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# Maternity Leave

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## Abstract

Supporting working mothers to balance their work and childcare responsibilities is a central objective of maternal and parental leave policies. Nearly all countries offer some forms of maternity and family leave programs for childbearing on a national basis. This chapter reviews various types of leave policies available for working mothers (or parents) across countries and whether and how the policies affect women's labor market outcomes, their own and children's health, and child development. The leave policies can also influence women's fertility choices, as well as household specialization and husbands' labor supply. Recent studies also note the potential impacts on employers and coworkers of mothers who are on leave. One message that this chapter draws from the vast literature – with diverse and, in some instances, contradictory findings – is that policy debates should not center around whether or not governments should offer paid leave; rather they should focus on how to design more efficient or optimal leave programs. This chapter discusses some preliminary lessons for designing a leave program.

*Keywords:* maternity leave, parental leave, gender role, birth outcomes, breastfeeding, infant health, children's outcomes, mothers' health, labor supply, fertility, divorce.

*JEL classification:* H31, I12, I18, J21, J22, J16, J71, J78, J22, J12, J13, J38, J83, J88, K36.

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## Abstract

Supporting working mothers to balance their work and childcare responsibilities is a central objective of maternal and parental leave policies. Nearly all countries offer some forms of maternity and family leave programs for childbearing on a national basis. This chapter reviews various types of leave policies available for working mothers (or parents) across countries and whether and how the policies affect women's labor market outcomes, their own and children's health, and child development. The leave policies can also influence women's fertility choices, as well as household specialization and husbands' labor supply. Recent studies also note the potential impacts on employers and coworkers of mothers who are on leave. One message that this chapter draws from the vast literature – with diverse and, in some instances, contradictory findings – is that policy debates should not center around whether or not governments should offer paid leave; rather they should focus on how to design more efficient or optimal leave programs. This chapter discusses some preliminary lessons for designing a leave program.

## 1 Introduction

Offering maternity leave is now becoming a priority to protect women in the workforce and foster development of their children. Almost all countries, from the least developed to developed, mandate statutory maternity leave for childbirth and pregnancy. The history of maternity leave policies dates back to over a century ago. Women's rapidly increasing participation in the labor force during World War I (1914 to 1918) created the need of, and subsequently intensified voices for, providing time-off to balance work and family responsibilities surrounding the time of childbirth. In response, the International Labor Organization (ILO), in its founding year, adopted the Maternity Protection Convention of 1919, laying out the basic principles and rights of women before and after childbirth. They included providing 12 weeks of maternity leave, medical benefits, wage replacement, and a prohibition against employers dismissing women while being absent due to childbirth. Since then, many countries have been introducing or expanding the coverage of paid maternity leave, as its need has become more glaring amid more women joining the workforce.

One of the primary objectives of maternity leave policies is to help women balance their roles at work and at home, which may in turn have implications for marriages and other family members. Such policies are also linked to early childhood education and long-term child development, be it physical or cognitive, via potentially better childcare and parent-child interactions (Heckman (2008)). Notwithstanding the increasing adoption of maternity leave worldwide, many argue that such programs in many countries are not sufficient and should be expanded. As a result, most recently, the European Council and European Parliament enacted a Work-Life Balance Directive (PE-CONS 20/19) in 2019 that aims to provide even more generous parental leave with a longer

duration of leave, higher compensation rates, and extended coverage to the other parent. In contrast to such global efforts, the United States continues to lack a policy offering paid leave for new mothers on a national level.

To the countries with varied maternity leave programs already in place, the debate centers on what is the optimal package. Part of the roadblock in maternity leave coverage in the United States is rooted in opponents' arguments that it has possible adverse impacts both on women's career and at the workplace, especially small businesses. For example, some argue that maternity leave policies may in fact increase women's disutility of work, which can delay women's return to work and even reduce their willingness to return to work, and lead to loss of work experience. Depending on market structures and the ways of how maternity leave policies are funded, employers may also respond to the direct and indirect costs of maternity leave policies or perceived costs by reducing their demand for female workers.

To provide clear guidance to policymakers divided in favor and against maternity leave entitlements and to address concerns regarding the optimal level of maternity leave policies, it is imperative to assess the possible impacts of the maternity leave programs on varied outcomes considered in the debates. Specifically, scholars and policymakers are interested in the following questions: What are the effects of leave entitlement in women's short-term labor market outcomes and their employment trajectories? Are leaves beneficial in improving mothers' health? How effective are leaves in fostering child development? Do leave policies lead to stable family: couples staying married and improved fertility? How do maternity leave policies affect husbands or other family members? Do leaves create a burden for employers by disturbing work-flow and productivity? And finally, do the benefits outweigh the costs from a society's perspective?

Social scientists have attempted to answer the above questions. A burgeoning literature on mothers' employment and children's outcomes has begun to shed some light on effectiveness of maternity leave policies in various institutional settings and contexts. Some great, comprehensive accounts of the literature exist (e.g., Rossin-Slater (2018) and Olivetti and Petrongolo (2017)). Since then, however, more research has been conducted with new evidence confirming or contrasting the existing results as well as more evidence on previously less explored outcomes, some of which are included in this chapter. Nonetheless, this chapter is not intended to simply updating the existing surveys, but instead to present a systematic and self-contained review of the literature, even though there are inexorably some duplicate efforts, especially those influential ones that have been cited

elsewhere. It is also important to note that this chapter is not intended to provide a comprehensive survey of every paper in the field, but instead to point out findings that are important and need to be highlighted, and to reference *some* empirical studies with the findings. In what follows, this chapter first discusses the types of leave policies available across the world to lay the foundation for analyzing and understanding the effectiveness of leaves in various contexts. Second, this chapter summarizes some empirical challenges and the solutions adopted in the literature in more details. Then, this chapter organizes the review loosely around the questions raised above. This chapter reviews (1) whether leaves are supportive in advancing mothers' employment trajectory; (2) limited evidence available on mothers' health outcomes; (3) how both pre-natal and post-natal leaves affect newborn's health and mother's breastfeeding behavior; (4) whether enhanced time investment, stemming from leave, in newborns creates any long-lasting effects in their childhood and adulthood; (5) whether leaves are able to achieve their intended goal of encouraging fathers to take up leave to share their child care responsibility and narrow gender gap; (6) the role of leaves in fertility behavior; (7) whether leaves affect employers and co-workers.

Our review of the literature indicates that while few consensus findings have emerged, the policy effects on many outcomes are generally diverse, and empirical studies still face many challenges surrounding estimation and have their limitations such as credible identification strategies, generalizability and external validity of the results, paucity of data available to examine the *direct* effects on long-term outcomes, and a relatively narrow focus on certain dimensions of the policies and the outcomes. More research is needed to address these issues to provide credible estimates and a more complete picture of the policy impacts on a society as a whole. It is particularly important to understand how the effectiveness of maternity leave interacts with other institutional settings, particularly unionization and the availability of affordable and quality childcare. Given vast heterogeneity in the generosity of benefits and mixed outcomes, the next direction of research should also move towards providing evidence in designing the optimal leave in terms of duration and generosity.

## 2 Evolution and Availability of Maternity Leave Across Countries

It has been over a century since the International Labor Organization (ILO) adopted the Maternity Protection Convention in 1919, calling for maternity leave to protect new mothers during the period

surrounding childbirth. Today almost all countries mandate paid maternity leave for employed women on a national basis, though the generosity of leave varies widely across countries. One notable outlier in providing a nationwide paid leave is the US, along with a few countries like Tonga and Papua New Guinea.

## 2.1 Types and Classifications of Leave Programs

Individual countries have a different set of leave systems which mothers can avail before or after the birth of a child. Their classification is not universal, often depending on whether such programs are also available to the other parent. For example, Sweden offers a parental leave of 240 days for each parent, most of which can be transferred to the other parent. Likewise, Portugal does not offer maternity leave but does parental leave in which initial 10 weeks are solely allocated for mothers. Three types of leave available for parents for issues related to child birth or pregnancy are briefly described.

- (i.) Maternity leave: It permits employed mothers to take leave of absence surrounding the time of childbirth (or adoption in a number of countries). It offers continued receipt of full or partial income and job protection.
- (ii.) Paternity leave: It permits employed fathers to take leave of absence during or after childbirth. It also offers continued receipt of full or partial income and job protection.
- (iii.) Parental leave: It is of a similar manner to maternity or paternity leave. This leave often precedes paternity or maternity leave, and could be shared between parents. However, some countries allow parents to share only a certain amount of leave so as to encourage fathers to take it.

Having knowledge of the distinctions above can facilitate our understanding of the total amount (hence upper bound) of leave available for mothers and the international comparison of leave policies. Moreover, such knowledge is also important for understanding the potential impacts of policies on gender roles, household specialization, and working decisions of other family members. Note that the classification system here by no means covers all possible leave policies available for parents. For example, on top of parental leave, Belgium also permits a “career break” from employment for any reason, including childcare. Maternity and parental leaves are used here as generic terms, and sometimes interchangeably, in order to facilitate the discussion.

## 2.2 Multitudes of the Policies

Not only do countries have different types of paid leave programs, but they also vary considerably on many policy dimensions. Varying aspects of these programs across countries are briefly reviewed.

**Length of Leave, Income Support, and Job Protection.** The most crucial aspects of leave provisions encompass its duration, the income replacement rate (the benefit amount divided by pre-leave income), and whether a mother’s job is protected during and after the leave. Across the world, both the length of leave and benefit amount vary widely. Figure 1 displays the cross-country variation in the generosity of paid leave programs. A total of 106 countries offer paid leave of at least 14 weeks, while 33 of them have leave programs running into 52 weeks or longer. In some countries maternity leave replaces 100 percent of the women’s previous earnings up to a certain period. According to Addati, Cassirer, and Gilchrist (2014), the leave benefit amount exceeds two-thirds of their previous earnings in 74 countries. Koslowski et al. (2019) note that 66 per cent of earnings or more (or a flat-rate of more than €1000 per month) is considered as “well-paid” leaves.

Comparatively, leave entitlements are more generous among OECD countries. According to the OECD (2019), the average duration of leave is over 18 weeks, which is slightly higher than the duration of 14 weeks stipulated in the ILO convention. In terms of duration, new mothers in the United Kingdom are entitled to the most generous leave running into 9 months, but the replacement rate of maternity benefits is relatively lower; it stands at less than one-third of the previous earnings, compared to that of around 77 percent on average across OECD countries. Switzerland, on the other hand, provides a shorter leave of 14 weeks but with a high wage replacement level at 80% for most women. In a total of 13 countries, maternity benefits fully replace the previous earnings for an average earner (OECD 2019). One notable exception of the prevalent practice of replacing lost income for women is a nationwide policy in the United States: the 1993 Family and Medical Leave Act (FMLA). It offers unpaid leave of up to 12 weeks after a childbirth. This leave is also available for the adoption of a child and for caring for a sick child or an adult relative. Employees can take leave intermittently or at once or anytime during the course of 12 months. This policy is only available to employees who have worked for at least 12 months and 1,250 hours over the past 12 months for an employer with 50 or more employees within a 75-mile radius.

