Preventing Child Maltreatment: Beneficial Side Effects of Public Childcare Provision

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Abstract: We investigate the impact of public childcare provision on the incidence of 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 led to a decline of 1.8% in child maltreatment cases. 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 2000's, 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 (detected) child maltreatment cases in the county. 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, all of 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. For example, 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 (e.g., Cunha et al. 2006; Cunha and Heckman 2007), child maltreatment – particularly at the beginning of life – leads to lifelong suffering in terms of psychosocial and health problems 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 (e.g., Ammerman et al. 1986, Hildyard and Wolfe 2002, and 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. (2017) 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 mostly include intensive at-home consulting for disadvantaged families, with the goal of reducing caregivers' abusive and neglectful parenting behaviors (see summaries of the results in Doyle & Aizer 2018, Levey et al. 2017, or 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 therefore less stigmatizing. Although public childcare does not directly focus on reducing child maltreatment, it may influence the risk of child maltreatment because it may change care quality, parental employment, the time that children spend with inadequate caregivers, and the behavior of inadequate caregivers. However, 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 the provision of universal childcare can reduce child maltreatment.

This study is the first to investigate the effects of childcare availability on reported cases of child maltreatment. Our measure for child maltreatment comes from unique high-quality

[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).

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 places were available for less than 3% of children, by 2015, the reform had initiated a 25% increase in childcare availability in West Germany. We use the plausibly exogenous variation in the speed and level of the expansion across counties and over time, as well as differences in the starting points, in 324 West German counties. Following Berlinski et al. (2009), Havnes and Mogstad (2011), and Bauernschuster et al. (2016), we apply 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.

Our results show that a one-percentage-point increase in the availability of childcare reduces maltreatment cases for children below age six by approximately 1.8%. This figure suggests that the expansion avoided approximately 20,000 maltreatment cases in our observation period of 2002-2015, compared with a scenario of no childcare expansion. Due to potentially significant unreported cases of child maltreatment, we can interpret our results as lower-bound estimates. As the increase in childcare facilities may have increased the detection of child maltreatment cases (Fitzpatrick et al. 2020, Baron et al. 2020), this higher detection would have led to more – rather than fewer – cases in the official reporting statistics.

We conduct an event-study analysis that allows us to show that counties with different childcare expansion trajectories were on parallel trends in child maltreatment rates before the policy change. Our robustness checks also show that our results are maintained across various

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

alternative specifications and for 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 the structure or organization of local child protective services (CPS) in response to the childcare expansion may have influenced the incidence of maltreatment.[4]

We believe our results acquired particular relevance in 2020, when many countries have 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.[5] 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, which likely increased maternal earnings and women's bargaining power in the household. Second, we find that the strongest reduction occurs in households in which a male partner or husband is present, while childcare expansion has 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 the CPS. Finally, we find that the reduction concentrates on child protection cases that are initiated because of abuse and neglect. Child protection cases that are initiated because of parental overburden are not affected. These findings suggest that the substitution of inadequate informal childcare (by men) in

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

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

families at risk constitutes the main channel for the reduction in child maltreatment cases. This explanation is in line with Lindo et al. (2018), who demonstrate that cases of child maltreatment increase if men, as a main source of informal childcare, spend more time with children.

Our setting is particularly suitable for this analysis for the following three reasons. First, several studies investigating other outcomes of the German childcare expansion, such as child development or fertility, show that the variation in the expansion was independent of county characteristics (e.g., Bauernschuster et al. 2016; Felfe and Lalive 2018). This is supported by our own analysis. Therefore, the daycare expansion for children below age three provides a natural experiment enabling us to identify causal effects. Second, childcare fees are means-tested and depend on available household income. Free childcare is provided for low-income and welfare-receiving families, who are at the highest risk of child maltreatment (e.g., McLoyd, 1990; Paxson and Waldfogel, 2002). Therefore, self-selection due to budgetary constraints is not very likely, particularly for families at risk. Indeed, 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. Therefore, no state or county can deviate from it by creating child protection legislation that correlates (intentionally or not) with childcare availability.

Because our paper is the first to analyze the effects of expanding public childcare for young children on child maltreatment, 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 to intensive programs, using universal childcare does not stigmatize families at risk and therefore leads to a much higher take-up rate among these families. The effect of a reduction in child maltreatment thus strengthens 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, the results of this study can influence the discussion in the U.S., where no nationwide universal preschool or early childcare programs are available but where the Obama administration's *Zero to Five* plan, which the Trump administration largely continued, aimed to create similar initiatives.

Second, because maltreatment has strong detrimental effects on children's cognitive and noncognitive 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 (e.g., Drange and Havnes 2019, Bitler et al. 2015, Peter et al. 2016, Kottelenberg and Lehrer 2017, Felfe and Lalive 2018).[6]

Because child maltreatment occurs more frequently in more disadvantaged families, our study presents a channel through which childcare positively affects child development therein. Our results indicate that childcare utilization has a positive impact on development, not only through the increased provision of stimulating nurseries or peers, as many scholars suggest (e.g., 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 relationships

[6] 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).

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). These studies rely mostly on correlations or have weaknesses in their measures of child maltreatment. However, two recent studies have used small-area time variation and administrative data for identification. For the U.S., Brown and DeCao (2018) find that high unemployment rates increase child neglect. 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 make an important contribution to these findings by showing that the provision of public childcare creates an opportunity to attenuate the consequences of economic hardship, unemployment and, in particular, 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 explains 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 presented in section 6, followed by an analysis of potential mechanisms in section 7. Section 8 discusses the results, policy implications and conclusions.

