MANDATED SICK PAY:
COVERAGE, UTILIZATION, AND CROWDING-IN

Johanna Catherine Maclean
Stefan Pichler
Nicolas R. Ziebarth

ABSTRACT

Using the National Compensation Survey from 2009 to 2022 and difference-in-differences methods, we find that state-level sick pay mandates are effective in broadening access for U.S. workers. Increases in coverage reach 30ppt from a 63% baseline five years post-mandate. Mandates have more bite in jobs with low pre-mandate coverage. Further, mandates reduce inequality in access to paid sick leave substantially, both across and within firms. Covid-19 reinforced existing positive trends in coverage and take-up. Sick leave use increases linearly, whereas costs plateau after five years. Finally, we find crowding-in of non-mandated benefits which we label "job upscaling" by firms to differentiate jobs and attract labor.

Johanna Catherine Maclean
Schar School of Policy and Government
George Mason University
Mason Square
Van Metre Hall
3351 Fairfax Drive
Arlington, VA 22201
and NBER
jmaclea@gmu.edu

Stefan Pichler
Nettelbosje 2
Groningen 9747AE
Netherlands
s.pichler@rug.nl

Nicolas R. Ziebarth
ZEW Mannheim
D-68161, Mannheim
Germany
and ZEW Mannheim
nicolas.ziebarth@zew.de

1   Introduction

For decades, the design of social insurance systems has been a core research field in economics (Card et al., 2017; Nekoei and Weber, 2017; Powell and Seabury, 2018; Fadlon and Nielsen, 2019; Johnson, 2020). Economists have studied questions such as: What are the consequences when the government mandates employers to pay minimum wages or provide benefits such as paid parental leave (Summers, 1989; Lalive et al., 2014; Cengiz et al., 2019)? How effective are such mandates and what is the impact on employers and employees (Gruber, 1994; Ruhm, 1998)? Are there unintended consequences (Bailey et al., 2019)? This paper empirically studies these questions for U.S. sick pay mandates over the last 15 years. In particular, we estimate the impact of state-level sick pay mandates on (inequality in) job coverage, utilization ('moral hazard'), labor costs, and non-mandated fringe benefits ('spillovers').

Of the countries in the Organization for Economic Cooperation and Development (OECD), four do not mandate universal access to short-term paid sick leave for employees: Canada, Japan, Korea, and the United States. Traditionally, in the United States, employers have voluntarily provided paid sick leave. This is true even after the covid-19 pandemic that resulted in the first federal, but temporary, emergency sick pay provision (H.R.6201 - Families First Coronavirus Response Act, 2020; Jelliffe et al., 2021). Nevertheless, in March of 2022, 23% of all private sector jobs *lacked* paid sick leave. Further, there exists substantial inequality in paid sick leave coverage across types of jobs. While 98% of private sector jobs in the insurance industry have paid sick leave, only 53% of all jobs in accommodation and food services have this benefit. Among the bottom quintile of jobs by wages, 38% provide sick pay; among the top quintile, 96% provide sick pay (Bureau of Labor Statistics, 2023a). As a result, for almost two decades, Congress has debated whether to pass the Healthy Families Act (2023) which contains a sick leave provision similar to the ones studied in this paper.[1] Because of a lack of bipartisan support at the federal level, 14 states and dozens of cities in the U.S. have passed sick pay mandates at the local level at the time of writing.

Although all but four OECD countries guarantee universal access to paid sick leave for short-term sickness, their specific design varies substantially across countries (Heymann et al., 2010; OECD, 2010; Raub et al., 2018; OECD Policy Responses to Coronavirus, 2020). In Europe, short-term sick pay is typically organized via employer mandates (like in the U.S.), meaning a law mandates employers to provide benefits. Further, long-term sick pay (called "medical leave" in

---

[1]Paid family and medical leave provisions have also been implemented and are under discussion, see Pichler and Ziebarth (2024) for a comparison. Family leave is similar to parental leave and primarily designed to provide paid time off before and after birth or adoption (Bana et al., 2023), whereas medical leave is equivalent to long-term sick leave in Europe (Ziebarth, 2013).

the U.S.) is typically provided by social insurance institutions where employees and/or employers must apply to take-up benefits. The latter is also true for disability insurance which provides social insurance benefits when employees are permanently work disabled. Pichler and Ziebarth (2024) provide an overview and a categorization of such benefits.

Eligibility periods and replacement levels of employer-provided short-term sick leave vary across OECD countries as well. Germany has arguably one of the most generous systems and provides a 100% replacement rate for up to six weeks per sickness spell (Ziebarth and Karlsson, 2010, 2014). Sweden offers 14 days of employer-provided sick leave at a minimum replacement rate of 80% and has a waiting period of one day—that is, there is no mandated wage replacement for the first day of a spell to reduce shirking behavior (Hesselius et al., 2009). Both countries require doctors' notes after three (Germany) and seven (Sweden) consecutive sick days. Medical certificates are not required in the United States as such requirements would put undue burden on those with high deductibles or a lack of access to healthcare professionals. However, employees must notify their employers when they are sick, both in Europe and the United States.

While the design of European sick leave schemes resembles that of unemployment insurance, in the United States, paid sick leave resembles medical saving accounts (cf. Schreyögg, 2004): This means that employers are mandated to maintain sick leave accounts with a running balance for each employee's sick pay credit. Typically, employees have the right to "earn" one hour of paid sick time (at 100% of the wage) per 30 to 40 hours of working time. Sick pay credit is thus individualized; earned and unused sick time accumulates over the course of a year, and employees can take it whenever needed. Unused sick time rolls over to the next year. Note that employees can also take sick time to take care of sick children or for healthcare services.

This paper uses a firm-level survey by the Bureau of Labor Statistics (BLS) to estimate the first-order effects of U.S. state-level sick pay mandates on (a) the probability that jobs provide paid sick leave, (b) the use of both unpaid and paid sick leave, (c) labor costs, and (d) a range of non-mandated fringe benefits such as paid vacation or group insurance policies that employers could systematically reduce in response to the mandates. We also assess whether hours worked and paid systematically change in response to the mandates. Existing papers also estimate effects on coverage and take-up using the National Health Interview Survey (NHIS) and Current Population Survey (CPS), however, they rely on employee self-reports which may suffer from response and recall biases (Stearns and White, 2018; Callison and Pesko, 2022; Slopen, 2024).[2] Further, to derive

---

[2]One exception is Pichler and Ziebarth (2020) who rely on administrative BLS data using the Quarterly Census of Employment and Wages. However, Pichler and Ziebarth (2020) solely study employment and wage effects *in the aggregate, at the county level*. Pichler and Ziebarth (2020) has an entirely different focus and uses synthetic control group

policy recommendations, the effect of gaining access on taking paid and unpaid sick leave and their impact on labor costs is crucial. Our data contain both hourly paid and unpaid use as well as labor costs linked to sick leave, calculated by the BLS. Moreover, to assess possible unintended consequences, testing whether mandates crowd-out non-mandated fringe benefits is important. Our data include a range of non-mandated benefits and allow for such estimates.

To this end, we use restricted-access data from the National Compensation Survey (NCS) at the firm-job level from 2009 to 2022, coupled with difference-in-differences (DD) models. Specifically, we use the (Callaway and Sant'Anna, 2021) (CS) DD estimator that is robust to heterogeneous and dynamic treatment effects under staggered policy adoption over states and time. We also plot CS event studies. NCS data are specifically designed to measure employee compensation and employer costs—indeed, the U.S. government uses the NCS to adjust federal employee compensation.

[Insert Figure 1 about here]

Figure 1 illustrates how the number of U.S. private sector employees covered by state-level sick pay mandates had increased from 2009 to 2022, namely from half a million in 2009 to more than 48 million in 2022, representing about a third of all U.S. employees in 2022.From 2009 to 2022, 13 U.S. states implemented sick pay mandates.[3] For four states (California, Connecticut, Massachusetts, Oregon), we observe at least five post-mandate years.

We find that state-level mandates are effective in increasing sick pay access. They also reduce inequality in access to paid sick leave across jobs. Within the first five years after the mandates' implementation, on average, the probability that a job provides paid sick leave increases by 20 percentage points (ppt) or 32% from a pre-mandate level of 63%. The increase grows over time during the first four years and then plateaus. It enables more employees to take sick days: on average, paid sick leave use increases by a significant 3.9 hours per year. Scaling this average increase by the increase in coverage implies that employees in newly covered jobs take about two additional sick days per year. Unpaid sick leave use—mandates also compel coverage of unpaid leave—increases by a significant 0.85 hours per year for newly covered jobs. These relatively modest increases in sick leave use even five years into the mandates' implementation either suggest

methods to assess whether there is macro-level evidence that mandates could reduce employment or wage growth (a main argument against mandates). The paper does not find much evidence for that. In contrast, this paper uses micro-level data at the *firm-job level* and studies a set of different outcomes. Ahn and Yelowitz (2015) use ACS data to assess the labor market effects of the first state law in Connecticut. They find small and non-significant, positive labor force participation effects.

[3]Note that we leave out D.C. from our analysis as D.C already implemented the mandate in 2008 and thus we only observe posttreatment years. Further, three states passed paid time off (PTO) mandates which provide a minimum number of paid leave days, irrespective of the reason for leave taking.

reductions of infections at the workplace and/or the absence of widespread shirking behavior, consistent with existing evidence and in line with incentive-compatibility of individualized sick pay credit (Pichler et al., 2020; Cronin et al., 2022; Andersen et al., 2023).

Sick leave costs for firms increase by a significant six cents per hour worked or by 31 cents in jobs that newly provide sick pay. Finally, consistent with positive cascading effects after the introduction of minimum wages, we find positive spillover effects on non-mandated benefits such as short- and long-term disability insurance policies, life insurance, and dental plans. We dub this finding "job upscaling." In line with responses from employer surveys, we interpret job upscaling as a result of employer efforts to differentiate themselves (or the jobs) from competitors (or part-time jobs) to attract labor.

This paper contributes to several literatures. First and foremost, the paper contributes to the economics literature on sick leave. In the U.S., the literature has begun to develop, see above[4], but has a much longer tradition in Europe.[5] One general finding in the literature is that labor supply is elastic with respect to the benefit level ("moral hazard") and around -1 (Johansson and Palme, 1996, 2002, 2005; Ziebarth and Karlsson, 2010, 2014; De Paola et al., 2014; Fevang et al., 2014; Kanninen et al., 2022). Further, more generous sick leave reduces the spread of infectious diseases and relapses (Pichler and Ziebarth, 2017; Stearns and White, 2018; Pichler et al., 2020; Marie and Vall-Castello, 2023; Pichler et al., 2021; Andersen et al., 2023). Adams-Prassl et al. (2023) find in survey experiments that providing information on the positive health externality of paid sick leave increases support for a public provision of sick pay.

The rich European literature also finds that sick leave and other social insurance programs are complements (Fevang et al., 2017), leave taking is lower during probation periods (Ichino and Riphahn, 2005), women take more sick days than men (Ichino and Moretti, 2009; Herrmann and Rockoff, 2012), culture (Ichino and Maggi, 2000) and social norms (Bauernschuster et al., 2010) matter for leave-taking, coworkers' sick leave is a complement (Hesselius et al., 2009), union members' labor supply is more elastic (Goerke and Pannenberg, 2015), compulsory dialogue meet-

---

[4]Additional unpublished papers or papers outside of economics find that women are at a higher risk of working sick ("presenteeism") and that mandating access improves their health (Susser and Ziebarth, 2016; Slopen, 2023). Further, studies exploiting variation in U.S. mandates find a higher employee productivity and firm profitability as well as reduced firm bankruptcy (Chunyu et al., 2022; Miller, 2022). Ahn and Yelowitz (2016) exploit variation in the strength of the flu for identification, similar to Cronin et al. (2022), and find that sick leave coverage increases use by 1.2 days per year per work, comparable to this study.

[5]Gilleskie (1998, 2010) represent notable exceptions on early U.S. sick leave research. Gilleskie (1998) uses 1987 data from the Medical Expenditure Survey to estimate structural parameters in a discrete choice dynamic optimization problem where individuals decide on missing work due to acute illness. Policy simulations on providing paid sick leave to all individuals increase sick leave use by 10.6% and also doctor visits. Thus, health care and sick leave use are substitutes. Gilleskie (2010) uses a similar approach and finds that men's labor supply elasticity with respect to sick leave benefits is larger than women's.

ings do not reduce leave taking for short-term (Alpino et al., 2022) but for long-term sick leave (Markussen et al., 2018)—as does gatekeeping trough physician certification (Markussen and Røed, 2017)—while a lower unemployment rate (Nordberg and Røed, 2009), and higher marginal taxes increase absenteeism (Dale-Olsen, 2013). Further, recent work using Latin American settings and administrative data find that Brazilian employers respond to sickness spells by increasing hiring, but only by under one-tenth of a worker, whereas the hiring effect is much larger for maternity leave (Schmutte and Skira, 2024). Barone (2023) estimates a structural model of optimal sick leave using Chilean administrative data and variation in economic incentives by day of the week. She finds that the replacement rate of the optimal, welfare improving, sick pay scheme decreases in the spell duration.

This paper also contributes to research on labor market inequalities (Card et al., 2013; Maestas et al., 2018; Song et al., 2019) and paid family (parental) leave (Ruhm, 1998; Lalive et al., 2014; Dahl et al., 2016; Baum and Ruhm, 2016; Brenøe et al., 2023).[6] Finally, the paper also contributes to research on disability insurance and workers' compensation (Staubli, 2011; Maestas et al., 2013; Powell and Seabury, 2018; Dahl and Gielen, 2021; Fischer et al., 2022; Hallter et al., 2023) as well as the economics of employer mandates (Summers, 1989; Gruber, 1994) and optimal social insurance more generally (Chetty and Finkelstein, 2013; Kolsrud et al., 2018).

2 U.S. Sick Pay Mandates

Paid sick leave was an integral part of the first social insurance system in the world. The Sickness Insurance Law of 1883 implemented federally mandated employer-provided health insurance in Germany, which covered up to 13 weeks of paid sick leave along with healthcare. Paid sick leave—insurance against wage losses due to health shocks—was a crucial element of health insurance at that time. Given the limited availability of medical treatments in the 19th century, expenditures for paid sick leave initially accounted for more than half of all health insurance costs (Busse and Blümel, 2014). Subsequently, other European countries also implemented sick leave mandates. Today, although the generosity varies, every European country provides universal access to paid sick leave for employees.

In the United States, Senator Theodore Kennedy spearheaded the first legislation for a federal sick pay mandate—the *Healthy Families Act*. First introduced to the U.S. Congress in 2005, the bill was reintroduced in 2023 after several failed attempts at passage (Healthy Families Act,

---

[6]Sick leave differs from parental leave in both aim and scope. Parental leave is typically mandated with the objective of balancing employees' family and work responsibilities and addressing gender inequality in the workplace.

2023). In the meantime, numerous U.S. cities and states have passed similar sick pay mandates within their jurisdictions. San Francisco was the first locality to implement a mandate in 2007, increasing coverage rates above 90% among employees (Colla et al., 2014). In the following years, based on widespread voter support—opinion polls suggest that 75% of Americans support sick pay mandates, with majority support across party affiliation (National Paid Sick Days Study, 2010; HuffPost/YouGov, 2013)—a wave of cities and states adopted sick leave legislation. As of writing, 15 states, D.C. and 20 cities and counties (including Chicago, New York City, Philadelphia, Portland, Seattle, and Washington D.C.) have passed sick pay mandates, see A Better Balance (2024). (This paper uses data up to and including 2022 and variation from 13 states.)

Connecticut was the first U.S. state to mandate paid sick leave effective January 1, 2012. However, the mandate only applies to service sector employees who work for large firms and covers just 20% of the workforce. Over our study period, 13 state-level mandates became effective, see Table A1 (Appendix).

Moreover, in response to the covid-19 pandemic, in March of 2020, Congress passed a bipartisan *Families First Coronavirus Response Act (FFCRA)*. The Act mandated up to two weeks of covid-19 related emergency sick leave for employees in private firms with 50 to 500 employees (H.R.6201 - Families First Coronavirus Response Act, 2020). This emergency provision has now expired (National Partnership for Women and Families, 2020). Many other countries around the world also enacted legislation to bolster sick pay availability due to covid-19, see OECD Policy Responses to Coronavirus (2020).

FMLA. In the United States, the Family and Medical Leave Act (FMLA) is the only current federal law related to leave. FMLA stipulates employees' rights to take *unpaid* leave in case of pregnancy, own sickness, or sickness of a family member. The Act applies to employees who work at least 1,250 hours per year for a firm with at least 50 employees (cf. Waldfogel, 1999). Jorgensen and Appelbaum (2014) estimate that 44% of private sector employees are eligible for FMLA. The state-level sick pay mandates analyzed in this paper provide employees with the right to take paid and also *unpaid* sick leave. This entails dismissal protection while on sick leave. That is, although U.S. employment is overwhelmingly at will and employees can be terminated without reason or warning, employers cannot terminate employees for taking sick leave.

Sick Time Credit and Accrual Rates. Table A1 (Appendix) provides a summary of all U.S. state-level mandates enacted at the time of writing. While the details of the mandates differ from state to

state, all mandates are employer mandates, meaning that the law mandates employers to provide sick leave as follows: Employees gain the right to 'earn' sick time credit of typically one hour for every 30 to 40 hours worked. This credit implies paid sick leave at a 100% wage rate when taken. If unused, the sick time credit rolls over to the next calendar year. Because employees must first accrue credit, most mandates stipulate a 90 day accrual period before employees can start taking paid sick leave. Further, there exist waiting periods for newly hired employees similar to European countries, meaning that employees cannot take sick leave immediately after starting a new job. Finally, as indicated in Table A1, several states exempt small firms but then typically mandate them to provide *unpaid* sick leave (Massachusetts Attorney General's Office, 2016).

All state-level mandates stipulate individual credit accounts and have similar structures, framed after the *Healthy Families Act* (Healthy Families Act, 2023). While accrual rates and waiting periods differ slightly,[7] the design is otherwise homogeneous. Thus, while we compare the effects across states below, in general, we do not differentiate by mandate generosity in our empirical specifications. That is, we primarily study the effects on the extensive, not the intensive, margin.

