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Paid Sick Days and Health:
Cost Savings from Reduced Emergency Department Visits

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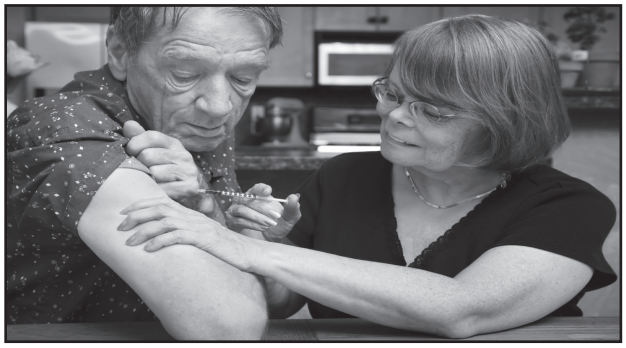


About This Report

This study examines the effect of paid sick days coverage among private sector employees on self-reported health status, delays in medical care, and emergency department visits using the National Health Interview Survey data, produced by the National Center for Health Statistics at the Center for Disease Control and Prevention. After controlling for demographic characteristics, the analyses in this report reveal that paid sick days are associated with better self-reported health, fewer delays in medical care, and fewer emergency department visits for adults and their children. These findings suggest the potential for large savings resulting from reduced department utilization with universal paid sick days coverage. The project is part of a broader body of research by the Institute for Women's Policy Research on the costs and benefits of paid sick days. The research was made possible by grants from the Annie E. Casey Foundation, the Ford Foundation, and the Public Welfare Foundation.

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The Institute for Women's Policy Research (IWPR) conducts rigorous research and disseminates its findings to address the needs of women and their families, promote public dialogue, and strengthen communities and societies. IWPR is a 501(c)(3) tax-exempt organization that also works in affiliation with the women's studies and public policy programs at The George Washington University.

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Institute for Women's Policy Research

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Executive Summary

Many states and localities, as well as the U.S. Congress, have considered legislation requiring that employers provide paid sick days to their workers. Such laws have been approved in the state of Connecticut, the cities of San Francisco and Seattle, and the District of Columbia. There has been much debate about the merits of such legislation—which could affect the lives of the two-fifths of private sector employees without access to paid sick days—particularly regarding the costs and benefits for affected employees and businesses, as well as health effects for employees. This report focuses on the potential impact of paid sick days on the health of employees and their families and, presents the following findings:

- Paid sick days are associated with better self-reported general health among workers;

- Workers with paid sick days are less likely to delay medical care for themselves or for family members;

- Access to paid sick days is associated with lower usage of hospital emergency departments, a finding that holds true for those workers and families with private health insurance, those with public health insurance (e.g. Medicaid or SCHIP), and those with no health insurance; and

- 1.3 million hospital emergency department visits could be prevented in the United States each year by providing paid sick days to workers who currently lack access, reducing medical costs by $1.1 billion annually, with over $500 million in savings for public health insurance programs.

The analyses mainly rely upon a sample of 19,634 private sector employees between the ages of 18 and 64 years (inclusive) drawn from the 2008 and 2009 administrations of the National Health Interview Survey (NHIS) conducted by the National Center for Health Statistics at the Center for Disease Control and Prevention. These data include information on adult demographic characteristics and employment status, health insurance coverage, access to paid sick days, self-reported health, delays in medical care or treatment for adult respondents and family members, and visits to an emergency department by the respondent and, where relevant, a sample child during the previous year.

Because health status and utilization of health care services may be related to a variety of causal factors, the effects of paid sick days are estimated using regression analyses that control for many of these factors. The results suggest that paid sick days may improve self-reported health status, reduce delays in obtaining needed medical treatment, and reduce preventable emergency department visits.

The analysis is repeated for separate groups of individuals with public insurance, private insurance, and no health insurance. The results are distinct for these groups, with the public insurance group reporting the poorest average health status and an emergency department usage rate over twice that of respondents with private insurance. The public insurance group is predicted to experience the largest estimated reductions in emergency department visits with paid sick days coverage. The private insurance group

reports better health, fewer delays in medical treatment, fewer emergency department visits, and smaller improvements from paid sick days relative to the other groups. The group with no insurance reports health status, emergency department use, and paid sick days effects that are between those found for the other two groups, but higher rates of delayed medical treatment.

Predictions from regressions for emergency department visits for the three health insurance groups (private, public, and no insurance) are used to simulate the effect of providing new coverage to employees who did not previously have paid sick days coverage. For individuals in the public insurance group, annual emergency department visits are predicted to decline from 79.3 to 70.8 visits per 100 persons; for those with private insurance, the decline is from 32.7 to 30.6; and for those with no health insurance the decline is from 44.5 to 40.0. Weighting these figures by the relative size of each group yields an annual average reduction in emergency department usage from 38.2 to 35.2 visits per 100 persons (i.e., an eight percent reduction in emergency department visits).

Predicted reductions in emergency department usage among workers with paid sick days were used as the basis of an estimate of the emergency department costs that could be saved with universal access to paid sick days. Universal access to paid sick days is predicted to result in the prevention of about 1.3 million emergency department visits each year. An additional assumption is that, on average and for a set of preventable illnesses, a single doctor's visit would replace a single emergency department visit as a result of new paid sick days coverage, resulting in substantial cost savings. It is estimated that $1 billion in health care expenses could have been avoided in 2010 in the United States if access to paid sick days had been universal.

These potential cost savings would be shared by hospitals, physicians, patients, private insurers, and public health insurance programs such as Medicaid and the State Children's Health Insurance Program (SCHIP). The public health insurance programs are of particular interest—partly because they are funded by taxpayers, but also because they serve vulnerable populations including low-income individuals and families, as well as individuals with disabilities. Analyses of data on those receiving public health insurance reveal that, although only one-tenth of working families participate in public health insurance programs, they account for about one-fifth of all emergency department visits annually. Applying the same analytical methods as for the overall sample, a 2010 savings of $500 million (about one half of the total savings) is predicted for public health insurance programs—and taxpayers—as a result of making paid sick days universally accessible.

