

RESEARCH ARTICLE OPEN ACCESS

Sociodemographic, Industry and Health Factors Associated With Underutilization of Workers' Compensation Insurance

Sara Wuellner  | David Bonauto

SHARP Program, Washington State Department of Labor & Industries, Olympia, Washington, USA

Correspondence: Sara Wuellner (sara.wuellner@lni.wa.gov)

Received: 15 August 2025 | **Revised:** 29 September 2025 | **Accepted:** 4 October 2025

Funding: This work was supported by the State Occupational Safety and Health Surveillance Program grant from the National Institute for Occupational Safety and Health (NIOSH) under grant number U60OH008487.

Keywords: occupational injury | survey | underreporting | work injury | workers' compensation

ABSTRACT

Objective: Workers' compensation insurance is an important financial resource for workers, and a key source of occupational injury and illness surveillance and research data. Underutilization of workers compensation is an ongoing concern. Using statewide data for a general working population, we estimated the portion of workers whose work-related injury or illness (WRII) was paid by workers' compensation and assessed workers' compensation utilization by industry, occupation, demographic and health characteristics, and over time.

Methods: We combined 5 years of Behavioral Risk Factor Surveillance System telephone survey data (2017–2022, excluding 2020) from Washington State for workers ($n = 31,171$) and identified respondents with WRII ($n = 1463$). We estimated the percent of workers who utilized workers' compensation to pay for treatment of their WRII, and calculated adjusted prevalence ratios to estimate underutilization controlling for sociodemographic, work and health factors. Estimates were weighted to be representative of the Washington adult population.

Results: Of the 5.1% of Washington workers who experienced a WRII within the past 12 months, just over half (51.3%, 95% CI: 48.1%, 54.5%) reported that their WRII was paid by workers' compensation insurance. Controlling for other sociodemographic, work and health factors, workers' compensation utilization was lower among workers who were younger, male, graduated from college, reported poorer mental health, and could not afford medical care. Workers' compensation utilization was lower among most service-related industries and occupations. Annual estimates of utilization statewide changed little over time.

Conclusion: Underutilization of workers' compensation insurance is substantial. Workers' compensation data are more likely to miss younger workers, and workers in service-related industries and occupations.

1 | Introduction

Workers' compensation is a no-fault insurance system that covers medical costs and provides wage replacement for missed work or disability for workers injured or made ill on the job. In the U.S., each state regulates its own workers' compensation insurance

program, establishing which workers are covered, the conditions eligible for compensation, and the level of benefits. In addition to providing financial assistance to workers, workers' compensation insurance data are a key source of occupational injury and illness data that can be used to identify priorities, inform policies, and develop prevention efforts [1–4].

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](https://creativecommons.org/licenses/by-nc/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2025 The Author(s). *American Journal of Industrial Medicine* published by Wiley Periodicals LLC.

Most workers in the U.S. are covered by workers' compensation insurance; all but three states mandate coverage for all employers with few exceptions (workers generally excluded from coverage are self-employed workers, domestic workers, and state-specific agriculture and small firm exceptions). In 2022, workers' compensation systems covered 146 million jobs [5] among the 169.8 million workers in the U.S [6].

Despite eligibility, many workers do not file a claim with workers' compensation for coverage. Workers report a burdensome claim process [7–10], fear of retaliation by employers or coworkers [8–12], inadequate benefits [9, 12], and a lack of knowledge about the workers' compensation system [8, 10, 12].

Estimates first published over 20 years ago found workers' compensation utilization to be low. A nationally representative survey of Canadian workers estimated 60% of injured workers filed a workers' compensation claim [13]. Based on Behavioral Risk Factor Surveillance System (BRFSS) survey data from 10 U.S. states, the percent of injured workers in 2007 whose treatment was paid by workers' compensation ranged from 47% in Texas to 77% in Kentucky [14]. Claim-filing propensity has been found to differ by demographic and injury characteristics. Multiple studies suggest that workers' compensation utilization increases with worker age [9, 15], job physicality or hazard [15–17], and injury severity [15, 17, 18]. Lakdawalla et al. [19] observed increased claim filing among workers with private health insurance, and lower workers compensation utilization among uninsured workers. The relationship between workers' compensation utilization and other factors is less clear. Inconsistent results have been reported for education [16, 17], tenure [9, 18, 20], and income [18, 20].

Underutilization of workers' compensation is an ongoing concern, with limited research on differences in utilization across a broad working population. To date, most studies of U.S. workers have examined select aspects of underutilization of workers' compensation, focusing on specific industries, occupations or conditions [9, 12, 15, 18]. In contrast, Fan et al. [21] were the first to evaluate underutilization of workers' compensation across a statewide general working population in the U.S., but the small sample size limited the study's power to detect statistically significant differences. In this study, we use multiple years of Washington BRFSS data to estimate use of workers' compensation insurance among Washington workers, identify sociodemographic factors associated with underutilization, including industry and occupation, and evaluate underutilization over time.

2 | Methods

2.1 | Data Source

We used Washington BRFSS survey data to estimate the percent of Washington workers who experienced a work-related injury or illness (WRII) in the past year, and the portion of workers with WRII whose treatment was covered by workers' compensation insurance.

A partnership between the U.S. Centers for Disease Control and Prevention and the states and territories, BRFSS administers telephone surveys annually to assess health status

and risks [22]. The questionnaire consists of a core set of questions asked by all states, optional modules asked by states that elect to include them, and state-added questions. The state survey is designed to be representative of the state adult noninstitutionalized population.

Questions on WRII and payment of WRII were developed by Washington and included as state-added questions in the Washington BRFSS questionnaire. To assess WRII, recently employed respondents were asked: "In the past 12 months, have you been injured while performing your job, OR has a doctor or other medical professional told you that you have a work-related illness?" (Washington BRFSS variable EMPLINJM). Respondents who answered affirmatively were then asked: "Thinking of the most severe work-related injury or illness in the past 12 months, who paid for your treatment?" (Washington BRFSS variable INJPAY). Data on industry (type of business) and occupation (a person's job) were collected via the Industry and Occupation optional module. Free text responses for industry and occupation were coded to North American Industry Classification System (NAICS) and Standard Occupational Classification (SOC) codes using the National Institute for Occupational Safety and Health's Industry and Occupation Computerized Coding System [23].

