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The Impacts of Paid Family and Medical Leave on Worker Health, Family Well-Being, and Employer Outcomes

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Keywords

paid family and medical leave, parental leave, caregiving, health, employment, employers

Abstract

This article reviews the evidence on the impacts of paid family and medical leave (PFML) policies on workers' health, family well-being, and employer outcomes. While an extensive body of research demonstrates the mostly beneficial effects of PFML taken by new parents on infant, child, and parental health, less is known about its impact on employees who need leave to care for older children, adult family members, or elderly relatives. The evidence on employers is similarly limited but indicates that PFML does not impose major burdens on them. Taken together, the evidence suggests that PFML policies are likely to have important short- and long-term benefits for population health, without generating large costs for employers. At the

same time, further research is needed to understand the effects of different policy parameters (e.g., wage replacement rate and leave duration) and of other types of leave beyond parental leave.

1. INTRODUCTION

The COVID-19 pandemic has intensified the problem of work–family balance for millions of workers, fueling public discussions about the lack of a federal paid family and medical leave (PFML) policy in the United States. Indeed, out of the 38 Organisation for Economic Cooperation and Development (OECD) countries, the United States is the only one that does not offer paid leave to new mothers and one of just a few that does not provide paid leave to new fathers.¹ The provision of paid leave to care for ill family members is less common than paid parental leave in other countries, and the United States does not provide such leave at the federal level either.

The only federal legislation concerning leave-taking in the United States is the Family and Medical Leave Act (FMLA) of 1993, which provides 12 weeks of unpaid job-protected leave with continued health insurance coverage for workers who need time off to care for a newborn or newly adopted child, an ill family member, or the employee's own serious medical condition.² The FMLA has strict eligibility requirements, such as needing to have worked at least 1,250 hours for an employer with 50 or more employees during the 12 months preceding the start of the leave. Data from 2018 suggest that only 56% of private-sector workers are eligible for the FMLA (54). Data on FMLA usage from the same year indicate that 51% of leaves were for an employee's own illness, 25% for a newborn, and only 19% for a seriously ill family member (whether a child or adult), with 5% for other reasons (21).

Ten states and Washington, DC, have implemented or passed PFML legislation as of 2022, with many others actively considering such legislation.³ These policies vary in specifics, such as statutory leave duration, benefit amount, and job protection (**Table 1**).⁴ Finally, ~23% of private-sector workers have access to paid family leave (PFL) from their employers, and there are large socioeconomic and racial inequities in access to employer-provided paid leave (77).

The lack of federal policy action on PFML is inconsistent with public preferences—for example, PFML is one of the most popular policies in President Joseph R. Biden's Build Back Better agenda, and the policy has been favored by Americans across the political spectrum in recent years (73). Thus, PFML will likely continue to be at the forefront of the US policy landscape, underscoring the importance of a comprehensive understanding of the impacts of PFML on workers, families, and employers.

This article provides an overview of the existing literature on the impact of PFML on worker health, family well-being, and employer outcomes. Section 2 discusses the vast body of research on the impacts of paid maternity leave, parental leave, and (to a lesser extent) paternity leave policies.

¹See the World Policy Center for up-to-date information on international comparisons of PFML policies (<https://www.worldpolicycenter.org/topics/labor/policies>).

²Job protection refers to a worker's right to return to the same or equivalent job after taking leave.

³The following currently have active PFML policies: California, Massachusetts, New Jersey, New York, Rhode Island, Washington, the District of Columbia, Connecticut, and Maryland. Policies in Oregon and Colorado have been passed but not yet implemented (see <https://bipartisanpolicy.org/explainer/state-paid-family-leave-laws-across-the-u-s/>).

⁴They also vary considerably on other dimensions such as the requirements for eligibility and the definition of a family member.

Table 1 State paid family and medical leave policies

State	Effective date	Maximum weeks for family leave	Maximum weeks for own illness	Maximum % of worker's salary replaced	Maximum dollar amount per week	Job protection beyond FMLA
California	2004	8	52	70%	\$1,540	No
New Jersey	2009	12	26	85%	\$993	Yes
Rhode Island	2014	5	30	60%	\$978	Yes
New York	2018	12	26	67% (family leave); 50% (own health)	\$1,068 (family leave); \$170 (own health)	Yes
District of Columbia	2020	8	2	90%	\$1,009	Yes
Washington	2020	12	12	90%	\$1,327	No
Massachusetts	2021	12	20	80%	\$1,084	Yes
Connecticut	2022	12	12	95% (up to amount equal to 40 times the state minimum wage)	\$780	Yes
Oregon	2023	12	12	100%	TBD	Yes
Colorado	2024	12	12	90%	\$1,100	Yes
Maryland	2025	12	12	90%	\$1,000	Yes

Abbreviations: FMLA, Family Medical Leave Act; TBD, to be determined.

Data from National Partnership for Women and Families (55) and A Better Balance (1). Maximum weeks and benefit amounts as of 2022 (1).

To keep this section relatively concise, we focus mostly on studies with empirical designs that attempt to isolate causal effects rather than correlations. Section 3 discusses the literature on the impacts of paid leave to care for children with serious health conditions. Section 4 synthesizes the studies on the impacts of paid leave to care for elderly, disabled, or seriously ill adults. Section 5 reviews the literature on the effects of PFML on employers. Reflecting the notably smaller volume of research compared to that in Section 2, Sections 3–5 include descriptive studies in addition to the few studies that have used quasi-experimental causal inference methods. The last section concludes and offers directions for future research.