Introduction

The United States spends $2.5 trillion per year on health care, or more than any other nation in the Organisation for Economic Co-operation and Development (OECD), both in absolute terms and as a share of the gross domestic product (CMS 2011a; OECD 2010). At the same time, the United States has one of the highest rates of infant mortality and a shorter expected lifespan than in 27 other developed nations (OECD 2010). One reason for poor health outcomes in tandem with high spending is that individuals without health insurance often use emergency department (ED) services at hospitals, either because they cannot obtain less expensive health care through a doctor's office or clinic, or because they delay medical treatment until illness or injury rises to the level of a medical emergency (Billings, Parikh, and Mijanovich 2000). Annual spending on ED services totaled $47.3 billion in 2008 (AHRQ 2008b).

Two-fifths of private sector employees in the United States do not have access to even one paid sick day per year (Williams et al. 2011). It is possible that employees who lack access to paid sick days (PSD) in the workplace also use expensive ED services instead of primary care (Lovell 2004; HIP 2009). Employees who have access to PSD may find it easier to schedule doctors' appointments during normal business hours for themselves or their family members, rather than using ED services during non-work hours. PSD may help employees to avoid delays in medical care that occur when they cannot get permission from a supervisor to attend to health needs nor afford unpaid time away from the job. PSD might also allow individuals to stay at home when they or a family member are ill, reducing the likelihood of a condition worsening until ED services are needed. Access to PSD should also result in elevated levels of preventive care utilization, such as regular doctors' visits for physical examinations or for children to receive vaccines to ward off childhood illnesses. Enhanced use of preventive services should result in better health and reduced ED utilization over time.

As a result, it is reasonable to hypothesize that individuals with access to PSD use ED services less frequently, delay medical care for themselves or their family members less often, and experience better general health. This report provides evidence relevant to this hypothesis, using data from the National Health Interview Survey (NHIS), conducted by the National Center for Health Statistics at the Center for Disease Control and Prevention (CDC), to shed new light on the questions of whether private-sector employees with PSD are better able to access health services and are in better health. Additional public data are used to estimate the potential cost savings that would result from increased access to PSD and decreased ED use.

Background

In 2006, San Francisco became the first municipality in the United States to approve an ordinance requiring that employers provide their workers with PSD. Since then, the District of Columbia, the city of Milwaukee, WI, the state of Connecticut, and the city of Seattle, WA, have approved similar laws.[1] Campaigns to pass similar laws are active in cities and states around the country, as is a national campaign to pass a similar law, the Healthy Families Act, in the U.S. Congress.

Advocates for PSD argue that the laws will yield a variety of benefits: economic security for workers and their families since workers might otherwise lose pay or their jobs for missing work; improved morale and reduced turnover among workers; reduced spread of contagious illnesses such as influenza, gastroenteritis, and the common cold; and the ability of workers to address health issues and seek medical care in a timely fashion, perhaps leading to better health outcomes (Lovell 2004). A random sample of San Francisco employers subject to the city's PSD law revealed that a full two-thirds were supportive of the mandate (Drago and Lovell 2011).

Researchers have quantified the economic benefits of PSD laws in some detail. The Institute for Women's Policy Research (IWPR) has led work on attempts to quantify the personnel costs of PSD policies in comparison with the benefits of PSD likely to be experienced by businesses implementing such policies, Though PSD policies are likely to result in some costs to employers—notably wages and benefits paid to absent workers—IWPR research has demonstrated that the benefits from reduced worker turnover and reduced workplace contagion would outweigh the costs (for an example, see Miller and Williams 2010).

Human Impact Partners (HIP) has sought to describe the likely health effects of PSD policies in their health impact assessments. They note that passage of PSD laws will likely result in workers more often being able to take leave for illness or to care for dependents and seek timely care—and less likely to use ED services. HIP also indicates these laws will likely result in reduced levels of contagion of influenza and food-borne illnesses, as well as economic benefits for workers. Their research included an original analysis of health data from the NHIS in which they concluded there is some statistical evidence that access to PSD is associated with improved health outcomes (see: CDC 2009, HIP 2009, HIP and SFDPH 2009).

In the present research, IWPR builds upon the analyses conducted by HIP by clarifying the likely improvements in access to health care that workers without PSD and their families would experience if they were to gain access to PSD. An additional goal is to quantify the current costs resulting from preventable ED usage among American workers without PSD and their families both among the general population and among those who rely on public sources of health insurance.

[1] The city of Milwaukee's law has been challenged both judicially and legislatively since it was passed by referendum. In March 2011, the legislature of the state of Wisconsin passed a law stating that jurisdictions within the state cannot pass laws providing a legal right to leave that is more generous than that provided in state law, invalidating the Milwaukee law (see Wisconsin Journal Sentinel 2011).

Data Sources and Methods

The estimates in this report use data from the 2008 and 2009 NHIS (CDC 2008, 2009), the 2009 American Communities Survey (ACS) administered by the U.S. Bureau of the Census (Ruggles et al. 2010), and the 2008 Medical Expenditures Panel Survey (MEPS) produced by the U.S. Agency for Healthcare Research and Quality (AHRQ 2008a, 2008b, 2008c).

In this report, data from the 2008 and 2009 NHIS are combined and regressions are estimated to gauge the impact of PSD after controlling for a variety of respondent characteristics including age, gender, race/ethnicity, education, and family income (see Appendix A for greater detail; see Appendix B for relevant NHIS questions). Individuals are classified into two groups for health status: those reporting poor or fair health and those reporting better health. For delayed medical care, respondents were asked whether medical care was delayed due to worries about the cost of care. For ED visits, the measure combines counts of such visits in the last year by the respondent and, where relevant, a sample child.