Qualifying Reasons. As seen in Table A1 (Appendix), qualifying reasons for sick leave are own sickness or sickness of a dependent child (and sometimes a family member). Note that, in contrast to most European schemes, employers cannot require doctors' notes. Rather, moral hazard is mainly contained through the individualized sick time credits in combination with relatively restrictive accrual rates of one hour credit per 30 to 40 hours worked.[8] Note that *none* of the mandates levy an explicit employer or employee tax to fund the sick days. Instead, benefits are funded entirely through work credit and an employer mandate, as described above.

Workplace Notification. Firms must post notifications about paid sick leave rights at the workplace. Figure A1a shows a sick time notice that complies with Massachusetts' workplace poster requirements (Commonwealth of Massachusetts, 2019). Alternatively, firms could post notices as in Figure A1b that include *all* employee rights (Industrial Commission of Arizona, 2019).

Substate Mandates. In addition to states, dozens of cities have passed sick pay mandates since 2009, see A Better Balance (2024) for an overview. This paper focuses on the state-level mandates and disregards all sub-state mandates due to the geographic information in our data. As detailed

---

[7]In Table A1, all but one state (and D.C.) require at least one hour of sick leave credit per 30 to 40 hours worked. Vermont is an exception with 52 hours and Washington DC requires 43 hours.

[8]An open question for future research is employee sick leave behavior when changing jobs. The current laws do not specify any mandated pay out rate. This incentivizes employees to take their accrued sick time prior to leaving the job.

below, the main reason is that county identifiers do not map to the city-level mandate boundaries, plus the county-level data suffer from small, non-representative, sample sizes. We routinely drop counties that adopted mandates and counties that include city-level mandates. Note that these counties or cities passed mandates *prior* to their states.[9] Whenever state and sub-state mandates coexist, legal complexities arise: When states pass mandates, existing sub-state laws are typically preempted; for example, the 13 New Jersey city laws that existed prior to the state law (Title 34. Chapter 11D. (New) Sick Leave §§ 1-11). However, preemption is not always the case, especially not when city laws are passed *after* the state law and are more comprehensive. Because we focus on state-level mandates, we circumvent the legal complexities of this institutional city-state-interplay.

Lawsuits.   Sick pay mandates have been challenged through the court system, mostly by business groups seeking to have the laws overturned. For example, Airlines for America has sued the states of Massachusetts and Washington to seek an exemption from the law, arguing that the law would adversely affect their carrier prices, routes, and services (Bloomberg BNA - Workplace Law Report, 2018). As another example, the Massachusetts Supreme Judicial Court ruled that sick pay does not constitute wages, which implies that firms are not liable if they do not pay out unused sick days to employees (Kaczmarek, 2018). In the empirical specifications, we do not differentiate by whether a lawsuit is pending anywhere at a given time for a specific jurisdiction.

Discrimination.   One possible unintended consequence of the mandates is that firms may now discriminate against employees based on observable factors that firms believe are correlated with sick leave use. However, federal anti-discrimination law may limit such potential discrimination. Moreover, compared to other mandated benefits, for example, Workers Compensation or health insurance, sick leave mandates are relatively minor mandates in terms of costs to employers. Thus, mandate-induced discrimination is likely negligible but we cannot rule it out. As this paper primarily estimates the impact of the mandates on firm-level provision of benefits, discrimination in recruiting is outside the scope of this paper. In terms of the impact on sick leave use, we would expect such (illegal) hiring practices to mute mandate effects. Our intent-to-treat (ITT) estimates would then reflect lower bounds compared to a counterfactual without changes in the employee composition.

---

[9]Our findings are robust to including fully or partially treated counties. These results are available upon request.

3   National Compensation Survey (NCS)

The NCS is designed to provide a detailed picture of wage and non-wage compensation in the United States. The data are used to produce government statistics on a wide range of compensation and labor cost items. The data are also used to officially adjust wages for federal employees.

The NCS is a rotating panel of firms,[10] where firms typically stay in the sample for three to five years. Further, the NCS is nationally representative at the firm-job level. Throughout our analysis, we use BLS survey weights to provide nationally representative estimates at the job level.[11] We use the restricted access version of the NCS which is collected and maintained by the BLS. Importantly, the restricted access version includes county identifiers which allows us to match state-level mandates to the data and drop fully or partially treated counties, see Section 2.

Sampling. In the NCS, random sampling is first carried out at the firm level. The BLS defines firms as "a single economic unit that engages in one, or predominantly one, type of economic activity" (Bureau of Labor Statistics, 2023b). Second, for every job within each firm, the NCS collects information on compensation and benefits at the *job* level (Bureau of Labor Statistics, 2023b).[12] The BLS selects firms and jobs within firms probabilistically. Within a selected firm, four to eight jobs are probabilistically sampled from a list of employees provided by the firm. Thus, in the NCS, a job is an employee or a group of employees within a sampled firm with the same job. Please see the NCS documentation for full details (Bureau of Labor Statistics, 2023c). In the manuscript, for stylistic reasons, we use the terms 'firm', 'employer,' and 'establishment' as synonyms.

The human resource administrator of each firm then provides detailed information to the BLS field economists on a range of wage and non-wage benefits, including paid sick leave as well as paid and unpaid sick leave use. Because the information uses firm-level administrative records, response error due to, for example, employees being unaware of their benefits is minimized. Further, these data allow us to explore potential spillovers from sick leave mandates to non-mandated benefits such as paid vacation or parental leave.

Interview Timing and Reform Coverage. In principle, the NCS is a quarterly survey. However, we focus on the first quarter responses at the end of March; this is because the BLS only provides

---

[10]Technically, the NCS is an establishment-level survey.

[11]Note that the NCS is not representative at the state-level. To the best of our knowledge, no state-level representative dataset exists. If our identification assumptions hold, non-representativeness at the state level is no threat to the internal validity of our estimates.

[12]Note that within a firm-job cell, there can be multiple employees. When there are multiple employees, the NCS reports the average value.

information from this interview for many benefits, including paid sick leave. This implies that we leverage six annual waves of post-mandate data for four states (CA, CT, MA, and OR) , five annual waves of post-mandate data for another four states (AZ, MD, VT, and WA), four waves for three states (NJ, MI, and RI), and two waves for two states (CO and NY).

Stock vs. Flow Measures. One can distinguish between stock and flow measures in the NCS. The stock measures (such as access to paid sick leave) refer to the status quo at the time of the first quarter interview in March. The flow measures (such as sick leave utilization) generally refer to *the past 12 months*; that is, from April of the previous year to March of the survey year.[13] Finally, note that we only observe the total average number of sick hours taken in the past 12 months, but do not see *when* specifically these hours were taken.

[Insert Table 1 about here]

Sample Selection. In our main analysis, we leave the micro-data at the firm-job level and restrict the sample to private sector firms (as the mandates only apply to the private sector). Table 1 reports the summary statistics. In our main sample, we have 443,740 observations at the firm-job level for the years 2009 to 2022. Using the Consumer Price Index, we convert all monetary values to 2019 U.S. dollars.

3.1 Outcome Variables

This paper evaluates how sick pay mandates affect firm propensities to offer mandated and non-mandated benefits, employee use of paid and unpaid sick leave, and firm costs directly related to sick leave. Our first outcome measures firm provision of paid sick leave as of March in a given calendar year. *Sick leave offered* is one if a job provides paid sick leave and zero otherwise. Over all jobs and years, the average coverage rate is 63% (Table 1).

Our second outcome measures *paid sick hours taken* in the previous 12 months; if the specific job is filled by more than one employee, human resources administrators report average use among all employees in this job. Again, note that we do not observe the specific weekdays or calendar months of use. The sample average is 16.8 hours, which corresponds to taking just over two full workdays of paid sick leave.

---

[13]Thus, for all states, the first post-mandate year only partially records utilization, for example, for CA and MA nine months are counted (Table A1).

Our third outcome measures *unpaid sick hours taken* in the previous 12 months. Unpaid sick leave may be a substitute for paid sick leave; also, recall that many employees (who are not covered by FMLA) gain access to unpaid sick leave through the mandates. The average number of unpaid sick days taken is 0.15 per employee and year.

Our fourth outcome measure is *sick leave costs per hour worked* and is calculated by the BLS. The average is 27.5 cents per hour worked. Again, following the flow measure concept of sick leave utilization, this measure refers to the past 12 months before the first quarter interview. The BLS NCS survey administrators generate this variable and use employees' own wage and own hours worked per year in the calculation. The variable assumes that sick hours represent 100% lost labor and does not consider changes in employee on-the-job productivity because of sick pay, or compensatory behavior by employees after returning to work. Moreover, our data do not allow us to calculate the potential employer costs of finding a replacement for employees on sick leave or other workplace disruptions when an employee is away from the job for short spells.

The second panel of Table 1 lists job characteristics, that is, control variables and variables to stratify the sample in order to investigate effect heterogeneity. In particular, they measure full-time work (74%), unionization (8%), the hourly wage ($22.63), annuals hours worked (1,702) and annual hours paid(1,840) as well as paid overtime hours (58). Further, we know occupation and industry of each job. The three most common occupations are 'office and administrative,' 'sales,' and 'food preparation and serving.' The three most common industries are 'healthcare and social assistance,' 'retail and trade,' and 'manufacturing.'

3.2 Other fringe benefits

On average, American jobs offer 69 paid vacation hours and 44 paid national holiday hours per year. Moreover, 68% of all jobs offer health insurance[14] and 56% offer life insurance. Short-term disability insurance is offered in 38% of all jobs and long-term disability insurance in 32% of all jobs (cf. Pichler and Ziebarth, 2024). Fourteen percent of all U.S. jobs offer paid family leave.

4 Empirical Approach

Our objective is to estimate the effect of state-level sick pay mandates on provision of paid sick leave, use of paid and unpaid sick leave, labor costs, and non-mandated benefits. We use difference-

---

[14]To be precise, here we use what the BLS labels 'medical insurance.' This variable does not necessarily cover prescription drugs.

in-differences (DD) methods; our target parameter is the average treatment effect on the treated (ATT). States adopt paid sick leave mandates at different points in time, thus we use methods proposed by Callaway and Sant'Anna (2021) (CS). The CS DD estimator is robust to bias from both forbidden comparisons (that is, comparing later treated units to earlier treated units) attributable to dynamics in treatment effects as well as heterogeneity in treatment effects across treated units.

The central assumption of DD methods, including the Callaway and Sant'Anna (2021), is common trends between adopting and non-adopting units. While this assumption is untestable as counterfactual outcomes are not observed, we will follow the literature and estimate event studies to provide suggestive evidence on pre-mandate trends. Subsection 4.1 describes, first, the DD methods. Subsection 4.2 describes, second, the event studies.

4.1 Difference-in-Differences

Equation 1 outlines our DD specification:

$$y_{f,j,s,t} = \gamma_s + \delta_t + \phi D_f \times T_{s,t} + \mu_{f,j,s,t} \tag{1}$$

where $y_{f,j,t}$ is one of the outcome variables (e.g., *paid sick leave offered*) at firm f in job j in state s and year t. γ_s are state fixed effects and δ_t are year fixed effects from 2009 to 2022. In additional specifications, we control for state paid time off mandates and job-level covariates (part-time vs. full-time, and union vs. non-union). We also control for firm-job fixed effects in some specifications.[15]

D_f is an firm-specific treatment indicator, coded one for firms that have to comply with the mandates (considering mandate-specific size thresholds).[16] These firms are located within states that implemented a sick pay mandate between 2009 and 2022.[17] The interaction of D_f with the vector $T_{s,t}$, where s refers to the state specific treatment timing, yields the binary DD variable.

---

[15]The Callaway and Sant'Anna (2021) estimator does not automatically accommodate firm-job fixed effect. Thus, we first net out the firm-job fixed effects from each outcome and then use the residualized outcome. For results using the Bacon Decomposition Goodman-Bacon (2021), please see Maclean et al. (2021).

[16]Note that firms below the threshold are included in the comparison group. In a robustness check, results available on request, we exclude small firms from the comparison group and find slightly larger effects (although 95% confidence intervals generally overlap which makes us reluctant to overstate any heterogeneity).

[17]In particular, treatment status is absorbing, that is no states repeal their paid sick leave mandate. Moreover, as mentioned earlier, in the main specification, we exclude all counties and cities which passed county-level or city-level mandates. However, our findings are robust to including those treated counties in the sample. As mentioned in Section 2, one complication with the city-level mandates is that the city boundaries where the mandate applies rarely coincide with the county boundaries, which is why we elect to exclude the entire county from the analysis.

The interaction term is one for firms above the size threshold in states and time periods in which a paid sick leave mandate is in effect (see Table A1, Column (3)).

The standard errors ($\mu_{f,j,t}$) are clustered at the state-level (Bertrand et al., 2004). We use the doubly robust DD estimator proposed by Sant'Anna and Zhao (2020) that is based on stabilized inverse probability weighting and OLS. We use never treated units as our comparison group, but show robustness checks using 'not yet treated.'

4.2 Event Study

We estimate and plot event studies to complement the DD method described above. To this end, we decompose the binary $T_{s,t}$ time indicator in Equation (1) into a series of leads and lags around the effective date of each mandate using Callaway and Sant'Anna (2021). We report indicators for five or more years through one year in advance of the state-level mandates ('leads', $\sum_{i=-5}^{-1} Lead_{f,i}$), the effective year of the mandate, and one through five or more years following the mandate ('lags', $\sum_{k=0}^{5} Lag_{f,k}$). we assign all states without a mandate a zero for all lead and lag variables. Our event study equation is as follows:

$$y_{f,j,t} = \gamma_{f,j} + \delta_t + \kappa_j \sum_{i=-5}^{-1} Lead_{f,i} + \gamma_k \sum_{k=0}^{5} Lag_{f,k} + \rho X_{f,j,t} + \epsilon_{f,j,t} \tag{2}$$

The event study model offers two important extensions to the traditional DD model. First, visual examination of the normalized pre-mandate trends (that is, the coefficient estimates on the lead indicator variables) allows us to test for the plausibility of the common time trends assumption. Second, inclusion of the lag variables allow treatment effects to vary over time in the post-mandate years. For example, if firms are slow to comply with the mandated benefits, allowing for dynamic treatment effects may be crucial. We note again that employees must learn about their rights, earn, and accrue sick time before they can claim sick pay; this suggests that effects may emerge over time.

4.3 Identification

Overall, we evaluate the average impact of the mandates adopted at the state-level between March 2009 and March 2022 .[18] If mandates are a reaction to pre-existing trends in the outcome variables

---

[18]Note that Washington D.C. adopted its mandate in the year prior to our study period (2008) and is therefore dropped from our analysis.

in the treated states, we would identify such an endogenous implementation via our event study (that is, coefficient estimates on the mandate lead variables that are statistically different from zero). Similarly, event studies have the power to provide evidence for anticipation effects.

The main remaining identification assumption is the absence of other confounding effects that are correlated with the staggered implementation of the sick pay mandates in all states over a decade. Specifically, the implementation of the mandates and the outcome variables must not be correlated with a systematic, third, unobservable driving force. Note that the mandates were implemented at different times of the year, in January as well as July (Table A1), which adds to the credibility of the identifying assumption. Because we rely on variation over across 13 U.S. states from 2009 to 2022, as compared to the canonical DD setting with just one treatment and one comparison group, other policies (or unobservables) contemporaneous to the treatments in all states inflicting a systematic bias are much less likely to occur.

If the identification assumptions hold, Equations (1) and (2) estimate internally valid causal mandate effects. The extent to which these estimates are externally valid for other U.S. states is difficult to assess. For such predictions, using estimates of regions whose labor markets are most similar to those in the state of interest is a promising approach. Our detailed heterogeneity analysis by industry, occupation, and both type of employee and employer will provide additional guidance.

5 Results

We begin this section by estimating Equation (2). That is, we estimate event studies to elicit intent-to-treat (ITT) effects of the state-level mandates on a range of outcomes. We then supplement these event studies with average DD post-reform estimates as in Equation (1). As discussed, we routinely use the Callaway and Sant'Anna (2021) estimator that corrects for biases due to effect heterogeneity and dynamic treatment effects. Our default control group are the 'never treated' but we also conduct robust checks with the 'not yet treated.' Event time is unbalanced due to the staggered design; however, three states up to and including Oregon (CA, MA, and OR) include full event time observations ($\sum_{i=-5}^{-2} Lead_{f,i}$ to $\sum_{k=0}^{5} Lag_{f,k}$).

5.1 Impact of Mandates on Firms' Benefit Provision and Employee Take-Up

Event Studies: Main Outcomes

Figure 2 plots events studies for our four main outcome variables. The x-axis of Figure 2 shows the normalized time dimension for all treatment states. The y-axis shows the treatment effect in natural units.

By examining the mandate leads, event studies allow us to asses the main identification assumption, that is, common trends. As seen, there are no differential trends between the treatment and comparison groups; the pre-mandate coefficient estimates are small in magnitude and the gray confidence bands entirely cover the zero line on the y-axis.

[Insert Figure 2 about here]

Coverage. Figure 2a documents a substantial increase of jobs with sick pay access in the year of the mandate's adoption. (For example, in California, where the law became effective July 1st, 2015, $\gamma = 0$ refers to the first post-mandate year and March 2016.) In the next three post-mandate years, $\gamma_k \sum_{k=1}^{3} Lag_{s,k}$, coverage rates further strongly increase to exceed 20 percentage points ('ppt'), and then flatten through $\gamma = 5$. All post-mandate treatment effects are highly significant at conventional statistical levels.[19]

Take-up. Figure 2b and c show the dynamic effects on paid and unpaid sick leave utilization. Recall that the mandates grant employees access to unpaid *and* paid sick leave. After the mandates' implementation, paid sick leave utilization strongly increases—linearly through $\gamma = 5$. The linear dynamic increase in paid sick leave use is plausible as employees earn and accumulate sick leave credit over time.[20]

Regarding unpaid sick leave use in Figure 2c, we observe nonlinear dynamic effects featuring an inverse U-shape. After employees in small firms gained the right to take unpaid sick days because of the mandates, we observe increases in use for the first three post-mandate data points, $\gamma_k \sum_{k=0}^{2} Lag_{s,k}$. Then, take up of unpaid sick hours starts to decline again and reverts back to the

---

[19]Similar to non-compliance in case of minimum wage laws (Basu et al., 2010) or workplace safety regulations (Johnson, 2020), deliberate non-compliance could limit benefit provision.Second, mandates may not be strictly enforced, e.g., due to pending lawsuits. Third, despite our best efforts, our classification of treatment status may include unavoidable imprecision due to the nature of the mandates and mapping legal specifics to data. As an example, in Connecticut, the mandate provides relief to firms that experience seasonal or transitional fluctuations in their workforce. This exemption may lead us to mis-classify some firms.

