When Dad Can Stay Home: Fathers' Workplace Flexibility and Maternal Health*

Petra Persson[†] Maya Rossin-Slater[‡]

July 5, 2022

Abstract

We study how fathers' access to workplace flexibility affects maternal postpartum health. We use variation from a Swedish reform that granted new fathers more flexibility to take intermittent parental leave during the postpartum period and show that increasing the father's temporal flexibility—and thereby his ability to be present at home together with the mother—reduces the incidence of maternal postpartum health complications. Our results suggest that mothers bear part of the burden from a lack of workplace flexibility for men because a father's inability to respond to domestic shocks exacerbates the maternal health cost of childbearing.

JEL classification: I12, I18, I31, J12, J13, J38

Keywords: workplace flexibility, intra-household spillovers, maternal postpartum health, paternity leave

*We thank Marcella Alsan, Marianne Bitler, Marika Cabral, Claudia Goldin, Caroline Hoxby, Hilary Hoynes, Erin Kelly, Samuel Lee, Emily Oster, Isaac Sorkin, Betsey Stevenson, Barbara Wolfe, and seminar and conference participants at the NBER Summer Institute, the AEA meetings, Stanford University, Princeton University, Cornell University, University of Chicago, University of Bonn, Tinbergen Institute, Yale University, Duke University, UC Berkeley School of Public Health, UC Berkeley Goldman School of Public Policy, Arizona State University, Stockholm University IIES, the Western Economics Association International Conference, University of Nebraska, the Annual Health Economics Conference, and USC-CESR for helpful comments. We thank Lindsey Uniat and Kate Moulton, as well as to Sarah Bögl at the Research Institute for Industrial Economics, for excellent research assistance. Research reported in this article was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the National Institutes of Health under award number R03HD096184. Persson additionally acknowledges funding from Jan Wallanders och Tom Hedelius stiftelse. Rossin-Slater additionally acknowledges funding from the National Science Foundation (NSF) CAREER Award No. 1752203. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the National Science Foundation.

[†]Department of Economics, Stanford University; NBER; CEPR; Research Institute for Industrial Economics, Stockholm. Email: perssonp@stanford.edu.

[‡]Department of Medicine, Stanford University School of Medicine; NBER; IZA. Email: mrossin@stanford.edu.

1 Introduction

Temporal flexibility in the workplace is increasingly important for modern households in which both parents work. Workplace flexibility allows parents to rearrange their work hours in case of an unforeseen family need—such as a child's sickness or a snow day—while minimizing work interruption. In other words, workplace flexibility often generates flexibility in *when to stay home from work*. As mothers are more likely to be "on call" for unanticipated domestic events (Weeden et al., 2016), a burgeoning literature identifies workplace flexibility as a key factor for improving maternal labor market outcomes and further reducing the gender pay gap (Bertrand et al., 2010; Goldin, 2014; Goldin and Katz, 2016).

Yet other important aspects of workplace flexibility remain less well understood. First, relative to the research on the implications of workplace flexibility for women's *career* costs of family formation, we know less about its impacts on other costs associated with having children.[1] Many women face large health costs during the postpartum period: A substantial share of all new mothers have physical health complications, such as infections, or mental health issues, such as postpartum depression and anxiety.[2]

Second, little is known about *fathers'* demand for workplace flexibility, or the spillover effects of fathers' access to workplace flexibility on maternal well-being. Such impacts would be consistent with a broad range of economic models of the household, which posit that an expansion of the choice set for one spouse (as a result of workplace flexibility initiatives, for example) would induce household re-optimization that may alter the well-being of the other spouse (see, e.g., Becker, 1973; Chiappori, 1992; Lundberg and Pollak, 1993; Persson, 2020). While recent studies estimate intra-household spillover effects of maternity leave benefits on spousal labor market outcomes (Canaan, 2019; Ginja et al., 2020a,b), the impacts of fathers' benefits on maternal health outcomes may be different.

Third, the benefits of workplace flexibility policies are often weighed against potential moral hazard-related costs. While such costs have been discussed in the context of paid sick leave legislation (see, e.g., Pichler and Ziebarth, 2017), less is known about the role of moral hazard in the context of policies targeting new parents. In many paid family leave policies, a father's (or non-birthing-parent's) right to take time off from work to be at home with their child is conditioned on the (birthing) mother returning to the labor market or being enrolled in school at the same time.[3] This rule is intended to guard against moral hazard, which in this

[1] See, e.g., Kleven et al. (2019), for evidence of the "child penalty" in earnings. The career cost of having children grows in magnitude over time since childbirth; by contrast, the health cost is largely concentrated in the immediate postpartum period.

[2] Studies from multiple countries document that between 23 and 83 percent of new mothers experience pain in various parts of their bodies (including the perineum, cesarean-section incisions, the back or the head) following childbirth (see Cheng et al., 2006 for an overview). In the United States, about five to seven percent of new mothers experience an infection associated with childbirth or breastfeeding (Dalton and Castillo, 2014), and more than one out of every 100 new mothers is readmitted into the hospital within 30 days after childbirth (Clapp et al., 2017). In Sweden, our data show that three percent of new mothers are hospitalized in the first month after childbirth, while ten and six percent require prescription painkiller and antibiotic drugs, respectively. With regard to mental health, recent estimates suggest that about one in nine women in the U.S. report symptoms of postpartum depression (Ko et al., 2017). In Sweden, around 11 percent of new mothers are found to have depressive symptoms based on the Edinburgh Postnatal Depression Scale at two months post-childbirth (Rubertsson et al., 2005). Our data also show that more than one out of every 100 new mothers are prescribed anti-depressant or anti-anxiety medications in the first month after giving birth.

[3] As one example, the Norwegian policy, which has been extensively studied in the prior literature (e.g., Cools et al., 2015; Dahl et al., 2016; Bütikofer et al., 2021) states: "If the father/co-mother wants to take parts of the shared period [of leave], the mother must be occupationally active (work, education or similar)." See: `https://www.norden.org/en/info-norden/parental-benefit-norway`.

setting would constitute one parent—stereotypically, the father—engaging in leisure activities while the other parent—stereotypically, the mother—cares for the child. However, if a father's presence at home together with the mother improves the mother's health, then such a moral-hazard-reducing provision is costly; further, it becomes essential to understand whether this (theoretical) moral hazard consideration is in fact empirically relevant.

This paper begins to fill these gaps by analyzing fathers' demand for workplace flexibility and the spillover effects of fathers' access to workplace flexibility on maternal health. We study a Swedish reform that increased workplace flexibility for new fathers by relaxing a central restriction in the parental leave system. At the time of the reform, Swedish households were granted 16 months of job-protected paid leave (per child), to be allocated across the two parents.[4] However, parents were generally not allowed to be on leave *at the same time*—in fact, simultaneous leave use was permitted for only 10 days around childbirth (hereafter referred to as "baseline leave"). Since nearly all mothers take full-time leave in the months following childbirth, this rule effectively limited fathers' ability to use paid leave alongside the mother during most of the immediate postpartum period.

The "Double Days" reform, implemented on January 1, 2012, relaxed this restriction by allowing both parents to use full-time leave benefits at the same time for up to 30 additional days during the child's first year of life. These days could be taken on a flexible, intermittent basis. Importantly, the reform did not alter the total duration of leave available to households. Thus, fathers were granted more flexibility to choose, on a day-to-day basis, whether to claim a paid leave benefit to stay home together with the mother and child or whether to save the benefit for the family's future use.[5] Put differently, households gained increased flexibility to be able to remove the father from the labor force on days when the value of doing so is high. For example, additional support for the mother may be especially valuable on days when she is not feeling well (e.g., because she is coming down with a post-childbirth or breastfeeding-related infection), is fatigued or stressed, or is having mental health issues.

We use detailed linked Swedish administrative data and begin by showing that maternal health issues are substantially more prevalent in the *first month after childbirth* than in the subsequent months, underscoring the potential value of access to flexible leave for fathers during that initial postpartum month. To identify the causal impacts of access to such leave, we leverage the non-linear variation in the share of days during the child's first month of life that a family is eligible for simultaneous leave among parents of children born in the months surrounding the reform: parents of children born on January 1, 2012 or later are eligible for the entirety of the first post-birth month; parents of children born on December 1st through 31st of 2011 are eligible for a share of days that varies linearly between 0 and 1; while parents of children born on November 30, 2011 or earlier are not eligible for any "Double Days" in the first postpartum month. We then consider all families with firstborn singleton children born in the three months before and after January 1, 2012, as well

[4]Parents faced some restrictions on how to split this leave. In particular, at the time of the reform, two months were earmarked for each parent. See Section 2 for details.

[5]Importantly, Swedish law states that parents are not required to notify their employers in advance of taking this leave. See Section 2 for more details.

as families with children born in these same calendar months in the three prior years, and estimate regression models that use the "share days eligible" as the key treatment variable, while controlling flexibly for seasonality and cohort effects. In addition, we implement a "doughnut" Regression Discontinuity Difference-in-Differences (RD-DD) model, which drops all December births, and compares the outcomes of parents of children born on October 1st through November 30th of 2011 and January 1st through March 31st of 2012, relative to the analogous difference between parents of children born on these days in the three prior years. Our empirical strategy thus exploits the reform-driven change in eligibility for simultaneous leave *during the first postpartum month*, while accounting for other sources of variation in family outcomes across children born on different days of the year.[6]

We find that households have substantial demand for paternal workplace flexibility in the first postpartum month. Being fully eligible for the "Double Days" in the first month post-childbirth raises the likelihood that a father uses more than the 10 days of baseline leave (hereafter referred to as "post-baseline leave") in that first month by 3.9 percentage points, which represents a 92 percent effect size relative to the sample mean. Interestingly, while the effect on *any* post-baseline leave is large, we observe a small 0.32 day increase in the total number of leave days taken. Thus, it appears that families respond mostly on the extensive rather than the intensive margin, which is consistent with most fathers only using a short period of leave when it is of high value for the family, as opposed to taking advantage of the policy to shirk from their jobs for lengthy periods of time. Put differently, moral hazard concerns related to simultaneous leave use by new parents do not seem to be supported by the data.

We also show that access to workplace flexibility for fathers during the first postpartum month has positive spillover effects on maternal health. We find that mothers in families that have full access to "Double Days" during the first month post-childbirth have a 1.0 percentage point (12 percent) lower likelihood of having an inpatient or specialist outpatient visit for childbirth-related complications, and a 1.5 percentage point (14 percent) lower likelihood of having an antibiotic prescription in the same month. We additionally find suggestive evidence of a reduced likelihood of having a visit for external causes or counseling,[7] and of having an anti-anxiety drug prescription in the first postpartum month. The effects on maternal health outcomes are larger in both absolute and relative terms for mothers with pre-childbirth medical histories.[8]

The large maternal health effect magnitudes are consistent with the idea that fathers take leave on days when the marginal benefit of doing so is especially high. To provide further support for this conjecture, we show that the "Double Days" reform increases the likelihood that the father takes at least one day of leave

[6]Such differences may stem from a variety of factors, including seasonality in births, differences in holiday time off work, and differential sorting because of school starting-age laws (see, e.g., Buckles and Hungerman, 2008; Currie and Schwandt, 2013; Black et al., 2011).

[7]This category of visits includes those that are coded as "factors influencing health status and contact with health services." These codes are used for occasions when there are circumstances other than a disease, injury, or other diagnosed external cause that lead to a health encounter. Most relevant to our study, these codes can be used to classify visits in which a new mother receives medical counseling or advice, but is not diagnosed with any particular condition (e.g., she may receive advice regarding postpartum "baby blues," but is not formally diagnosed with depression). See Section 3 and Appendix C for more details.

[8]We define mothers with a pre-birth medical history as those who have either any inpatient visit in the 24 months before childbirth or any specialist outpatient visit for mental health reasons in the 60 months before childbirth or any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth. See Section 3 for more details.

on the same day as when the mother has an encounter with the health care system. This result suggests that the option to take simultaneous leave allows fathers to stay home and care for their infants while mothers get medical care. The fact that we also find an overall reduction in maternal health care encounters with hospitals and specialist providers (as well as in prescription drug use) additionally suggests that fathers' flexibility to be able to stay home averts health complications that necessitate medical intervention in the first place. For instance, if a mother starts coming down with symptoms of mastitis—a common breastfeeding-related infection—then having the father stay at home may allow her to rest, sleep, and breastfeed (i.e., following the recommended protocol for treating initial symptoms of mastitis) and avoid the need for antibiotics.[9]

Our study contributes to a large literature on parental leave (for some recent overviews, see: Olivetti and Petrongolo, 2017; Rossin-Slater, 2018; Rossin-Slater and Uniat, 2019). However, unlike most studies that identify the impacts of program implementation or extensions, our paper instead provides insights into the details of program *design*. In the pre-reform period, Sweden constrained fathers' ability to take leave at the same time as the mothers. Similar inflexibility is built into parental leave systems in numerous other countries because policymakers view paternity leave as a way of promoting father-child bonding, changing gender norms, and improving maternal labor market outcomes. These goals are perceived to be more attainable if fathers are encouraged to stay at home *alone* with the child and for a *consolidated* time period.[10] While the evidence on the potential (bonding or labor market) benefits of such inflexibility is mixed,[11] our study demonstrates that doing the opposite—letting fathers take leave *intermittently* and *jointly* with the mother, especially immediately after childbirth—could be critical to maternal postpartum recovery. Our results are consistent with findings from Fontenay and Tojerow (2020)'s ongoing research in Belgium, which shows that fathers' eligibility for two weeks of paternity leave in the month after childbirth (i.e., while the mother is also on leave) reduces maternal use of disability insurance.[12]

Moreover, the absence of a large moral hazard cost associated with the reform—as evidenced by the small increase in the total number of days of leave taken—likely stems from the fact that parents incur the marginal cost of taking a "Double Day" by foregoing the option to take an additional parental leave day in the future.

[9]We do not have any data on primary care visits. It is also possible that allowing fathers the option to take leave at the same time as mothers allows mothers to seek prompt primary care and thus avoid more serious health complications that require specialist or inpatient treatment.

[10]Indeed, nearly all existing studies of paternity leave focus on the consequences of so-called "Daddy Month" reforms. While countries differ in whether or not fathers are explicitly prohibited from taking leave at the same time as mothers, in practice, these policies tend to generate a lumpy leave-taking pattern, where fathers take leave *after mothers return to work*. See, e.g., Duvander and Johansson, 2012; Ekberg et al., 2013; Duvander and Johansson, 2014, 2015; Avdic and Karimi, 2018; Rege and Solli, 2013; Dahl et al., 2014; Cools et al., 2015; Dahl et al., 2016; Eydal and Gislason, 2008; Schober, 2014; Bünning, 2015; Patnaik, 2019; Farré and González, 2019; Olafsson and Steingrimsdottir, 2020; Andresen and Nix, 2019; Lappegård et al., 2020.

[11]While there are some studies suggesting that Swedish fathers who take longer leaves share household tasks and childcare more equally than those who take shorter leaves (e.g., Almqvist and Duvander, 2014), others find null or even adverse effects on paternal participation in childcare, parental labor market trajectories, and marital stability (Ekberg et al., 2013; Duvander and Johansson, 2015; Avdic and Karimi, 2018; Gerst and Grund, 2020; Lappegård et al., 2020).

[12]By contrast, research set in Norway shows no effect of the Norwegian "Daddy Month" reform on maternal sick leave use (Ugreninov, 2013). While both Fontenay and Tojerow (2020) and Ugreninov (2013) examine proxies of maternal health based on social insurance take-up, research on more direct maternal health measures is limited. One study from Great Britain finds that self-reported health outcomes of postpartum women whose partners took two weeks of paternity leave are better than those of postpartum women whose partners took no leave, conditional on selected observable characteristics (Redshaw and Henderson, 2013). Another correlational study using Swedish data finds that infants of fathers who do not take any paternity leave are less likely to be breastfed than infants of fathers who do (Flacking et al., 2010). However, unobservable differences between families with fathers who do and do not use paternity leave generate challenges for causal interpretation.

This feature makes the policy potentially less costly than other interventions that could be used to support mothers during the postpartum period, such as nurse home visiting programs. It also limits the potential for adverse future labor market consequences associated with longer paternity leaves (e.g., as found by Gerst and Grund, 2020).[13] By leveraging families' private information about when it is most desirable to stay home relative to the cost of missed time at work, workplace flexibility allows households to ensure that they reap large benefits relative to the number of leave days used.

In sum, the central insight that emerges from our analysis is that mothers bear the majority of the cost of a lack of workplace flexibility—not only directly through greater career costs of family formation (as documented in prior literature)—but also *indirectly*, as fathers' inability to respond to domestic shocks exacerbates the maternal health costs of childbearing.[14] More broadly, our results contribute to our understanding of how policy influences maternal postpartum health. While discussions about maternal health often center around the role of the medical system,[15] less attention has been paid to the mother's postpartum environment *at home*, where women spend the majority of their time in the weeks following childbirth. Consistent with the idea that the home environment could be important for maternal health, a growing literature shows that *maternity* leave benefits are associated with improvements in mothers' health outcomes (Hyde et al., 1995; Staehelin et al., 2007; Baker and Milligan, 2008; Chatterji and Markowitz, 2012; Aitken et al., 2015; Avendano et al., 2015; Beuchert et al., 2016; Bütikofer et al., 2021; Hewitt et al., 2017; Heymann et al., 2017; Jou et al., 2018; Guertzgen and Hank, 2018; Bullinger, 2019).[16] This paper emphasizes the importance of a particular aspect of a new mother's home environment: the presence of the father.

2 Institutional Setting and Theoretical Predictions

Sweden implemented its gender-neutral paid parental leave policy in 1974, replacing the previous maternity leave system that only covered mothers.[17] The program is largely funded through employer social security contributions. Since the early 2000s, the program has featured a per-child benefit of 13 months of wage-

[13] Related, Johnsen et al. (2020) use data from Norway to demonstrate that a father's labor market trajectory is influenced by the share of his co-workers who take paternity leave through a "competition effect"—fathers who have a higher share of co-workers taking leave have higher future earnings than their counterparts who have a lower share of leave-taking co-workers.