Job protection when mothers are on leave is another key element of leave programs. Such protection ensures that new mothers will have their jobs upon return, so as to avoid any interruption

in their career; it could also help new mothers maintain their bargaining power for other employment opportunities and reservation wage if they want to switch to a new career. While it is less meaningful to have a leave policy without job protection, the reality is that many paid leave programs indeed lack such feature. According to Addati, Cassirer, and Gilchrist (2014), out of 146 countries which provide information on the employment protection provision of maternity leave, 81 countries do not guarantee that mothers of new borns can return to the same or an equivalent position after leave (of the remainder of their sample, 24 countries do guarantee the right of mothers to return to the same position and 37 countries to the same or an equivalent position). Furthermore, some countries provide job protection for the full duration of leave, while others offer only up to a certain period. For some countries, even though the job is protected, a mother is not guaranteed to have the same position, and sometimes they can be assigned to a less-skilled position post leave (Czech Mothers 2020). There are also instances where job protection may be longer than the duration of paid leave. For example, as noted in Lalive et al. (2014), prior to 1996, Austria had both the duration of cash benefits and job protection at 24 months. Its 1996 reform reduced the duration of cash benefits to 18 months, leading to a longer period of job protection than that of cash benefits until 2000, when yet another reform increased the duration of cash benefits to 30 months.

**National versus Local Leave.** Amid inability of a national policy to address the differential need of local leave provisions arising from social, cultural, and economic systems, local governments have unveiled their own programs, which lead to substantial geographic variations in actual offering of leave. For example, in China, the national leave program mandates 98 days of leave for all female employees (“Special Rules on the Labor Protection of Female Employees” enacted in 2012), but in some provinces such as Guangdong, the duration of maternity leave is extended to a minimum of 178 days (“Guangdong province population and family planning regulations” enacted in 2018).

In the U.S., the lack of nationwide paid leave program has pushed states and local employers to actively involve in policy action for designing and developing their own policies. California was the first state to launch its own legislation in 2004, and other states followed suit. So far, New Jersey (2009), Rhode Island (2014), New York (2018), District of Columbia (2020), Washington (2020), Massachusetts (2021), and Connecticut (2022) have introduced paid leave legislation. Oregon and Colorado are planning to introduce their own leave program in 2023 and 2024, respectively. The generosity differs across states, and they replace past earnings up to a certain percent that is considerably lower than their European counterparts. Moreover, job protection is not necessarily



guaranteed and may only be achieved in combination with FMLA leave. These detailed features are particularly helpful for us to consider who may benefit from the leave policies. See the subsection on leave taking for an example. There are also some employers that separately offer paid leave on their own. As a result, the share of women having access to paid leave is on the rise in the U.S., reaching about 17 percent of civilian workers in 2018 (Bureau of Labor Statistics 2018). Further, unpaid leave was available for 89 percent of them. Though these shares in the U.S. are substantially lower as compared to other developed countries, they at a minimum reflect a growing bottom-up movement toward a wider adoption of paid leave programs.

In addition to regular leave policies solely intended for pregnancy and child birth, there have existed some “accidental” leave policies. For example, in five states – California, Rhode Island, New York, New Jersey, and Hawaii – where Temporary Disability Insurance (TDI) was in place, a federal judge’s ruling mandating the equal treatment between disabled and pregnant employees forced the adoption of a paid leave policy in 1978. As a result, employed women in these five states were able to avail 6 to 8 weeks of paid leave for pregnancy and childbirth even though the federal ruling was not intended to introduce a leave policy for them.

**Prenatal Leave.** Another prominent feature of maternity leave is that it has a pre-natal provision (that is, leave prior to childbirth) in most countries. The duration ranges from 11 weeks in the United Kingdom to 2 weeks in Ireland and Poland. The root of the provision stems from the fetal origins hypothesis that states the persistence of the effect of events before birth into adulthood (Almond and Currie 2011).

**Other Provisions of Leave.** Many countries (from low-income countries like Afghanistan to developed countries like Sweden) even have a provision of compulsory leave during the time of childbirth to ensure that women are indeed absent from their work (Addati, Cassirer, and Gilchrist 2014). Such a provision prevents employers from having women, who may otherwise feel pressured or the need to return to work early, worked during the leave period. Some countries have begun to extend maternity leave to cover miscarriage, stillbirth, and other complications related to childbirth. For example, the Philippines provides 60 days of leave for mothers for miscarriage or the emergency termination of pregnancy.

**Left Behind Mothers.** Despite expansion in coverage and generosity in leave over time, still a section of women are often excluded from access to leave. Typically, they include the self-employed, those not having sufficient work history or in some cases part-time workers, and those working in

informal sectors or contracts. Incomplete compliance, especially in middle- or low-income countries, constitutes a roadblock in gaining access to leave.

### **2.3 Timing and Motivations behind the Policies**

Maternity leave programs have evolved considerably over time. There is ongoing shift towards making maternity leave more generous in terms of its duration and replacement of the previous earnings. The visualization of availability of paid leave programs in 1970 and 2017 in Figure 2 illuminates cross-sectional and temporal differences in paid leave programs within OECD countries, a club of somewhat similar advanced economies. Even many of advanced economies did not adopt paid leave in 1970, and the average duration of paid leave was about 11 weeks, as compared to 54 weeks in 2017. Notably, the trend in growth in generosity of paid leave policies goes beyond OECD countries, highlighting the ongoing shift across the globe.

The motivations that underlie countries' decisions to adopt paid leave policies or reforms are numerous and diverse. The substantial policy actions happened during the 1970s, 1980s, and 1990s, which coincided with the rising labor force participation of women, liberalizing trade, and opening up economies. Maternity leave programs may be enacted to safeguard mothers of new borns against physically demanding works, which could potentially harm their own and children's health. Economic development is also often cited as a main reason for more generous leave policies in European countries and Canada. However, there also appears to be a lot of heterogeneity within a certain income level to draw any conclusion. In some rapidly aging society where fertility rates have fallen below the replacement level, maternity or parental leave policies have been introduced and enhanced to provide incentives to increase fertility. In some countries with already generous leave programs, reforms are introduced, among many reasons, to expand the coverage to previously ignored groups such as self-employed mothers. For example, Koslowski et al. (2019) document that in 2017, Belgium introduced a series of reforms that included significant changes to maternity leave for self-employed mothers. They receive €485 per week for 12 weeks (with three weeks of compulsory leave).

More recently, scholars have also emphasized the influences on individual country's reforms of international organizations like the European Union (EU), the International Labor Organization (ILO), the Organization for Economic Co-operation and Development (OECD), and United Nations

(UN) agencies. Focusing on the case studies of a relatively sudden adoption of paid leave programs in Australia, New Zealand, and the United Kingdom, White (2017) argues that domestic factors, especially the election of more liberal parties, played a key role.

Women’s increasing involvement in political activity, their election in the legislative body, and their influence within political parties should have facilitated the passage of paid leave programs as well.

### 3 Identification and Interpretation Challenges

Identifying and interpreting the *causal* impacts of maternity leave on various outcomes is empirically challenging. Not only do our somewhat lengthy discussions of maternity leave policies in Section (2.1) provide necessary background on the issues; they also highlight some of the potential empirical challenges and point to potential opportunities to address them.

Early studies of the impacts of maternity leave policies (e.g., Ruhm 1998) rely on cross-country analysis that associate differences in outcomes of interest with differences in leave policies. However, as discussed above, the policy determination process is complex, and the inception of the leave policies coincided with many national and international events. Those countries having more generous or longer duration of leaves also tend to have different cultural and political structures and labor market institutions than those having less generous policies. What variables should be controlled for in estimation and how to separate the independent effects of maternity leave policies in cross-country analyses are not entirely clear. Therefore, the observed association between the outcomes of interest and maternity leave policies can be driven, at least, partly by the differences in cultural and labor market structures across countries.

With availability of richer data, including administrative data in the European countries, recent studies have provided more credible causal estimates by instead focusing on individual-level analysis within a country. However, mothers (or families) that have access to maternity leave and do spend more time with their children after childbirth can be different from those that do not have access to leave, especially along unobservable dimensions. For example, as mentioned above, leave is oftentimes limited to women in formal sectors who have different educational, cultural, and socioeconomic backgrounds from those “ineligible” mothers. Further, the 1993 FMLA in the U.S. is available to women working in large firms. The selection problem is ubiquitous in this literature,

and researchers cannot draw any causal inferences about the efficacy of the leave policies from a naive comparison of eligible families to non-eligible families. To address this issue, some studies have employed the difference-in-differences (DID) approach to isolate the causal effects of maternity leaves by exploiting the variations in local policies and leave eligibility by time and space, which are often exogenous to individual choices. The DID approach can be applied in cases where there are a substantial number of areas that are affected by the policy change and when a “common trend” assumption is met. When the key common trend assumption fails to hold or when there is only one area with policy changes, some studies (e.g., Pac et al., 2019) have used the Synthetic control (SC) approach to reweigh the areas to match their pre-policy trends and to estimate the causal impacts (Arkhangelsky et al. (2019)). See Callaway (forthcoming) in this Handbook series for more detailed discussions of the DID approach and its recent developments.

Some studies have employed regression discontinuity (RD) to exploit the assumption that mothers or families with childbirths immediately before and after the policy change should be similar except for their access to maternity leaves as a result of the reform. Practical implementation of the RD approach also hinges on the definition of “immediately” before and after or the closeness to the policy change date, namely the bandwidth. When assessing the robustness of the choice of bandwidths, one may deviate from the original RD design and induce birthday effects. The literature indeed documents the role of seasonality both in various economic outcomes and in child development (Buckles and Hungerman 2013), which can lead to the differences in the outcomes of interest right before and after the policy implementation and bias the RD estimates. To address such an issue, some studies further combine the RD with the DID, using nearby year(s) as control group. Though this approach is appealing and intuitive, it is important to note that the validity of such approach depends on whether outcomes of interest were evolving in the same way within each year. A recent paper by Bana, Bedard, and Rossin-Slater (2020) also utilize the regression kink (RK) approach that exploits the fact that in the case of the California Family Leave program, mothers with pre-leave earnings right around the threshold of the maximum leave benefits are similar but have drastically different marginal wage replacement rates. See Melly and Lalive (2020) in this Handbook series for more detailed discussions of the DID approach and its recent developments.

It is useful to note that there is no clear preference or order among the empirical methods adopted. All econometric methods rely on certain assumptions that cannot be verified, and what researchers can do is to assess the implications of these assumptions as well as the sensitivity of

the results to departures from the original assumptions. Researchers should also pay attention to the parameters that each method identifies. For example, the DID identifies the average treatment effects on the treated, while the RD identifies the local treatment effects around the childbirth. Not only these estimates may lack external validity and not be generalizable, but they also make the comparison between coefficients across studies difficult, let alone understanding the sources of differences. Another more subtle point is less discussed in the literature. A more generous maternity leave may further promote more equitable gender norm and values that could impact not only women with access to maternity leave, but also those without. Empirical studies ignoring the general-equilibrium effects may underestimate the impacts of maternity leave policies. Bearing these caveats in mind, this chapter reviews empirical evidence on the impacts of leave policies.