We note that although leave for a worker's own illness or temporary disability is the most common type of (unpaid) leave taken under the FMLA (21), we do not have a section on this topic because there is virtually no research on the impacts of state paid leave programs covering these types of leaves. This lack of research is because the first four states to enact PFL—California, New Jersey, Rhode Island, and New York—added these programs on top of preexisting state disability insurance (SDI) systems, which have operated for many decades, providing partially paid leave to cover workers' own temporary disabilities.⁵ It is only in recent years, starting with Washington in 2020, that states have introduced integrated paid family and medical leave policies that include new provisions for paid leave for employees' own medical conditions. Thus, understanding the impacts of this type of leave remains an important avenue for future work, which we emphasize again in the concluding section of this article.

⁵There is some variation in the degree of similarity of policy parameters between paid family leave and SDI programs across states. For example, California's PFL and SDI policies have the same wage replacement rates, whereas New York's SDI program has a much lower wage replacement rate than the one in its PFML policy.

2. EFFECTS OF PAID MATERNITY LEAVE, PARENTAL LEAVE, AND PATERNITY LEAVE ON THE HEALTH AND WELL-BEING OF PARENTS AND INFANTS

The relationship between PFL taken to care for a newborn or newly adopted child and the health and developmental outcomes of infants and young children has been extensively investigated, with somewhat less research on corresponding impacts on the health of the parents or longer-run impacts on children. Because the United States offers so little paid leave, a large share of this research has been set in Europe and other high-income countries. However, there has been rapid growth in US studies focusing on state-level programs, particularly the first-in-the nation PFL program in California, which took effect in 2004. This review focuses on quasi-experimental analyses that exploit policy changes to estimate PFL effects.⁶

2.1. International Studies

In an influential early study, Ruhm (69) examined the effects of PFL on infant and child health using data from 16 European countries from 1969 to 1994. The key finding was that, controlling for country and year fixed effects, more generous leave policies were associated with lower infant and child mortality rates, with particularly large reductions during the postneonatal period (the second through twelfth months of life) and between the child's first and fifth birthdays, periods when parental time investments are likely to be most important. The research also demonstrated reductions in low birth weight and perinatal and neonatal mortality, but the point estimates were smaller and never statistically significant.

Several subsequent studies built on Ruhm's cross-country methods for examining PFL effects. Tanaka (76) extended the sample to include 18 countries (adding the United States and Japan) and the time period to cover 1969–2000. In addition to considering low birth weight and infant and child mortality rates, Tanaka also looked at immunizations by the end of the infant's first year. The results again indicated reductions in mortality, particularly during the postneonatal and early childhood periods, as well as statistically significant decreases in low birth weight. There were no statistically significant effects on immunizations. Shim (74) further augmented the analysis by adding Korea to the sample (for a total of 19 countries) and extending the analysis period to 2010. Once again, the primary findings were of reduced mortality during the postneonatal and early childhood periods (she did not examine birth weight). Khan (48), using data for 35 OECD countries from 1990 to 2016, again confirmed the relationship between maternity leave and lower infant and young child mortality rates; however, the effects were less apparent for paid paternity leave, and neither appeared to have much effect on measles immunizations. Using different methods, Ahmed & Fielding's (4) examination of 18 African and Asian countries over the period 1990–2016 again indicated that longer durations of maternity leave (the policy they examined) were associated with reductions in infant mortality rates, although these longer durations were also accompanied by decreases in formal-sector employment among women. Finally, using data from eight European nations, Avendano et al. (8) found that, among mothers giving birth between the 1960s and mid-1990s, having maternity leave available around the time of birth was associated with reductions in depression symptoms at older ages (age 50 and above).

⁶Our focus here contrasts with some earlier work that examined how outcomes varied for mothers or fathers taking different amounts of time off work following the birth of a child [e.g., see Chatterji & Markowitz (25), Chatterji et al. (26), or Dagher et al. (32) in a US context or Huerta et al. (46) for a multicountry study]. In these studies, it will often be difficult to arrive at causal estimates because of the potential endogeneity of voluntary leave-taking.

The cross-national analyses, just described, have strengths but also limitations. In particular, the policies are likely to be quite heterogenous across countries (and sometimes even within them), and the sets of controls included and methodological approaches used are necessarily limited. For this reason, most recent research has examined the effects of policy changes implemented within countries.

Several investigations have focused on Norway because of the combination of substantial policy changes and the availability of high-quality and comprehensive administrative data. A key policy reform occurred in 1977 when Norway moved from offering 12 weeks of unpaid maternity leave to a combination of four months of paid leave and an additional 12 months of unpaid leave. Comparing individuals born just before and just after the policy change, and following them through age 33, Carneiro et al. (24) found that the more generous leave policy was associated with substantial long-term increases in earnings and educational attainment, particularly for later-born (versus first-born) children. Using data from the same reform, Bütikofer et al. (23) documented improvements in a variety of aspects of maternal health at around age 40, although in this study the effects were concentrated among first-time mothers (at the time of the reform). They also examined later Norwegian reforms that extended the duration of paid leave and found that these extensions had weaker (if any) effects. Similarly, Dahl et al. (33) indicated that the post-1977 reforms yielded few, if any, benefits on the exam scores of ninth-grade students or on high-school dropout rates.

Paid leave effects on child and maternal outcomes have also been estimated for several other Scandinavian or other Northern European countries. Liu & Skans (51) studied a 1989 Swedish reform that extended paid leave from 12 to 15 months (with a 90% wage replacement rate) and found little effect on scholastic performance, proxied by test scores, of 16-year-old children. Danzer & Lavy (34) examined an Austrian policy change in 1990 that increased the duration of paid leave from 12 to 24 months. They found no evidence of changes in schooling outcomes (as measured by standardized test scores) of 15-year-olds. Ahammer et al. (3) studied a 1974 Austrian policy reform that increased the mandatory prenatal maternity leave period from six to eight weeks and discovered no effects on infant's health outcomes (such as birth weight and length of gestation), longer-term health or labor market outcomes (e.g., earnings, wages, medical expenses), or subsequent maternal health outcomes. Beuchert et al. (18) examined effects on infant and maternal health of a 2002 Danish policy that switched the leave available to mothers from 24 weeks at full pay and 52 weeks at a 60% wage replacement rate to 46 weeks with wages fully replaced. Since relatively few women used all the prereform partially paid leave, the policy increased average leave durations by 32 days. They found no indication of changes in child health, as measured by hospital visits or emergency department visits one or three years after birth, but did obtain evidence of decreased hospital admissions for mothers over the same time periods.

