Spillover Effects of Paid Leave for Mothers – Does It Help Fathers' Health?

Jiyoon Kim[†]

Abstract

I investigate the effects of California's paid family leave (CA-PFL) program, the first state-mandated paid leave available to both mothers and fathers, on parental health. Little is known about the policy's impact on father's health, despite mounting evidence of its beneficial effects on mother's and infant's health at or after childbirth. Using health care utilization data from the Survey of Income and Program Participation (SIPP), I find that CA-PFL improved mother's health *both* before and after childbirth. CA-PFL also led to an increase in excellent health reporting of fathers immediately around childbirth, supporting the hypothesis of spillover effects from mothers, but I observe an increase in the number of days sick starting from 5 months after childbirth. Further analysis reveals that the share of fathers who are not working or absent from work without pay increases 4 to 6 months after birth, when mothers use up the paid leave weeks.

Keywords: Paid family leave, California, Fathers, Health, SIPP

JEL Classification: J13, I18, I38

[†] Department of Economics, Bryn Mawr College.
101 North Merion Ave, Bryn Mawr, PA 19010-2899, USA
Email: jkim4@brynmawr.edu
ORCID ID: 0000-0002-8018-7746

I. INTRODUCTION

The United States is the only country that does not mandate paid maternity leave among all OECD countries (OECD Family Database, 2018). The only existing national mandate in the U.S. is the Family and Medical Leave Act (FMLA) of 1993, which provides women with unpaid, job-protected leave for up to 12 weeks after birth. However, a recent study found that only about 60 percent of private sector employees are eligible for FMLA (Klerman, Daley, & Pozniak, 2012).

In response to the limited aspects of the FMLA, California enacted the first state-level paid family leave in 2004 and six other states[1] and Washington D.C. have followed suit since then. California's Paid Family Leave (CA-PFL) commenced on July 1, 2004 by offering six weeks of paid leave to all new parents with a 55 percent wage replacement rate up to a maximum benefit of $728 per week. By claiming State Disability Insurance (SDI) and CA-PFL consecutively, pregnant women in California can take the partially paid leave for four weeks before giving birth and for 12 to 14 weeks after giving birth. For the first time, fathers with a newborn are able to take the partially paid leave for six weeks after childbirth.

Given that CA-PFL was the first source of government-provided paid leave available to both mothers and fathers, the goal of this study is to identify the effects of CA-PFL on both mother's and father's health and health care utilization before and after childbirth. I make two major contributions to the broad body of literatures that documents the effects of CA-PFL on health.

Foremost, I provide the first evidence of the effects of CA-PFL on mother's and father's health measured *prior to* giving birth in addition to health measured *following* childbirth. Most

[1] Specifically, six states with effective years are New Jersey (2009), Rhode Island (2014), New York (2018), Washington (2019), Massachusetts (2019), and Connecticut (2022).

prior research has only documented *post-birth* health outcomes of mothers such as breastfeeding duration, self-reported health, postnatal outpatient visits, or mental health (Appelbaum & Milkman, 2011; Chatterji & Markowitz, 2005; Chatterji & Markowitz, 2012; Huang and Yang, 2015; Bullinger, 2019). If the paid leave affects mother's health positively *even before* giving birth, this could be considered as additional health benefits of the program. I shed light on this aspect by leveraging the variation of timing of Survey of Income and Program Participation (SIPP) topical module relative to the month of childbirth to estimate the effects on parental health during both pre- and post-birth periods.

Second, there has been little attention to the CA-PFL's potential effects on father's health, despite the fact that CA-PFL covers both male and female workers. To my knowledge, there are two papers that study the effects of CA-PFL on parents' health: Bullinger (2019) uses data from National Survey of Children's Health and focuses on parental mental health. She finds no statistically significant effect on father's mental health with the argument that the increase in father's leave-taking in response to the introduction of CA-PFL was much smaller relative to that of mothers. Lee et al. (2020) use data from the Panel Study of Income Dynamics and document and find that after CA-PFL, psychological distress was reduced for mothers, but increased for fathers, though not statistically significant. These two studies shed some light on the effect of CA-PFL on father's mental health. However, no studies to date have examined the health care utilization and physical health outcomes of fathers around childbirth. By utilizing various health outcomes such as self-reported health status, number of nights at hospital, any days sick, and daily prescription drug usage, this paper attempts to supplement the literature by filling this gap.

With the extensive evidence that father's take-up of CA-PFL is much lower than mother's (Klerman, Daley, & Pozniak, 2012; Baum & Ruhm, 2016; Bartel et al. 2018), it is less

clear how CA-PFL will affect father's health. On one hand, watching their spouse bonding with a newborn at home while recovering from delivery and being paid could consequently improve father's health, which is also supported by studies finding a high correlation between spouses' health (Wilson, 2002; Hoppmann et al. 2011; Kim et al. 2014). On the other hand, if the take-up of paid family leave is unequally shared and hence exclusively used by mothers, despite it being equally available to both parents, the effects of paid family leave on father's health are unclear. When all available weeks of both paid and unpaid leave expire a few months after birth and by the time when mothers have to return to work, fathers would need to be abruptly engaged in newborn care by using every resource they have – e.g.) taking paid and/or unpaid leave, seeking nonparental care, or being absent from work without pay – which could potentially add stress and worsen father's health.