A logistic approach is used for the regression testing whether health status and delayed medical care are affected by PSD. For ED visits, which are central to the cost analyses that follow, a negative binomial regression method is applied because individuals can have more than one ED visit per year, but not fewer than zero.[2] For each regression, simulations are performed to estimate the effect of having or not having PSD on health status, delayed medical care, or ED visits, holding the other variables constant at their mean values.

Specification tests are applied to address the possibilities that health status either affects PSD coverage or mediates the effect of PSD on ED visits. Additionally, the estimations are replicated for the subsamples of respondents with public health insurance, with private health insurance, and with no health insurance in order to account for the possibilities that insurance coverage itself affects PSD coverage or—as seems likely—that insurance coverage alters the probability that individuals with or without PSD coverage will use ED services.

The number of observations of private-sector employees aged 18 to 64 years in the combined 2008 and 2009 NHIS data is 19,634.[3] The analysis is limited to the private sector because rates of PSD coverage are much higher among public-sector employees (around 90 percent; BLS 2010a). As a result, there is little variance available to analyze the effects of PSD coverage for public-sector employees. The self-employed are excluded because the meaning of PSD coverage for that group is ambiguous. The subsample of private-sector employees who are either on public health insurance (e.g., Medicaid) or whose children are on public health insurance (e.g., the State Children's Health Insurance Program or SCHIP) includes 1,455 respondents, while 3,777 respondents had no health insurance.

[2] Traditionally, Poisson regression models were used for count data. The negative binomial method is more general and includes the Poisson as a special case (see StataCorp 2007, p. 359).

[3] The age cut-off for the earlier HIP (2009) study was 24 to 64 years, which is expanded here to include younger individuals.

The estimates of potential ED cost savings are constructed using data on private-sector PSD coverage using the NHIS and ACS data (see Williams et al. 2011). The predicted number of ED visits among employees with PSD was applied to the total number of private-sector employees to estimate the number of ED visits that would occur if PSD were universal.

For the cost savings that would occur for each prevented ED visit, a list of common, preventable illnesses was drawn from data from the U.S. Agency for Healthcare Research and Quality (AHRQ 2007). The 2008 MEPS data provide information on the average cost of treating a subset of the most common of these illnesses through ED visits, as opposed to outpatient or office visits. These figures were inflated to 2010 dollars, yielding average cost savings for each specific illness. The different cost savings figures were weighted by the relative annual prevalence of events (ED visits as opposed to office and outpatient visits for the same illness) in the MEPS data to generate an average cost savings figure. Multiplying the average cost savings by the number of ED visits that could be prevented yields estimated total cost savings.

In general, the estimates are constructed to be as accurate as possible with the data and estimation techniques currently available. Where there are ambiguities, the analyses err on the side of understating the potential cost savings associated with universal PSD. For example, in many cases, a preventable illness may require only a simple vaccination which is less costly than the average cost of a visit to a doctor's office. Similarly, no attempt is made to estimate reduced ED visits for more than the one child per family covered by the NHIS data, although it is reasonable to believe that there would be additional reductions in ED visits from universal PSD coverage among the parents of these children.

Paid Sick Days, Health Care, and Health Outcomes

Initial statistical analyses of the NHIS data found that having access to PSD is predicted to be associated with better self-reported health (those with PSD are predicted to be 1.2 percentage points less likely to be in poor or fair health), a lower likelihood of delaying medical care (5.9 percentage points less likely), and lower likelihood of ED use (5.6 fewer visits per 100 persons), even after controlling for demographic factors and chronic health conditions (Table 1).

Table 1. Predicted effects: paid sick days (PSD) coverage and self-reported health, delayed medical care, and emergency department (ED) use, private-sector employees.

	Percentage self-reporting poor or fair health	Percentage reporting delayed medical care for self or family member in the last year	Number of ED visits for self or sample child in the last year
Has PSD	3.5%	14.7%	34.1 per 100 persons
No PSD	4.7%	20.6%	39.7 per 100 persons
Overall	4.0%	17.0 %	36.4 per 100 persons

Note: Estimates control for gender, age, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other race), education, household income, and chronic conditions.
Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 NHIS data for adults aged 18–64 years.

Though these differences may seem small in absolute magnitude, the predicted effects are, in fact, large: reports of poor or fair health occur 26 percent less often among respondents having PSD, delays of medical care occur 29 percent less often, and respondents with PSD are predicted to use ED services 14 percent less often than those without PSD. When the size of the U.S. population lacking PSD is considered, it is clear that access to PSD has large cumulative effects. A total of 44 million private-sector workers in the United States lack access to PSD (42 percent of the private-sector workforce; Williams et al. 2011). Reductions of a few percentage points in the delay of medical care or the use of EDs among those workers could translate into significant cost savings for consumers, health care providers, and insurers—including taxpayers—in the United States.

Paid Sick Days and Health Status

A complication concerns the role of self-reported health status and ED visits. Health status may be a causal factor in ED visits to the extent that individuals who are ill or have a disability are more likely to need and use an ED, as suggested by previous HIP (2009) analysis. If this is true, then any positive link between having PSD and ED visits may be at least partly due to more complex causal pathways that are health-related.

To test this hypothesis, the ED visit regression was run separately on two subsamples of employees: those reporting fair or poor health and those reporting good or excellent health. As expected from the HIP analyses, individuals with better self-reported health visit the ED at far lower rates (34 visits per 100 respondents) than those reporting poor health (74 visits per 100 respondents). The association between having PSD coverage and making fewer ED visits remains in both subsamples, supporting the hypothesis that having access to PSD reduces ED visits both for persons in good health and those in poor health. Further, weighting the predicted ED effect in the two subsamples by the number of respondents in good or poor health reveals only a slight decline in the simulated effect of PSD on ED visits.[4]

It is also possible that having PSD has an indirect effect on ED visits by reducing delays in medical care which, in turn, reduce ED usage. A regression adding delayed medical care as a predictor was conducted in order to test this hypothesis. Including delayed medical care as a predictor slightly reduces the estimated direct relationship between PSD and ED use (a result that is consistent with an indirect effect), but the direct effect of PSD remains significant.