2. Theoretical Considerations of 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 increasing parental skills or reducing child maltreatment, it has the potential to reduce child maltreatment through various channels. To illustrate these channels, we discuss the two most likely reactions of families when more childcare placements become available: switching from home care (where the mother is the main caregiver) to childcare, or

from informal care (e.g., where nannies, the father or partner of the mother, or other relatives are the main caregivers) to childcare.[7]

For those families who substitute informal with formal childcare, the quality of care is likely to increase as children will spend less time with potentially inadequate caregivers. This is particularly true for Germany, as the law sets high quality standards for public childcare.[8] This higher quality may prevent child maltreatment. In line with this explanation, 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, mothers 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.

Given the low childcare fees in Germany, an expansion of maternal labor supply with an accompanied switch from home 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. Moreover, higher employment may 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. However, Paxon and Waldfogel (2002) also discuss potential negative effects of maternal employment, 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)

[7] Informal care includes nannies, fathers, grandparents, partners, older siblings, friends and, in the worst case, the child being left alone. Leaving a small child alone is a direct form of neglect.
[8] The higher quality of formal childcare, compared with informal childcare, is also documented in Datta Gupta and Simonsen (2010), Herbst (2013), and Gathmann and Sass (2018).

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 available 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 a separation from a potential male perpetrator, or a change 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.[9] 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 and, in turn, prevent maltreatment. Additionally, in allocating places in childcare, CPS may focus particularly on families at risk, be it to relieve

[9] 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.

their stress, to monitor them (which may change the behavior of a potential perpetrator), or to obtain access to the families to connect them with other intensive early childhood interventions. Overall, these measures may reduce the number of child maltreatment cases.

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

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 as a proxy for child maltreatment. Our data source is the German Child and Youth Welfare Statistics (*Deutsche Kinder- und Jugendhilfe Statistik),* which contains all individual cases of child protection 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 case 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, CPS is organized at the county level and is in charge of initiating child protection cases. The local CPS becomes active if the situation in a family – which is often already under the observation of the local CPS – becomes critical for the child. A CPS worker then decides whether a persistent danger to the child's well-being exists. If so, the CPS places the child outside the family.[10] 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 an extreme case, a long-term foster care placement (see Petermann et al. 2014 for details on legal regulation).

For several reasons, our measure of child maltreatment – the number of child protection cases – is a very reliable proxy for the overall incidence of child maltreatment. First, in each reported child protection case, 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, although an unknown rate of unreported cases remains, for serious cases, this rate is likely to be lower than for less serious cases. For this reason, it is unlikely that the detection rate differs systematically by county. Third, the rules for a child protection case in Germany are defined at the federal level in the German Social Code Book (*Sozialgesetzbuch*). 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 definitions of child maltreatment.

[10] A family judge becomes involved only if parents disagree with the initiation of a child protection case.

For each child protection case, the data include the age – categorized into seven age groups – of the protected child.[11] In addition to the age of the child, the year, and the county, the data provide the reason for the incidence, 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 4,420 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, 48,757 child protection cases were initiated for children under age 6 from 2002 to 2015. (For total numbers per year see Appendix I.) The most frequent reasons[12] were overburden of the parents (37%), child neglect (36%) and child abuse (12%). The most frequent household situation in which a maltreated child lived is a single parent household (41%), followed by a nuclear family (33%), a biological parent with a new partner (13%), and other household arrangements (12%). The local CPS reported most of the cases (67%). Parents who seek help by themselves (11%) and police (10%) are the second most frequent reporting sources. Nurseries account for only a small number of reports (1%).

< Figure 1 about here >

The maps in Figure 1 show the development of child protection cases per 1,000 children 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 II

[11] Age is separated in the following seven age groups: below 3, 3 to 6, 6 to 9, 9 to 12, 12 to 14, 14 to 16, and 16 to 18.

[12] The reported reasons are not mutually exclusive and multiple assignments are possible but rarely the case. In the analysis below we impose the following ordering: overburden < neglect < abuse, and use the reason with the highest rank.

for details). The overall increase in reporting may reflect a number of additional causes, including better overall awareness of child well-being[13] (Witt et al. 2017) and prominent cases of child abuse in Germany (and worldwide) in the mid-2000s that received major media attention.[14] The very low overall report rate from nurseries suggests (see Table 1) that increased reports by nurseries due to higher exposure to public childcare do not appear to be the main cause for the increase in child maltreatment cases.

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.[15] 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.[16]

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

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

[14] 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).

[15] 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.

[16] 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.

on support for children,[17] 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[18] to obtain information on public 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. Figure 2 shows the county-level coverage rates for all years from 2002 and 2006 to 2015.

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%). Nonetheless, the maps further show considerable variation in the expansion across counties – even within the same state. Bauernschuster et al. (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 >

A further implication of Figure 2 is that we observe a shift to the right of the entire distribution of childcare coverage. However, no convergence process between counties exists (see also Bauernschuster et al. 2016). Instead, the standard deviation of coverage rates steadily increased from 2002 to 2015 (see Appendix III for details), likely due to different expansion

[17] *Kinderförderungsgesetz.*
[18] *Statistische Landesämter.*

patterns across counties (some have expanded very slowly, others very rapidly). Some counties have 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 very 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 many complex and intertwined decisions by municipality, county, and state authorities. On the one hand, 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. On the other hand, 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 (e.g., 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, serious 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 and shocks to the local supply of new childcare places – shocks resulting from lengthy and intricate administrative processes and rules (e.g., 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 (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. In addition, these families are on a priority list for receiving a place in childcare. The waiving of fees for welfare-dependent families and the preferred placement allocation they receive are both independent of employment status.

