Potential Economic Benefits of Paid Sick Leave in Reducing Absenteeism Related to the Spread of Influenza-Like Illness

Abay Asfaw, PhD, Roger Rosa, PhD, and Regina Pana-Cryan, PhD

Objective: Most U.S. employers are not required to provide paid sick leave (PSL), and there is limited information on the economic return of providing PSL. We estimated potential benefits to employers of PSL in reducing absenteeism related to the spread of influenza-like illness (ILI). **Methods:** We used nationally representative data and a negative binomial random effects model to estimate the impact of PSL in reducing overall absence due to illness or injury. We used published data to compute the share of ILI from the total days of absence, ILI transmission rates at workplaces, wages, and other parameters. **Results:** Providing PSL could have saved employers $0.63 to $1.88 billion in reduced ILI-related absenteeism costs per year during 2007 to 2014 in 2016 dollars. **Conclusion:** These findings might help employers consider PSL as an investment rather than as a cost without any return.

Learning Objectives

- Discuss current access to paid sick leave (PSL) among US workers, and give examples of possible benefits to employers of extending PSL.
- Summarize the new estimates of the potential savings from reducing influenza-like like illness (ILI) in the workplace by providing PSL.
- Discuss the implications for talking to employers about considering PSL ''as an investment rather than a cost.''

Access to paid sick leave (PSL) varies widely across firm size, employment conditions, industries, and occupations. In the U.S., 64% of workers in the private sector and 90% of workers in the public sector had PSL in 2016.[1] Lower percentages were found in goods-producing industries, small-sized firms (1 to 99 employees), and construction, extraction, farming, fishing, and forestry occupations. The lowest percentages were found among part-time workers in the private sector (30%) and workers within the lowest 10% wage categories (27%).[1] Most U.S. employers are not required to provide PSL, which may contribute to this wide variation.[2] As of November 2016, there were seven states and 32 localities with enacted PSL days laws. See Appendix 1 for the details.

Employers might not provide PSL because they expect unmanageable financial burdens or suspect that PSL would be used by workers for other purposes.[3] Some empirical studies, however, have demonstrated some benefits of PSL to employers, workers, and society at large.[4–8] Review of this literature suggests several broad categories of potential benefits to employers from investing in PSL.

First, PSL can help reduce job turnover, which is a challenge for managers.[9–11] Studies have indicated that job turnover could cost employers between 25% and 200% of the annual salary of departing workers.[12–16] Cooper and Monheit[4] estimated that having PSL could help reduce job turnover by 3.61% to 6.43% based on the sex and marital status of workers.

A second benefit of PSL is reducing presenteeism, defined as being present at the job but performing at a reduced capacity due to illness or injury. Previous studies showed that presenteeism could lead to a reduction in the output of sick or injured workers and the output of coworkers if the sick or injured worker was part of a team at work.[17,18] Hemp[18] indicated that the cost of presenteeism for U.S. firms could have been over $150 billion in 2002. Providing PSL could help reduce the cost of presenteeism by allowing workers to get timely medical care and have quicker recovery at home. Long waiting times, inability to get off work, and being too busy with work and other commitments have been noted as major nonmonetary constraints for delayed and unmet medical care.[7]

Third, availability of PSL could help reduce the incidence of fatal and nonfatal workplace injury. Sickness or stress could impair the ability of workers to follow safety instructions or to make sound decisions, and this could increase their risk of suffering workplace injuries.[5,19–21] Asfaw et al[5] reported that workers with PSL were 28% less likely than workers without access to PSL to be injured at work.

Fourth, PSL could help workers and their family members receive timely preventive health care services. Lack of access to preventive services can lead to serious health complications and contribute to increased health care costs and employer-sponsored health insurance premiums. Peipins et al[6] reported that workers with PSL used preventive services, such as cancer screening, more frequently than workers without PSL. Using 2006 to 2010 data from the Medical Expenditure Panel Survey (MEPS), Wilson et al[7] showed that employers with PSL were more likely to be vaccinated against influenza [odds ratio (OR) = 1.42, confidence interval (CI): 1.31 to 1.53] than workers without PSL, resulting in reduced absence and medical costs.