## 4 Empirical Evidence

In line with a growing literature that examines the effects of maternity leave policy on broad spectrum of outcomes, this section reviews evidence on various outcomes related to mothers and family members, as well as some evidence of effects on firms and co-workers. This section provides some self-contained details about the policies examined in these papers to facilitate interpretations of the results.

### 4.1 Maternal Labor Market Outcomes

New mothers face a daunting challenge to reconcile their work and family responsibilities and manage their health while being pregnant or giving birth to a child. Maternity leave's supposedly main role is to facilitate them in these tasks and erase a competitive disadvantage, associated with their reproductive role, at the workplace. Comparing the wage gap between mothers and other women in Britain and the United States and using the availability of paid leave across the two countries, Waldfogel (1998a) provides suggestive evidence that paid maternity leave is helpful to offset the wage penalty arising from childbearing. A balanced, well-designed maternity leave scheme can help women remain attached to and advance in their career in the workforce. Not having any leave may compel them to choose family over career, and thus exit the labor market. On the other extreme, having a longer duration of leave, especially running into years, may lead to depreciation of women's skills and even increase disutility of work. Women may, as a result, develop preferences

for and attachment to the home production over the market production. This subsection examines the impacts of leave policies on various labor market outcomes.

#### **4.1.1 Aggregate-level Evidence.**

One approach employed in the literature to study how parental leaves affect labor market outcomes is to relate cross-country differences in outcomes to differences in the duration of parental leave available. Leveraging variation in paid parental leave in 9 European countries, Ruhm (1998) shows that three months of paid parental leave led to around 3 to 4 percent increase in the employment-to-population (FP) ratio of women in their childbearing age, while 9 months of leave increases the ratio by around 4 percent. The critical message from this finding is a steeply declining marginal effects of leave. In a recent paper, Del Rey, Kyriacou, and Silva (2021) use differences in maternity leave entitlements across 159 countries and create a unbalanced dataset with three points (the years 1994, 2004, and 2011). They provide evidence of an inverted  $U$ -shape relationship between the duration of maternity leave and women’s labor force participation. They suggest the 30-week maternity leave as a critical point from which the sign of the relationship switches from positive to negative. Amid studies providing mixed results on the effectiveness of maternity leave entitlements on mothers’ labor supply, (a point that is discussed in more detail later), this study makes an attempt to quantify the right amount of leave. This is essential for the purpose of finding policies that are more effective and that require reconsideration in their generosity in terms of duration.

Unlike Del Rey, Kyriacou, and Silva (2021), Aslim, Panovska, and Ta (2021) focus instead on high-frequency, annual data only on emerging economies. They find that an increase in the duration of maternity leave led to (i) only a short-run decline in productivity, but not in the long run, and (ii) a positive but limited effect on women’s labor force participation. Using the panel data from 18 African and Asian countries during the period of 1995–2016, in contrast, Ahmed and Fielding (2019) find the opposite: extending the duration of leave led to a reduction in female employment in the formal sector. Though these studies provide important discussions on the impacts and efficacy of maternity leave policies on women’s labor supply, it is important to keep in mind that evidence is derived based on cross-country aggregate data, and it is difficult to rule out the role of other confounders that can contribute to both women’s labor market outcomes and changes in leave policies.

### 4.1.2 Micro-level Evidence

The introduction and the expansion of paid leave policies in various countries since 1970s have provided quasi-natural experiments to study their effects in a particular context or country. With the increasing availability of rich individual-level data, most recent studies have been able to exploit these reforms to employ better identification strategies as discussed above and to isolate more convincing causal effects of maternity leave within a single country. Unlike aggregate data, which only enable researchers to examine the policy effect on broader measures such as the labor-force participation rate and the employment rate, micro-level data offer more detailed outcome measures at various stages of women’s careers (both pre- and post-birth, short vs long run) and can help distinguish the impacts of different features of a leave policy. Below the discussion of the findings of the outcomes is roughly according to their temporal orders. Note, however, that such classification is inevitably imperfect, and some outcomes can have some overlap and even be combined. For example, leave taking can be thought of as one of the short-run employment outcomes, but in our view, it is an important issue that merits a separate discussion.

**Outcome 1: Pre-birth Outcomes and Anticipatory Effects.** Expectant mothers may try to adjust their pre-leave labor supply behavior; this may be the case especially when the access to maternity leave depends on a woman’s employment history and her earnings prior to child birth. For example, Girsberger et al. (2021) find that the introduction of the paid maternity leave policy in Switzerland in 2005 increased women’s real earnings at six, three, and one months prior to birth. Their heterogeneous analysis shows that low-earnings women adjusted their labor supply behavior at both the intensive margin (through improved hours worked) and extensive margin (through increased employment) during their pregnancy. Such anticipation effects may also pose some empirical challenges for the DID or RD research designs which compare labor market outcomes right before and after the birth, using a leave policy that is announced sufficiently ahead of its implementation.

**Outcome 2: Leave Taking** An important goal of maternity leave is to allow new mothers to take time off working to recoup from childbirth and to care their newborns. Increased leave coverage is expected to increase leave-taking, which is generally supported by empirical evidence (e.g., Stearns (2018); Rossin-Slater (2018)). The extent to which new mothers use leave entitlements, however, depends on a range of factors, including leave features (job protected versus unprotected and the

extent of wage replacement), women’s human capital and their position in the workplace, family income and endowment, and firm characteristics. For example, evidence has shown that the FMLA, an unpaid leave with job protection, benefits mostly educated, married women. This is due to the fact that low-income mothers may be more financially constrained and thus cannot afford leave without pay. Paid leave can increase the leave take-up among this group. In fact, many studies note that the take-up of paid leave in Europe is nearly universal (e.g., Dustmann and Schnberg (2012)). While considerably less generous than in most European countries, paid leave in the U.S. (e.g., as a result of temporary disability insurance (TDI) and 1978 Pregnancy Discrimination Act) benefits mostly low-income, and more disadvantaged mothers in the U.S.. This is even true for the California paid leave program without job protection (Rossin-Slater, Ruhm, and Waldfogel 2013b; Bana, Bedard, and Rossin-Slater (2018)).

Lack of universal leave taking may be partly attributable to lack of job protection. Using novel administrative data from the California Employment Development Department, Bana, Bedard, and Rossin-Slater (2018) further show that in California, individuals in small firms – who may not be able to combine their leave with the FMLA for job protection – are less likely to take up the leave. Moreover, there is also evidence that women eligible for the leave may not necessarily take full advantage of the maximum amount of leave allowed when the leave may lack job protection and provides only partial wage replacements (Bana, Bedard, and Rossin-Slater 2020).

Another important reason for lack of universal leave taking during the initial stage of a leave policy may be lack of awareness and “fear of negative employment consequences for using it” (Rossin-Slater, Ruhm, and Waldfogel 2013b). There is some evidence that certain institutional features may help ameliorate this issue. For instance, using the National Longitudinal Survey of Youth 1997, Park, Lee, and Budd (2019) find that the take-up rates of maternity leave among union-represented workers are significantly higher than their non-union counterparts. They note that unions can encourage employees to utilize their available leave by easing off the concern of possible workplace retaliation.

### **Outcome 3: Short-run Labor Market Outcomes**

The literature typically analyzes women’s short-run labor market outcomes post childbirth with two sets of variables: employment and work, and wages and incomes. Note, again, that there is no uniformly accepted definition of “short-run”; our definition here loosely refers to a period up to three and a half years post childbirth. Unlike their effects on leave taking, the effects of increased



access to maternity leave on some of these outcomes are theoretically ambiguous (Klerman and Leibowitz, 1995). Following childbirth, women can be either employed or unemployed. Among the employed, some are at work and others may be on leave (employed but not at work). On the one hand, the increased leave can increase the likelihood of staying employed for those who would have quit the job in the absence of a leave policy, thereby improving women’s employment. On the other hand, the increased leave may simply lengthen the leave duration for those who would otherwise have remained employed but returned to work earlier in the absence of the leave; in this case, the leave policy does not affect the overall employment rates. However, it can potentially reduce the employment rates (had these women used the extended leave, forgone their work experience and depreciated human capital, developed a preference for staying home, and eventually quit their jobs) (Han, Ruhm, and Waldfogel, 2009 ). Baker and Milligan (2008a) further discuss the theoretical prediction from an interesting monthly perspective: during the early months post birth that are covered by both a firm’s voluntary leave and the leave mandate, the employment at work effect should be zero; but during the months covered by the mandate but beyond allowed by the voluntary leave, more women would be employed but on leave and the employment at work effects should be negative.

Understanding which effect prevails is of paramount importance for us to understand the possible impacts on child outcomes. As discussed below, one of the important channels through which increased maternity leave can potentially lead to better child outcomes is through more time spent with a newborn, which is an important part of early childhood environment key to a child’s cognitive and non-cognitive development, as well as health outcomes. The type of persons that maternity leave policies affect would determine whether the policies can indeed be effective in increasing the amount of time input. For example, if maternity leave simply keeps those women who would have quit their job in the absence of a policy employed but on leave, the amount of time spent at home with the newborn remains unchanged during the leave.

Similar to the theoretical predictions, the vast empirical literature presents a wide range of estimates of the relationship between leave policy and short-run employment and work outcomes. The results are mixed and inconclusive. Rossin-Slater (2018) argue that duration of leave plays an important role: shorter leave (e.g., some in Canada and U.S.) are often considered to be more effective in increasing women’s employment and work, but prolonged leave (e.g., some in many European countries) may lead to the opposite outcomes. Baker and Milligan (2008a) find that the

introduction of a relatively shorter leave of 17-18 weeks in Canada increased the “employed and on leave” but had little effect on the “employed and at work”, thereby leading to a positive effect on overall employment. However, the authors find that later extensions to longer leaves significantly reduced the number of mothers employed and at work, which can potentially offset the increased number of people who are employed but on leave. Their analysis sheds light. on the labor supply behavior around the time of leave.

The general pattern concerning the impact of a shorter leave can be more complicated, depending on other features of a leave program. For example, Girsberger et al. (2021) find that the introduction of the first federal paid maternity leave mandate in Switzerland in 2005 – which offers 14 weeks of leave with 80% of pre-birth earnings – had little effects on labor force participation and employment rates. Using the 1977 Norwegian reform –which provided additional 4 months of paid leave on top of pre-existing 12 weeks of unpaid leave (a total of leave days less than a year)– Carneiro, Lken, and Salvanes (2015) find that leave entitlement did not affect mothers’ employment two years after childbirth. Short, unpaid leave with job protection such as the 12-week leave granted by the Federal Maternal Legislation Act (FMLA) in U.S. is found to have limited effects on women’s short run employment outcomes (Waldfogel (1999); Baum 2003). Han, Ruhm, and Waldfogel (2009) also find that some of the expanded leave coverage in the U.S. are not associated with changes in overall employment rates.

