



## Research Article

# Employer Paid Sick Leave, Disability, and Workers' Compensation Trends for Employees Whose Spouses have Cancer Conditions in the United States

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## Abstract

**Purpose:** U.S. firms often include medical and prescription insurance for their employees and dependents as well as absence benefits for employees. Employers recognize that family illnesses can impact employee health and absences. This research compares all-cause absence utilization and changes from baseline for eligible employees whose spouses have cancer. **Methods:** Spouses with cancer healthcare claims were identified in the Workpartners database between January-2001 and December-2020 and analyzed retrospectively. Outcomes included annual prevalence (of spouse-patients with cancer), and for spouse-patients and employees: direct costs (medical and prescription) and overall severity. All-cause short- and long-term disability (STD and LTD, respectively), workers' compensation (WC), and sick leave (SL) benefit utilization, mean days of leave, and disability payments were analyzed for the employees for cancer overall and for specific cancer categories. Annual outcomes were calculated over the 20-year period. Trends were compared to detect differences from zero and across types of cancer. **Results:** At baseline (2001), 4.6% of employees' spouses had cancer, and among these employees, 45.5% used SL, 4.8% filed STD claims, 0.1% filed LTD claims, and 1.2% filed WC claims. Baseline mean medical and drug costs for spouse-patients with cancer were \$9139 and \$995, respectively, and for employee-caregivers were \$2252 and \$690, respectively. From 2001 to 2020, cancer prevalence rates increased significantly, by 0.79 cases per 1000 per year. While medical costs, drug costs, and sick days per employee-caregiver increased significantly, the percent of employee-caregivers using SL varied year to year while STD, LTD, and WC were relatively flat. Significant differences in trends among cancer types were identified. **Conclusions** While medical and drug costs for employee-caregivers of spouses with cancer have increased over 2001-2020, caregiver utilization of sick leave has varied, and caregiver disability payments have remained more consistent.

**Keywords:** Sick Leave; Paid; United States; Spouses.

## Introduction

United States employers frequently pay a portion of the costs of employee and dependent direct care for medical and pharmacy services. While not limited to employer-based insurance, medical care and prescription cancer drugs were estimated to be \$208.9 billion in 2020 [1,2] with costs and cost growth varying by type of cancer [1].

In addition to the direct care components, some US employers also provide employees with salary-based paid personal time off called sick leave (SL) for illnesses typically lasting less than two weeks. Most employers provide short- (STD) and long-term disability [3] (LTD) coverage for longer non-work related illnesses and workers' compensation [4] (WC) for workplace illnesses and accidents. These benefits are summarized in Table 1.

Absence Benefit	Typical Illness Duration	Percent of Salary Paid During Absence	Employees in the Workpartners RRDb with coverage
Sick Leave	<2 weeks	100%	710,000
Short-Term Disability <sup>3</sup>	2 weeks to 6 months	60%-100%	1.2 million
Long-Term Disability <sup>3</sup>	>6 months	50%-70%	1.1 million
Workers’ Compensation <sup>4</sup>	any	66%-80%	1.4 million

**Table 1:** United States Employers Absence Benefits and Coverage.

The US Centers for Disease Control and Prevention estimated 1.8 million people were diagnosed with cancer in the US in 2020 [5]. This has important implications for employers and workers alike. However, comprehensive cost and absence information are limited for working-age persons in the US whose spouses have cancer. Additionally, limited publications on the work absence costs or lost time are available for employees with cancer [6-12] and fewer publications were found on employees whose spouses have cancer [6,13].

This present retrospective research examines trends in the costs and absences of eligible employees whose spouses have cancer conditions. For the employees and their spouses with cancer, all-cause cost and severity trends were identified based on claims and payments for medical care and prescription drugs. In addition, for the employees, all-cause short- and long-term disability, workers’ compensation, and sick leave utilization were examined annually and as changes from baseline. Different categories of cancer were compared to understand whether trends were similar across types of cancer.