Paid Sick Days and Health Insurance

There are multiple reasons to be concerned with the role of health insurance in terms of any relationship between PSD and health outcomes or behaviors. One possibility is that individuals with private health insurance may have a regular health care provider and be less likely to use an ED visit for their health care needs. Those same employees are also more likely to have PSD,[5] meaning the measured effect of PSD on ED visits may be masking the effect of private health insurance coverage on ED visits.

Public health insurance coverage involves a slightly different set of issues. Either directly or through state governments, the federal government funds health insurance for 28 percent of the American population, including civilian federal employees; military personnel; military veterans; the elderly through Medicare; and low-income adults and children through Medicaid and the State Children's Health Insurance program (SCHIP; DeNavas-Walt, Proctor, and Smith 2008). As such, it is reasonable to assume that reductions in ED usage resulting from improved access to PSD among American workers would likely result in savings for government programs providing health insurance.

Most adults of working age receiving public health insurance participate in the Medicaid program.[6] The Medicaid program provides health care to low-income individuals

[4] Simulations reveal that ED visits are projected to decline from 39.3 to 33.7 per 100 respondents per year in the presence of PSD coverage for the subsample reporting good or excellent health, and from 86.6 to only 59.6 visits for the subsample in poorer health. Instead of the 5.6-point decline in ED visits for PSD reported in Table 1, weighting the results for the health status subsamples yields a 5.2-point decline.

[5] In the NHIS sample used to generate figures in Table 1, the simple correlation between a dummy variable for no health insurance coverage and paid sick days coverage is -.37, indicating that employees with health insurance are more likely to have paid sick days.

[6] For example, among adults aged 35–44 years, 67 percent of those using public health insurance are enrolled in Medicaid and 20 percent are enrolled in Medicare, with the remainder covered by military health care (note that active duty military personnel are included in the last category of public insurance, but excluded from our analyses of private sector employees). See DeNavas-Walt, Proctor, and Smith (2008, Table C-3).

and families, while the Medicare program (covering fewer individuals) is provided to those individuals of working age with significant disabilities and seniors (CMS 2011b)[7]. In either case, individuals covered under these programs should exhibit relatively poor health and higher rates of ED usage either directly due to poor health or perhaps because some health care providers refuse to accept Medicaid patients making them more likely to use ED services (New York Times 2010). Given that individuals who rely on public health insurance are often low-income, it is not surprising to discover that the NHIS shows that only 33 percent of workers with public insurance have access to PSD, compared with 58 percent of all private-sector workers.

The earlier regression analysis (Table 1) is replicated on the subsamples of respondents with public insurance, with private insurance, and with no insurance coverage (see Appendix C for complete results). These analyses allow for the possibility that PSD effects are masking the effects of private health insurance and permit the identification of effects for the population with public health insurance.

For the public health insurance analyses, the sample excludes military health insurance, but includes workers who rely on the Medicaid, Medicare, SCHIP, and Veterans Affairs programs for their health insurance coverage. After controlling for various factors, workers with public health insurance are predicted to report poorer health, with 8.3 percent reporting poor or fair health (Table 2) compared with 4.0 percent in the overall private sector employee population (Table 1). They are also predicted to be more than twice as likely to use ED services as the average American private-sector employee; the average rate is 76.4 visits annually per 100 persons with public health insurance compared with 36.4 visits in the overall sample. As in the general population, however, access to PSD is associated with better self-reported health and a lower likelihood of delaying medical care, with both figures around one-third lower for respondents with PSD coverage. Rates of ED usage are also lower among workers with PSD, by 8.5 visits annually per 100 persons (an 11 percent reduction; Table 2).

Table 2. Predicted effects: paid sick days (PSD) coverage and self-reported health, delayed medical care, and emergency department (ED) use among those with public health insurance, private-sector employees.

	Percentage self-reporting poor or fair health	Percentage reporting delayed medical care for self or family member in the last year	Number of ED visits for self or sample child in the last year
Has PSD	6.0%	11.1%	70.8 per 100 persons
No PSD	9.5%	15.4%	79.3 per 100 persons
Overall	8.3%	13.9%	76.4 per 100 persons

Note: Estimates control for gender, age, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other race), education, household income, and chronic conditions.
Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 NHIS data for adults aged 18–64 years.

[7] Individuals over the age of 64 were not included in the present analysis.

Table 3. Predicted effects: paid sick days (PSD) coverage and self-reported health, delayed medical care, and emergency department (ED) use among families with private health insurance, private-sector employees.

	Percentage self-reporting poor or fair health	Percentage reporting delayed medical care for self or family member in the last year	Number of ED visits for self or sample child in the last year
Has PSD	2.9%	12.1%	30.6 per 100 persons
No PSD	3.2%	13.8%	32.7 per 100 persons
Overall	3.0%	12.6%	31.2 per 100 persons

Note: Estimates control for gender, age, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other race), education, household income, and chronic conditions.
Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 NHIS data for adults aged 18–64 years.