[20]Recall that utilization is recorded for the past 12 months as of March in a given year. Thus, the first post-mandate year does not record the full 12 months whereas the second does.

zero line in $\gamma = 3$. This nonlinear effect is plausibly a function of how the sick pay mandates are designed—employees must first earn paid sick time credit through work. Hence, initially, employees (have to) take unpaid sick time. Once they have accrued sufficient paid sick time, employees increasingly take paid sick time—and unpaid sick leave use decreases again. This nonlinear pattern suggests no significant medium to long-term effect on unpaid use of sick leave.

Labor Costs. Finally, Figure 2d shows the event study for sick leave costs per hour worked. Again, there is no significant trending in pre-mandate years. Once employees begin to take paid sick time after being able to earn credit, labor costs increase. This is expected as sick leave costs are simply the product of paid sick hours taken and employees' hourly wage.

DD Models: Main Outcomes

Table 2 reports the results from Equation (1) for our main outcome variables. Each panel shows eight separate DD models. Panel A includes year and firm fixed effects, whereas Panel B adds employee controls, and Panel C adds firm-job fixed effects. Overall, the results are robust across the various specifications. For each of the four main outcomes and each panel, we report the findings from two regressions. In uneven columns, we report estimates from standard two-way fixed effects DD models that suffer potentially from bias but allow us to plot year fixed effects for the covid-19 years 2020, 2021, and 2022. This approach pinpoints general underlying trends during the pandemic in a succinct manner within our standard framework.[21] In even columns, we report Callaway and Sant'Anna (2021) DD estimates which capture the average post-mandate effect as seen in Figure 2.

Note that, when adding firm-job fixed effects in Panel C, the coefficient estimates shrink substantially (but remain statistically significant). The reason is that the NCS features a short rotating panel of firms, see above. We do not observe any job over the full event time, which implies that adding extremely rich sets of job fixed effects substantially attenuates the coefficient estimates.

[Insert Table 2 about here]

---

[21]Recall that FFRCA included the first federal, but temporary, emergency sick leave provision for firms with fewer than 500 employees for reasons related to covid-19. The provision went into effect April 1, 2020 and expired December 31, 2020 (it was later extended for initial non-users). The Act provided up to two weeks of sick leave and applied to all states. Further, select states expanded existing laws or passed new emergency sick leave legislation due to covid-19, see A Better Balance (2021) and H.R.6201 - Families First Coronavirus Response Act (2020); Jelliffe et al. (2021); Andersen et al. (2023).

Coverage. Column (2) of Panel A and B in Table 2 show that, on average, state-level sick pay mandates increase coverage rates, highly significantly, by 20ppt over all post-mandate years. Relative to the pre-mandate coverage rates in treated states of 63%, the effects translate into an increase of 32%. Further, on average, during each covid-19 year, paid sick leave coverage increased by 8ppt throughout the United States. The effect is a weighted average of covid-19 related emergency sick leave provisions and general time trends that were likely also driven by covid-19 experiences with infections at the workplace, see A Better Balance (2021).

Take-Up. Columns (3) to (6) of Table 2 show the estimated take-up effects on paid and unpaid sick leave use in the 12 months prior to the March interviews. Column (4) shows robust evidence that paid sick leave use increased by almost four hours per year, which corresponds to a 22% increase relative to the pre-treament baseline. Scaling the 3.9 hour increase in Panel A by the 20ppt increase in coverage yields a 19 hours increase for marginal firms, or 2.4 paid sick days taken per year and newly covered employee. Like coverage, take-up was consistently higher during the pandemic with about three additional hours of paid leave taken in 2020, 2021, and 2022, compared to pre-covid years.

In Column (6) the use of unpaid sick hours more than doubles to 0.17, with a scaled effect of 0.85 hours per marginal employee. However, recall the nonlinear effect in Figure 2c, suggesting no longer-term impact on unpaid sick leave use. Interestingly, but potentially expected, during the pandemic unpaid sick leave use was significantly below pre-covid levels and a statistically significant -0.22 for each of the three years of the pandemic.

Labor Costs. Column (8) shows effects for labor costs per hour worked. Labor costs are important to assess in this context because mandate critics commonly cite rising labor costs and depressed labor demand as reasons against government mandated sick pay (Kruth, 2018). We find that mandates increase sick leave costs per hour worked by 6.2 cents (Column (8), Panel A). Scaling this cost increase by the 20ppt increase in coverage rates, costs increase by 31 cents per hour for the marginal employer.

We note that this cost estimate is a static calculation. In particular, the calculation does not consider possible changes in work productivity attributable to the mandate. For instance, overall work productivity could increase because employees can recover from their sickness, work moral among employees could increase, or employees may (over-) compensate for lost labor after their

sick leave. On the other hand, shirking and a lower work morale among employees who are not on sick leave (and therefore must cover for their sick coworkers) could reduce productivity.

However, the labor cost estimate implicitly considers potentially lower infection rates at the workplace and thus a reduced need for sick leave (cf. Pichler and Ziebarth, 2017; Stearns and White, 2018; Pichler et al., 2020). If total sick hours taken decreases in some firms or occupations as a result of less presenteeism behavior and fewer infections, our labor cost estimate would implicitly consider such an effect.

Heterogeneity in Main Outcomes

Hypotheses. Next, we explore effect heterogeneity by type of job and by type of firm. Given the large inequalities across jobs in the pre-mandate era, one would hypothesize that heterogeneity in mandate effects should be large as well. In other words, we expect the mandates to have more bite in part-time and low-wage jobs where voluntary coverage was low(er) in pre-mandate years. Partly, this hypothesis is mechanically true due to 'ceiling effects:' For jobs with very high pre-mandate coverage, the potential increase in coverage to a maximum of 100% (of all jobs) has, by construction, a lower ceiling than for jobs with very low pre-mandate coverage rates. Analogously, we hypothesize take-up and labor cost effects to be large in jobs with low pre-mandate coverage.

Type of Firm. To this end, we re-estimate Equation (1) on split samples, e.g. full time vs. part-time jobs in Panel A of Table 3. As seen, our main hypothesis is on target. Coverage rates increase by 13ppt in full-time jobs, on average, but by 38ppt—three times as much—in part-time jobs. Average absolute take up increases by 3.3 hours (full-time) and 4.2 hours (part-time). However, the scaled effect is larger for full-time (25.8 hours) as compared to part-time (11.2 hours) jobs. The reason is accrual rates that are identical for both types of jobs: obviously, part-time workers accrue fewer credit and are thus unable to take sick time at the same rate as full-time workers. Also, to the extent that they do not work every day, part-time workers have fewer possibilities to fall sick on a given day during the year.

[Insert Table 3 about here]

Nevertheless, our conjectures are on target for firms with less than 50 vs. 500 or more workers (Panel C) as well as unionized vs. non-unionized jobs (Panel B). Here, we observe much larger percentage point increases in non-unionized compared to unionized jobs, not only for coverage (21.9 vs. 3.5ppt), but also for paid hourly use (4.3 vs. 0.5), unpaid hourly use (0.2 vs. -0.3) and

labor costs (0.08 vs. -0.06). We also observe much larger coverage increases of 33.9ppt for small firms with low pre-mandate coverage of just 48% (vs. 85% for large firms with coverage increases of 5.9ppt due to the mandates). Take-up of paid sick leave increases by a highly significant 5.9 hours for small firms and labor costs by a significant 9 cents per hour worked (paid use and labor cost increases are not significant for larger firms). Take-up of unpaid leave is also larger for small firms (0.4 vs. -0.2).

Type of Job. To test whether job-specific human capital and the substitutability of workers matter, we also stratify jobs by the share of college graduates. To do so, we create 516 industry-occupation cells in the representative American Community Survey, and differentiate these cells by whether they have an above or below average share of employees with college degrees.[22] Then we split the sample based on this variable. However, Panel D of Table 3 shows effect sizes that are similar to the sample average.

Industry and Occupation. Next, we investigate effect heterogeneity by industry and occupation. The results are in Table B1. Again, our main conjectures are confirmed. Mandates have most bite in industries and occupations with very low (voluntary) rates of sick leave provision pre-mandate, such as in 'construction' (40%), 'administration, support and waste management' (37%), 'accommodation and food services' (18%), or 'food preparation and serving' (18%). In addition to disproportional increases in job coverage, these industries and occupations see increases in paid sick leave use of between four and eight hours per year (unscaled), and also significant increases in labor costs of between 4.4 and 13.6 cents per hour worked (also unscaled).

[Insert Figure 3 about here]

Figure 3 graphically illustrates the effect heterogeneity in coverage by industry and occupation. The dark dots report the baseline coverage rates, whereas the lighter diamonds show the post-mandate coverage rates (that is, the summation of the baseline rates and treatment effects in Table B1). As discussed, across industries and occupations, pre-mandate, there was substantial inequality in access to paid sick leave. The mandates have substantially reduced this inequality, where jobs with low pre-mandate coverage rates have seen much larger increases and mandate bite (Figure 3a). Take-up—paid sick leave use—has increased across all industries and occupations, but to a different extent, which is certainly a function of the type of job, worker composition,

---

[22]The industry and occupation classifications in the ACS are identical to the NCS. The NCS does not include information on education, thus we cannot isolate this information from the NCS.

pre-mandate access, and leave taking behavior as well as the stock of accrued sick time. For example, Figure 3c shows paid sick time use scaled by coverage levels in Figure 3a, that is, the figure shows sick time use *per job that offers the benefit*. For almost all industries and occupations, and averaged over all post-mandate years, sick time use per job has *decreased* in the first post-mandate years, but by different magnitudes. This is probably not surprising as newly covered workers tend to have lower-than-average use, simply because they have less sick time credit in their accounts.

One exception is the construction industry were use of paid sick hours per job has increased from 20 to 22 hours per year. We see this pattern for the construction industry although a large share (of more than 20ppt) of construction jobs gained coverage because of the mandates. The changes in sick leave use (per job with sick leave) may either be explained by the time it takes to accrue sick time for workers who just gained the right to earn sick time (Cronin et al., 2022), and/or by differences in labor supply elasticities which may be a function of pre-mandate sick leave behavior, mental or physical job strain, labor composition, and how infections at the workplace change when more employees take sick leave (cf. Pichler et al., 2021; Andersen et al., 2023).

Inequality Within Firms. While the discussion above has shown that the mandates have reduced inequality in sick pay access across types of jobs and firms, by industry and occupation, it remains unclear whether inequality across jobs *within* firms has also decreased. Figure B1 (Appendix) uses solely states and years without a mandate in place; it then plots a bar diagram showing the fraction of jobs within firms that come with voluntary sick pay. We observe heaping at both 0 and 1 representing firms that offer no sick pay at all, or sick pay for all jobs. Nevertheless, clearly a large share of jobs only offer sick pay in some of their jobs, represented by the fractions that are roughly equally distributed between 0.2 and 0.9.

[Insert Figure 4 about here]

To test whether the mandates reduced such inequality within firms, we generate two outcome variables and use them in standard event study models as in Equation (2): The first, Figure 4a, indicates whether sick pay is provided for some but not all full-time jobs in the firm. Figure 4b does the same for part-time jobs. We clearly see a significant decrease in inequity of sick pay provision among full-time jobs within the same firm. The decrease increases linearly over the post-mandate periods and becomes significant in $\gamma = +4$. In $\gamma = +5$, inequality approaches 0.04 off a baseline of 0.13, implying a decrease of 31%.

On the other hand, no such pattern is observed for part-time jobs in Figure 4b, but we also cannot exclude relative large effect sizes of [-0.5; 0.5]. A potential explanation is the exemptions that many mandates entailed. For example, Connecticut explicitly only covers full-time employees and the mandates in Maryland, Michigan, Minnesota, and Vermont specifically have "hours per week worked" requirements. Further, other mandates, e.g. in Massachusetts and Oregon, exempt small firms that have larger shares of part-time workers.

Event Studies Illustrating Coverage Heterogeneity. Figures 5 to 7 show event studies illustrating effect heterogeneity in access to paid sick leave. Those mirror what the point estimates in Tables 3 and B1 reveal: much steeper slopes for jobs with lower pre-mandate baseline coverage rates. The medium-term increases in access to paid sick leave for part-time jobs (Figures 5b), small firms (Figures 5d), and occupations such as 'food preparation and serving' (Figure 7c) or 'transportation' (Figure 7d) approach 50ppt in $\gamma = 5$ but visibly flatten over time. Assuming that the effects in $\gamma = 5$ roughy represent the long-term effects of the mandates seems plausible. The long-term increases in sick pay coverage for non-unionized jobs approach 30ppt (Figure 6b), and those for full-time jobs 20ppt (Figure 5a). By contrast, the effects are clearly below 10ppt for large firms and unionized jobs (Figure 5c, Figure 6a).

[Insert Figures 5 to 7 about here]

Heterogeneity by State. As our final analysis of mandate heterogeneity and its underlying mechanisms, we study coverage effects for select states. We first show raw time trends for California (Figure B2a), Arizona (Figure B2b), Oregon (Figure B2c), and Connecticut (Figure B2d), and then show event studies for the same states in Figure B3 (Appendix).

In all states but Connecticut (where the mandate only covered 20% of the workforce), the event studies show what the raw trends forecast: relatively flat and common time trends pre-mandate, and then increasing coverage rates post-mandate. Coverage approaches 100% over time, but effects take four to five years to rise to this level, potentially due to mandate unawareness by firms or lags in reporting. In Connecticut, one extreme of the spectrum with a very lax mandate and many exemptions (Table A1), one observes upward trends in coverage but no visible reform effect. In California, the other extreme with barely any exemptions, we observe the strongest mandate-driven increase in sick leave coverage of about 30ppt. This effect is reached in the fourth March after the mandate's inception as of July 2015, that is, in March of 2019. As a consequence,

when the covid-19 hit one year later, sick leave coverage among workers in California was much more comprehensive than anywhere else in the United States.

5.2 Effects on Hours Worked and Type of Sick Plan

In Figure 8, we show effects on (a) annual hours worked, (b) overtime hours, (c) paid national holiday hours, and (d) wages. The post-mandate coefficient estimates are in Table B2 (Appendix).

[Insert Figure 8 about here]

Although the effects are imprecisely estimated, we do not observe much evidence for structural changes in the number of annual hours worked; the coefficient estimate is 0.6% of the mean and not statistically significant. For overtime hours, we observe some more systematic downward trending; however, the coefficient estimate of -5.3 (hours per year) only becomes marginally significant when adding employee controls. One potential explanation could be that the need to work overtime decreases when employees accumulate earmarked time off to take care of sick children or to take doctor appointments. For national holiday hours, we do not find systematic changes and the coefficient estimates in our standard models in Panel A and B of Table B2 (Appendix) are non significant. As for hourly wages, there is some suggestive evidence for modestly rising wages but the effect appears to return to the baseline.[23] In any case, we do not find any evidence for reduced wages as textbook models would suggest (Summers, 1989; Gruber, 1994). This finding is in line with prior research on the wage effects of sick pay mandates (Pichler and Ziebarth, 2020).

However, the evidence regarding the type of sick plan that firms set up to comply with the mandates is very clear: separate sick plans are overwhelmingly drive almost the entire coverage effect (Figure 8f) as opposed to a 'consolidated leave plan' (Figure 8c). The latter plans are also called consolidated 'paid-time-off' (PTO) plans and have become increasingly popular in the U.S. Under a consolidated PTO plan, employers do not provide a *separate* number of days for sick leave, vacation, or parental leave, but instead aggregate or *consolidate* the total number of paid leave days per year, independent of reason for paid time away from work (Lindemann and Miller, 2012). For instance, the BLS reports that the average consolidated PTO plan has accumulated 19 days of available paid leave after five years of service with the employer (Bureau of Labor Statistics, 2023d). Table 1 shows that 22% of all jobs offer a consolidated PTO plan. Sick plan mandates

---

[23]Note that we control for the effective minimum wage in this regression (results are very similar, and available on request, if we do not control for minimum wages), thus unmeasured changes in wage policies are not likely to lead to this finding.

are in compliance with such PTO plans as long as they are as least as generous as the sick leave accounts required by the law (ADP, 2016).

5.3 Effects on Non-Mandated Benefits: Job Upscaling

Table 4 and Figure 9 report estimates on non-mandated benefits. Such fringe benefits are plausibly valuable to employees, but costly to firms and not mandated. Hence one could hypothesize that firms curtail them to offset the increased sick leave costs as studied above. We thus test for compensatory and spillover effects of mandating paid sick leave.

Figure 9 shows some potentially unexpected results. Contrary to expectations and textbook model predictions (Summers, 1989), our event studies show relatively clear *positive* spillover effects of mandating paid sick leave on a range of fringe benefits such as medical, prescription drug, and dental insurance (Figures 9a, b, c), group life insurance (Figures 9d) as well as short- and long-term disability insurance (Figures 9e and f). The post-mandate coefficient estimates range from 3.2% for prescription drug coverage to 9.3% for life insurance and 15.1% for long-term disability insurance. In other words, we find clear evidence for *crowding-in* of non-mandated benefits.

[Insert Table 4 and Figure 9 about here]

We call this finding 'job upscaling.' We explain job upscaling through increased provision of non-mandated fringe benefits as follows: firms use it to attract skilled labor and signal high quality jobs. This phenomenon represents an effort by (some) employers to differentiate themselves. Note, however, that job upscaling affects 'only' three to four percentage points of all jobs, that is, an overall tiny share of jobs. Firms that offered sick pay voluntarily significantly differ from firms that did not offer it pre-mandate:[24] they are bigger, more likely to be unionized, and have a higher share of full-time jobs that are also better paid. Importantly, they are about twice as likely to offer medical (83% vs. 43%), prescription drug (81% vs. 42%) and dental insurance (53% vs. 23%) and are more than twice as likely to provide group life (71% vs. 30%), short-term disability (47% vs. 22%), and long-term disability (44% vs. 13%) insurance.

How employers qualitatively assess the effects of the sick pay mandates nicely illustrates how this job upscaling mechanism operates at the firm level, see page 20 of Boots et al. (2009):

> "The policies I had in place before were there to reduce turnover and get better employees –
> and they did have an effect. But now, since the new ordinance, employees will have the same
> benefit no matter where they work."

---

[24]Values not shown in any table or figure; more specific results are available upon request.

Or, by another employer:

> "Now my part-time employees are getting to be equal to my full-timers, those full-timers are upset that they're getting the same benefits—they feel mistreated. There needs to be some distinction for those that work full time and have been working for me for a while."