We analyzed 5 years of Washington BRFSS data: 2017–2019 and 2021–2022. These were the years during which the relevant WRII questions were included in the Washington questionnaire. The median response rate for Washington in those years was 45.0% and ranged from 39.5% to 50.0%.¹

2.2 | Study Population

We included in the analysis respondents aged 18 years and older currently employed for wages or out of work < 1 year. Respondents out of work for < 1 year were included to capture the experience of recent workers, including those who may have left the workforce because of WRII. Self-employed respondents were excluded because they are not required to obtain workers' compensation insurance. Respondents who worked in the military, identified from industry and occupation fields, were also excluded because they were outside the jurisdiction of state workers' compensation insurance programs.

2.3 | Variable Definitions

We defined WRII as a work injury or illness that involved treatment. Combining responses from EMPLINJM and INJPAY, respondents who indicated that they had a work injury or illness in the past 12 months (based on responses to EMPLINJM) and that the injury or illness involved treatment (based on responses to INJPAY) were classified as having a WRII. This definition includes injuries and illnesses with days of missed work and cases limited to medical treatment only (i.e., no missed work). Respondents who indicated that their recent work injury or illness involved no treatment were grouped with respondents with no recent work injury or illness and were classified as not having a WRII.

We defined WRII paid by workers' compensation as treatment paid by workers' comp or filing a workers' compensation claim for treatment. All other responses were classified as not paid by workers' compensation.

Industry classifications were grouped by NAICS sector, and occupation classifications were grouped by SOC major group. Some groups were combined further to account for small numbers of cases.

2.4 | Statistical Analysis

To estimate workers' compensation utilization for WRII by sociodemographic characteristics, industry and occupation, and health status, we combined 5 years of data (2017–2019, 2021–2022), increasing the statistical power and reliability of estimates. Responses were weighted to be representative of the state population. Annual survey weights were adjusted for differences in sample size by year, so that each year of data contributed equally to the combined estimates. Estimates based on subgroups with less than 50 observations in the sample or with a relative standard error greater than 25% were not reported.

To identify factors associated with underutilization of workers compensation, independent of other sociodemographic, work, or health characteristics, a multivariable regression model was constructed using backward selection. All variables were entered into the initial multivariable model and removed one at a time, in decreasing order of their *p*-value, until all remaining variables had a *p*-value < 0.25. Model estimates were used to calculate adjusted prevalence ratios (aPR) for underutilization and 95% confidence intervals. Analyses were conducted using SAS 9.4 (Cary, NC), using the survey procedures, including the surveylogistic procedure and nlmeans macro to estimate aPR.

To assess temporal trends in workers' compensation utilization, annual estimates for years 2017–2022 (excluding 2020) were compared to published estimates of Washington BRFSS data for years 2002 and 2007. The question asked in 2002 was identical to the question asked in 2017–2022. In 2007, respondents were asked, "During the past 12 months, were you injured seriously enough while performing your job that you got medical advice or treatment?"

The study, which is limited to deidentified publicly available data, is not considered human subjects research and is not subject to IRB review.

3 | Results

3.1 | Incidence of Work-Related Injuries and Illnesses

In 2017–2022 (excluding 2020), 5.1% (95% CI: 4.8%, 5.4%) of Washington workers experienced a WRII within the past 12 months, while 94.9% had no WRII (including 0.5% of workers who experienced an injury or illness but did not receive medical treatment).

The percent of workers with WRII was higher among workers who were younger (18–34 years), male, unmarried, earned less than \$100,000 per year, did not have a college degree, reported being unable to afford medical care (for any condition, work-related or general health), reported fair or poor health, and experienced more days of poor physical or mental health (Table 1). The industry with the greatest percent of workers with WRII was transportation, warehousing and utilities (7.6%), and the equivalent occupation was protective services (15.8%) (Table 2).

3.2 | WRII Paid by Workers' Compensation Insurance

Of the 5.1% of workers with WRII, just over half (51.3%, 95% CI: 48.1%, 54.5%) reported that their WRII was paid by workers' compensation insurance.

3.2.1 | Workers Compensation Utilization by Sociodemographic and Health-Related Characteristics

Workers' compensation utilization was lowest among workers age 18–24 years (35.8%), increasing with age, to 58.7% among workers age 55 years and older (Table 1). Utilization decreased with education, from 57.1% among workers with no college experience to 42.1% among workers with a college degree. No significant difference in utilization was observed by race-ethnicity, income, or rural residence (*p* > 0.05). Use of workers' compensation was lower among workers with health insurance (although not statistically significant), workers unable to afford medical care (for any condition), workers reporting fair or poor health, and workers with 1–7 days of poor physical health in the past 30 days. Workers' compensation utilization decreased as days of poor mental health increased, from 59.8% among workers with 0 days of poor mental health in the past 30 days to 43.3% among workers' with 8 or more days.

3.2.2 | Workers Compensation Utilization by Industry and Occupation

Transportation, warehousing, and utilities had the highest workers' compensation utilization by industry (61.5%), and protective service occupations had the highest utilization by occupation (67.7%).

By industry and occupation, use of workers' compensation generally rose as the percent of workers with WRII increased. Notable exceptions included: the accommodation and food services, arts and recreation industry which saw the second-highest incidence of WRII and the second-lowest use of workers compensation by industry (Figure 1); food preparation and serving occupations (high rate of WRII, low use of workers compensation, Figure 2); and management, business and financial occupations (low rate of WRII, high workers compensation utilization).

TABLE 1 | Estimated percent of adults with self-reported work-related injury or illness and the portion paid by workers compensation, by select sociodemographic characteristics -- Behavioral Risk Factor Surveillance System, Washington, 2017–2022^a.