**Methods**

To better understand the impact of cancer conditions on employed caregivers of patients with cancer and on their work absenteeism, claims from the Workpartners Research Reference Database (RRDb) were analyzed from January 1,2001–December 31, 2020. The RRDb links employees to their spouses and dependents and contains data on employee job-related information (e.g., salary, exempt-/non-exempt status, full-/part-time status,

etc.), plus payments and lost time for four absence benefits: sick leave, short-term disability, long-term disability, and workers’ compensation. This national database contains de-identified direct medical and prescription claims from multiple insurance carriers on 3.6 million US employees and 1.9 million dependents from multiple employers in the manufacturing, retail, service, medical, transportation, technology, energy, financial, and utility industries. Employees in the RRDb with eligibility for the absence benefits are shown in Table 1.

The RRDb has been used to analyze the trends of absence payments and lost productivity for employee-caregivers where the spouse had major depressive disorder and suicidal ideation or suicidal attempt, [14] epilepsy with partial-onset seizures, [15] and multiple sclerosis [16]. The RRDb has also been used to study the impact on the employee-caregiver when a dependent child had pediatric asthma [17]. Recent RRDb research has also been published on employees with mental disorders and substance use disorders, [18] acromegaly, [19] and rheumatoid arthritis [20].

This research focuses on employees whose spouses have cancer. Similar to Hess et al. [13] we defined cancer caregivers as adult co-policy holders of the cancer patients retrospectively identified in the Workpartners RRDb, based on claims with International Classification of Diseases ninth and tenth revision (ICD-9/-10) codes for the cancer categories defined by the US Agency for Healthcare Research and Quality [21] (AHRQ) (Table 2). Study data were analyzed over the calendar years beginning January 2001 and ending December 2020.

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Category Name	Number of Unique Employee-Years for Employees whose Spouses have Cancer	Cancer Type	% of Total
Cancer of breast	7,164	Breast	6.4%
Benign neoplasm of uterus	20,587	Female	18.5%
Cancer of cervix	4,815	Female	4.3%
Cancer of other female genital organs	600	Female	0.5%
Cancer of ovary	842	Female	0.8%
Cancer of uterus	822	Female	0.7%
Cancer of bladder	734	GI	0.7%
Cancer of colon	1,750	GI	1.6%
Cancer of esophagus	230	GI	0.2%
Cancer of liver and intrahepatic bile duct	502	GI	0.5%
Cancer of other GI organs; peritoneum	593	GI	0.5%
Cancer of rectum and anus	1,057	GI	0.9%
Cancer of stomach	335	GI	0.3%
Cancer of other male genital organs	59	Male	0.1%
Cancer of prostate	2,523	Male	2.3%
Cancer of testis	294	Male	0.3%
Melanomas of skin	870	Other	0.8%
Multiple myeloma	821	Other	0.7%
Other non-epithelial cancer of skin	1,456	Other	1.3%
Cancer of bone and connective tissue	1,198	Other	1.1%
Cancer of brain and nervous system	766	Other	0.7%
Cancer of bronchus; lung	143	Other	0.1%
Cancer of head and neck	353	Other	0.3%
Cancer of kidney and renal pelvis	1,764	Other	1.6%
Cancer of other urinary organs	172	Other	0.2%
Cancer of pancreas	400	Other	0.4%
Cancer of thyroid	855	Other	0.8%
Cancer; other respiratory and intrathoracic	1,537	Other	1.4%
Hodgkin's disease	3,256	Other	2.9%
Leukemias	2,597	Skin	2.3%
Non-Hodgkin's lymphoma	372	Skin	0.3%
Secondary malignancies*	14,254	Skin	12.8%

Category Name	Number of Unique Employee-Years for Employees whose Spouses have Cancer	Cancer Type	% of Total
Cancer; other and unspecified primary*	1,404	Excluded	1.3%
Maintenance chemotherapy; radiotherapy*	4,085	Excluded	3.7%
Malignant neoplasm without specification of site*	1,133	Excluded	1.0%
Neoplasms of unspecified nature or uncertain behavior*	14,485	Excluded	13.0%
Other and unspecified benign neoplasm*	16,591	Excluded	14.9%
All categories	111,419		

**Table 2:** Unique Employees whose Spouses have US Agency for Healthcare Research and Quality Cancer Category Diagnoses [21];  
\*Eliminated per protocol due to the non-specific nature of the category.