Finally, PSL might help reduce absenteeism due to contagious diseases, which is the focus of this study. The economic implications of an outbreak of a contagious disease could be enormous to employers, employees, and society at large. Meltzer et al[22] estimated that the societal economic burden of an influenza pandemic would be $71.3 to $166.5 billion in 1995 dollars. Molinari et al[23] estimated the societal economic burden of seasonal influenza in the United States at $87.1 billion (95% CI: $47.2 to $149.5 billion) in 2003. Using 2010 Census data, Mao et al[24] reported that the median economic cost of seasonal influenza across 3143 U.S. counties was $2.47 million per county during that year.

Minimizing contact with infected individuals is one of the strategies for controlling the spread of influenza. The Centers for

From the Centers for Disease Control and Prevention (CDC) - National Institute for Occupational Safety and Health (NIOSH), Office of the Director, Economics Research and Support Office, Washington, District of Columbia (Drs Asfaw, Pana-Cryan), and Centers for Disease Control and Prevention (CDC) - National Institute for Occupational Safety and Health (NIOSH), Office of the Director, Washington, District of Columbia (Dr Rosa).

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Address correspondence to: Abay Asfaw, PhD, Economist, Centers for Disease Control and Prevention (CDC) - National Institute for Occupational Safety and Health (NIOSH), Office of the Director, Economics Research and Support Office, 395 E Streets, SW, Washington, DC 20201 (hqp0@cdc.gov).

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Disease Control and Prevention (CDC) recommends individuals with influenza-like illness (ILI) stay home (except when getting medical care) to minimize interpersonal contact until at least a day after their fever subsides.[25] Similarly, the Occupational Safety and Health Administration (OSHA) advises employers to encourage sick workers to stay home during the flu season.[26]

The ability and willingness of workers to stay home while sick partially depends on the availability of PSL. Lack of access to PSL could increase the probability that workers will work while sick, which exposes coworkers to contagious diseases that can magnify the problem of presenteeism and increase absenteeism. In a case–cohort study of New York State nursing homes, Li et al[27] found that the relative risk of nosocomial respiratory or gastrointestinal disease outbreaks was 38% lower in nursing homes with PSL policies than in nursing homes without such policies. Heymann et al[28] and Lord and King[29] indicated that access to PSL could help parents take care of their sick children at home. Parents without PSL are more likely to send their sick children to school or day care facilities, potentially spreading the disease to other children and workers.[28,30,31] The American Public Health Association indicated that employees who were not fully recovered from their H1N1 infection and went to work were associated with 7 million additional infections and 1,500 deaths during the 2009 H1N1 pandemic in the U.S.[32] Kumar et al[8] showed that providing PSL to all employees could help reduce the burden of absenteeism from the transmission of pandemic influenza in workplaces. DeRigne et al[33] showed that both full- and part-time workers without PSL were more likely to attend work while sick than their counterparts with PSL.

The present study provides preliminary estimates of some of the potential benefits to employers of PSL in reducing absenteeism related to the spread of ILI. Developing these estimates required synthesis of primary and secondary data and represents our attempt to inspire future improvements in available data.

DATA

We used the Medical Expenditure Panel Survey (MEPS), a comprehensive, in-person, and publically available survey of U.S families and individuals about their medical expenses, providers, and employers for our analysis. MEPS is a 2-year rotating panel of families and individuals based on the National Health Interview Survey (NHIS) sampling from a previous year to represent the U.S. civilian noninstitutionalized population. Each respondent is interviewed five times over 2 years. MEPS has been reviewed and approved by the Westat IRB, established under a multiproject assurance (MPA M-1531) granted by the Office for Protection from Research Risks.

We used MEPS data from 2007 to 2008 to 2013 to 2014 that included panels 12 through 18. Combining these seven panels enhanced our ability to analyze data on private sector workers and reduced the standard errors of our estimates.[34] We excluded respondents whose primary employment was in the military or public sector, because our focus was on the private sector and its employees. We also excluded self-employed individuals because there is no clear distinction among those with and those without PSL in that group. See Appendix 2 for details on each panel and excluded observations.

