

Impact of Economic Downturn on California Workers' Compensation Claim Frequency

By the WCIRB Medical Analytics Research Team

Executive Summary

California has experienced dramatic drops in employment as the COVID-19 pandemic continues to unfold. According to the state's Employment Development Department (EDD), about 4.3 million first-time Unemployment Insurance (UI) claims were processed in the first ten weeks since the start of the pandemic¹. This comprises more than 20% of California's total labor force prior to the pandemic.² The pandemic led to a stay-at-home order that triggered widespread business closures, bringing the economy in some sectors almost to a halt. The impact of this COVID-19 induced economic downturn on the workers' compensation system is unclear given the magnitude and suddenness of the employment drop, uncertainty surrounding the economy reopening, trends in post-termination claims and potential future waves of COVID-19 infections. While the current economic situation is unique, patterns of historical impacts of prior economic downturns on the workers' compensation system may shed light on what we could anticipate in the California workers' compensation system. In this study, the WCIRB analyzed historical impacts of economic cycles between 1961 and 2017 on workers' compensation claim frequency, provided forecasts of claim frequency changes in light of the current economic situation and summarized the potential impact of post-termination and COVID-19 claims on claim frequency.

The WCIRB's findings include:

- While many factors influence claim frequency, between 1961 and 2017, overall claim frequency decreased modestly more during years of economic recession than during years of expansion. The modest decline during economic downturns was partly due to cumulative trauma (CT) claims, which, unlike other claims, often increased during downturns.
- For industry sectors that were hit the hardest during the 2001 recession and the Great Recession, claim frequency tended to fall along with job losses or fall faster during economic downturns compared to economic expansions.
- Based on the post-COVID-19 national unemployment rate for April 2020 of 14.7%,³ the WCIRB's econometric model⁴ projects indemnity claim frequency to decline by 14% in 2020. This estimate accounts for several economic and claims related factors but does not fully reflect recent trends in post-termination claims or the impact of COVID-19 claims.
- Since 2012, about 25 post-termination claims (most are CT claims) have been filed for every 1,000 jobs lost. If only 50% of the rate of post-termination claims is applied to the 4.3 million Californians who have lost jobs, about 54,000 post-termination claims could be filed over the next year, increasing statewide indemnity claim frequency by approximately 25%.
- Many claims with a COVID-19 diagnosis are emerging in the workers' compensation system. Based on two cost estimates of presumptions of compensability that the WCIRB recently published,^{5,6} the estimated frequency increase from COVID-19 claims ranges from 14% over a four-month period of a rebuttable presumption applied to all workers directed to work outside of home to 42% over an annual period of a conclusive presumption to all essential workers.

¹ Filing of UI claims as a result of COVID-19 recession starts from March 9, 2020; the initial claim count numbers are released each week by EDD <https://oui.doleta.gov/unemploy/archive.asp>. The total number of initial UI claims does not include Pandemic Unemployment Assistance (PUA) recipients, who defined by the EDD may be self-employed, business owners, independent contractors, those who have limited work history, and those who have recently collected all of the available benefits on their regular UI claim.

² The U.S. Bureau of Labor Statistics lists a Civilian Labor Force of 19.5 million California workers in February 2020 with an unemployment rate of 3.9%.

³ [Bureau of Labor Statistics Employment Situation Summary for April 2020](#).

⁴ The WCIRB uses an econometric model to forecast future claim frequency based on several economic and claims related variables. For technical details, please see Brooks, Ward. "California workers compensation benefit utilization – a study of changes in frequency and severity in response to changes in statutory workers compensation benefit levels," *Proceedings of the Casualty Actuarial Society*, Volume LXXXVI (1999): 80-262.

⁵ "[Cost evaluation of potential conclusive COVID-19 presumption in California workers' compensation](#)." WCIRB, April 20, 2020.

⁶ "[Evaluation of Cost Impact of Governor Newsom's Executive Order on Rebuttable Presumption for COVID-19 California Workers' Compensation Claims](#)." WCIRB, May 22, 2020.

Background

The COVID-19 pandemic and the resultant stay-at-home order have led to an unprecedented slowdown of commerce and skyrocketing unemployment benefit claims in the U.S. and California. About 4.3 million first-time claims for unemployment benefits were processed by the state EDD in the first ten weeks of the pandemic.⁷ These claims comprise more than 20% of California's total labor force prior to the pandemic.⁸

Several industry sectors have been hit hard due to a sudden halt of some economic activities, while others are less impacted. The sudden change in employment is significantly impacting the workers' compensation system, affecting payroll and premium levels as well as claim frequency, claim severity and duration of disability benefits. The WCIRB completed a retrospective analysis of the impact of shifts in employment level on claim frequency during the past 56 years to help understand the potential impact of the current dramatic shift in economic activity on the California workers' compensation system.