[14] Work-family conflict is a major source of stress (Shockley et al., 2017) that is associated with adverse physical and mental health outcomes (Frone, 2000; Allen and Armstrong, 2006; Backé et al., 2012; Berkman et al., 2015; O'Donnell et al., 2019). While there is some evidence that public and organizational policies that promote workplace flexibility can mitigate this relationship (Dionne and Dostie, 2007; Kelly et al., 2011; Moen et al., 2013; Ziebarth and Karlsson, 2014; Bloom et al., 2014; Moen et al., 2016; Pichler and Ziebarth, 2017; Stearns and White, 2018), most studies use relatively small samples of workers in specific firms or industries, and focus on interventions that increase workers' autonomy in navigating their typical day-to-day workloads (e.g., shortened work hours, work-from-home options, and sick leave days). Further, little is known about the potentially distinct impacts of workplace flexibility during *critical* periods in workers' lives, such as shortly after the birth of a child.

[15] For example, the "Lost Mothers" special series by the National Public Radio (NPR) largely focuses on the role of the medical system in contributing to rising maternal mortality in the United States. See: `https://www.npr.org/series/543928389/lost-mothers`.

[16] Beuchert et al. (2016) study a reform in Denmark that increased leave duration for both parents. However, given that they find that mothers' leave duration responds much more strongly to the reform than fathers' leave duration, the authors attribute estimated maternal health benefits to the effects of extended maternity leave.

[17] Sweden's parental leave program is not tied to marital status. Thus, it confers benefits to the (biological or adoptive) parents of a child regardless of whether they are married or not. In practice, a substantial share of parents are unmarried but cohabiting at childbirth (Persson, 2020), and, as we discuss further below, we control for marital status in our empirical models.

replaced leave, as well as an additional 3 months of leave with a flat-rate benefit.[18] Parental leave benefits do not need to all be used in one spell; they can be claimed at any point until the child turns 8 or, more recently, 12 years old.[19] Moreover, the benefits can be claimed on a part-time basis.[20]

Parental leave is job protected in Sweden, with different rules applying during the first 18 months post-childbirth and beyond. During the first period, parents are entitled to full-time leave with job protection. Then, until the child turns 8 (or 12) years old, parents are legally able to reduce their working hours by as much as 25 percent while still working at the same job.[21]

Additionally, although leave in the original system was completely transferrable between parents, the vast majority of the leave days was taken by mothers.[22] In an effort to promote a more gender-equitable division of parental leave, the Swedish government has implemented three reforms (in 1995, 2002, and 2016) that each earmarked one month of wage-replaced leave to each parent. In other words, if a parent does not use their earmarked leave, the family loses that amount of leave. Since virtually all mothers take more than three months of leave throughout this time period, these reforms are in actuality only binding for fathers, and therefore colloquially referred to as the "Daddy Month" reforms.

Restrictions on simultaneous leave use. While both parents have access to paid leave in Sweden, there are important restrictions on the *simultaneous* use of parental leave. Specifically, until 2012, fathers were only entitled to ten "baseline days" of wage-replaced leave that could be used while mothers claim full-time leave, and they could only use them during the first 60 days after childbirth.[23] Beyond these ten days, parents could only be on leave simultaneously part-time while also working part-time, as long as the total amount of leave claimed by the two parents did not exceed the equivalent of a full-time job. In practice, however, since nearly all mothers were taking full-time leave in the months following childbirth, a father could only claim paid leave if the mother did not claim her benefit on that day (i.e., she took unpaid leave for the day).

Appendix Figure A1 presents a stylized representation of how the median Swedish family allocated leave between parents, using data on parents of firstborn singleton children born in 2008–2011. The figure shows that other than a maximum of ten baseline leave days that could be taken by fathers shortly after childbirth, the median mother was at home alone on full-time leave for about 14 months. After she returned to work,

[18] During the time period covered in our analysis, the replacement rate was approximately 78 percent of prior gross earnings, up to a ceiling. The flat-rate benefit has increased over time: from 180 SEK per day in the mid-2000s to 250 SEK (approximately $27) per day in 2016. To be eligible for the wage-replaced benefits, individuals must have had at least 240 days of employment paid at or above the flat-rate (e.g., 250 SEK per day in 2016) before the expected date of childbirth. Individuals who do not meet this employment requirement receive the lower flat-rate benefit only (Duvander et al., 2017).

[19] Specifically, for children born before January 1, 2014, parental leave benefits can be claimed until the child turns 8 or finishes the first year of school; for children born thereafter, benefits can be claimed until the child turns 12 years old.

[20] In particular, a parent can file for 100% leave (corresponding to 8 hours), 87.5% leave (corresponding to 7 hours), and so on, down to the smallest claim amount of 12.5% leave (1 hour).

[21] In order to help employers plan for long employee absences, an employer may request that their employees notify them in advance of planned parental leave spells. For example, as we discuss below, the median mother takes around 14 months of parental leave following childbirth. This does not preclude employers from allowing employees to take leave on short notice, and, in practice, unplanned leave spells of a few days or less typically fall into this category.

[22] Duvander and Johansson (2012) report that men used 0.5 percent of all parental leave days at the time of the program's inception in 1974, and this number rose only slightly over the next two decades.

[23] These ten days of baseline paternity leave do not count toward the total amount of wage-replaced parental leave that the parents divide between them.

the median father took two months of leave. Children then typically entered public daycare, and the parents could use any remaining days of leave on a sporadic basis until the child's 8th birthday. As children's summer school breaks are usually longer than parental vacation time off, in practice these days are often used to cover the childcare gap during the summer.

This figure highlights that most policy efforts surrounding encouraging fathers to take leave are focused on *sequential* (rather than simultaneous) and *lumpy* (rather than intermittent) leave. Indeed, as evidenced by the picture, the median Swedish father was taking the full two "Daddy Months" that were available during the 2008-2011 time period, but he was doing so in one stretch after the mother returned to work. Yet while policies that incentivize fathers to stay home on their own for a consolidated stretch of time may be important for father-child bonding and promoting paternal participation in household work (despite mixed evidence on these outcomes), they also preclude the father from having flexibility to be home during the vulnerable immediate postpartum period.

"Double Days" reform. On January 1, 2012, Sweden implemented a "Double Days" reform, which changed the parental leave system such that parents were now allowed to take full-time wage-replaced leave *at the same time* for up to 30 additional days (beyond the baseline days) during the child's first year of life.[24] Importantly, parents are *not* required to notify their employers in advance of taking this leave, especially if the second leave-taker—who is, in virtually all cases, the father or non-birthing co-parent—is doing so because the primary caregiver of the child is sick.[25] Further, the reform left all other policy details—including total leave duration, the wage replacement rate, and the amount of earmarked leave—completely unchanged. Thus, the "Double Days" reform essentially provided families with more flexibility in choosing how to allocate the timing of their leave; fathers could now take full-time paid leave on an as-needed basis during the postpartum period when the mothers were also at home on paid leave.

The fact that the total duration of leave allotted to parents remained unchanged implies that families incur a cost of the father taking a "Double Day" while the mother is on leave—the family must forego the option to take a day of leave in the future. Therefore, while the reform allowed parents to use up to 30 days of full-time leave simultaneously, we should not expect all households to use up all of their "Double Days," nor should we expect that they use them in a single spell. This is made clear in Appendix Figure A2. The figure plots the distribution of the length of all joint spells of leave taken by parents of firstborn children born in January–March 2012 in the first year after childbirth, and demonstrates that a large share of these spells are only one or a few days long.[26]

Since all parents of children under age one become eligible for "Double Days" starting on January 1, 2012, parents of children born in 2011 are in principle able to use "Double Days," but only as their children age (i.e.,

[24] The Swedish parliament voted on the reform on October 12, 2011; i.e., less than three months before it went into effect (Riksdag, 2011). Thus, there was minimal scope for any "anticipation effects," especially in terms of the decision of when to have a child.

[25] See paragraph 13 of the Swedish law here: `https://www.do.se/diskriminering/lagar-om-diskriminering/foraldraledighetslagen`.

[26] Note that the range of joint spell lengths includes cases that exceed 30 days. This happens because we count as a day of joint leave any day in which both parents claim either part- or full-time leave, paid or unpaid.

they are *not* eligible immediately at the time of childbirth). However, if maternal health complications are most common in the immediate postpartum period, then the value of the father being able to stay home in that initial period is potentially higher than his ability to do so at a later point during the child's first year of life. Figure 1 plots trends in the total number of health care encounters and prescription drug claims for various physical and mental health conditions by month following childbirth, averaged across the 2008–2011 birth cohorts in our data.[27] Out of the nine measures of health issues displayed in the figure, all but one exhibit significantly higher prevalence in the first month after childbirth than in any of the subsequent months.[28] Therefore, as we explain in more detail in Section 4 below, our empirical strategy focuses on identifying the effects of eligibility for "Double Days" *during the first month post-childbirth.*

Other benefits. In the pre-reform period, when fathers were restricted to only ten baseline days during which they could take full-time paid parental leave at the same time as mothers, fathers could in principle rely on other benefits to stay home if necessary. While Sweden does not provide any family leave benefits to care for adult family members (i.e., postpartum mothers), it is possible that fathers relied on own sick leave benefits for these purposes. In addition, if a mother claims her sick leave benefit instead of her parental leave benefit on a given day, then the father can claim a full-time parental leave benefit on that same day. However, sick leave benefits are reimbursed at a lower rate than parental leave benefits for most parents, making this a potentially unappealing option. Nevertheless, if parents were using sick leave for these purposes before the "Double Days" reform, we would expect there to be a decline in sick leave use among both mothers and fathers in the post-reform period.

As sick leave data are only available at an annual level, we compare the annual number of sick leave days used by parents of firstborn singleton children born in January–March 2011 and January–March 2012 in Appendix Table A1. We do not detect any statistically significant differences either in the average number of sick leave days or in the share of parents with any sick leave across the two groups, suggesting that substitution from sick leave toward parental leave is not affecting the interpretation of our main estimates.

Unfortunately, we do not have data on other benefits such as vacation days. However, in Sweden, vacation benefits are not very temporally flexible, as vacation time has to be scheduled with the employer in advance (moreover, employees are typically required to take at least a portion during the summer months). Thus, vacation benefits are far less flexible than sick leave benefits, which we do observe. Nonetheless, if anything, substitution from other time off to paid parental leave among fathers would imply that our effects of fathers' workplace flexibility on maternal health are attenuated.

Theoretical predictions about the impacts of the "Double Days" reform. To understand household demand for father presence at home as well as the potential impacts of fathers' access to increased temporal

[27] For inpatient and outpatient visits and antibiotic drug claims, we aggregate across all encounters/claims that occur in each 30-day period post-childbirth (i.e., if a mother has multiple visits, then we count each of them). For mental health prescription drugs, we aggregate across initial prescription drug claims post-childbirth only, since once a mother receives a prescription for a mental health drug, she is likely to continue to consume the drug in the subsequent months to treat the same underlying condition.

[28] The only exception is outpatient visits with mental health diagnoses, for which prevalence is somewhat higher in the second and third months postpartum.

workplace flexibility on maternal wellbeing, Appendix B presents a theoretical analysis of the flexibility reform. Based on four parsimonious assumptions about the benefits and costs of parental leave, our dynamic model describes how parents divide a household's allocation of parental leave days, taking into account the evolution of the labor market costs and household benefits of the presence of each parent. We first derive parents' optimal division of leave when they are *not* allowed to take leave simultaneously. This characterization is highly consistent with actual parental leave use in Sweden in the pre-reform period, which underscores the model's applicability to our setting. We then introduce a reform that relaxes the restriction on simultaneous leave. Our analysis of optimal household behavior in this framework emphasizes that, in a setting where households have the flexibility to decide when to take simultaneous leave, the *timing* of the take-up of a joint day of parental leave is not random. Instead, households optimally respond to the need for maternal support by removing the father from the labor force on precisely the days when the household has private information that the benefit of doing so is the highest. Our model thus predicts large maternal health benefits associated with a relatively low number of leave days taken by the father.

3 Data

Our empirical analysis uses multiple Swedish administrative data sets: birth records data from the National Board of Health and Welfare (NBHW; in Swedish *Socialstyrelsen*), population register data from Statistics Sweden containing demographic and labor market information on the parents, data on parental leave claims from the Swedish Social Insurance Agency (*Forsakringskassan*), as well as inpatient, outpatient, and prescription drug claims data from NBHW to measure maternal health outcomes.

Births data. We have data on all Swedish births from 2000 to 2016, with unique parental and child identifiers, and with detailed information on pregnancy and delivery characteristics and birth outcomes, including child gender, birth order, birth type (singleton versus multiple birth), gestational age in days, expected due date, birth weight in grams, the Apgar score, an indicator for small-for-gestational-age (SGA), and indicators for cesarean section (c-section) deliveries, inductions of labor, and various pregnancy risk factors and labor/delivery complications. We use these data to identify firstborn singleton live births during our analysis time frame, and to calculate the children's exact dates of birth using information on gestational age and expected due date.[29]

Demographic information and parental leave claims. We use administrative data from Statistics Sweden to obtain information about each mother's and father's age, educational attainment, marital status, and income in the year before the first child's birth. To measure take-up of parental leave, we add spell-level data from the Swedish Social Insurance Agency. For each child, we observe the universe of parental leave spells taken from 1993 until 2016. For each spell, the data contain the exact start and end dates, as well as

[29]Specifically, we subtract 280 days (40 weeks) from the expected due date to obtain the conception date, and then add the gestational age in days to obtain the actual date of birth.

information about the type of compensation (wage-replaced or flat-rate day), as described in Section 2 above. We merge the two data sets to the birth records data using parental identifiers.

Our two main leave outcomes are: an indicator for any post-baseline leave taken by fathers during the first 30 days post-childbirth, and the total number of post-baseline leave days taken by fathers during this period.[30]

Maternal health outcomes. We merge information from inpatient care, specialist outpatient care, and prescription drug records using maternal identifiers. We have access to inpatient records from 1995 to 2016, specialist outpatient records from 2001 to 2016, and prescription drug records from 2005 to 2017. The inpatient records contain information on the universe of a patient's visits to the hospital that result in hospital admission, including cases where the individual is admitted and discharged on the same day. The outpatient data records all visits *excluding* primary care. In Sweden, primary care (e.g., regular postpartum check-ups and annual physical exams) is provided at municipal "care centers" (*Vårdcentraler*), which are mostly staffed with nurses. "Care centers" can provide referrals to more specialized outpatient care, which is what we observe in the outpatient records. The drug records contain the universe of an individual's prescription drug purchases made in pharmacies, but do not include drugs administered in hospitals.

For each visit to an inpatient or specialized outpatient provider, the data contain information on the date of the visit, the associated International Classification of Diseases (ICD-10) diagnosis codes, and the length of stay (for inpatient data only). For each occasion when a prescription drug was obtained, the prescription data contain information about the drug name, active substance, average daily dose, and the drug's exact Anatomical Therapeutic Chemical (ATC) code.[31] The ATC classification allows us to link the drugs to the conditions they are most commonly used to treat.

We examine maternal health outcomes measured in the first 30 days post-childbirth. Using the inpatient and outpatient data, we define indicators for any inpatient or outpatient visit following the child's birth (excluding the birth itself), as well as indicators for any visits associated with the following three distinct diagnosis groups: (i) conditions related to pregnancy, childbirth, or the puerperium period, (ii) diagnoses for mental, behavioral, and neurodevelopmental disorders,[32] and (iii) external causes and medical counseling.[33]

In the prescription drug data, we create indicators for any drug claims in the following four categories: anti-anxiety, anti-depressant, antibiotic, and painkiller. Appendix C lists the exact ICD and ATC codes for all of our outcomes.

Finally, to examine a particularly vulnerable sub-group of new mothers, we use information from the inpatient, outpatient, and prescription drug records to measure pre-childbirth medical histories. We classify

[30]For both measures, we count any day with any leave benefit claimed, regardless of whether it is wage-replaced or a flat rate, and regardless of whether it is full-time or part-time, as a day of leave.

[31]The ATC classification system is controlled by the World Health Organization Collaborating Centre for Drug Statistics Methodology (WHOCC), and was first published in 1976.

[32]Note that inpatient and outpatient visits with a mental health diagnosis are generally associated with severe and/or chronic mental illness. Milder or more temporary cases of mental health issues may instead show up in our data in the form of prescription drug treatment. To that point, one does not need to have a formal mental health diagnosis in order to be prescribed anti-anxiety or anti-depressant medications.

[33]As noted in footnote 7, "medical counseling" refers to visits with codes that start with the letter Z in the ICD-10 system for "factors influencing health status and contact with health services." The external causes category includes visits for injuries, poisonings, accidents, and assaults.

mothers as having a medical history if they satisfy any of the following conditions: (i) any inpatient visit in the 24 months before childbirth, (ii) any specialist outpatient visit for mental health reasons in the 60 months before childbirth, or (iii) any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth.[34]

Analysis sample and summary statistics. To analyze the effects of the 2012 "Double Days" reform, we first consider all 233,981 firstborn singleton children born in 2008-2012, and then limit the sample to the 222,638 observations for which we can calculate exact dates of birth.[35] Additionally, to zoom in on families with children born in a time window surrounding the reform, we constrain our sample to only include those with children born in October through December of 2011 and January through March of 2012, as well as those with children born in these same months in the three prior years (i.e., October–December of 2008, 2009, and 2010 and January–March of 2009, 2010, and 2011).

Table 1 reports sample means of selected parental background characteristics and maternal health outcomes measured in the first month post-childbirth. Column (1) includes all firstborn singleton children born in 2008–2012. Column (2) limits the sample to children with information on exact date of birth. Column (3) uses our primary analysis sample of families with children born in October–December of 2008–2011 and January–March of 2009–2012, while column (4) further limits the analysis sample to families with mothers who have a pre-childbirth medical history. About 45 percent of mothers and 57 percent of fathers have a low education level (defined as high school or less), respectively, and the average mother (father) is 29 (32) years old in the year before birth. Maternal and paternal average annual employment incomes in the year before birth are 208,000SEK ($29,060) and 276,000SEK ($38,498) in 2010, respectively. About 21 (22) percent of the mothers (fathers) in our data are born outside of Sweden. There are no large differences in these characteristics across the first three columns, while families in which mothers have a pre-birth medical history (column 4) have lower average education levels and incomes.