5. Empirical Approach

To identify the effects of universal public childcare provision on child protection cases, we follow the empirical approach applied 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 approach estimates 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.

This generalized model can be specified as follows:

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

where y_{ct} is the logarithm of the number of child protection cases per 1,000 children in county *c* at time *t,* and $treat\_cr_{ct}$ 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.[19] $\boldsymbol{X'}_{ct}$ 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 because 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. Therefore, the expansion also affects children older than three, and we consider this by estimating the effects on children in the larger age bracket.

Since we are controlling for county fixed effects, the public childcare expansion need not be orthogonal to time-constant county characteristics. Several other studies have shown that the German childcare expansion is exogenous to time-varying county characteristics (see Felfe and Lalive 2018 and Bauernschuster et al. 2016 for the expansion considered in this study, Cornelissen et al. 2018 for the childcare expansion for children aged three to six years). Nevertheless, we test whether time-varying county characteristics correlate with both the childcare expansion and child protection cases, and we include them as controls in the regressions.

[19] To accommodate for county-year cells with zero observations, we add one case to each cell.

As measures of a county's economic and demographic characteristics in each year, we consider the overall unemployment rate, male and female employment rates,[20] and the share of foreign population. In addition, we consider the annual percentage of school dropouts and the percentage of school graduates with a high school degree (*Abitur*) as proxies of low- and high-skill population rates. Finally, we include the annual share of the population below 6 years and the share of the population between 6 and 18 years, to control for changes in the population's composition related to the childcare expansion.

The identifying assumption is that, conditional on county fixed-effects and the 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. We run regressions both with and without the set of county-specific time-varying covariates to investigate the robustness of the estimated effects.

One possible 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 protective service initiates fewer cases, even though the rate of parents who maltreat 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. With this placebo estimation, we can test whether the CPS changed its procedure in response to the childcare expansion, or whether time variant characteristics change according to the expansion. As the

[20] Employment subject to social security contributions, which excludes marginal employment below an income threshold of a monthly salary of 450 Euro.

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 for the validity of our approach.

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

Finally, it is important to note that we interpret our estimation results as lower-bound estimates of the corresponding effects. Because the issue of child maltreatment is subject to a large number of unreported cases (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 addition to its positive effects on parental behavior. A higher probability of detection in treated counties would therefore reduce the expected positive effect in terms of a lower number of child protection cases due to public childcare provision.

6. Empirical Results

Before turning to the estimation results for our main groups, we test for the exogeneity of the timing of childcare slots' creation across counties. To do so, we regress the childcare coverage rates on sociodemographic characteristics (see Table 2). In the first two columns we use the full sample (with non-missing data in childcare coverage and the controls), while in the last two columns we restrict to county-year cells with non-missing child maltreatment cases.

The first and third columns do not include county or year fixed-effects. Childcare coverage was higher in counties with lower unemployment rates, higher female employment, and with a lower share of children in the population. The second and fourth columns show the results when we include county and year fixed-effects. The covariates are no longer jointly significant. In line with previous research and our argumentation above, these estimates demonstrate that changes in the county sociodemographic characteristics are not significantly correlated with the childcare expansion. Hence, the results in Table 2 support our identifying assumption that both the intensity and timing of new childcare slot creation are plausibly exogenous.[21]

< Table 2 about here >

Table 3 presents our main estimation results for different age groups. Panel A shows the results for children from age group 0 to 6 and for children from age group 12 to 18. Panel B separates children 0 to 6, in 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 logarithm of child protection cases per 1,000 children. Column 1 shows the results without time-varying county characteristics, while Column 2 additionally includes socioeconomic characteristics and Column 3 also includes educational and population county characteristics.

< 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 1.8%. The results in Columns 2 and 3 are very similar in size and significance, confirming that the childcare expansion was exogenous to our time-varying county characteristics. Columns 4, 5, and 6 of Panel A present the corresponding results for the older children. For this older age group, the

[21] 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.

coefficients are insignificant and close to zero. The pattern of the estimates is robust, independent of whether we consider time-varying county characteristics in the regression model. The results 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 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 results are of similar size for children in the age group 0 to 3 years and in the age group 3 to below 6 years. Again, the results are robust independently of whether we take time-varying county characteristics into consideration or not. The results for both age groups are similar in size. This could be due to some delay in the effects, or to spillover effects between siblings, such that a child below three years attending early childcare may affect the whole family. Because the expansion affects all children below six years, we continue presenting the pooled results for children in the age group 0 to 6.

To investigate the robustness of our main results presented in Table 3, we estimate a number of additional model specifications, shown in Table 4. First, we use the number of cases per 1,000 children as the dependent variable instead of its log (Column 1). The results show that a one-percentage-point increase in childcare significantly reduces child maltreatment by 0.03 cases per 1,000 children, which corresponds to an effect size of 2.7%. We can thus show that the results are not sensitive to counties with zero cases or the distributional form of the dependent variable.

< Table 4 about here >

Second, to maintain the log nature of our outcome of interest but avoid the linearity assumption, we estimate equation 1 with a Poisson model. By doing so, we take account of the count nature of our data and require the specification of the conditional mean only (Wooldridge

1999). Columns 2 shows the results from the Poisson model, which are very close to the main specification.

Third, although in Germany legislation for child protection comes from the federal level, we consider state-year fixed effects as an additional robustness test (Column 3). We do so because legislation 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.

Fourth, in addition to the county and year fixed effects, we include linear and quadratic time-state trends. These trend-interactions (Column 4) allow states to follow specific trends and should support the validity that maltreatment trends would be the same in states in the absence of childcare expansion. The main result is robust to the inclusion of state trends.