MEPS contains information on the availability of PSL, the number of days respondents were away from work due to illness or injury, as well as detailed personal and employer characteristics. All of the MEPS variables we used were self-reported, and we described them in Table 1. For variables in the longitudinal file that were not tracked over a full year, we used the last status in the first year (the third round of interviews, if the third round was fully completed in the first year of the survey, or the second round of interviews, if not) and the initial status in the second year (the third round of interviews, if the third round was fully completed in the second year, or the fourth round, if the third round was completed in the first year). For respondents with more than one job, we considered their main jobs. Respondents with missing observations in both years were dropped from the analysis. However, to reduce the number of missing respondents, if only 1 year's observation was missing, we used the value from the other year (same value in both years). This is a reasonable assumption because there were few changes in most of the variables between the first and the second periods. For instance, only 3.6% of the respondents with complete information had different PSL status in the two periods.

METHODS

We estimated the monetary benefit of PSL in reducing absenteeism from the spread of ILI by contagious workers according to following steps:

Step 1: Estimate the difference between workers with PSL and workers without PSL in number of days away from work due to illness or injury.

Data from MEPS panels 12 to 18 were used to examine the effect of PSL in reducing the number of days workers went to work while sick. MEPS does not contain specific information on the number of days respondents worked while they were sick, but it does contain information on the number of days respondents were away from work due to illness or injury. We used the difference in the number of days away from work due to illness or injury between workers with and without PSL to indicate the effect of PSL on number of days a worker without PSL went to work while sick.

To examine this effect, we specified the following model:

$$A_{it} = f(w_{it}, s_{it,} \mathrm{pe}_{it}, X_{it}, Z_{it}).$$

Where i and t represent worker and time, A represents the number of days away from work due to illness or injury, w represents the wage level, and h, s, and pe are indicator variables taking a value of 1 if the worker has employer-sponsored health insurance, PSL, and a pension plan, respectively, and 0 otherwise; X is a vector of individual and family-level indicators that might affect the number of days a worker could be absent from work due to illness or injury. We identified the following individual and family-level variables that might affect the number of days away from work due to illness or injury: age, sex, ethnicity/race (non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic Asian, non-Hispanic others), college education (2 years college education and above), obesity (BMI $\geq$ 30), self-reported physical health status, self-reported mental health status, diabetes diagnosed by health professionals, marital status (married, never married, divorced or separated, widowed), family size, and family annual income. Z is a vector of other workplace characteristics, including union membership, industry (10 categories), and region (four categories). To account for a potential nonlinear relationship between days of absence and age, we included an age-squared variable in the regression. We also log-transformed family income to reduce skewness in the distribution of that variable.

Because the number of days away from work is a frequency variable, we used a negative binomial random effects model to estimate the equation. We used a random effects instead of a fixed effects model because most of our variables do not vary within a year and dropping variables during the fixed effects demeaning process (ie, subtracting the mean) would decrease the efficiency of our results due to lost information. At the same time, as indicated by Gardner,[35] the fixed effects demeaning process could magnify measurement errors. We did not expect any selection bias in our specification because the decision to be absent from work due to illness or injury would not affect the likelihood of having PSL. We estimated the number of days a worker went to work while sick due to lack of PSL using the marginal coefficient of the PSL variable from the negative binomial random effects model. We used STATA[36] version 14 (Stata Corp LP, College Station, TX) to

TABLE 1. Descriptive Statistics of Variables* used from Medical Expenditure Panel Survey (MEPS): Panel 12 (2007/2008) to Panel 18 (2013/2014)