Specifically, the WCIRB explored how indemnity claim frequency changed as the unemployment rate increased and how the most recent economic recessions, the 2001 Dot-com recession and the Great Recession (2007-2009), impacted claim frequency in industry sectors with steep declines in employment levels. We also analyzed the extent to which the recent sharp and sudden rise in unemployment could impact claim frequency as well as the likely increase in post-termination claims. Last, we reviewed the potential impact of emerging COVID-19 claims on indemnity claim frequency.

Analysis Approach

This analysis examined the WCIRB unit statistical report data between 1961 and 2017 for the long-term trend of claim frequency and WCIRB survey data for post-termination claims.⁹ For purposes of this study, frequency values are based on unit statistical reported indemnity claim counts at the first report level (18 months from policy inception) compared to reported insured payroll adjusted to the 2018 wage level. We also relied on the economic data from the Department of Labor, the Bureau of Labor Statistics (BLS) and published economic forecasts to project claim frequency using the WCIRB's econometric model, which estimates changes in claim frequency based on several economic and claims related variables.¹⁰ A number of key assumptions regarding future trajectory of claim frequency were made based on the patterns of the historical data and the latest available economic data. These assumptions are explicitly detailed in this research brief's findings.

Findings

Impact of Economic Cycles on Claim Frequency Changes

Statewide Indemnity Claim Frequency

The economic cycle is one of many factors that influence frequency of workers' compensation claims. Historically in California, other factors, such as legislative or regulatory changes, have had a greater impact. Indemnity claim frequency has generally dropped for decades in California as in most other states.¹¹ After excluding years of significant legislative reforms since 1961, indemnity claim frequency tended to decrease modestly more when the unemployment rate spiked than when the unemployment rate remained low (Figure 1). The decline during

⁷ Initial UI claim count starts from March 9, 2020; the numbers are released each week by EDD <https://oui.doleta.gov/unemploy/archive.asp>. The total number of initial UI claims does not include PUA recipients.

⁸ The U.S. Bureau of Labor Statistics lists a Civilian Labor Force of 19.5 million California workers in February 2020 with an unemployment rate of 3.9%.

⁹ The WCIRB collects an annual claim survey comprised of a stratified random sample of 2,000 permanent disability (PD) claims from the insured employers covered by insurers reporting to the WCIRB. The survey provides more detailed information about PD claims, including but not limited to the degree of impairment, the type and cost of specialty exams, case settlement and the method used to settle the claim.

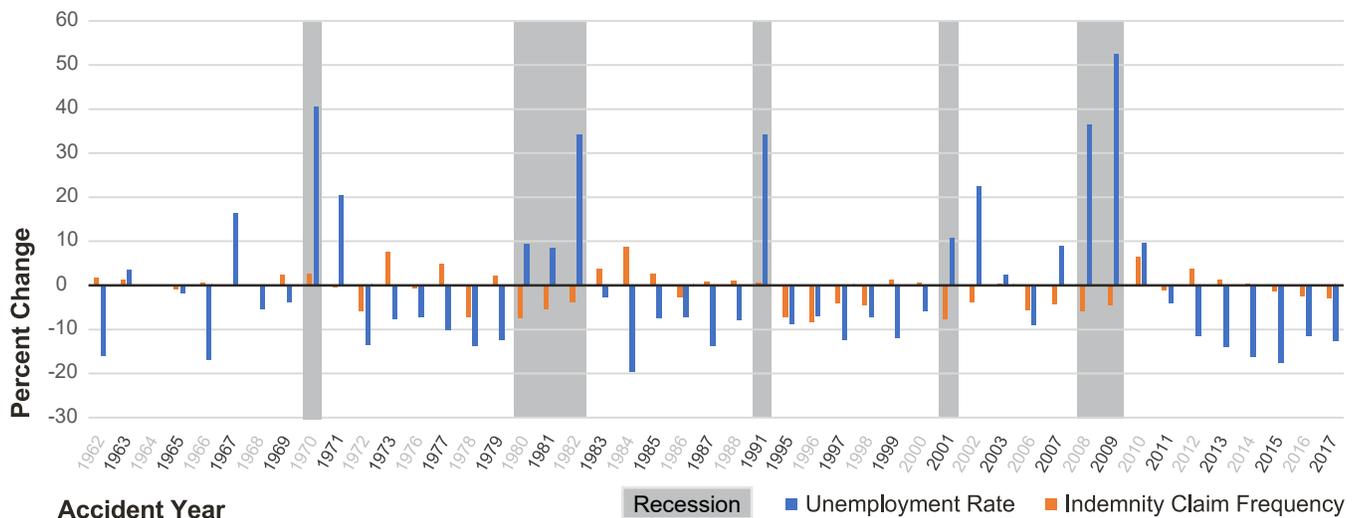
¹⁰ Brooks, Ward, "California workers compensation benefit utilization – a study of changes in frequency and severity in response to changes in statutory workers compensation benefit levels," *Proceedings of the Casualty Actuarial Society*, Volume LXXXVI (1999): 80-262.