	No. in sample	Percent with WRII (95% CI)	No. in sample	Percent of WRII paid by WC (95% CI)	p value ^b
Total	31,171	5.1 (4.8, 5.4)	1463	51.3 (48.1, 54.5)	
Demographics					
Age					0.001
18–24	2000	5.9 (4.8, 7.1)	117	35.8 (26.2, 45.3)	
25–34	5426	6.0 (5.2, 6.8)	284	51.0 (44.1, 57.9)	
35–54	14,010	4.5 (4.1, 5.0)	589	52.8 (48.0, 57.7)	
55+	9735	4.9 (4.3, 5.4)	432	58.7 (53.0, 64.4)	
Sex					0.182
Male	16,111	5.7 (5.2, 6.1)	815	53.0 (48.9, 57.2)	
Female	15,060	4.4 (4.0, 4.9)	607	48.6 (43.5, 53.6)	
Race-ethnicity					0.611
Hispanic	3112	5.1 (4.2, 6.0)	150	52.3 (42.8, 61.7)	
White	23,584	5.1 (4.7, 5.5)	1052	52.2 (48.4, 55.9)	
Other	4475	5.2 (4.4, 6.0)	220	47.9 (39.9, 56.0)	
Marital status					0.011
Married	17,989	4.3 (3.9, 4.6)	679	55.8 (51.3, 60.3)	
Not married	13,182	6.1 (5.6, 6.7)	743	47.5 (43.0, 52.1)	
Annual household income					0.237
< \$50,000	6848	6.6 (5.9, 7.4)	429	48.4 (42.6, 54.2)	
\$50,000–\$100,000	8685	5.8 (5.2, 6.4)	455	53.7 (47.9, 59.4)	
> \$100,000	11,249	3.8 (3.3, 4.2)	367	55.3 (49.1, 61.5)	
Education					0.002
No college	7433	6.3 (5.6, 6.9)	441	57.1 (51.6, 62.6)	
Some college	8238	6.3 (5.6, 6.9)	487	50.9 (45.6, 56.3)	
Graduated college	15,357	3.1 (2.8, 3.4)	488	42.1 (36.8, 47.4)	
Rural					0.131
Urban/Suburban	21,957	5.1 (4.7, 5.4)	997	50.6 (46.9, 54.4)	
Large, Small Town/Rural	7372	5.2 (4.5, 5.9)	337	56.9 (49.7, 64.1)	
Health status					
Health insurance					0.238
Yes	28,738	5.1 (4.8, 5.4)	1,302	50.7 (47.3, 54.1)	
No	1974	5.7 (4.5, 7.0)	105	57.8 (46.6, 69.0)	
Able to afford medical care					0.005
Yes	28,132	4.6 (4.3, 4.9)	1,174	53.6 (50.0, 57.1)	
No	2973	9.0 (7.7, 10.3)	242	41.7 (34.4, 49.0)	
Health status					0.036
Good or better	28,061	4.7 (4.4, 5.1)	1,180	52.8 (49.3, 56.4)	
Fair or poor	3071	8.5 (7.2, 9.7)	242	43.7 (36.0, 51.4)	
Days of poor physical health					0.001
0 days	19,910	3.5 (3.2, 3.9)	621	57.1 (52.3, 61.9)	
1–7 days	7764	6.3 (5.6, 7.0)	435	43.0 (37.4, 48.7)	

(Continues)

TABLE 1 | (Continued)

	No. in sample	Percent with WRII (95% CI)	No. in sample	Percent of WRII paid by WC (95% CI)	<i>p</i> value ^b
8+ days	3108	11.8 (10.3, 13.3)	336	51.5 (44.7, 58.2)	< 0.001
Days of poor mental health					
0 days	17,431	3.9 (3.6, 4.3)	618	59.8 (54.9, 64.7)	
1–7 days	8225	5.0 (4.4, 5.5)	380	47.1 (41.0, 53.1)	
8+ days	5167	8.5 (7.5, 9.4)	396	43.3 (37.2, 49.3)	

Abbreviations: CI, confidence interval; WC, workers' compensation; WRII, work-related injury or illness.

^aExcludes 2020.

^bRao-Scott chi-square test for differences in the percentage of WRII paid by WC.

3.2.3 | APR for Underutilization of Workers Compensation

The final multivariable model included age, sex, marital status, education, health insurance, affordability of medical care, days of poor mental health, industry and occupation. After controlling for other factors, young workers were least likely to use workers compensation, with an aPR for underutilization (aPR) = 1.49 (95% CI: 1.11, 1.87) (Table 3). Underutilization increased with education; compared to workers with no college experience, underutilization was 25% higher among workers with some college, and 41% higher among workers who completed college. Workers with one or more days of poor mental health were less likely to use workers' compensation, as were workers who reported being unable to afford medical care. After controlling for other factors, women were more likely than men to use workers' compensation (aPR = 0.81).

3.2.4 | Temporal Trends in Utilization of Workers' Compensation

The annual estimate of the portion of workers who used workers' compensation for their WRII fluctuated, although none differed significantly from each other, except for years 2017 (59.7%, 95% CI: 52.4%, 67.0%) and 2019 (44.5%, 95% CI: 37.0%, 52.0%). Annual estimates for 2017 through 2022 were similar to published estimates of workers' compensation utilization for 2002 [21] and 2007 [14], which were estimated at 52% and 61%, respectively (Figure 3).

4 | Discussion

Using data representative of the state population, we estimate that nearly half of Washington workers with a work injury or illness do not file a workers' compensation claim. The estimate is similar to previous estimates of Washington workers compensation utilization based on BRFSS data [14, 21], and the stability of the estimates suggest that utilization of workers' compensation has not changed substantially over the past 20 years.