The table further shows that about three percent of new mothers have at least one inpatient visit in the first month postpartum, while 16 percent have at least one specialist outpatient visit during the same time frame. Eight percent of mothers have an inpatient or outpatient visit for childbirth-related complications, 0.5 percent have a visit with a mental health diagnosis, while 0.1 percent have a visit for external causes or medical counseling. Consistent with the idea that one does not need to have a formal mental health diagnosis in order to be prescribed a mental health-related medication (see footnote 32), we observe that one percent of new mothers have an anti-anxiety or anti-depressant drug prescription, which is double the share of women with a diagnosis. Six and ten percent of new mothers have painkiller and antibiotic prescriptions, respectively, during the first month after giving birth. Not surprisingly, the means of the maternal health outcomes are

[34] We choose these time frames such that we capture women with a medical history in a time period sufficiently close to childbirth, and that we retain enough sample size to have sufficient statistical power. We choose to focus on outpatient visits and prescription drugs related to mental health since most women have at least some kind of (non-mental-health-related) specialist outpatient visit or prescription drug in the months before childbirth. Our results are not sensitive to small alterations to the time windows used to measure medical histories.

[35] We are unable to calculate exact dates of birth for the approximately five percent of observations that are missing data on the expected due date.

higher among mothers with pre-birth medical histories in column (4).

4 Empirical Methods

Our goal is to examine the causal link between fathers' access to workplace flexibility and maternal health in the immediate postpartum period. We study this question by exploiting the natural experiment stemming from the "Double Days" reform on January 1, 2012. Specifically, we calculate the share of days between the child's first and 30th day of life that the parents are eligible for the "Double Days". Thus, a family with a child born on January 1, 2012 or later gets a value of 1 for this share. A family with a child born on December 31, 2011 gets a value of $\frac{29}{30} = 0.96$, while a family with a child born on December 1, 2011 gets a value of $\frac{1}{30} = 0.03$. Families with children born on November 30, 2011 or earlier get a value of 0.

Intuitively, our quasi-experiment compares the outcomes of parents of firstborn singleton children born in January–March 2012 and October–December 2011 (the "reform period"), relative to the difference in outcomes in the same months in the previous three years (January–March 2011, 2010, and 2009 versus October–December 2010, 2009, and 2008; the "non-reform periods"). This is effectively a type of Regression Discontinuity Difference-in-Differences (RD-DD) model, except we alter it in two ways: (1) we model treatment using the (non-linear but continuous) "share days eligible" variable rather than measuring a discontinuous jump between December 31, 2011 and January 1, 2012 births, and (2) we estimate a "doughnut" RD-DD in which we drop all December births.

Specifically, the "share days eligible" model takes the form:

$$
\begin{aligned}
y_{idp} = {} & \alpha_0 + \alpha_1 ShareDaysEligible_{idp} + \alpha_2 \mathbf{1}[d \geq c] + \\
& + f(d-c) + \mathbf{1}[d \geq c] \times f(d-c) + \mathbf{x'}_i \kappa + \theta_p + \varepsilon_{idp}
\end{aligned} \tag{1}
$$

for each family of child i born on day of the year d in time period p, where we refer to each October through March as a separate period (e.g., October 2008–March 2009, October 2009–March 2010, etc.) y_{idp} is an outcome of interest, such as an indicator for any post-baseline leave use in the month after childbirth or an indicator for a maternal inpatient or outpatient visit in the first postpartum month. c denotes January 1, the reform threshold and the first day of every calendar year. The dummy variable $\mathbf{1}[d \geq c]$ is set to 1 for children born in January–March in any year. $f(d-c)$ is a flexible function of the day of birth centered around January 1 (the "running variable"), for which we use a quadratic polynomial in our main specifications and allow for it to have a different shape on opposite sides of the threshold in all periods. We also include fixed effects for every time period, θ_p.[36]

The vector $\mathbf{x}_i$ includes a dummy for child gender, as well as the following family control variables, measured in the year before birth: maternal and paternal earnings (in 1000s of real SEK in year 2010 terms), indicators

[36]Note that the main effect of being in the reform sample is absorbed with the inclusion of period fixed effects.

for each parent's age groups (<20, 20-24, 25-34, 35+), indicators for each parent's education levels (high school or less, some college, university degree or more), an indicator for the parents being married, and indicators for each parent being foreign-born. ε_{idp} is an unobserved error term. The coefficient of interest is α_1, which represents the effect of moving from 0 to 100 percent of days eligible for the "Double Days" in the first postpartum month.

For the "doughnut" RD-DD model, we exclude all families with children born in December of any year, and estimate:

$$y_{idp} = \beta_0 + \beta_1 R_i \times \mathbf{1}[d \geq c] + \beta_2 \mathbf{1}[d \geq c] + \\ + f(d-c) + \mathbf{1}[d \geq c] \times f(d-c) + \mathbf{x'}_i \gamma + \rho_p + \epsilon_{idp} \quad (2)$$

for each family of child i born on day of the year d in time period p. Here, R_i is an indicator set to 1 for children who are in the reform period (i.e., the October 2011–March 2012 births, excluding December 2011 births), and 0 otherwise. The coefficient of interest is on the interaction between the reform period dummy, R_i and the dummy for January–March births, $\mathbf{1}[d \geq c]$, and is denoted by β_1. It represents an estimate of the difference in parental outcomes between January–March and October–November births in the reform period, relative to the analogous difference in outcomes in the non-reform periods. All other variables are the same as in model (1).

Due to the large number of outcomes that we study, we use the Romano-Wolf correction to account for multiple hypothesis testing and report the Romano-Wolf $p-$value associated with our key coefficient for each outcome and in each model.[37]

Identifying assumption. We purposely do not use a standard regression discontinuity (RD) design in our analysis since our treatment variable—eligibility for the "Double Days" in the first postpartum month—does *not* change discontinuously at the reform date. Instead, it only jumps from 0 to 1 between births on November 30, 2011 and January 1, 2012, and varies linearly between 0 and 1 for all births in December 2011. However, similar to an RD model, we rely on an assumption that all other variables possibly related to our outcomes of interest are smooth and continuous functions of the day of birth (Imbens and Lemieux, 2008; Lee and Lemieux, 2010), and are not systematically correlated with the "share days eligible" variable.

As documented in multiple prior studies, there are important differences in the number and composition of births across months of the year due to non-random fertility patterns and environmental or health factors such as the timing of the influenza season (Buckles and Hungerman, 2008; Currie and Schwandt, 2013). Additionally, January 1 is the school starting age cut-off date in Sweden, implying that parents who wish to have their children be the oldest or youngest in the class may strategically sort on different sides of the cut-off.

[37] The Romano-Wolf correction controls for the familywise error rate, which is the probability of rejecting at least one true null hypothesis among a family of hypotheses under a test. See Romano and Wolf (2005a), Romano and Wolf (2005b), Romano et al. (2010), Romano and Wolf (2016), Clarke et al. (2020).

Further, and relevant to our study of leave use, there are differences in the number of holidays when parents can stay home from work across these months. To net out all the seasonal differences in births unrelated to the "Double Days" reform, we use as a control group births in the same months in three years before the reform, as described above.

To further probe the plausibility of the identifying assumption, we first perform the RD-DD version of the McCrary (2008) test. Specifically, we collapse our data into week-of-birth bins, and estimate a version of model (2) using the collapsed data with the number of firstborn singleton births as the dependent variable and a 26-week (6 month) bandwidth. The running variable is the week of birth normalized relative to the first week of January in every period, and we report coefficients from RD-DD models that use 1st through 6th order polynomials in the running variable. Appendix Table A2 presents the results, and we also report the Akaike Information Criterion (AIC) in the bottom row of each table. The results are very stable across the different specifications, and, importantly, we detect no significant discontinuities in the number of births at the time of the reform. Appendix Figure A3 presents analogous graphical evidence: sub-figure (a) plots the total number of births by birth week in the reform sample, while sub-figure (b) plots the average of the total number of births by birth week across all years in the non-reform sample. The fitted lines are predicted from 4th order polynomial models; we follow Lee and Lemieux (2010) by selecting the model with the smallest AIC value.

We next check whether any pre-determined characteristics of families are correlated with eligibility for the "Double Days". Appendix Tables A3 and A4 report results from estimating versions of models (1) and (2), omitting the controls in vector $\mathbf{x}_i$ and instead using parental characteristics, children's birth outcomes, and maternal pre-birth medical history indicators as the dependent variables. Out of the 40 coefficients reported across the two tables, only four are statistically significant at the 5% level. None of the estimates is statistically significant once we account for multiple hypothesis testing. Moreover, in both tables, joint F-tests from seemingly unrelated regression models yield insignificant results. These results are reassuring and suggest that there are no systematic differences between families who are and are not eligible for "Double Days" in the first postpartum month, allowing for a causal interpretation of our main models.

5 Results

Effects of the "Double Days" reform on paternity leave use. We begin by providing evidence that the "Double Days" reform affects paternity leave use in the month immediately following childbirth. Figure 2 plots the share of fathers who use any post-baseline leave in the first 30 days after childbirth by the child's birth week, separately for births in 2011–2012 (the reform period), and 2010–2011, 2009–2010, and 2008–2009 (the non-reform periods). We also plot the predictions and 95% confidence intervals from estimating local linear polynomial models on each side of the first week of January in each period.

There are three key take-aways from this set of graphs. First, there is a clear jump in fathers' leave use in the first month post-childbirth at the time of the reform (January 2012), but such a jump does not exist in any of the non-reform periods. Second, fathers' leave take-up exhibits some seasonal variation, which supports our use of families with children born in non-reform periods but in the same calendar months as those in the reform period as a control group. Third, fathers' leave use appears to begin to increase starting with births in the last four weeks of 2011, which is consistent with parents of children born shortly before the reform becoming eligible for "Double Days" on the reform date. Since we are only measuring leave use in the first month after childbirth in these graphs, the lack of change in leave use for fathers of children born in earlier weeks of 2011 is consistent with them not being eligible in the immediate postpartum period.

Table 2 presents results from estimating equations (1) and (2) using our two main paternity leave variables as outcomes: (1) any post-baseline leave in the first 30 days post-childbirth, and (b) the total number of post-baseline leave days in the first 30 days. We show estimates for the whole sample (Panel A) and for the sub-sample of families with mothers who have a pre-birth medical history (Panel B). For each outcome and sample, we report the α_1 coefficient from model (1), the β_1 coefficient from model (2), the corresponding robust standard errors, and the Romano-Wolf $p-$values that account for multiple hypothesis testing.

In the overall sample, column (1) shows that moving from zero to 100 percent eligibility for "Double Days" in the first postpartum month raises the likelihood that the father uses any post-baseline leave by 3.9 percentage points, which is a 92 percent effect at the sample mean. In column (2), we observe that the total number of post-baseline leave days used increases by 0.32 days. The coefficients from the "doughnut" RD-DD model are similar in magnitude. We observe bigger impacts in both absolute and relative terms among fathers in families with mothers who have a medical history: a 5.4 percentage point increase in any leave use (96 percent at the sample mean), and a 0.43 day increase in the total number of post-baseline leave days used. These effects remain highly statistically significant after adjusting for multiple hypothesis testing.[38]

To explore the impacts of the reform on the distribution of post-baseline leave days taken by fathers in the first month post-childbirth, Appendix Figure A4 plots the α_1 coefficients from model (1) and the associated 95% confidence intervals from separate regression models that use as outcomes indicator variables for fathers taking different numbers of post-baseline leave days denoted in bins on the $x-$axis of each graph. We show results for the overall sample in sub-figure (a), and for families with mothers who have a medical history in sub-figure (b). Consistent with the estimates in Table 2, we observe significant extensive margin effects—in both samples, there are large reductions in the shares of fathers who take zero post-baseline leave days. However, we also see increases in the likelihoods of fathers taking one to five days, six to ten days, and 11-20 days of leave, and no change in the likelihood of taking 21-30 days of leave. Thus, it appears that the fairly small effect magnitude on the total number of leave days taken likely reflects that most fathers are more likely to go from zero to one or a few days of leave, while a smaller share of fathers—concentrated in families where mothers may be most prone to health problems—taking a more extended period of time off.

[38]A Swedish government report on the evaluation of the Double Days reform notes that the response in parental leave take-up was larger among the types of families in which fathers would have been less likely to take any parental leave pre-reform (Inspektionen för socialförsäkringen, 2018). We have explored differences in impacts on leave take-up by parental characteristics (e.g., heterogeneity with respect to maternal and paternal educational attainment), finding no statistically significant differences across groups (results available on request).

Importantly, as discussed in Section 2 and formalized in our theoretical model in Appendix B, households may reap gains from a reform that grants flexibility in the use of simultaneous parental leave, even if fathers, *ex post*, end up shifting only a few extra days of leave to the immediate postpartum period. The availability of simultaneous leave allows families to keep the father in the household on precisely the days when his presence is particularly valuable for the family. Next, we examine the impacts of such leave on maternal postpartum health.

Effects of the "Double Days" reform on maternal health. Figure 3 plots raw means of three of our maternal health outcomes measured as indicators in the first 30 days post-childbirth—inpatient and outpatient visits for childbirth complications, antibiotic drug prescriptions, and anti-anxiety drug prescriptions—by birth week, separately for 2011–2012 births (the reform period), and 2010–2011, 2009–2010, and 2008–2009 births (the non-reform periods). As in Figure 2, we plot the predictions and 95% confidence intervals from estimating local linear polynomial models on each side of the first week of January in each period. We observe suggestive evidence of a reduced incidence of each outcome at the time of the reform, and no evidence of any change in the non-reform periods.

We next proceed to analyze maternal health outcomes using our regression models. Tables 3 and 4 present estimates from models (1) and (2) using maternal health outcomes from inpatient/outpatient and prescription drug data, respectively. Again, we report the α_1 coefficient from model (1), the β_1 coefficient from model (2), robust standard errors, and the Romano-Wolf $p-$values that account for multiple hypothesis testing.

Table 3 shows that in the overall sample, moving from zero to 100 percent eligibility for the "Double Days" in the first postpartum month leads to a 1.0 percentage point (12 percent) lower likelihood of an inpatient or specialist outpatient visit for childbirth-related complications. For mothers with pre-birth medical histories, the corresponding effect size is a 2.0 percentage point (20 percent) reduction in visits for childbirth-related complications. The coefficients from the "doughnut" RD-DD models are similar in magnitude. While all of these coefficients are statistically significant individually, only one—the coefficient from the "doughnut" RD-DD model in the overall sample—remains significant when we adjust for multiple hypothesis testing. We do not observe any impacts on inpatient and outpatient visits with mental health diagnoses.

We also see some suggestive evidence of a decline in visits for external causes and counseling: a 0.1 percentage point (108 percent) reduction in the overall sample, and a 0.2 percentage point (122 percent) in the sub-sample of mothers with pre-birth medical history. We note, however, that only one of these coefficients remains marginally significant when we adjust for multiple hypothesis testing (p-value=0.08).

Table 4 shows that being fully eligible for the "Double Days" in the first month post-childbirth reduces the likelihood that the mother has an antibiotic prescription by 1.5 percentage points (14 percent) in the overall sample, and by 1.8 percentage points (14 percent) in the sub-sample of those with pre-birth medical histories. The coefficients from both of our models in the overall sample remain statistically significant when we adjust for multiple hypothesis testing. We also find suggestive evidence of a reduction in anti-anxiety prescriptions by 0.2 percentage points (72 percent) in the overall sample, and 0.5 percentage points (79 percent) in the sub-sample of mothers with pre-birth medical histories. While these coefficients are individually marginally significant at the 10% level, they are no longer significant after adjusting for multiple hypothesis testing. We do not observe any changes in painkiller or anti-depressant prescriptions.

Mechanisms. We argue that the increased flexibility of the "Double Days" reform allows households to keep the father at home on days when the marginal benefit of doing so is particularly high. This is consistent with the fact that the magnitudes of our estimated effects on maternal inpatient and specialist outpatient visits, as well as prescription drugs use, are large when compared to the modest increase in the total number of leave days that fathers use. Our results suggest that fathers' ability to take a day or two of paid leave when this is especially needed may avert maternal health complications that require medical intervention.[39]

However, it is also possible that the "Double Days" reform allows fathers to take leave so that mothers can seek prompt medical care. To examine this possibility, we ask whether there is an increase in the likelihood that the father takes leave on the same days as when the mother has a health care encounter. Table 5 presents results from our two regression models, using as the outcome an indicator set to 1 when the father takes leave on a day that overlaps with when the mother has either an inpatient or outpatient visit or fills a drug prescription. We find that having full eligibility for the "Double Days" is associated with a 0.5 percentage point (40 percent) increase in the likelihood of this event occurring in the overall sample (Panel A), and a 1.3 percentage point (65 percent) increase among families with mothers who have a pre-birth medical history (Panel B). This result suggests that in families in which mothers are particularly vulnerable to postpartum health issues, the "Double Days" reform grants fathers the flexibility to take leave and stay home with their infants on days when mothers need medical care.

In addition, we have analyzed whether the effects of the "Double Days" reform differ across families who do and do not have at least one grandparent residing in the same county. Fathers' ability to take flexible leave in the postpartum period may be especially important for families who do not have another family member—such as the child's grandparent—who can step in to help when a mother experiences health issues. That said, Swedish grandparents typically do not play a big role in childcare according to social norms, making this dimension of heterogeneity less relevant for our context. We find some suggestive evidence that the impacts of the "Double Days" reform on some measures of maternal physical health appear to be larger for families without a grandparent in the same county, but the differences are not statistically significant across sub-groups (results available upon request).