Variable	Without PSL	With PSL	Overall
Total number of observations	31,562	39,682	71,244
Total number of observations per year (weighted)	45,142,857	69,636,232	114,779,089
Number of days absent from work due to illness or injury/year (mean)	2.1	2.9	2.6
Male (%)	47.5	51.3	49.8
Age (mean)	38.4	43.3	41.4
Ethnicity/Race (%)			
Non-Hispanic white	62.6	70.2	67.2
Non-Hispanic black	10.8	10.8	10.9
Hispanic	20.4	11.0	14.7
Non-Hispanic Asian	3.9	6.0	5.1
Non-Hispanic others	2.2	2.0	2.1
Two years or more college education (%)	32.7	61.4	50.2
Marital status (%)			
Married	43.9	61.8	54.8
Never married	40.9	22.2	29.5
Divorced or separated	13.2	14.4	13.9
Widowed	2.1	1.6	1.8
Obese [body mass index (BMI) $\geq$ 30] (%)	28.0	31.1	29.9
Diabetes status: (self-reported as diagnosed by a health professional) (%)	4.7	5.0	4.9
Poor or fair self-reported physical health status (%)	8.5	6.3	7.2
Poor or fair self-reported mental health status (%)	4.9	3.3	3.9
Family size (mean)	2.8	2.7	2.7
Annual family income (mean)	$60,260	$87,891	$77,048
Number of hours worked/week (mean)	33.1	42.0	38.5
Hourly wage in 2016 (mean)	$15.29	$25.86	$21.81
Have more than one job (%)	7.7	7.0	7.2
Member of a union (%)	5.9	13.5	10.5
Have access to employer-sponsored health insurance (%)	59.3	95.4	81.4
Have access to employer-sponsored pension plan (%)	18.5	75.0	52.7
Industry (%)			
Natural resources	1.9	0.5	1.0
Mining	0.4	0.5	0.5
Construction	8.9	3.3	5.5
Manufacturing	11.0	12.5	12.0
Wholesale and retail trade	17.0	12.8	14.4
Transportation and utilities	4.5	5.8	5.3
Services	38.5	30.2	33.5
Education, health, and social services	17.4	33.7	27.3
Public administration	0.3	0.3	0.3
Other	0.2	0.3	0.2
Region (%)			
Northeast	15.8	19.7	18.2
Midwest	25.1	22.5	23.5
South	36.1	36.2	36.1
West	23.1	21.7	22.2

PSL, paid sick leave.
*All variables in this table were self-reported.

estimate the negative binomial random effects model. The descriptive statistics are adjusted for weight, strata, and the primary sampling unit (PSU) of MEPS. The negative binomial random effects model does not allow for weight, strata, and PSU adjustments. However, we tested the sensitivity of our results to not adjusting for these sampling procedures by considering the MEPS data as nonpanel and estimating two negative binomial models with and without adjustment to weight, strata, and PSU. The coefficients of the variables in these two models were very similar in sign, significance level, and magnitude.

Step 2: Calculate the subset of days a worker went to work while suffering from ILI from the total number of sick-at-work days derived in step 1.

O'Reilly and Stevens[37] indicated that ILI could account for 10% to 12% of all sickness-related absence from work. Therefore, we multiplied the number of days a worker went to work while sick (from Step 1) by 10% to 12% to estimate the number of days a worker without PSL went to work while contagious.

Step 3: Calculate the number of coworkers who would be infected by a worker without PSL based on days at work while sick with ILI.

We could not find a study that directly examined the rate of ILI transmission at the workplace. Consequently, we adapted a method developed by researchers from Emory University and CDC that estimated the pandemic influenza transmission rate per 1 minute of contact for various age groups of infected and susceptible persons.[38] On the basis of their model, the working-age (19 to 64) adult-to-adult transmission probability per 1 minute of contact was 0.00032. We adjusted this transmission rate to 0.00026 based on the average number of workers vaccinated against influenza[39] and the average effectiveness of influenza vaccination[40] during our study period. Lovell[41] assumed that a typical worker would have contacts with five coworkers per day. We also used a lower number of daily contacts with three coworkers for a more conservative estimate. We used these contact numbers and the adjusted transmission rate to estimate the average number of coworkers a contagious worker without PSL would infect while at work.