The prevalence of cancer overall and the prevalence of the individual AHRQ-specific cancer conditions were calculated for each year. Non-specific categories such as maintenance chemotherapy, radiotherapy, and unspecified neoplasms were excluded from the study. The remaining categories were categorized into five groups: breast cancer (6.4%, including male and female), gastrointestinal (“GI”) cancers (4.7%), “female” cancers (24.8%, including of the cervix, uterus, ovary, or other female genital organs but excluding breast cancer), “male” cancers (2.6%, including of the prostate, testes, and other male genital organs, excluding breast cancer), and “skin” (12.2%, e.g., dermatologic cancers, including melanomas, other non-epithelial cancer of skin). The remaining categories were grouped together as “Other.”

For each year’s prevalent cancer populations, the annual medical and prescription costs and Charlson Comorbidity Index (CCI) scores [22] were calculated for both the spouses (with cancer) and the employee ‘Caregivers’. Infused and injected agents paid for under the medical benefit are reported with the medical costs.

For each absence benefit, the caregiver population was restricted to those employees with eligibility for the benefit, and the percent utilizing the benefit was calculated. All absence outcomes (percent using, cost and days of leave) were aggregated based on the year the leave began. For short-term disability, long-term disability, and workers’ compensation, the mean days of leave and the median disability payment as a percent of salary were calculated. Sick leave payments are equal to salary payments; they are included in the average cost analyses but not in the median cost analyses. Outcomes from 2002 through 2020 were compared with

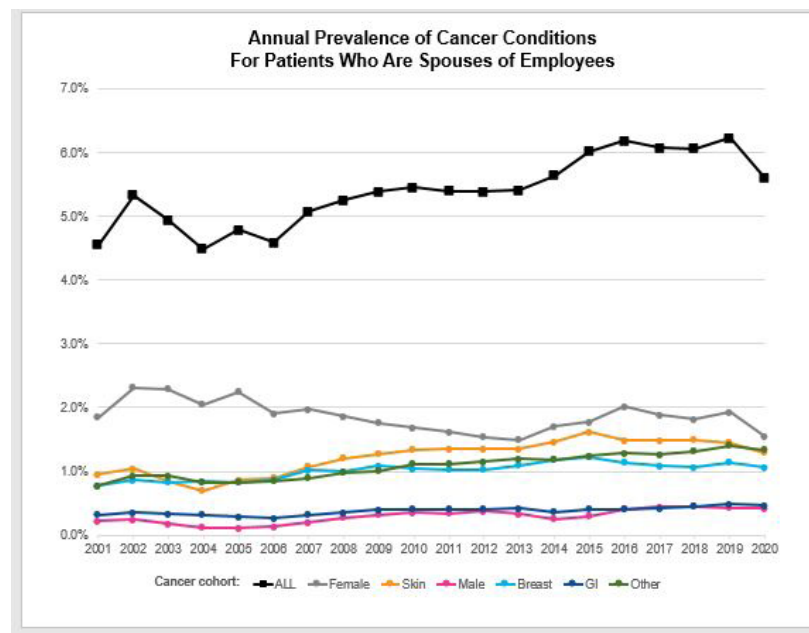
baseline (2001).

Long-term disability and workers’ compensation payments included lump-sum distributions, and short-term disability, long-term disability, and workers’ compensation leaves potentially extended beyond the year initiated. Workplace accidents were paid under the workers’ compensation benefit. Workers’ compensation claims without absence from work (medical-only claims) were excluded. Vacation time, paid time off (not classified as sick leave), and absences under the Family Medical Leave Act (FMLA) were not included in the analysis.

The prevalence, cohorts’ comorbidity (CCI) and direct benefit costs for caregivers and patients (medical and prescription), and caregiver sick leave, short-term disability, long-term disability, and workers’ compensation), and absence days utilization (sick leave, short-term disability, long-term disability, workers’ compensation) were calculated, and trend lines were created overall and for each of the top cancer categories. The difference in the slopes of the trend lines were compared among the cancer categories and over time.