Finally, specifications (5) and (6) consider the development of treatment effects over time. Column 5 considers the effect of public childcare provision on the log of child protection cases in the following year (lag specification). The corresponding coefficient estimate shows a lasting effect, reducing the number of child protection cases in the following period. Column 6 provides a simple test on potentially reversed causality, i.e., that the number of child protection cases may have forced a stronger expansion of public childcare provision. This does not seem to be the case, as the small and insignificant coefficient estimate implies.

< Figure 3 about here >

We strengthen these results further by estimating a full event-study specification (following Schmidheiny and Siegloch 2020) that includes a set of three leads and three lags for childcare

expansion in the county.[22] The results are displayed in Figure 3 (specification in levels). The coefficients on the leads are small and statistically indistinguishable from zero. This supports our identifying assumption, as we find no evidence of pre-existing differential trends that are correlated with the treatment. We find large and 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.

Overall, the main empirical results are robust to different specifications: A one percentage-point increase in childcare places leads to a reduction of about 1.8% 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, 45% 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 20,625 more 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 it reduces time in inadequate care. Third, it may improve the bargain position of mothers. Fourth, it may reduce overburden if parents' leisure time increases, and finally, it may give state

[22] In order to increase the number of periods included in this specification, we extend our data set with information on childcare slots up to 2017, and impute childcare coverage in 2003 and 2004 using linear interpolation.

authorities the opportunity to monitor families at risk, which may change the behavior of potential perpetrators.

7.1 Descriptive evidence from GSOEP

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 IV shows the fraction of households using formal childcare in 2005, 2010 and 2015, according to the German Socio-Economic Panel (SOEP). The sample includes all households with children under age 3.

Overall, only 9% of households reported that their child attended formal childcare in 2005. This fraction reached almost 34% in 2015. The increase in utilization was more pronounced among single-parent families, reaching almost 40% in 2015 (versus 31.5% 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 over time. By 2015, 38% of welfare-receiving households made use of formal daycare, compared with 33% of non-welfare recipients. Utilization was 36% among immigrant households, versus 31% in native families.

The descriptive evidence presented here suggests that lower SES households (single parents, welfare recipients, immigrants) were more 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).

The dependent variable is the female employment rate in a county and year, while 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 (2019) also find positive effects of childcare reform on mothers' labor supply.

Figure 4 shows the results from an event-study analysis with three leads and three lags. 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. The employment elasticity that we document is however smaller than one, suggesting that not all mothers who accessed childcare expanded their labor supply.

< Table 5 and Figure 4 about here >

7.3 Heterogeneous effects

To examine the remaining potential channels, Table 6 presents the effects of childcare expansion separately for different characteristics (reporting source, family situation, type of maltreatment, and gender) of maltreatment cases. ***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 serious maltreatment case occurred. This observation 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; relatedly, 39% of these families received welfare benefits in 2018 (Destatis, 2019).[23]

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. If parents or police report the case, it is unlikely that the CPS observed the parents already, or they would have made the report. 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 cases reported by the CPS decrease most strongly (2.6% by a one-percentage-point childcare increase), while we do not observe 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. Finally, nurseries do not report more cases in regions with larger expansions, indicating that in this setting, more childcare utilization does not increase the reporting of maltreatment.

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)[24] in which maltreatment cases occur. While the childcare expansion has no significant effect on single-parent households, cases of maltreatment decrease

[23] Data on the characteristics and the numbers of families under observation of the CPS are only available for recent years.

[24] 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.

significantly in households where an adult male is present, with the strongest decrease in households where the mother lives with a new partner.[25] This finding indicates that the presence of a male adult in the household plays an important role in why childcare reduces child maltreatment.

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 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.

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 if a male is present in the household. 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.

From this argumentation, also the answer follows why childcare expansion has only small effects on mostly female-headed single-parent households. In single-parent households, childcare mostly substitutes maternal care. It appears that this substitution has only small effects

[25] 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).

on child maltreatment. An alternative explanation for the small effects for single parents might be lower childcare utilization by single parents than by nuclear families. However, Appendix IV shows that single parents are in fact more likely to use childcare for children below three 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 cases initiated because of child abuse and neglect, while we find no significant decrease in cases initiated because of overburden. 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. Therefore, the reduction in abuse and neglect as the main driver also points to the direction in which inadequate care is reduced.

Finally, ***Panel D*** shows that the expansion affects maltreatment cases of ***girls*** somewhat more than boys. Nevertheless, the effects are significant for both genders.

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 in families at risk, reduced time in inadequate care with a potential male perpetrator 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.

8. Conclusions

We investigate the effects of public childcare provision on child protection cases. 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 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. While also advocating for mental health services for parents, ensuring access for all children to affordable, quality health care and increasing efforts to alleviate social problems such as poverty, Prevent Child Abuse America does not mention public childcare provision as an effective preventive policy.[26]

Our results further show that maltreatment reduction is strongest in families at risk of maltreatment in which a male adult is present. This finding strengthens 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 households, more intensive programs appear to remain important in these households for preventing child maltreatment.[27]

[26] See http://preventchildabuse.org/resource/preventing-child-neglect/ for details.

[27] 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).

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 leads to enormous long-run fiscal costs for societies due to increased need for special education, impaired health, and higher welfare payments.

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 20,625 cases of serious maltreatment, the expansion generated savings for German society of about $2.3 billion over the observation period. These savings represent 63% 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 child care provision, such as tax revenues and social security contributions due to higher female employment and a better educated workforce in the long-run.