Step 4: Calculate the average number of workdays lost due to ILI by multiplying the average number of coworkers infected by a worker without PSL by the average number of workdays missed due to ILI.

We multiplied this number by the average number of workers without PSL to estimate the total number of coworkers who could be infected. Employees with ILI missed an average of 2 to 6.5 workdays per year.[42–45] We used a minimum of 2 and an average of 3 workdays lost per year to estimate the total number of workdays lost due to ILI spread by workers without PSL.

Step 5: Calculate monetary benefit.

We multiplied the total number of workdays missed due to ILI by the average productivity of workers to estimate the monetary benefits of PSL to employers in reduced absenteeism costs from ILI. We used the MEPS average hourly wage rate between 2007 and 2014 as an indicator of productivity. In MEPS, all hourly wage rates above $78 were recorded as $78. This might underestimate our average hourly wage estimate. We converted the average yearly wages to 2016 dollars using the U.S. consumer price index (Available at: https://www.bls.gov/cpi/data.htm).

RESULTS

Table 1 presents descriptive statistics of the variables used in the analysis stratified by access to PSL. The average number of workers without PSL during the study period was 45.1 million per year. This implies that 39.46% of workers in our data did not have access to PSL during 2007 to 2014, which is very similar to the 39.13% of private sector workers without PSL reported by BLS during the same period. The average daily wage rate in our data was $171 in 2016 dollars.

Table 2 presents incidence rate ratios (IRRs) derived from the coefficients of the negative binomial random effects regression model. Controlling for covariates in the model, the incidence rate of days away from work due to illness or injury was 32% higher for workers with PSL than workers without PSL. Most of the covariates took the expected sign and were statistically significant. The incidence rate of days away from work due to illness or injury was higher for women, workers with college education, and workers with more than one job. Compared with non-Hispanic white workers, the incidence rate of absence for other racial and ethnic groups was relatively low. Obesity, diabetes, self-reported poor physical health, and self-reported poor mental health increased the incidence rate of absence due to illness or injury. Workers with access to employer-sponsored health insurance and pension plan, and workers who were members of unions, also had higher incidence rates of absence due to illness or injury. Divorced or separated workers were more likely, and never married workers less likely, to be absent from work than married workers, the reference category. Compared with workers in the services industry, the reference category, workers in the manufacturing and construction industry had lower incidence of absence from work due to illness or injury. Workers in the West and Midwest regions of the country had higher incidence of absence than workers in the Northeast region, the reference category.

We predicted the number of days workers were away from work due to illness or injury by assuming that random effects were zero in the negative binomial random effects regression. Results showed that workers with PSL spent an average of 4.58 days away from work per year due to illness or injury, while workers without PSL spent 3.48 [or 1.10 fewer (95% CI: 0.90 to 1.30)] days away from work, controlling for all covariates in the model. Assuming 10% to 12% of days absent due to ILI, 0.026% transmission rate (adjusted for flu vaccination and vaccination effectiveness rate), and an average daily contact of three to five coworkers, a worker at work due to lack of PSL could infect on the average 0.0405 to 0.0810 coworkers per year. Assuming 2 to 3 days lost due to ILI per year, an average daily wage of $171, and 45.1 million workers without PSL per year, this implies that expanding PSL to workers without PSL could save employers $0.63 to $1.88 billion per year in 2016 dollars in reduced absenteeism costs from ILI. See Appendix 3 for the details.[38–42,45–47]

TABLE 2. Incidence Rate Ratios (IRRs) for the Effect of Paid Sick Leave and Covariates on the Number of Days Absent from Work: Random Effects Negative Binomial Regression from the Medical Expenditure Panel Survey (MEPS): Panel 12 (2007/2008) to Panel 18 (2013/2014)*