To answer the question, I use data from the Survey of Income and Program Participation (SIPP) topical module. The Medical Expenses/Utilization of Health Care topical module allows me to observe various health outcomes for both mothers and fathers during months around childbirth. I compare health outcomes of mothers and fathers before and after CA-PFL, in California versus other states. Additional analysis compares mothers or fathers of infants in California to those of children aged 1-3 or 3-5, relative to corresponding mothers or fathers of the same age children in other states, before and after the CA-PFL program, to identify the causal effects of CA-PFL on maternal and paternal health.

The findings consistently show that mother's health has improved after the introduction of CA-PFL, with a higher rate of self-reported health being excellent, fewer number of days feeling sick, lower daily prescription drug usage and fewer nights spent at hospital during pregnancy and immediately following birth. For fathers, I find CA-PFL led to an increase in

excellent health reporting. All other paternal health outcomes also move in a positive direction, yet the estimates lose statistical significance when I utilize the heteroskedasticity adjustment from Ferman and Pinto (2019) to account for differences in treated and control group size. Most of the positive health effects on mothers continue to persist five to 20 months after childbirth. However, I observe a sudden increase in the number of days sick for fathers during this time frame.

To explore why I observe positive effects on parents even before giving girth and more nuanced effects on father's health later on, I perform the mechanism analysis by investigating i) a career interruption due to childbirth; ii) parental leave usage for pre- and post-birth periods; and iii) work and personal earnings trajectories around childbirth. The first mechanism analysis reveals that CA-PFL raises the share of fathers who are not working or absent from work without pay by 1.6 percentage points, starting exactly from four months after birth – the time when mothers use up all the available leave benefits. It provides suggestive evidence that as mothers use up the mix of paid and unpaid leave weeks, the burden of childcare starts pressing on their spouse, consequently affecting their health during post-natal months. From the second mechanism analysis, I find that maternal paid leave take-up starts to rise *even before* giving birth, which explains the positive spillover effects of CA-PFL on mothers' prenatal health. Last mechanism analysis highlights a stark difference between California mothers and fathers' work and earnings trajectory during months surrounding childbirth before and after CA-PFL. This helps understanding the heterogenous impact of CA-PFL on parental health around childbirth.

My study adds to mounting evidence by confirming the positive effects of CA-PFL on maternal health. Especially, I find that CA-PFL leads to better *prenatal* health, even before women have actual access to the paid leave. This finding provides timely evidence to inform

ongoing policy discourse at the federal and state level. My study also offers new evidence of the effects on father's health care utilization around childbirth. Although CA-PFL was designed to be gender neutral, its short duration, low wage replacement rate, absence of job protection could trigger an unequal usage across parents. Thus, these aspects should continue to be actively discussed as a potential source of unintended consequences that could partly affect father's health in a more nuanced direction.

II. BACKGROUND

California is one of several states that have had long-standing State disability insurance (SDI) programs. States with SDI have offered maternity leave to pregnant employees with partial wage replacement, since the Pregnancy Discrimination Act (PDA) of 1978 required employers to treat a normal pregnancy and childbirth (in addition to pregnancy with complications) like any other temporary disability. As a result, women in California can claim SDI benefits for up to four weeks before the delivery and six weeks after birth (eight weeks for Caesarean sections).

Most recently, California's Paid family leave (CA-PFL) went into effect in July 2004 and offered six weeks of paid leave to all new parents (including fathers), with a 55 percent wage replacement rate up to a maximum benefit of $728 per week in 2004 (which has now increased to $1,357 per week with a wage replacement rate up to 60 to 70 percent). The six weeks of CA-PFL *extend* existing SDI of ten weeks. Consequently, pregnant women in California can take the partially paid leave for four weeks before giving birth and for 12 to 14 weeks after giving birth by claiming SDI and CA-PFL consecutively. The leave does not need to be taken all at once or immediately after birth as long as they are used in a 12-month period after birth. CA-PFL does not provide job protection nor continuation of fringe benefits, unless leave under FMLA is taken simultaneously.

Unlike strict eligibility requirements under FMLA, an employee is eligible for CA-PFL if they have paid SDI taxes on at least $300 earned approximately five to 18 months before the leave begins. CA-PFL is funded by the employee payroll taxes, similar to the SDI program.[2]

Finally, CA-PFL is a gender-neutral program where eligible parents are entitled to take the same amount of leave, either simultaneously or separately. In the U.S, fathers' access to paid leave on the private market has been very low and the take-up rate has been even lower. According to a 2012 report, only 14 percent of employers offer paid paternity leave to most of their male employees (Klerman, Daley, & Pozniak, 2012), and less than 2 percent of fathers of children under age one reported being on leave according to the 2013 American Communities Survey (Bartel et al. 2018). In this regard, CA-PFL is salient in light of its entitlement to both mothers and fathers. However, in the first year of the program's passage, only 17 percent of new child claims were made by male worker, which has increased to 30 percent in 2013. Bartel et al. (2018) find that fathers of infants in California are 46 percent more likely to be on leave after CA-PFL has become available, relative to its baseline take-up rate of 1.99 percent. Given that CA-PFL has allowed an increasing number of fathers to be on leave, it is pivotal to measure the impact of CA-PFL on father's health and health care utilization. If we do not detect any health benefits on fathers, it is important to question why we do not find any.