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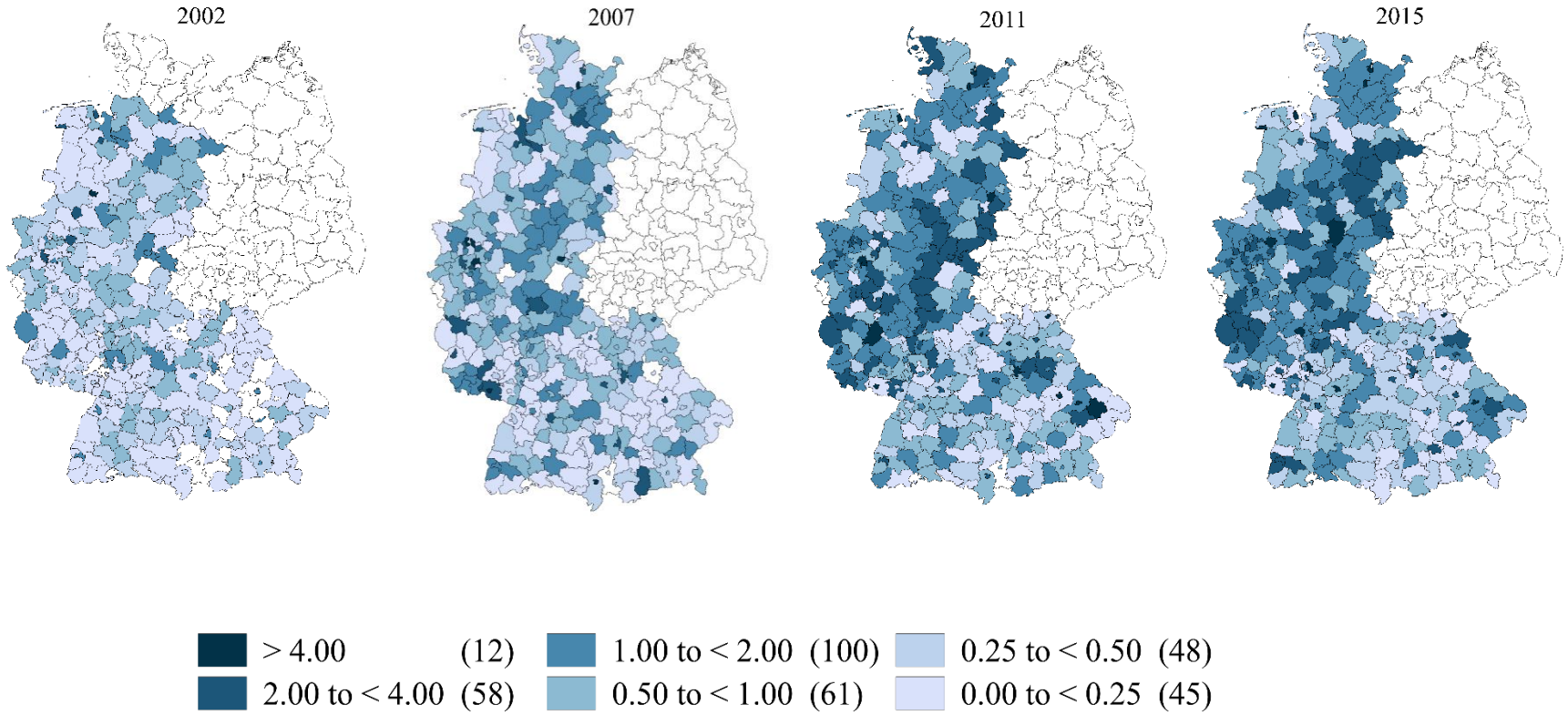
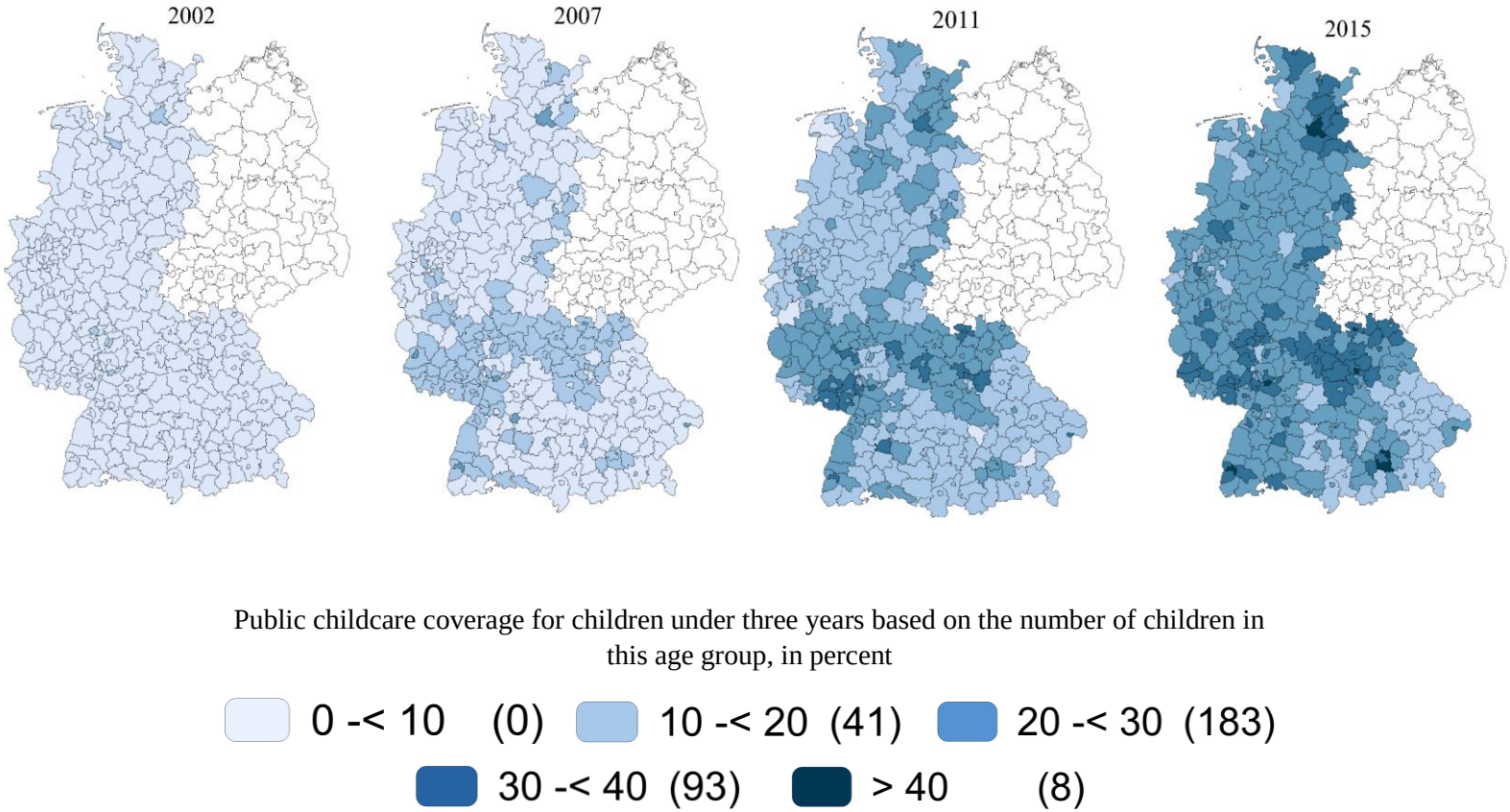
Figure 1: Child protection cases per 1,000 children by county in West Germany between 2002 and 2015.