In other words, prior to the mandates, firms used the voluntary provision of fringe benefits to attract qualified workers, signal "good jobs", and differentiate job quality by type of work. After the mandate, as all jobs come now with sick pay, this differentiation through voluntary sick pay provision falls flat. This is why, apparently, many firms now offer other non-mandated benefits such as short- and long-term disability insurance.

5.4 Robustness

Finally we aggregate our data (a) at the firm-level (Table B3, Appendix), (b) at the county-level (Table B4, Appendix) as well as (c) at the state-level (Table B5, Appendix). Note that these aggregations create some imprecision as the sample of firms is changing over time. Therefore, estimated effects might be due to actual treatment effects (changes within a firm over time) or changes in the firm composition over time. However, our results show that the estimated effects are fairly robust to these different types of aggregation. As observed for all outcomes and model specifications, the results with aggregate data are very similar to our results based on job-level data.

Further, in Tables B6 to B9, we conduction additional falsification tests. For example, while we code firms below mandate thresholds as not treated in states that exempt small firm, Table B6 excludes these observations from the sample. Further, while our sample is representative for the U.S., the representativeness for smaller states might be limited. To see whether smaller states drive our results, we solely keep California and all untreated states in Table B7. As seen, although the point estimates increase slightly (for coverage and take-up) when focusing on California, they are not appreciably different from our main results. Table B8 also replicates our main Table 2 but uses the 'not yet treated' as controls, not the 'never treated' as in our standard approach, see Callaway and Sant'Anna (2021). As seen, the results are robust. They are also robust to solely keeping treated states with full event time observations, that is, three states (CA, MA, OR), see Figure B4. Finally, the sample used to produce Table B9 drops the covid-19 years 2020-2022 and shows robust findings.

6 Discussion and Conclusion

This paper evaluates how state-level sick pay mandates operate at the firm-job level in the United States. In particular, we leverage the experiences of 13 U.S. states with a total of about 50 million employees. Using the National Compensation Survey (NCS) from 2009 to 2022, coupled with Callaway and Sant'Anna (2021) difference-in-differences and event study methods, we exploit the policy-induced variation in the implementation of 13 mandates across U.S. states over a decade. The NCS is a BLS survey at the firm-job level specifically designed to measure wage and non-wage compensation.

Our findings address important gaps in the economics literature on labor market inequalities and employer mandates more broadly. The U.S. has one of the least generous paid leave systems among all OECD countries (Adema et al., 2016; Raub et al., 2018; OECD Policy Responses to Coronavirus, 2020). Federal minimum standards concerning paid vacation, paid parental leave, paid eldercare, and paid sick leave are largely absent, leading to inequality in the voluntary provision of such benefits by firms and across jobs. In general, better paying full-time jobs for higher educated employees tend to offer paid leave benefits, whereas part-time and low-income jobs, especially in the service sector, do not. An important question is to what extent employer mandates are effective in providing and facilitating the provision and use of such benefits; or whether they have unintended consequences and lead to substantially higher labor costs, and a reduction of non-mandated benefits, or even employment.

We find that mandates are highly effective in increasing on-the-job access to paid sick leave. Four to five years after the mandates' implementation, coverage rates have increased by 30ppt from a baseline of 63%. Heterogeneity in mandate bite is large. In general, industries, occupations, and jobs with low voluntary provision (of sick pay absent mandates) have experienced the largest increases in coverage as a result of the mandates. For example, fewer than half of all jobs in small firms as well as in the 'construction' or 'accommodation and food services' industry offer paid sick leave absent a mandate. Further, we find that mandates have more bite, the more comprehensive the mandate is, such as the mandate in California. In any case, we find that mandates decrease inequality in sick pay access across occupations, industries and type of jobs but also within firms: The likelihood that firms offer paid sick leave to some, but not all, full-time jobs linearly and significantly decreases over time after the mandates' implementation.

As expected, we also find a significant increases in take up of paid sick leave. Employees in newly covered jobs take, on average, two additional sick days per year, on average in the first five

post-mandate years. However, use is linearly increasing over time, whereas labor costs linked to sick leave flatten after four years into the mandate. Our findings also suggest that use of unpaid leave sick will not increase significantly in the long-run when employees will have accumulated enough paid sick time.

Finally, contrary to our initial priors, we find that mandates *increase* the likelihood that firms offer non-mandated fringe benefits such as short- or long-term disability policies. We dub that phenomenon 'job upscaling.' This finding is akin to the positive wage spillovers of higher minimum wages to higher income jobs, as shown in Cengiz et al. (2019). Apparently, (some) firms see the need to signal high quality jobs and to attract skilled labor through the provision of non-mandated benefits. As one employer puts in in a post-mandate survey:

> "The policies I had in place before were there to reduce turnover and get better employees—and they did have an effect. But now [...] employees will have the same benefit no matter where they work." Boots et al. (p. 20, 2009)

As states continue to implement sick pay mandates, more empirical evidence on the indented and unintended consequences of these mandates will become available. We look forward to fruitful discussions among social scientists.

References

A Better Balance (2021). *Emergency Paid Sick Leave Tracker: State, City, and County Developments.* https://www.abetterbalance.org/resources/emergencysickleavetracker/, retrieved March 9, 2021.

A Better Balance (2024). *Overview of paid sick time laws in the United States.* https://www.abetterbalance.org/paid-sick-time-laws/, retrieved April 9, 2024.

Adams-Prassl, A., T. Boneva, M. Golin, and C. Rauh (2023). The value of sick pay. *European Economic Review 151*, 104314.

Adema, W., C. Clarke, and V. Frey (2016). Paid parental leave and other supports for parents with young children: The United States in international comparison. *International Social Security Review 69*(2), 29–51.

ADP (2016). *Paid sick leave vs. PTO: Frequently asked questions.* https://sbshrs.adpinfo.com/blog/paid-sick-leave-vs-pto-frequently-asked-questions, retrieved October 9, 2018.

Ahn, T. and A. Yelowitz (2015). The short-run impacts of connecticut's paid sick leave legislation. *Applied Economics Letters 22*(15), 1267–1272.

Ahn, T. and A. Yelowitz (2016). Paid Sick Leave and Absenteeism: The First Evidence from the U.S. MPRA Paper 69794.

Alpino, M., K. E. Hauge, A. Kotsadam, and S. Markussen (2022). Effects of dialogue meetings on sickness absence—evidence from a large field experiment. *Journal of Health Economics 83*, 102615.

Andersen, M., J. C. Maclean, M. F. Pesko, and K. Simon (2023). Does paid sick leave encourage staying at home? evidence from the united states during a pandemic. *Health Economics 32*(6), 1256–1283.

Bailey, M. J., T. S. Byker, E. Patel, and S. Ramnath (2019). The long-term effects of California's 2004 Paid Family Leave Act on women's careers: Evidence from U.S. tax data. Technical report. NBER Working Paper 26416.

Bana, S., K. Bedard, M. Rossin-Slater, and J. Stearns (2023). Unequal use of social insurance benefits: The role of employers. *Journal of Econometrics 233*(2), 633–660.

Barone, V. (2023). On the design of paid sick leave: A structural approach. Technical report. `https://viquibarone.github.io/baronevictoria/Barone_JMP.pdf`, retrieved July 23, 2023.

Basu, A. K., N. H. Chau, and R. Kanbur (2010). Turning a blind eye: Costly enforcement, credible commitment and minimum wage laws. *The Economic Journal 120*(543), 244–269.

Bauernschuster, S., P. Duersch, J. Oechssler, and R. Vadovic (2010). Mandatory sick pay provision: A labor market experiment. *Journal of Public Economics 94*(11), 870 – 877.

Baum, C. L. and C. J. Ruhm (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., E. Duflo, and M. Sendhil (2004). How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics 119*(1), 249–275.

Bloomberg BNA - Workplace Law Report (2018). *Airline group wants to stop Massachusetts sick leave law*. `https://convergenceapi.bna.com/`, retrieved April 19, 2019.

Boots, S. W., K. Martinson, and A. Danziger (2009). Employers' perspectives on San Francisco's paid sick leave policy. Technical report, The Urban Institute.

Brenøe, A. A., S. P. Canaan, N. A. Harmon, and H. N. Royer (2023). Is parental leave costly for firms and coworkers? *Journal of Labor Economics forthcoming*.

Bureau of Labor Statistics (2023a). *Employee Benefits in the United States, March 2023*. U.S. Department of Labor. `https://www.bls.gov/ebs/publications/september-2022-landing-page-employee-benefits-in-the-united-states-march-2022.htm`, retrieved April 15, 2024.

Bureau of Labor Statistics (2023b). *Handbook of Measures: National Compensation Measures*. `https://www.bls.gov/opub/hom/ncs/home.htm`, retrieved July 19, 2023.

Bureau of Labor Statistics (2023c). *National Compensation Survey*. https://www.bls.gov/ebs/publications/september-2022-landing-page-employee-benefits-in-the-united-states-march-2022.htm, retrieved July 19, 2023.

Bureau of Labor Statistics (2023d). *Paid Sick Leave, Paid Vacation, and Consolidated Leave Plan Provisions in the United States, December 2022*. U.S. Department of Labor. `https://www.bls.gov/ebs/notices/2023/paid-sick-leave-paid-vacation-and-consolidated-leave-plan-provisions-in-the-united-st htm`, retrieved April 15, 2024.

Busse, R. and M. Blümel (2014). Germany: Health system review. *Health Systems in Transition 16*(2), 1–296.

Callaway, B. and P. H. Sant'Anna (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics 225*(2), 200–230.

Callison, K. and M. Pesko (2022). The effect of paid sick leave mandates on access to paid leave and work absences. *Journal of Human Resources 57*(4), 1178–1208.

Card, D., J. Heining, and P. Kline (2013). Workplace heterogeneity and the rise of West German wage inequality. *The Quarterly Journal of Economics 128*(3), 967–1015.

Card, D., J. Kluve, and A. Weber (2017, 10). What works? A meta analysis of recent active labor market program evaluations. *Journal of the European Economic Association 16*(3), 894–931.

Cengiz, D., A. Dube, A. Lindner, and B. Zipperer (2019). The Effect of Minimum Wages on Low-Wage Jobs. *The Quarterly Journal of Economics 134*(3), 1405–1454.

Chetty, R. and A. Finkelstein (2013). Social insurance: Connecting theory to data. In *Handbook of Public Economics*, Volume 5, pp. 111–193.

Chunyu, L., P. F. Volpin, and X. Zhu (2022). Do paid sick leave mandates increase productivity? Technical report. Available at SSRN: https://ssrn.com/abstract=4096707orhttp://dx.doi.org/10.2139/ssrn.4096707.

Colla, C. H., W. H. Dow, A. Dube, and V. Lovell (2014). Early effects of the San Francisco paid sick leave policy. *American Journal of Public Health 104*(12), 2453–2460.

Commonwealth of Massachusetts (2019). *Massachusetts workplace poster requirements.* https://www.mass.gov/service-details/massachusetts-workplace-poster-requirements, retrieved April 19, 2019.

Cronin, C. J., M. C. Harris, and N. R. Ziebarth (2022). The anatomy of U.S. sick leave schemes: Evidence from public school teachers. Working Paper 29956, National Bureau of Economic Research.

Dahl, G. B. and A. C. Gielen (2021). Intergenerational spillovers in disability insurance. *American Economic Journal: Applied Economics 13*(2), 16–50.

Dahl, G. B., K. V. Løken, M. Mogstad, and K. V. Salvanes (2016). What is the case for paid maternity leave? *Review of Economics and Statistics 98*(4), 655–670.

Dale-Olsen, H. (2013). Absenteeism, efficiency wages, and marginal taxes. *Scandinavian Journal of Economics 115*(4), 1158–1185.

De Paola, M., V. Scoppa, and V. Pupo (2014). Absenteeism in the Italian public sector: The effects of changes in sick leave policy. *Journal of Labor Economics 32*(2), 337–360.

Fadlon, I. and T. H. Nielsen (2019). Household labor supply and the gains from social insurance. *Journal of Public Economics 171*(C), 18–28.

Fevang, E., I. Hardoy, and K. Røed (2017). Temporary disability and economic incentives. *The Economic Journal 127*(603), 1410–1432.

Fevang, E., S. Markussen, and K. Røed (2014). The sick pay trap. *Journal of Labor Economics 32*(2), 305–336.

Fischer, B., J. Geyer, and N. R. Ziebarth (2022). Fundamentally reforming the DI system: Evidence from german cohorts. Working Paper 30812, National Bureau of Economic Research.

Gilleskie, D. (2010). Work absences and doctor visits during an illness episode: The differential role of preferences, production, and policies among men and women. *Journal of Econometrics 156*(1), 148–163.

Gilleskie, D. B. (1998). A dynamic stochastic model of medical care use and work absence. *Econometrica 66*(1), 1–45.

Goerke, L. and M. Pannenberg (2015). Trade union membership and sickness absence: Evidence from a sick pay reform. *Labour Economics 33*(C), 13–25.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics 225*(2), 254–277.

Gruber, J. (1994). The incidence of mandated maternity benefits. *American Economic Review 84*(3), 622–641.

Hallter, A., S. Staubli, and J. Zweimüller (2023). Designing disability insurance reforms: Tightening eligibility rules or reducing benefits? *Econometrica forthcoming*.

Healthy Families Act (2023). *Senate Bill 1664, 118th United States Congress.* https://www.congress.gov/bill/118th-congress/senate-bill/1664/text, retrieved April 15, 2024.

Herrmann, M. A. and J. E. Rockoff (2012). Does menstruation explain gender gaps in work absenteeism? *Journal of Human Resources 47*(2), 493–508.

Hesselius, P., J. P. Nilsson, and P. Johansson (2009). Sick of your colleagues' absence? *Journal of the European Economic Association 7*(2-3), 583–594.

Heymann, J., H. J. Rho, J. Schmitt, and A. Earle (2010). Ensuring a healthy and productive workforce: Comparing the generosity of paid sick day and sick leave policies in 22 countries. *International Journal of Health Services 40*(1), 1–22.

H.R.6201 - Families First Coronavirus Response Act (2020). *116th United States Congress*. https://www.congress.gov/bill/116th-congress/house-bill/6201, retrieved April 3, 2020.

HuffPost/YouGov (2013). *Paid Sick Leave Supported By Most Americans, Poll Finds.* https://www.huffpost.com/entry/paid-sick-leave-poll_n_3471789? by Emily Swanson and Dave Jamieson, retrieved April 2, 2020.

Ichino, A. and G. Maggi (2000). Work environment and individual background: Explaining regional shirking differentials in a large Italian firm. *The Quarterly Journal of Economics 115*(3), 1057–1090.

Ichino, A. and E. Moretti (2009). Biological gender differences, absenteeism, and the earnings gap. *American Economic Journal: Applied Economics 1*(1), 183–218.

Ichino, A. and R. T. Riphahn (2005). The effect of employment protection on worker effort. A comparison of absenteeism during and after probation. *Journal of the European Economic Association 3*(1), 120–143.

Imbens, G. W. and J. M. Wooldridge (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature 47*(1), 5–86.

Industrial Commission of Arizona (2019). *Requirements for posters that employers must display.* https://www.azica.gov/posters-employers-must-display, retrieved April 19, 2019.

Jelliffe, E., P. Pangburn, S. Pichler, and N. R. Ziebarth (2021). Awareness and use of (emergency) sick leave: Us employees' unaddressed sick leave needs in a global pandemic. *Proceedings of the National Academy of Sciences 118*(29).

Johansson, P. and M. Palme (1996). Do economic incentives affect work absence? Empirical evidence using Swedish micro data. *Journal of Public Economics 59*(1), 195–218.

Johansson, P. and M. Palme (2002). Assessing the effect of public policy on worker absenteeism. *Journal of Human Resources 37*(2), 381–409.

Johansson, P. and M. Palme (2005). Moral hazard and sickness insurance. *Journal of Public Economics 89*(9-10), 1879–1890.

Johnson, M. S. (2020). Regulation by shaming: Deterrence effects of publicizing violations of workplace safety and health laws. *American Economic Review 110*(6), 1866–1904.

Jorgensen, H. and E. Appelbaum (2014). Expanding federal family and medical leave coverage: Who benefits from changes in eligibility requirements? CEPR Reports and Issue Briefs.

Kaczmarek, C. B. (2018). Massachusetts high court rules that sick pay does not constitute wages under state law. Technical report. https://www.littler.com/publication-press/publication/massachusetts-high-court-rules-sick-pay-does-not-constitute-wages, retrieved April 19, 2019.

Kanninen, O., P. Böckerman, and I. Suoniemi (2022). Income–well-being gradient in sickness and health. Technical report. Available at SSRN: https://ssrn.com/abstract=4137072.

Kolsrud, J., C. Landais, P. Nilsson, and J. Spinnewijn (2018). The optimal timing of unemployment benefits: Theory and evidence from Sweden. *American Economic Review 108*(4-5).

Kruth, R. (2018). *Michigan manufacturers say paid sick leave mandate could hurt job growth.* http://www.michiganradio.org/post/michigan-manufacturers-say-paid-sick-leave-mandate-could-hurt-job-growth, retrieved December 7, 2018.

Lalive, R., A. Schlosser, A. Steinhauer, and J. Zweimüller (2014). Parental leave and mothers' careers: The relative importance of job protection and cash benefits. *The Review of Economic Studies 81*(1), 219–265.

Lindemann, A. and K. Miller (2012). Paid time off: The elements and prevalence of consolidated leave plans. Technical report, Institute for Women's Policy Research. https://iwpr.org/publications/paid-time-off-the-elements-and-prevalence-of-consolidated-leave-plans/, retrieved October 19, 2018.

Maclean, J. C., S. Pichler, and N. R. Ziebarth (2021). Mandated sick pay: Coverage, utilization, and welfare effects. NBER Working Paper 26832, National Bureau of Economic Research.

Maestas, N., K. J. Mullen, D. Powell, T. von Wachter, and J. B. Wenger (2018). The value of working conditions in the United States and implications for the structure of wages. NBER Working Paper 25204.

Maestas, N., K. J. Mullen, and A. Strand (2013). Does disability insurance receipt discourage work? Using examiner assignment to estimate causal effects of SSDI receipt. *American Economic Review 103*(5), 1797–1829.

Marie, O. and J. Vall-Castello (2023). Sick leave cuts and (unhealthy) returns to work. *Journal of Labor Economics forthcoming*.