We found workers' compensation utilization was lower among workers who were younger, male, had at least some college experience, were unable to afford medical care, experienced days of

poor mental health, and worked in many service-related industries and occupations. This adds to the evidence reported by others that workers' compensation utilization increases with age [9, 15] and decreases with education [16, 20]. To our knowledge, this is the first study to report greater utilization among industries and occupations with higher rates of WRII. This finding, while distinct, is analogous to the increased use of workers' compensation by those in high-hazard or physical jobs reported previously [15–17]. We also identified mental health and medical care affordability as factors associated with workers' compensation claim filing. While we did not find race-ethnicity to be a factor in workers' compensation utilization where other have [24], we were unable to evaluate detailed classifications of race or ethnicity due to small sample sizes.

Underutilization of workers' compensation has both financial and workplace safety implications. When workers' compensation is not utilized for WRII, the cost of treatment is assumed by private health insurance, government programs, or the individual worker, driving up costs among these groups [25, 26]. The workers' compensation system aims to incentivize workplace safety in part by basing insurance premiums on claim costs. Circumventing the workers' compensation system, whether intentionally or not, means that employers face reduced financial incentives to implement prevention measures [27]. Additionally, many employers rely on workers' compensation data to track workplace injuries and illnesses [28, 29]. Underutilization of workers' compensation means that employers lack accurate data needed to develop effective injury and illness prevention programs. Similarly, public health surveillance systems that rely on workers' compensation for occupational safety and health data are hindered in their ability to quantify the magnitude of WRII and to set priorities [2].

While this study did not examine reasons for underutilization of workers' compensation, a growing body of evidence from across industries and occupations suggests common reasons include lack of knowledge about the workers' compensation system, burdensome process, inadequate benefits, availability of sick or vacation leave, and fear of reprisal from employer or co-workers [8–11, 30–32]. Additionally, young male workers report feeling pressured to hide WRII [33]. Among any one group, potential reasons for underutilization are numerous. For example, workers with higher education may perceive the process as burdensome and seek care outside the system; they may use sick leave instead of workers' compensation, knowing that only a portion of their wages will be covered by workers' compensation; or they may have less severe injuries (i.e., involve little or no missed work). Formal education

TABLE 2 | Estimated percent of adults with self-reported work-related injury or illness and the portion paid by workers compensation, by industry and occupation -- Behavioral Risk Factor Surveillance System, Washington, 2017–2022^a.

	No. in sample	Percent with WRII (95% CI)	No. in sample	Percent of WRII paid by WC (95% CI)	p value ^b
Industry^c	31,171	5.1 (4.8, 5.4)	1463	51.3 (48.1, 54.5)	0.001
Transportation, Warehousing and Utilities	1770	7.6 (6.1, 9.2)	123	61.5 (50.9, 72.1)	
Manufacturing	2935	5.9 (4.8, 7.0)	148	60.1 (50.7, 69.5)	
Construction	2126	6.8 (5.4, 8.2)	120	60.0 (49.6, 70.4)	
Public Administration	2328	6.7 (5.4, 8.0)	131	58.1 (47.9, 68.2)	
Agriculture, Forestry, Fishing, Mining	924	4.6 (3.0, 6.2)	47	54.9 (36.8, 73.0)	
Wholesale and Retail Trade	2946	5.6 (4.5, 6.6)	153	53.0 (43.3, 62.8)	
Administrative and support and waste management and Other Services	1883	4.8 (3.6, 6.0)	78	50.9 (37.8, 64.1)	
Health Care and Social Assistance	4972	5.3 (4.5, 6.1)	250	48.2 (40.4, 56.0)	
Educational Services	3500	3.6 (2.8, 4.4)	122	48.1 (36.7, 59.5)	
Accommodation and Food Services, Arts and Recreation	1837	6.8 (5.3, 8.2)	117	37.1 (26.5, 47.7)	
Information, Finance, Real Estate, Professional, Management	4701	2.3 (1.8, 2.8)	95	33.5 (22.4, 44.6)	
Occupation^d					< 0.001
Protective Service	582	15.8 (12.0, 19.6)	78	67.7 (55.3, 80.1)	
Installation, Maintenance, and Repair	992	9.2 (7.1, 11.3)	88	66.7 (55.6, 77.9)	
Management, Business and Financial	4,935	2.0 (1.5, 2.5)	90	60.1 (48.4, 71.9)	
Transportation and Material Moving	1587	8.3 (6.7, 10.0)	129	58.4 (48.1, 68.7)	
Construction and Extraction	1451	8.5 (6.7, 10.4)	114	58.3 (47.0, 69.6)	
Office and Administrative Support	2823	4.3 (3.3, 5.3)	109	57.1 (45.5, 68.7)	
Production	969	8.4 (6.2, 10.5)	80	56.1 (42.6, 69.6)	
Farming, Fishing, and Forestry	469	5.7 (3.2, 8.2)	28	49.5 (27.4, 71.7)	
Healthcare Practitioners and Technical	2257	6.2 (4.9, 7.6)	127	49.3 (38.4, 60.2)	
Healthcare Support, Personal Care, and Building and Grounds Cleaning	2305	6.4 (5.2, 7.7)	134	45.2 (35.0, 55.5)	
Sales and Related	2141	4.0 (2.9, 5.1)	83	43.9 (30.3, 57.5)	
Education, Legal, Community Service, Arts, and Media	3673	3.6 (2.8, 4.3)	123	34.8 (24.6, 45.0)	
Food Preparation and Serving Related	957	8.7 (6.5, 10.9)	79	31.8 (20.3, 43.4)	
Computer, Engineering, and Science	3821	2.1 (1.6, 2.7)	74	29.3 (17.7, 41.0)	

Abbreviations: CI, confidence interval; WC, workers' compensation; WRII, work-related injury or illness.