Table 3 displays comparable results for private-sector employees with private health insurance coverage. These respondents report poor or fair health at a rate (3.0 percent) well below that for all private-sector workers (4.0 percent) and report delays in medical care at a rate of only 12.6 percent compared with 17.0 percent in the larger population. They also report fewer ED visits per 100 persons (31.2) compared with the overall population of private-sector employees (36.4), and only a small reduction in ED visits for PSD coverage (a 6.4 percent reduction). Nonetheless, for each indicator, PSD is positively related to health outcomes.[8]

[8] The linkage between PSD and ED use depends upon the logic that inflexible working time arrangements make PSD important for employees needing to access lower-cost health care in a timely fashion. Golden (2001) found that jobs involving around 40 hours per week are the least flexible. Replicating the regressions reported in Tables 2 through 4 for the subsample of employees working between 38 and 42 hours per week (inclusive), does result in larger effects for paid sick days where the sample size involves at least 1,000 respondents (i.e., for those with private insurance or with no insurance). According to Golden's finding, workers with longer and shorter hours than average tend to have higher levels of flexibility. This specification test was suggested by Christopher Ruhm, University of Virginia.

Table 4 displays comparable results for private sector employees without health insurance. Their self-reported health status and rates of ED use are in between the levels found in the private insurance and public insurance subsamples, but they are around three times more likely to delay medical care compared with either group.

Table 4. Predicted effects: paid sick days (PSD) coverage and self-reported health, delayed medical care, and emergency department (ED) use among families without health insurance, private sector employees.

	Percentage self-reporting poor or fair health	Percentage reporting delayed medical care for self or family member in the last year	Number of ED visits for self or sample child in the last year
Has PSD	5.9%	35.5%	40.0 per 100 persons
No PSD	8.0%	37.7%	44.5 per 100 persons
Overall	7.5%	37.2%	43.5 per 100 persons

Note: Estimates control for gender, age, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other race), education, household income, and chronic conditions.
Source: Institute for Women's Policy Research estimates based upon analysis of the 2008 and 2009 NHIS data for adults aged 18-64 years.

Given that the results presented in Tables 2 through 4 are so distinct, simulations for the likely effects of PSD coverage on ED visits use a weighted average of the results for the three health insurance groups, rather than the results provided in Table 1.[9] Weighting yields an estimate of an average reduction in annual ED visits from 38.2 to 35.2 per 100 persons among private-sector employees provided with PSD.

[9] The weights are the proportions of the population of private sector employees with each of the three health insurance types as found in the NHIS data.

Paid Sick Days and Emergency Department Costs

Delaying medical care can aggravate chronic health conditions or increase the severity of critical health conditions or injuries. For workers without PSD and the family members who rely upon them, promptly or regularly addressing health needs may be impossible due to inability to take time off work. The data above suggest that the inability to obtain timely and prompt health care resulting from a lack of paid sick time may lead to both worse general health and greater reliance on ED services.

Health care costs for ED use are shared across a variety of insurers, and by hospitals and patients (Families USA 2005). For individuals without private or public insurance, costs are either passed on indirectly to insurers through higher prices for covered services, or the hospital seeks payment from the patient. The latter is one reason individuals file for bankruptcy (Himmelstein et al. 2005), implying that universal PSD would help to reduce rates of bankruptcy by reducing ED usage by individuals with limited or no medical insurance.

Though it is difficult to calculate the total monetary costs of delayed medical care, the high costs of ED use relative to regular outpatient care are well documented. Machlin and Chowdhury (2011) analyzed the 2008 MEPS data and discovered that the mean cost of ED visits and of office-based visits were $922 and $199, respectively. These figures suggest that ED visits are around four-and-a-half times as expensive as office visits. That study does not, however, address preventable conditions. Many reasons for visiting an ED are not preventable in the sense either that earlier treatment reduces the extent and cost of treatment or that a clinic or doctor's office visit would have sufficed if they were available (e.g., in the case of severe head trauma). Reductions in ED visits among employees with PSD, on the other hand, should represent cases where either early treatment or treatment in non-ED settings is preferable—and will reduce costs.

For many illnesses, ED visits may be directly prevented as a result of having PSD; for example, keeping an ill child at home or staying home when ill may result in recovery from flu or other illnesses that might otherwise worsen and lead to an ED visit. It is also possible that PSD would be used for a relatively inexpensive visit to the doctor—say to obtain antibiotics for an infection—that would prevent an ED visit and costly hospitalization later. It, therefore, seems cautious to assume that a single visit to a doctor's office or outpatient setting in a hospital would replace a single ED visit as a result of PSD access and utilization

Given this assumption, the costs of ED and outpatient or office visits for six preventable illnesses were taken from the 2008 MEPS data and adjusted for inflation to 2010 levels (see Appendix A for details). The cost savings for each of the six illnesses range from $256 less for the treatment of pneumonia in an outpatient or office setting as opposed to an ED, to a high of $1,800 less for the treatment of congestive heart failure in an outpatient or office setting as opposed to an ED.. The six savings estimates were weighted by the relative annual frequency of events (or visits) involving the specific illness to obtain an overall average cost savings of $826 per prevented ED visit.

Table 5 provides a national cost-savings estimate for reductions in ED use by private-sector employees and their children if PSD were made universal. The private-sector workforce of about 105 million workers is divided into approximately 44 million workers without and 61 million workers with PSD (Williams et al. 2011). Multiplying those figures by average ED visits per year for workers with and without PSD and summing the result yields current estimated ED use of 38 million visits. If the entire workforce had access to PSD, reducing ED usage proportionally, the resulting estimate is 36.8 million ED visits. If workers without PSD were to gain access, more than 1.3 million unnecessary ED visits per year would be prevented, resulting in health care savings of just over $1 billion annually. These savings would be passed on to individuals, hospitals, private insurers, and government insurance programs.

Table 5. Estimated cost-savings arising from preventable emergency department (ED) visits with universal PSD, private-sector employees.

Number of workers	104,697,285
Workers with no PSD	43,972,860
Workers with PSD	60,724,425
Annual ED visits per worker with no PSD	38.2 per 100 persons
Annual ED visits per worker with PSD	35.2 per 100 persons
Current total ED use	38,129,076
ED visits with universal PSD	36,801,096
Preventable ED visits with universal PSD	1,327,980
Cost savings per prevented ED visit	$825.57
Current avoidable cost (ED visits preventable with PSD)	$1,096,347,000

Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 NHIS, the 2009 American Community Survey (ACS), and the 2008 MEPS.