Markussen, S., K. Rød, and R. C. Schreiner (2018). Can compulsory dialogues nudge sick listed workers back to work? *Economic Journal 128*(610), 1276–1303.

Markussen, S. and K. Røed (2017). The market for paid sick leave. *Journal of Health Economics 55*(C), 244–261.

Massachusetts Attorney General's Office (2016). *Earned Sick Time in Massachusetts: Frequently Asked Questions*. www.mass.gov/ago/docs/workplace/earned-sick-time/est-faqs.pdf, retrieved December 7, 2017.

Miller, M. M. (2022). The impact of paid sick leave laws on consumer and business bankruptcies. *Journal of Empirical Legal Studies 19*(4), 844–896.

National Paid Sick Days Study (2010). *Paid sick days: Attitudes and experiences*. http://www.nationalpartnership.org/our-work/resources/workplace/paid-sick-days/paid-sick-days-attitudes-and-experiences.pdf, retrieved January 9, 2019.

National Partnership for Women and Families (2020). *Voters Show Bipartisan Support for Permanent Paid Sick Days and Paid Family and Medical Leave*. https://www.nationalpartnership.org/our-work/resources/economic-justice/voters-show-bipartisan-support-for-permanent-paid-sick-days-and-paid-family-and-medic pdf, retrieved November 2, 2021.

Nekoei, A. and A. Weber (2017). Does extending unemployment benefits improve job quality? *American Economic Review 107*(2), 527–61.

Nordberg, M. and K. Røed (2009). Economic incentives, business cycles, and long-term sickness absence. *Industrial Relations 48*(2), 203–230.

OECD (2010). *Sickness, Disability and Work: Breaking the Barriers*. https://www.oecd-ilibrary.org/content/publication/9789264088856-en, retrieved July 19, 2023.

OECD Policy Responses to Coronavirus (2020). *Paid sick leave to protect income, health and jobs through the COVID-19 crisis*. https://www.oecd.org/coronavirus/policy-responses/paid-sick-leave-to-protect-income-health-and-jobs-through-the-covid-19-crisis-a9e1a15 retrieved December 29, 2020.

Pichler, S., K. Wen, and N. R. Ziebarth (2020). Covid-19 emergency sick leave has helped flatten the curve in the United States. *Health Affairs 39*(12), 2197–2204.

Pichler, S., K. Wen, and N. R. Ziebarth (2021). Positive health externalities of mandating paid sick leave. *Journal of Policy Analysis and Management 40*(3), 715–743.

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

Pichler, S. and N. R. Ziebarth (2020). Labor market effects of U.S. sick pay mandates. *Journal of Human Resources 55*(2), 611–659.

Pichler, S. and N. R. Ziebarth (2024). Sick Leave and Medical Leave in the United States: A Categorization and Recent Trends. IZA Policy Papers 206, Institute of Labor Economics (IZA).

Powell, D. and S. Seabury (2018). Medical care spending and labor market outcomes: Evidence from workers' compensation reforms. *American Economic Review 108*(10), 2995–3027.

Raub, A., P. Chung, P. Batra, A. Earle, B. Bose, N. De Guzman Chorny, E. Wong, D. Franken, and J. Heymann (2018). Paid leave for personal illness: A detailed look at approaches across OECD countries. Technical report, WORLD Policy Analysis Center. https://www.worldpolicycenter.org/ retrieved February 10, 2020.

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

Sant'Anna, P. H. and J. Zhao (2020). Doubly robust difference-in-differences estimators. *Journal of econometrics 219*(1), 101–122.

Schmutte, I. M. and M. M. Skira (2024). The response of firms to maternity leave and sickness absence. *Journal of Human Resources*.

Schreyögg, J. (2004). Demographic development and moral hazard: Health insurance with medical savings accounts. *The Geneva Papers on Risk and Insurance - Issues and Practice 29*(4), 689–704.

Slopen, M. (2023). The impact of paid sick leave mandates on women's health. *Social Science & Medicine 323*, 115839.

Slopen, M. (2024). The impact of paid sick leave mandates on women's employment and economic security. *Journal of Policy Analysis and Management forthcoming*.

Song, J., D. J. Price, F. Guvenen, N. Bloom, and T. von Wachter (2019). Firming up inequality. *The Quarterly Journal of Economics 134*(1), 1–50.

Staubli, S. (2011). The impact of stricter criteria for disability insurance on labor force participation. *Journal of Public Economics 95*(9-10), 1223–1235.

Stearns, J. and C. White (2018). Can paid sick leave mandates reduce leave-taking? *Labour Economics 51*, 227–246.

Summers, L. H. (1989). Some simple economics of mandated benefits. *American Economic Review 79*(2), 177–183.

Susser, P. and N. R. Ziebarth (2016). Profiling the US sick leave landscape: Presenteeim among females. *Health Services Research 51*(6), 2305–2317.

Waldfogel, J. (1999). The impact of the Family and Medical Leave Act. *Journal of Policy Analysis and Management 18*(2), 281–302.

Ziebarth, N. R. (2013). Long-term absenteeism and moral hazard—Evidence from a natural experiment. *Labour Economics 24*, 277–292.

Ziebarth, N. R. and M. Karlsson (2010). A natural experiment on sick pay cuts, sickness absence, and labor costs. *Journal of Public Economics 94*(11-12), 1108–1122.

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

Figures and Tables

Figure 1: Number of Employees Covered by State-Level Sick Pay Mandates
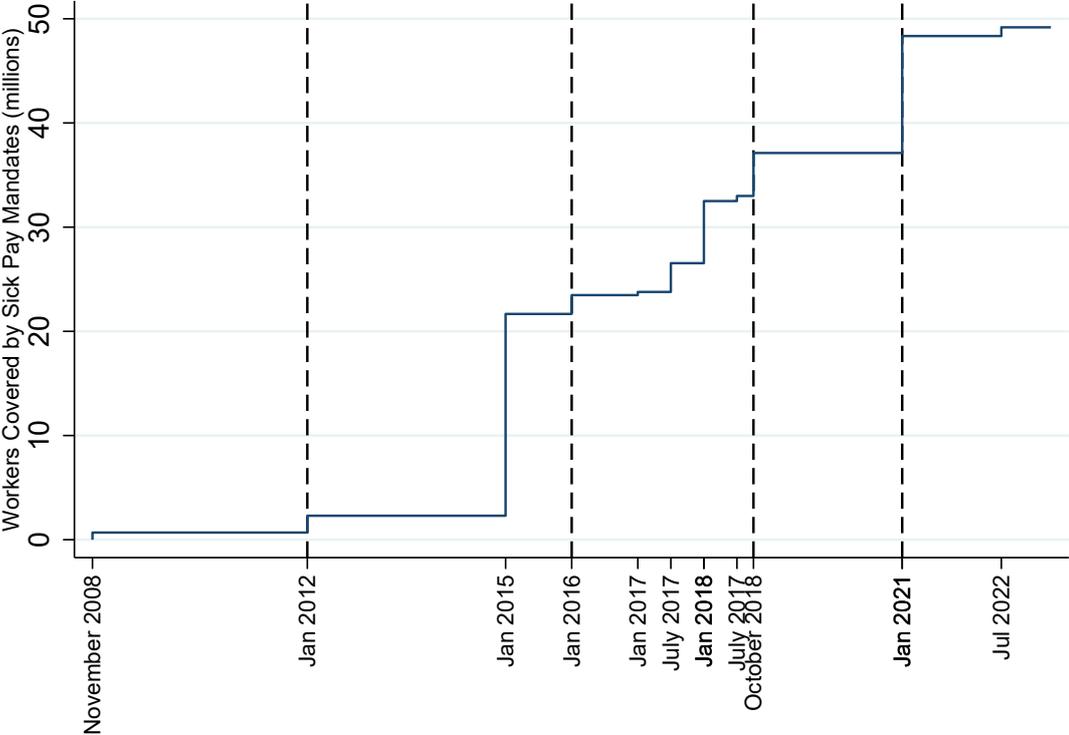
Source: Quarterly Census of Employment and Wages. Own data collection and illustration. The figure shows the number of private sector employees covered by sick pay mandates between 2009 and 2022 in D.C., Connecticut, California and Massachusetts, Oregon, Vermont, Arizona, Washington, Maryland, Rhode Island, New Jersey, and Michigan. Employees in city and county level jurisdictions with mandates are not included, and neither are they in our main models.

Figure 2: Event Studies from Difference-in-Differences Models
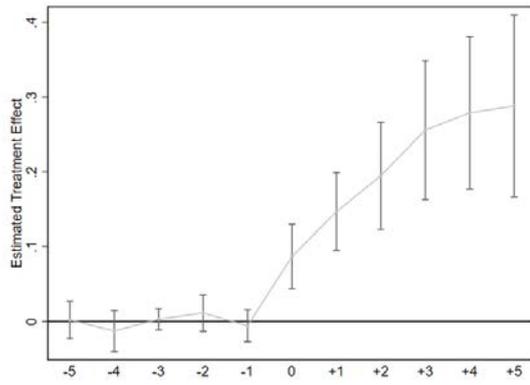
(a) Sick pay coverage
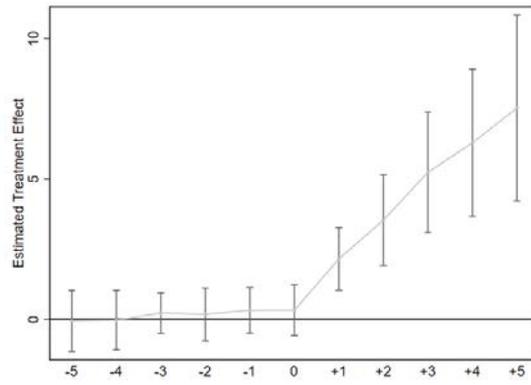
(b) Paid sick hours taken
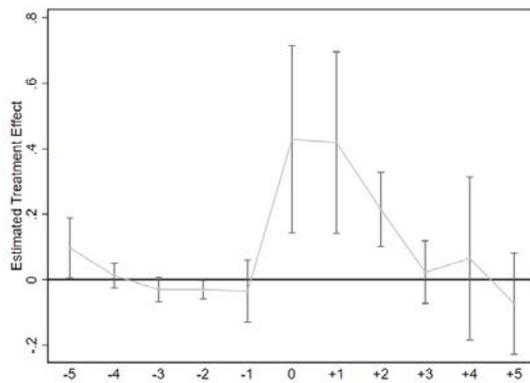
(c) Unpaid sick hours taken
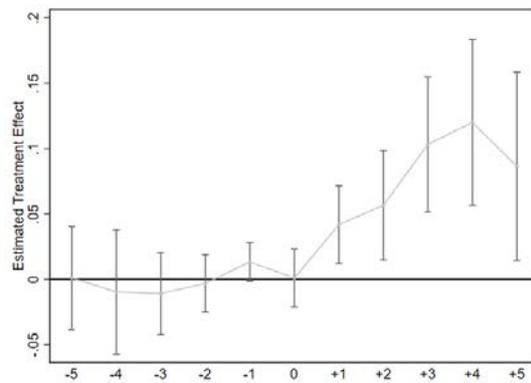
(d) Sick pay costs per hour worked

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 3: Coverage Effect Heterogeneity by Industry and Occupation
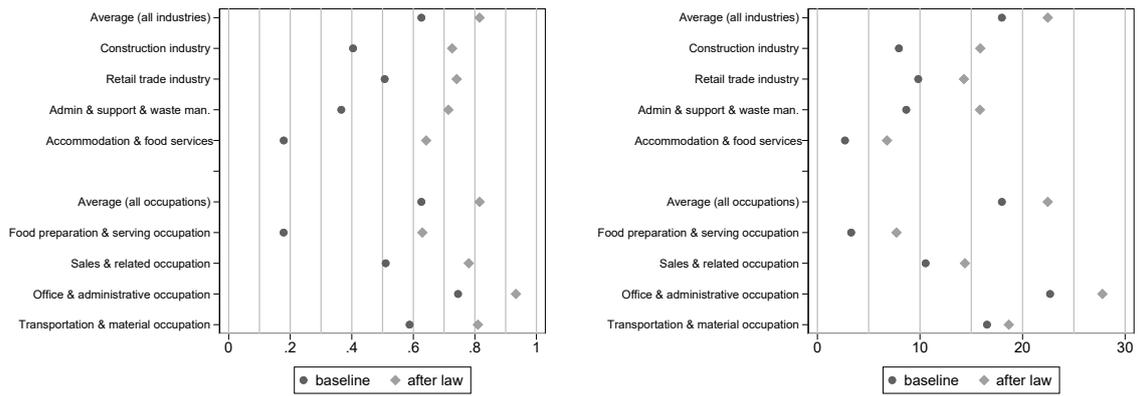
(a) Sick leave offered on job

(b) Paid sick hours taken
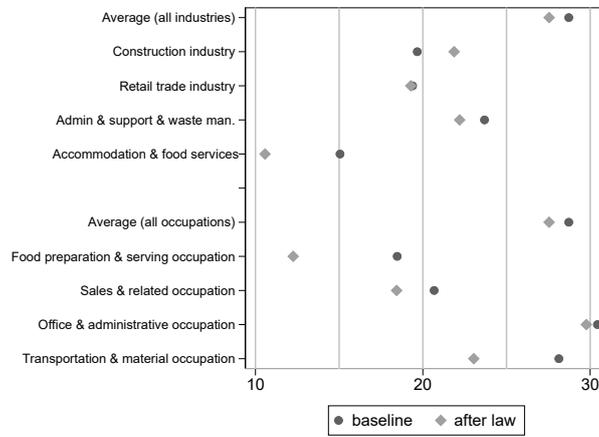
(c) Hours taken per job offering sick leave

Results with additional outcomes are in Table B1; event studies are in Figure 7. Industries and occupations are sorted by the weighted frequency of the biggest industries and occupations. That is why the average of the industries and occupations shown does not equal the sample average, please see Table 1 for the full list of industries and occupations. Figure c reports the ratio of b and a.

Figure 4: Effects on Inequality of Provision Within Firm

(a) Full-time   (b) Part-time
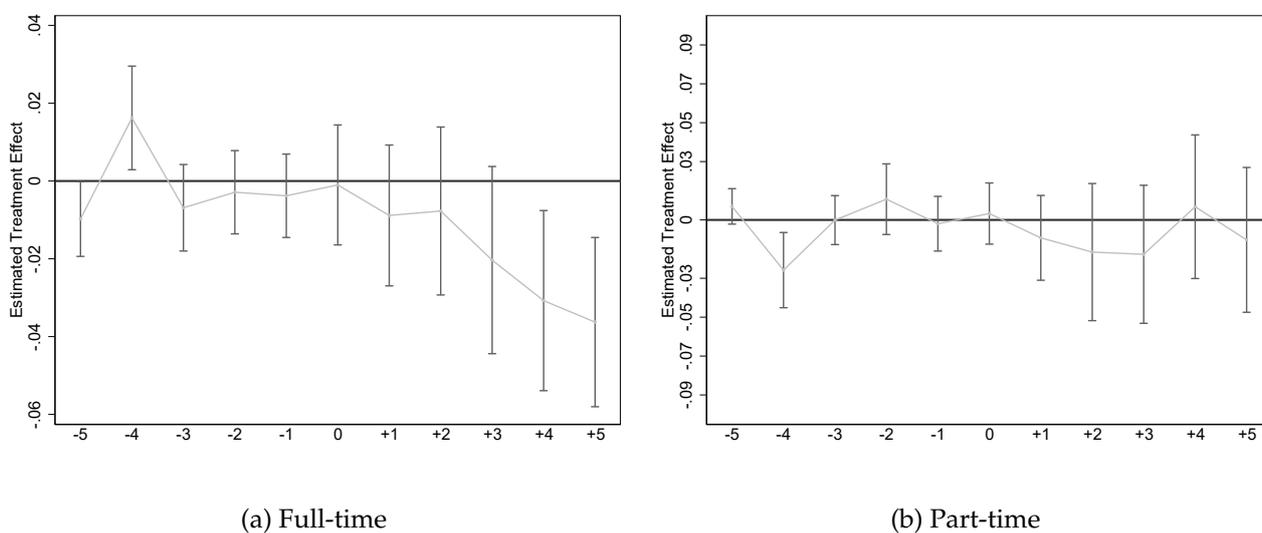
Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies where the outcome is whether sick pay is provided for some but not all full-time (a) or part-time (b) jobs in the firm. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 5: Event Studies: By Type of Job
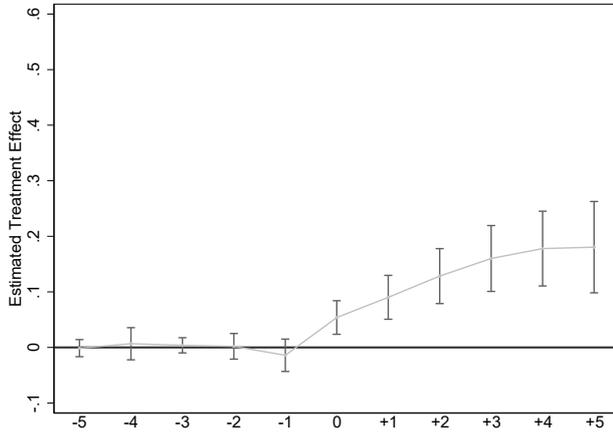
(a) Full-time job
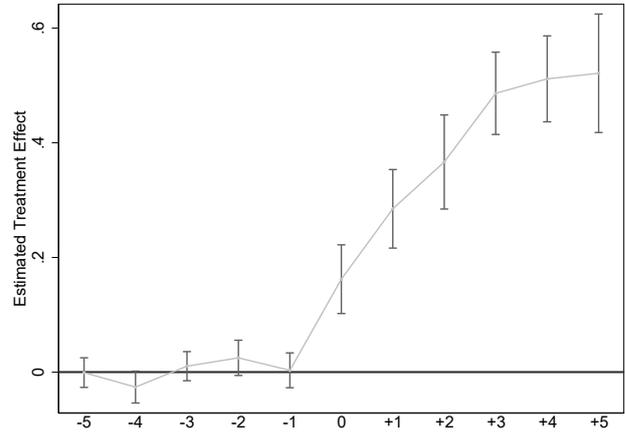
(b) Part-time job
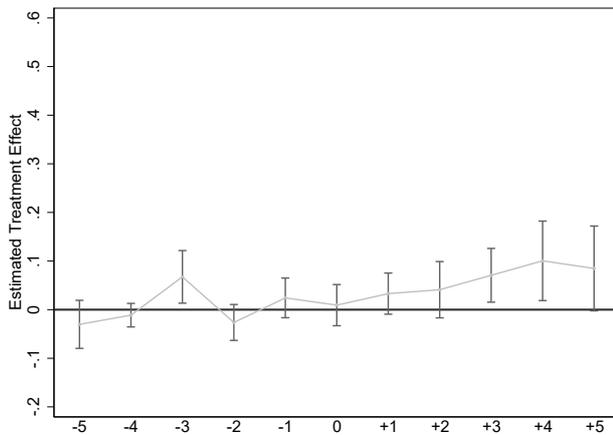
(c) Firm >500 employees
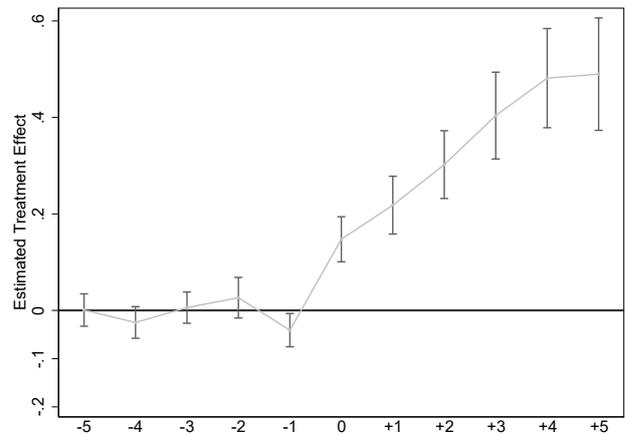
(d) Firm <50 employees