^aExcludes 2020.^bRao-Scott chi-square test for differences in the percentage of WRII paid by WC.^cExcludes 1249 respondents unable to be classified by industry due to insufficient information.^dExcludes 2209 respondents unable to be classified by occupation due to insufficient information.

may not translate to knowledge about the workers' compensation system, which may instead be gleaned from the experiences of friends, family, or coworkers. Reasons for underutilization of workers' compensation among other groups are less clear; these

include workers who reported being unable to afford medical care—which may be a proxy indicator for some other characteristic, or the result of the WRII. Securing benefits through workers' compensation is a multi-step, often complex process involving the



FIGURE 1 | Percent of adults with self-reported work-related injury or illness and the portion paid by workers compensation, by industry -- Behavioral Risk Factor Surveillance System, Washington, 2017–2022^a. WC, workers' compensation; WRII, work-related injury or illness. ^aExcludes 2020.

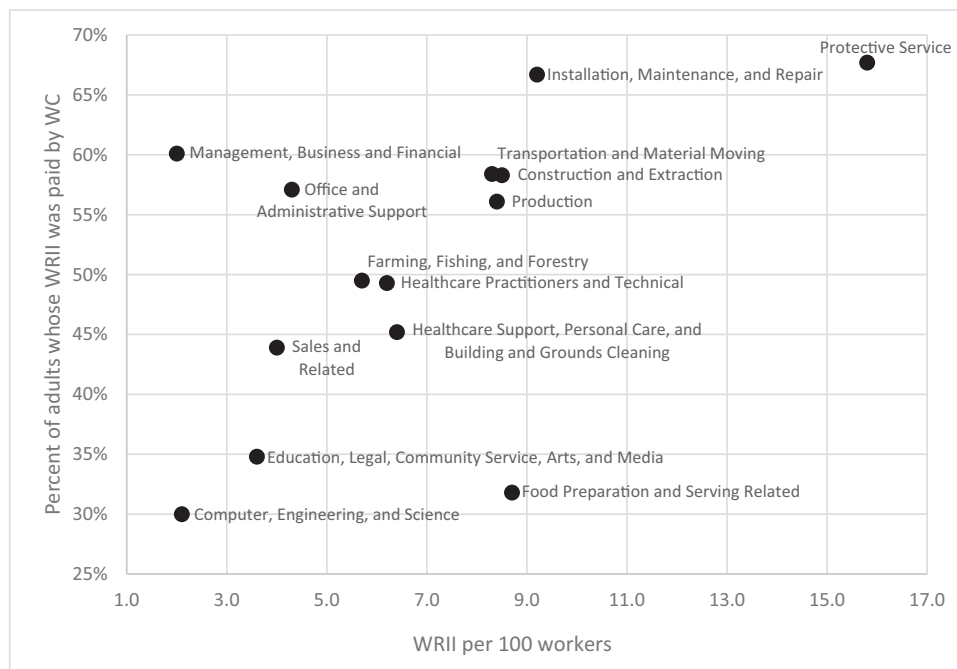


FIGURE 2 | Percent of adults with self-reported work-related injury or illness and the portion paid by workers compensation, by occupation -- Behavioral Risk Factor Surveillance System, Washington, 2017–2022^a. WC, workers' compensation; WRII, work-related injury or illness. ^aExcludes 2020.

worker, employer, healthcare provider, and insurer, with barriers present at each step [34]. Efforts to improve access to workers' compensation require addressing the myriad reasons for underutilization.

Finally, while this study, like most others, focused on the actions of the worker, this is one dimension within a larger system. Lawmakers, regulatory agencies, and insurance providers

play pivotal roles in utilization and are positioned to ease many of the existing barriers to access.

4.1 | Limitations

There are several limitations to this study. First, the cross-sectional study design prevents us from ascertaining the order

TABLE 3 | Prevalence ratios for underutilization of workers' compensation among adults with self-reported work-related injury or illness -- Behavioral Risk Factor Surveillance System, Washington, 2017–2022^a

Characteristic	Unadjusted prevalence ratios (95% CI)	p value	Adjusted prevalence ratios (95% CI) ^b	p value
Age		0.002		0.034
18–24 versus 55+	1.56 (1.24, 1.87)		1.49 (1.11, 1.87)	
25–34 versus 55+	1.19 (0.95, 1.42)		1.06 (0.82, 1.30)	
35–54 versus 55+	1.14 (0.95, 1.34)		1.15 (0.93, 1.37)	
Sex		0.182		0.017
Female versus Male	1.10 (0.95, 1.24)		0.81 (0.66, 0.96)	
Race ethnicity		0.638		
Hispanic versus White	1.00 (0.79, 1.21)		--	
Other versus White	1.09 (0.90, 1.28)		--	
Marital status		0.012		0.105
Not married versus Married	1.19 (1.03, 1.35)		1.13 (0.96, 1.31)	
Income		0.014		
< \$50,000 versus > \$100,000	1.16 (0.95, 1.36)		--	
\$50,000–\$100,000 versus > \$100,000	1.04 (0.84, 1.23)		--	
Education		0.001		0.003
Some college vs No college	1.14 (0.95, 1.34)		1.25 (1.02, 1.49)	
Graduated from college versus No college	1.35 (1.14, 1.56)		1.41 (1.13, 1.69)	
Rural residence		0.132		
Urban/Suburban versus Large, Small Town/Rural	1.15 (0.94, 1.36)		--	
Health insurance		0.239		0.064
Yes versus No	1.17 (0.85, 1.49)		1.29 (0.91, 1.67)	
Able to afford medical care		0.005		0.036
No versus Yes	1.25 (1.07, 1.44)		1.24 (1.00, 1.48)	
Health status		0.037		
Fair or poor versus Good or better	1.19 (1.01, 1.38)		--	
Days of poor physical health		0.001		
1–7 days versus 0 days	1.33 (1.13, 1.53)		--	
8+ days versus 0 days	1.13 (0.93, 1.33)		--	
Days of poor mental health		< 0.0001		0.015
1–7 days versus 0 days	1.32 (1.10, 1.54)		1.27 (1.04, 1.51)	
8+ days versus 0 days	1.41 (1.18, 1.64)		1.25 (1.01, 1.49)	

Note: --, variable did not meet threshold for inclusion in the multivariable model.