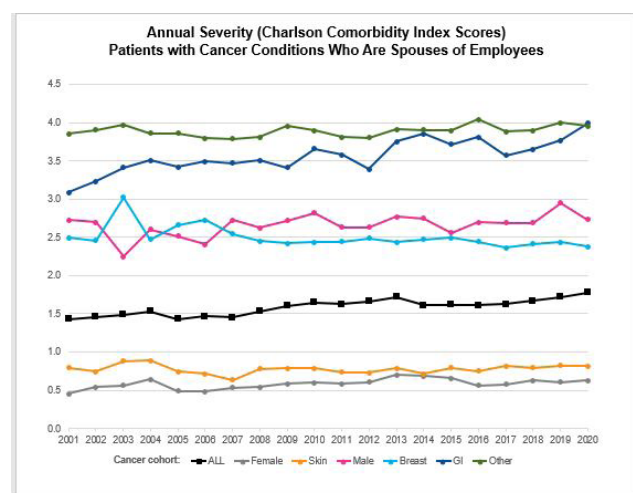
## Results

The annual prevalence of all cancer conditions (Figure 1) averaged 5.5% over the study period, with the highest prevalence in 2019 (6.2%) and the lowest prevalence (4.5%) in 2004. Among the specific categories, the highest prevalence through most of the study was for female cancers, with GI and male cancers the least prevalent. The prevalence trend for female cancers was negative (significantly decreasing) and all other groups were positive (significantly increasing) including the “all Cancer” category.



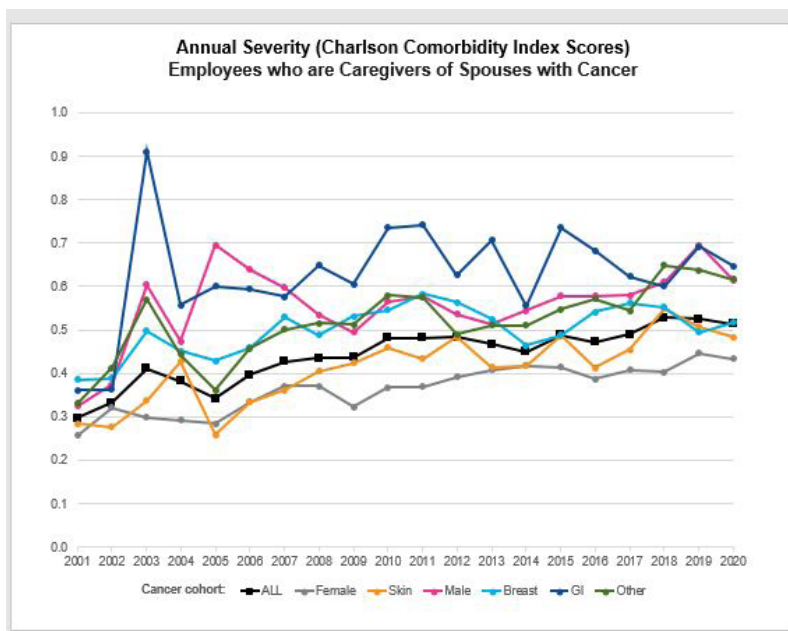
**Figure 1:** Annual Prevalence of Cancer Conditions for Patients Who Are Spouses of Employees.

Overall severity of comorbidities for the patients and employee-caregivers as measured by the annual CCI scores are presented in Figures 2A and 2B, respectively, with CCIs averaging 1.58 for the patients and 0.44 for the caregivers. The patient CCIs were consistently ranked highest to lowest for Other, GI, Male, Breast, All, Skin and Female except for 2003 to 2006, when Breast was higher than Male. For the caregivers, the CCIs were highest in most years for GI and lowest for Female. The patient and employee-caregiver trend line slopes of the CCI scores for all study cancers were relatively flat during the 2001-2020 study period. Slight significant trend increases were identified for patients and caregivers of ALL and Female cancers, caregivers of Male, Skin, and Other cancers, and patients with GI. Patients with Breast had slight significant decreases in CCI.