6 Conclusion

When a woman gives birth to a child, much of the attention is typically placed on the health and well-being of the newborn baby. There are many medical and social policy interventions targeting infants, and a plethora

[39] As noted in Section 3, we do not have data on primary care visits. Thus, it is possible that the "Double Days" reform allows fathers to take leave so that mothers seek prompt primary care and thereby avoid more serious complications that would have required specialist visits or hospitalizations.

of research has been dedicated to understanding the causes and consequences of early-life health (see, e.g., Currie, 2011; Almond and Currie, 2011; Chen et al., 2016; Almond et al., 2018; Persson and Rossin-Slater, 2018; Chen et al., 2019). New mothers, who undergo a significant physical and emotional transition after childbirth, are comparably under-discussed and under-studied.

A recent influential medical study in *The Lancet* journal has raised awareness about the state of maternal postpartum health by documenting that the United States has experienced a disturbing increasing trend in maternal mortality in the last several decades (Kassebaum et al., 2016). A lot of the resulting discussion has centered around the role of the health care system in delivering prenatal and postpartum care.[40] But the mother's environment at home can have significant influence on her well-being during the often emotional and overwhelming months of new parenthood. In fact, in recent commentary about the rise in maternal mortality in the U.S., Dr. Neel Shah, a leading maternal health expert at the Harvard Medical School, argues:

> "*What's important to understand is that most maternal deaths happen after women have the baby and the fundamental failure is not unsafe medical care but lack of adequate social support...a lot of the risks around childbirth happen after the baby is born during that vulnerable time when you're trying to care for an infant while also taking care of your household and doing all the things we expect of moms.*"[41]

Our paper attempts to isolate the effect of a key factor in the mother's postpartum home environment: the presence (or absence) of the child's father in the month immediately following childbirth. To study this question, we take advantage of linked Swedish administrative data and quasi-experimental variation from a reform in January 2012, which granted fathers the flexibility to take paid leave on an intermittent basis alongside the mother during the postpartum period. We document that this reform is associated with a 92 percent increase in the share of fathers using leave in the first month after childbirth.

Then, we present evidence that fathers' access to flexible leave in the immediate postpartum period improves maternal health. We find a 12 percent decrease in the likelihood of a mother having an inpatient or specialist outpatient visit for childbirth-related complications and a 14 percent reduction in the likelihood of having an antibiotic drug prescription in the same month. We also observe some suggestive evidence of declines in visits for external causes and counseling, as well as anti-anxiety prescription drugs. The effects on these maternal health outcomes are larger in both absolute and relative terms for mothers with a pre-birth medical history, who may be particularly vulnerable and thus benefit the most from a policy that grants fathers the flexibility so stay home from work in the postpartum period. These large effects are consistent with our theoretical framework, in which households use their private information to optimally choose to keep the father at home on precisely the days when his presence is especially valuable.

In addition to informing questions about determinants of maternal postpartum health, our findings have

[40] For examples of these discussions in the press, see: https://www.vox.com/science-and-health/2017/6/26/15872734/what-no-one-tells-new-moms-about-what-happens-after-childbirth
https://www.npr.org/2017/05/12/528098789/u-s-has-the-worst-rate-of-maternal-deaths-in-the-developed-world
https://www.npr.org/2017/05/12/527806002/focus-on-infants-during-childbirth-leaves-u-s-moms-in-danger.

[41] See: `https://www.pbs.org/newshour/show/whats-behind-americas-rising-maternal-mortality-rate`.

important implications for debates about workplace flexibility and the design of paid family leave (PFL) policies. The United States remains the only high-income country without a national PFL policy, although ten states and Washington, D.C., have either implemented or passed PFL legislation that provides partially paid parental leave to both mothers and fathers.[42] Just as in other countries that have had paid parental leave policies for decades, fathers in states with PFL programs take much less leave than mothers do.[43] While discussions about encouraging men to take paternity leave typically focus on policies that promote sequential and consolidated leave use (such as "Daddy Month"-style programs), our findings imply that policies that restrict fathers' flexibility in being able to take leave at the same time as mothers on an intermittent basis could have negative spillover effects on maternal health.

Finally, our results suggest that workplace flexibility for fathers may be a highly cost-effective way of improving maternal postpartum health, when compared with other public programs such as nurse home visiting. The "Double Days" reform does not change the total number of days of leave allocated to the household; rather, it grants parents agency to allocate their leave in a way that maximizes the household's benefits. The medical and psychological literature suggests that these benefits may be long-lasting—maternal postpartum health issues have important consequences for the mother's long-term wellbeing as well as the family's welfare overall (see Meltzer-Brody and Stuebe, 2014 and Saxbe et al., 2018 for some overviews). Thus, our finding of short-term benefits for maternal health may underestimate the total value of paternal access to workplace flexibility.

References

Aitken, Zoe, Cameryn C Garrett, Belinda Hewitt, Louise Keogh, Jane S Hocking, and Anne M Kavanagh, "The maternal health outcomes of paid maternity leave: A systematic review," *Social Science & Medicine*, 2015, *130*, 32–41.

Albrecht, James, Peter Skogman Thoursie, and Susan Vroman, "Parental Leave and the Glass Ceiling in Sweden," in "Gender Convergence in the Labor Market," Emerald Group Publishing Limited, 2015, pp. 89–114.

Allen, Tammy D. and Jeremy Armstrong, "Further Examination of the Link Between Work-Family Conflict and Physical Health: The Role of Health-Related Behaviors," *American Behavioral Scientist*, 2006, *49* (9), 1204–1221.

Almond, D. and J. Currie, "Human Capital Development before Age Five," in O. Ashenfleter and D. Card, eds., *Handbook of Labor Economics*, Vol. 4, Elsevier, 2011, pp. 1315–1486.

Almond, Douglas, Janet Currie, and Valentina Duque, "Childhood circumstances and adult outcomes: Act II," *Journal of Economic Literature*, 2018, *56* (4), 1360–1446.

[42] These are: California (in 2004), New Jersey (in 2009), Rhode Island (in 2014), New York (in 2018), D.C. (in 2020), Washington state (in 2020), Massachusetts (in 2021), Connecticut (in 2022), and Oregon (in 2023), Colorado (in 2024), and Maryland (in 2025).

[43] Bartel et al. (2018) estimate that the introduction of California's 6-week PFL program only increased fathers' leave duration from about 1 to 1.5 weeks on average. Bana et al. (2018) document that only 12 percent of eligible new fathers in California made a PFL claim in 2014, ten years after the introduction of the program. In contrast, in the same year, 47 percent of eligible new mothers made a PFL claim. Moreover, while fathers in California are eligible for 6 weeks of paid leave, over three-quarters of those who take leave take less than the maximum amount.

Almqvist, Anna-Lena and Ann-Zofie Duvander, "Changes in gender equality? : Swedish fathers' parental leave, division of childcare and housework," *Journal of family studies*, 2014, *20* (1), 19–27. Author-Count:2;.

Andresen, Martin Eckhoff and Emily Nix, "What Causes the Child Penalty? Evidence from Same Sex Couples and Policy Reforms," 2019. University of Southern California, unpublished manuscript.

Avdic, Daniel and Arizo Karimi, "Modern Family? Paternity Leave and Marital Stability," *American Economic Journal: Applied Economics*, 2018, *10* (4), 283–307.

Avendano, Mauricio, Lisa F Berkman, Agar Brugiavini, and Giacomo Pasini, "The long-run effect of maternity leave benefits on mental health: evidence from European countries," *Social Science & Medicine*, 2015, *132*, 45–53.

Backé, Eva-Maria, Andreas Seidler, Ute Latza, Karin Rossnagel, and Barbara Schumann, "The role of psychosocial stress at work for the development of cardiovascular diseases: a systematic review," *International Archives of Occupational and Environmental Health*, Jan 2012, *85* (1), 67–79.

Baker, Michael and Kevin Milligan, "Maternal employment, breastfeeding, and health: Evidence from maternity leave mandates," *Journal of Health Economics*, 2008, *27* (4), 871–887.

Bana, Sarah, Kelly Bedard, and Maya Rossin-Slater, "Trends and Disparities in Leave Use Under California's Paid Family Leave Program: New Evidence from Administrative Data," *AEA Papers and Proceedings*, May 2018.

Bartel, Ann, Maya Rossin-Slater, Christopher Ruhm, Jenna Stearns, and Jane Waldfogel, "Paid Family Leave, Fathers' Leave-Taking, and Leave-Sharing in Dual-Earner Households," *Journal of Policy Analysis and Management*, 2018, *37* (1), 10–37.

Becker, Gary S, "A Theory of Marriage: Part I," *The Journal of Political Economy*, 1973, *81* (4), 813–846.

Berkman, Lisa F, Sze Yan Liu, Leslie Hammer, Phyllis Moen, Laura Cousino Klein, Erin Kelly, Martha Fay, Kelly Davis, Mary Durham, Georgia Karuntzos et al., "Work–family conflict, cardiometabolic risk, and sleep duration in nursing employees.," *Journal of occupational health psychology*, 2015, *20* (4), 420.

Bertrand, Marianne, Claudia Goldin, and Lawrence F Katz, "Dynamics of the gender gap for young professionals in the financial and corporate sectors," *American Economic Journal: Applied Economics*, 2010, *2* (3), 228–55.

Beuchert, Louise Voldby, Maria Knoth Humlum, and Rune Vejlin, "The length of maternity leave and family health," *Labour Economics*, 2016, *43*, 55–71.

Bičáková, Alena and Klára Kalíšková, "Career Breaks after Childbirth: The Impact of Family Leave Reforms in the Czech Republic," Discussion Paper 10149, Institute for the Study of Labor (IZA) 2016.

Black, Sandra E, Paul J Devereux, and Kjell G Salvanes, "Too young to leave the nest? The effects of school starting age," *The Review of Economics and Statistics*, 2011, *93* (2), 455–467.

Blau, Francine D and Lawrence M Kahn, "Female labor supply: Why is the United States falling behind?," *The American Economic Review*, 2013, *103* (3), 251–256.

Bloom, Nicholas, James Liang, John Roberts, and Zhichun Jenny Ying, "Does working from home work? Evidence from a Chinese experiment," *The Quarterly Journal of Economics*, 2014, *130* (1), 165–218.

Buckles, Kasey S and Daniel M Hungerman, "Season of birth and later outcomes: Old questions, new answers," *Review of Economics and Statistics*, 2008, *95* (3), 711–724.

Bullinger, Lindsey Rose, "The Effect of Paid Family Leave on Infant and Parental Health in the United States," *Journal of Health Economics*, 2019.

Bünning, Mareike, "What Happens after the 'Daddy Months'? Fathers' Involvement in Paid Work, Childcare, and Housework after Taking Parental Leave in Germany," *European Sociological Review*, 2015, *0* (0), 1–11.

Bütikofer, Aline, Julie Riise, and Meghan M Skira, "The impact of paid maternity leave on maternal health," *American Economic Journal: Economic Policy*, 2021, *13* (1), 67–105.

Canaan, Serena, "Parental Leave, Household Specialization and Children's Well-Being," Discussion Paper 12420, IZA 2019.

Chatterji, Pinka and Sara Markowitz, "Family leave after childbirth and the mental health of new mothers," *Journal of Mental Health Policy and Economics*, 2012, *15* (2), 61.

Chen, Alice, Emily Oster, and Heidi Williams, "Why is infant mortality higher in the United States than in Europe?," *American Economic Journal: Economic Policy*, 2016, *8* (2), 89–124.

Chen, Yiqun, Petra Persson, and Maria Polyakova, "The Roots of Health Inequality and the Value of Intra-family Expertise," Working Paper 25618, National Bureau of Economic Research February 2019.

Cheng, Ching-Yu, Eileen R Fowles, and Lorraine O Walker, "Postpartum maternal health care in the United States: A critical review," *The Journal of Perinatal Education*, 2006, *15* (3), 34.

Chiappori, P. A., "Collective Labor Supply and Welfare," *Journal of Political Economy*, 1992, *100* (3), 437–467.

Clapp, Mark A, Sarah E Little, Jie Zheng, Anjali J Kaimal, and Julian N Robinson, "Hospital-level variation in postpartum readmissions," *Jama*, 2017, *317* (20), 2128–2129.

Clarke, Damian, Joseph P Romano, and Michael Wolf, "The Romano–Wolf multiple-hypothesis correction in Stata," *The Stata Journal*, 2020, *20* (4), 812–843.

Cools, Sara, Jon H Fiva, and Lars J Kirkebøen, "Causal effects of paternity leave on children and parents," *The Scandinavian Journal of Economics*, 2015, *117* (3), 801–828.

Currie, Janet, "Inequality at Birth: Some Causes and Consequences," *The American Economic Review*, 2011, *101* (3), 1–22.

_ and Hannes Schwandt, "Within-mother analysis of seasonal patterns in health at birth," *Proceedings of the National Academy of Sciences*, 2013, *110* (30), 12265–12270.

Dahl, Gordon B, Katrine V Løken, and Magne Mogstad, "Peer effects in program participation," *The American Economic Review*, 2014, *104* (7), 2049–2074.

_ , _ , _ , and Kari Vea Salvanes, "What is the case for paid maternity leave?," *Review of Economics and Statistics*, 2016, *98* (4), 655–670.

Dalton, E and E Castillo, "Post partum infections: A review for the non-OBGYN," *Obstetric medicine*, 2014, *7* (3), 98–102.

Dionne, Georges and Benoit Dostie, "New Evidence on the Determinants of Absenteeism Using Linked Employer-Employee Data," *ILR Review*, 2007, *61* (1), 108–120.

Duvander, A.-Z., L. Haas, and P. Hwang, "Sweden country note," in S. Blum, A. Koslowski, and P. Moss, eds., *International Review of Leave Policies and Research*, 2017.

Duvander, Ann-Zofie and Mats Johansson, "What are the effects of reforms promoting fathers' parental leave use?," *Journal of European Social Policy*, 2012, *22* (3), 319–330.

_ and _ , "Parental leave use for different fathers: a study of the impact of three Swedish parental leave reforms," *Fatherhood in the Nordic welfare states: Comparing care policies and practice*, 2014, pp. 349–374.

— **and** — , “Reforms in the Swedish Parental Leave System and Their Effects on Gender Equality,” Working Paper 2015:2, Swedish Social Insurance Inspectorate 2015.

Ekberg, John, Rickard Eriksson, and Guido Friebel, “Parental leave: A policy evaluation of the Swedish “Daddy-Month” reform,” *Journal of Public Economics*, 2013, *97*, 131–143.

Eydal, G.B. and I.V. Gislason, “Paid parental leave in Iceland ? History and context,” in G.B. Eydal and I.V. Gislason, eds., *Equal rights to earn and care ? Parental leave in Iceland*, 2008.

Farré, Lídia and Libertad González, “Does paternity leave reduce fertility?,” *Journal of Public Economics*, 2019, *172*, 52–66.

Flacking, Renée, Fiona Dykes, and Uwe Ewald, “The influence of fathersâ socioeconomic status and paternity leave on breastfeeding duration: a population-based cohort study,” *Scandinavian journal of public health*, 2010, *38* (4), 337–343.

Fontenay, Sebastien and Ilan Tojerow, “The “Other” Child Penalty: Work Disability after Motherhood and how Paternity Leave can help,” 2020. Universite Libre de Bruxelles, unpublished manuscript.

Frone, M.R., “Workâfamily conflict and employee psychiatric disorders: The national comorbidity survey,” *Journal of Applied Psychology*, 2000, *85* (6), 888–895.

Gerst, Benedikt and Christian Grund, “Gender-Specific Duration of Parental Leave and Current Earnings,” Discussion Paper 13216, IZA 2020.

Ginja, Rita, Arizo Karimi, and Pengpeng Xiao, “Employer Responses to Family Leave Programs,” 2020. University of Bergen, unpublished manuscript.

— **, Jenny Jans, and Arizo Karimi**, “Parental leave benefits, household labor supply, and childrenâs long-run outcomes,” *Journal of Labor Economics*, 2020, *38* (1), 261–320.

Goldin, Claudia, “A grand gender convergence: Its last chapter,” *The American Economic Review*, 2014, *104* (4), 1091–1119.

— **and Lawrence F Katz**, “A most egalitarian profession: pharmacy and the evolution of a family-friendly occupation,” *Journal of Labor Economics*, 2016, *34* (3), 705–746.

Guertzgen, Nicole and Karsten Hank, “Maternity Leave and Mothersâ Long-Term Sickness Absence: Evidence From West Germany,” *Demography*, 2018, *55* (2), 587–615.

Hewitt, Belinda, Lyndall Strazdins, and Bill Martin, “The benefits of paid maternity leave for mothers’ post-partum health and wellbeing: Evidence from an Australian evaluation,” *Social Science & Medicine*, 2017, *182*, 97–105.

Heymann, Jody, Aleta R Sprague, Arijit Nandi, Alison Earle, Priya Batra, Adam Schickedanz, Paul J Chung, and Amy Raub, “Paid parental leave and family wellbeing in the sustainable development era,” *Public health reviews*, 2017, *38* (1), 21.

Hyde, Janet Shibley, Marjorie H Klein, Marilyn J Essex, and Roseanne Clark, “Maternity leave and women’s mental health,” *Psychology of Women Quarterly*, 1995, *19* (2), 257–285.

Imbens, Guido W and Thomas Lemieux, “Regression discontinuity designs: A guide to practice,” *Journal of econometrics*, 2008, *142* (2), 615–635.

Inspektionen för socialförsäkringen, “Dubbeldagar – vissa pappors vägin i föräldrapenningen?,” Technical Report 2018:13 2018.

Johnsen, Julian, Hyejin Ku, and Kjell G Salvanes, “Competition and Career Advancement: The Hidden Costs of Paid Leave,” Discussion Paper 13, NHH Department of Economics 2020.

Jou, Judy, Katy B Kozhimannil, Jean M Abraham, Lynn A Blewett, and Patricia M McGovern, "Paid Maternity Leave in the United States: Associations with Maternal and Infant Health," *Maternal and child health journal*, 2018, *22* (2), 216–225.

Kassebaum, Nicholas J, Ryan M Barber, Zulfiqar A Bhutta, Lalit Dandona, Peter W Gething, Simon I Hay, Yohannes Kinfu, Heidi J Larson, Xiaofeng Liang, Stephen S Lim et al., "Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015," *The Lancet*, 2016, *388* (10053), 1775–1812.