III. DATA

A. Survey of Income and Program Participation (SIPP)

To measure the impact of CA-PFL on various health outcomes of mothers and fathers around childbirth, it is essential to know the child's birth month and year, state of residence at birth, a parent's employment status as well as both mother's and father's health outcomes during

[2] More details regarding CA-PFL can be found: https://www.edd.ca.gov/disability/paid-family-leave/

pre- and post-PFL years. The Survey of Income and Program Participation (SIPP) contains all of these critical measures.

I use data from the 1996, 2001, 2004 and 2008 panels, whose reference period spans from 1996 through 2012. Given that paid family leave went into law in July 2004 in California, the study's reference period covers sufficient time frames to measure the changes in outcomes before and after the policy went into effect.

This paper's main outcomes are collected through the SIPP topical modules, which are designed to gather specific information on a wide variety of subjects. The SIPP topical modules are not repeated in each wave, but collected only in selected waves. I merge data from Medical Expenses/Utilization of Health Care topical modules in the 1996 to 2008 SIPP panels with data from the SIPP core survey. Table 1 lists the years and months when individuals were surveyed about their medical expenses and utilization of health care in each panel. As a concrete example, a mother who gave birth in July 2003 would have her health topical modules implemented twice: once about six to nine months before giving birth (2001 Wave 6) and another time about three to six months after giving birth (2001 Wave 9). Taking advantage of the variation in the timing of the SIPP topical modules relative to the month of childbirth across all mothers and fathers, I examine the impact of CA-PFL on health during both pre-birth period and post-birth period.

While the panel nature of the SIPP is useful, the intermittency of health topical modules limits my ability to explore the month-to-month evolution of health outcomes before and after childbirth. Hence it is more accurate to think of the study's main analysis as using repeated cross-sections (Rodgers, 2020). Nevertheless, in order to explore potential mechanisms through which CA-PFL affects parental health, I leverage the panel nature of SIPP core surveys to depict

a monthly trajectory of labor force participation, working, career disruptions and personal earnings of mothers and fathers during months leading up to and following childbirth.

The Medical Expenses/Utilization of Health Care topical modules has detailed health-related questions. I focus on the following five outcomes[3] in my study: 1) report of current health status being excellent, 2) any days feeling sick, 3) number of days feeling sick, 4) number of nights spent at hospital[4], and 5) daily prescription medications usage. Table 2 shows the survey questions for each outcome.

B. Analysis Sample

The benefit of using the SIPP data is that it reports the birth month and birth year of all individuals in the households. Accordingly, I can identify newborns whose birth month and birth year align with the month and year of the survey. By using a variable to link children with their parents, I identify the mothers and fathers of newborns. I restrict to individuals whose age at birth ranges between 18 and 45 years old for mothers and 18 and 50 years old for fathers.

The paid family leave would be only relevant if an individual is in the workforce. Accordingly, in the main analysis, I restrict to mothers or fathers who reported working and had non-zero earnings during nine months prior to birth. I drop self-employed individuals. Given that New Jersey introduced its own PFL program in July 2009, I omit New Jersey mothers and fathers who gave birth in or after July 2009 to avoid its confounding effects in the study.

[3] I focus on health outcomes that can be clearly identified to be either health improving or deteriorating. There are other health outcomes available in the SIPP topical modules, e.g.) number of visits to a doctor, any hospital stays, and any prescription drug usages. I do not use these outcomes because I am not able to identify whether any changes in these outcomes indicate a positive or a negative change. For example, I am unable to tell the visits to a doctor is a well-visit or a sick visit. Studying the incidence of hospital stay is not meaningful because almost all women in my sample is hospitalized for giving birth. Prescription drug usage can be health-improving and necessary in some circumstances, while it can be risky in other circumstances.

[4] Outliers above 99.5 percentiles in the number of days sick and number of nights at hospital are dropped.

Since some health care questions are asked with a reference period of past 12 months, I use the health measures only if they were collected between zero and five months following the childbirth to detect the effects of CA-PFL in the months surrounding childbirth – covering the entire pregnancy period and five months after childbirth. Summary statistics for the main analysis sample are presented in Table 3. It is clearly observed that there was a significant reduction in the likelihood of reporting any days sick, the number of days sick and the prevalence of daily prescription drug usage for CA mothers and fathers, compared to their counterparts residing in the rest of the U.S. It is also noteworthy that the probability of working (which includes paid time off in the SIPP) increases significantly after birth for CA mothers, while it is not observed for mothers in other states.

IV. EMPIRICAL STRATEGY

A. Methodology

I estimate the following equation to examine the impact of CA-PFL on mother's and father's health.

$$(1)\quad Y_{isyt} = \alpha + \beta_1 CA \cdot Post_{isyt} + X_{isyt}'\gamma + State_s + Year_y + months\ to\ birth_{it} + \lambda_{sy} + \varepsilon_{isyt}$$

The outcome of interest Y_{isyt} is the health outcome during month *t* for a mother-birth (or a father-birth)[5] *i* who gave birth in year *y* in state *s*. The treatment variable, $CA \cdot Post_{isyt}$, is an indicator equal to one if the birth occurred in California in or after July 2004 and zero otherwise. I include birth state ($State_s$) and birth year ($Year_y$) fixed effects to address time-invariant state-level differences in health outcomes and nationwide changes in health over time, respectively. X is a vector of individual controls such as age at birth, number of children, race, marital status,