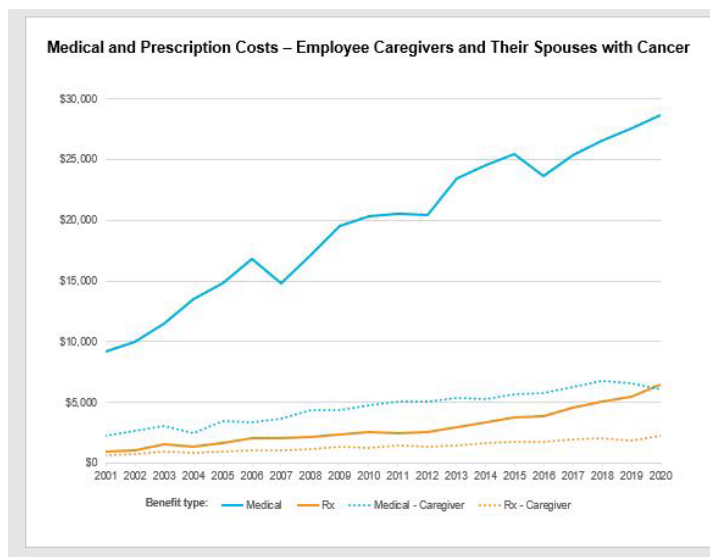
**Figure 2:** Annual Severity (Charlson Comorbidity Index Scores)

2A) Annual Severity (Charlson Comorbidity Index Scores) for Patients with Cancer Conditions Who Are Spouses of Employees;



## 2B)Annual Severity (Charlson Comorbidity Index Scores) Employees who are Caregivers of Spouses with Cancer

The overall average direct medical and prescription (Rx) costs for spouse-patients with cancer at baseline were \$9139 and \$995, respectively and for employee-caregivers were \$2252 and \$690, respectively. Medical and prescription costs steadily increased from 2001 to 2020, with medical costs increasing at a rate about four times higher than prescription costs for the patients and three times higher than prescription costs for the caregivers (Figure 3). The patient medical and prescription cost slopes for each cancer type were all increasing. Medical costs of patients with Skin cancer increased at a significantly lower rate than GI and Other. Prescription costs for Skin, Female and Breast increased at a lower rate than Other, and Female prescription cost growth was lower than GI. Caregiver medical and prescription costs all increased at similar rates across cancer types.



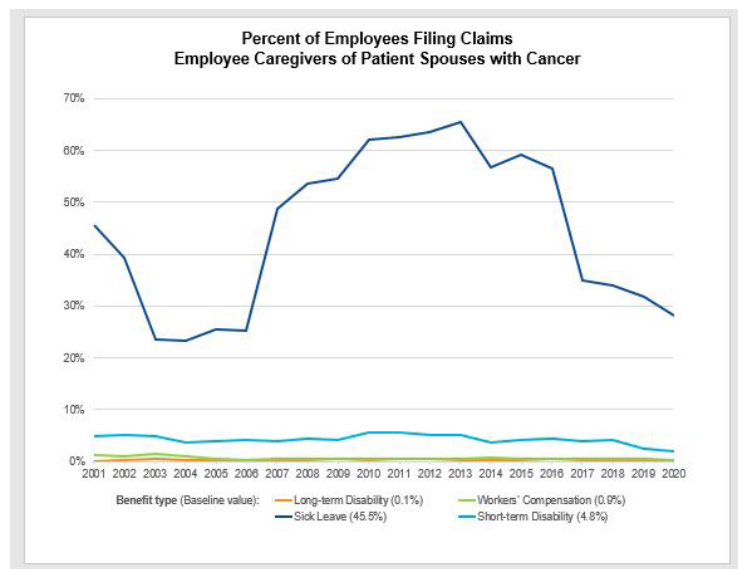
**Figure 3:** Direct Medical and Prescription Costs–Employee Caregivers and Their Spouses with Cancer.



	Sick Leave	Short-term Disability	Long-term Disability	Workers' Compensation
Utilization, % of Cohort	45.5%	4.8%	0.1%	1.2%
Days of leave, mean	4.9	35.7	87.8	42.7
Average Payment	\$879	\$4109	\$10,500	\$7146
Median Payment, % of salary	NA	69.6%	39.5%	84.3%