These overall estimates include private-sector employees who use public health insurance. The results for only those workers who use public insurance are shown separately in Table 6. Although workers between the ages of 18 and 64 who rely on public health insurance comprise only 11 percent of workers in that age range (compare the first rows of Tables 5 and 6), their high rates of ED usage means that these workers account for 22 percent of the visits to emergency departments among employed persons and their children (compare current total ED use in the tables 5 and 6). Because of high baseline rates of ED use, a strong predicted negative relationship between PSD access and ED use, and low current levels of access to PSD, the analyses suggest that the lack of access to PSD for workers with public health insurance results in approximately 600,000 unnecessary ED visits annually, or just less than one-half of the overall estimate of current unnecessary ED visits resulting from lack of PSD. The lack of access to PSD among workers with public insurance is estimated to result in an annual preventable cost of

Table 6. Estimated cost-savings arising from preventable emergency department (ED) visits among families those with public health insurance, with universal PSD, private-sector employees.

Number of workers	11,159,887
Workers with no PSD	7,365,525
Workers with PSD	3,794,361
Annual ED visits per worker with no PSD	79.3 per 100 persons
Annual ED visits per worker with PSD	70.8 per 100 persons
Current ED visits	8,523,921
ED visits with universal PSD	7,897,852
Preventable ED visits with universal PSD	626,069
Cost Savings Per Prevented ED visit	$825.57
Current avoidable costs (ED visits preventable with PSD)	$516,867,000

Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 NHIS, the 2009 ACS, and the 2008 MEPS.

more than $500 million. For individuals or families relying upon public health insurance, the costs of medical care are reimbursed by the government. As a result, public health insurance systems in the United States—and thus, the federal and state governments—would save $500 million annually from reduced ED usage if PSD were universal.

Conclusions

The present research demonstrates the importance of access to PSD for the ability of workers and families to access health care, as well as the connection between access to PSD and self-reported general health. Analyses of ED use among workers with and without PSD suggest that having PSD reduces the use of ED services, probably by enhancing the ability of workers to access primary care providers or other sources of medical care during normal business hours and on short notice. An ED visit is more expensive than a visit to a doctor's office, on average, and these higher costs are borne by hospitals or passed along to private health insurance companies, individual consumers, and public health insurance programs. Avoidable ED usage resulting from gaps in access to PSD represents a $1 billion liability for our society. Given that the nation spends about $47 billion annually on ED services (AHRQ 2008c), the findings suggest a straightforward way to reduce costs without sacrificing quality of care.

These estimated cost savings include $500 million currently paid for by taxpayers through public health insurance programs such as Medicaid, Medicare, SCHIP, and Veterans Affairs services. The fact that individuals with public health insurance account for such a disproportionate amount of the prospective savings, while perhaps surprising, is consistent with the results of previous studies of preventable hospitalizations.[10]

Although this analysis provides the first financial estimate of the costs of increased ED use by workers who lack PSD, the analysis likely underestimates relevant cost savings. Due to data limitations, the present analysis includes ED visits accounting for only one "sample child" and, as a result, total ED usage—and potential cost savings—may be higher in multi-child families. Those potential cost savings could not be accounted for in this study. The current analysis also does not address the medical or monetary benefits of being better able to provide more timely and non-emergency care for family members other than children such as spouses/romantic partners or elders; nor does it make any attempt to estimate the costs of hospitalizations that could be prevented through more timely treatment, if PSD were universally available.

Efforts to improve the efficiency of our health care system were central to debates around passage of the Affordable Care Act in 2010 (for example, see Center for American Progress 2010) and those efforts to improve efficiency will likely continue given the substantial costs of health care and health insurance. Further, ED use rose by 30 percent in the last decade, while the number of non-rural hospitals providing ED services declined by 27 percent during the last two decades (Hsia, Kellerman, and Shen 2011). The case for reducing ED usage has never been stronger, and the analyses presented in this report suggest that one relatively low-cost route to reining in ED costs—while simultaneously improving health—lies in increased access to PSD.

[10] Jiang, Russo, and Barrett (2009) find that Medicare patients account for 67 percent of all preventable hospitalization costs (they estimate total preventable costs of $30.8 billion as of 2006).

Appendix A: Methodology

The estimates in this report use data from the 2008 and 2009 National Health Interview Survey (NHIS), the 2009 American Communities Survey (ACS), and the 2008 Medical Expenditures Panel Survey (MEPS).

The estimated effect of PSD on health utilization and health outcomes builds upon the method used by Human Impact Partners (2009). That study used a previous year of the NHIS and regression models to predict the impact of PSD on health-related outcomes. The approach used here differs in that self-rated health status is treated as a dependent (rather than independent) variable, and the variable for "regular place for medical care" is excluded since the existence of PSD could influence an individual's ability to find and use such a place. Other variables were constructed identically as dummies for gender, race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other race, non-Hispanic), and the existence of a chronic health condition. The earlier study used single dummy variables for age, education, and family income. More finely-grained information is available in the NHIS for these variables and is used for the analyses presented in this report. Age is introduced as a quadratic (i.e., age and age-squared), educational attainment includes three dummy variables for less than high school (or GED), high school diploma only, and at least a bachelor's degree (the omitted category is some college or an associate's degree). The four categories for family income are translated into three dummy variables (leaving the lowest income level as the omitted category).

Complete NHIS PSD and health questions are provided in Appendix B. For the dependent variables of self-reported health and delayed medical care, logit regressions are run in STATA, with the predict command used to simulate the effect of PSD on the dependent variable. For the dependent variable of the number of ED visits, the sample child file is combined with the adult respondent file, and the variables for each regarding the number of ED visits in the last year are added. Because the ED visit variable is categorical, it is assigned (conservatively) the lowest value provided for each category. Further, because the ED visit variable is discrete and cannot fall below zero, a negative binomial regression model is used to obtain an estimated number of ED visits per year, with and without PSD. These regressions use the entire sample for results reported in Table 1 and the health insurance subsamples for results reported in Tables 2 through 4.