[5] Some individuals have multiple births during the same panel, so I treat two births to the same parents as two different observations. There are not enough observations to make use of mother (or father) fixed effects.

education, average earnings before birth, household-level income and whether the birth occurred in July 2004 or later. It is important to control for the month in which the health topical module questions were asked ($months\ to\ birth_{it}$ dummies), since health status could be substantially different depending on when it was measured relative to childbirth. Lastly, I control for state-year level characteristics (λ_{sy}) such as unemployment rate, TANF benefit levels, poverty rate, minimum wage, whether the state governor is democrats or not, log of state population, and per capita income. The coefficient of interest, β_1, represents the effects of CA-PFL on various health outcomes, which is identified off by comparing mothers or fathers who gave birth before or after July 2004, in California versus other states. SIPP person weights are used in all regressions. Standard errors are clustered at the state level; however, when the number of treated clusters is small, exploiting policy variation across states using standard errors clustered at the state level may be challenging (Bertrand, Duflo, & Mullainathan, 2004; Donald & Lang, 2007). Accordingly, I also derive p-values outlined in Ferman and Pinto (2019), to address the single treated state and heterogeneous cluster sizes in this study setting.[6]

In the next analysis, I expand my study sample by including mothers or fathers whose youngest child is 1-3 years old or 3-5 years old, who therefore are not affected by CA-PFL, to address the possibility that the factors specific to California affected the health outcomes around the time of CA-PFL's introduction. This specification allows me to identify the effects of CA-PFL by comparing mothers or fathers with newborns to mothers or fathers of older children, before and after July 2004, in California versus other states:

$$(2)\quad Y_{isyt} = \alpha + \beta_2 \cdot CA \cdot POST \cdot Newborn_{isyt} + \partial \cdot CA \cdot Newborn_{isyt}$$

[6] Bartel et al. (2018), Rodgers (2020), and Golightly & Meyerhofer (2022) employ the Ferman-Pinto method for calculating p-values in the same CA-PFL setting. I am grateful to Luke P. Rodgers for his generous assistance in applying this method to the SIPP data.

$$+\theta \cdot POST \cdot Newborn_{isyt} + \delta \cdot CA \cdot Post_{isyt} + \sigma \cdot Newborn_{isyt} + X_{ist}{}'\gamma + State_s + Year_y + months\ to\ birth_{it} + \lambda_{sy} + \varepsilon_{ist}$$

The coefficient of interest, β_2, now represents the effects of CA-PFL after isolating its effects from other California-specific changes over time that influenced health of mothers and fathers.[7] As in equation (1), standard errors are clustered at the state level, but I again verify the statistical significance by using Ferman-Pinto p-values (Ferman & Pinto, 2019). I apply the same sample criteria on mothers and fathers in the comparison group who report any hours worked with non-zero earnings. For mothers or fathers with a newborn, I include their health outcomes based on the timing of topical modules relative to the month of childbirth – specifically when the topical modules are implemented during zero to five months following childbirth. However, mothers and fathers in the comparison group do not have a birth reference point. Accordingly, for every observation, I assign months-to-birth dummies by generating random numbers with a uniform distribution between zero and five. Appendix Table A1 shows the summary statistics of older mothers and fathers whose youngest child is 1-3 years old.[8]

Finally, to study potential mechanisms through which CA-PFL affects parental health status, I utilize the longitudinal nature of SIPP core surveys to observe the month-to-month changes in working and personal earnings before and after childbirth. Specifically, I estimate the effects of CA-PFL in the event study (Jacobson et al. 1993) by following the same mothers and fathers in California and comparing the work and earnings trajectory between ones who gave birth before CA-PFL to those who gave birth after CA-PFL.

[7] I do not use the terminologies, "difference-in-differences (DD)" or "triple-differences (DDD)" for the specifications as it is inappropriate given the intermittent timing of the SIPP topical modules data.
[8] I do not show the summary statistics of mothers and fathers with youngest child 3-5 years old to conserve space, but the table can be provided upon request.

$$(3)\quad Y_{iyt} = \sum_{m=-12}^{12} \delta_m \cdot I_{iyt}(t - t_i^* = m) + \sum_{m=-12}^{12} \beta_m \cdot I_{iyt}(t - t_i^* = m) \cdot Post_{iyt} + \gamma_i + \varepsilon_{iyt}$$

Y_{iyt} is the outcome for a mother-birth (or a father-birth) *i* during month *t* who gave birth in year *y* month t_i^*.[9] I include a set of mother-birth (or father-birth) fixed effects (γ_i) to account for both observed and unobserved time-invariant individual characteristics.

t_i^* is the month of childbirth for a mother *i* or a father *i*. Thus, $I_{iyt}(t - t_i^* = m)$ is a set of dummy variables that indicate each observation's timing relative to a birth, with *m* ranging from 12 months before to 12 months after birth. I omit as a reference group the 9th to 12th month prior to birth (m=-9 to -12) so that the coefficients of interest (β_m) map the time path of outcomes relative to the pre-pregnancy level. $Post_{iyt}$ equals to one when a mother (or a father) *i* gave birth *after* the paid family leave was in effect in California. I cluster the standard errors at mother-birth or father-birth level. The coefficients of interest, β_m, capture the differences in outcomes during month *m* between a mother (or a father) subject to paid family leave and her (his) counterpart who was not exposed to paid family leave in California. Yet, as noted earlier, not all individuals have information for the full 12 lead and 12 lag months; this is so because women gave birth at different times within the SIPP panel. Therefore, it is important to highlight that there exists substantial variation across individuals in the number of months with valid outcomes. In other words, the trajectory of work and personal earnings does not represent a balanced panel that follows individuals every month throughout the entire pre- and post-birth period.