The results on the 2004 California Family Paid Leave (CFPL) Act, a leave program with considerably shorter duration and lower benefits compared to the European policies, are generally more optimistic. For example, Rossin-Slater, Ruhm, and Waldfogel (2013a) uncover evidence that it helped to considerably improve hours worked in 1-3 years after the birth of a child for mothers conditional on being employed. Baum II and Ruhm (2016) also provide similar evidence in that it led to a rise in hours worked and employment probability in 9-12 months after giving birth to a child. Such effects on labor supply are observed in the second year as well. There is, however, some recent evidence showing potentially contradictory results. Using larger administrative data, Bailey et al. (2019) find that the CFPL decreased employment for new mothers, especially for those who took up the leave. Das and Polachek (2015) also find CPFL led to higher unemployment rates and unemployment duration in the years after implementation among young women.

With regards longer leaves such as those in Europe, the expansions of the leave programs can have some negative consequences on women’s short-run employment outcomes. Dustmann and

Schnberg (2012) analyze three reforms in Germany; the first two reforms that expanded two to six months in 1979 and six to ten months (1986) both reduced maternal employment to a larger extent than the 1992 expansion from 18 to 36 months. Lalive and Zweimller (2009) – which examines a 1990 Austria reform that extended leave coverage from 1 to 2 years – find a larger negative effect than the 1992 reform examined in Dustmann and Schnberg (2012); this may be due to stronger financial incentives to shorten birth spacing in the Austria case. Schönberg and Ludsteck (2014) show that the generosity of leave in Germany delayed mothers’ return to work and had a small negative effect on women’s overall employment. Bišáková and Kalíšková (2019) find that in the Czech Republic, prolonging the existing family leave from 3 to 4 years (but with job protection up to three years) led to an increase in non-employment among post-leave mothers; the effects are particularly large for those mothers with a three-year-old child, but waned by the time when the child was five. The impacts are driven by changes in both unemployment and inactivity among these mothers.

**Is increasing cash benefits more effective in improving women’s short-run employment outcomes?** Stearns (2018) finds that the 1994 U.K. eligibility reform –which drastically increased eligibility for wage replacement without changing the amount of benefits offered – tended to increase the probability of returning to work and hence short-term employment. Asai (2015) uses a not-so-common policy reform that raises the cash benefit amount in 2001 in Japan. The reform increased the replacement rate to 40% percent, up from 25%, while keeping the provision of duration and job protection intact. She finds that the expansion in the benefit amount was not effective in influencing the labor supply behavior of new mothers. Bana, Bedard, and Rossin-Slater (2020) also fail to find any associations between changes in the wage replacement rates as a result of CFPL and an increase in leave or an increase in post-birth employment among those high-earning women. In contrast, Kluve and Schmitz (2018) find that the 2007 Germany reform – which provided a generous cash benefit of up to \$28,000 for up to 14 months for those having pre-birth employment and a basic transfer payment of at least \$4,000 for those who did not have pre-birth earnings – decreased mothers’ probability of being employed in the short run; this result is mainly driven by high-income mothers and first-time mothers. Bergemann and Riphahn (2022) further examine the impact of this reform by exploiting its two features: it (i) extended eligibility for more mothers, who were ineligible under the means-tested provision of the previous program (the *new* recipients) and (ii) shortened the duration of benefits to 12 months for mothers who began receiving benefits prior to the reform (the *prior* benefit recipients). The authors indeed find

different results when taking into account these two types of recipients. Specifically, the reform did not significantly affect the labor force participation of newly eligible mothers in the first year (the period of benefits eligibility), but improved the likelihood that both types of mothers return to the labor force 12 months after childbirth, when their leave benefits expire.

Sánchez-Mangas and Sánchez-Marcos (2008) examine the 2003 Spanish reform that provides working mothers with a monthly cash benefit of 100 euros per child aged under 3. In an economy like Spain where female labor force participation is particularly low and the use of formal childcare for children under age 3 is rare, such reform was found to significantly increase the labor market participation rate among mothers of children aged under 3.

**Alternative Outcomes** Earnings and incomes are another set of commonly examined variables for labor market outcomes. These variables can reflect both women’s labor supply at the intensive margin and unobservable productivity. The effects of maternity leave policies on earnings and incomes are, therefore, also theoretically ambiguous, depending partly on the amount of changes in labor supply and how women’s human capital is affected by maternity leave. On the one hand, more generous leave policies may lead women to spend more time at home and to postpone their return to work, as intended; but that can lower their level of human capital through both interruption of the accumulation process and depreciation. On the other hand, better leave coverage can allow women to maintain job continuity and the good match with the pre-birth employer, as well as to keep their firm- or occupation-specific human capital intact. Hence, leave-induced changes in human capital can lead to changes in their productivity in women’s post-birth career. Furthermore, the effects may also differ across education levels or skills since human capital depreciation or accumulation process differs along these dimensions.

The literature has found limited and sometimes even negative effects on wages and incomes. The Norwegian paid leave programs examined in Carneiro, Lken, and Salvanes (2015) had little effects on mothers’ incomes in the year of and one year following childbirth. The subsequent expansions examined in Dahl et al. (2016) had similar effects. In contrast, Ginja, Jans, and Karimi (2020) find that higher levels of leave benefits decreased mothers’ earnings in the short run, a result of combined reduction in mothers’ both extensive and intensive margin labor supply. Their results also reveal that increased maternity benefits led to a larger reduction of labor supply of mothers in the lower end of the income distribution; these results are in line with the theory that depreciation of human capital may be increasing in education and experience, and that the cost of staying at

home may be higher for the more skilled mothers. Dustmann and Schnberg (2012) find that while the earlier expansions with partial pay slightly increased mothers' cumulative income up to 40 months after childbirth, the 1992 expansion in unpaid leave from 18 to 36 months resulted in a significant income loss.

**Outcome 4: Conditional on post-birth employment decisions, do mothers return to their pre-birth employers and maintain job continuity?**

An important goal of maternity leave is not simply to provide job security during leave taking period and to encourage them to work, but more importantly, to allow mothers to return to their pre-birth employers and maintain job continuity. Presumably, job continuity makes easier and smoother the post-birth re-integration process into the labor market. It could allow mothers to avoid career interruptions and to collect on the benefits from pre-birth investment in human capital (especially firm-specific human capital) at places where they had a good match with the employer (Klerman and Leibowitz, 1999). Altogether, maternity leave policies can also help reduce the motherhood penalty between mothers and the women who have never had children (Waldfogel, 1998b). The literature has generally found that maternity leave improves the likelihood of mothers' return to their pre-birth employers. For example, the Canadian reforms examined in Baker and Milligan (2008a) were instrumental in helping women continue working with their pre-birth employer. Girsberger et al. (2021) similarly find "increased job continuity with the pre-birth employer in the two to three years after birth".

Using California administrative data and focusing on high-income women (with earnings near the maximum benefit threshold), Bana, Bedard, and Rossin-Slater (2020) find that the the California paid leave policy increased the likelihood that new mothers, when returning to work following the child birth, stay with their pre-leave employer.

By contrast, examining the impacts for *average* mothers using a large administrative dataset, Bailey et al. (2019) document that women exposed to paid leave did not have a higher likelihood of returning to their pre-birth employer compared to non-exposed women.

**Outcome 5: Medium to Long-term Labor Market outcomes**

In addition to the short-run effects, it is also important to consider the impacts of leave policies on mothers' longer-run labor market outcomes because both individuals and firms can have more time to adjust their behavior in response to the changes of leave policies. A small amount of

studies exist on the longer-run effects. Some evidence from European countries appears to suggest that the short-run effects on employment and income, be it beneficial or negative, dissipate in the longer run. For instance, Carneiro, Lken, and Salvanes (2015) find that the introduction of the paid leave program in Norway on July 1, 1977, providing additional 4 months of paid leave, did not affect women’s incomes nor their employment five years after childbirth. Evaluating subsequent expansions from 1987 to 1992, increasing the total duration to 35 weeks, Dahl et al. (2016) find similar results for mothers’ employment and income in the next 14 years after each reform.

Evidence from German, Austrian, and Swiss reforms is qualitatively similar to that of Norway. Schönberg and Ludsteck (2014) evaluate how five major expansions in maternity leave coverage in Germany between 1979 and 1992 affected mothers’ post birth employment in the long run. Even though these expansions delayed mothers’ return to work, as discussed above, the negative effects generally waned over time. Importantly, four out of five expansions had limited effects on a mother’s employment and income 3 to 6 years after the birth of a child. However, the results on the 1986 reform stand out. Relative to other reforms that provided job protection at least for the period of benefits receipt, this reform – which provided benefits amount up to 22 months but job protection for only 10 months – had a much greater adverse impact on women’s long-run career, including return to work, labor force participation, and full-time work. These results underscore the important role of job protection in re-integrating new mothers into the workforce.

The 2007 German reform examined in Kluve and Schmitz (2018), despite its initial negative employment effects discussed above, actually had a positive boost to mothers’ labor market outcomes in the medium run (between three and five years after childbirth). The reform brought more women, who were outside the labor force, into employment, encouraged first-time mothers to hold part time jobs, improved the high-earnings women’s full time employment, and increased their likelihood of staying on the same job trajectory. However, the reform was not supportive in providing any pronounced benefits for low-income women. Lalive and Zweimller (2009) also find that for the 1990 Austria reform, the initial adverse effects are largely recovered in the long run (10 years after birth). Girsberger et al. (2021) confirm similar findings using the Switzerland data for women up to five years after birth, for both low- and high-earning women.

As for the U.S., there is some evidence for potentially negative effects on mothers’ long-run labor market outcomes. For instance, by using rich administrative data, Bailey et al. (2019) examine how a state-level paid leave program in California led new mothers, who used the leave

benefit, to experience a substantial decline in both their employment and annual earnings even in ten years after giving birth. But the authors also find that such adverse effects may be offset by increases in self-employment incomes as a result of more flexible working schedules.

Moreover, extended leave policies may also impact women’s career advancement negatively in the longer-term. For instance, there is evidence that access to FMLA may reduce women’s chance of moving up the career ladder (Thomas, 2020). Using a series of Norwegian reforms, which expanded paid leave from 30 weeks in 1989 to 52 weeks in 1993, Corekcioglu, Francesconi, and Kunze (2021) also find that the expansion in maternity leave “did not affect, and possibly decreased, the probability for women to be at the top over their life cycle.” These results are in line with the fact that working women in other advanced countries with more generous leave policies are more likely to work part-time and less likely to hold managerial level positions than their U.S. counterparts (Blau and Kahn (2013), Thomas, 2020 ).

In contrast to the conventional reduced-form approaches, a few studies have adopted a structural approach. One advantage of the structural method is that it permits researchers to construct counterfactual scenarios and to estimate the effects in different time horizons. Using a series of policy changes in Austria, Lalive et al. (2014) build a structural search model to examine how job protection versus cash benefits affect mothers’ propensity to return to work. Their structural simulation suggests that instead of having a stand-alone feature of either job protection or cash benefits feature in a leave program, combining both is more effective in inducing mothers to provide more childcare after birth and strengthening their attachment to employment in the medium run. Likewise, employing a dynamic discrete choice structural model in the context of Japan’s leave reforms, Yamaguchi (2019) shows that 1-year job protected leave policy significantly improved new mothers’ employment in several years after the birth of a child. However, the author notes that increasing the job-protected leave from 1 to 3 years has virtually no effect on their employment.