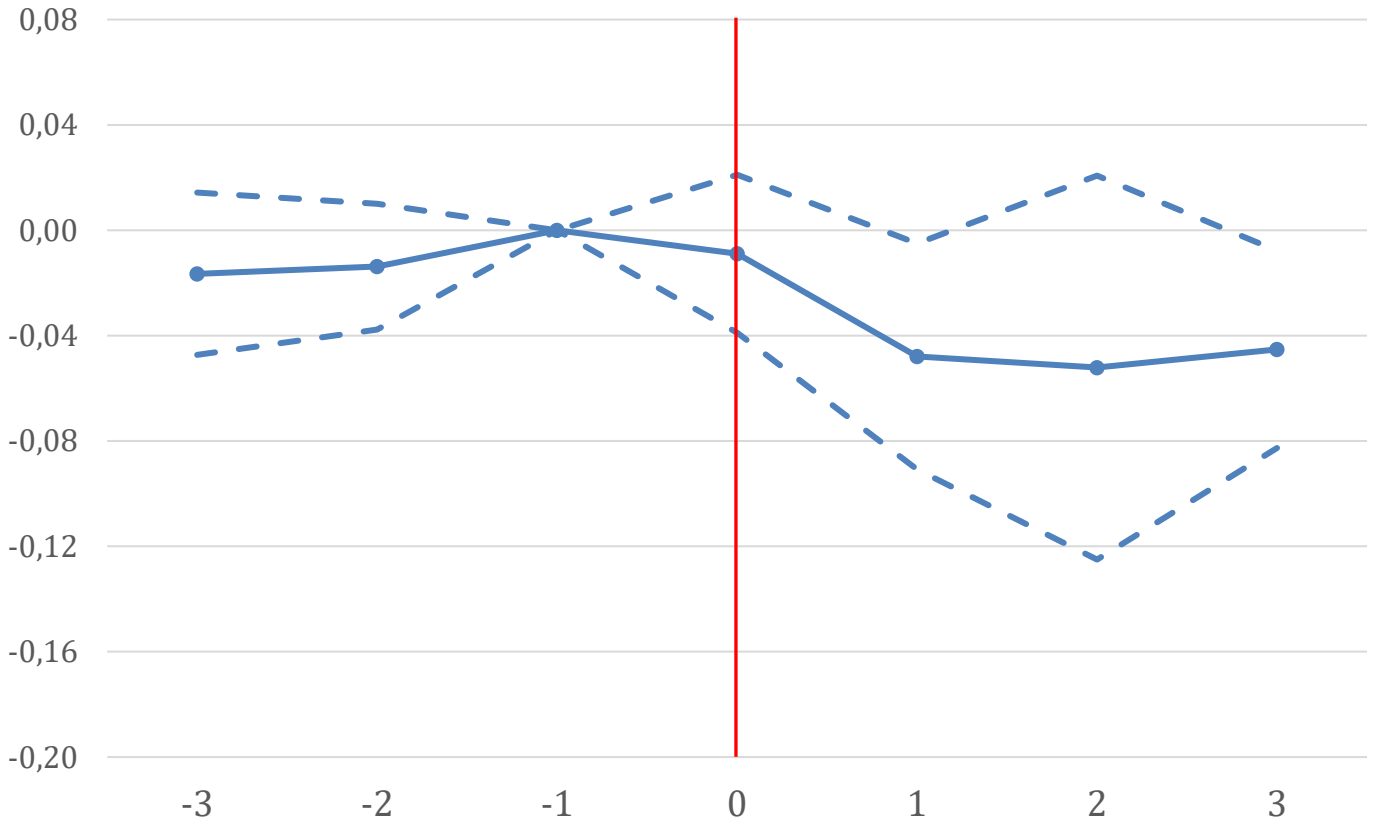
Notes: Data provided by the German Child and Youth Welfare Statistic on individual cases of child protection in a particular year on the county level of children under six years of age (per 1,000 children). Numbers in brackets refer to number of counties in each class in 2015. Calculations by the authors.