Abbreviations: CI, confidence interval; WC, workers' compensation; WRIL, work-related injury or illness.

^aExcludes 2020.

^bAdjusted for industry, occupation, and all variables, with adjusted prevalence ratios displayed in the table.

of events, specifically whether the issues of health care affordability and poor mental health preceded the WRIL or arose from it. Clarifying these relationships is necessary to address underutilization of workers compensation. Second, we were limited to data collected by BRFSS, which did not capture information on factors previously associated with underutilization including severity, type of injury, tenure, or unionization [13, 17, 18]. Our estimates of APR from the multivariable regression model may

be confounded by these factors. Third, characteristics may be misclassified, including the classification of workers as eligible for workers' compensation. We assumed all nonmilitary workers currently employed for wages or out of work < 1 year were eligible for workers' compensation; however, some may have been excluded from coverage. This overestimates the number of workers eligible for workers compensation, underestimates the portion of workers who utilize workers compensation and

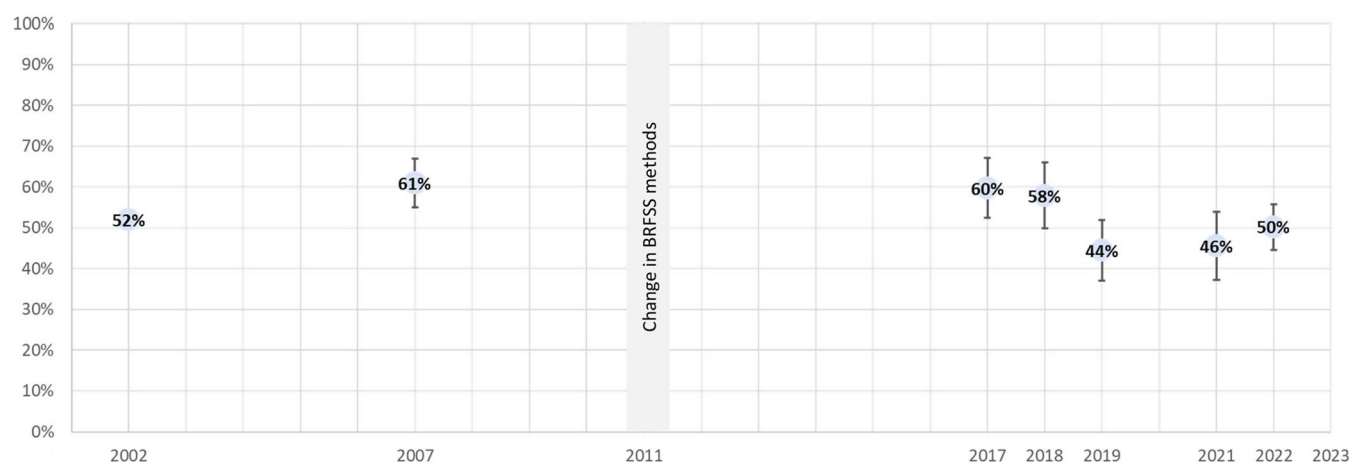


FIGURE 3 | Annual estimates of workers compensation utilization -- Behavioral Risk Factor Surveillance System, Washington, 2002, 2007, 2017–2022 (excluding 2020). 2002 Estimate obtained from Fan ZJ, Bonauto DK, Foley MP, Silverstein BA. Underreporting of work-related injury or illness to workers' compensation: individual and industry factors. *J Occup Environ Med*. 2006 Sep;48(9):914–22. 2007 Estimate obtained from Centers for Disease Control and Prevention (CDC). Proportion of workers who were work-injured and payment by workers' compensation systems - 10 states, 2007. *MMWR Morb Mortal Wkly Rep*. 2010 Jul 30;59(29):897–900.

underestimates underutilization. Relatedly, we were unable to assess claim denials using BRFSS data; however, the 16% of Washington workers' compensation claims denied in 2022² is notably lower than the estimated prevalence of underutilization, and common reasons for denial suggest they would not have been a WRII eligible for Washington workers' compensation (e.g., the worker was covered by another state or federal workers' compensation system, the filed claim was a duplicate, the claim was filed for a hazardous exposure with no resulting injury or illness). Fourth, BRFSS participants were asked to report on their WRII in the past 12 months. The self-reported data are subject to recall, social desirability, and non-response bias (although BRFSS weighting methods attempt to account for nonresponse, low response rates remain a challenge). Of particular concern is how well the survey captures the experiences of non-English speaking workers, since the number who participated in the survey was small. Finally, industry and occupation were grouped into broad categories, which may obscure important differences in utilization within groups.

Our estimate of the magnitude of workers compensation utilization may not be representative of other states or workers' compensation jurisdictions. Washington is one of four states that operates a single-payer workers' compensation system whereby employers obtain insurance from the state-run program (unless they are approved to self-insure). Indeed, the magnitude of workers' compensation utilization has been shown to differ by state [14], while state rates of employer-reported injuries and illnesses have been tied to workers' compensation characteristics, specifically waiting periods for time loss benefits [35].

More research is needed to better understand trends in workers' compensation utilization over time. Low precision of the annual estimates, and the inability to directly compare estimates before and after the change in BRFSS methodology that occurred in 2011 make it difficult to detect changes over time.

5 | Conclusion

Underutilization of workers' compensation is substantial. Workers who are least likely to use workers' compensation can be prioritized in efforts to address common reasons for underreporting. Augmenting workers' compensation data with additional data sources may help improve public health surveillance and research. Policy implications of cost shifting from state workers' compensation insurance to other public and private health and disability insurance programs (and possibly vice versa) need further exploration.

Author Contributions

Sara Wuellner and David Bonauto contributed to the conceptualization and design of the study. Sara Wuellner performed the data analysis and drafted the manuscript. Sara Wuellner and David Bonauto were involved in the interpretation of the data, provided critical reviews of the manuscript, and participated in final approval. Sara Wuellner and David Bonauto agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity are appropriately investigated and resolved.