Variable†	IRR	95% CI
Paid sick leave (PSL)	1.32[a]	[1.27–1.37]
Sex (male = 1)	0.68[a]	[0.66–0.71]
Age	0.99[c]	[0.99–1.00]
Age squared	1.00	[1.00–1.00]
Race (Ref. Non-Hispanic white)		
Non-Hispanic black	0.84[a]	[0.66–0.72]
Hispanic	0.69[a]	[0.80–0.87]
Non-Hispanic Asian	0.68[a]	[0.64–0.72]
Non-Hispanic others	1.07	[0.98–1.18]
Two years or more college education	1.04[b]	[1.01–1.08]
Marital status (Ref. Married)		
Never married	0.89[a]	[0.85–0.93]
Divorced or separated	1.10[a]	[1.06–1.15]
Widowed	1.08	[0.97–1.21]
Obese (body mass index ≥ 30)	1.18[a]	[1.14–1.22]
Diabetic	1.26[a]	[1.18–1.33]
Poor or fair physical health	2.18[a]	[2.08–2.28]
Poor or fair mental health	1.42[a]	[1.33–1.50]
Family size	0.92[a]	[0.91–0.93]
Ln annual family income	0.96[a]	[0.93–0.98]
Number of hours worked per week	1.00	[1.00–1.00]
Ln hourly wage	1.00	[1.00–1.00]
More than one job	1.17[a]	[1.11–1.23]
Member of a union	1.12[a]	[1.07–1.18]
Employer-sponsored health insurance	1.17[a]	[1.13–1.22]
Employer-sponsored pension plan	1.16[a]	[1.13–1.21]
Industry (Ref. Services)		
Natural resources	0.96	[0.84–1.11]
Mining	0.82	[0.64–1.05]
Construction	0.92[c]	[0.86–1.00]
Manufacturing	0.93[a]	[0.89–0.98]
Wholesale and retail trade	0.98	[0.94–1.03]
Transportation and utilities	1.00	[0.94–1.08]
Education, health, and social services	1.01	[0.98–1.05]
Public administration	0.86	[0.68–1.11]
Other	0.53[a]	[0.36–0.80]
Region (Ref: Northeast)		
Midwest	1.07[a]	[1.02–1.12]
South	0.95[b]	[0.91–0.99]
West	1.05[c]	[1.00–1.10]
Observations (number of individuals)	71,244 (38,924)	

Note: [a]$P < 0.01$, [b]$P < 0.05$, [c]$P < 0.1$.
95% CI, 95% confidence interval; IRR, incidence rate ratio; PSL, paid sick leave.
*Results were adjusted for panel years (panel 12–18).
†All variables in this table were self-reported.

DISCUSSION

As of November 2016, legislators and voters in Connecticut, California, Massachusetts, Oregon, Vermont, Arizona, Washington, and 32 localities considered the issue of PSL.[48] However, only 64% of private sector workers had PSL in 2015.[1] Lack of evidence about the economic benefit of providing PSL could be one reason for the low percentage of private sector workers with access to PSL. The current study partially fills this gap by suggesting some potential economic benefits of PSL in reducing the cost of absenteeism from the spread of ILI at workplaces. As indicated by Johns[49] and Heymann et al,[31] working while sick may be the only viable option for workers without PSL, because they might not be able to afford unpaid leave or they might fear being fired. Smith[50] reported that, overall, 68% of workers went to work while suffering from stomach flu and other contagious diseases, while another study[51] showed that half of workers who went to work while sick would have stayed at home if they had had access to PSL. Our results support these assertions and findings. We found a statistically significant difference in the number of days away from work due to illness or injury between workers with and without PSL. Controlling for demographic, health, economic, and firm level characteristics, workers without PSL were away from work because they were sick 1.10 fewer days per year than workers with PSL.