Outside Europe, two studies by Baker & Milligan (10, 11) examined the 2002 policy change in Canada that increased the period of paid parental leave benefits from 25 to 50 weeks. Although maternal time caring for children increased as a result, they detected little consistent evidence of changes in child socioemotional development at 7–12 or 13–24 months (10) or at ages 4 and 5 (11).

2.2. US Studies

Two studies, Rossin (67) and Washbrook et al. (79), supplied information on how unpaid leave in the United States, provided under the FMLA, was related to child and maternal outcomes. The first of these studies uncovered evidence of better infant health (as measured by higher birth weight and lower rates of premature births and infant mortality) for children whose mothers were most likely to use the leave (67); the second study failed to obtain evidence that the policy changed the duration of breastfeeding or rates of maternal depression, while possibly increasing the frequency

of well-baby doctor visits (79). In addition, neither study indicated improvements in cognitive or behavioral test scores for children prior to school entry.

Stearns (75) provided an interesting analysis of the infant health effects of temporary disability insurance (TDI) programs provided in five states. The key aspect of this analysis was that prior to 1978, TDI generally did not cover normal pregnancies; however, starting that year, these benefits were extended to pregnant women. This reform resulted in 6–12 weeks of partially paid leave being provided to mothers around the period of birth.⁷ Stearns found that the availability of TDI leave reduced the share of low weight births, with the strongest effects for unmarried and Black mothers.

A large majority of US studies have analyzed the effects of California's PFL program, which took effect in 2004 and originally offered 6 weeks of paid leave with a replacement rate of 55% (see **Table 1** for current provisions).⁸ Three studies provide evidence that California's PFL increased at least some types of breastfeeding, although in the latter two studies, these impacts were limited to exclusive breastfeeding (42, 44, 59).⁹ Choudhury & Polachek (28), as well as Pac et al. (59), found that introduction of paid leave improved the timeliness of early vaccinations. Child health improved as well. Bullinger (22) provides evidence of improved overall health and reductions in asthma and some allergies, Pihl & Basso (64) cite decreases in infant hospitalizations, and Chen (27) notes reductions in infant deaths. Lichtman-Sadot & Bell (50) suggested that these benefits continued to later ages, finding that California's PFL was associated with better overall health, lower rates of elementary school children being overweight, and reductions in attention-deficit/hyperactivity disorder, ear infections, and hearing or communication problems. The program was also associated with health improvements for mothers. Bullinger's (22) study, cited above, indicated that California's PFL was associated with better maternal mental health, a result also obtained by Doran et al. (35).

Although largely beyond the scope of this review, a substantial body of research has examined the labor market impacts of PFL programs, focusing particularly on parental and maternity leave, in both the United States and international contexts. An unambiguous, and probably not surprising, conclusion is that the availability of such programs increases leave-taking rates, particularly by mothers, during the period surrounding childbirth with, in many circumstances, almost universal take-up of highly paid leave but much lower use of leave that is unpaid or at low wage replacement rates (58, 68). The results for job continuity, future employment, and wages are more ambiguous but with generally beneficial effects when the leaves are not too long. In the European context, "too long" corresponds to leave durations of more than six months or a year in length (depending on the study), with some evidence of detrimental effects for longer leaves. It is less clear how this distinction would translate to the United States, where maximum leave durations are typically measured in weeks rather than in months or years; one recent study suggests negative employment and wage effects from the enactment of California's PFL program (9).

2.3. Paternity Leave

Although most of the literature on parental leave has focused on mothers, several studies have considered the effects of PFL on fathers' leave-taking and, in turn, the effects of fathers' leave-taking

⁷The period varied by state as did the distribution of leave taken before versus after the birth. For instance, Stearns (75) states that mothers in California and New Jersey could typically take four weeks off work before the birth and six weeks after it.

⁸In 2018, the maximum wage replacement rate increased to 70% for low-wage workers, and in 2020 the maximum duration was raised to 8 weeks.

⁹Hamad et al. (42) also use data from New Jersey's 2009 implementation of parental leave in their analysis.

on child and family well-being. Research in Europe, where most countries have added paternity leave to long-standing maternity leave policies, has found that providing leave entitlements to men led to increased paternal leave-taking, with no adverse effects on men's employment or earnings [see reviews by Rossin-Slater (68) and Olivetti & Petrongolo (58)]. Research in the United States, where state PFL policies provide bonding leave for both mothers and fathers, has also found that offering paid leave to fathers increased men's leave-taking (16, 17).

Some evidence indicates that fathers' leave-taking leads to improved child and family well-being. Studying a Swedish reform that gave fathers more flexibility to take intermittent leave after the birth of a child, Persson & Rossin-Slater (61) found that increasing fathers' flexibility led to improved maternal postpartum physical and mental health. A study of a Norwegian reform indicated that introducing leave for fathers improved children's school performance at age 16, particularly when fathers were more educated than mothers (31). Correlational studies suggest that fathers' leave-taking is associated with more involvement with children (41, 46, 56, 65), improved father-child relationships (63), and better mother-father relationships (62), but there is no causal evidence to date on these associations. Similarly, there have been no causal studies of the effects of parental leave on fathers' own health and well-being; correlational research in Sweden showed that parental leave use was associated with lower all-cause mortality and alcohol-related deaths for new fathers (52), but these associations may have been due to other differences between fathers who did or did not take leave.