## 4.2 Mothers’ Health

Helping women avoid and recoup from any deterioration in their health during pregnancy, childbirth and the postnatal period falls within the broader objective of maternity leave to improve maternal well-being. Whether or not such goals are accomplished is, however, empirically inconclusive at best. Several studies of the state-level implementation of paid leave policies in the U.S. show

positive effects on mothers' health status, and particularly, mental health (Bullinger 2019, Irish et al. (2021) and Lee et al. (2020)).

It also appears that the introduction of paid leave policies is more likely to produce a beneficial effect on maternal health than expansion of these policies. Btikofer, Riise, and Skira (2021) studied how the introduction of paid leave in Norway in 1977 affected mothers' medium- and long-term maternal health. Norway introduced a paid maternity leave policy in July 1977, as a result of which women were entitled to 18 weeks of paid leave and additional 52 weeks of unpaid leave. Prior to that, women could only get unpaid leave of 12 weeks. They find significantly positive effects on a wide variety of health outcomes studied (such as body mass index (BMI), blood pressure, cholesterol levels, diabetes, self-reported pain, self-reported physical and mental health, and health behaviors like smoking and exercise). Since the reform increased time at home, without affecting maternal income, the beneficial effects are more pronounced among disadvantaged mothers who could not have taken much unpaid leave after childbirth. They also find that the timing of the reforms and the duration of leave matter.

By contrast, Btikofer, Riise, and Skira (2021) find that subsequent expansions during the period of 1987-1992 with even longer paid leaves are less effective in improving maternal health outcomes than the initial introduction of leave. Similarly, other studies examining the *extensions* of the existing leave policies also find limited effects on *short-run* maternal health. Baker and Milligan (2008b) study the expansion of maternity leave coverage in Canada in December 2000. Canada expanded the duration of leave that fathers and mothers could share by 25 weeks, which increased a maximum duration of leave that a mother could take to 50 weeks. They did not find any evidence supporting that the expansion led to an improvement in mothers' health outcomes studied, such as mother's health, mother's depression, and absence of postpartum depression and problem

Exploiting an extension in the average maternity leave coverage in Denmark by 32 days, Beuchert, Humlum, and Vejlin (2016) examine the effects on mothers' health outcomes, particularly inpatient hospital admission, hospitalization with depression, and receiving antidepressants. They consider these outcomes in two time frames: within a year after giving birth and within three years. They find limited evidence of the impacts of the extension on mothers' outcomes examined. Particularly, out of six outcomes, they find significant effects only on inpatient hospital admission within a year of giving a birth of child. When examining the heterogeneous effects across income



groups, they find that the extension benefited low-income mothers more strongly.

Another study by Guertzgen and Hank (2018), which examines the long-term health effects on maternal health of a leave extension in Germany, actually finds a surprisingly *negative* effect. Specifically, they study an increase in maternity leave coverage to 6 months from 2 months in 1979 in Germany on mothers. They measure the health outcome as the number of and duration of sickness absence spells in the next three decades after childbirth. Using the sample of mothers who return to the labor force following childbirth, they show that the extension elevates sickness absence among mothers exposed to the extension. Such a negative effect may be a result of selection. The authors hypothesize that the extension may have encouraged mothers with poor health, the type who are more likely to exit, to continuously be attached with the labor market. In other words, instead of the extension actually deteriorating the health of mothers, it actually changed the composition of working mothers, leading to a lower observed health outcomes in overall.

### 4.3 Child Outcomes

One important argument in favor of enacting maternity leave policies is to foster child development, both short- and long-run. This argument is originally based on epidemiological studies which have shown the critical role of early periods of life, including the prenatal period, in laying the foundation for a newborn's overall development. For example, human brain grows in the fastest pace in early few years and synapses which enable communications between neurons are largely formulated in the first year of life (Woodhead 2006). Maternity leave can enable parents to improve their investment, enhancing the overall condition and environment during the child's most crucial phase of development. On the back of a more generous maternity leave, especially a policy with high level of income replacement, mothers can improve child health by increasing the quality and quantity of their time in caring of infants and by extending breastfeeding period (which is associated with many beneficial health effects for children ) (e.g., Pac et al., 2019). An increase in time spent by mothers with infants can strengthen the type of mother-child interactions that can promote a child's cognitive, social, and emotional developments. Further, prenatal leave—time off from work before childbirth may reduce a mother-to-be's work-related-stress during pregnancy, which may improve birth outcomes. These potential beneficial effects are expected to persist in their adulthood, positively and profoundly impacting their long-term development. On the other hand, extended leave beyond certain age can also crowd out necessary and equally beneficial interactions

with caregivers other than mothers. Unpaid leave or leave with a lower replacement level can lower the amount of resources available for child development. The two subsections that follow review the importance of maternity leaves for infant health and breastfeeding and for a child’s short- and long-term outcomes.

### 4.3.1 Child health and breastfeeding

Like labor market outcomes, the initial evidence for health outcomes also comes from the cross-country analysis. Ruhm (2000) provides the first investigation into the connection between parental leave and child health, using aggregate data from 16 European countries over the period 1969-1994. He finds that the duration of paid leave is associated with a decline in infant mortality among other measures of child health. The findings of Tanaka (2005) are also consistent with those of Ruhm (2000). Though the cross-country analysis provides strong effects, a possibility remains that differences in other social policies and in business cycles across countries can explain at least partially these effects.

Micro data offer better avenues to identify the causal relationship between the said outcomes and leave entitlements. The literature has found some encouraging evidence on the beneficial effects of maternity leave on child health, with increased breastfeeding duration being an important channel; the effects again vary across maternal socio-economic statuses and depend on availability of formal childcare alternatives. For example, exploiting the *accidental* availability of paid maternal leave in the five states discussed above, Stearns (2015) provides credible evidence on birth weights of newborns. This paid leave program decreased the share of births with low weight by 3.2 percent. It was also beneficial in reducing the probability of early term birth by 6.6 percent, which could be mediated through reduction in both physical and psychological stress. Benefits were more pronounced in black women, a more economically disadvantaged group. Using the 1993 Family and Medical leave Act (FMLA), Rossin (2011) also shows a small positive effect on birth weight and a decline in a premature birth. The policy, which was applicable for women worked with an employer having more than 50 employees, led to a large decline in the mortality rates among children of educated mothers, who are more likely to benefit from the FMLA.

Leveraging the first state-level paid leave program in the United States, Pihl and Basso (2019) show that California’s paid family leave (PFL) program led to a decline in the hospitalization

rate of infants. Similarly, Bullinger (2019) shows that such policy led to a better parent-reported health outcome of infants.

Considering the role of breastfeeding in providing much-needed nutrients to infants, thus helping them improve their health outcomes, studies further analyze a potentially important mechanism on whether this paid leave program has increased breastfeeding duration (Pac et al. 2019 and Huang and Yang 2015). For example, Pac et al. (2019) suggest that the leave program of up to six weeks in California led new mothers to increase breastfeeding duration by around 18 days and increased the probability that they would breastfeed their newborns for at least six months by 5 percentage points. Increased duration of breastfeeding can serve as a potential mechanism behind a decline in infant hospitalizations. Further, their finding of substantially larger effects on breastfeeding duration for some disadvantaged mothers is also consistent with the results in Stearns (2015). The positive effects of a paid leave program on breastfeeding are also evident in other countries such as China (Jia, Dong, and Song, 2018).

Some studies have also examined the effects of leave policies on children’s long-term health outcomes. Exploiting the 1979 Germany reform, which extended maternity leave coverage from two to six months, Fabel (2021) find that the reform led to a drastic decrease in the hospitalization rates among the individuals aged 16–35 who were exposed to the reform as children. The effect was primarily driven by a reduction in mental and behavioral disorders. Such effects are also consistent with the beneficial effects of extended parent-child interactions and bonding. The effects are concentrated in urban areas where more women worked and were eligible for the leave, and their children may have benefited more from the policy. Similarly, Danzer et al. (2021) find a beneficial effect of the paid leave on children’s long-term health outcomes measured by the disability status up to the age of 23 and whether male children are fit for military service, but only for those who would have had only informal care by grandparents in the absence of the leave policy (mainly those in the communities without nurseries).

Finally, there is only limited evidence on the importance of *prenatal* leave for newborns’ health outcomes. Ahammer, Halla, and Schneeweis (2020) study a two-week expansion in maternity leave in Austria that resulted in a total of at least 8 weeks of mandatory prenatal leave. The expansion did not have any effects on birth length and weight. These findings highlight the possibility that maternal employment (during the 33rd and 34th week of gestation) is not harmful, which is also consistent with or supported by studies in the literature (Wüst 2015). Similarly, in

examining an earlier policy reform in Austria, which influenced the likelihood of pregnant women working in the first seven months (up to the 32nd week of pregnancy), Chuard (2020) also fail to find any detrimental effects of prenatal employment on newborn health outcomes such as birth weight.

#### **4.3.2 Children’s Short- and Long- Term Development Outcomes**

Researchers have also investigated whether paid leave has any effect for child development in both the short and the long runs. It appears that the initial leave policy tends to have a positive effect on child long-run outcomes. For example, Carneiro, Lken, and Salvanes (2015) study the initial rollout of paid maternity leave entitlement in Norway. Their findings indicate that the introduction of the policy decreased the high school dropout rates and also led to an increase in wages at age 30. Their results indicate more pronounced effects in more vulnerable women, who would not otherwise be able to afford to longer unpaid leave. Similarly, using the availability of paid leave in 5 states in the U.S., induced by the Pregnancy Discrimination Act of 1978, Regmi and Wang (2020) provided the first investigation into children’s long-term educational and employment outcomes in the U.S. context. They provide evidence that the maternity leave policy improved the likelihood of children obtaining a college degree.

By contrast, the effects of subsequent expansions on child outcomes are less clear. The patterns of findings generally mirror those found for labor market outcomes: positive, null, and, in some instances, negative; the magnitudes and the direction of the effects also vary substantially across families. Albagli and Rau (2019) study whether the expansion in maternity leave from 12 weeks to 24 weeks in 2011 in Chile had any effect on child development. Their measures of child development were based on the standardized tests, which were administered to children ages from seven months to six years. The tests intended to evaluate child development along four dimensions: cognitive, language, motor and socio emotional abilities. The authors provide evidence that the expansion significantly improved the children’s cognitive skills, with effects being more pronounced for the children of mothers with low education, but it did not change non-cognitive skills. Contrary to these positive findings, Dahl et al. (2016), who evaluate three *subsequent* reforms that expanded the initial paid maternity leave program in Norway, reach a different conclusion. They measure the educational attainment by the written exam taken at the end of junior high school (required for all students) and high-school dropout rates. However, these reforms did not have any beneficial

effects on these educational outcomes.