B. Identifying Assumption

[9] In this specification, I don't use the subscript *s* because I restrict to women and men who gave birth in California.

To interpret the estimates in this study as the causal effect of CA-PFL, the major identifying assumption would be that there are no other time-varying factors of mother's and father's health that is correlated with the implementation of the policy. If the CA-PFL law induced selection into the sample by altering the sample composition, the estimates will not be able to detect the pure effects of CA-PFL on health. To evaluate this possibility, I run equation (1) with an outcome replaced with each of mother's or father's demographic characteristics to estimate the effects of CA-PFL on the compositional changes in demographic characteristics of those who gave birth after the policy compared to their pre-policy counterparts. Appendix Table A2 and A3 shows that CA-PFL is uncorrelated with time-varying factors such as fertility (measured by the number of children) or total household income. Furthermore, I find there are no differential compositional changes in California versus other states for the majority of observed demographic characteristics for mothers. However, I find that fathers who are not married, white, black, or whose highest education degree is the high school degree are more likely to represent the sample after CA-PFL. This is not surprising given the extensive evidence that CA-PFL has been particularly beneficial to those with disadvantaged backgrounds who have had limited access to the paid leave in the past. That said, in order to address the concern that differential demographic trends among mothers and fathers of newborns in California may drive the results, I control for individual demographic characteristics in the models.

Another critical identifying assumption is to check whether there exist parallel trends in health outcomes between California and other states before CA-PFL became effective. I test for the assumption, separately for mothers and fathers, and present that this pre-trends assumption is not violated. I discuss this in detail in the Results section.

V. RESULTS

A. The effects of CA-PFL on mother's health around childbirth

The main results for mother's health are presented in Table 4. The first column for each outcome shows the regression coefficients β_1 from equation (1). As mentioned earlier, β_1 are derived by comparing mothers in California who gave birth before and after CA-PFL to mothers in other states who gave birth before and after CA-PFL. Hence, the estimates may capture contemporaneous factors which affected all mothers' health in California. Accordingly, I include older mothers whose youngest child was 1 to 3 years old or 3 to 5 years old in order to net out any potential factors that affected all California mothers' health over time. These estimates are reported in the last two columns for each outcome, and they correspond to the regression coefficients β_2 from equation (2).

Table 4 suggests that CA-PFL leads to an overall improvement in mother's health starting from pregnancy period to the first five months following childbirth. Column 1 to 3 shows that CA-PFL leads to an improvement in mother's self-reported health during this critical period surrounding childbirth. Specifically, the share of mothers who report their health to be in the top category, i.e. excellent, is higher by 20 to 21 percentage points. The likelihood of reporting any days feeling sick is lower by 22 to 30 percentage points (29 to 40 percent when evaluated at the pre-PFL mean) and the number of days sick is lower by five days for mothers with access to CA-PFL. While almost every mother is hospitalized during childbirth episode, the number of nights spent during hospitalization is significantly lower by one to 1.2 nights for California mothers after the introduction of PFL compared to mothers without PFL. It also shows that mothers have a lower likelihood of taking daily prescription medication by 19 to 28 percentage points. This finding is worth highlighting given that taking prescription drugs during

pregnancy is known to be risky, which could cause premature birth, pregnancy loss, or birth defects such as development disabilities (CDC, 2020). Overall, the results highlight that mother's health both before and after childbirth has improved as a result of CA-PFL.

I test for the parallel trends assumption by estimating the model only for the pre-treatment years and using any one of the pre-treatment years as the year of "artificial policy change", to see whether the coefficient on the interaction term in the regression of health outcomes is indistinguishable from zero. Appendix Table A4 provides suggestive evidence that there are no confounding trends in any of maternal health outcomes in California prior to the introduction of CA-PFL, showing opposite signs if any.

B. The effects of CA-PFL on father's health around childbirth

Next, I turn to father's health. Previous studies have found that there is a high correlation between health of spouses (Wilson, 2002; Hoppmann et al. 2011; Kim et al. 2014). Hence, we could expect that there exists a spillover effect of improvement in mother's health to father's health. Table 5 suggests that CA-PFL led to an increase in the share of fathers reporting excellent health, by 12 to 13 percentage points (30 to 32.5 percent increase from the pre-treatment mean). There is also evidence that CA-PFL led to a decrease in the likelihood of reporting any days sick, number of days sick, number of nights at hospital, and daily prescription medication usage. It is certainly promising that CA-PFL has affected father's health toward a positive direction, like their spouses, during this critical period. However, they are statistically significant only when standard errors are clustered at the state level but mostly insignificant with Ferman-Pinto p-values.