3. IMPACTS OF PAID LEAVE TO CARE FOR CHILDREN WITH A SERIOUS HEALTH CONDITION

In contrast to the large body of research examining the impacts of paid parental leave on the health and well-being of newborns, relatively few studies have analyzed the impacts of paid leave for families with older children needing care due to a serious health condition (78). This lack of research may be because, in contrast to long-standing parental leave policies, policies providing family leave for the care of children with a serious health condition have frequently been instituted more recently and less consistently.¹⁰ However, that is not the case in the United States, where the federal FMLA—while limited in that it does not provide paid leave and covers only half the workforce—has always covered leave to care for children (as well as newborns and adult family members) with serious health conditions, as do the newer state PFL laws.

What do we know about the impact of the FMLA and state PFL laws on the health and well-being of families with children with a serious health condition? Several studies have focused on the ~15% of families who have children with special health care needs, which can require parents to take frequent time off work for specialist appointments, acute episodes, surgeries, etc.¹¹ Chung and coauthors (29) surveyed 1,105 parents of children with special health care needs in Chicago and Los Angeles in 2003 and 2004. Among the 574 parents who were employed full time, just under half were eligible for the FMLA. Parents who were eligible for the FMLA and aware of their eligibility were three times more likely to take time off work when their child was ill than were other parents. When California became the first state in the United States to implement

¹⁰While every OECD country except the United States has paid maternity leave, 25% of OECD countries do not have legislation providing paid leave for the care of a seriously ill family member; when countries do have such policies, entitlements frequently vary depending on whether the family member is a child or an adult and on the severity of their medical condition (57, 66).

¹¹Children with special health care needs may have physical, intellectual, or developmental disabilities or chronic health conditions such as asthma or diabetes.

PFL, the same research group conducted another survey of employed parents with children with special health care needs in Chicago and Los Angeles in 2005 and 2006 (71). The researchers expected to find that, following the implementation of PFL, parents in Los Angeles would be more likely to report increased leave-taking (relative to the prelaw baseline), compared to parents in Chicago who did not have access to state-level PFL. However, 18 months after California's law came into effect, Schuster et al. (71) found that only 18% of parents had heard of it and only 5% had used it. A subsequent qualitative study revealed numerous barriers to using PFL among parents of children with special health care needs, including lack of knowledge by employers, complex rules and processes, and inadequate benefits; in addition, parents were often too overwhelmed to arrange leaves in the presence of an urgent health care crisis (30).

Of course, it is not just parents of children with special health care needs who may need to use leave. Virtually all children during the course of childhood and adolescence will have episodes of acute serious illness requiring them to stay home from school and requiring a parent (or another adult) to take time off work to look after them, a problem that has been amplified during the COVID-19 pandemic. Even before the pandemic, more than one-third of families with children had a child home sick for at least two weeks each year (43). However, as noted above, family and medical leave programs are most commonly used for employees' own illness, followed by care for a newborn, and—least frequently—for a family member with a serious health condition. Thus, use of state PFL programs to care for children (other than newborns) is relatively rare, perhaps because parents are less aware that PFL covers such leave or because they take leave through other mechanisms (e.g., sick leave benefits).

Given the relatively low incidence of parents taking PFL to care for children with serious health conditions, it is perhaps not surprising that there have been few studies of the effects of such leave on child and family health and well-being. In one small-scale study, Schuster and coauthors (72) surveyed 585 parents of children with special health care needs who had taken time off for their child's illness during the previous year. Most of the parents reported positive effects of leave use on their child's health and their own health, but most also reported leave-related financial problems. Parents receiving full pay during the leave were more likely to report positive health effects for their child and themselves and less likely to report financial problems.

4. IMPACTS OF PAID LEAVE TO CARE FOR ELDERLY, DISABLED, OR SERIOUSLY ILL ADULTS

Family caregiving for elders and disabled adults is a large and growing need in the United States. An estimated 53 million people in the United States provide unpaid care for family members, though only 27% of workers have access to paid leave for eldercare (13). Among caregivers, 61% were employed when the caretaking need arose, and 17% left the labor market due to their caregiving responsibilities (2).

Bana et al. (12), using administrative claims data from California, showed that uptake for leaves to care for an ill family member increased over the 2005–2014 period but that the leaves were short; 65% of women and 70% of men who took leave used less than six weeks of caregiving leave. Analyzing data from the Survey of Income and Program Participation (SIPP), Saad-Lessler (70) found that the implementation of California's PFL increased labor force participation of unpaid caregivers by 1%.

Few studies have examined the impact of paid leave on caregiver physical and mental health, and the evidence is mixed. In one early study of the impact of workplace policies on employed female caregivers in the National Longitudinal Survey of Young Women, the availability of paid leave or time off was not associated with lower psychological distress (60). Conversely, in a sample

of 2,455 employed adults, Earle & Heymann (36) indicated that employer-provided paid leave was correlated with better mental health status. In a study evaluating state-mandated PFL in California, Gimm & Yang (38) found no effect of PFL on caregiver physical or mental health using data from the Health and Retirement Survey. However, since these studies focused on employer-provided PFL, more research is needed to understand the impact of state PFL policies.

California's PFL has been found to support the employment of middle-aged women who are caregivers (19, 47, 70) or who have a disabled spouse (13). Estimated increases in their employment after PFL came into effect range from 0.9 percentage points (13) to 5.4 percentage points in a sample limited to caregivers (47). Similarly, in a study considering both the California and New Jersey PFL, Braga et al. (19) found that women providing caregiving to a spouse were 7.4 percentage points more likely to work compared to those living in non-PFL states. However, Anand et al. (5) found limited impacts of state paid leave policies on the likelihood that caretaking spouses returned to work full time after a health shock, though paid leave mandates did reduce the likelihood that caregivers reduced their work hours. The employment of men with a disabled spouse was also found to increase by a smaller magnitude (13), though Braga et al. (19) found that PFL had less consistent effects on men.