There could also exist heterogeneous effects across socioeconomic and demographic characteristics. Danzer and Lavy (2018) examine how the extension in job protected maternity leave from 12 months to 24 months in Austria affected children’s educational outcomes when they reach 15 years of age. Though the extension had close to zero effects overall, there existed heterogeneous effects by socioeconomic status. Children, especially boys, of highly educated mothers significantly benefited in their test scores, while the extension had adverse effects on children of less educated mothers. Their results contrast with others studies (e.g, Carneiro, Lken, and Salvanes 2015), who provide evidence of leave coverage becoming more beneficial for children with a low socioeconomic status. One potential explanation behind the positive effect is that care from a better educated mother is more instrumental in fostering a child’s cognitive development than informal care. At the time of the reform, formal childcare was rare in Austria, forcing mothers to rely on informal arrangements. Their findings largely mirror those of Liu and Skans (2010), who evaluate a three-month extension of paid leave to 15 months in Sweden. They find no evidence in support of the extension significantly improving children’s outcomes. However, the heterogeneous analysis shows that children of high educated mothers experienced significant, positive effects, while the effect on children of less educated mothers was negative but imprecise.

Some studies have found mixed effects along different dimensions. For example, Baker and Milligan (2010) study how a half-year extension in parental leave in the first year of newborns affected the level of maternal care and corresponding impact on these newborn’s development. They show that the amount of maternal care significantly increased and that there was a corresponding decrease in both the use of informal care and their full-time work. However, there were virtually no measured beneficial effects on their cognitive and behavioral development up to age 29 months. In a subsequent paper, Baker and Milligan (2015) investigate the effect of this extension when children were ages 4 and 5. They find that the extension did not translate into any improvement in children’s cognitive and behavior development. Instead, children’s PPVT scores were *negatively* affected.

There is also some evidence for potentially negative effects. As mentioned above, Dustmann and Schnberg (2012) assess whether three expansions in maternity leave coverage—in 1979, 1986, and 1992—in Germany affected children’s long term educational and employment outcomes. Their outcomes of interest include the children’ academic track (low medium, and high track), years of

education, wages and full-time employment (only for the cohort exposed to the 1986 expansion). Overall, they find no evidence of these reforms improving these outcomes of children. Instead, the authors uncover some *negative* effects of the 1992 reform on children’s educational attainment, particularly the likelihood of them attending high track. The adverse effect on children’s education could be explained by a further decline in mothers’ labor market outcomes and by the possibility that for children after certain months, childcare offers more cognitive stimulation than mother care. As discussed above, the 1992 reform that extended unpaid leave had different effects for mothers than previous two reforms: It reduced mothers’ income and decreased their employment for longer period.

Canaan (2021) further contributes to the debate over whether prolonged leave can have adverse effects on children’s well-being. Leveraging a French reform that increased parental access to cash benefits for up to three years, Canaan (2021) show that the reform negatively affected children’s verbal development. In exploring potential explanations, she uncovers evidence of the reform heightening mothers’ exit from the labor force and increasing fathers’ work hours to probably offset the loss in family income arising from the spouse’s non-employment. Likewise, the propensity of children entering preschool significantly declined. These events indicate that crowding out preschool and a potential reduction in the use of other childcares due to their mother being at home and subsequent declines in social interactions proved to be harmful for child development. It is also likely that due to their increased hours at work, fathers reduced their time investment in their child. That could lower the emotional connection between the father and child, a factor that is crucial for fostering child development.

Leave coverage can create spillover effects for siblings too. In this regard, there is some evidence from the Swedish context. Sweden had one uncommon but important feature of its parental leave (PL) regime which allowed a mother to continuously avail the PL benefits for a subsequent child if the birth of the subsequent child came within a certain interval after the birth of the previous child. Sweden expanded the interval to space births to 20 weeks in 1980 and 30 weeks in 1986. Ginja, Karim, and Xiao (forthcoming) find that the beneficial effects of the expansion prevailed among the older children in the household, but not the newborn directly affected by the policy. A potential explanation for their result was an increase in maternal time for the older children before the baby was born.

## 4.4 Effects on Fathers

While typically aimed to improve women’s and children’s outcomes, family leave policies can also have effects on such outcomes as labor supply and earnings of other household members, especially fathers. These effects could in turn operate as potential mechanisms to affect both women’s and children’s outcomes and impact the policy effectiveness. The extent and type of the effects on fathers depend on whether the leave policy is exclusive to mothers, or can be shared between spouses, or is exclusive to fathers.

Maternity leave, which is exclusive to mothers, can impact a father’s labor supply and earnings by changing the extent of household specialization. Paid maternity leave, for instance, can lower the opportunity costs of women’s time spent on childcare and home activities, thereby leading to a reduction in female labor supply and an increase in both household specialization and father’s labor supply. Moreover, when a family is financially constrained, fathers may also increase their labor supply to insure themselves against a drop in family income; the so-called insurance effect (Ginja, Jans, and Karimi (2020)). Using the Swedish reform mentioned above, Ginja, Jans, and Karimi (2020) find the household specialization effect prevails among families with women in the top third of the earnings distribution, but fail to find any evidence supporting the insurance effect.

Over years, many countries have begun offering parental or family leaves, allowing couples to share them. This is an attempt to give fathers an incentive to engage in child care and home production, easing the burden for women. It is *a priori* theoretically ambiguous how these leaves affect fathers’ leave taking behavior. With the availability of leave, fathers may feel encouraged to take leave. On the other hand, having access to paid leave for mothers may make the mothers the primary caregiver and alleviate fathers’ responsibilities to share household chores. As a result, fathers may go on to spend even more time in the labor market than they would otherwise have done in the absence of wives’ leave. This could reinforce, rather than weaken, the traditional gender norm. There is limited and mixed evidence on how the mothers’ leave-taking behavior affects fathers’ labor market outcomes. Han, Ruhm, and Waldfogel (2009) explore the leave taking behavior of fathers after the birth of a child and show a rise in it. By contrast, Canaan (2021) finds that in response to the French reform that granted either or both parents cash benefits during the first three years after childbirth, mothers became the primary caregiver. And fathers did not take

up the benefits, and their actual working hours instead increased.

Some countries have taken a further step in pushing fathers towards the child care and home production by offering paternity leave, which could only be taken by fathers. The empirical studies are scarce but show some promises of paternity leave in bringing some positive changes.

Unlike “shared” parental leave, paternity leave appears to be effective in at least encouraging fathers to take leave. Studying the introduction of one month of leave reserved for fathers in 1995 in Sweden (also termed as “daddy month” leave), Ekberg, Eriksson, and Friebe (2013) show that fathers’ leave taking increased by about 15 days. Analyzing the 2007 German reform that allocated at least 2 months of parental leave for fathers, Tamm (2019) shows limited impacts on the pattern of fathers’ employment. This reform increased fathers’ leave-taking, reducing their labor supply in the short run, but left their post-leave work hours virtually unaffected. Patnaik (2019) studies the launch of the Quebec Parental Insurance Plan in Canada in 2006, which reserved untransferable leave for fathers only. One important feature of the plan was to attach the “daddy-only” label in it to induce changes in social norms or stigma towards gender roles in child care. Consistent with the intended objective, the program led to a substantial increase of 250% in fathers’ leave taking.

In using parental leave to encourage fathers to take leaves, policy makers have three related goals in mind: (i) to increase their involvement in rearing children and sharing household works, (ii) to lessen relative disadvantage in career advancement or labor market positions for women due to them being long absent from work for childbearing, and (iii) to change societal norms and attitudes to create gender equality. There is some evidence that the paternal leave policy is able to achieve its first goal. Using data from Norway, Kotsadam and Finseraas (2011) find that the 4 weeks of the daddy quota improved the involvement of fathers in washing clothes and erased the conflict with regards to the division of household labor. Tamm (2019) shows that the 2007 German reform that allocated 2 months of paid leave for fathers led to their increased involvement in both household works and childcare. However, Ekberg, Eriksson, and Friebe (2013) find that “daddy-month”-induced-father-leave did not translate into more equitable division of child care work.

With regards to the second goal, Farr and Gonzalez (2019) provide evidence of the 2-week’s paternity leave in Spain producing significant effects in improving the likelihood that mothers whose partners were exposed to the leave program were employed in the 24 months after childbirth.



There is also evidence supporting sustained positive changes in gender norms and attitude directly as a result of paternity leave, and more than what maternity leave does. Examining whether or not the policy-induced initial changes in the division of household work and in their participation in paid work persists in the post-leave period, the literature has generally found some persistent effects, consistent with changing norms. Tamm (2019) shows that the effects of paid leave for fathers on childcare and household works persisted even after the end of leave, indicating that they were able to change the norms of household works. Leveraging time use diary data, Patnaik (2019) shows that the daddy quota in Canada promoted gender equality in both market and non-market works like child care in the long run. Meanwhile, Rege and Solli (2013) show that a paternity-leave quota in 1993 culminated in a decline of new fathers' future earnings by 1.4 percent, an indication of reduced labor supply at the intensive margin.

## 4.5 Fertility

The literature has focused predominantly on women's labor market outcomes and child outcomes, but very few have examined fertility. Not only can understanding the impacts of leave policies on fertility have important implications for the aforementioned outcomes of both women and children; it is also important in its own right for designing policies aimed at improving the aging society around the world. To the degree that paid leave promotes women's labor market positions, reducing the wage-penalty associated with child birth and gender equality in both market and non-market works, it can motivate individuals to re-consider their fertility choices. The consequences of paid leave on both outcomes can be viewed using the traditional model in Becker (1981), in which the opportunity cost of labor affects women's decision to bear and rear a child and the comparative advantage across genders in specializing household or market works supports childbearing. Consistent with this view, Boeri and Van Ours (2013, p.189) note that a family policy that allows "reconciliation of childrearing and earnings from work" would certainly increase fertility . It is not surprising that, governments, especially in developed countries that are experiencing an aging population and below-replacement fertility, have considered their maternity leave programs as a vehicle to counteract declining fertility rates among working mothers. Moreover, this is also helpful for us to understanding the effects on child outcomes given the quality-quantity trade-off argument.

There is some evidence for leave policies boosting fertility, and such effects can persist even in the long run. Malkova (2018) uses the 1981 Russian maternity benefit program to estimate its

effect on childbearing. Under the program, a woman received a fixed monthly payment amounting to 27 percent of the average monthly salary of all women for the first 12 months of a child's life, and job protected leave for 18 months. Besides, the program offered one-time top-up cash benefit, which amounted to 38 percent of the national monthly salary of women for the first birth and 76 percent for the second or third birth. Childbearing increased immediately after the expansion by 8.2 percent. Most of the births were of higher order, suggesting that the expansion led to a permanent rise in childbearing. As the data are available for a long period, the author was able to distinguish between the effect on the timing of childbearing and the actual increase in the number of children. Any increase in births in the short-run could be the result of women having their childbearing decision at an earlier time in response to incentives.

The 1990 Austrian reform provided another context to analyze the paid-leave-induced childbearing. The reform allowed new mothers to continue staying on leave for another child if the next birth happens within 27.5 months of the previous birth. Ability to combine the benefits of two leaves (which totaled the duration of leave at 4 years) should become a strong incentive for women to have a higher-order birth. Lalive and Zweimller (2009) find that mothers who had their first child immediately after the Austrian reform were more likely to have a second child as well. Not only did the reform promote women to give another birth in hopes of combining their benefits; the lengthened duration also provided incentives to have more babies. And the authors uncover the persistent effect of the reform up to 10 years after the first birth.