Acknowledgments

The authors would like to acknowledge Jennifer Marcum (Washington State Department of Labor & Industries SHARP Program) and Graham Crawbuck (Washington State Dept. of Health) for their thoughtful reviews. BRFSS data were provided by the Washington State Department of Health, Center for Health Statistics, Behavioral Risk Factor Surveillance System, supported in part by the Centers for Disease Control and Prevention, Cooperative Agreements NU58/DP006066-03 (2017), NU58/DP006066-04 (2018), NU58/DP006066-05 (2019), NU58/DP006865-02 (2021), and NU58/DP006865-03 (2022). No AI tool was used for this study. Grant sponsor: State Occupational Safety and Health Surveillance Program grant from the National Institute for Occupational Safety and Health; Grant number: U60OH008487.

Disclosure

The authors have nothing to report.

Ethics Statement

The study, which is limited to deidentified publicly available data, is not considered human subjects research and is not subject to IRB review.

Conflicts of Interest

The authors declare no conflicts of interest.

Endnotes

¹ Response rates for BRFSS are calculated using standards set by the American Association for Public Opinion Research (AAPOR) Response Rate Formula #4 (Standard Definitions - AAPOR). The response rate is the number of respondents who completed the survey as a proportion of all eligible and likely-eligible people.

² Percent of Washington State Fund claims denied for FY2022: https://www.lni.wa.gov/agency/_docs/LNIFactsAndFigures 2022. pdf

References

1. D. F. Utterback, T. M. Schnorr, B. A. Silverstein, E. A. Spieler, T. B. Leamon, and B. C. Amick, "Occupational Health and Safety Surveillance and Research Using Workers' Compensation Data," *Journal of Occupational & Environmental Medicine* 54, no. 2 (2012): 171–176.
2. D. Bonauto, B. Silverstein, D. Adams, and M. Foley, "Prioritizing Industries for Occupational Injury and Illness Prevention and Research, Washington State Workers' Compensation Claims, 1999–2003," *Journal of Occupational and Environmental Medicine* 48, no. 8 (2006): 840–851.
3. A. R. Meyers, I. S. Al-Tarawneh, S. J. Wurzelbacher, et al., "Applying Machine Learning to Workers' Compensation Data to Identify Industry-Specific Ergonomic and Safety Prevention Priorities: Ohio, 2001 to 2011," *Journal of Occupational & Environmental Medicine* 60, no. 1 (2018): 55–73, <https://doi.org/10.1097/jom.0000000000001162>.
4. S. J. Wurzelbacher, S. J. Bertke, M. P. Lampl, et al., "The Effectiveness of Insurer-Supported Safety and Health Engineering Controls in Reducing Workers' Compensation Claims and Costs," *American Journal of Industrial Medicine* 57, no. 12 (2014): 1398–1412, <https://doi.org/10.1002/ajim.22372>.
5. T. Q. Welch, G. T. Murphy, and M. Manley, *Workers' Compensation: Benefits, Costs, and Coverage 2022* (Washington DC: National Academy of Social Insurance, 2024). accessed 8/12/2025, <https://www.nasi.org/research/workers-compensation/workers-compensation-benefits-costs-and-coverage-2022-data/>.
6. US Department of Labor, Bureau of Labor Statistics. *Work Experience of the Population - 2022*, accessed 8/12/2025, https://www.bls.gov/news.release/archives/work_12192023.htm.
7. L. Strunin and L. I. Boden, "The Workers' Compensation System: Worker Friend or Foe?," *American Journal of Industrial Medicine* 45, no. 4 (2004): 338–345, <https://doi.org/10.1002/ajim.10356>.
8. D. R. Green, S. G. Gerberich, H. Kim, et al., "Knowledge of Work-Related Injury Reporting and Perceived Barriers Among Janitors," *Journal of Safety Research* 69 (2019): 1–10, <https://doi.org/10.1016/j.jsr.2019.01.003>.
9. M. Galizzi, P. Miesmaa, L. Punnett, and C. Slatin, "Injured Workers' Underreporting in the Health Care Industry: An Analysis Using Quantitative, Qualitative, and Observational Data," *Industrial Relations: A Journal of Economy and Society* 49, no. 1 (2010): 22–43, <https://doi.org/10.1111/j.1468-232X.2009.00585.x>.
10. T. Scherzer, R. Rugulies, and N. Krause, "Work-Related Pain and Injury and Barriers to Workers' Compensation Among Las Vegas Hotel Room Cleaners," *American Journal of Public Health* 95, no. 3 (2005): 483–488, <https://doi.org/10.2105/ajph.2003.033266>.
11. S. Premji, M. Begum, and K. Laila, "Claim Suppression of Occupational Injuries and Illnesses Among Precariously Employed Immigrant Workers in Ontario," *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy* 35, no. 1 (2025): 9–21, <https://doi.org/10.1177/10482911241312387>.
12. N. J. Anderson, C. K. Smith, and M. P. Foley, "Work-Related Injury Burden, Workers' Compensation Claim Filing, and Barriers: Results From a Statewide Survey of Janitors," *American Journal of Industrial Medicine* 65, no. 3 (2022): 173–195, <https://doi.org/10.1002/ajim.23319>.
13. H. S. Shannon and G. S. Lowe, "How Many Injured Workers Do Not File Claims for Workers' Compensation Benefits?," *American Journal of Industrial Medicine* 2, no. 6 (2002): 467–473, <https://doi.org/10.1002/ajim.10142>.
14. Centers for Disease C, Prevention, "Proportion of Workers Who Were Work-Injured and Payment by Workers' Compensation Systems - 10 States, 2007," *MMWR. Morbidity and Mortality Weekly Report* 59, no. 29 (2010): 897–900.
15. J. Biddle and K. Roberts, "Claiming Behavior in Workers' Compensation," *Journal of Risk and Insurance* 70, no. 4 (2003): 759–780, <https://doi.org/10.1046/j.0022-4367.2003.00074.x>.
16. V. Nadalin and P. M. Smith, "Examining the Impact of Occupational Health and Safety Vulnerability on Injury Claim Reporting in Three Canadian Provinces," *American Journal of Industrial Medicine* 63, no. 5 (2020): 435–441, <https://doi.org/10.1002/ajim.23094>.
17. J. Qin, A. Kurowski, R. Gore, and L. Punnett, "The Impact of Workplace Factors on Filing of Workers' Compensation Claims Among Nursing Home Workers," *BMC Musculoskeletal Disorders* 15 (2014): 29, <https://doi.org/10.1186/1471-2474-15-29>.
18. K. D. Rosenman, J. C. Gardiner, J. Wang, et al., "Why Most Workers With Occupational Repetitive Trauma Do Not File for Workers' Compensation," *Journal of Occupational and Environmental Medicine* 42, no. 1 (2000): 25–34.
19. D. N. Lakdawalla, R. T. Reville, and S. A. Seabury, "How Does Health Insurance Affect Workers' Compensation Filing?," *Economic Inquiry* 45, no. 2 (2007): 286–303, <https://doi.org/10.1111/j.1465-7295.2006.00011.x>.
20. S. Stock, N. Nicolakakis, H. Raiq, K. Messing, K. Lippel, and A. Turcot, "Underreporting Work Absences for Nontraumatic Work-Related Musculoskeletal Disorders to Workers' Compensation: Results of a 2007–2008 Survey of the Quebec Working Population," *American Journal of Public Health* 104, no. 3 (2014): e94–e101, <https://doi.org/10.2105/ajph.2013.301562>.
21. Z. J. Fan, D. K. Bonauto, M. P. Foley, and B. A. Silverstein, "Underreporting of Work-Related Injury or Illness to Workers' Compensation: Individual and Industry Factors," *Journal of Occupational and Environmental Medicine* 48, no. 9 (2006): 914–922, <https://doi.org/10.1097/01.jom.0000226253.54138.1e>.
22. Centers for Disease Control and Prevention (CDC). *The BRFSS Data User Guide*. 2013, accessed 8/12/2025, https://www.cdc.gov/brfss/data_documentation/pdf/UserguideJune2013.pdf.
23. National Institute for Occupational Safety and Health (NIOSH). NIOSH Industry and Occupation Computerized Coding System (NIOCCS). U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Division of Field Studies & Engineering, Health Informatics Branch; 2023.
24. M. Kyung, S. J. Lee, C. Dancu, and O. Hong, "Underreporting of Workers' Injuries or Illnesses and Contributing Factors: A Systematic Review," *BMC Public Health* 23, no. 1 (2023): 558, <https://doi.org/10.1186/s12889-023-15487-0>.
25. J. P. Leigh and J. P. Marcin, "Workers' Compensation Benefits and Shifting Costs for Occupational Injury and Illness," *Journal of Occupational & Environmental Medicine* 54, no. 4 (2012): 445–450, <https://doi.org/10.1097/JOM.0b013e3182451e54>.