The statistical significance of the PSD coefficient in the ED visit regressions is as follows. The coefficient is significant at the .01 level in the overall regression (results for Table 1), for the subsamples with fair or poor and with better health (not shared), and for the subsample with private insurance (Table 3), but not for the smaller sample with public health insurance (Table 2), nor for the sample with no health insurance coverage (Table 4).

The estimates of ED cost savings reported in Tables 5 and 6 are constructed as follows. The estimate in Table 5 uses the national figures for predicted annual ED usage among private-sector employees with and without PSD in the health insurance status subsamples (see Tables 2 through 4). These are multiplied by the estimated number of private-sector employees with and without PSD at present, respectively (these estimates use the NHIS and 2009 ACS data; see Williams et al. 2011), and the numbers are added to generate the existing annual number of ED visits. Next, the predicted number of

ED visits among employees with PSD is applied to the total number of private-sector employees to estimate the number of ED visits that would occur if PSD were universal. The latter number is subtracted from the existing annual level to produce the preventable ED visits figure. For Table 6, the exercise is identical except that national estimates for PSD effects on employees with public health insurance (presented in Table 2) are applied to individuals with public health insurance for themselves or their children (from 2009 ACS data).

For the cost estimates, a list of common and preventable illnesses is drawn from data from the U.S. Agency for Healthcare Research and Quality (AHRQ 2007). The MEPS data provide information on the average cost of treating a subset of these illnesses through ED visits as opposed to outpatient or office visits, as shown in Table A1.[11] Note that the costs have been inflated to 2010 dollars using service-specific CPI-U inflators (BLS 2010b). The estimated cost savings for each event within each category of illness, calculated by subtracting the outpatient/office-based cost from the ED visit cost, is shown in the third numeric column. The MEPS also provides information on the number of events for each illness, in the right-most column of Table A1. The information on number of events is used to calculate weights for the cost figures to generate the average ED cost per event for these illnesses combined, the average outpatient or office visit cost per event for these illnesses combined, as well as the average cost savings per event, as shown at the bottom row of the table.

The net result is a cost savings of $826 per event for these preventable illnesses. That figure represents an average saving of 39 percent of the cost of ED services for the same bundle of illnesses. That estimate does not account for the fact that some of these illnesses are more frequently treated in an outpatient or office setting than other illnesses. To obtain an alternate estimate, the weight was adjusted by the relative frequency of outpatient or office-based visits for each illness and the cost savings were re-estimated.[12] That exercise results in a small increase in estimated cost savings (from $826 per incident to $827), suggesting the estimate used ($826) here is conservative.

[11] Illnesses not included in this study are dehydration, diabetes, hypertension, influenza, otitis media (ear infection), and sexually transmitted infections (STIs). These are not included due to an insufficient number of observations on either ED visits or outpatient and office visits (see AHRQ 2008b).

[12] Steven Sheingold, Ph.D., and Nguyen Nguyen, Ph.D., of the U.S. Department of Health and Human Services, Division of Health Financing Policy in the Office of Health Policy, reviewed the methodology and suggested the alternative described here.

Table A1. Estimated cost savings for outpatient or office-based visits compared with emergency department (ED) visits.

Ambulatory care sensitive condition (preventable)	Emergency department (ED) visit costs	Hospital outpatient or office-based provider visits costs	Cost savings per event	Total incidents reported
Asthma	$974.92	$489.87	$485.04	89,930,000
Congestive heart failure	$2,902.85	$1,093.76	$1,809.09	64,073,000
Gastroenteritis	$1,454.31	$790.76	$663.54	21,168,000
Pharyngitis/ bronchitis	$556.60	$200.59	$356.01	40,657,000
Pneumonia	$590.02	$333.62	$256.40	7,012,000
Urinary tract infections	$716.78	$357.90	$358.88	12,600,000
Average cost weighted by relative number of events	$1,445.18	$619.60	$825.57	
Total Events				253,440,000

Source: Institute for Women's Policy Research calculations using visit incidence rates by condition and average visit costs from the 2008 MEPS (AHRQ 2008a and AHRQb), inflated to 2010 dollars using the 2008–2010 CPI-U inflation rates for "medical care - hospital services" (Emergency Room Visit Costs) and "medical care - professional services" (Hospital Outpatient or Office-Based Provider Visits Costs; BLS 2010b); list of preventable conditions based on availability of cost and incidence data as well as literature about ambulatory care sensitive conditions (AHRQ 2007; Billings, Anderson, and Newman 1996)

Appendix B: NHIS Paid Sick Days and Health Questions

The indicator for PSD coverage in the NHIS is based on asking current employees the "yes" or "no" question, "Do you have paid sick leave on this main job or business?" Those who are not currently employed but have been in the past are asked about paid sick leave for the job most recently held. However, we include only current private-sector employees in the sample, so past employment is not relevant to this analysis.