The literature on the role that PFL plays in improving care recipients' health and reducing health costs is limited. In a study using Center for Medicare and Medicaid Services data, Arora & Wolf (7) found that California PFL induced a significant 11% reduction in nursing home use among older persons and decreased Medicaid expenditures compared to states without a PFL policy.

5. IMPACT OF PFL ON EMPLOYERS

Although the benefits of PFL for workers and their families have been documented as discussed in the prior sections, the lack of federal policy action in the United States may be due in part to concerns about the potential burden that PFL might impose on employers. While nearly all current state policies use employee payroll taxes as financing mechanisms, employers may face other costs and challenges associated with having to manage worker leaves. Evidence on the impacts of PFL on employers is therefore critical for informing the policy debate.

A small set of studies has analyzed the impact of PFL on employers. Appelbaum and Milkman (6, 53) pioneered this research with a survey of 250 California firms, conducted 4–5 years after California's first-in-the-nation PFL program was implemented. A central finding was that 90% of California employers reported that the PFL policy had either a positive or a neutral effect on employee productivity, morale, and costs. Another study of 18 employers in New Jersey indicated that businesses did not report adverse impacts of New Jersey's second-in-the-nation PFL program on profitability or employee productivity (49). Most recently, Goodman et al. (40) examined San Francisco's Paid Parental Leave Ordinance, which was implemented in 2017 and is the first US policy to mandate that employers provide fully paid leave to workers. The authors surveyed employers in San Francisco and surrounding Bay Area counties in 2018 and showed that employers reported minimal negative impacts and high support for the policy. While these studies have broken new ground in collecting data on employer outcomes, they were limited by a lack of baseline data on pre-PFL outcomes, did not have control groups that could be followed over time, and did not use representative samples of firms.

Bartel et al. (14) addressed these concerns in their study of the impact of New York's Paid Family Leave Act, implemented in January 2018. The authors surveyed a representative sample of firms with 10–99 employees in New York and Pennsylvania in each year from 2016 to 2019, 2 years before and after New York's PFL policy went into effect. Pennsylvania does not have a PFL

policy and served as a control state. The authors compared changes in outcomes in observably similar New York and Pennsylvania firms from before to after New York's PFL implementation. The authors found no indication that PFL had any adverse impacts on employer ratings of employee performance, contrary to common concerns about the potential burdens of PFL on employers, and found suggestive evidence of an improvement in employers' ratings of employee commitment and cooperation and an increase in employers' ratings of the ease of handling employee absences.

In another paper, Bartel et al. (15) used employer surveys from New York and New Jersey to study the attitudes of employers toward their states' PFL policies, with special attention to changes in attitudes during the COVID-19 pandemic. The authors found that employer support increased during the pandemic, and use of PFL was associated with greater support. These results suggest that concerns about negative impacts of PFL on small employers should not be an impediment to enacting PFL programs.

In addition, a few studies have used data from Europe to analyze the impact of employee leave-taking on employer outcomes. Brenøe et al. (20) analyzed Danish administrative data for 2001–2013 with a difference-in-difference design to compare small firms in which a female employee was about to give birth to an observationally equivalent sample of small firms with female employees who were not close to giving birth. They found little evidence that parental leave take-up had a negative impact on firm output, profitability, or survival and no evidence of adverse impacts on coworkers. By contrast, Gallen (37) indicated that a 2002 Danish reform that expanded fully compensated parental leave by 22 weeks did have a negative effect on firm survival and the retention of mothers. Ginja et al. (39) studied a 1989 parental leave expansion in Sweden and demonstrated that firms responded to this reform by hiring additional workers and increasing incumbent workers' hours and thus incurred additional wage costs. Huebener et al. (45) found that firms responded to a 2007 German parental leave reform by hiring fewer women of childbearing age into occupations where they were difficult to replace internally.

Research on US employers has shown no adverse impacts of state PFL policies on a range of employer outcomes. Unfortunately, the lack of US administrative data that link employee data to firm-level data on wages, output, and profitability precludes the type of studies that have been done in Europe. The European studies have mixed results, making it difficult to draw a conclusion that applies to multiple European countries. Furthermore, the dramatic differences in statutory leave duration, labor market characteristics, and broader policy environments between European countries and the United States present challenges to inferring lessons from the European evidence for the US setting.

6. CONCLUSION

PFML allows workers to take time off work to focus on their caregiving responsibilities during vulnerable periods in their lives, for example, when they become new parents or when they navigate the serious illness of a family member. PFML also allows workers to have protected and paid time off to care for themselves if they are ill or temporarily disabled. This article highlights the multitude of ways in which access to PFML benefits the health, well-being, and career trajectories of workers and their families. Moreover, it emphasizes that the central concern of opponents to PFML—that the policy may be too costly and burdensome for employers, and especially small businesses—does not appear to be warranted by the US data. In fact, evidence suggests that the majority of small employers in two states with PFML policies, New Jersey and New York, are supportive of their states' programs and that this support grew during the COVID-19 pandemic (15). Thus, the body of evidence on PFML suggests that implementing such a policy on the federal

level would likely have important short- and long-term benefits for population health, without creating major problems for employers.