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies by type of job as indicated. When mandates exempt small firms, they are coded as such or dropped (see Table B6, Appendix). Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 6: Event Studies: By Type of Job (II)
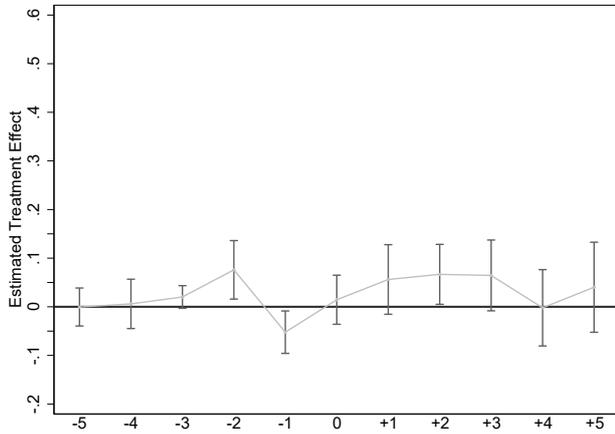
(a) Unionized
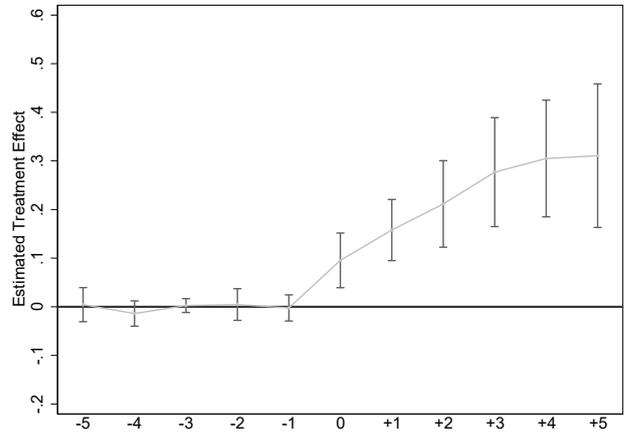
(b) Not unionized
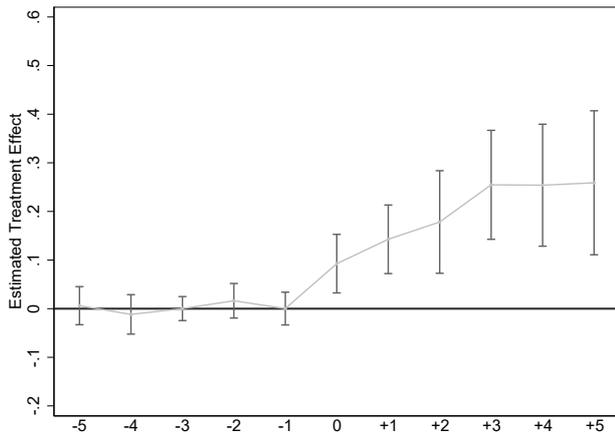
(c) Low college education
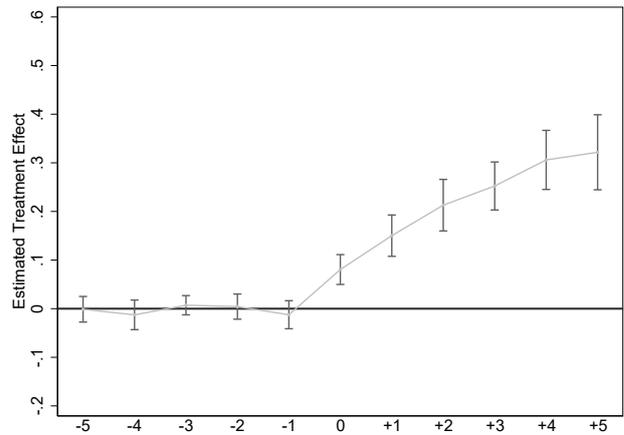
(d) High college education

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies by type of job as indicated. In subfigures c and d, the job is flagged according whether it has a below or above share of college educated employees. For this analysis, we rely on to 516 occupation-industry cells in the 2010 American Community Survey; those cell have identical classifications in the NCS. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 7: Event Studies: Select Industries and Occupations
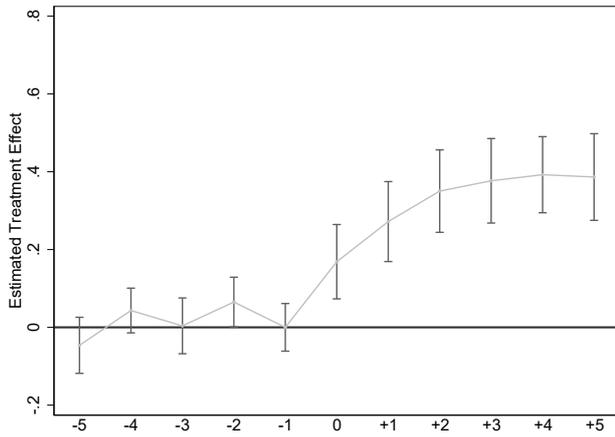
(a) Construction
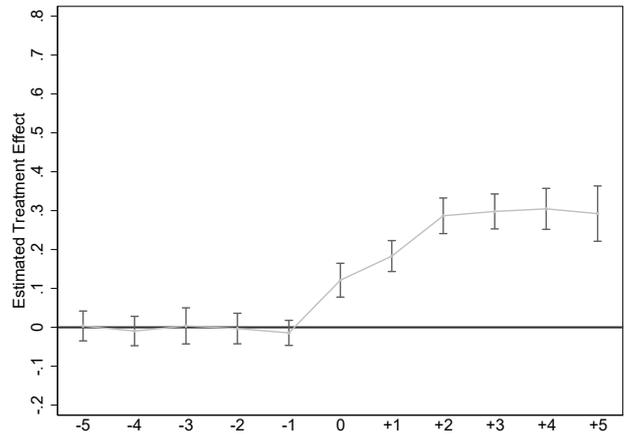
(b) Retail
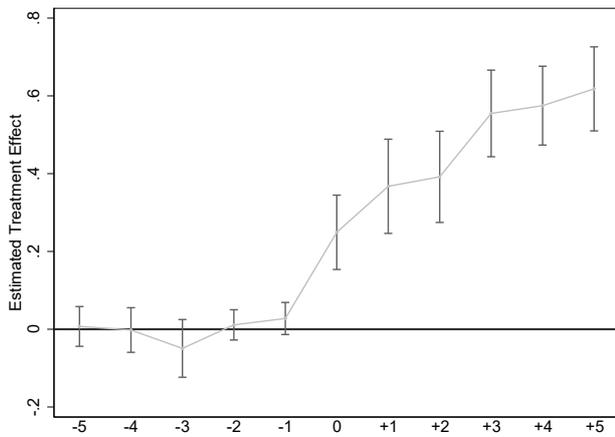
(c) Food Prep. & Serving
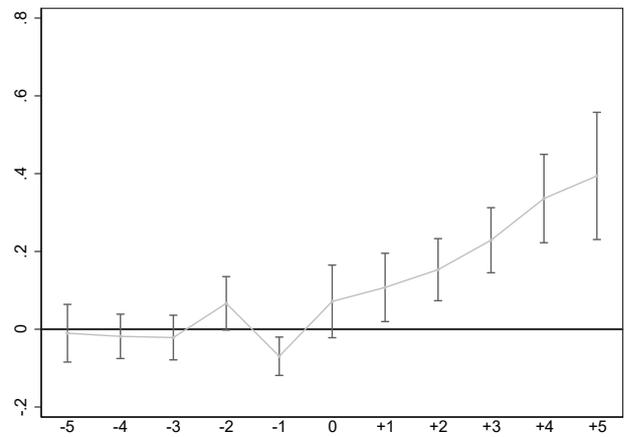
(d) Transportation & Material

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies by industries (a and b) and occupations (c and d) as indicated. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 8: Event Studies: Effects on Hours Worked, Overtime, Wages
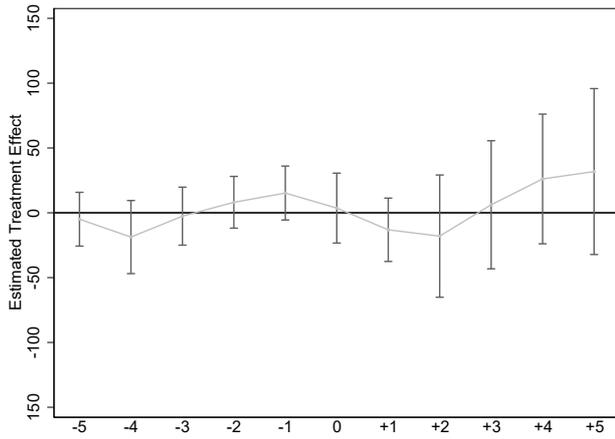

(a) Annual Hours Worked
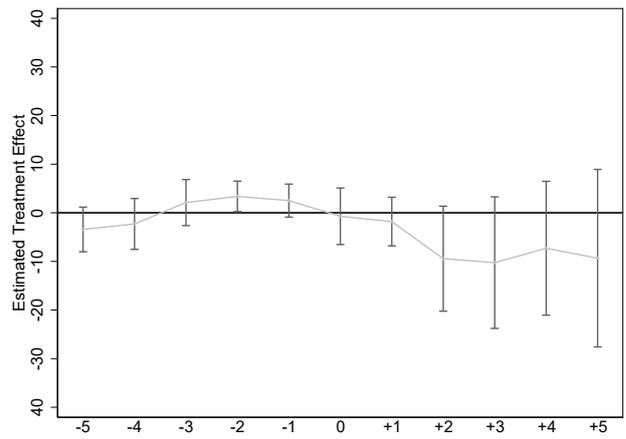
(b) Overtime Hours
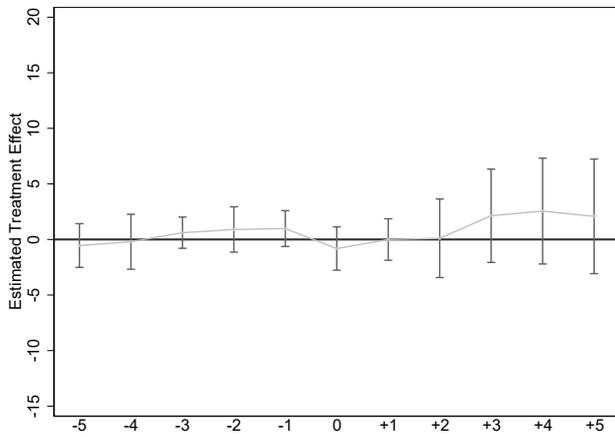
(c) Paid National Holiday Hours
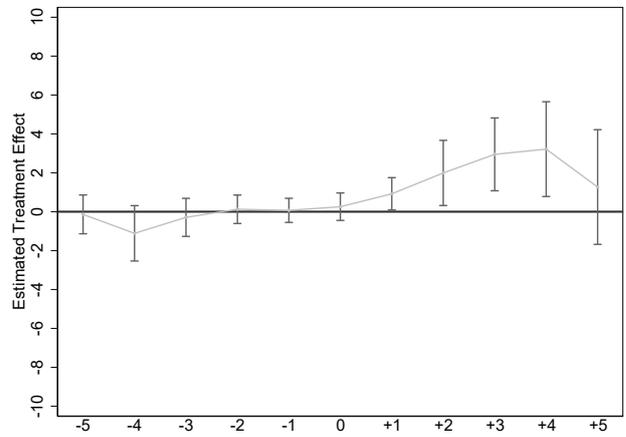
(d) Wages
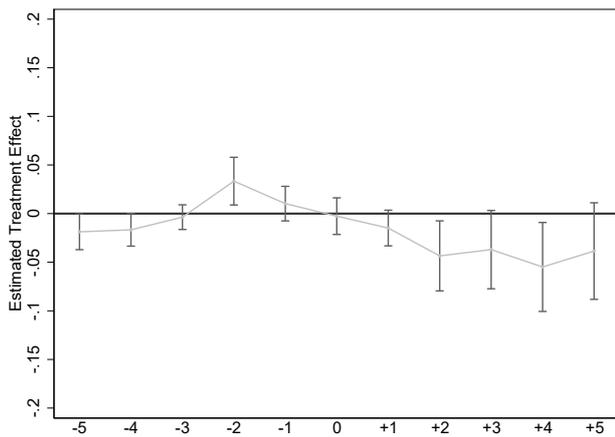
(a) Paid Time Off (PTO) Plan
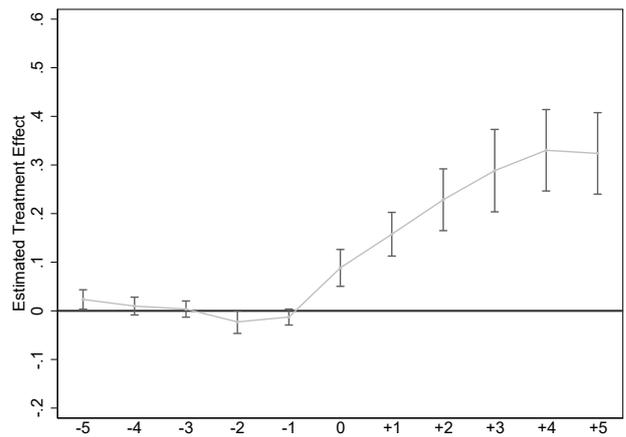
(b) Separate Sick Pay Plan

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies by industries (a and b) and occupations (c and d) as indicated. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Figure 9: Event Studies: Effects on Non-Mandated Benefits
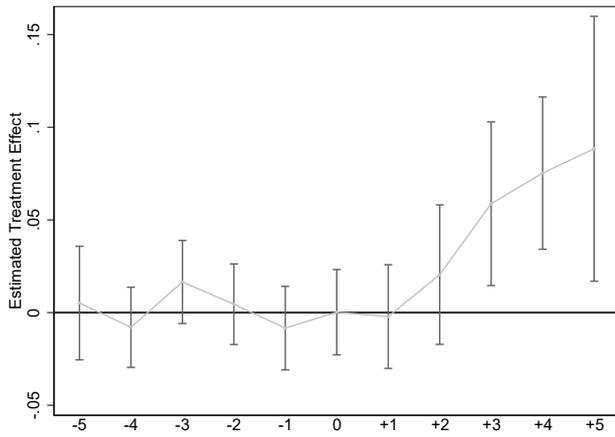
(a) Medical Insurance
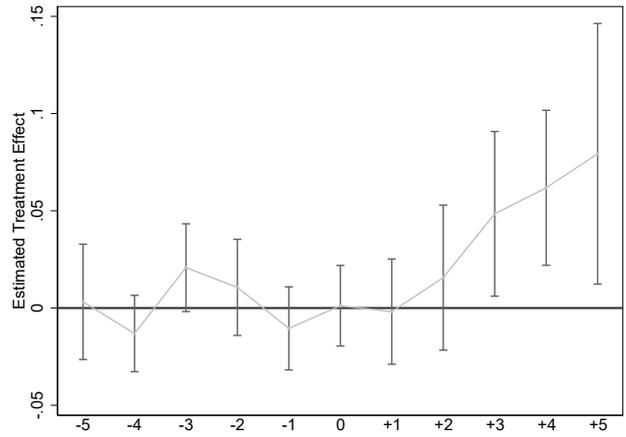
(b) Prescription Drug Insurance
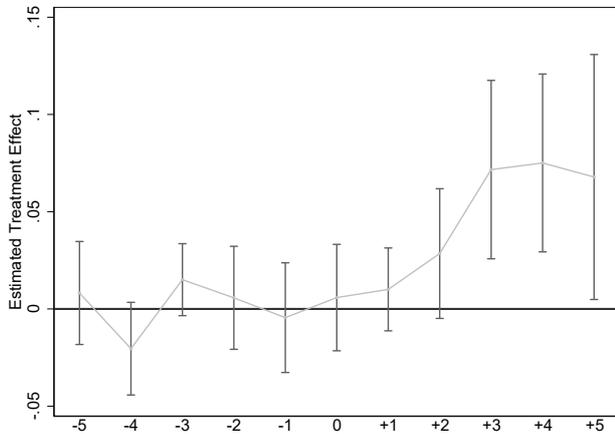
(c) Dental Insurance
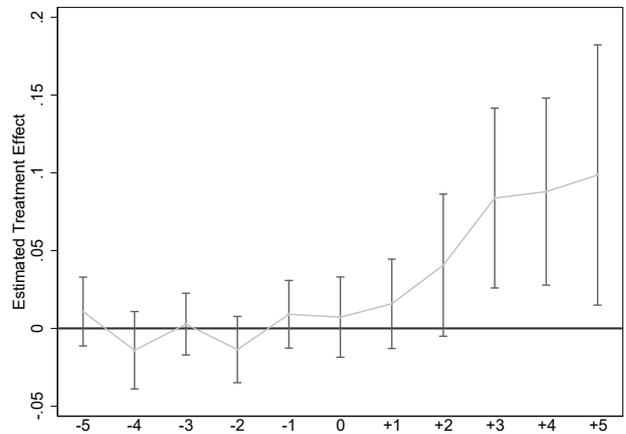
(d) Group Life Insurance
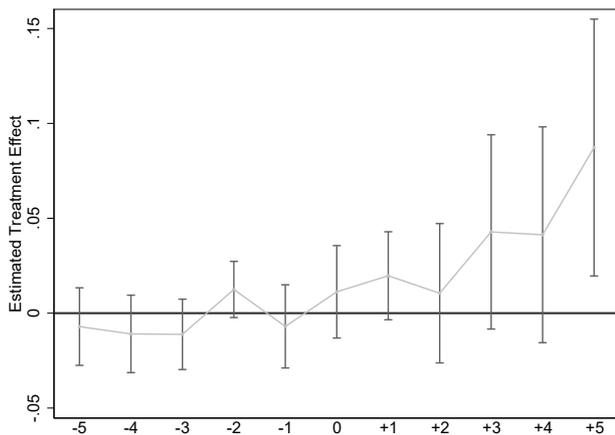
(e) Short-Term Disability Insurance
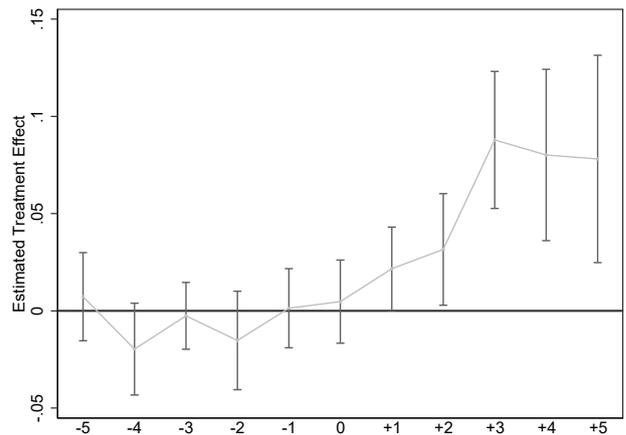
(f) Long-Term Disability Insurance

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies by industries (a and b) and occupations (c and d) as indicated. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects. For more information about the sick pay reforms, see Table A1.