26. A. Bhattacharya and R. M. Park, "Excess Healthcare Costs Associated With Prior Workers' Compensation Activity," *American Journal of Industrial Medicine* 55, no. 11 (2012): 1018–1027, <https://doi.org/10.1002/ajim.22112>.
27. A. Thompson, "The Consequences of Underreporting Workers' Compensation Claims," *Canadian Medical Association Journal* 176, no. 3 (2007): 343–344, <https://doi.org/10.1503/cmaj.060953>.
28. C. L. Rappin, S. E. Wuellner, and D. K. Bonauto, "Employer Reasons for Failing to Report Eligible Workers' Compensation Claims in the BLS Survey of Occupational Injuries and Illnesses," *American Journal of Industrial Medicine* 59, no. 5 (2016): 343–356, <https://doi.org/10.1002/ajim.22582>.
29. S. E. Wuellner and D. K. Bonauto, "Exploring the Relationship Between Employer Recordkeeping and Underreporting in the BLS Survey of Occupational Injuries and Illnesses," *American Journal of Industrial Medicine* 57, no. 10 (2014): 1133–1143, <https://doi.org/10.1002/ajim.22350>.
30. G. Pransky, T. Snyder, A. Dembe, and J. Himmelstein, "Under-Reporting of Work-Related Disorders in the Workplace: A Case Study and Review of the Literature," *Ergonomics* 42, no. 1 (1999): 171–182, <https://doi.org/10.1080/001401399185874>.
31. J. Taylor Moore, K. P. Cigularov, J. M. Sampson, J. C. Rosecrance, and P. Y. Chen, "Construction Workers' Reasons for Not Reporting Work-Related Injuries: An Exploratory Study," *International Journal of Occupational Safety and Ergonomics* 19, no. 1 (2013): 97–105.
32. R. Saunders, J. O'Grady, and S. Cardoso, *Issue Briefing: Nature and Extent of Claim Suppression in B.C. 's Workers' Compensation System* (Toronto Ontario: Institute for Work and Health, 2021). accessed 9/24/2025, https://www.iwh.on.ca/sites/iwh/files/iwh/reports/iwh_issue_briefing_claim_%20suppression_bc_2021.pdf.
33. S. Tucker, D. Diekrager, N. Turner, and E. K. Kelloway, "Work-Related Injury Underreporting Among Young Workers: Prevalence, Gender Differences, and Explanations for Underreporting," *Journal of Safety Research* 50 (2014): 67–73, <https://doi.org/10.1016/j.jsr.2014.04.001>.
34. L. S. Azaroff, C. Levenstein, and D. H. Wegman, "Occupational Injury and Illness Surveillance: Conceptual Filters Explain Under-reporting," *American Journal of Public Health* 92, no. 9 (2002): 1421–1429.
35. J. Mendeloff and R. Burns, "States With Low Non-Fatal Injury Rates Have High Fatality Rates and Vice-Versa," *American Journal of Industrial Medicine* 56, no. 5 (2013): 509–519, <https://doi.org/10.1002/ajim.22047>.