The growing prevalence of PFML policies at the state level, and the incomplete evidence to date, points to the importance of further investigation. First, researchers should be proactive and collect data on various outcomes in states that are discussing PFML policies but have not yet implemented them so that investigators have sufficient prepolicy data to study future policy impacts. Second, as the features of state policies vary substantially—on policy specifications including leave duration, the wage replacement rate, who is eligible, and whether the leave is job protected—it is important to better understand how these different parameters independently influence worker, family, and employer outcomes. Third, as mentioned above, we know very little about the impacts of paid leave beyond parental leave, including leave taken for an employee's own medical condition, despite it being the most common reason for FMLA leave. In addition, there is a need for studies that estimate the causal effects of PFL on families with children with serious health conditions, specifically research looking at the effects on parents' leave-taking to care for children with serious health conditions, the health and well-being of children and their parents, and parents' labor market outcomes and economic circumstances. We also need studies that assess the causal impacts of PFL programs on the health, employment, and well-being of caregivers for ill, disabled, or elderly adult family members. In addition, expanded understanding of the potential for PFL to support the health of care recipients and lower medical costs is a critical area for future research. Fourth, as employers are increasingly offering their own paid leave policies, we need to know how these firm-level benefits interact with state-level programs in terms of their impacts on leave-taking, as well as worker, family, and employer outcomes. Lastly, because opponents of PFML argue that small businesses are particularly burdened by these policies, it is important to better understand the perspectives of these employers.

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LITERATURE CITED

1. A Better Balance. 2022. *Comparative chart of paid family and medical leave laws in the United States*. Chart, A Better Balance, New York. <https://www.abetterbalance.org/resources/paid-family-leave-laws-chart/>
2. AARP, Natl. Alliance Caregiving. 2020. *Caregiving in the U.S. 2020 Report*. Res. Rep., AARP, Natl. Alliance Caregiving, Washington, DC. <https://www.caregiving.org/wp-content/uploads/2021/01/full-report-caregiving-in-the-united-states-01-21.pdf>
3. Ahammer A, Halla M, Schneeweis N. 2020. The effect of prenatal maternity leave on short and long-term child outcomes. *J. Health Econ.* 70:102250
4. Ahmed S, Fielding D. 2019. Changes in maternity leave coverage: implications for fertility, labour force participation and child mortality. *Soc. Sci. Med.* 241:112573
5. Anand P, Dague L, Wagner KL. 2022. The role of paid family leave in labor supply responses to a spouse's disability or health shock. *J. Health Econ.* 83:102621

6. Appelbaum E, Milkman R. 2011. *Leaves that pay: employer and worker experiences with paid family leave in California*. Rep., Cent. Econ. Policy Res., Washington, DC. <https://www.cepr.net/documents/publications/paid-family-leave-1-2011.pdf>
7. Arora K, Wolf DA. 2018. Does paid family leave reduce nursing home use? The California experience. *J. Policy Anal. Manag.* 37:38–62
8. Avendano M, Berkman LF, Brugiavini A, Pasini G. 2015. The long-run effect of maternity leave benefits on mental health: evidence from European countries. *Soc. Sci. Med.* 132:45–53
9. Bailey MJ, Byker TS, Patel E, Ramnath S. 2019. *The long-term effects of California's 2004 Paid Family Leave Act on women's careers: evidence from U.S. tax data*. Work. Pap. 26416, Natl. Bur. Econ. Res., Cambridge, MA. <https://www.nber.org/papers/w26416>
10. Baker M, Milligan K. 2010. Evidence from maternity leave expansions of the impact of maternal care on early child development. *J. Hum. Resour.* 45(1):1–32
11. Baker M, Milligan K. 2015. Maternity leave and children's cognitive and behavioral development. *J. Popul. Econ.* 28(2):373–91
12. Bana S, Bedard K, Rossin-Slater M. 2018. Trends and disparities in leave use under California's paid family leave program: new evidence from administrative data. *AEA Pap. Proc.* 108:388–91
13. Bartel AP, Kim S, Ruhm CJ, Waldfogel J. 2021. *California's paid family leave law and the employment of 45–64 year old adults*. IZA Discuss. Pap. 14380, Inst. Labor Econ. (IZA), Bonn, Ger. <https://docs.iza.org/dp14380.pdf>
14. Bartel AP, Rossin-Slater M, Ruhm C, Slopen M, Waldfogel J. 2021. *The impact of paid family leave on employers: evidence from New York*. Work. Pap. 28672, Natl. Bur. Econ. Res., Cambridge, MA. <https://docs.iza.org/dp14262.pdf>
15. Bartel AP, Rossin-Slater M, Ruhm CJ, Slopen M, Waldfogel J. 2021. Support for paid family leave among small employers increases during the COVID-19 pandemic. *Socius* 7. <https://doi.org/10.1177/23780231211061959>
16. Bartel AP, Rossin-Slater M, Ruhm CJ, Stearns J, Waldfogel J. 2018. Paid family leave, fathers' leave-taking, and leave-sharing in dual-earner households. *J. Policy Anal. Manag.* 37(1):10–37
17. Baum CL, Ruhm CJ. 2016. The effects of paid family leave in California on labor market outcomes. *J. Policy Anal. Manag.* 35(2):333–56
18. Beuchert LV, Humlum MK, Vejlin R. 2016. The length of maternity leave and family health. *Labour Econ.* 43:55–71
19. Braga B, Butrica BA, Mudrazija S, Peters HE. 2022. *Impacts of state paid family leave policies for older workers with spouses or parents in poor health*. IZA Discuss. Pap. 15007, Inst. Labor Econ. (IZA), Bonn, Ger. <https://docs.iza.org/dp15007.pdf>
20. Brenøe AA, Canaan SP, Harmon NA, Royer HN. 2020. *Is parental leave costly for firms and coworkers?* Work. Pap., w26622, Natl. Bur. Econ. Res., Cambridge, MA. <https://www.nber.org/papers/w26622>
21. Brown S, Herr J, Roy R, Klerman J. 2020. *Employee and worksite perspectives of the Family and Medical Leave Act: results from the 2018 surveys*. Rep., Abt Assoc., Rockville, MD. https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/WHD_FMLA2018SurveyResults_FinalReport_Aug2020.pdf
22. Bullinger LR. 2019. The effect of paid family leave on infant and parental health in the United States. *J. Health Econ.* 66:101–16
23. Bütikofer A, Riise J, Skira MM. 2021. The impact of paid maternity leave on maternal health. *Am. Econ. J. Econ. Policy* 13(1):67–105
24. Carneiro P, Løken KV, Salvanes KG. 2015. A flying start? Maternity leave benefits and long-run outcomes of children. *J. Polit. Econ.* 123(2):365–412
25. Chatterji P, Markowitz S. 2005. Does the length of maternity leave affect maternal health? *South. Econ. J.* 72(1):16–41
26. Chatterji P, Markowitz S, Brooks-Gunn J. 2013. Effects of early maternal employment on maternal health and well-being. *J. Popul. Econ.* 26(1):285–301
27. Chen F. 2021. *Does paid family leave save infant lives? Evidence from United States*. GLO Discuss. Pap. 874, Glob. Labor. Organ. (GLO), Essen, Ger. <https://ideas.repec.org/p/zbw/glodps/874.html>
28. Choudhury AR, Polachek SW. 2021. The impact of paid family leave on the timely vaccination of infants. *Vaccine* 39(21):2886–93

