)
Effects of 1 pp. childcare expansion	-0.0102***	-0.0093***	-0.0088**	0.0017	-0.0014	0.0008
	(0.0034)	(0.0031)	(0.0035)	(0.0052)	(0.0052)	(0.0047)
Panel B	**Age 0 to <3**			**Age 3 to <6**		
	(1)	(2)	(4)	(5)	(6)	(7)
Effects of 1 pp. childcare expansion	-0.0115***	-0.0107***	-0.0101**	-0.0083***	-0.0072***	-0.0071**
	(0.0042)	(0.0038)	(0.0044)	(0.0028)	(0.0026)	(0.0029)
Economic controls	No	Yes	Yes	No	Yes	Yes
Education controls	No	No	Yes	No	No	Yes

Notes: The table reports coefficients from regressions of the log of child maltreatment cases per 1,000 children on childcare rate for years 2002 to 2015. All specifications include county and year fixed effects. Regional economic and educational factors include the variables shown in Table 2. All observations are weighted by the county population of the observed age group. Data are provided by the German child and youth welfare statistic. Standard errors reported in parentheses are clustered on the county level. The number of observations is 4,497, and there are 324 counties. Statistical significance indicated by asterisks (* p<0.1, ** p<0.05, *** p<0.01).

Table 4. Effects of universal public childcare provision on child protection cases - different model specifications

	(1)	(2)	(3)	(4)	(5)
Panel A			**Age 0 to <6**		
Effects of one pp. childcare expansion	-0.0102***	-0.0309***	-0.0197**	-0.00828**	-0.00903**
	(0.00339)	(0.00983)	(0.00821)	(0.00361)	(0.00386)
Panel B			**Age 0 to <3**		
Effects of one pp. childcare expansion	-0.0115***	-0.0396***	-0.0256**	-0.0102**	-0.0112**
	(0.00423)	(0.0137)	(0.0108)	(0.00441)	(0.00463)
Panel C			**Age 3 to <6**		
Effects of one pp. childcare expansion	-0.00831***	-0.0220***	-0.0136**	-0.00532*	-0.00586*
	(0.00281)	(0.00702)	(0.00678)	(0.00316)	(0.00347)
Observations	4,497	4,497	4,497	4,497	4,497
State trends	No	No	No	Yes	No
State-year fixed effects	No	No	No	No	Yes
Model	Baseline	Levels	No weights	Baseline	Baseline

Notes: The table reports coefficients from regressions of different specifications of equation (1). All specifications include county and year fixed effects. All observations are weighted by the county population of the observed age group (except for column 3). Standard errors reported in parentheses are clustered at the county level. The number of counties is 324. Statistical significance indicated by asterisks (* p<0.1, ** p<0.05, *** p<0.01).

Table 5. Effects of public childcare provision on female employment and divorce

	Female employment rate	Divorce rate
Effects of 1pp. childcare expansion	0.0572***	0.0268
	(0.0162)	(0.0385)
Average dep. var.	46.5	23.9
County-year observations	4,497	3,040
Number of counties	324	218

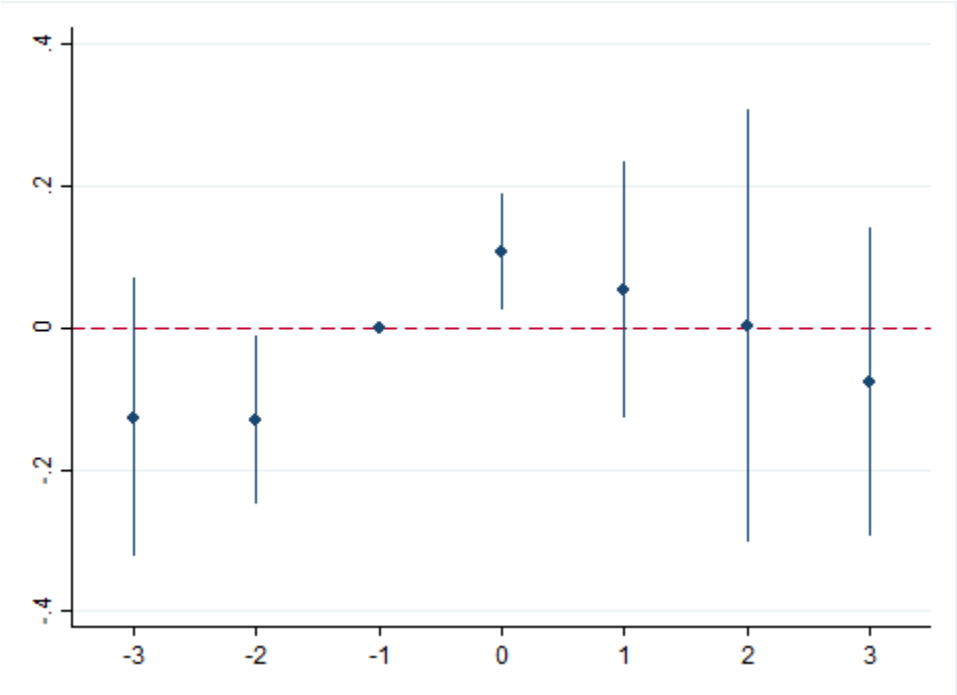
Notes: The table reports coefficients from regressions of equation (1), the female employment rate or the divorce rate in the county as the dependent variable. Estimations are based on fixed-effects panel regressions for years 2002 to 2015. All specifications include county and year fixed effects. All observations are weighted by county population age 0 to under 6 years. Standard errors reported in parentheses are clustered at the county level. Statistical significance is indicated by stars (* p<0.1, ** p<0.05, *** p<0.01)