¹¹ This long-term frequency decline is attributable to several factors including shifts to a less hazardous industrial mix, increased mechanization and enhanced workplace safety efforts.

economic downturns, as shown by research,¹² is often attributed to fewer inexperienced workers and more reluctance among workers to file a workers' compensation claim when available job opportunities are scarce. There is also evidence that increases in CT claims in California during an economic slowdown can partially offset declines in other claims.

During economic expansion periods, on the other hand, claim frequency in California generally decreased modestly less than during periods of economic downturn. Specifically, over the long-term, the average annual decline in claim frequency was 0.9% during the periods of expansion and 1.8% during times of economic downturn. These differences related to the economic cycle are modest as shifts in claim frequency are often heavily affected by non-economic factors.¹³

Figure 1. Year-to-Year Percent Change in Unemployment Rate and Indemnity Claim Frequency¹⁴ (1961 – 2017¹⁵)



As discussed above, prevalence of CT claims in California can moderate the decline of indemnity claim frequency during periods of economic downturn. This is because CT claims,¹⁶ which in some cases may involve an element of discretion as to when a claim is to be filed, can be significantly impacted by changing economic conditions. Over the last twenty-three years, the proportion of CT claims tended to increase significantly during economic downturns relative to periods of economic expansion (Table 1). For example, during the Great Recession, the average annual increase in CT claim frequency was 7.5% compared to 0.1% during the preceding economic expansion period. Similarly, we found that claims with injuries that often involve less objective medical evidence, such as soft tissue and carpal tunnel injuries, tended to decrease at a slower rate, compared to claims involving more objective medical evidence, such as fracture and crushing injuries, during periods of economic downturn.

¹² Breslin, Curtis, and Peter Smith, Trial by fire: a multivariate examination of the relation between job tenure and work injuries. *Occupational and Environmental Medicine*, 63 (2006): 27-32; Shuford PhD, Harry, Workers' compensation and the business cycle: an overview, *NCCI*, October 30, 2008..

¹³ Shuford PhD, Harry, Workers' Compensation and the Business Cycle: An Overview, *NCCI*, October 30, 2008.

¹⁴ Exposure reported to the WCIRB was adjusted to the 2018 wage level.

¹⁵ Years of reforms in the workers' compensation system were excluded from the chart, including 1974-1975, 1989-1990, 1992-1994 and 2004-2005.

¹⁶ See [The World of Cumulative Trauma Claims](#) (WCIRB, October 2018) for the WCIRB's most recent published report on cumulative trauma claims in California.

Table 1. Relationship between Economic Cycles¹⁷ and Cumulative Trauma Claims per 100 Indemnity Claims (1994 – 2017)

Average Year-to-Year Percent Change in Cumulative Trauma Claims per 100 Indemnity Claims		
Time Period (excl. years of reforms)	Economic Expansion	Economic Downturn
1994 – 2001 (incl. 2001 recession)	-3.2 %	1.1 %
2001 – 2009 (incl. Great Recession)	0.1%	7.5 %
2009 – 2017	4.2 %	-

Claim Frequency Changes for Industry Sectors Most Impacted by the Recent Recessions

Not all industry sectors are affected equally during a recession. Depending on the nature of the recession, industry sectors may be affected with distinctive timing and intensity that could translate to significant changes in indemnity claim frequency. Using the Great Recession and the Dot-com recession as examples, we examined claim frequency changes for the most impacted sectors in California.