Our results suggest that providing PSL to workers without PSL could help decrease the number of workdays lost from workplace ILI infection by between 3.66 and 10.97 million per year. CDC estimated that up to 111 million workdays are lost annually because of influenza.[52] This implies that providing PSL could help decrease ILI-related absenteeism by between 3.30% and 9.88%. Similar results were reported by Kumar et al. Using an agent-based model and NHIS, Kumar et al[8] showed that universal access to PSL could help reduce workplace infection from pandemic influenza by 5.86%. Our results also showed that providing PSL could have decreased ILI-related absenteeism costs by $0.63 to $1.88 billion per year during the study period. We believe this to be a conservative estimate because the transmission rate and the number of workdays missed due to ILI could be higher than the values used in our study.[43] For instance, Lovell[41] reported that the probability of a healthy worker to be infected by a contagious coworker was 18%. On the basis of this transmission rate, Lovell[41] estimated that availability of PSL could have saved employers $28.7 million (in 2004) in absenteeism costs through reduced flu infection at Massachusetts workplaces alone. Employers in San Francisco could have saved $1.07 million (in 2005).[41] In a controlled case study that examined the benefits of influenza vaccination, Kumpulainen and Mäkelä [43] reported an average of 4.9 workdays missed due to influenza. The average daily wage rate in our data is also underestimated because the maximum hourly wage reported in the MEPS data was only $78 per hour. As a result, the average daily wage rate in the MEPS data during the study period was $171 in 2016 dollar compared with the average daily wage rate of $197 in 2016 dollar computed from BLS data (http://data.bls.gov/cgi-bin/dsrv) during the same period. Consequently, the actual monetary benefit of PSL may be higher than our estimate.

The results of our study should be interpreted with caution for the following reasons. First, there are no nationally representative data to enable straightforward estimates of the number of days that workers were on duty while sick with ILI. We used different sources of published results to estimate the transmission rate of ILI, effectiveness of flu vaccination, and number of close daily work contact. Those studies used different data and methods that produced estimates with wide ranges. Consequently, monetizing PSL benefits was challenging due to lack of clear-cut parameters. Second, we assumed that utilization of PSL would be similar between workers who had PSL and workers who might get PSL in the future. We also did not consider other types of fringe benefits, such as paid vacation, or employment arrangements, such as flexible work schedules. Third, we did not consider second stage transmissions by workers at work while sick for reasons other than access to PSL. On the basis of a report by the National Foundation for Infectious Diseases,[53] Kumar et al[8] assumed that 28% of employees continued to go to work while sick with ILI for reasons other than access to PSL. Studies have also shown that, even after returning to work, employees might not perform at their full capacity for several days (presenteeism).[54] Fourth, we considered only minimum and average values of our parameters to produce a conservative estimate of the economic effect of providing PSL in reducing the cost of absenteeism related to ILI. Finally, this estimated benefit could vary from industry to industry and across occupations and sizes of firms. A future study might explore these issues in detail.

CONCLUSION

PSL has become an important public health policy matter in the U.S. One major issue in this debate is whether economic returns can be realized by employers investing in PSL. We provided some evidence that encourages business sector participation in this issue by quantifying and monetizing the potential value of PSL in reducing costs associated with absenteeism from workplace spread of ILI.

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APPENDIX 1: States and Localities with Enacted PSL Days Laws as of November 2016

State/County/City	Date		State/County/City	Date	
State	Enacted	Effective	County/City (cont.)	Enacted	Effective
Connecticut	2011	2012	Montclair, NJ	2013/2014	2014/2015
California	2014	2015	Newark, NJ	2013/2014	2014/2015
Massachusetts	2014	2015	Paterson, NJ	2013/2014	2014/2015
Oregon	2015	2016	Passaic, NJ	2013/2014	2014/2015
Vermont	2016	2017† 2018‡	Trenton, NJ	2013/2014	2014/2015
Arizona	2016	2017	Oakland, CA	2014	2015
Washington	2016	2018	San Diego, CA	2014	2016*
County/City			Emeryville, CA	2015	2015
Montgomery county, MD	2015	2016	Tacoma, WA	2015	2016
Minneapolis, MN	2016	2017	Bloomfield, NJ	2015	2015
St. Paul, MN	2016	2017	Elizabeth, NJ	2015	2016
Chicago, IL	2016	2017	New Brunswick, NJ	2015	2016
Cook county, IL	2016	2017	Philadelphia, PA	2015	2015
San Francisco, CA	2006	2007	Pittsburgh, PA	2015	§
Washington, DC	2008	2014	Santa Monica, CA	2016	2017
Seattle, WA	2011	2012	Los Angeles, CA	2016	2016
New York City, NY	2013/2014	2014	Berkeley, CA	2016	2017
East Orange, NJ	2013/2014	2014/ 2015	Spokane, WA	2016	2017
Irvington, NJ	2013/2014	2014/ 2015	Plainfield, NJ	2016	2016
Jersey City, NJ	2013/2014	2014/ 2015	Morristown, NJ	2016	‖