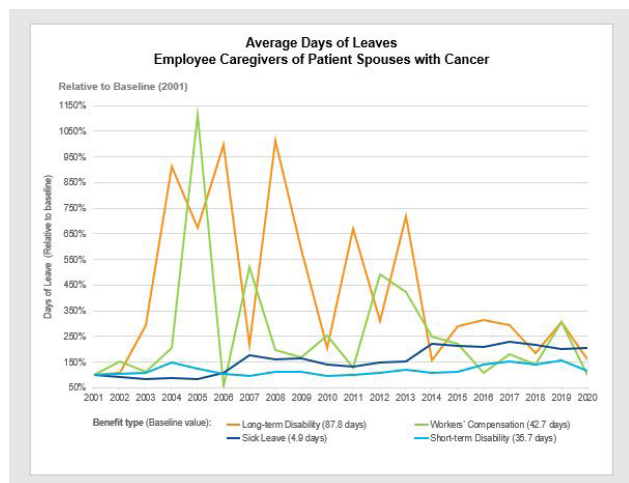
**Table 3:** Employee-Caregivers Baseline (2001) Absence Benefit Utilization; NA not applicable.

At baseline (2001, Table 3), sick leave was found to be the most-utilized benefit by employees whose spouses had cancer, followed by short-term disability, workers' compensation, then long-term disability. The annual percentages of employees utilizing each of the different absence benefits are shown in Figure 4. From 2001 through 2020, short-term disability utilization was 2.0%-5.7%, long-term disability utilization was 0.1%-0.5%, workers' compensation was 0.3%-1.5%, and sick leave was 23.4%-65.5%.



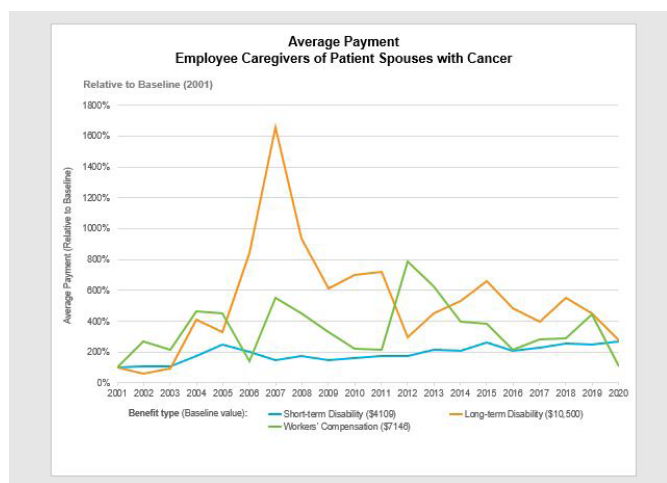
**Figure 4:** Percent of Employees Filing Claims by Condition and Benefit.

The employee-caregiver workers' compensation trend line decreased slightly, and all of the other benefit utilizations were flat (e.g., they all included zero in the confidence intervals and thus did not reach statistical significance). For the individual cancers, most benefit utilization was flat. Decreasing utilization trends were found in workers' compensation for All, Other, and Breast, and in short-term disability for GI and Breast.



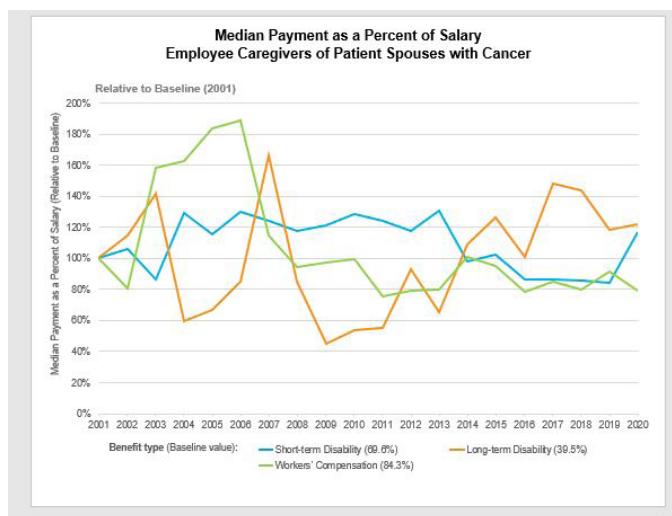
**Figure 5:** Average Days of Leaves (as a percent of baseline).