Kelly, Erin L, Phyllis Moen, and Eric Tranby, "Changing workplaces to reduce work-family conflict: Schedule control in a white-collar organization," *American Sociological Review*, 2011, *76* (2), 265–290.

Kleven, Henrik, Camille Landais, and Jakob Egholt Søgaard, "Children and gender inequality: Evidence from Denmark," *American Economic Journal: Applied Economics*, 2019, *11* (4), 181–209.

Ko, Jean Y, Karilynn M Rockhill, Van T Tong, Brian Morrow, and Sherry L Farr, "Trends in postpartum depressive symptomsâ27 states, 2004, 2008, and 2012," *MMWR. Morbidity and mortality weekly report*, 2017, *66* (6), 153.

Lalive, Rafael and Josef Zweimüller, "How Does Parental Leave Affect Fertility and Return to Work? Evidence from Two Natural Experiments," *The Quarterly Journal of Economics*, 2009, *124* (3), 1363–1402.

Lappegård, Trude, Ann-Zofie Duvander, Gerda Neyer, Ida Viklund, Synøve N Andersen, and Ólöf Garðarsdóttir, "Fathers' Use of Parental Leave and Union Dissolution," *European Journal of Population*, 2020, *36* (1), 1–25.

Lee, David S. and Thomas Lemieux, "Regression Discontinuity Designs in Economics," *Journal of Economic Literature*, June 2010, *48* (2), 281–355.

Lequien, Laurent, "The Impact of Parental Leave Duration on Later Wages," *Annals of Economics and Statistics*, 2012, *107/108* (July/December), 267–285.

Lundberg, Shelly and Robert A. Pollak, "Separate Spheres Bargaining and the Marriage Market," *Journal of Political Economy*, 1993, *101* (6), 988–1010.

McCrary, Justin, "Manipulation of the running variable in the regression discontinuity design: A density test," *Journal of econometrics*, 2008, *142* (2), 698–714.

Meltzer-Brody, Samantha and Alison Stuebe, "The long-term psychiatric and medical prognosis of perinatal mental illness," *Best Practice & Research Clinical Obstetrics & Gynaecology*, 2014, *28* (1), 49–60.

Moen, Phyllis, Erin L Kelly, Wen Fan, Shi-Rong Lee, David Almeida, Ellen Ernst Kossek, and Orfeu M Buxton, "Does a flexibility/support organizational initiative improve high-tech employees' well-being? Evidence from the work, family, and health network," *American Sociological Review*, 2016, *81* (1), 134–164.

_ , Wen Fan, and Erin L Kelly, "Team-level flexibility, work–home spillover, and health behavior," *Social Science & Medicine*, 2013, *84*, 69–79.

O'Donnell, Emily, Lisa F. Berkman, Erin Kelly, Leslie Hammer, Jessica Marden, and Orfeu M. Buxton, "Cardiometabolic risks associated with work-to-family conflict: findings from the Work Family Health Network," *Community, Work & Family*, 2019, *22* (2), 203–228.

Olafsson, Arna and Herdis Steingrimsdottir, "How Does Daddy at Home Affect Marital Stability?," *The Economic Journal*, 2020, *130* (629), 1471–1500.

Olivetti, Claudia and Barbara Petrongolo, "The economic consequences of family policies: lessons from a century of legislation in high-income countries," *The Journal of Economic Perspectives*, 2017, *31* (1), 205–230.

Patnaik, Ankita, "Reserving Time for Daddy: The Consequences of Fathersâ Quotas," *Journal of Labor Economics*, 2019, *37* (4), 1009–1059.

Pedulla, David S, "Penalized or protected? Gender and the consequences of nonstandard and mismatched employment histories," *American Sociological Review*, 2016, *81* (2), 262–289.

Persson, Petra, "Social insurance and the marriage market," *Journal of Political Economy*, 2020, *128* (1), 252–300.

_ **and Maya Rossin-Slater**, "Family Ruptures, Stress, and the Mental Health of the Next Generation," *American Economic Review*, 2018, *108* (4-5), 1214–52.

Pichler, Stefan and Nicolas R. Ziebarth, "The pros and cons of sick pay schemes: Testing for contagious presenteeism and noncontagious absenteeism behavior," *Journal of Public Economics*, 2017, *156*, 14 – 33.

Redshaw, Maggie and Jane Henderson, "Fathersâ engagement in pregnancy and childbirth: evidence from a national survey," *BMC pregnancy and childbirth*, 2013, *13* (1), 70.

Rege, Mari and Ingeborg F. Solli, "The Impact of Paternity Leave on Fathers' Future Earnings," *Demography*, 2013, *50* (6), 2255–2277.

Riksdag, Sveriges, "Riksdagens protokoll 2011/12:15," 2011. Accessed August 2021. `https://data.riksdagen.se/fil/C05364A6-E4C5-4A9E-9853-EA012F87CD1A`.

Romano, Joseph P and Michael Wolf, "Exact and approximate stepdown methods for multiple hypothesis testing," *Journal of the American Statistical Association*, 2005, *100* (469), 94–108.

_ **and** _ , "Stepwise multiple testing as formalized data snooping," *Econometrica*, 2005, *73* (4), 1237–1282.

_ **and** _ , "Efficient computation of adjusted p-values for resampling-based stepdown multiple testing," *Statistics & Probability Letters*, 2016, *113*, 38–40.

_ **, Azeem M Shaikh, and Michael Wolf**, "Hypothesis testing in econometrics," *Annu. Rev. Econ.*, 2010, *2* (1), 75–104.

Rossin-Slater, Maya, "Maternity and Family Leave Policy," in Susan L. Averett, Laura M. Argys, and Saul D Hoffman, eds., *The Oxford Handbook of Women and the Economy*, Oxford University Press, 2018.

_ **and Lindsey Uniat**, "Paid Family Leave Policies And Population Health," *Health Affairs Policy Brief*, March 2019.

Rubertsson, Christine, B Wickberg, P Gustavsson, and Ingela Rådestad, "Depressive symptoms in early pregnancy, two months and one year postpartum-prevalence and psychosocial risk factors in a national Swedish sample," *Archives of Womenâs Mental Health*, 2005, *8* (2), 97–104.

Ruhm, C J, "The economic consequences of parental leave mandates: Lessons from Europe," *Quarterly Journal of Economics*, feb 1998, *113* (1), 285–317.

Saxbe, Darby, Maya Rossin-Slater, and Diane Goldenberg, "The transition to parenthood as a critical window for adult health.," *American Psychologist*, 2018, *73* (9), 1190.

Schober, Pia S, "Parental leave and domestic work of mothers and fathers: A longitudinal study of two reforms in West Germany," *Journal of Social Policy*, 2014, *43* (02), 351–372.

Schönberg, Uta and Johannes Ludsteck, "Expansions in Maternity Leave Coverage and Mothers' Labor Market Outcomes after Childbirth," *Journal of Labor Economics*, 2014, *32* (3), 469–505.

Shockley, K. M., W. Shen, M. M. DeNunzio, M. L. Arvan, and E. A. Knudsen, "Disentangling the relationship between gender and workâfamily conflict: An integration of theoretical perspectives using meta-analytic methods.," *Journal of Applied Psychology*, 2017, *102* (12), 1601–1635.

Staehelin, Katharina, Paola Coda Bertea, and Elisabeth Zemp Stutz, "Length of maternity leave and health of mother and child–a review," *International Journal of Public Health*, 2007, *52* (4), 202–209.

Stearns, Jenna and Corey White, "Can paid sick leave mandates reduce leave-taking?," *Labour Economics*, 2018, *51*, 227–246.

Thévenon, Olivier and Anne Solaz, "Labour market effects of parental leave policies in OECD countries," Working Paper 141, OECD Social, Employment, and Migration 2013.

Tô, Linh T, "The Signaling Role of Parental Leave," 2018. Harvard University, unpublished manuscript.

Ugreninov, Elisabeth, "Can family policy reduce mothersâ sick leave absence? A causal analysis of the Norwegian paternity leave reform," *Journal of Family and Economic Issues*, 2013, *34* (4), 435–446.

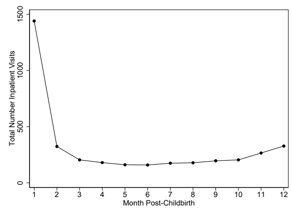
Weeden, Kim A, Youngjoo Cha, and Mauricio Bucca, "Long work hours, part-time work, and trends in the gender gap in pay, the motherhood wage penalty, and the fatherhood wage premium," *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 2016, *2* (4), 71–102.

Ziebarth, Nicolas R. and Martin Karlsson, "The effects of expanding the generosity of the statutory sickness insurance system," *Journal of Applied Econometrics*, 2014, *29* (2), 208–230.

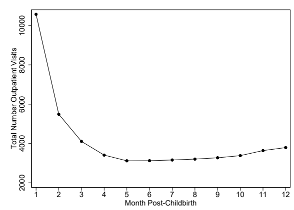
7 Figures and Tables

Figure 1: Frequency of Maternal Health Issues by Month Post-Childbirth, 2008-2011 Births

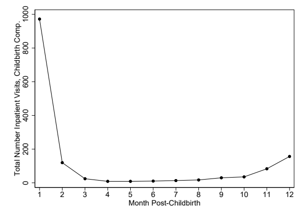
(a) Inpatient Visits



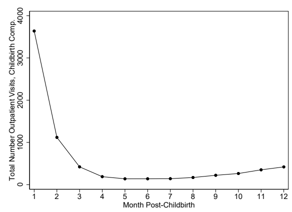
(b) Outpatient Visits



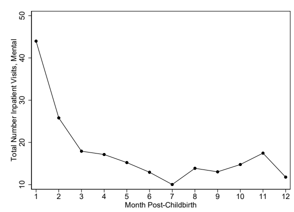
(c) Inpatient Visits, Childbirth Complications



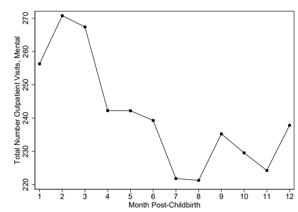
(d) Outpatient Visits, Childbirth Complications



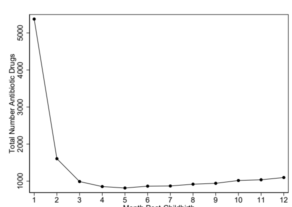
(e) Inpatient Visits, Mental Health Diagnoses



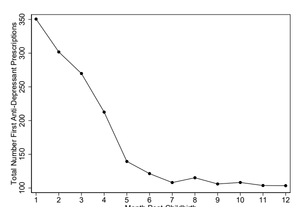
(f) Outpatient Visits, Mental Health Diagnoses



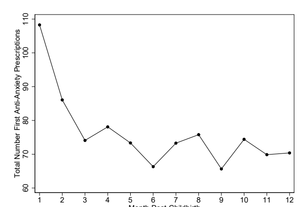
(g) Antibiotic Drugs



(h) Anti-Depressants, (Initial Prescriptions)



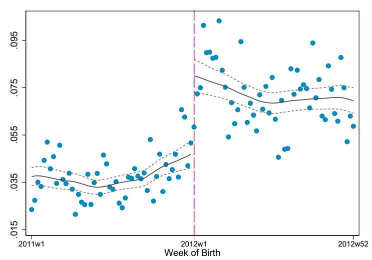
(i) Anti-Anxiety Drugs, (Initial Prescriptions)



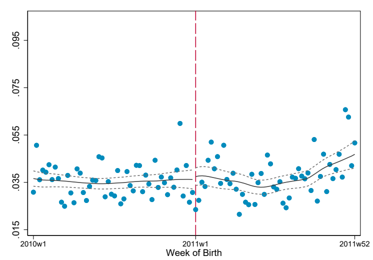
Note: The sample includes all firstborn singleton children born in 2008-2011 with information on exact date of birth (see footnote 29 for details on how we obtain exact dates of birth). Sub-figures (a)-(g) display the total number of health care encounters or prescription drug claims (listed in the sub-title) in each 30-day period following childbirth, averaged across the four cohorts of births. Sub-figures (h) and (i) display the total number of initial prescription drug claims (i.e., the first prescription for a given mother post-childbirth) in each 30-day period following childbirth, averaged across the four cohorts of births. See Appendix C for more details on the exact ICD and ATC codes for outcomes.

Figure 2: Fathers' Post-Baseline Leave Use in the First 30 Days Post-Childbirth by Week of Childbirth

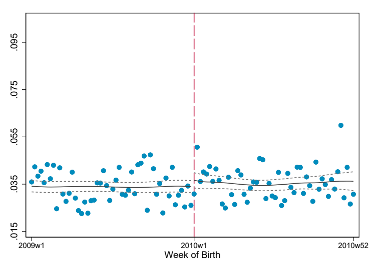
(a) Any Leave in First 30 Days, 2011-2012 (Reform)



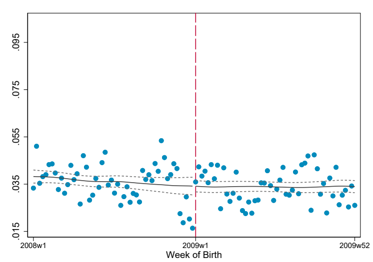
(b) Any Leave in First 30 Days, 2010-2011 (Non-Reform)



(c) Any Leave in First 30 Days, 2009-2010 (Non-Reform)



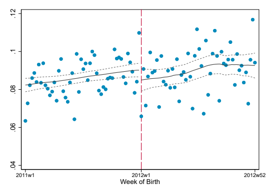
(d) Any Leave in First 30 Days, 2008-2009 (Non-Reform)



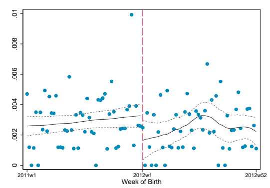
Note: The sample includes all firstborn singleton children born in 2008-2012 with information on exact date of birth (see footnote 29 for details on how we obtain exact dates of birth). The figures display the share of fathers who use any post-baseline leave in the first 30 days after childbirth by the child's birth week. Sub-figure (a) uses the reform period (2011-2012 births), while the remainder of the sub-figures use non-reform periods. The first week of January is denoted with vertical red dashed lines in every sub-figure. The fitted curves and 95% confidence intervals are predicted from local linear polynomial models on each side of the cut-off.

Figure 3: Maternal Health Outcomes in First 30 Days Post-Childbirth by Week of Childbirth

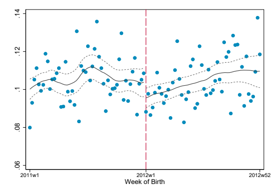
(a) Childbirth Complications, 2011-2012 (Reform)



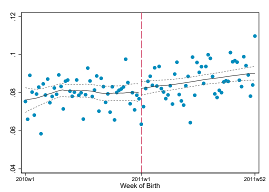
(b) Anti-Anxiety Drug, 2011-2012 (Reform)



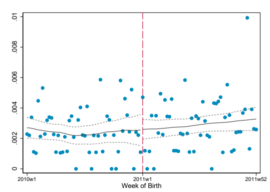
(c) Antibiotic Drug, 2011-2012 (Reform)



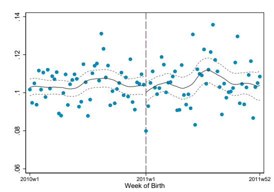
(d) Childbirth Complications, 2010-2011 (Non-Reform)



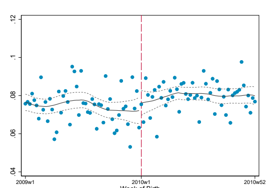
(e) Anti-Anxiety Drug, 2010-2011 (Non-Reform)



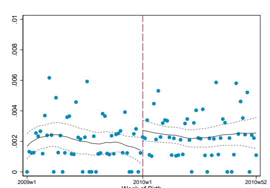
(f) Antibiotic Drug, 2010-2011 (Non-Reform)



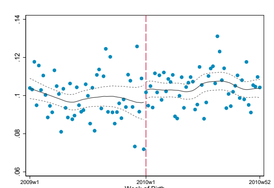
(g) Childbirth Complications, 2009-2010 (Non-Reform)



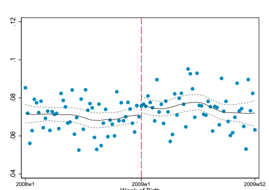
(h) Anti-Anxiety Drug, 2009-2010 (Non-Reform)



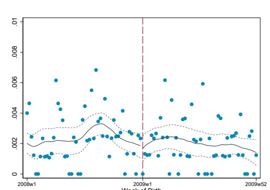
(i) Antibiotic Drug, 2009-2010 (Non-Reform)



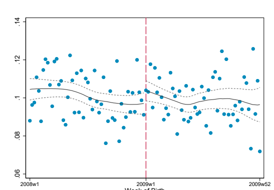
(j) Childbirth Complications, 2008-2009 (Non-Reform)



(k) Anti-Anxiety Drug, 2008-2009 (Non-Reform)



(l) Antibiotic Drug, 2008-2009 (Non-Reform)



Note: The sample includes all firstborn singleton children born in 2008-2012 with information on exact date of birth (see footnote 29 for details on how we obtain exact dates of birth). The figures display means of maternal health outcomes by the child's birth week. All outcomes are measured in the first 30 days post-childbirth. Sub-figures (a)–(c) use the reform period (2011-2012 births), while the remainder of the sub-figures use non-reform periods. The first week of January is denoted with vertical red dashed lines in every sub-figure. The fitted curves and 95% confidence intervals are predicted from local linear polynomial models on each side of the cut-off. See Appendix C for more details on the exact ICD and ATC codes for outcomes.