Table 6. Effects of childcare coverage on child protection cases for subgroups (age 0 to under 6 years)

Panel A. Who reported the case	*Youth Office (0.66)*	*Parents (0.11)*	*Police (0.11)*	*Nursery (0.01)*
Effects of 1 pp. childcare exp.	-0.0109***	-0.00161	-0.000028	-0.000221
	(0.00331)	(0.00112)	(0.000894)	(0.000236)
Panel B. Living arrangements	*Single (0.42)*	*Both parents (0.33)*	*Single w/ partner (0.12)*	
Effects of 1 pp. childcare exp.	-0.00393	-0.00643***	-0.00335**	
	(0.00257)	(0.00180)	(0.00134)	
Panel C. Reason for the case	*Abuse (0.11)*	*Neglect (0.32)*	*Overburden (0.37)*	
Effects of 1 pp. childcare exp.	-0.00320***	-0.00520***	-0.00576**	
	(0.000933)	(0.00192)	(0.00240)	
Panel D. Gender of the child	*Boy (0.53)*	*Girl (0.47)*		
Effects of 1 pp. childcare exp.	-0.00616**	-0.00926***		
	(0.00248)	(0.00254)		
Panel E. Population density	*Rural*	*Urban*		
Effects of 1 pp. childcare exp.	0.000434	-0.0186***		
	(0.00392)	(0.00466)		
Panel F. By duration	*Below median*	*Above median*		
Effects of 1 pp. childcare exp.	-0.00615**	-0.0101*		
	(0.00277)	(0.00545)		

Notes: The table reports coefficients from regressions of equation (1) with log cases per 1,000 children in the specific category as dependent variable. We report in parentheses the fraction of all cases belonging to each category. Estimations are based on panel regressions for years 2002 to 2015. The number of observations is always 4,497. All specifications include county and year fixed effects. All observations are weighted by county population age 0 to under 6 years. Standard errors reported in parentheses are clustered on the county level and are robust. Statistical significance indicated by stars (* p<0.1, ** p<0.05, *** p<0.01).

Appendix Figure 1. The effect of childcare expansion on cases under surveillance: Leads and lags



Note: The figure displays coefficients and their 95% confidence intervals from a regression where the dependent variable is the number of households under surveillance by child protection per 1,000 children in a county, and the main explanatory variable is the year-to-year change in the childcare coverage rate, as well as its lags and leads (following Schmidheiny and Siegloch 2020) (the first lead is omitted the last lead and lag are binned). We also control for year and county fixed-effects. We use data on child maltreatment for years 2002 to 2015, and on childcare coverage for years 2002 to 2017. All observations are weighted by the county population of the age group (0-6). Data are provided by the German child and youth welfare statistic. Standard errors are clustered at the county level.