Table 1: Descriptive Statistics, National Compensation Survey (NCS)

	All	Treated States, pre-mandate	Control States difference	Normalized
Main outcomes				
Sick leave offered (binary)	0.632	0.626	0.597	0.1618
Paid sick hours taken (hours p.a.)	16.79	17.99	15.42	0.1727
Unpaid sick hours taken (hours p.a.)	0.153	0.135	0.132	0.0007
Sick leave costs (per hour worked)	0.275	0.338	0.233	0.2129
Job characteristics				
Full-time employment (binary)	0.738	0.724	0.742	0.0061
Part-time employment (binary)	0.262	0.276	0.258	0.0061
Non-unionized (binary)	0.924	0.899	0.932	0.0775
Unionized (binary)	0.0757	0.101	0.0680	0.0775
Hourly wage (in $2022)	22.63	24.81	21.32	0.2032
Annual hours worked	1702.1	1665.5	1715.6	0.0916
Annual hours paid	1840.2	1804.7	1850.7	0.05948
Overtime hours paid	58.42	47.94	62.94	0.1199
Annual paid leave hours	138.0	139.2	135.1	0.0968
Other fringe benefits				
Paid vacation hours per year	68.73	68.64	67.73	0.0633
Paid national holiday hours per year	44.11	44.38	43.59	0.0678
Medical insurance offered (binary)	0.681	0.686	0.676	0.0325
Presc. drug insurance offered (binary)	0.668	0.673	0.663	0.0325
Dental insurance offered (binary)	0.418	0.475	0.395	0.1521
Life insurance offered (binary)	0.560	0.536	0.568	0.0014
Short-term disability offered (binary)	0.379	0.440	0.365	0.0494
Long-term disability offered (binary)	0.325	0.310	0.328	0.0323
Family leave offered (binary)	0.144	0.127	0.134	0.0441
Fixed paid sick time (binary)	0.369	0.396	0.324	0.1460
Consolidated sick plan PTO (binary)	0.221	0.181	0.228	0.0351
Health insurance cost per hour	2.393	2.588	2.271	0.1531
Non-production cost per hour	0.654	0.640	0.635	0.0355
Main occupations (by share)				
Office and administrative	0.162	0.170	0.160	0.0158
Sales and related	0.113	0.110	0.114	0.0303
Food preparation and serving	0.105	0.116	0.103	0.0216
Transportation and material	0.0829	0.0778	0.0856	0.0128
Production	0.0827	0.0674	0.0907	0.0984
Health practitioners and technicians	0.0614	0.0566	0.0628	0.0275
Installation, maintenance, and repair	0.0453	0.0385	0.0483	0.0386
Management	0.0432	0.0477	0.0405	0.0526
Main industries (by share)				
Healthcare and social assistance	0.163	0.158	0.162	0.0323
Retail trade	0.140	0.141	0.141	0.0066
Manufacturing	0.116	0.107	0.121	0.0792
Accommodation and food services	0.115	0.121	0.115	0.0195
Admin, support, waste mgmt; remed. services	0.0668	0.0633	0.0676	0.0015
Professional, scientific, technical services	0.0685	0.0804	0.0626	0.0351
Finance and insurance	0.0506	0.0483	0.0512	0.0081
Construction	0.0514	0.0489	0.0530	0.0240
Wholesale trade	0.0460	0.0478	0.0458	0
Transportation and warehousing	0.0433	0.0374	0.0453	0.0066
Firm size	623.0	664.0	584.1	0.0903
Observations	443740	92403	315079	

Source: National Compensation Survey , 2009-2017 (Bureau of Labor Statistics, 2023c), authors' calculations. Data are yearly and at the firm-job level; they are weighted by BLS provided weights. Minimum and maximum values not available due to data confidentiality reasons. According to BLS' definition, "medical insurance" is health insurance without drug coverage. The 'normalized difference' is calculated according to Imbens and

Table 2: Effect of Mandates on Coverage, Utilization and Labor Costs

Outcome	Sick leave offered		Paid sick hours taken		Unpaid sick hours taken		Sick leave costs per hour	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pretreatment mean:								
(in treated localities)	0.6262		17.9862		0.1354		0.3378	
Panel A								
Sick leave mandate	0.189***	0.202***	4.472***	3.906***	0.180***	0.172**	0.085***	0.062***
$(D_c \times T_t)$	(0.026)	(0.047)	(0.574)	(1.046)	(0.039)	(0.068)	(0.013)	(0.022)
year==2020	0.079***		2.812***		-0.214***		0.066***	
	(0.014)		(0.659)		(0.073)		(0.013)	
year==2021	0.085***		3.091***		-0.225***		0.058***	
	(0.014)		(0.711)		(0.075)		(0.012)	
year==2022	0.087***		2.982***		-0.217***		0.044***	
	(0.014)		(0.625)		(0.077)		(0.010)	
Year FE	X	X	X	X	X	X	X	X
Firm FE	X	X	X	X	X	X	X	X
Panel B								
Sick leave mandate	0.187***	0.198***	4.367***	3.630***	0.187***	0.182**	0.084***	0.058***
$(D_c \times T_t)$	(0.020)	(0.029)	(0.460)	(0.622)	(0.040)	(0.073)	(0.011)	(0.017)
Year FE	X	X	X	X	X	X	X	X
Firm FE	X	X	X	X	X	X	X	X
Employee controls	X	X	X	X	X	X	X	X
Panel C								
Sick leave mandate	0.096**	0.057**	1.309	0.713***	0.441**	0.223***	0.014	0.005
$(D_c \times T_t)$	(0.047)	(0.010)	(0.806)	(0.195)	(0.211)	(0.094)	(0.015)	(0.004)
Year FE	X	X	X	X	X	X	X	X
Firm-job FE	X	X	X	X	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c). FE=fixed-effects. Each uneven column in each panel stands for one Two-Way-Fixed Effects (TWFE) DD model as in Equation (1); each even column stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Employee controls: unionized job and part-time employment. Standard errors clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations. Firms below the firm size cutoff are coded as zero. See Table B6 for results after dropping these observations.

Table 3: Effect Heterogeneity of Mandates: By Firm and Type of Job

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean:				
(in treated localities)	0.6262	17.9862	0.1354	0.3378
Panel A: Full-time vs. part-time				
Full-time	0.128***	3.313***	0.071	0.046*
	(0.033)	(1.124)	(0.073)	(0.028)
Mean	0.7789	23.5940	0.1468	0.4327
Part-time	0.375***	4.196***	0.456***	0.080***
	(0.040)	(0.422)	(0.118)	(0.019)
Mean	0.2267	3.3119	0.1054	0.0895
Panel B: Union vs. non-union				
Union	0.035	0.491	-0.331	-0.056
	(0.038)	(2.385)	(0.283)	(0.126)
Mean	0.7523	26.5441	0.4262	0.6562
Non-Union	0.219***	4.293***	0.226***	0.077***
	(0.058)	(0.993)	(0.085)	(0.016)
Mean	0.6121	17.0272	0.1028	0.3021
Panel C: Large vs small employers				
Big firm (>500 employees)	0.059*	0.318	-0.224	-0.035
	(0.032)	(1.812)	(0.152)	(0.067)
Mean	0.8469	29.9609	0.1771	0.7022
Small firm (<50 employees)	0.339***	5.926***	0.405***	0.090***
	(0.043)	(0.611)	(0.144)	(0.017)
Mean	0.4844	11.7839	0.1584	0.1766
Panel D: High vs. lower educated employees				
Share with college > median	0.190***	3.198**	0.188*	0.058
	(0.061)	(1.625)	(0.100)	(0.039)
Mean	0.6349	19.4501	0.0837	0.4634
Share with college < median	0.214***	4.393***	0.149*	0.046***
	(0.024)	(0.646)	(0.088)	(0.009)
Mean	0.6349	19.4501	0.0837	0.4634

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations. All models control for year and state fixed-effects (FE). For event studies, please see Tables 5 and 6.

Table 4: Effect of Sick Leave Mandates on Non-Mandated Benefits

	Insurance plans				Disability		Family	Paid sick leave	
	health	presc. medic.	dental	life	short-term	long-term	leave	fixed	consolidated
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pretreatment mean: *(in treated localities)*	0.6863	0.6729	0.4753	0.5365	0.4404	0.3101	0.1268	0.3965	0.1806
Panel A									
Sick leave mandate	0.036*	0.029	0.037**	0.050**	0.034	0.047***	0.016	0.233***	-0.034**
	(0.019)	(0.018)	(0.017)	(0.025)	(0.021)	(0.016)	(0.011)	(0.038)	(0.015)
Year FE	X	X	X	X	X	X	X	X	X
Firm FE	X	X	X	X	X	X	X	X	X
Panel B									
Sick leave mandate	0.028**	0.022*	0.031**	0.045***	0.033**	0.041***	0.016*	0.230***	-0.034***
	(0.012)	(0.012)	(0.013)	(0.015)	(0.016)	(0.013)	(0.009)	(0.029)	(0.013)
Year FE	X	X	X	X	X	X	X	X	X
Firm FE	X	X	X	X	X	X	X	X	X
Employee controls	X	X	X	X	X	X	X	X	X
Panel C									
Sick leave mandate	0.001	0.003	0.002	0.002	0.003	-0.001	0.000	0.062***	-0.005***
	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.010)	(0.001)
Year FE	X	X	X	X	X	X	X	X	X
Sample Weights	X	X	X	X	X	X	X		
Firm-job FE	X	X	X	X	X	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations except for models (8) and (9) where we observe sick leave plans for 392,225 job year pairs. For event studies, please see Figure 9.

Online Appendix (not for publication)

Figure A1: Examples of Legally Required Employee Right Notifications

Left figure shows an earned sick time poster from Massachusetts (Commonwealth of Massachusetts, 2019). Right figure shows a general workplace poster that is compliant with notification requirements in Arizona (Industrial Commission of Arizona, 2019). The Arizona poster includes all labor laws that firms are required to post at the workplace in Arizona.

Table A1: Overview of State-Level Sick Pay Mandates in the U.S.

Region (1)	Law Passed (2)	Law Effective (3)	Content (4)
Washington D.C.	May 13, 2008	Nov 13, 2008	'qualified employees'; 1 hour of paid sick leave for every 43 hours, 90 days accrual period; up to 3 to 9 days depend. on Firm size; own sickness or family; no health care or restaurant employees
	Dec 18, 2013	Feb 22, 2014	extension to 20,000 temporary and tipped employees (retrosp. in Sep 2014)
Connecticut	July 1, 2011	Jan 1, 2012	full-time service sector employees at firms with >49 employees (20% of workforce); 1 hour for every 40 hours; up to 5 days; own sickness or family member, 680 hours accrual period (4 months)
California	September 19, 2014	July 1, 2015	all employees; 1 hour of paid sick leave for every 30 hours; minimum 24 hours; own sickness or family member; 90 days accrual period
Massachusetts	Nov 4, 2014	July 1, 2015	all employees at firms with >10 employees; 1 hour for every 40 hours; up to 40 hours; own sickness or family member; 90 days accrual period
Oregon	June 22, 2015	Jan 1, 2016	all employees at firms with >9 employees; 1 hour every 30 hours; 90 days accrual period; up to 40 hours; own sickness or family member
Vermont	March 9, 2016	Jan 1, 2017	employees w/ 18 hours/week & >20 weeks/year at firms with > 5 employees; 1 hour every 52 hours; up to 24 hours in 2017, 40 hours thereafter; own sickness or family member; underage employees and firms in first year exempt; some state employees & per diem employees in health care or long-term care facility exempt
Arizona	November 8, 2016	July 1, 2017	all employees; 1 hour for every 30 hours; up to 40 hours at firms with >14 employees, up to 24 hours <15 employees; own sickness or family member; firms can impose 90 day accrual period for new employees
Washington	Nov 8, 2016	Jan 1, 2018	all employees except those who are exempt from minimum wage law; 1 hour for every 40 hours; no cap but no more than 40 hours carry over; own sickness or family member; 90 day accrual for new employees
Maryland	Jan 12, 2018 (override veto by Governor)	Feb 11, 2018	employees w/ 12 hours/week at firms with > 14 employees (<15 employees 40 hours unpaid); 1 hour for every 30 hours; firms can cap at 64 hours accrual and 40 hours carry over; own sickness or family member, also for parental leave; certain groups exempt (e.g. temp. agency employees)
Rhode Island	Sept 28, 2017	July 1, 2018	all employees; 1 hour for every 35 hours; 24 hours in firms >17 (2018, 2019); 40 hours in firms >17 (2020+) own sickness or family member; 90-day accrual period;
New Jersey	May 2, 2018	Oct 28, 2018	all employees; 1 hour for every 30 hours up to 40 hours/year; per diem health care employees exempt own sickness or family member; 120 day accrual for new employees; preempts city laws

Overview of Employer Sick Pay Mandates in the U.S. (II)

Region (1)	Law Passed (2)	Law Effective (3)	Content (4)
Michigan	Dec 13, 2018 (weakened in lame duck session)	March 28, 2019	employees w/ 25 hours/week employed for 25 weeks at firms with > 49 employees; 1 hour for every 35 hours; government employees, certain railway and air carrier employees exempt; own sickness or family member; 90 day accrual for new employees
New York	April 3, 2020	Sep 30, 2020 (accrue) Jan 1, 2021 (take)	employees at firms with > 100 employees; up to 56 hours; <100 employees 40 hours (unpaid if <5 employees & < $1M in earnings); own sickness or family member; 1 hour per 30 hours of work; independent contractors and public employees exempt; accrual, use and bank can be limited to 48 hours
Colorado	July 14, 2020	immediately (covid-19) Jan 1 2021, Jan 1, 2022	all employees; 1 hour for every 30 hours; up to 48 hours p.a. supplemental sick leave when public health emergency; own sickness or family member; accrual, use and bank can be limited to 48 hours
New Mexico	April 1, 2021	July 1, 2022	all employees; some airline, railroad, government, tribe workers exempt; 1 hour for every 30 hours; own sickness or family member; use up to 64 hours p.a.
Minnesota	May 24, 2023	Jan 1, 2024	all employees with 80 hours/year; independent contractors exempt; building/construction exempt if covered by a CBA and clear waiver of requirements; 1 hour for every 30 hours; accrue and carry forward up to 80 hours; own sickness or family member

Source: A Better Balance (2024), own collection, own illustration. Note: Nevada (Jan 1, 2020), Maine (Jan 1, 2023), and Illinois (Jan 1, 2024) passed paid time off mandates, requiring employers to allow employees to accrue general paid time off, without specific reason.