Table 1: Means of Background Characteristics and Maternal Health Outcomes in First 30 Days Post-Childbirth

	All	Exact DOB	Analysis Sample	Med. History
Mother low education	0.447	0.448	0.447	0.533
Father low education	0.569	0.569	0.570	0.623
Mother age	28.835	28.789	28.848	28.629
Father age	31.900	31.860	31.914	31.614
Mother income (1000s)	207.841	207.002	205.600	179.234
Father income (1000s)	275.262	274.219	273.321	258.545
Mother foreign-born	0.211	0.213	0.215	0.181
Father foreign-born	0.216	0.218	0.218	0.198
Any inpatient	0.030	0.031	0.030	0.038
Any specialist outpatient	0.160	0.169	0.163	0.204
Any visit for childbirth comp.	0.076	0.080	0.077	0.095
Any visit for mental health	0.005	0.005	0.005	0.014
Any visit for external causes/medical counseling	0.001	0.001	0.001	0.002
Any anti-anxiety/antidepressant drug	0.012	0.012	0.012	0.037
Any painkiller drugs	0.057	0.060	0.056	0.078
Any antibiotic drugs	0.098	0.103	0.098	0.121
Observations	233836	222497	88450	25439

Notes: This table reports the means of selected parental background characteristics and maternal health outcomes measured in the first 30 days post-childbirth. Column (1) includes all firstborn singleton children born in 2008-2012. Column (2) limits the sample to children with information on exact date of birth (see footnote 29 for details on how we obtain exact dates of birth). Column (3) uses our primary analysis sample, which consists of firstborn singleton children with information on exact dates of birth born in the months of October-December of 2008-2011 and January-March of 2009-2012. Column (4) limits the analysis sample to children of mothers who have a pre-birth medical history, which we define as either having any inpatient visit in the 24 months before childbirth or any specialist outpatient visit for mental health reasons in the 60 months before childbirth or any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth. See text for more details. Appendix C provides more details on the exact ICD and ATC codes for maternal health outcomes.

Table 2: Effects of "Double Days" Reform on Paternity Leave Take-Up in First 30 Days Post-Childbirth

	(1) Any Post-Baseline Leave	(2) Tot Num. Days
A. All first births		
Share Days Eligible in Days 1-30 Post-Birth	0.0394***	0.318***
	[0.00380]	[0.0411]
Romano-Wolf p	{0.010}	{0.010}
Dep. var mean	0.0432	0.376
N	82558	82558
RD-DD Drop December Births		
Reform x Birth Jan - Mar	0.0433***	0.351***
	[0.00390]	[0.0425]
Romano-Wolf p	{0.010}	{0.010}
Dep. var mean	0.0447	0.390
N	69953	69953
B. Mothers with medical history		
Share Days Eligible in Days 1-30 Post-Birth	0.0539***	0.425***
	[0.00768]	[0.0873]
Romano-Wolf p	{0.010}	{0.010}
Dep. var mean	0.0561	0.523
N	23935	23935
RD-DD Drop December Births		
Reform x Birth Jan - Mar	0.0592***	0.475***
	[0.00797]	[0.0910]
Romano-Wolf p	{0.010}	{0.010}
Dep. var mean	0.0587	0.550
N	20230	20230

Notes: Each coefficient is from a separate regression. The outcomes are: (1) indicator for any post-baseline paternity leave in the first 30 days post-childbirth and (2) total number of post-baseline paternity leave days in the first 30 days post-childbirth. The reported coefficients are from either the "Share Days Eligible" model using the full analysis sample, or the "doughnut" RD-DD model dropping all December births. See notes under Table 1 for more details about the analysis sample. All regressions include controls for child gender and for the following family characteristics measured in the year before birth: maternal and paternal earnings (in 1000s of SEK), indicators for each parent's age groups (<20, 20-24, 25-34, 35+), indicators for each parent's education levels (high school or less, some college, university degree or more), an indicator for the parents being married, indicators for each parent being foreign-born. We also include birth year fixed effects. Robust standard errors are in brackets, while p-values from implementing the Romano-Wolf multiple hypothesis correction are in curvy brackets. Panel A reports results for the whole analysis sample, while Panel B limits the sample to mothers with a pre-birth medical history, which we define as either having any inpatient visit in the 24 months before childbirth or any specialist outpatient visit for mental health reasons in the 60 months before childbirth or any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth.

Significance levels: * p<0.1 ** p<0.05 *** p<0.01

Table 3: Effects of "Double Days" Reform on Maternal Health Outcomes in First 30 Days Post-Childbirth in Inpatient and Outpatient Data

	Any	Diagnosis Categories		
		Childbirth Comp.	Mental	External/Counseling
A. All first births				
Share Days Eligible in Days 1-30 Post-Birth	-0.0103	-0.00976**	0.000336	-0.00135**
	[0.00677]	[0.00484]	[0.00125]	[0.000586]
Romano-Wolf p	{0.267}	{0.178}	{0.792}	{0.079}
Dep. var mean	0.185	0.0799	0.00492	0.00125
N	82558	82558	82558	82558
RD-DD Drop December Births				
Reform x Birth Jan - Mar	-0.0128*	-0.0130***	0.00109	-0.00120**
	[0.00706]	[0.00504]	[0.00128]	[0.000592]
Romano-Wolf p	{0.198}	{0.050}	{0.455}	{0.139}
Dep. var mean	0.185	0.0801	0.00496	0.00119
N	69953	69953	69953	69953
B. Mothers with medical history				
Share Days Eligible in Days 1-30 Post-Birth	-0.00400	-0.0197**	0.000567	-0.00194*
	[0.0132]	[0.00955]	[0.00388]	[0.00114]
Romano-Wolf p	{0.941}	{0.238}	{0.941}	{0.347}
Dep. var mean	0.229	0.0972	0.0143	0.00159
N	23935	23935	23935	23935
RD-DD Drop December Births				
Reform x Birth Jan - Mar	-0.00567	-0.0208**	0.00266	-0.00133
	[0.0139]	[0.00999]	[0.00400]	[0.00107]
Romano-Wolf p	{0.772}	{0.168}	{0.772}	{0.505}
Dep. var mean	0.228	0.0983	0.0146	0.00153
N	20230	20230	20230	20230

Notes: Each coefficient is from a separate regression. All of the outcomes are measured in the first 30 days post-childbirth. The outcomes are indicators for: (1) any inpatient or specialist outpatient visit, (2) any visit for childbirth complications, (3) any visit for mental health reasons, and (4) any visit for external causes or counseling. The reported coefficients are from either the "Share Days Eligible" model using the full analysis sample, or the "doughnut" RD-DD model dropping all December births. See notes under Tables 1 and 2 for more details about the analysis sample and specifications. Robust standard errors are in brackets, while p-values from implementing the Romano-Wolf multiple hypothesis correction are in curvy brackets. Panel A reports results for the whole analysis sample, while Panel B limits the sample to mothers with a pre-birth medical history, which we define as either having any inpatient visit in the 24 months before childbirth or any specialist outpatient visit for mental health reasons in the 60 months before childbirth or any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth. Appendix C provides more details on the exact ICD and ATC codes for maternal health outcomes.

Significance levels: * p<0.1 ** p<0.05 *** p<0.01

Table 4: Effects of "Double Days" Reform on Maternal Health Outcomes in First 30 Days Post-Childbirth in Prescription Drug Data

	Any Anti-Anxiety	Any Anti-Depressant	Any Painkiller	Any Antibiotic
A. All first births				
Share Days Eligible in Days 1-30 Post-Birth	-0.00172*	-0.000998	-0.00386	-0.0145***
	[0.000899]	[0.00160]	[0.00398]	[0.00519]
Romano-Wolf p	{0.129}	{0.515}	{0.515}	{0.030}
Dep. var mean	0.00240	0.00855	0.0579	0.101
N	82558	82558	82558	82558
RD-DD Drop December Births				
Reform x Birth Jan - Mar	-0.00147	-0.000782	-0.00346	-0.0186***
	[0.000931]	[0.00168]	[0.00416]	[0.00543]
Romano-Wolf p	{0.356}	{0.723}	{0.703}	{0.030}
Dep. var mean	0.00247	0.00875	0.0583	0.101
N	69953	69953	69953	69953
B. Mothers with medical history				
Share Days Eligible in Days 1-30 Post-Birth	-0.00487*	-0.00525	-0.00341	-0.0178*
	[0.00255]	[0.00515]	[0.00831]	[0.0103]
Romano-Wolf p	{0.248}	{0.455}	{0.624}	{0.248}
Dep. var mean	0.00618	0.0280	0.0804	0.125
N	23935	23935	23935	23935
RD-DD Drop December Births				
Reform x Birth Jan - Mar	-0.00401	-0.00471	-0.00183	-0.0235**
	[0.00263]	[0.00547]	[0.00874]	[0.0109]
Romano-Wolf p	{0.347}	{0.703}	{0.822}	{0.119}
Dep. var mean	0.00623	0.0287	0.0812	0.126
N	20230	20230	20230	20230

Notes: Each coefficient is from a separate regression. All of the outcomes are measured in the first 30 days post-childbirth. The outcomes are indicators for: (1) any anti-anxiety drug, (2) any anti-anxiety drug, (2) any anti-depressant drug, (3) any painkiller drug, and (4) any antibiotic drug. The reported coefficients are from either the "Share Days Eligible" model using the full analysis sample, or the "doughnut" RD-DD model dropping all December births. See notes under Tables 1 and 2 for more details about the analysis sample and specifications. Robust standard errors are in brackets, while p-values from implementing the Romano-Wolf multiple hypothesis correction are in curvy brackets. Panel A reports results for the whole analysis sample, while Panel B limits the sample to mothers with a pre-birth medical history, which we define as either having any inpatient visit in the 24 months before childbirth or any specialist outpatient visit for mental health reasons in the 60 months before childbirth or any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth. Appendix C provides more details on the exact ICD and ATC codes for maternal health outcomes.
Significance levels: * p<0.1 ** p<0.05 *** p<0.01

Table 5: Effect of "Double Days" Reform on the Likelihood of Father Taking Leave on Days When Mother Needs Medical Care

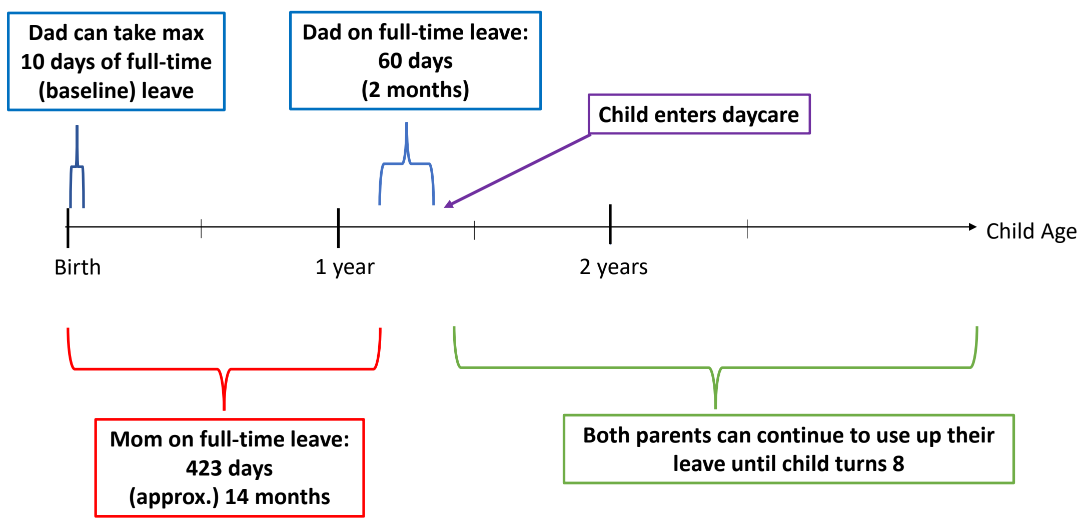
	Father Takes Leave When Mother Gets Medical Care	
	Share Days Eligible Model	"Doughnut" RD-DD
A. All first births		
Share Days Eligible in First 30 Days	0.00495**	
	[0.00200]	
Reform x Birth Jan - Mar		0.00577***
		[0.00209]
Dep. var mean	0.0125	0.0130
N	82558	69953
B. Mothers with medical history		
Share Days Eligible in First 30 Days	0.0128***	
	[0.00451]	
Reform x Birth Jan - Mar		0.0134***
		[0.00479]
Dep. var mean	0.0198	0.0209
N	23935	20230

Notes: Each coefficient is from a separate regression. The outcome is an indicator that is equal to one if a father takes at least one day of leave on the same day as when the mother has an inpatient or specialist outpatient visit or fills a prescription, measured during the first 30 days days post-childbirth. The reported coefficients in column (1) are from the "Share Days Eligible" model, while the coefficients in column (2) are from the "doughnut" RD-DD model that excludes December births. Panel A uses our full analysis sample, while Panel B limits the sample to mothers with a pre-birth medical history. See notes under Tables 1 and 2 for more details about the analysis sample and specifications. Robust standard errors in brackets.
Significance levels: * p<0.1 ** p<0.05 *** p<0.01

ONLINE APPENDIX

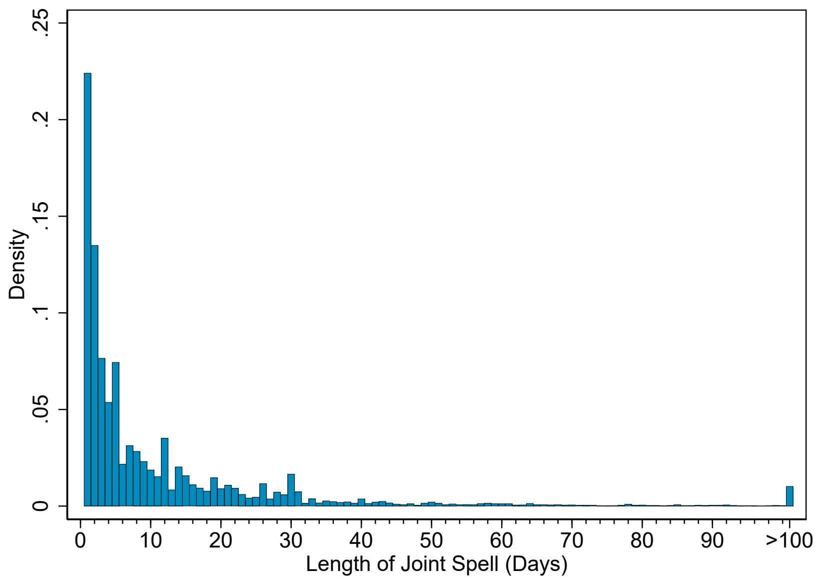
A Additional Results

Figure A1: How Parents Allocate Leave: The Case of the Median Household, 2008-2011



Note: The figure represents how the median family in Sweden allocates leave between parents, using data on parents of firstborn singleton children born in 2008-2011. The number of days on full-time leave for each parent (423 days for mothers and 60 days for fathers) are the medians of the two respective distributions in the data.

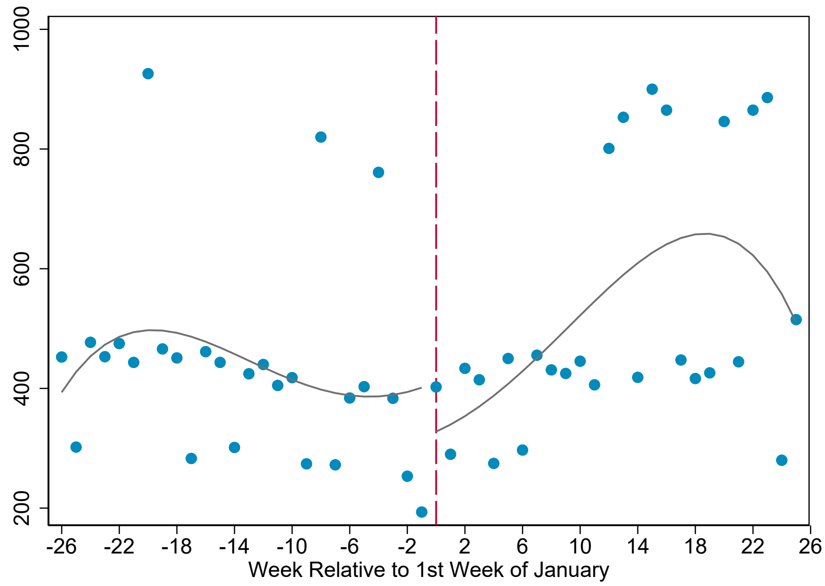
Figure A2: Distribution of Joint Leave Length, Parents of Firstborn Children Born in Jan-Mar 2012



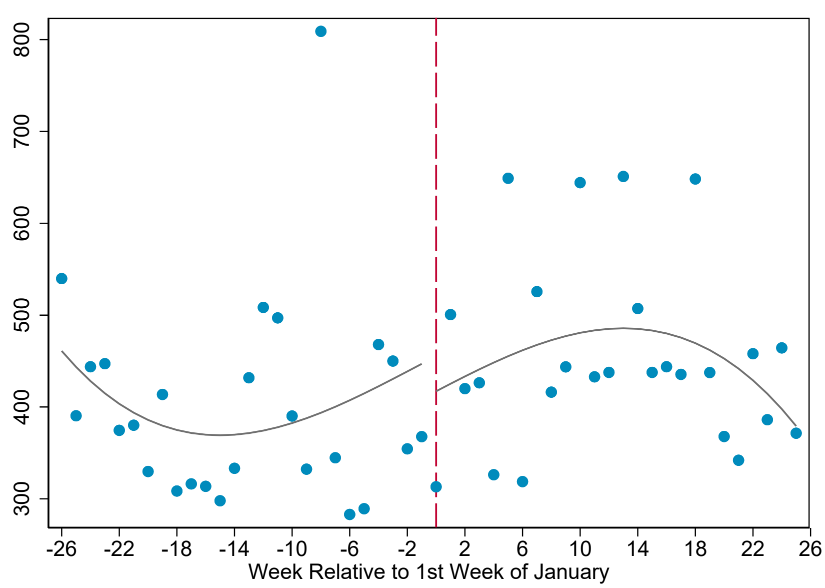
Note: The figure uses data on all spells of joint leave (i.e., any spell in which one or more days of leave overlap between the two parents, regardless of it is full- or part-time leave, paid or unpaid) in the first year after childbirth. The sample includes parents of firstborn children born in January to March 2012. The figure shows the distribution of the length of these spells.