The Great Recession was characterized by a chain reaction across economic sectors that started with the housing bust and a sharp drop of employment in construction and real estate sectors (Table 2). The housing bust precipitated the ensuing financial crisis, which led to substantial job losses in the financial sector. By 2009, the housing-financial crisis led to job losses in most industry sectors. As shown in Table 2, manufacturing, a traditionally cyclical sector that had been losing jobs for a decade before the recession, experienced an acceleration of employment declines. The professional services and administration sector also had heavy losses primarily in the temporary employment services. For most of these hard-hit sectors, claim frequency continued to drop during the recession compared to the preceding expansion. The rate of decline in manufacturing and professional services almost doubled, while the decline in construction claim frequency during the Great Recession was similar in magnitude to that during the preceding economic expansion. The widespread use of furloughs of higher-pay jobs likely contributed to the atypical effects of recession on claim frequency in the real estate and finance sector. However, in 2010 and 2011, the frequency declines in construction and manufacturing moderated.¹⁸

Different from the Great Recession, the Dot-com recession in 2001 was heavily concentrated within the information sector, a high-pay and low claim frequency sector, and then spread to some other sectors in part as a result of the September 11 terrorist attacks. The information sector experienced the steepest job losses during the recession at an annual rate of 16.8%, a striking contrast with a 4% annual increase in employment during the Dot-com boom (Table 2). The impact of the Dot-com boom and bust for information sector claim frequency is more consistent with the typical relationship between employment and claim frequency, a 4.1% yearly increase during the boom and a 3.7% average decline during the bust. We found a similar impact in the manufacturing sector, with steep declines in employment and claim frequency during the recession and very modest change in both measures before the recession.

¹⁷ Economic cycles determined by the National Bureau of Economic Research.

¹⁸ See WCIRB's [Analysis of Changes in Indemnity Claim Frequency - 2012](#) and [Analysis of Changes in Indemnity Claim Frequency - 2016](#).

Table 2. Relationship between Shifts in Employment Level and Changes of Claim Frequency (per \$1 million exposure adjusted to the sector’s 2018 wage level) among Industries Most Affected during Great Recession and 2001 Recession

Industry	Annualized Rate of Change in Employment	Average Year-to-Year Percent Change in Claim Frequency	Annualized Rate of Change in Employment	Average Year-to-Year Percent Change in Claim Frequency
	Economic Expansion Preceding Great Recession (2001-2007, excl. years of reforms ¹⁹)		Great Recession (2007-2009)	
Construction ²⁰	4.5%	-6.5%	-13.9%	-5.4%
Professional Services and Administration	1.9%	-2.0%	-7.9%	-3.6%
Real Estate & Finance	0.7%	-3.9%	-7.0%	3.3%
Manufacturing	-1.6%	-3.3%	-3.9%	-6.0%
	Economic Expansion Preceding the 2001 Recession (excl. a reform year ²¹)		2001 Recession	
Information	4.0%	4.1%	-16.8%	-3.7%
Manufacturing	-0.1%	-0.5%	-7.4%	-8.0%

WCIRB’s Forecast of Indemnity Claim Frequency Changes

The current COVID-19 recession is unique regarding the abruptness of its descent due to the government-issued stay-at-home orders resulting in business closures from the coronavirus pandemic. The direct trigger of the recession is very different from the previous recessions that accompanied the housing-financial crisis or the Dot-com bubble burst. The current recession is particularly impacting industry sectors that rely heavily on consumer spending and close interaction with customers, triggering dramatic job losses in those sectors within a short period of time. Based on the latest national numbers from the BLS, the largest employment decline in April 2020 was in leisure and hospitality, followed by education and health services, retail and other goods-producing sectors.²² Therefore, the implications of the current recession on claim frequency in these sectors may be more significant compared to the previous recessions. In addition, given the nature of the pandemic and resultant stay-at-home orders, many workers’ duties have been restructured to be clerical in nature and performed at home and others continue to be paid but not working. These shifts may result in fewer claims being filed. However, the WCIRB has proposed regulatory changes to allow the exposure for these employees performing clerical duties to be reported in the clerical classification and for wages paid to workers who are not working to be excluded from

¹⁹ Years of reforms (2004-2005) in the workers’ compensation system were excluded.

²⁰ For the purpose of this study, the period for construction preceding the recession was defined from November 2001 to August 2006, wherein August 2006 had the highest employment rate based on the EDD employment monthly estimate. The recession period for construction is from August 2006 to June 2009.