Again, in Appendix Table A5, I test for the parallel trends assumption by estimating the model only for the pre-treatment years and using any one of the pre-treatment years as the

"hypothetical policy year", to check whether there exist any pre-trends in father's health outcomes prior to the introduction of CA-PFL. Appendix Table A5 provides strong evidence that there are no confounding trends in any of paternal health outcomes in California before CA-PFL became effective. I do observe statistically significant and sizable estimates for self-reported excellent health status in California. That said, the estimates are negative, an opposite sign of what I obtain when using 2004 as the true policy year.

C. The effects of CA-PFL on parental post-birth health

Next, I analyze the impact of CA-PFL on parental health during postnatal months, specifically five to 20 months following childbirth, during which the paid family leave duration ends, to see whether the positive health effects persist. Table 6 presents the results. I find that the positive effects on maternal health still exist even after the paid leave ends, with a lower likelihood of getting sick and a reduction in the number of days sick, number of nights at hospital, and daily prescription medication. Fathers report a higher rating of their own health (which is not statistically significant when the standard errors are clustered at the state level), with a significant decrease in daily prescription medication. Yet, the number of days sick now turns to be 1.1 days greater than their male counterparts without paid family leave. Further investigation of heterogeneity of the effects across parents after birth is warranted.

VI. MECHANISM ANALYSIS

A. Career interruptions

To explore potential mechanisms through which CA-PFL influences parent's health and healthcare utilization, I examine a proxy for career interruptions as an outcome. The SIPP core survey asks whether the respondent has ever been absent from work without pay or did not work at all *due to* pregnancy, childbirth, or childcare, and if so, the number of such weeks. If

respondents report these events in the months following childbirth, it would represent a significant interruption to one's career, specifically caused by the birth of a child. Not being able to work or absent from work without getting paid could potentially impose mental distress and anxiety on new parents, especially if they used to work before having a child, which could then further worsen physical health.

Consequently, I use these variables as an outcome in equation (1) to estimate the effects of CA-PFL on the incidence of work absence or not working because of the birth of a child for mothers and for fathers, separately. In Table 7 column 1 to 3, I find that the likelihood of being absent from work without pay or not working at all due to childbirth/childcare is significantly lower for California mothers after CA-PFL is in effect – it is lower by 21 percentage points in the first four months after birth, yet the effects disappear after month four. During the first four months after childbirth, the effect is equivalent to a reduction of *1.2 extra weeks* than the number of such weeks of mothers residing in other states, as shown in column 4 of Table 7. Again, this difference goes away after month 4. These numbers closely align with the estimates from Bartel et al. (2018), where they estimate CA-PFL increases the leave-taking of new mothers by six more days.[10] Most importantly, this analysis also confirms the hypothesis that most women in California use paid family leaves *immediately following childbirth*, rather than saving them for later usage within a 12-month time frame.

Table 8 indicates that California fathers are more likely to report such weeks from fourth month following childbirth – Table 8 column 5 suggests that California fathers have additional tenth of weeks with no job or being absent from work without pay from month 4 to month 6 after

[10] Existing research suggests that CA-PFL increased the use of leave-taking among mothers by three to five weeks, particularly among socio-economically disadvantaged groups (Baum and Ruhm, 2016; Rossin-Slater et al. 2013;) while it increased leave-taking by nearly one week for fathers (Baum and Ruhm, 2016).

childbirth, that is, approximately a 1.6 percentage point increase in the likelihood of such case (Table 8 column 2). It provides suggestive evidence that mothers are most likely to take up the mix of paid leave and unpaid family leave immediately after childbirth, which expires around month 4, consequently putting joint childcare burdens on fathers.

This analysis implies that a relatively short duration of the paid leave and its absence of job protection could have an unintended consequence, causing an interruption of one's career. While it may capture only a small fraction of the whole mechanism through which CA-PFL plays a role on parental health, a stark difference between mother's and father's incidence of unpaid work absences particularly due to childbirth implies that the leave is not utilized equally across parents. This helps understanding the heterogenous impact of CA-PFL on *postnatal* parental health, particularly the finding that fathers report a higher number of days feeling sick precisely from month 5.

B. Leave usage

In the latest SIPP waves from 2019 and 2020, all parental leave information, separately for pre- and post-birth periods, is collected regarding the respondent's first child (Scherer, 2022). Using this data, I estimate the same model for the following three outcomes: likelihood of quitting work, usage of paid/unpaid/any leave before and after childbirth. Table 9 shows that CA-PFL led mothers to use unpaid leave *less* during pregnancy than their counterparts from other states. This reduction in unpaid leave usage appears to shift to an *increase* in paid leave usage. After a child is born, mothers with CA-PFL are less likely to quit their work and use *both* paid and unpaid leave more, increasing overall usage of any leave by 13.3 percentage points, or about 24 percent.[11] As a further data check, I use the 2008 SIPP Panel Fertility History Topical

[11] Unfortunately, I am unable to produce the estimates for fathers due to a small sample size (which is less than half of that of mothers).

module to produce an event-study plot that compares California mothers who use any paid leave before and after childbirth to corresponding mothers in other states. Appendix Figure A1 shows that there is a clear upward trend in paid leave usage of California mothers after year 2004 (corresponding to time=0), compared to pre-PFL years. Overall average treatment effect on treated is estimated to be 0.269, or 27 percent, consistent with the estimates derived from Table 9.