Exploiting the 2005 Switzerland reform, which introduced the first federal maternity leave mandate, with 14 weeks of paid leave and 80% of pre-birth earnings for most women, Girsberger et al. (2021) also find the reform increased fertility even in nine years after the birth of women's first child. More importantly, the effect is more pronounced among women living in regions with greater early child care availability, suggesting an important interplay between childcare availability and leave policies in fertility decisions.

In contrast, Farr and Gonzalez (2019) provide evidence that the parental paid leave of 2 weeks introduced in Spain in 2007 led to a reduction in subsequent births accompanying a rise in birth spacing. Two potential mechanisms behind their findings may be that (i) leave-taking by fathers facilitates and strengthens mothers' engagement in and the attachment to the labor market and (ii) fathers' leave-induced involvement in child care reduces their interest in having more babies. Cygan-Rehm (2016), leveraging the 2007 German reform discussed above, show that newly eligible

mothers were less likely to have another child in the next three years after giving birth. The effect is concentrated among low-income mothers.

Another important question is: Are higher replacement rates more effective in improving fertility? The answer may depend on maternal characteristics such as mother's education and income. A higher level of earnings replacement can make highly educated women, who have a higher opportunity cost of having a child, more responsive to the maternity leave entitlement. Using a 2007 German reform that increased the replacement rate of women's pre-birth income, Raute (2019) finds that the reform had a significant, positive effect on highly educated women's fertility. In investigating the effect on higher-order birth, however, the policy led to a decline in childbearing and an increase in birth spacing among low-income mothers. In a similar vein, Tudor (2020) studies how a transition in benefits payment in Romania from originally being based on a mother's pre-birth earnings to a fixed amount calculated according to the national average income affected fertility decision. The reform increased live births not by increasing the frequency of conceptions, but by reducing the frequency of abortions. Furthermore, the author finds the effect being concentrated in the low-income group, the group that the reform disproportionately benefited. One theme emerging from both Raute (2019) and Tudor (2020) is that maternity leave, providing unexpected financial gains, does improve fertility, but the effects would concentrate in the group that benefits most out of it.

Finally, there are also studies examining how the changes of family policies may affect other aspects of fertility such as timing. For example, Tamm (2013) sheds some light on how expectant mothers respond to parental leave policy changes. Exploiting the 2007 German reform, the author shows that about 1000 parents, expecting the birth of their child in December 2006, delayed the delivery of baby until January 2007 when the policy came into effect.

## 4.6 Marital Stability

As mentioned above, some of the parental leave policies are specifically aimed at increasing fathers' involvement in childcare. Such policies can potentially alter the division of labor within a household and affect marital relationship and stability. On the one hand, increased fathers' involvement can reduce divorce risk by equalizing shared responsibilities that can lead to a higher value of a marriage (Oppenheimer, 1994) or signaling a commitment by fathers toward a greater investment

in public goods that could strengthen marital relationships (Petts, Carlson, and Knoester, 2020). Similarly, the role conflict model in psychology and sociology suggests that having a child leads to “a reorganisation of social roles along more traditional lines” (Twenge, Campbell, and Foster (2003); Olafsson and Steingrimsdottir (2020)). Increased fathers’ involvement can reduce stress and conflicts after childbirth (,which may otherwise occur when mothers do not prefer the traditional roles nor want to give up their careers,) and increase marital stability. Using the 2001 reform in Iceland, which allocated one month of the total amount of parental leave to fathers solely, Olafsson and Steingrimsdottir (2020) indeed find evidence supporting the positive effects of such reform on marital stability, with the effects being even observed 15 years after childbirth. Moreover, consistent with the conflict model, they also find the strongest effect is concentrated among “couples where the mother has higher, or equal, educational attainment to that of the father” and prefer less traditional roles. Petts, Carlson, and Knoester (2020) similarly find a positive association between leave taking for a short period, especially for less than two weeks, and relationship stability.

On the other hand, increased fathers’ involvement and time spent at home can potentially bring about informational shock to marriage quality, and decrease fathers’ earnings and family incomes, both of which can cause strain on the relationship and increase divorce risk. Using the the 1995 Swedish reform in which one month of paid leave is earmarked to each parent, Avdic and Karimi (2018) find evidence supporting this possibility. Moreover, the authors also find that the increased divorce rates were primarily driven by retimed divorces, rather than those that would not have happened in the absence of the reform. The effects are largely concentrated among women in the lower tail of the pre-birth income distributions who had to compensate the decrease of parental leave with unpaid leave.

There is also evidence that the effects on marital stability depend heavily on the design of the leave policies and how they are carried out. In fact, Avdic and Karimi (2018) find that the subsequent reform in Sweden that added an additional transferable month of parental leave did not have any effects on marital stability. Hart, Andersen, and Drange (2022) also find that increased father’s parental leave duration in Norway did not impact either father’s or mother’s earnings; nor does it have any effects on marital stability.

## 4.7 (Un)Intended Costs at the Workplace

Beyond family members, the absence of leave by mothers from work may affect their employers and co-workers. A possible imposition of burden on the end of employers, especially on small business, has been gaining increasing attention in policy discussions. Though the exact provision may differ across countries, some countries pay the wage replacement benefits through payroll taxes or general government revenue; in this case, firms do not bear the direct wage replacement cost, and the direct costs involve costs associated with replacing the workers on leave. It may be challenging to replace workers on leave due to their firm-specific skills. It can be difficult to increase working hours at the intensive margin due to the lack of availability of the internal pool of workers, especially in smaller firms; so can be hiring at the extensive margin due to costs associated with the availability, hiring and training of new workers. On the contrary, paid leave for mothers can be beneficial for firms as this can enhance the retention of their good “matches” or “hard-to-replace” workers with longer experience and more firm-specific skills. With the availability of paid leave to raise newborns, new mothers may stay at the pre-birth workplace. The overall effects can depend on both the importance of firm-specific skills and the external labor market conditions.

Notwithstanding a proliferation of the literature regarding a broad spectrum of effects of paid leave on family members, plausible evidence is scarce on the direct and indirect challenges or costs of family leave programs borne by firms, including their adjustment responses, hiring strategies, and performance. The first challenge facing firms is how to manage employee absences due to maternity leave. An important adjustment strategy that could be adopted by firms is to hire new workers and to increase existing workers’ working hours. Using the universe of firms and workers in Denmark from 2001 to 2013, Brenøe et al. (2020) compare observably similar firms in which women stay on leave amid childbirth to those in which there is no new birth by their female employees in the next few years. They focus on small firms with 3-30 employees, which are more likely to bear the burden. The firms facing the absence of leave by mothers tend to hire more temporary workers, keeping the total number of hours worked intact. The policy has also slightly helped to retain other workers in the same occupation as that of the women on leave. Using the 1989 Swedish reform that increased potential paid leave by three months to a total of 15 months, Ginja, Karim, and Xiao (forthcoming) suggest that firms attempted to replace mothers on leave by hiring new *permanent* workers and increasing coworkers’ contracted hours. Huebener et al. (2021) note that firms adjust mothers’ birth-related absence by hiring external substitutes, especially when

there are fewer options to replace the mother on leave internally. In contrast, Gallen (2019) shows the 22-week expansion in parental leave in Denmark in 2002 has no effect on coworkers' earnings, indicating that firms did not increase the working hours of internal workers to adjust for new mothers' leave taking.

While the firms were able to adjust to employee absences, such adjustment is not necessarily frictionless and easy. Using a unique survey collected by the authors themselves, Bartel et al. (2021) study the impact of New York's paid leave policy on employers' experiences with managing employee absences. They find that while there was generally an increase in employers' rating of their ease of handling workers' absences in the first year of the policy, such an ease did not sustain and quickly disappeared by the second year. More importantly, both Brenøe et al. (2020) and Ginja, Karim, and Xiao (forthcoming) find that the total wage bills increased with the new hires and additional working hours, suggesting that adjustment is costly. Ginja, Karim, and Xiao (forthcoming) further find that the magnitude of the increased labor costs depends on the level of internal substitutability – the lower the level is, the more likely a firm would hire external workers, the cost of which can be higher.

The impacts of maternity leave on firm performances are unclear. While Brenøe et al. (2020) fail to find any evidence supporting the overall adverse effects on firm's profit and survival chances, their heterogeneous analysis show negative effects for small firms, in which finding a replacement could be more costly. In contrast, Gallen (2019) finds adverse impacts on firm survival. Ginja, Karim, and Xiao (forthcoming) also find some suggestive evidence of a decline in firm performances measured as sales revenue in the manufacturing industry. Friedrich and Hackmann (2021) find some negative effects arising from parental leave on firm outcomes in the context of the health care industry. They show that the policy increased the leave taking of nurses, which led to a rise in nursing home mortality and acute myocardial infarction patients to readmit to hospital within 30 days.

Finally, there could be further unintended effects on employers and the labor market. Bartel et al. (2021) find that the share of firms opposing the paid leave law, albeit small, increased during their survey years. Leave policies can also promote statistical discrimination against young women. If the absence of leave is costly for firms, it is possible that they reduce the hiring of young women to minimize their cost or equivalently to maximize their profit. Huebener et al. (2021) provide evidence that in response to longer paid leave, firms hired fewer women of childbearing age, especially

in occupations where replacing workers was difficult. Ginja, Karim, and Xiao (forthcoming)’s descriptive general equilibrium analysis also shows some potentially staggering unintended effects on women’s labor market outcomes: after the reform was introduced, women of childbearing ages experienced worsened outcomes in terms of promotion rates, hiring rates, and starting wages, leading to widened gender gap.

Despite asking similar questions, there are some discrepancies in the findings of different studies discussed above. Such discrepancies may stem from the differences in research designs and hence the interpretations of the results. For example, as Brenøe et al. (2020) and Gallen (2019) base their analysis on the same country, which means their setting is similar in terms of labor market, other social safety nets, culture and perception, and child care, comparing their differential effects yields deeper insights. One possible reason behind the contradictory findings between Brenøe et al. (2020) and Gallen (2019) may be the measurement of the burden and hence the definition of treatment effect – the former measures the effect of an additional worker taking leave, while the latter measures the effect of an additional month of leave by its workers. Hence, one possible implication is that managing the slightly longer duration of leave can be more costly than managing the time-off of a worker.

## 5 Some Lessons for Designing Leave Programs

This chapter has thus far reviewed an extensive body of empirical evidence on the impacts of leave programs on a wide range of outcomes. While the literature has provided diverse estimates and the patterns are not always clearly discernible, one strong message that emerges from our review is, however, unequivocal: parental leaves are generally helpful and beneficial for new mothers and their children on several important outcomes that a policy typically aims to improve, including mental and physical health, as well as children’s long-run outcomes. The debate should not be about whether countries should have a leave program, but rather about how it can benefit more people and what constitutes an optimal program. This is certainly a challenging question to answer, and the literature does not provide a clear-cut solution. Leaves can be more helpful for some families than others, depending on their design and features. Certain features of a leave program can also produce contradictory effects on different outcomes across different institutional settings. Nevertheless, what is hoped to achieve here is to at least draw some lessons from the existing

studies, especially those showing possibly negative consequences, to alert us to features that may be associated with negative effects in hopes of avoiding some when considering a leave policy.