²¹ 1994 as a year of reform was excluded.

²² [Bureau of Labor Statistics Employment Situation Summary for April 2020.](#)

reported payrolls.²³ As a result, if these changes are adopted by the Insurance Commissioner, indemnity claim frequency on a class mix adjusted basis should be less significantly affected.

The historical relationship between economic cycles and claim frequency in the workers' compensation system highlights the tangible impact of shifts in the labor market on claim frequency changes. Non-economic factors, such as changes in benefit levels, legislative reforms and industry mix, however, often are the more dominant influencing factors. For a number of years, the WCIRB indicated advisory pure premium rates have relied in part on an econometric model that projects future indemnity claim frequency changes based on approximately 50 years of frequency experience and several economic and claims-related explanatory variables, such as the unemployment rate, the rate of CT claims and statutory indemnity benefit changes.²⁴ For simplicity, the unemployment rate is used as a proxy for economic changes as it is the dominant factor among all the economic variables reflected in the WCIRB's model.²⁵

Prior to the pandemic, the WCIRB's model estimated indemnity claim frequency would decline by 2% in 2020 primarily because the pre-COVID-19 forecast of unemployment rate for 2020 was 4.3% and all other factors were assumed to remain approximately the same (Figure 2). Since then, there have been dramatic shifts in employment. Based on the updated post-COVID-19 national unemployment rate for April 2020 of 14.7%,²⁶ the WCIRB's model projects a claim frequency decline of 14% in 2020 (See Appendix for model specification). While the model accounts for the historical ratios of CT claims to non-CT claims,²⁷ if the increase in CT claims during the current recession is similar to the increase during the Great Recession, the estimated decline in the overall indemnity claim frequency may be moderated (down to 9%). To the extent the unemployment rate in California for 2020 may be higher, the model's corresponding frequency decline would be greater. For example, if the unemployment rate hits 25%, the model's corresponding projected frequency decline would be 19%. Conversely, if the unemployment rate flattens out at the end of 2020 resulting in the annual unemployment rate declining to 10% and the CT claim rate shows increases similar to the Great Recession, the model's projected frequency decline would be 6%.

It should be noted that the fifty-year history upon which the model was developed does not reflect employment drops of this magnitude in such a short time period. In addition, there are always concerns when relying upon model results if the explanatory variables are well beyond normal ranges. We conducted a sensitivity analysis to compare the estimated claim frequency change attributed to economic factors to the actual claim frequency change for 9 years with a high employment rate, and found that the model estimates deviate from the actual values by 2.7 percentage points on average.²⁸ While the model estimates for years of historically high unemployment rates seem stable, our forecast of claim frequency changes based on the current unprecedented unemployment rate remains an approximate estimate. In addition, this estimated claim frequency change does not include the impact of emerging COVID-19 claims or, to a significant extent, post-termination claims.

²³ See the WCIRB's proposed amendments to the *California Workers' Compensation Uniform Statistical Reporting Plan—1995* that were submitted to the Insurance Commissioner on April 20, 2020 (CDI File No REG-2020-00007).

²⁴ Brooks, Ward, "California workers compensation benefit utilization – a study of changes in frequency and severity in response to changes in statutory workers compensation benefit levels," *Proceedings of the Casualty Actuarial Society*, Volume LXXXVI (1999): 80-262.