All in all, the 2019 and 2020 SIPP leave data allows me to paint a more complete picture of maternal leave-taking behaviors around childbirth by documenting the effects separately for pre- and post-birth periods. In particular, the finding that CA-PFL allows mothers to use more of a paid leave and less of an unpaid leave even *before* giving birth suggests that the positive effects of CA-PFL could expand beyond the post-natal periods.

C. The event study analysis of parental work and earnings

Lastly, I leverage the panel structure of the SIPP core survey and draw a month-by-month work and earnings trajectory of mothers and fathers around childbirth. In other words, I plot the coefficient β_m from equation (3) for 12 months before and 12 months after childbirth.

Figure 1 Panel A to D confirm the findings from Table 7 and 8 by illustrating that share of mothers who are not working or being absent from work without pay due to childbirth/childcare is much smaller after CA-PFL became effective, while there is no pre- vs post- difference for mothers in other states. Fathers experience such incidences *more* during month 5 to 6 in California, with marginally significant estimates shown in Panel C, which is not detected in other states (Panel D).

Figure 2 shows work and earnings trajectory of mothers. Consistent with the findings in many other studies (Rossin-Slater et al. 2013; Baum and Ruhm, 2016; Byker, 2016), the share of

mothers in the labor force (Panel A) and who are working[12] (Panel C) are significantly higher after the introduction of CA-PFL. In particular, the difference in the share of mothers participating in the labor force emerges even before giving birth. This is also evident in the total hours worked (Panel E), which includes paid leave hours. As shown in Figure 2 Panel B, D, and F, we don't observe such trends for mothers residing in other states before and after July 2014 with the pre- and post- difference being indistinguishable from zero. Interestingly, mothers in California show a slightly higher level of personal earnings with marginal statistical significance after the policy is in effect (Panel G), again the difference starting even before giving birth.

Figure 3 displays the same outcomes for California fathers. Unlike figures for mothers, I do not detect any difference between fathers from California and those from other states in any of the outcomes. As mentioned in section V, however, these event study plots should be read with caution because the timing of birth relative to the SIPP survey results in an unbalanced panel before and after birth.

VII. CONCLUSION

It is less straightforward how California's paid family leave will affect father's health relative to their spouse. A dominating number of research has been conducted on examining mother's employment, health, and well-being, despite the fact that both mothers and fathers are eligible for CA-PFL. With a rising attention to improve equal access across mothers and fathers to paid leave, it is critical to examine the impact of PFL mandated in California, which is the first source of government-provided paid parental leave available to fathers in the U.S. I use the Survey of Income and Program Participation (SIPP) health care topical module to examine the impact of CA-PFL on father's health in addition to mother's health.

[12] In the SIPP, a person is coded as "working" even if s/he is on any paid/unpaid leave.

I find that mother's health has improved after CA-PFL in every measure that I use – they experience fewer sick days, spend fewer nights at hospital, and show a decrease in daily prescription drug usage with a substantial increase in self-reported health, both before and after giving birth. This is accompanied by a significantly lower likelihood of being absent from work without pay or not working due to pregnancy/childbirth during the first four months of their newborn compared to their counterparts in the rest of the U.S. Further mechanism analysis reveals that mothers start to utilize paid leave even before giving birth, highlighting the policy's potential spillover effects beyond post-birth periods. Also, I confirm that the positive health effects on mothers are accompanied with a higher share of mothers who are attached to the labor force and working with marginally higher levels of personal earnings.

Fathers show a similarly improved health during the critical period around childbirth, supporting the hypothesis of spillover effects from the improved health of mothers. Yet I observe that fathers suddenly report more days feeling sick, starting from five months after a baby is born. At the same time, fathers report a slight increase in the prevalence of being absent from work without pay or not working due to childbirth from month 4 to 6 following childbirth. Consistent with what has been documented in many existing studies, my event-study analysis confirms that there is no statistically significant difference in father's labor force participation, working, or personal earnings before and after the policy change.

To my knowledge, this is the first study that explores the health of mothers and fathers both before and after birth. Many existing studies have used health outcomes measured *after* giving birth, by using the sample of infants and their parents without information on the child's birth month and year.

This paper also contributes to the existing literature by studying the effects of CA-PFL on father's health for the first time. While the findings on mother's health is promising, understanding its spillover effects on father's health and leave usage is pivotal to evaluate the program's overall benefits and potential unintended consequences. CA-PFL first started in 2004 with a low wage replacement rate of 55 percent and provided no job protection, which resulted in lower take-up rate for fathers imposing a higher opportunity cost. Indeed, my study suggests that mothers exclusively take up the paid leave immediately following childbirth, then the childcare responsibility starts to press on fathers around month 4 and 6, when mothers need to return to work. Since California is the very first state that introduced paid family leave for almost all employees, it may have taken some time for parents to learn about the new policy and come up with strategies to make the best use of it, such as maximizing the total amount of time spent with infant at home or balancing out the time to take care of infants between parents, etc.

The study has several limitations. First, due to the sample size, I am unable to test for heterogeneity of the effects by parent characteristics like income, education, or race/ethnicity or by birth order of a child. Moreover, the infrequency of the topical modules prohibits me from taking advantage of the SIPP's panel structure and hence limits my ability of following the same individuals and illustrating the changes in health outcomes over time. These limitations highlight the potential for future research on this topic to meaningfully inform policy design.