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



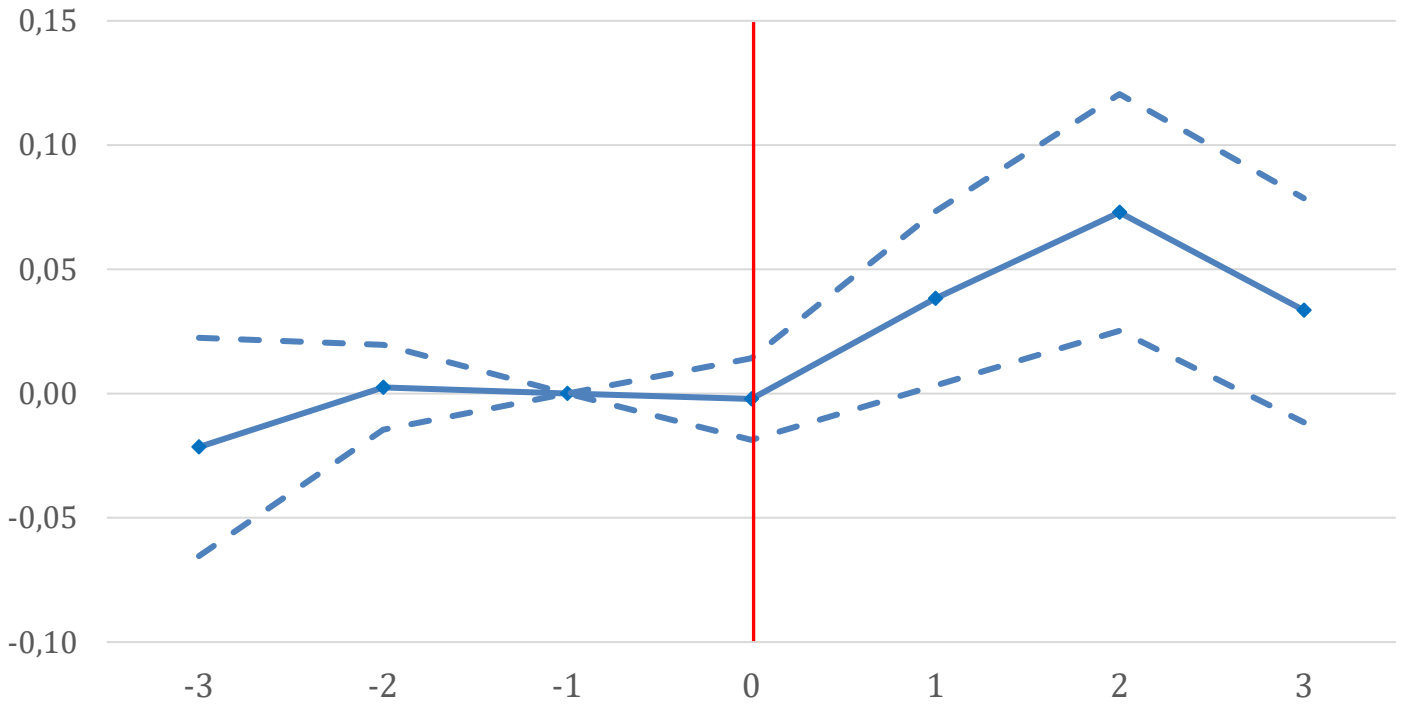
Notes: Data provided by the Statistical Offices of the German Laender on public childcare coverage for children under the age of three. Numbers in brackets refer to number of counties in each class in 2015. Calculations by the authors.

Figure 3. The effect of childcare expansion on child maltreatment: Event-study results



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 (the first lead is omitted). 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.

Figure 4. The effect of childcare expansion on female employment rates: Event-study results



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 (the first lead is omitted). 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 (0-6). Standard errors are clustered at the county level.

Table 1: Sample descriptive statistics

	Age: 0 to <6
	Mean
Gender	
Male	0.54
Reason for the Case	
Overburden of Parents	0.37
Neglect	0.36
Abuse and Sexual Abuse	0.12
Other	0.26
Living Arrangement Before the Case	
Single Parent	0.41
Both Parents	0.33
Single Parent with Partner	0.13
Relatives, Foster Family, Other	0.12
Case was Suggested by	
Youth Office	0.67
Parents	0.11
Police	0.10
Nursery/Teacher	0.01
Medical System, Relatives, Other	0.11
Number of Cases	48,757

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

Table 2. Balancing test

Unemployment rate	-0.488***	-0.231**	-0.484***	-0.209*
	(0.158)	(0.110)	(0.158)	(0.112)
Share of women in the workforce	0.688***	0.191	0.699***	0.0988
	(0.106)	(0.167)	(0.106)	(0.164)
Share of men in the workforce	0.0290	-0.108	0.0156	-0.0469
	(0.0796)	(0.119)	(0.0791)	(0.118)
Share of foreign population	-0.152**	-0.0355	-0.176**	-0.0313
	(0.0745)	(0.116)	(0.0751)	(0.113)
Share of the population below 6	-1.432**	-0.756	-1.177*	-0.989*
	(0.600)	(0.537)	(0.613)	(0.539)
Share of the population between 6 and 18	-3.538***	-0.108	-3.568***	-0.179
	(0.333)	(0.375)	(0.335)	(0.380)
Share of school drop-outs (w/o degree)	-26.13**	-0.371	-25.21**	-0.537
	(11.47)	(1.645)	(11.36)	(1.594)
Share of school graduates with high-school degree	3.109***	0.0691	2.998***	0.0887
	(1.131)	(0.223)	(1.120)	(0.220)
County fixed-effects	no	yes	no	yes
Year fixed-effects	no	yes	no	yes
p-value for joint significance of covariates	0.000	0.1991	0.000	0.2144
Observations	3,511	3,511	3,444	3,444