The baseline average annual days of leave by benefit are shown in Table 3, and annual days of leave relative to baseline are presented in Figure 5. During the 20-year period (from 2001 through 2020) as a percent of baseline, relative mean days of sick leave were 84.3%-228.8%, short-term disability leaves were 93.8%-154.4%, long-term disability leaves were 107.3%-1013.7%, and workers' compensation leaves were 55.1%-1115.8%. The slopes of the absence days of the long-term disability and workers' compensation trend lines for the individual cancers were all non-significantly different from zero. Sick leave days increased, with similar slopes for all cancer cohorts in the study. Short-term disability trend lines had similar slopes that were increasing for Female and Skin cancer, however the slopes of All, Breast, GI, Male and Other cancers were non-significant.



**Figure 6:** Average Payment by Benefit (as a percent of baseline).

The range of average absence payments as a percent of baseline are shown in Figure 6 for each benefit. From 2001-2020 as a percent of baseline, the average payments were 92.8%-461.2% for sick leave, 106.4%-269.6% for short-term disability, long-term disability payments were 61.4%-1653.3%, and workers' compensation payments were 107.7%-787.4%. Long-term disability and workers' compensation payment trends were non-significant for all cancer types. Average payments significantly increased for sick leave for all cancer types, and short-term disability payments significantly increased for Female, Skin, Breast, and All cancers.



**Figure 7:** Median Payment as a Percent of Salary by Benefit (as a percent of baseline). Because sick leave payments are equal to salary, they are omitted from this chart.

At baseline, sick leave median payments were equal to salary, and for the other benefits, the median payments as a percent of salary were highest for workers' compensation, followed by short-term disability and long-term disability. Compared with baseline, the range of relative median payments as a percent of salary is shown in Figure 7. From 2001 to 2020, the median payments were 84.1%-130.7% of baseline for short-term disability, 44.8%-166.5% for long-term disability, and 75.9%-188.7% for workers' compensation. The slopes of the short-term disability median payment lines for employee-caregivers of spouses with the individual cancers were non-significant except for Other cancers which significantly decreased. While the overall workers' compensation trend line significantly decreased, all of the individual cancer median payment trends were non-significant. The employee-caregiver long-term disability median payment trend lines increased for Other cancers, while the rest of the trend lines for all and the remaining cancers were non-significant.



## Discussion

This study focused on outcomes trends using real-world data for employees whose spouses have cancer, covering directing costs, indirect costs, and days of leave. Although studies focus on the impact of cancer on work absence, disability, and cost, studies in the literature using integrated employee benefits and payroll system data on caregivers are limited [14-17]. The trends reported in recent RRDb research has also been published on employee trends with mental disorders and substance use disorders [18] and rheumatoid arthritis [20] and cohort studies on acromegaly, [19] multiple sclerosis, [23] and other conditions [24-29].

Similar to the study by Hess et al. [13] the present research found that in the period following their spouses' diagnosis, employee-caregivers used slightly fewer healthcare resources and expended less costs than their spouses and supports their conclusion that while the amount of time invested in informal caregiving is not recorded in claims databases, their findings suggest that during the year following diagnosis, adult caregivers may forego health care for themselves as their focus is on the health and wellbeing of the cancer patient.

Few prior studies cover multiple benefit types. Chang et al. [6] researched seven types of cancer in 1999 and 2000. For absence components, sick leave caregiver data were reported for all cancers, with 2.2 absence days per month (26.4 days per year). But, constant wage data were used to derive the estimated monthly caregivers' sick leave costs of \$255 (\$5995 per year inflation adjusted to 2020 dollars) [6]. Recent publications have reported that the use of constant wage data may not be accurate [18,20,30].

In comparison to Chang, our research identified 7.6 annual sick leave days per year (range of 4.1-11.2) at an average cost of \$2455 (range \$816-\$4054), and for short-term disability an average of 42.0 days (range 33.5-55.1). We also included long-term disability and workers' compensation absences, which are rare in general and may not be directly impacted (caused) by the patients. While it is unlikely a spouse's cancer directly causes an accident at work, caregivers concerned about their spouse's condition may have a loss in concentration that results in an accident and workers' compensation claim.