All in all, this study suggests that policymakers should continue to view paid leave as an opportunity to improve health outcomes during months surrounding childbirth for both mothers and fathers. Nevertheless, the fact that I find more nuanced effects on father's post-natal health and a subsequent increase in father's work absence implies that there could be some untended

consequences of the program, which should be accounted for when expanding such programs in the future, especially with the focus on equal utilization of both parents.

STATEMENTS AND DECLARATIONS

The authors have no relevant financial or non-financial interests to disclose.

REFERENCES

Appelbaum,E. & Milkman, R. 2011. Leaves that pay: Employer and Worker Experience with Paid Family Leave in California. Center for Research on Economic Policy, 1–36.

Bartel, A. P., Rossin-Slater, M., Ruhm, C. J., Stearns, J. & Waldfogel, J. 2018. Paid Family Leave, Father's Leave Taking, and Leave-sharing in Dual-earner Households. *Journal of Policy Analysis and Management.* 37 (1), 10–37.

Baum, C. L. & Ruhm, C. J. 2016. The Effects of Paid Family Leave in California on Labor Market Outcomes." *Journal of Policy Analysis and Management*, 35 (2), 333–356.

Bertrand, M., Duflo, E., & Mullainathan, S. 2004. How Much Should We Trust Differences-in-differences Estimates? *Quarterly Journal of Economics*, 119, 249–275.

Bullinger, L. R. 2019. "The Effect of Paid Family Leave on Infant and Parental Health in the United States." *Journal of Health Economics,* 66 (July): 101–16.

Byker, T. 2016. "Paid Parental Leave Laws in the United States: Does Short-Duration Leave Affect Women's Labor-Force Attachment?" *American Economic Review: Papers & Proceedings* 106(5): 242–246.

Centers for Disease Control and Prevention (CDC). 2020. Treating for Two: Medicine and Pregnancy. https://www.cdc.gov/pregnancy/meds/treatingfortwo/index.html

Chatterji, P. & Markowitz, S. 2005. Does the Length of Maternity Leave Affect Maternal Health? *South Econ Journal*. 72:16–41.

Chatterji, P. & Markowitz, S. 2012. Family Leave After Childbirth and the Mental Health of New Mothers. *The Journal of Mental Health Policy and Economics*, 15(2): 61–76.

Donald, S.G. & Lang, K. 2007. Inference with Difference-in-Differences and Other Panel Data. *Review of Economics and Statistics*, 89, 221–233.

Ferman, B. & Pinto, C. 2019. Inference in Difference-in-Differences with Few Treated Groups and Heteroskedasticity. *Review of Economics and Statistics,* 101(3): 452–467.

Golightly, E. & Meyerhofer, P. 2022. Does Paid Family Leave Cause Mothers to Have More Children? Evidence from California. *Journal of Labor Research*, https://doi.org/10.1007/s12122-022-09329-y

Hoppmann, C. A., Gerstorf, D., & Hibbert, A. 2011. Spousal Associations Between Functional Limitation and Depressive Symptom Trajectories: Longitudinal Findings from the Study of Asset and Health Dynamics Among the Oldest Old (AHEAD). *Health Psychology*, 30(2): 153–162.

Huang, R. & Yang, M. 2015. Paid Maternity Leave and Breastfeeding Practice Before and After California's Implementation of the Nation's First Paid Family Leave Program. *Economics and Human Biology* 16, 45–49.

Jacobson, L. S., LaLonde, R. J. & Sullivan, D. 1993. Earnings Losses of Displaced Workers. *American Economic Review,* 83 (4): 685–703.

Kim, E. S., Chopik, W. J. & Smith, J. 2014. Are People Healthier if Their Partners are More Optimistic? The Dyadic Effect of Optimism on Health among Older Adults. *Journal of Psychosomatic Research,* 76 (6): 447–453.

Klerman, J. A., Daley, K. & Pozniak, A. 2012. Family and Medical Leave in 2012: Technical report, prepared for the U.S. Department of Labor, Contract #GS10FOO86K. Cambridge, MA: Abt Associates. Retrieved August 10, 2021, from https://www.dol.gov/sites/dolgov/files/OASP/legacy/files/FMLA-2012-Technical-Report.pdf

Lee, B., Modrek, S., White, J. S., Batra, A., Collin, D. F. & Hamad, R. 2020. The Effect of California's Paid Family Leave Policy on Parent Health: A Quasi-experiemental Study. *Social Science & Medicine* 251 (April 2020): 112915

OECD Family Database, 2018. Public Policies for Families and Children, Child-related Leave, PF2.1. Parental Leave Systems. https://www.oecd.org/els/soc/PF2_1_Parental_leave_systems.pdf

Rodgers, L. P. 2020. The Impact of Paid Family Leave on Household Savings. *Labour Economics* 67 (2020) 101921.

Rossin-Slater, M, Ruhm, C. J., and Waldfogel, J. 2013. The Effects of California's Paid Family Leave Program on Mothers' Leave-Taking and Subsequent Labor Market Outcomes. *Journal of Policy Analysis and Management* 32 (2): 224–45

Scherer, Zachary, 2022. Evaluation of the Reintroduced Parental Leave Content in the 2019 Survey of Income and Program Participation. *SEHSD Working Paper #2022-01.*

Wilson, S. E. 2002. The Health Capital of Families: An Investigation of the Inter-Spousal Correlation in Health Status. *Social Science & Medicine*, 55(7): 1157–1172.