Notes: The table reports coefficients from regressions of the childcare 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 years Log cases per 1,000 children**			**Age 12 to <18 years Log cases per 1,000 children**		
	(1)	(2)	(3)	(4)	(5)	(6)
Effects of one pp. childcare expansion	-0.018**	-0.017**	-0.017**	0.002	0.001	0.002
	(0.008)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)
Year fixed effects	yes	yes	yes	yes	yes	yes
County fixed effects	yes	yes	yes	yes	yes	yes
Regional economic factors	no	yes	yes	no	yes	yes
Regional educational factors	no	no	yes	no	no	yes
County year observations	*3,496*	*3,469*	*3,447*	*3,496*	*3,469*	*3,447*
Number of counties		*324*			*324*	

Panel B	**Age 0 to <3 years Log cases per 1,000 children**			**Age 3 to <6 years Log cases per 1,000 children**		
	(1)	(2)	(3)	(4)	(5)	(6)
Effects of one pp. childcare expansion	-0.018*	-0.017*	-0.016*	-0.020***	-0.019***	-0.019***
	(0.009)	(0.008)	(0.011)	(0.007)	(0.007)	(0.007)
Year fixed effects	yes	yes	yes	yes	yes	yes
County fixed effects	yes	yes	yes	yes	yes	yes
Regional economic factors	no	yes	yes	no	yes	yes
Regional educational factors	no	no	yes	no	no	yes
County year observations	*3,496*	*3,469*	*3,447*	*3,496*	*3,469*	*3,447*
Number of counties		*324*			*324*	

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. 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. Statistical significance indicated by stars (* p<0.1, ** p<0.05, *** p<0.01).

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

	Age 0 to <6 years					
	Cases per 1,000 children	**Cases per 1,000 children (Poisson regression)**	**Log cases per 1,000 children**	**Log cases per 1,000 children**	**Log cases per 1,000 children (childcare t-1)**	**Log cases per 1,000 children (childcare t+1)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Effects of one pp. childcare expansion	-0.030***	-0.018*	-0.018**	-0.020**	-0.019***	-0.003
	(0.010)	(0.010)	(0.009)	(0.009)	(0.007)	(0.009)
Year fixed effects	yes	yes	yes	yes	yes	yes
County fixed effects	yes	yes	yes	yes	yes	yes
State-year fixed effects	no	no	yes	no	no	no
Linear and quadratic state trends	no	no	no	yes	no	no
County year observations	*3,496*					
Number of counties	*324*					

Notes: The table reports coefficients from regressions of different specifications of equation (1). All observations are weighted by the county population of the observed age group. Columns 1-4 show the effect of childcare expansion in t while column 5 shows the effect of childcare expansion in t-1 and column 6 in t+1. Standard errors reported in parentheses are clustered on county level. Statistical significance indicated by stars (* 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	0.0566***	0.0022
	(0.0171)	(0.0040)
Year fixed effects	yes	yes
County fixed effects	yes	yes
County-year observations	4,536	3,052
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 observations are weighted by county population age 0 to 6. 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: Effect for subgroups for age 0 to <6

Panel A: Who reported the Case	Youth Office	Police	Parents	Nursery
Effects of one pp. childcare expansion	-0.026**	-0.001	-0.013	-0.000
	(0.010)	(0.007)	(0.008)	(0.004)
Panel B: Living Arrangement Before Case	Single	Both parents	Single with partner	
Effects of one pp. childcare expansion	-0.009	-0.017**	-0.030***	
	(0.008)	(0.005)	(0.002)	
Panel C: Reason for the Case	Overburden	Neglect	Abuse	
Effects of one pp. childcare expansion	-0.006	-0.017**	-0.019***	
	(0.010)	(0.008)	(0.006)	
Panel D: Gender	Boy	Girl		
Effects of one pp. childcare expansion	-0.015**	-0.023***		
	(0.007)	(0.009)		
Year fixed effects	yes	yes	yes	yes
County fixed effects	yes	yes	yes	yes

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 observations are weighted by county population age 0 to 6. 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 I: Total cases of child protection age < 6 in each year

Year	Total number of cases, age < 6
2002	2,150
2003	2,147
2004	2,085
2005	2,149
2006	2,566
2007	3,050
2008	3,823
2009	3,865
2010	4,044
2011	4,277
2012	4,604
2013	4,523
2014	4,760
2015	5,116
All years	49,160

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 II: Average cases of child protection age < 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. Calculations by the authors.

Appendix III: Childcare coverage over time.

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 IV: Childcare utilization by family characteristics

	2005	2010	2015
All households	8.9	26.9	33.6
Two-parent households	8.5	22.5	31.5
Single-parent households	10.9	18.6	39.6
Households receiving welfare	8.0	15.0	37.8
Households not on welfare	9.0	28.6	33.3
Immigrant households	6.0	25.0	35.6
Non-immigrant households	10.2	28.3	31.0
Number of households	*1,003*	*4,329*	*2,079*

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. Figures in percent (except numbers of households).