29. Chung PJ, Garfield CF, Elliott MN, Carey C, Eriksson C, Schuster MA. 2007. Need for and use of family leave among parents of children with special health care needs. *Pediatrics* 119(5):e1047–55
30. Chung PJ, Lui CK, Cowgill BO, Hoffman G, Elijah J, Schuster MA. 2012. Employment, family leave, and parents of newborns or seriously ill children. *Acad. Pediatr.* 12(3):181–88
31. Cools S, Fiva JH, Kirkeboen LJ. 2015. Causal effects of paternity leave on children and parents. *Scand. J. Econ.* 117(3):801–28
32. Dagher RK, McGovern PM, Dowd BE. 2014. Maternity leave duration and postpartum mental and physical health: implications for leave policies. *J. Health Politics Policy Law.* 39(2):369–416
33. Dahl GB, Løken KV, Mogstad M, Salvanes KV. 2016. What is the case for paid maternity leave? *Rev. Econ. Stat.* 98(4):655–70
34. Danzer N, Lavy V. 2018. Paid parental leave and children’s schooling outcomes. *Econ. J.* 128(608):81–117
35. Doran EL, Bartel AP, Ruhm CJ, Waldfogel J. 2020. California’s paid family leave law improves maternal psychological health. *Soc. Sci. Med.* 256:113003
36. Earle A, Heymann J. 2011. Protecting the health of employees caring for family members with special health care needs. *Soc. Sci. Med.* 73(1):68–78
37. Gallen Y. 2018. *The effect of parental leave extensions on firms and coworkers*. Work. Pap. 2018–40, Becker Friedman Inst., Univ. Chicago, Chicago
38. Gimm G, Yang YT. 2016. The effect of paid leave laws on family caregivers for the elderly. *Ageing Int.* 41(2):214–26
39. Ginja R, Karimi A, Xiao P. 2020. *Employer responses to family leave programs*. IZA Work. Pap. 13833, Inst. Labor Econ. (IZA), Bonn, Ger. <https://www.iza.org/publications/dp/13833/employer-responses-to-family-leave-programs>
40. Goodman JM, Elser H, Dow WH. 2020. Employer-reported access to paid parental leave: a study of San Francisco’s paid parental leave ordinance. *SSM Popul. Health* 11:100627
41. Haas L, Hwang CP. 2008. The impact of taking parental leave on fathers’ participation in childcare and relationships with children: lessons from Sweden. *Community Work Fam.* 11(1):85–104
42. Hamad R, Modrek S, White JS. 2019. Paid family leave effects on breastfeeding: a quasi-experimental study of US policies. *Am. J. Public Health* 109(1):164–66
43. Heymann SJ, Earle A, Egleston B. 1996. Parental availability for the care of sick children. *Pediatrics* 98(2):226–30
44. Huang R, Yang M. 2015. Paid maternity leave and breastfeeding practice before and after California’s implementation of the nation’s first paid family leave program. *Econ. Hum. Biol.* 16:45–59
45. Huebener M, Jessen J, Kühnle D, Oberfichtner M. 2021. *A firm-side perspective on parental leave*. IZA Work. Pap. 14478, Inst. Labor Econ. (IZA), Bonn, Ger. <https://docs.iza.org/dp14478.pdf>
46. Huerta MC, Adema W, Baxter J, Han W-J, Lausten M, et al. 2014. Fathers’ leave and fathers’ involvement: evidence from four OECD countries. *Eur. J. Soc. Secur.* 16(4):308–46
47. Kang JY, Park S, Kim B, Kwon E, Cho J. 2019. The effect of California’s paid family leave program on employment among middle-aged female caregivers. *Gerontologist* 59(6):1092–102
48. Khan MS. 2020. Paid family leave and children health outcomes in OECD countries. *Child. Youth Serv. Rev.* 116:105259
49. Lerner S, Appelbaum E. 2014. *Business as usual: New Jersey employers’ experiences with family leave insurance*. CEPR Rep. Issue Briefs 2014–12, Cent. Econ. Policy Res. (CEPR), Washington, DC. <https://www.cepr.net/documents/nj-fl-i-2014-06.pdf>
50. Lichtman-Sadot S, Bell NP. 2017. Child health in elementary school following California’s paid family leave program. *J. Policy Anal. Manag.* 36(4):790–827
51. Liu Q, Skans ON. 2010. The duration of paid parental leave and children’s scholastic performance. *BE J. Econ. Anal. Policy.* 10(1):3
52. Månsson A, Lindholm L, Winkvist A. 2007. Paternity leave in Sweden—costs, savings and health gains. *Health Policy* 82(1):102–15
53. Milkman R, Appelbaum E. 2013. *Unfinished Business: Paid Family Leave in California and the Future of U.S. Work-Family Policy*. Ithaca, NY: Cornell Univ. Press