Figure A3: Number of Births by Birth Month in Reform and Non-Reform Samples

(a) Reform Sample



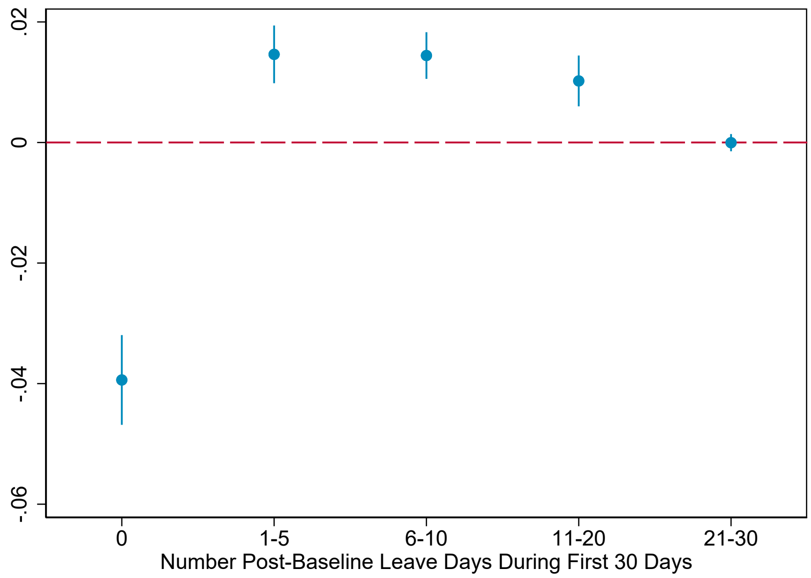
(b) Non-Reform Sample



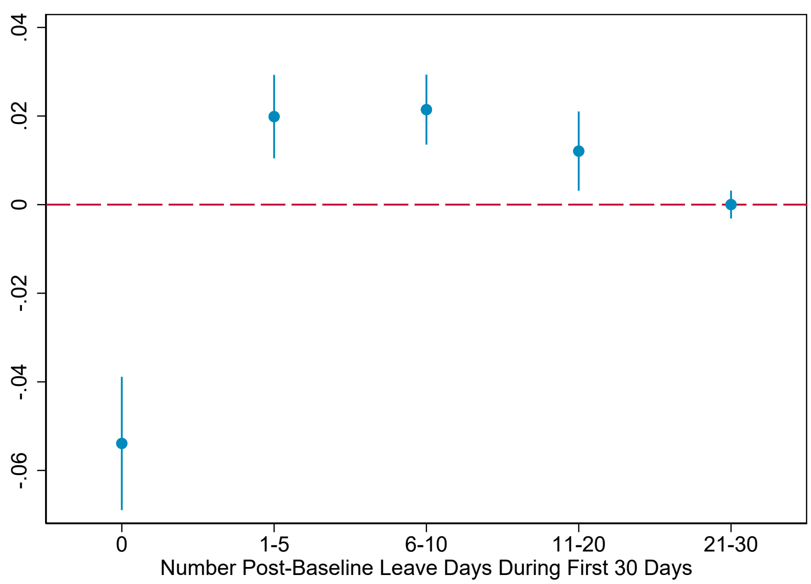
Note: The sample includes all firstborn singleton children born in 2008-2012 with information on exact date of birth (see footnote 29 for details on how we obtain exact dates of birth). Sub-figure (a) plots the total number of births by birth week in the reform sample with a 6-month bandwidth (July 2011 - June 2012). Sub-figure (b) plots the average of the total number of births by birth week across all years in the non-reform sample with the same bandwidth (July 2008 - June 2011). The fitted lines are predicted from 4th order polynomial models. We follow Lee and Lemieux (2010) by selecting the model with the smallest Akaike Information Criterion (AIC) value.

Figure A4: Effect of 2012 "Double Days" Reform on the Distribution of Post-Baseline Leave Days Taken by Fathers During First 30 Days Post-Childbirth

(a) All Families



(b) Mothers With Pre-Birth Medical History



Note: The figures plot the key treatment coefficients and 95% confidence intervals from the "Share Days Eligible" model using separate regressions that each use as the outcome an indicator for the father taking the number of post-baseline leave days denoted in bins on the $x-$axis of each graph. Sub-figure (a) uses our primary analysis sample, while sub-figure (b) limits the analysis sample to families with mothers who have a pre-birth medical history. See notes under Tables 1 and 2 for more details about the analysis sample and specifications.

Table A1: Parental Sick Leave Use: Jan-Mar 2011 vs. Jan-Mar 2012 Births

	Jan-Mar 2011	Jan-Mar 2012	P-value
A. Fathers			
Days of Sick Leave	2.707	2.652	0.845
Any Sick Leave	0.045	0.044	0.553
B. Mothers			
Days of Sick Leave	6.185	6.626	0.129
Any Sick Leave	0.202	0.206	0.488
Observations	11345	11491	

Notes: This table reports the means of the annual number of sick leave days and the share of parents who use any sick leave for parents of firstborn singleton children born in January-March 2011 and January-March 2012. Panel A presents the statistics for fathers, while Panel B for mothers. The last column reports the *p*-values from testing the differences between the values in the previous two columns.

Table A2: McCrary Test Using Different Polynomials in Week of Birth

	1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}	6^{th}
Reform × Birth Jan-June	35.82	35.82	35.82	35.82	35.82	35.82
	(60.95)	(60.55)	(60.17)	(59.45)	(59.61)	(59.84)
Reform	36.65	36.65	36.65	36.65	36.65	36.65
	(43.10)	(42.81)	(42.54)	(42.04)	(42.15)	(42.32)
Dummy for Birth Jan-June	1.224	1.224	-78.48	-78.48	-41.57	-41.57
	(68.18)	(67.72)	(85.82)	(84.80)	(100.3)	(100.7)
Observations	104	104	104	104	104	104
AIC	1349.6	1349.1	1348.8	1347.2	1348.7	1350.4

Notes: Each column reports coefficients from separate regressions. The data are collapsed into week-of-birth bins, with the outcome being the total number of firstborn singleton births. The reform sample includes births in July 2011 - June 2012, while the non-reform sample includes births in July 2008 - June 2011. We report results from models that use 1st through 6th order polynomials in the running variable, which is the week of birth normalized relative to the first week of January in each year. We report the Akaike Information Criterion (AIC) values in the bottom row. Robust standard errors in brackets.
Significance levels: * p<0.1 ** p<0.05 *** p<0.01

Table A3: The 2012 "Double Days" Reform and Parental Characteristics

	(1) M. Low Ed	(2) F. Low Ed	(3) M. F-born	(4) F. F-born	(5) M. Age	(6) F. Age	(7) M. Inc	(8) F. Inc
A. Share Days Eligible in Days 1-30 Post-Birth								
Share Days Eligible in Days 1-30 Post-Birth	-0.000408	0.00459	-0.000832	-0.00386	-0.0997	-0.0571	4694.1*	4289.3
	[0.00837]	[0.00834]	[0.00694]	[0.00700]	[0.0863]	[0.106]	[2584.3]	[4932.5]
Romano-Wolf p	{0.990}	{0.970}	{0.990}	{0.970}	{0.832}	{0.970}	{0.366}	{0.941}
Dep. var mean	0.448	0.571	0.215	0.218	28.82	31.89	204917.5	271989.0
Indiv. obs.	85902	85902	85902	85902	85902	85902	84205	83874
				F-Statistic: 1.12 P-value: 0.35				
B. RD-DD Drop December Births								
Reform x Birth Jan - Mar	-0.00526	0.00140	0.00114	-0.00483	-0.0994	-0.0793	5373.4**	8399.7**
	[0.00872]	[0.00869]	[0.00723]	[0.00730]	[0.0901]	[0.111]	[2711.8]	[3626.1]
Romano-Wolf p	{0.921}	{0.980}	{0.980}	{0.921}	{0.713}	{0.921}	{0.267}	{0.158}
Dep. var mean	0.448	0.568	0.213	0.216	28.91	31.98	205993.4	274132.6
Indiv. obs.	72354	72354	72354	72354	72354	72354	71253	70794
				F-Statistic: 1.68 P-value: 0.10				

Notes: Each column reports coefficients from separate regressions. The dependent variables are the following parental characteristics measured in the year before the child's birth: indicators for the mother having a low education level, the father having a low education level, the mother being foreign-born, the father being foreign-born, the mother's age in years, the father's age in years, the mother's income (1000s of SEK), and the father's income (1000s of SEK). In Panel A, the reported coefficients are from the "Share Days Eligible" model, excluding the controls for parental characteristics. In Panel B, the reported coefficients are from the "doughnut" RD-DD model (which excludes December births), excluding the controls for parental characteristics. See notes under Tables 1 and 2 for more details about the analysis sample and specifications. Robust standard errors are in brackets, while p-values from implementing the Romano-Wolf multiple hypothesis correction are in curvy brackets. In the bottom row, we report the F-statistic and associated p-value from a joint test of significance of all the coefficients using a seemingly unrelated regression model.
Significance levels: * p<0.1 ** p<0.05 *** p<0.01

Table A4: The 2012 “Double Days” Reform, Birth Outcomes, and Maternal Pre-Birth Medical History Indicators

	Birth Outcomes								Maternal Pre-Birth Medical History			
	(1) Bweight	(2) LBW	(3) Gest.	(4) Preterm	(5) Apgar<7	(6) SGA	(7) Induced	(8) C-section	(9) Inp	(10) Outp	(11) Drug	(12) Any
A. Share Days Eligible in Days 1-30 Post-Birth												
Share Days Eligible in Days 1-30 Post-Birth	7.531	-0.00292	0.00761	0.00110	-0.00329	-0.00350	-0.00398	-0.00447	-0.00540	0.00777*	0.00502	-0.000789
	[9.267]	[0.00329]	[0.0314]	[0.00390]	[0.00394]	[0.00300]	[0.00608]	[0.00643]	[0.00643]	[0.00469]	[0.00611]	[0.00781]
Romano-Wolf p	{0.980}	{0.980}	{0.980}	{0.980}	{0.980}	{0.881}	{0.980}	{0.980}	{0.980}	{0.644}	{0.980}	{0.980}
Dep. var mean	3448.5	0.0398	39.85	0.0584	0.0585	0.0317	0.141	0.181	0.165	0.0749	0.144	0.287
Indiv. obs.	85804	85902	85902	85902	85902	85902	85902	85902	84593	84593	84593	84593
F-Statistic: .71 P-value: 0.74												
B. RD-DD Drop December Births												
Reform x Birth Jan - Mar	5.105	-0.00170	0.00903	0.000708	-0.000809	-0.00159	-0.00173	-0.00539	-0.00155	0.00829*	0.00505	0.00341
	[9.622]	[0.00340]	[0.0326]	[0.00406]	[0.00405]	[0.00309]	[0.00631]	[0.00671]	[0.00664]	[0.00487]	[0.00636]	[0.00810]
Romano-Wolf p	{1.000}	{1.000}	{1.000}	{1.000}	{1.000}	{1.000}	{1.000}	{0.990}	{1.000}	{0.545}	{0.990}	{1.000}
Dep. var mean	3449.9	0.0397	39.85	0.0578	0.0579	0.0315	0.140	0.181	0.165	0.0750	0.145	0.288
Indiv. obs.	72285	72354	72354	72354	72354	72354	72354	72354	71249	71249	71249	71249
F-Statistic: .41 P-value: 0.96												

Notes: Each column reports coefficients from separate regressions. The dependent variables include the following birth outcomes: birth weight (in grams), indicator for low-birth-weight (<2,500g), gestation length (in weeks), indicator for preterm birth (<37 weeks), indicator for Apgar score <7, indicator for small-for-gestational-age, indicator for induction of labor, and indicator for delivery by cesarean section. In the last four columns we use as the dependent variables the following maternal pre-birth medical history indicators: any inpatient visit in the 24 months before childbirth, any specialist outpatient visit for mental health reasons in the 60 months before childbirth, any anti-anxiety or anti-depressant prescription drug in the 36 months before childbirth, as well as an indicator for any of these three conditions holding (i.e., our indicator for the mother having a pre-birth medical history). In Panel A, the reported coefficients are from the “Share Days Eligible” model, excluding the controls for parental characteristics. In Panel B, the reported coefficients are from the “doughnut” RD-DD model (which excludes December births), excluding the controls for parental characteristics. See notes under Tables 1 and 2 for more details about the analysis sample and specifications. Robust standard errors are in brackets, while p-values from implementing the Romano-Wolf multiple hypothesis correction are in curvy brackets. In the bottom row, we report the F-statistic and associated p-value from a joint test of significance of all the coefficients using a seemingly unrelated regression model.
Significance levels: * p<0.1 ** p<0.05 *** p<0.01

B A Model of Household Parental Leave Use

We develop a framework of parental leave use that describes how parents divide a household's allocation of parental leave days, taking into account the labor market costs as well as the household benefits of the presence of each parent. We start from a set-up that mimics Sweden's parental leave system before the introduction of "Double Days," and then examine how this reform alters the allocation of parental leave and household wellbeing.

B.1 General Notation

Consider a household consisting of a child, mom m, and dad d. Let t denote discrete time (in days), with childbirth at $t = 0$. Time is divided into two intervals, before and after publicly-provided childcare becomes available.[44] Specifically, there exists some $\bar{t} > 0$, such that:

- For $t < \bar{t}$, public childcare is not available. We refer to these days as "core" days.
- For $t \geq \bar{t}$, public childcare is generally available, except on some days (e.g., school holidays). We refer to days without childcare during this period as "miscellaneous" days.

The total number of parental leave days available to the family is $T > \bar{t}$. The total number of core and miscellaneous days exceeds T.[45]

Let $B_p(t)$ and $C_p(t)$ denote the benefit and cost of a leave day taken (alone) by parent $p \in \{m, d\}$, respectively, on a day before childcare is available (i.e., during a core day $t < \bar{t}$). The corresponding benefit and cost of taking leave on a miscellaneous day during $t \geq \bar{t}$ is given by $b_p(t)$ and $c_p(t)$, respectively.[46] Let the value of parental leave be strictly positive, $B_p - C_p > 0$ and $b_p - c_p > 0$, on days without childcare; and negative otherwise.

B.2 Assumptions

We assume that household decisions are efficient, and (for simplicity) abstract away from discounting.[47] The general household problem of choosing an allocation of leave days among the large set of permissible ones is complex and dynamic. To obtain specific predictions for how parents divide the leave, we need to impose more structure. We make four parsimonious assumptions about the benefits and costs of parental leave. They are not meant to reflect the reality of all families, but simply to be plausible for the "typical" family in our data.

[44] Children are eligible for publicly-provided childcare at age 1. In practice, most childcare slots open up in August (when all children are "shifted" one year forward). Thus, many children do not gain access to a desired childcare slot until August in the year after they turn one year old.

[45] Consistent with this conjecture, parents generally exhaust their leave days. (Recall that parental leave can be claimed until the child turns 8 years old; thus, the period $t \geq \bar{t}$ essentially lasts until the child's eighth birthday.)

[46] These benefits and costs pertain to those subjectively "perceived" by the family. To the extent that they differ from the true benefits and costs (i.e., their perceptions may be wrong), it is the perceived benefits and costs that matter for our analysis because they drive parental leave choices.

[47] As discussed in footnote 17, Sweden's parental leave program grants benefits to both parents of a child regardless of their marital or cohabitation status. In our model, we refer to the mom and dad as residing in one household; strictly speaking, however, we only require that parents are able to make efficient joint decisions.

The first two assumptions concern the benefits of parental leave. We define the difference between the benefit of the mom and the benefit of the dad taking leave on core and miscellaneous days, respectively, as: $\Delta_B(t) \equiv B_m(t) - B_d(t)$ and $\Delta_b(t) \equiv b_m(t) - b_d(t)$.

Assumption 1 (Early care). *$B_p(t)$ is strictly decreasing and converges to $b_p(t) = b_p > 0$.*

Intuitively, the benefit of parental care is the largest immediately after childbirth, and then gradually falls to b_p, the benefit of a miscellaneous day.

Assumption 2 (Maternal advantage). *$\Delta_B(t)$ is positive, strictly decreasing, and converges to $\Delta_b(t) = \Delta_b \geq 0$.*

The relative advantage of the mother staying home being decreasing over time is consistent with, for example, the fact that breastfeeding is usually concentrated in the beginning of a child's life.

The next two assumptions concern the costs of parental leave. Let $C_p(t) \equiv (1-\alpha)w_p + \kappa(\tau_p)$, where w_p is the (constant) current wage, α is the wage replacement rate, $\kappa(\tau_p)$ is a future career cost, and τ_p is total number of core leave days taken by parent p (up to t). By contrast, assume that leave taken on miscellaneous days does not have any long-term career consequences, i.e., $c_p(t) \equiv (1-\alpha)w_p$.

Assumption 3 (Parental income difference). *$w_d > w_m$.*

Consistent with this assumption, the intra-household median earnings difference (father minus mother earnings) in our analysis sample is positive.[48]

Assumption 4 (Career cost). *Let $\kappa > 0$ and $\frac{\bar{t}}{2} < \tau^c < \bar{t}$ such that*

$$\kappa(\tau_p) = \begin{cases} \kappa & \text{if } \tau_p \geq \tau_c \\ 0 & \text{otherwise} \end{cases}$$

Intuitively, this assumption captures the idea that absence from the labor market *for an extended period of time* (longer than τ^c) comes with a career cost. While we use a simple step function for tractability only, the idea that career costs are particularly pronounced when a parent takes a long period of leave is consistent with empirical evidence.[49] Here, the critical time threshold τ^c is chosen such that the career cost can be avoided if and only if the core days are (suitably) shared by both parents.[50]

[48]This fact is also true at the mean in our data. As can be seen in Table 1, the mean of mothers' earnings is approximately 75 percent of the mean of fathers' earnings. Note that we do not observe wages, only earnings (i.e., wage × hours). If, in contrast, the mother earns a higher wage than the father, then the wage effect pushes the household towards a distribution of leave-taking with greater leave use by the father. As long as the mother takes any leave at all (which is true in 100 percent of the households claiming leave in our data), Corollaries 1 and 2 below still hold, and Prediction 1 still holds with the modification that the future miscellaneous leave day crowded out by a double day also may be taken by dad.