In the case of less than universal coverage and full leave take-up, policymakers need to carefully consider who may benefit from a leave policy to avoid exacerbating the already large disparity across socio-economic statuses. For example, FMLA is more likely to benefit better educated and married mothers who have more resources and can afford such leave than those with less education or non-married mothers. The government should increase the accessibility of a leave program to expand the coverage of the population, especially to include those disadvantaged families. For example, a leave program can reduce the eligibility restrictions and make it less dependent on employment history, especially amount of work, prior to childbirth. There is evidence that women may respond to such restrictions to increase their labor supply even six months prior to childbirth, which can potentially increase women’s stress levels and physical burden during pregnancy and in turn affect the health of their newborns.

Increased access to a leave program is associated with a higher level of leave taking, but such relationship is not perfect. Women eligible for a leave do not always take up the leave or take full advantage of the leave allowed. The reasons for mothers’ less than full utilization of their rights may be because disadvantaged families are financially constrained and cannot afford the leave available to them, or because women fear using it may affect their job security. To avoid such situations, the government needs to ensure the wage replacement levels are sufficiently high and the leave is job-protected.

While the government and the society as a whole should strive to make paid leave programs available to *all* women, it is imperative to keep in mind that more generous programs are not necessarily always better in improving women’s labor market outcomes. Finding the optimal levels of duration of leave as well as benefits levels is key to designing a successful leave program. For example, there is some evidence that subsequent expansions of a leave program do not always produce more beneficial outcomes than the initial introduction of a program or less generous programs (for example, a series of reforms in Norway examined in Dahl et al. (2016), Carneiro, Lken, and Salvanes (2015) and Btikofer, Riise, and Skira (2021)). In their initial aggregate-level analysis, Del Rey, Kyriacou, and Silva (2021) note that positive effects are found only until 30 weeks after childbirth, beyond which the effects switch to negative. Rossin-Slater (2018) similarly argues that the leaves longer than one year can lead to adverse effects on women’s employment and work. Short



leaves are, however, not necessarily effective, either; some exceptions have been noted above. With regard to the replacement levels, evidence similarly shows that low levels of wage replacements may not be effective in improving women's employment outcomes (e.g., 40 percent in the Japanese reform examined in Asai (2015)), while cash benefits that are too generous can be harmful to women's employment outcomes (e.g., the Germany reform examined in Kluve and Schmitz (2018)). Furthermore, there is evidence that the effectiveness of these features also depends on whether or not job protection is included. Some of the adverse effects that the literature has found may be attributable to lack of job protection and the fact that women did not return to their pre-birth employers. While the long-run effects on employment and incomes are limited and again mixed, there is evidence showing that some leave programs may lower women's chances of advancing their careers and reaching top managerial positions.

A comprehensive leave program should also have components that involve fathers or partners more in both household works and childcare, which can help alleviate the overwhelming burden on women and sustain a fundamental and persistent change to social norms and attitudes toward gender equality. However, such a component of the policy should be carefully designed. Empirical evidence has shown that the way leave policies targeting father's involvement are implemented matter and may decrease family income and conflict with traditional gender roles, which could lead to a higher divorce risk.

Governments sometimes use a leave program as a device to incentivize fertility. There is some evidence showing that such programs, especially those that incentivize shortening birth spacing, can lead to frequent interruptions of women's careers for an extended period that could be detrimental to their careers.

Leaves and childcare policies are at interplay. The availability of high-quality and accessible childcare services, as well as lower childcare costs, can be important for the effectiveness of a leave policy in encouraging women to return to work and fostering child development. For example, Danzer and Lavy (2018) argue that the extension of job protected parental leave to the second year of a newborn in Austria was effective in improving the cognitive development of children born to high educated mothers, who provided better care than informal child care arrangements. In uncovering that an increase in the generosity of parental leave in Japan was ineffective in producing the desired effect in encouraging mothers to continue working, Asai (2015) attributes this to insufficient child care centers. Geyer, Haan, and Wrohlich (2015) similarly show that childcare support reduces the

decline in mothers' labor supply during the parental leave period. On the other hand, there is also evidence showing that extended leave beyond certain age can also crowd out necessary and equally beneficial interactions with caregivers other than mothers (Dustmann and Schnberg, 2012).

Finally, only a small number of studies have examined the impacts on employers. While there is some evidence that employers may incur some costs and be affected by the interruption of their production process, the results are still inconclusive, which calls for more research. Nevertheless, it is important to recognize these potential effects and ensure that a leave program is funded in a way that minimizes these potential costs.

## 6 Summary

Considering the rising labor force participation of women, governments across the world—to the exception of the United States and a few other countries like Togo and Papua New Guinea—have long offered paid maternity or other parental leave policies in order to help women balance their reproductive and workplace roles. Working women, in response to access to paid leave benefits, may alter their choices with regards to work, fertility, childcare, and other domestic responsibilities. How are leave policies affecting women's and their family's broad range of outcomes such as their labor market outcomes, health, fertility, marriage, and child development? So far, the answer is mixed. The results in the literature are, in many instances, contradictory and difficult to reconcile in order to draw straightforward messages. This is not surprising. The effectiveness of a program depends on a context, its specific features, and time horizons. The leave programs can affect not only mothers and children, primary beneficiaries of these programs, but also their family members (such as husbands and older children) and firms and their coworkers. The effects can also differ markedly across socioeconomic and demographic groups. There is an interplay between leave policies and other social welfare programs, social norms, and other institutional backgrounds. More evidence is needed to understand the long-run impacts, the groups who benefits most from the policies, and more importantly, the driving forces behind the mixed findings.

Amid growing participation of women in the labor force and rising budget constraints on the part of governments, many countries' leave programs face a dual challenge of helping new mothers to balance their work and home responsibilities and of maintaining fiscal balances. From a firm's perspective, a leave policy that does not impose severe burdens or costs by disturbing

their production process due to their workers being on leave is more desirable. From a society's perspective, the optimal leave policy should balance competing necessities and interests of families, governments, and employers. In view of the empirical evidence presented here, it is clear that there is no "one-size-fits-all" policy that countries can rely on. More research is warranted on the impacts of leave programs on firms and estimation of relevant costs and benefits for a particular country.

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## **Cross References**

Gender, Time Allocation, and Birth Controls

Fertility and Wellbeing

Gender and Income Inequality

Gender Wage Gaps and Skills

Female Labor Force Participation Decision

The Child Quantity-Quality Trade-off

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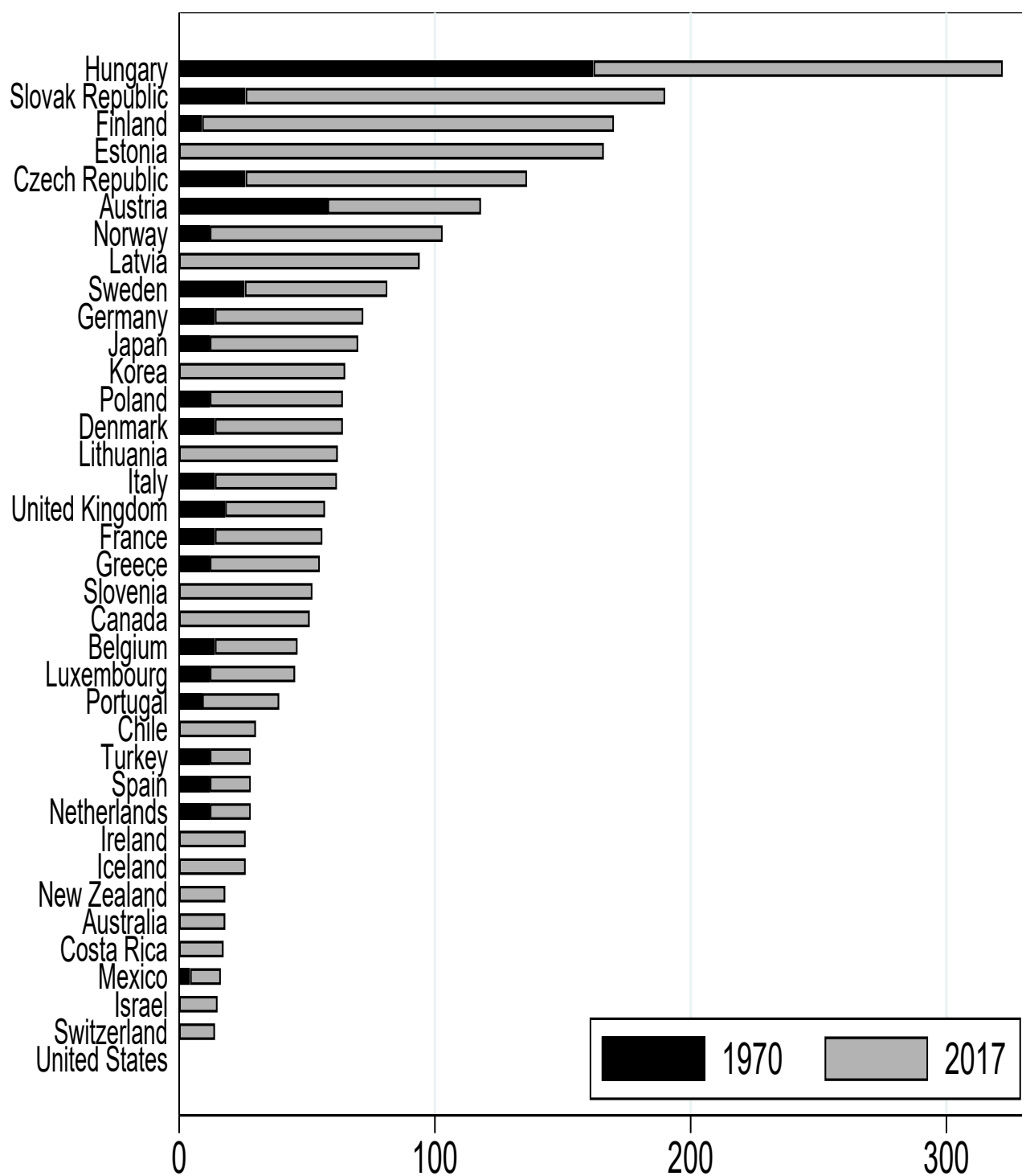
A world map illustrating the number of weeks of paid leave provided by various countries. The map uses a color scale to represent different ranges of weeks. The legend indicates the following categories:

- 52 weeks or more (Dark Blue)
- 26 - 51.9 weeks (Medium Blue)
- 14 - 25.9 weeks (Light Blue)
- Less than 14 weeks (Very Light Blue)
- No Paid Leave (White)

The map shows that countries in North America (USA, Canada), Australia, and several European nations provide 52 weeks or more of paid leave. Russia and China are in the 26-51.9 weeks range. Most other countries, including those in South America, Africa, and parts of Asia and Europe, provide between 14 and 25.9 weeks. Some countries in Africa and Asia provide less than 14 weeks, while others like the USA and Mexico provide no paid leave.

52

**Figure 2**  
Duration of Paid Leave in OECD Countries in 1970 and 2017



*Notes:* The figure displays the duration of paid leave in OECD countries in 1970 and 2017.

Source: OECD.