Appendix Table 1: Cases of child protection leading to out-of-home placement and surveillance inflows by year

Year	Cases of child removal, age<6	Cases of child removal, age<3	Surveillance inflows, age<6	Surveillance inflows, age<3
2002	1,913	1,131	6,718	4,242
2003	1,976	1,206	6,902	4,530
2004	2,023	1,202	8,451	5,209
2005	2,126	1,223	8,968	5,633
2006	2,536	1,487	9,966	6,252
2007	3,013	1,783	13,234	8,370
2008	3,830	2,271	16,649	10,457
2009	3,894	2,359	17,538	11,187
2010	4,016	2,427	17,767	11,223
2011	4,272	2,632	17,981	11,406
2012	4,533	2,803	18,133	11,320
2013	4,494	2,875	18,576	11,511
2014	4,708	2,971	19,476	12,083
2015	4,900	3,077	18,309	11,520
All years	48,234	29,447	198,668	124,943

Notes: Data provided by the German Child and Youth Welfare Statistic on absolute individual cases of child protection in a particular year on the county level of children under six years of age. Calculations by the authors. Cases of counties with missing data are imputed by the average cases per county within the state and the specific year.

Appendix Table 2: Average cases of child protection leading to out-of-home placement, ages <6 and between 12 and <18

		Average cases per 1000 children			
		Age: <6		Age: between 12 and <18	
Year	Counties	Mean	S.D.	Mean	S.D.
2002	286	0.501	0.753	1.873	2.365
2003	296	0.501	0.657	1.815	2.331
2004	311	0.534	0.672	1.832	2.377
2005	317	0.547	0.691	1.893	2.441
2006	316	0.690	0.877	1.927	2.400
2007	319	0.872	1.122	2.096	3.091
2008	322	1.089	1.179	2.437	2.717
2009	322	1.123	1.077	2.554	3.076
2010	319	1.198	1.223	2.707	2.866
2011	321	1.319	1.348	2.813	2.837
2012	321	1.252	1.191	2.970	3.078
2013	323	1.289	1.223	2.957	2.932
2014	323	1.317	1.261	3.063	3.307
2015	324	1.361	1.394	2.930	2.774
All years	4,420	0.980	1.132	2.430	2.817

Notes: Data provided by the German Child and Youth Welfare Statistic on absolute individual cases of child protection in a particular year on the county level of children under six years of age and for children between six and under twelve years of age. Calculations by the authors.

Appendix Table 3. Descriptive statistics, number of cases under surveillance by child protection services

Age group	(1) Age: 0 to <6	(2) Age: 0 to <3	(3) Age: 3 to <6	(4) Age: 6 to <12	(5) Age: 12 to <18
Panel A. Stock count					
Living arrangement before the case					
Single parent	0.36	0.39	0.32	0.28	0.26
Both parents	0.44	0.41	0.49	0.50	0.46
Single parent with partner	0.13	0.12	0.13	0.15	0.16
Relatives, foster family, other	0.07	0.08	0.06	0.07	0.12
Number of Cases	456,407	290,018	166,389	240,307	118,701
Panel B. Inflow count					
Living arrangement before the case					
Single parent	0.36	0.39	0.32	0.28	0.26
Both parents	0.44	0.41	0.48	0.50	0.45
Single parent with partner	0.12	0.12	0.13	0.15	0.16
Relatives, foster family, other	0.08	0.09	0.07	0.07	0.12
Number of Cases	198,668	124,943	73,725	103,534	60,032

Note: Data provided by the German child and youth welfare statistic for the years 2002 to 2015.

Appendix Table 4: Childcare coverage over time (under 3 years of age).

Year	Counties	Mean	S.D.	Min	Max
2002	324	0.022	0.023	0.000	0.130
2006	324	0.073	0.038	0.010	0.233
2007	324	0.094	0.044	0.022	0.284
2008	324	0.118	0.047	0.034	0.340
2009	324	0.142	0.049	0.036	0.344
2010	324	0.171	0.053	0.071	0.360
2011	324	0.200	0.060	0.092	0.378
2012	324	0.222	0.059	0.110	0.392
2013	324	0.242	0.060	0.113	0.432
2014	324	0.270	0.058	0.139	0.469
2015	324	0.274	0.058	0.136	0.472

Note: Data provided by the German Child and Youth Welfare Statistic. The figures show mean childcare coverage rates across West German counties as well as standard deviations, median, minimum, and maximum values. All information is provided for the years 2002 and 2006 to 2015. Calculations by the authors.

Appendix Table 5: Childcare utilization by family characteristics

	2005	2010	2015
All households	7.1	18.0	28.2
Two-parent households	7.0	17.9	27.9
Single-parent households	10.0	50.0	66.7
Households receiving welfare	4.9	12.4	24.3
Households not on welfare	7.3	19.0	29.0
Immigrant households	3.4	15.0	25.8
Non-immigrant households	8.0	19.0	30.3
Father employed	6.9	18.9	29.4
Father unemployed	8.7	11.4	20.2
Number of households	*439*	*1,870*	*847*

Notes: The results come from the German Socio-Economic Panel Study (SOEP) for the years 2005, 2010, and 2015. The sample includes all households with children below 3 years of age in West Germany. "Father" includes both biological fathers of the child and male partners of the mother of the child. Figures in percent (except numbers of households).