For individuals who are employed, the time spent providing care to a family member with cancer can impel caregivers to take time off from work, which can lead to lost wages and financial hardship [13] de Moor et al. [13] examined data from two surveys and stated that over 75% of cancer survivors reported their spouse (or partner) as their informal caregiver. They also stated that 38.9% of the caregivers made adjustments to their work schedule, work load, and/or job responsibilities, 32.9% took time off from work lasting less than two months or on an episodic basis, 12.2% experienced lost work opportunities such as losing a job, changing

jobs, delaying looking for work or not taking a promotion, and 8.6% made other changes. In spite of the overwhelming burden associated with caregiving, some caregivers are reluctant to quit work or reduce hours worked to maintain employer-based health insurance [32].

It has been reported that many cancer patients eventually return to work following diagnosis [33,34] and Bradley [35] reported their employed caregivers may follow a similar pattern, mirroring return to work and absenteeism of their patient.

The Workpartners RRDb has been leveraged to publish data on the impact from all four absence benefits using real-world data based on claims and payroll data [18-20,23-29,36] In the present study, annual cohort inclusion, prevalence, medical costs, and CCI were based on medical claims. Drug costs were derived from prescription claims, and the remaining outcomes were based on absence benefits.

The Charlson Comorbidity Indexes of the spouses with cancer in this study were compared with the CCIs of employees with cancer from other research performed in the same database [30]. Comparing the two studies, the CCIs of the spouses with cancer and employees with cancer were negatively correlated for those with Other, Skin, and Male cancers (Pearson correlation coefficients of -0.002, -0.129, and -0.426, respectively). Overall, CCIs for the employee-patients and spouse-patients had a correlation of 0.575 and were highest for GI (0.800), Female (0.715) and Breast (0.464).

The present study has several strengths. This study used real-world, objective data from employer disability/WC claims and payroll systems, and was conducted in a diverse, commercial workplace-centric database. The employers in the database represent a wide range of industries with multiple insurers and representation from throughout the US. The database also includes job-related information (salary, exempt status, and part-/full-time status), self-reported racial information not contained in other databases, and important to this research, links between employees and their spouses. Employee salary information was critical to the calculation of the median percent of salary paid under the different benefits compared in the study.

This study has several limitations. These administrative claims data are derived from employees and their spouses with commercial health insurance over the study period and may not be generalizable to employee-caregivers and their spouse-patients who do not have employer-sponsored health insurance or who are unemployed. In addition, it is unknown if others are present in the household or nearby to assist with caregiving or if the employee-caregiver is actively involved in caregiving.

Although the study examined subgroups of cancer and compared them with cancer overall, we did not examine all

individual cancer conditions. Also, this research focused on all-cause utilization of the absence benefits. Additionally, this study focused on spouses with cancer, and likely underestimated the total cost of cancer caregiving by not including children with cancer.

Today's therapies include a variety of oral, infused and outpatient agents with varying degrees of toxicity, which may have impacted caregiver absences. However, this research did not assess the impact of treatment or ascertain disease control or side effects experienced by the patients. In addition, comparisons with baseline allow for a level of control, but the study did not include specific control groups. The Workpartners RRDb provided a convenience-based sample, and the population expanded or contracted by employers joining or leaving the database. The study was conducted over a 20-year period, each year/condition was an evolving, and thus different, cohort with potential changes in benefits and employer-based interventions.

Future research should consider examining specific cancer conditions, using control cohorts (employees without the stated condition), adjusting inclusion/exclusion criteria to require multiple medical or prescription claims, and using two-part regression models to control for employee job-related information (e.g., salary, full-/part-time status, etc.) when estimating absences and costs, which might allow the impact to be projected to the US employed population. Finally, future research should explore the differences between overall disease severity for employees with cancer and spouses with cancer.

## Conclusions

In this real-world study, while medical and drug costs for employees whose spouses had cancer increased from 2001 to 2020, utilization of absence benefits and payments for those absences as a percent of salary have not increased. Additionally, for employees whose spouses had cancer the percent using disability, workers' compensation, or sick leave in a given year varied greatly. The days of leave, as well as payments for leave as a percent of salary, were highly variable over time and associated with benefit type. Estimates of caregiver impact should be based on objective, person-level or claim-level, absence and payment data from employer disability, workers' compensation, and payroll data systems.

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