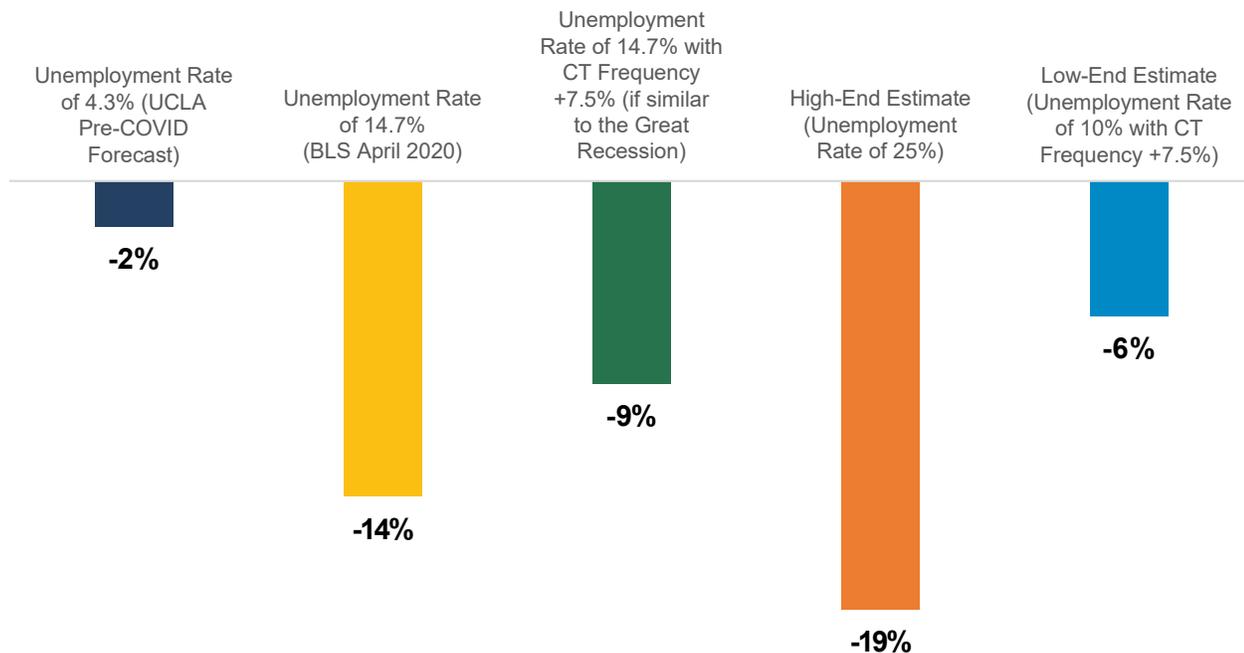
²⁵ Unemployment rate is one of the three economic factors (other two are aggregate employment and real gross state product) included in the WCIRB econometric model that estimates claim frequency change. The estimate relied on the first principle component in the principal component analysis of the three economic factors.

²⁶ This unemployment rate comes from [Bureau of Labor Statistics Employment Situation Summary for April 2020](#).

²⁷ Cumulative Injury Index, defined as the ratio of the number of CT claims to the number of non-CT claims, is one of the non-economic variables included in the WCIRB's econometric model. The ratio was based on the WCIRB unit statistical report data between 1979 and 2018. The model indicates that more CT claims would lead to an increase in indemnity frequency, holding all other factors constant.

²⁸ The indemnity claim frequency forecasts due to economic changes were produced by WCIRB's frequency model using historical data through 2 years before the forecasted year and removed the impact of non-economic factors. The actual claim frequency change due to economic changes was produced by the economic factors in the WCIRB's frequency model using historical data through 2018. The years tested with a high unemployment rate include 1991-1993, 2001-2003, and 2008-2010.

Figure 2. WCIRB’s Forecast of Indemnity Claim Frequency Change Due to Economic Changes



Post-Termination Claims

The filing of post-termination claims was restricted in the California workers’ compensation system by 1993 reform legislation. As a result, post-termination claims were relatively rare in California until recent years.²⁹ Beginning in 2011, several judicial decisions providing an expanded interpretation of the legal limitation on filing of post-termination claims enabled more workers to file CT claims after being terminated from work.³⁰ Subsequent to that, CT claims filed after the termination of employment have become significantly more common, particularly in the Los Angeles Basin.

WCIRB survey data suggests that about 40% of all newly reported CT claims are filed on a post-termination basis, and in recent years, between 15% and 20% of all newly filed indemnity claims are CT claims.³¹ To assess the potential impact of post-termination CT claims given the current economic conditions, the WCIRB compared the estimated number of statewide post-termination CT claims³² to statewide job losses for the same period.³³ On a statewide basis, estimated post-termination CT claims over the 2012 through 2017 period comprise about 25 claims per 1,000 jobs lost. If only one-half this rate is applied to the 4.3 million Californians who have already lost their jobs,³⁴ 54,000 post-termination CT claims could be filed over the next year, increasing statewide (including insured and self-insured employers) indemnity claim frequency by approximately 25%.

²⁹ The WCIRB’s Permanent Disability Claim Survey showed that less than 1% of all permanent disability claims up through 2007 were filed on a post-termination basis.