54. Natl. Partnersh. Women Fam. 2020. *New Department of Labor family and medical leave data illustrates gaps in coverage, threatening the financial security of American workers*. Press Release, August 10. <https://www.nationalpartnership.org/our-impact/news-room/press-statements/new-department-of-labor-data-shows-gap-in-coverage.html>
55. Natl. Partnersh. Women Fam. 2021. *State paid family & medical leave insurance laws*. Chart, Natl. Partnersh. Women Fam., Washington, DC. <https://www.nationalpartnership.org/our-work/resources/economic-justice/paid-leave/state-paid-family-leave-laws.pdf>
56. Nepomnyaschy L, Waldfogel J. 2007. Paternity leave and fathers' involvement with their young children. *Community Work Fam.* 10(4):427–53
57. OECD. 2020. *Employment: length of maternity leave, parental leave, and paid father-specific leave*. OECD Stat., updated Sept. 12, 2022. <https://stats.oecd.org>
58. Olivetti C, Petrongolo B. 2017. The economic consequences of family policies: lessons from a century of legislation in high-income countries. *J. Econ. Perspect.* 31(1):205–30
59. Pac J, Bartel AP, Ruhm CJ, Waldfogel J. 2019. *Paid family leave and breastfeeding: evidence from California*. Work. Pap. w25784, Natl. Bur. Econ. Res., Cambridge, MA. https://www.nber.org/system/files/working_papers/w25784/w25784.pdf
60. Pavalko EK, Henderson KA. 2006. Combining care work and paid work: Do workplace policies make a difference? *Res. Aging* 28(3):359–74
61. Persson P, Rossin-Slater M. 2019. *When dad can stay home: fathers' workplace flexibility and maternal health*. Work. Pap. 25902, Natl. Bur. Econ. Res., Cambridge, MA. <https://www.nber.org/papers/w25902>
62. Petts RJ, Knoester C. 2019. Paternity leave and parental relationships: variations by gender and mothers' work statuses. *J. Marriage Fam.* 81(2):468–86
63. Petts RJ, Knoester C. 2020. Are parental relationships improved if fathers take time off of work after the birth of a child? *Soc. Forces* 98(3):1223–56
64. Pihl AM, Basso G. 2019. Did California paid family leave impact infant health? *J. Policy Anal. Manag.* 38(1):155–80
65. Pragg B, Knoester C. 2017. Parental leave use among disadvantaged fathers. *J. Fam. Issues* 38(8):1157–85
66. Raub A, Nandi A, Earle A, De Guzman Chorny N, Wong E, et al. 2018. *Paid parental leave: a detailed look at approaches across OECD countries*. Rep., WORLD Policy Anal. Cent., Los Angeles. https://www.worldpolicycenter.org/sites/default/files/WORLD%20Report%20-%20Parental%20Leave%20OECD%20Country%20Approaches_0.pdf
67. Rossin M. 2011. The effects of maternity leave on children's birth and infant health outcomes in the United States. *J. Health Econ.* 30(2):221–39
68. Rossin-Slater M. 2018. Maternity and family leave policy. In *The Oxford Handbook of Women and the Economy*, ed. SL Averett, LM Argys, SD Hoffman, pp. 323–44. Oxford, UK: Oxford Univ. Press
69. Ruhm CJ. 2000. Parental leave and child health. *J. Health Econ.* 19(6):931–60
70. Saad-Lessler J. 2020. How does paid family leave affect unpaid care providers? *J. Econ. Ageing* 17:100265
71. Schuster MA, Chung PJ, Elliott MN, Garfield CF, Vestal KD, Klein DJ. 2008. Awareness and use of California's paid family leave insurance among parents of chronically ill children. *JAMA* 300(9):1047–55
72. Schuster MA, Chung PJ, Elliott MN, Garfield CF, Vestal KD, Klein DJ. 2009. Perceived effects of leave from work and the role of paid leave among parents of children with special health care needs. *Am. J. Public Health* 99(4):698–705
73. Shabo V. 2021. Polling summary: in Build Back Better, paid family and medical leave is one of the most popular policies. *New America Blog*, Nov. 10. <https://www.newamerica.org/better-life-lab/blog/polling-summary-paid-family-and-medical-leave-is-one-of-the-most-popular-planks-in-the-build-back-better-agenda>
74. Shim J. 2016. Family leave policy and child mortality: evidence from 19 OECD countries from 1969 to 2010. *Int. J. Soc. Welf.* 25(3):215–21
75. Stearns J. 2015. The effects of paid maternity leave: evidence from temporary disability insurance. *J. Health Econ.* 43:85–102

76. Tanaka S. 2005. Parental leave and child health across OECD countries. *Econ. J.* 115(501):F7–28
77. US Bur. Labor Stat. 2021. *What data does the BLS publish on family leave?* Fact Sheet, US Bur. Labor Stat., Washington, DC. <https://www.bls.gov/ncs/ebs/factsheet/family-leave-benefits-fact-sheet.htm>
78. Waldfogel J, Liebman E. 2019. *Paid family care leave: a missing piece in the U.S. social insurance system.* Rep., Wash. Cent. Equitable Growth, Washington, DC. <https://equitablegrowth.org/research-paper/paid-family-care-leave/>
79. Washbrook E, Ruhm CJ, Waldfogel J, Han W-J. 2011. Public policies, women's employment after childbearing, and child well-being. *BE J. Econ. Anal. Policy.* 11(1):2938

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