Figure B1: Share of Jobs within Firms with Voluntary Sick Pay

Figure B2: Treatment vs. Control States: Unconditional Time Trends
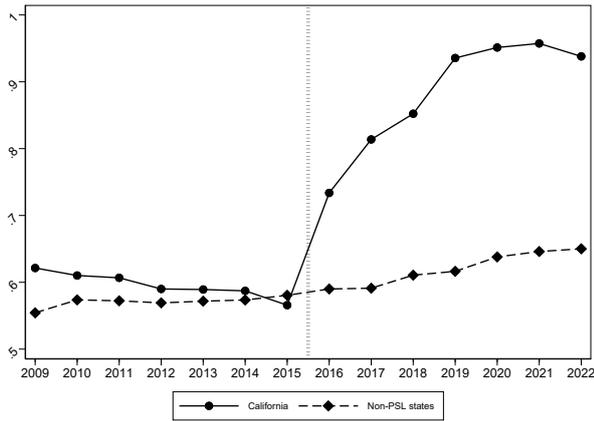
(a) California
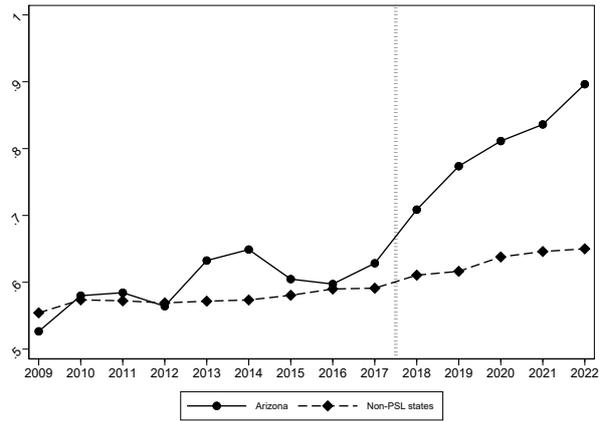
(b) Arizona
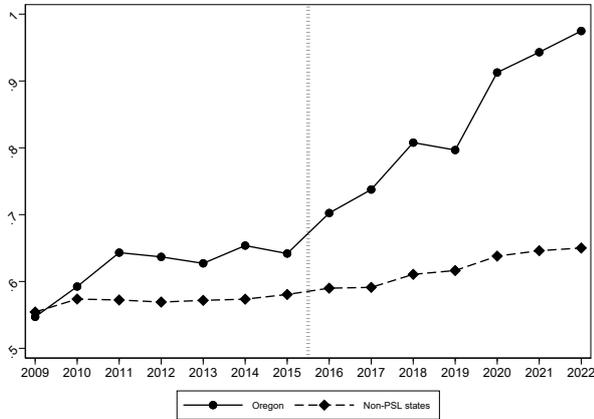
(c) Oregon
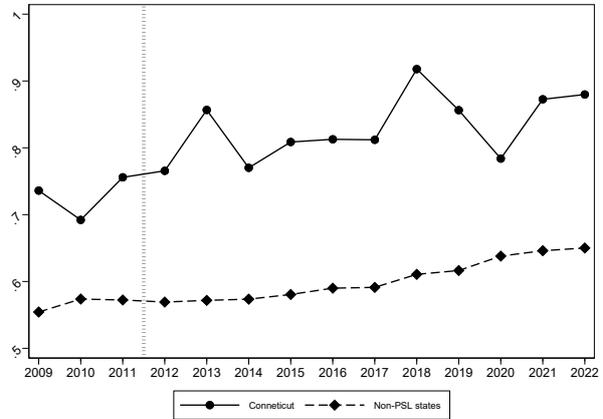
(d) Connecticut

Notes: NCS data from 2009-2022. All graphs show unconditional trends of the share of jobs with paid sick leave by year and treatment state as indicated vs. the group of states without mandates. For more information about the sick pay reforms, see Table A1.

Figure B3: Event Studies by Select Treatment States
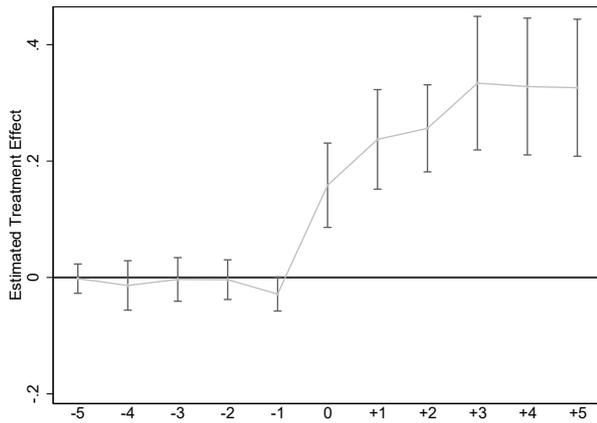
(a) California
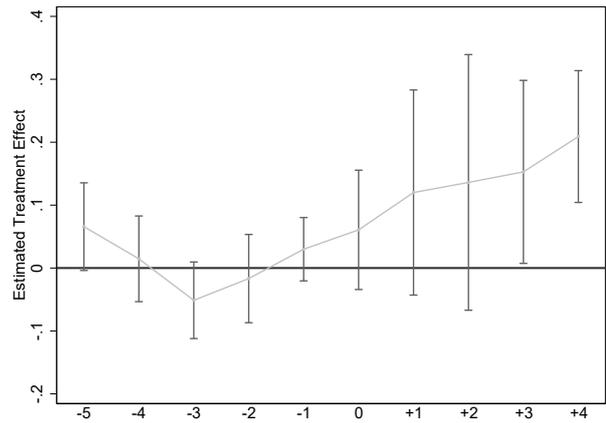
(b) Arizona
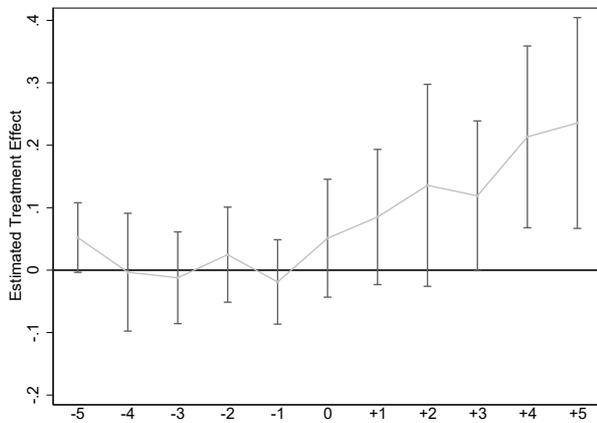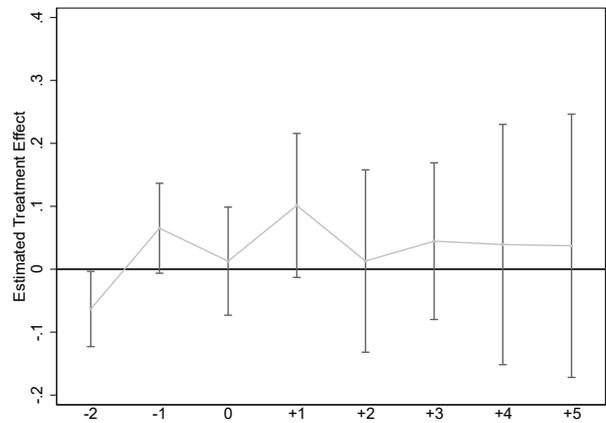
(c) Oregon

(d) Connecticut

Notes: NCS data from 2009-2022. All graphs show Callaway and Sant'Anna (2021) event studies. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event studies include year and firm fixed effects and only one treatment state as indicated (all other treated states are omitted). For more information about the sick pay reforms, see Table A1.

Figure B4: Event Studies Including Only States with Full Event Time
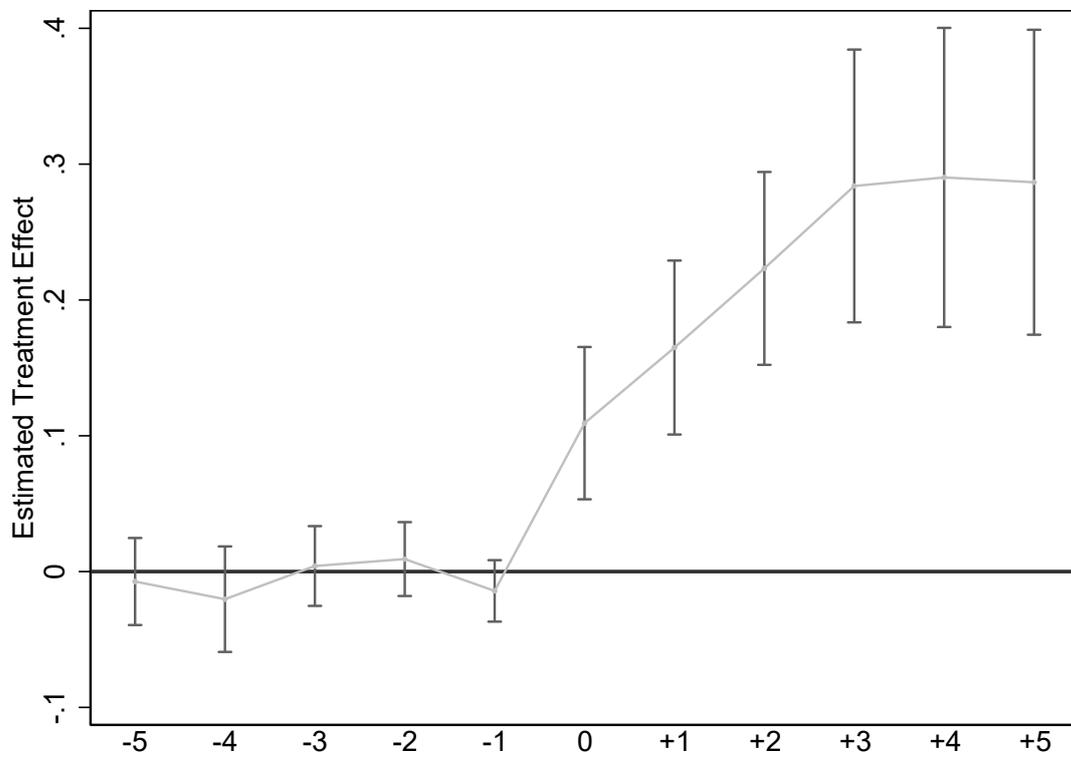
Source: National Compensation Survey (NCS) 2009-2017 (Bureau of Labor Statistics, 2023c). All graphs show Callaway and Sant'Anna (2021) event studies. Standard errors are clustered at the state level and the gray bars depict 95% confidence intervals. Event study includes year and firm fixed effects only and conditions on states with full event times, that is, up to and including Oregon, see Table A1.

Table B1: Effect Heterogeneity of Mandates: Industries and Occupations

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (5)
Pretreatment mean:				
(in treated localities)	0.6262	17.9862	0.1354	0.3378
Panel A: Industries				
Construction				
Sick leave mandate	0.322***	7.931***	0.591***	0.136***
	(0.048)	(0.940)	(0.175)	(0.017)
Mean	0.4041	7.9482	0.1346	0.1348
Retail trade				
Sick leave mandate	0.234***	4.456***	0.355***	0.048***
	(0.020)	(0.502)	(0.044)	(0.010)
Mean	0.5069	9.8275	0.1914	0.1082
Admin, support, waste mngmt., and remed. services				
Sick leave mandate	0.348***	7.182***	0.167	0.098***
	(0.058)	(1.457)	(0.161)	(0.017)
Mean	0.3658	8.6642	0.0032	0.1334
Accommodation and food services				
Sick leave mandate	0.463***	4.093***	0.724**	0.044***
	(0.059)	(1.415)	(0.344)	(0.011)
Mean	0.1788	2.6916	0.0379	0.0241
Panel B: Occupations				
Food preparation and serving				
Sick leave mandate	0.451***	4.417***	0.832**	0.044***
	(0.054)	(0.992)	(0.330)	(0.009)
Mean	0.1784	3.2949	0.0610	0.0307
Sales and related				
Sick leave mandate	0.270***	3.833***	0.305***	0.048***
	(0.033)	(1.062)	(0.070)	(0.016)
Mean	0.5102	10.5490	0.1066	0.1373
Office and administrative				
Sick leave mandate	0.188***	5.102***	0.013	0.049***
	(0.027)	(1.277)	(0.123)	(0.018)
Mean	0.7453	22.6839	0.1499	0.2695
Transportation and material				
Sick leave mandate	0.222***	2.126	-0.102	-0.075
	(0.040)	(1.937)	(0.232)	(0.106)
Mean	0.5878	16.5359	0.3230	0.3158

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors clustered at the state level and reported in parentheses. All models have different firm-job observations, depending on industry and occupation. All models control for year and state fixed-effects (FE). For event studies, please see Figure 7.

Table B2: Effect of Sick Pay Mandates on Hours Worked vs. on Paid Leave

	Annual hours			Total annual hours			Costs per hour		
	vacation (1)	holiday (2)	overtime (3)	worked (4)	paid leave (5)	paid (6)	wage (7)	health ins. (8)	non-production (9)
Pretreatment mean: *(in treated localities)*	68.6399	44.3836	47.9414	1665.4967	1804.7203	139.1737	24.8091	2.5877	0.6399
Panel A									
Sick leave mandate	5.048*	0.725	-5.396	1.076	11.073	10.042*	1.590*	0.206*	0.226**
	(2.698)	(1.838)	(6.344)	(22.286)	(26.297)	(5.484)	(0.850)	(0.107)	(0.096)
Year FE	X	X	X	X	X	X	X	X	
Firm FE	X	X	X	X	X	X	X	X	
Panel B									
Sick leave mandate	4.118***	0.062	-5.354*	-14.620**	-6.500	8.162***	1.391***	0.201***	0.202
	(1.364)	(0.748)	(3.237)	(6.403)	(6.370)	(2.272)	(0.496)	(0.064)	(0.169)
Year FE	X	X	X	X	X	X	X	X	
Firm FE	X	X	X	X	X	X	X	X	
Employee controls	X	X	X	X	X	X	X	X	
Panel C									
Sick leave mandate	0.233	-0.407***	-0.334	0.427	1.000	0.572*	0.091	-0.005	-0.013
	(0.275)	(0.120)	(0.350)	(0.764)	(0.810)	(0.313)	(0.074)	(0.014)	(0.015)
Year FE	X	X	X	X	X	X	X	X	
Sample Weights	X	X	X	X	X	X	X		
Firm-job FE	X	X	X	X	X	X	X	X	

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations. For event studies, please see Figure 8.

Table B3: Firm-Level Aggregation—Main Treatment Effects

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: *(in treated localities)*	0.7179	21.5191	0.1494	0.3987
Panel A				
Sick leave mandate	0.147***	2.907***	0.159***	0.042***
	(0.036)	(0.729)	(0.027)	(0.007)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Panel B				
Sick leave mandate	0.150***	2.892***	0.172***	0.044***
	(0.035)	(0.673)	(0.025)	(0.008)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Employee controls	X	X	X	X
Panel C				
Sick leave mandate	0.043***	0.598***	0.180***	0.004
	(0.012)	(0.199)	(0.064)	(0.004)
Year FE	X	X	X	X
Firm-job FE	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors are clustered at the state level and reported in parentheses. All models have 93,803 firm-year observations.

Table B4: County-Level Aggregation—Main Treatment Effects

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: (in treated localities)	0.6140	17.4594	0.0680	0.2952
Panel A				
Sick leave mandate	0.185***	3.588***	0.224***	0.055**
	(0.048)	(1.331)	(0.066)	(0.023)
Year FE	X	X	X	X
County FE	X	X	X	X
Panel B				
Sick leave mandate	0.183***	3.438***	0.231***	0.054**
	(0.043)	(1.095)	(0.064)	(0.021)
Year FE	X	X	X	X
County FE	X	X	X	X
Job controls	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' calculations. Yearly data at the county level. EEach cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. Standard errors are clustered at the state level and reported in parentheses. All models have 13,942 county-year observations.

Table B5: State-Level Aggregation—Main Treatment Effects

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: *(in treated localities)*	0.6012	16.8011	0.1121	0.2983
Panel A				
Sick leave mandate	0.158***	3.169**	0.147***	0.061***
	(0.038)	(1.280)	(0.056)	(0.021)
Year FE	X	X	X	X
State FE	X	X	X	X
Panel B				
Sick leave mandate	0.205***	3.280***	0.068	0.060**
	(0.050)	(1.259)	(0.104)	(0.025)
Year FE	X	X	X	X
State FE	X	X	X	X
Job controls	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' calculations. Yearly data at the county level. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. Standard errors are clustered at the state level and reported in parentheses. All models have 692 state-year observations.

Table B6: Dropping Employers below Firm Size Mandate Threshold

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: *(in treated localities)*	0.6302	18.2010	0.1384	0.3426
Panel A				
Sick leave mandate	0.203***	3.884***	0.171**	0.062***
	(0.046)	(1.033)	(0.073)	(0.023)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Panel B				
Sick leave mandate	0.199***	3.621***	0.181**	0.058***
	(0.029)	(0.631)	(0.076)	(0.017)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Employee controls	X	X	X	X
Panel C				
Sick leave mandate	0.057***	0.698***	0.224***	0.004
	(0.010)	(0.205)	(0.087)	(0.004)
Year FE	X	X	X	X
Firm-job FE	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' calculations. Yearly data at the county level. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. Standard errors are clustered at the state level and reported in parentheses. All models have 437,099 firm-job observations. Here, firms below the mandate firm-size threshold (for states that differentiate mandates by firm size, see Table A1) are dropped instead of assigned to the control group.

Table B7: Keeping only California and Untreated States

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: (*in treated localities*)	0.5954	16.9845	0.2474	0.3266
Panel A				
Sick leave mandate	0.278***	5.179***	0.134	0.076*
	(0.056)	(1.430)	(0.101)	(0.039)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Panel B				
Sick leave mandate	0.268***	4.535***	0.149	0.068**
	(0.034)	(0.784)	(0.105)	(0.031)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Employee controls	X	X	X	X
Panel C				
Sick leave mandate	0.100***	1.321***	0.372**	0.011*
	(0.018)	(0.345)	(0.146)	(0.007)
Year FE	X	X	X	X
Firm-job FE	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' own calculation and illustration. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights provided by the BLS. Standard errors are clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations.

Table B8: Using Not Yet Treated As Controls

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: (in treated localities)	0.6262	17.9862	0.1354	0.3378
Panel A				
Sick leave mandate	0.203***	3.958***	0.177***	0.066***
	(0.047)	(1.044)	(0.068)	(0.023)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Panel B				
Sick leave mandate	0.197***	3.651***	0.187**	0.062***
	(0.029)	(0.620)	(0.073)	(0.017)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Employee controls	X	X	X	X
Panel C				
Sick leave mandate	0.058***	0.729***	0.227**	0.005
	(0.010)	(0.195)	(0.095)	(0.004)
Year FE	X	X	X	X
Firm-job FE	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' calculations. Yearly data at the county level. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. Standard errors are clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations.

Table B9: Drop Covid-19 Years (2020-2022)

Outcome	Sick leave offered (1)	Paid sick hours taken (2)	Unpaid sick hours taken (3)	Sick leave costs per hour (4)
Pretreatment mean: *(in treated localities)*	0.6244	17.9040	0.1389	0.3371
Panel A				
Sick leave mandate	0.181***	2.415***	0.324***	0.046**
	(0.042)	(0.781)	(0.120)	(0.019)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Panel B				
Sick leave mandate	0.177***	2.168***	0.339***	0.044***
	(0.041)	(0.603)	(0.060)	(0.009)
Year FE	X	X	X	X
Firm FE	X	X	X	X
Employee controls	X	X	X	X
Panel C				
Sick leave mandate	0.069**	0.828**	0.270***	0.005
	(0.027)	(0.414)	(0.098)	(0.006)
Year FE	X	X	X	X
Firm-job FE	X	X	X	X

Source: NCS 2009-2022 (Bureau of Labor Statistics, 2023c), authors' calculations. Yearly data at the county level. Each cell stands for one Callaway and Sant'Anna (2021) model accounting for possible biases due to treatment dynamics and heterogeneity; ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. Standard errors are clustered at the state level and reported in parentheses. All models have 443,740 firm-job observations.