*Placed on hold pending voter approval in 2016.
†For large businesses.
‡For small businesses.
§Implementation on hold.
‖Not yet determined.
Source: http://www.nationalpartnership.org/research-library/work-family/psd/current-paid-sick-days-laws.pdf.

APPENDIX 2: Structure of the MEPS Data Used in This Study

Panel	Sample Size	Weighted
Panel 12 (2007/2008)	12,440	307,604,278
Panel 13 (2008/2009)	18,287	310,792,518
Panel 14 (2009/2010)	16,221	312,141,711
Panel 15 (2010/2011)	14,541	314,909,377
Panel 16 (2011/2012)	18,512	316,781,778
Panel 17 (2012/2013)	17,923	318,971,967
Panel 18 (2013/2014)	16,714	321,609,625
Total number of respondents	114,638	
We dropped respondents who were		
Less than 16 years of age	31,204	
Not employed in the first or second year of each of the survey panels	26,980	
In the military	231	
Public sector employees	2,322	
Self-employed	7,176	
Not interviewed in all the 5 rounds in each panel	1,383	
Missing values for the variables used in the analyses	6,418	
Respondents used in the analyses	38,924	
Total number of observations	71,244	

APPENDIX 3: Monetary Benefits of Providing Paid Sick Leave (PSL) in Reducing Absenteeism Related to Influenza-like Illness (ILI) (2008–2014)

Item	Row	Method	Value	Source
Excess number of days a worker without PSL went to work while sick or injured per year	A		1.10	*
Share of ILI from the total days of absence (%)				46,47
Minimum	B		10	
Average	C		12	
Number of days a worker without PSL went to work while sick with ILI per year				
Minimum	D	A × (B/100)	0.110	
Average	E	A × (C/100)	0.132	
Transmission rate of pandemic influenza from adult (age 19–64) to adult	F		0.00032	38
Adjusting the transmission rate based on the rate flu vaccination and effectiveness rates				
Percentage of workers vaccinated for flu (2009–2012)	G		40.3	39
Effectiveness of flu vaccination (2008–2012) (%)	H		49.8	40
Adjusted transmission rate	I	(1-(G/100 × H/100)) × F	0.000256	
Assumed number of close daily work contact				
Minimum	J		3	41
Average	K		5	42
Number of workers infected with ILI by a worker without PSL went to work while sick				
Minimum	L	D × I × J × 8 h × 60 min	0.0405	
Average	M	E × I × K × 8 h × 60 min	0.081	
Number of workers without PSL (thousand)	N		45,143	†
Number of days lost due to ILI per episode				42,45
Minimum	O		2	
Average	P		3	
Total number of days lost due to ILI transmitted by contagious workers without PSL went to work				
Minimum (thousand)	Q	L × N × O	3,657	
Average (thousand)	R	M × N × P	10,970	
Average daily wage for workers without PSL in 2016 dollars (productivity)	S		$171	‡
Cost saving from reduced absenteeism related to ILI in 2016 dollars (billion)				
Minimum	T	Q × S	$0.63	
Average	U	R × S	$1.88	

Note:
*Computed from our model using predictive margins command of STATA® 14.
†Computed from the Medical Expenditure Panel Survey (MEPS): panel 12–panel 18.
‡Computed from the Medical Expenditure Panel Survey (MEPS): panel 12–panel 18. Each year, the average wage rate was adjusted to the 2016 dollars using the U.S. consumer price index available at: https://www.bls.gov/cpi/data.htm.