The self-reported health dummy variable is constructed from the NHIS question below, with "excellent," "very good," and "good" coded to zero, and "fair" and "poor" coded to one, with other responses coded as missing:

Instrument Variable Name: PHSTAT **Would you say {your/ALIAS's} health in general is excellent, very good, good, fair or poor?**
Reported Health Status 1 Excellent 2 Very Good 3 Good 4 Fair 5 Poor 7 Refused 8 Not ascertained 9 Don't know

The delayed medical care dummy variable is constructed from the following question. Answers other than "yes" or "no" are treated as missing:

Instrument Variable Name: FDMEDYN **Recode based on FAU .010: DURING THE PAST 12 MONTHS, has medical care been delayed for {you/anyone in the family} because of worry about the cost? (Do not include dental care)**
Any family member delay* medical care, 12m? 1 Yes 2 No 7 Refused 8 Not ascertained 9 Don't know

The ED variable is constructed from the following, plus an identical question referring to the sample child (the sample child is selected at random of all children during NHIS survey administration):

Instrument Variable Name: AHERNOY2 **DURING THE PAST 12 MONTHS, HOW MANY TIMES have you gone to a HOSPITAL EMERGENCY ROOM about your own health? (This includes emergency room visits that resulted in a hospital admission.)**
times in ER/ED, past 12 m 00 None 01 1 02 2-3 03 4-5 04 6-7 05 8-9 06 10-12 07 13-15 08 16 or more 97 Refused 98 Not ascertained 99 Don't know

Appendix C: Regression Results for Health Insurance Subsamples

Table C1. Regression results for private-sector employees by health insurance status, 18–64 years: self-reported health status.

Variable	Public Health Insurance		Private Health Insurance		Without Health Insurance	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Paid Sick Days	0.496	0.217	0.091	0.092	0.336	0.156
Sex	-0.249	0.198	-0.111	0.087	-0.175	0.118
Age	-0.068	0.049	-0.081	0.027	-0.089	0.035
Age2	0.000	0.001	0.001	0.000	0.001	0.000
Hispanic	-0.123	0.228	-0.428	0.116	0.060	0.143
Black	0.090	0.232	-0.115	0.120	-0.026	0.165
Other Race	0.219	0.361	-0.006	0.196	-0.001	0.279
Less than High School or GED	-0.378	0.240	-0.569	0.130	-0.243	0.147
Some College or Associates	-0.081	0.230	0.053	0.108	0.035	0.161
At Least Bachelors Degree	0.209	0.367	0.712	0.140	0.670	0.278
$35,000-$74,999	0.540	0.238	0.409	0.101	0.448	0.142
$75,000-$99,999	0.608	0.502	0.881	0.155	1.038	0.470
$100,000 +	1.381	0.546	0.978	0.150	1.045	0.519
Ambulatory Case Sensitive Condition	-1.172	0.188	-1.382	0.091	-1.223	0.124
Constant	4.598	0.984	5.232	0.563	4.540	0.665
Pseudo R2	0.124	0.1217	0.0868			
Sample Size	1455	13269	3776			

Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 National Health Interview Survey data for private-sector employees aged 18–64 years. Logistic regression results.

Table C2. Regression results for private-sector employees by health insurance status, 18–64 years: delayed medical care.

Variable	Public Health Insurance		Private Health Insurance		Without Health Insurance	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Paid Sick Days	-0.368	0.180	-0.150	0.056	-0.093	0.086
Sex	0.230	0.172	0.241	0.052	0.411	0.071
Age	0.035	0.040	0.060	0.016	-0.007	0.021
Age2	0.000	0.001	-0.001	0.000	0.000	0.000
Hispanic	-0.244	0.194	-0.249	0.077	-0.631	0.085
Black	-0.580	0.209	-0.383	0.078	-0.455	0.104
Other Race	-0.241	0.284	-0.545	0.115	-0.794	0.164
Less than High School or GED	0.326	0.218	0.119	0.098	0.060	0.093
Some College or Associates	0.367	0.200	0.150	0.068	0.428	0.094
At least Bachelors Degree	0.346	0.288	-0.052	0.075	0.331	0.133
$35,000-$74,999	-0.018	0.185	-0.371	0.063	-0.109	0.080
$75,000-$99,999	-0.935	0.485	-0.845	0.088	-0.582	0.211
$100,000 +	-0.884	0.382	-1.375	0.091	-0.269	0.201
Ambulatory Case Sensitive Condition	0.311	0.164	0.404	0.056	0.764	0.086
Constant	-2.535	0.765	-2.337	0.299	-0.528	0.380
Pseudo R2	0.0297	0.0474	0.0595			
Sample Size	1456	13267	3776			

Source: Institute for Women's Policy Research estimates based on analysis of the 2008 and 2009 National Health Interview Survey data for private-sector employees aged 18–64 years. Logistic regression results.

Table C3. Regression results for private-sector employees by health insurance status, 18–64 years: emergency department (ED) visits.

Variable	Public health insurance		Private health insurance		Without health insuance	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Paid Sick Days	-0.113	0.097	-0.068	0.045	-0.107	0.090
Sex	0.435	0.102	0.191	0.041	0.504	0.074
Age	-0.033	0.023	0.037	0.013	0.047	0.022
Age2	0.000	0.000	-0.001	0.000	-0.001	0.000
Hispanic	-0.013	0.109	-0.026	0.062	-0.361	0.088
Black	0.054	0.108	0.379	0.058	0.174	0.103
Other Race	-0.251	0.175	-0.232	0.084	-0.082	0.167
Less than High School or GED	0.060	0.116	0.263	0.078	0.169	0.094
Some College or Associates	-0.057	0.108	0.038	0.054	0.124	0.097
At least Bachelors degree	-0.164	0.169	-0.367	0.060	-0.321	0.153
$35,000–$74,999	-0.456	0.112	-0.079	0.055	-0.034	0.084
$75,000–$99,999	-0.400	0.229	-0.049	0.070	-0.468	0.226
$100,000 +	-0.577	0.197	-0.001	0.066	-0.427	0.229
Ambulatory Case Sensitive Condition	0.616	0.094	0.450	0.045	0.688	0.086
Constant	0.602	0.428	-1.404	0.240	-1.475	0.401
Pseudo R2	0.0452	0.0232	0.0329			
Sample size	1456	13271	3777			

Source: Institute for Women's Policy Research estimates based upon analysis of the 2008 and 2009 National Health Interview Survey data for private-sector employees aged 18–64 years. Negative binomial regression results.

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