Appendix Table 6. Effects for subgroups (age under 3 years)

Panel A. Who reported the case	*Youth Office*	*Parents*	*Police*	*Nursery*
Effects of 1 pp. childcare	-0.0127***	-0.000239	-0.000641	-0.000539
	(0.00403)	(0.00140)	(0.00107)	(0.000327)
Panel B. Living arrangement	*Single*	*Both parents*	*Single w/*	
Effects of 1 pp. childcare	-0.00394	-0.00881***	-0.00284*	
	(0.00314)	(0.00242)	(0.00146)	
Panel C. Reason for the case	*Abuse*	*Neglect*	*Overburden*	
Effects of 1 pp. childcare	-0.00292***	-0.00657***	-0.00670**	
	(0.00103)	(0.00234)	(0.00322)	
Panel D. Gender of the child	*Boy*	*Girl*		
Effects of 1 pp. childcare	-0.00762**	-0.0102***		
	(0.00330)	(0.00317)		
Panel E. Population density	*Rural*	*Urban*		
Effects of 1 pp. childcare	-0.00141	-0.0199***		
	(0.00482)	(0.00578)		
Panel F. By duration	*Below median*	*Above*		
Effects of 1 pp. childcare	-0.00847**	-0.0108		
	(0.00330)	(0.00673)		

Notes: The table reports coefficients from regressions of equation (1) with log cases per 1,000 children in the specific category as dependent variable. Estimations are based on fixed-effects panel regressions for years 2002 to 2015. All specifications include county and year fixed effects. All observations are weighted by county population age 0 to under 3 years. Standard errors reported in parentheses are clustered on the county level. Statistical significance indicated by stars (* p<0.1, ** p<0.05, *** p<0.01).

Appendix Table 7. Effects of universal public childcare provision on cases under surveillance (log cases per 1,000 children).

6.1 Stock of cases

Panel A	**Age 0 to <6 years**			**Age 12 to <18**		
	(1)	(2)	(3)	(4)	(5)	(6)
Effects of 1 pp. childcare	0.00635	0.00142	0.00142	0.00272	-0.00237	-0.00261
	(0.00555)	(0.00516)	(0.00516)	(0.00591)	(0.00569)	(0.00561)
Panel B	**Age 0 to <3**			**Age 3 to <6**		
	(1)	(2)	(4)	(5)	(6)	(7)
Effects of 1 pp. childcare	0.00697	0.00133	0.00178	0.00614	0.00064	0.00148
	(0.00601)	(0.00562)	(0.00556)	(0.00531)	(0.00498)	(0.00501)
Economic controls	No	Yes	Yes	No	Yes	Yes
Educ controls	No	No	Yes	No	No	Yes

6.2 Inflow (new cases)

Panel A	**Age 0 to <6**			**Age 12 to <18**		
	(1)	(2)	(3)	(4)	(5)	(6)
Effects of 1 pp. childcare	0.00428	0.00042	0.00042	0.00334	-0.00023	-0.00029
	(0.00511)	(0.00478)	(0.00478)	(0.00504)	(0.00483)	(0.00476)
Panel B	**Age 0 to <3**			**Age 3 to <6**		
	(1)	(2)	(4)	(5)	(6)	(7)
Effects of 1 pp. childcare	0.00391	-0.00095	-0.00032	0.00490	0.00056	0.00155
	(0.00555)	(0.00506)	(0.00516)	(0.00481)	(0.00448)	(0.00459)
Economic controls	No	Yes	Yes	No	Yes	Yes
Educ controls	No	No	Yes	No	No	Yes

Notes: The table reports coefficients from regressions of the log of child maltreatment cases per 1,000 children on the childcare coverage rate for 2002 to 2015. All specifications include county and year fixed effects. The number of county-year observations is 4,200, and the number of counties is 324. Regional economic and educational factors include the variables shown in Table 2. All observations are weighted by the county population of the observed age group using analytic weights. Data are provided by the German child and youth welfare statistic. Robust standard errors reported in parentheses are clustered at the county level. Statistical significance indicated by stars (* p<0.1, ** p<0.05, *** p<0.01).