[49]Multiple studies document negative labor market impacts of prolonged leave (Lalive and Zweimüller, 2009; Lequien, 2012; Schönberg and Ludsteck, 2014; Bičáková and Kalíšková, 2016; Canaan, 2019). In general, cross-country comparisons suggest that provisions of leave of up to one year in length have zero or positive impacts on maternal employment, whereas longer leave entitlements can negatively affect women's long-term labor market outcomes (Ruhm, 1998; Blau and Kahn, 2013; Thévenon and Solaz, 2013; Olivetti and Petrongolo, 2017; Rossin-Slater, 2018).

[50]This is likely true in the typical Swedish setting, where the core period often extends beyond the child's first birthday (as discussed in footnote 45), while the literature documents career costs associated with leave entitlements longer than a year (as discussed in footnote 49).

B.3 Parental Leave System Before the "Double Day" Reform

We start by defining a "basic parental leave system" as one in which parents can freely divide the total allowance T, but where leave cannot be taken simultaneously by both parents. This represents a simplified version of Sweden's parental leave system before 1995 (when the first earmarked month of leave was introduced) and, more generally, is akin to typical parental leave systems around the world in which parents can divide up a total "budget" of leave days.

Corollary 1 (Basic system)**.** *Under the basic parental leave system, leave is taken during the entire core period, with residual leave days used in the miscellaneous period. Either mom takes all leave days, or mom takes all leave days except for a single interval of leave days taken by dad at the end of the core period.*

Proof. See Appendix B.5.1. □

This allocation intuitively reflects the above assumptions: Parental leave is concentrated at the start of a child's life due to the importance of early care (Assumption 1). Further, leave is taken predominantly, if not exclusively, by moms because of maternal advantages in childrearing and parental income differences (Assumptions 2 and 3); a countervailing effect is that extended leave by one parent negatively affects that parent's future career (Assumption 4). Thus, dad may take some core days when doing so allows the household to avoid the maternal career cost.

In Sweden, under the basic parental leave system (prior to 1995) only a small share of all fathers chose to take any leave (Duvander and Johansson, 2012)—this low rate of paternal leave use was in fact the motivation for introducing the first "Daddy Month." In light of the model, this pattern suggests either that parents' income differences were so large that not even career costs could overcome them, or that income differences were modest but career costs were not substantial enough to neutralize them.[51]

Next, we add earmarked leave. Specifically, out of the family's total allowance of T leave days, $E < T$ days are earmarked for each parent (but leave days still cannot be taken simultaneously). This structure resembles Sweden's parental leave system right before the "Double Day" reform that we study, when Sweden had implemented two "Daddy Months" (in 1995 and 2002). We assume that $T - E > \bar{t}$; that is, the household is able to cover the core period with only one parent taking leave.[52]

Corollary 2 (Earmarked leave and the value of a miscellaneous day)**.** *In a basic parental leave system with earmarked leave, if dad takes leave, then he takes it at the end of the core period or during the miscellaneous period. The magnitude of a household's response to the introduction of earmarked leave reflects the household's valuation of a miscellaneous day.*

Proof. See Appendix B.5.2. □

[51]This pattern could also be explained by fathers facing greater career costs of taking leave than mothers, as argued by Albrecht et al. (2015), Pedulla (2016), and Tô (2018). While for simplicity we abstract away from gender differences in career costs in our framework (i.e., we assume that κ is the same for both parents), all of the below corollaries would still hold if the career cost is larger for men than women.

[52]This assumption reflects the Swedish system at the time of the "Double Day" reform: T was 16 months, E was 2 months, and childcare eligibility occurred at 12 months.

Intuitively, earmarking affects households in which the dad would have otherwise taken less than E leave days by raising the opportunity cost of *not* taking a paternity leave day—without earmarking the mother can stay home instead; with earmarking, the day is lost. A father induced to take leave allocates it either to the end of the core period (when it can reduce maternal career costs) or during the miscellaneous period (when the household benefit differential is the smallest).

Corollaries 1 and B.5.2 are important for two reasons. First, they provide the model's prediction about parental division of leave before the introduction of "Double Days": Mothers take leave starting at childbirth and for the majority of the core period, while fathers take leave at the end of the core period or during (a subset of the) miscellaneous days. To gauge the plausibility of the model's predictions, we can use data on *actual* parental leave use in the pre-reform period. Appendix Figure A1 illustrates that Corollaries 1 and B.5.2 are highly consistent with actual parental leave use in Sweden in the period before the "Double Days" reform, underscoring the model's applicability to our empirical setting.

Second, the last statement in Corollary B.5.2 links a household's response to the introduction of earmarking to its valuation of a miscellaneous day. While we do not empirically analyze the impact of earmarking in our paper, this result provides an important link between existing evidence on earmarking and the model's predicted household responses to the reform that we study. In particular, multiple studies have documented that Sweden's earmarking reforms substantially increased paternity leave take-up (Duvander and Johansson, 2012; Ekberg et al., 2013; Duvander and Johansson, 2014, 2015; Avdic and Karimi, 2018). By Corollary B.5.2, this finding implies that households place a high valuation on a miscellaneous day.[53] This, in turn, has important implications for our analysis because, as we show in Section B.4 below, a household's benefit from using a "Double Day" is *directly related to a household's valuation of a miscellaneous day.* Thus, Corollary B.5.2 provides a theoretical link between existing studies on earmarking and the findings that we present in this paper. We explain this in detail below.

B.4 "Double Days" Reform

The "Double Days" reform relaxes the assumption that parents cannot take leave at the same time by allowing "double days." During the core period, parents can now take leave on the same day, using two units of leave. However, "double day" units do not count toward earmarked units.[54]

To capture the value of taking a double day, we introduce some additional notation. Let $B_{pp'}(t)$ capture the direct benefit of parent p taking leave to join parent p' at home on day t. Let $C_p(t)$ be the corresponding direct cost.

Assumption 5 (Flexibility and the value of a "double day")**.** *$B_{pp'}(t)$ contains a stochastic element. The double-day decision can be made flexibly, at time t, when the daily realization of $B_{pp'}(t)$ is observed.*

[53] Intuitively, as we show in the Proof of Corollary B.5.2, when earmarking induces a father to take an extra leave day (that he otherwise would not have taken), the household gains one miscellaneous day.

[54] This structure closely resembles Sweden's reform, which allowed the use of "double days" before the child's first birthday (and thus before the child is eligible for public childcare), and which did not allow for "double days" to count toward either parent's earmarked allowance.

In principle, $B_{pp'}(t)$ may encompass benefits to parent p who takes the additional leave (e.g., joy of leisure or domestic work), benefits to parent p' from having the second parent at home (e.g., help with household chores or emotional support), and benefits to the child from being home with two parents as opposed to one. We let this aggregate household benefit contain a stochastic element to capture the fact that it may be subject to domestic shocks that necessitate a flexible response. For example, additional support for the mother may be more valuable to the household on some days (e.g., when she is not feeling well, is fatigued, or is having mental health issues) than others.[55]

Further, for simplicity, we assume that the number of potential double days to be used is strictly smaller than $T - E - \bar{t}$. This simplifies our analysis as it ensures that use of a double day will not preclude use of a later (desired) double day.[56]

Prediction 1 (Double days)**.** *A double day is used if and only if*

$$B_{pp'}(t) > b_m + (1 - \alpha)(w_p - w_{p'}). \tag{3}$$

Proof. See Appendix B.5.3. □

Prediction B.5.3 contains two insights that are important for our empirical analysis. First, households choose to take a double day on days when the direct household benefit from parent p joining p' exceeds the threshold in (3). Thus, when parents have the flexibility to decide when to take joint leave on a day-to-day basis, the optimal response is to remove the additional parent from the labor force only on days when the benefit of doing so is perceived to be sufficiently high.

Second, the right-hand side of condition (3) formalizes the notion of "sufficiently high." Intuitively, a double day has a shadow cost beyond the foregone wage of parent p: it eliminates a future miscellaneous leave day that could be taken by mom.[57] This makes the overall opportunity cost of taking a double day potentially large. Specifically, for a double day taken by the dad to join the mom at home, condition (3) becomes

$$B_{dm}(t) > b_m + (1 - \alpha)\Delta_w$$

where $\Delta_w = w_d - w_m > 0$ is the wage difference between the dad and the mom. That is, the added benefit of dad joining mom on a core day allocated to mom would have to exceed the gross benefit of mom taking leave

[55] In principle, another example of a domestic shock that could affect $B_{pp'}(t)$ in this general set-up is child illness. However, since one parent is already at home during the core days—and thus able to flexibly respond to unexpected child health shocks by, for example, taking the infant to the doctor—the marginal value of the second parent also staying home in response to a child health shock is likely to be low. Consistent with this conjecture, we find no empirical evidence of effects of the "Double Days" reform on measures of child health available in our data (specialist outpatient and inpatient visits as well as prescription drugs like antibiotics).

[56] This assumption is made for convenience and can be relaxed. If relaxed, the household will be more conservative in its use of a double day (relative to the case when this assumption holds); consequently, the right-hand side of equation (3) is the lower bound of the direct benefit that must be obtained from taking a double day.

[57] Corollary 1 and B.5.2 together imply that any miscellaneous day taken by the father are taken in response to earmarking; thus, they count toward the father's earmarked allowance. Because double days do not count toward the earmarked allowance, a double day (taken by any parent) replaces a miscellaneous day taken by the mother in the future. See the Proof of Proposition B.5.3 for a more formal treatment.

on a future miscellaneous day without childcare, plus the difference in the non-replaced wage income.[58]

Thus, the higher is the household's valuation of a future miscellaneous day, the higher is the cutoff in (3) at which the household decides to take a double day. Further, a higher cutoff in (3) implies fewer days taken as double days, and a higher perceived household benefit of each claimed double day. This relates to our above discussion of Corollary B.5.2: The strong response in paternity leave take-up to Sweden's earlier earmarking reforms suggests that the value of a miscellaneous leave day is high. We thus obtain a clear prediction: the "Double Days" reform (i) induces a relatively small average increase in the number of double days taken, but (ii) ensures that the claimed double days are associated with substantial benefits to the household.

B.5 Mathematical Proofs

B.5.1 Proof of Corollary 1

First, we show that the dad under the "basic parental leave system" does not take leave on any miscellaneous days, but may take leave on core days. Under the assumptions in Section B.2, we have that $\Delta_c(t) = c_m(t) - c_d(t) < 0$ while $\Delta_b \geq 0$; thus, if a miscellaneous leave day is taken, then it is taken by mom. Under the assumptions in Section B.2, we also have that $\Delta_C(t) = C_m(t) - C_d(t)$ can be positive on days when mom would incur a career cost; thus, dad may take leave on core days when this allows the household to avoid the maternal career cost.

Second, we show that it is optimal for the household to claim leave during the entire core period. By Assumption 1, it is generally optimal to fill up core days before allocating leave to miscellaneous days. While the career cost can make taking more than τ^c of core leave days by one parent expensive, the family as a whole would always find it optimal to cover any remaining core days using the other parent (rather than have no one stay at home). This follows from the following two observations: (i) Mom and dad can allocate leave between them in a way that enables them to cover core days without incurring any career costs ($\frac{\bar{t}}{2} < \tau^c < \bar{t}$). (ii) Absent career costs, the household strictly prefers to take leave during a core day over not taking leave ($B_p - (1-\alpha)w_p > b_p - (1-\alpha)w_p > 0$).

Third, we show that, if dad takes leave, then it is taken as a single interval of leave days at the end of the core period. Within the core period, it follows directly from Assumptions 2 and 3 that it is optimal to allocate at least τ^c of core leave days to mom. If $(1-\alpha)w_m + \kappa - (1-\alpha)w_d \equiv \Delta^c_C > 0$, then it is potentially optimal to allocate some core leave days to dad.

- Specifically, on core days where $\Delta_B - \Delta^c_C < 0$, dad takes leave.
- Given Δ^c_C, the left-hand side is smaller for higher t, because Δ_B is smaller for higher t by Assumption 2. Hence, if dad takes any leave days, those will form a single interval at the end of the core period.

[58] Similarly, for a double day in which the mom joins dad at home, condition (3) becomes $B_{md}(t) > b_m$ (without career costs). In practice, however, as illustrated in Appendix Figure A1, the typical mother's first spell extends beyond the time period when double days can be used.

Fourth, we show that, once the core period is accounted for, any remaining leave days will be taken as miscellaneous days (by mom, as per the first argument in this proof). Because $b_m - (1-\alpha)w_m > 0$, the household prefers to use any miscellaneous day over not using it.

B.5.2 Proof of Corollary

First, for the $T - E$ days that mom can use without any impact on the total allowance, the same arguments apply as under the basic parental leave system (see proof of Corollary 1 in Section B.5.1 above). Given that $T - E > \bar{t}$, the above arguments imply that the core period will be covered under any allocation of leave in the presence of earmarking.

Second, the residual question is what the household does with the E days earmarked for dad. If dad takes more than E days under the basic parental leave system, then the earmarking reform does not affect the household's allocation of leave (described in Corollary 1). We thus henceforth focus on the case in which dad takes less than E leave days under the basic system. It is useful to note that, in this case, if dad had to take more leave days, then he would optimally take those extra days either during the miscellaneous period (because the benefit differential is smallest there, $\Delta_b \leq \Delta_B$), or towards the end of the core period (where, while the differential may be larger, he can reduce career costs for the mom).

Third, we show that if dad takes less than E leave days under the basic system, then the earmarking reform will strengthen his incentives to take more leave days. This is because the earmarking reform raises the household's opportunity cost of dad not taking a day of leave (up to E days): under the basic system, mom can take the day of leave instead; under earmarking, the household loses the leave benefit on that day. To see this, consider the following:

- Under the basic system, suppose dad considers taking a leave day. Since under the basic system, all T days are always used, this would effectively replace mom on that leave day who would have taken that leave day otherwise. If the candidate day is a late-period core day, then the marginal value of dad replacing mom on that day is
$$\Delta_B - \Delta_C^c,$$
and if the candidate day is a miscellaneous day, then the marginal value is
$$\Delta_b - \Delta_c.$$
- Now, suppose dad considers using an *earmarked* day to replace mom on the above candidate days. Because he uses an earmarked day, the family allowance effectively grows; that is, mom being replaced on that day means that she can allocate the "freed up" allowance to another miscellaneous day (all core days are filled). So, the marginal benefit of dad using an earmarked day to replace mom on a late-period core day is
$$\Delta_B - \Delta_C^c + [b_m(t) - (1-\alpha)w_m],$$

and to replace mom on a miscellaneous leave day is

$$\Delta_b - \Delta_c + [b_m(t) - (1-\alpha)w_m].$$

When comparing these to the analogous conditions under the basic system, we see that the term $[b_m(t) - (1-\alpha)w_m]$ is the added incentive that earmarking creates for dads to take more leave: the value of an additional miscellaneous leave day taken by mom.

B.5.3 Proof of Prediction

First, we show that the use of a double day always reduces the number of miscellaneous leave days. Recall that, under any allocation, the core period will be fully covered. Hence, if the use of double days reduces the total number of covered days, then the reduction will always come out of the set of miscellaneous days.

Second, it is useful to note the following on the take-up of miscellaneous days: Because $\Delta_b - \Delta_c < 0$, non-earmarked miscellaneous leave days are not taken by dad. Thus, any miscellaneous leave days taken by dad are earmarked for dad. All other miscellaneous leave days are taken by mom.

Third, we show that when a double day is taken, then it replaces one of mom's miscellaneous leave days.

- When all miscellaneous leave days are taken by mom, the use of a double day will replace one of mom's miscellaneous leave days.

- When some miscellaneous leave days are taken by dads, the use of a double day will (still) replace one of mom's miscellaneous leave days. This is because double days cannot be counted against earmarked days; hence, if a double day is used, eliminating a dad's miscellaneous leave day (which, by step 2 of this argument, is an earmarked day) does not prevent that a mom-only miscellaneous leave day is taken away. To see this, let $\hat{T}$ denote the total number of leave units taken, some possibly already on double days. Suppose $T - E < \hat{T} \leq T$, i.e., dad uses some but not more than his earmarked days (this is the necessary condition for dad to take miscellaneous leave days). Now suppose that the family decides to take another double day. To do this, the use of a unit of leave on another day must be eliminated. One could eliminate the use of another unit earmarked for dad, but this would reduce the number of allowed units $\hat{T}$ by one unit, so that the need to eliminate another, non-earmarked, unit in response to the added double day remains. As per previous arguments, if a non-earmarked unit must be eliminated and dad only uses earmarked days, then it is optimal to eliminate one of mom's miscellaneous leave days (rather than one of mom's core days).

Fourth, by the preceding arguments, a double day is taken when the value of "doubling up" exceeds the loss of a mom's miscellaneous leave day, i.e., $B_{pp'}(t) - (1-\alpha)w_p > b_m - (1-\alpha)w_m$.

C Definitions of Health-Related Outcomes

Diagnosis (ICD) codes For all mothers, we obtain comprehensive inpatient and outpatient medical records. We create indicators for visits associated with the following diagnosis codes (ICD-10) within different time periods from the birth of the child (in the inpatient records, we exclude the visit associated with the birth itself):

- Conditions related to or aggravated by the pregnancy, childbirth, or by the puerperium (maternal causes or obstetric causes) (O00-O99)
- Mental, behavioral and neurodevelopmental disorders (F00-F98)
- External causes and medical counseling
  - Injury, poisoning and certain other consequences of external causes (S00-S99, T00-T32, T66-T78)
  - Assault (X92-Y09)
  - Factors influencing health status and contact with health services (Z00-Z99)

Prescription drug (ATC) codes Prescription drugs are classified according to the Anatomical Therapeutic Chemical Classification System (ATC). To associate certain prescription drugs to certain diagnoses, we use the classification system below:

- Anti-anxiety: ATC code begins with "N05B"
- Anti-depressant: ATC code begins with "N06A"
- Antibiotic: ATC code begins with "J01"
- Painkiller (analgesic): ATC code begins with "N02"