³⁰ The interpretation of Labor Code 3600(a)(10) and Labor Code 5412 were discussed in detail with regards to determining if a filed post-termination claim was valid. One of these cases include *Chan v. Carl Karcher Enterprises, Inc.*

³¹ See [The World of Cumulative Trauma Claims](#) (WCIRB, October 2018) for the WCIRB’s most recent published report on cumulative trauma claims in California.

³² Based on the relative sizes of the insured and self-insured markets in California, the WCIRB estimated that the statewide total of post-termination claims was approximately 150% of that based on the insured market.

³³ Job losses data are from the Department of Labor, National Bureau of Economic Research, UCLA Anderson Forecast, and Oxford Economics.

³⁴ Job losses are counting initial UI claims from March 9 to May 16, 2020; the numbers are released each week by EDD <https://oui.doleta.gov/unemploy/archive.asp>. The total number of initial UI claims does not include PUA recipients.

WCIRB's Forecast of COVID-19 Claims

Many claims with a COVID-19 diagnosis are emerging in the workers' compensation system. At the request of the State Assembly Insurance Committee, in April, the WCIRB evaluated the potential cost impact of COVID-19 claims assuming that a conclusive presumption of the illness being work-related applied to all essential workers.³⁵ While that evaluation assumed a broad application of a conclusive presumption over an annual period, even at the low-end of the range of the estimated potential impacts, the WCIRB estimated that approximately 95,000 indemnity claims would arise from a COVID-19 diagnosis over the next year, which could increase indemnity claim frequency by approximately 42%. In May, the WCIRB published a cost impact evaluation of Governor Newsom's Executive Order providing for a rebuttable presumption of compensability applying to workers directed to work outside their home for the period from March 19, 2020 to July 5, 2020.³⁶ In this evaluation, the WCIRB's mid-range estimate projected that approximately 31,000 COVID-19 claims would emerge for the period that the Order applies, potentially increasing claim frequency by 14%.

Conclusion

Historically in the California workers' compensation system, indemnity claim frequency often declined during economic downturns at modestly greater rates than in periods of economic expansion. The rate of CT claims, on the other hand, often increased significantly during economic recessions. Non-economic factors also impact claim frequency. The WCIRB's econometric frequency model that accounts for both economic and non-economic factors suggests that with the dramatic post-COVID-19 economic slowdown and unprecedented job losses, indemnity claim frequency will drop significantly. However, the model does not reflect any claims arising from COVID-19 diagnosis nor does it fully reflect recent trends in post-termination CT claims. It is possible and perhaps likely that growth in these types of claims will more than offset the impact of the economic slowdown on claim frequency.

³⁵ ["Cost Evaluation of Potential Conclusive COVID-19 Presumption in California Workers' Compensation."](#) WCIRB, April 20, 2020.

³⁶ ["Evaluation of Cost Impact of Governor Newsom's Executive Order on Rebuttable Presumption for COVID-19 California Workers' Compensation Claims."](#) WCIRB, May 22, 2020.

Conditions and Limitations

1. Some of the data used in the analysis was based on the experience of insured employers only. When needed to estimate the impact for the California workers' compensation system as a whole, the WCIRB assumed the patterns evident in the insured employer experience data were applicable to the entire state.
2. As discussed in the report, many factors impact claim frequency. While this report focuses on the impact of economic factors on claim frequency, in some cases the impact of other factors such as legislative reforms, regulatory changes and judicial actions can be more significant and will interact with economic factors.
3. The data in this report reflects information on claims submitted by insurers to the WCIRB through unit statistical report submissions, surveys and other data collection tools. While the individual insurer data submissions are regularly checked for consistency and comparability with other data submitted by the insurer as well as with data submitted by other insurers, the source information underlying each insurer's data submission is not audited by the WCIRB.
4. The restructuring of many workers' duties to be clerical in nature and performed at home as well as the continuation of pay for some workers who are no longer working may result in fewer claims being filed. However, the WCIRB has proposed regulatory changes to allow the exposure for employees with duties reassigned to clerical to be reported in the clerical classification and for wages paid to workers who are not working to be excluded from reported payrolls. If these changes are adopted by the Insurance Commissioner, indemnity claim frequency on a class mix adjusted basis should be less significantly affected. The WCIRB has not attempted to quantify this potential impact.
5. As discussed in this report, the WCIRB relied upon many publicly available sources of information in this analysis. While we deemed the sources credible for the purposes that we used the information, we did not independently validate the underlying information.

Notice

This *Research Brief – Impact of Economic Downturn on California Workers' Compensation Claim Frequency* (Research Brief) was developed by the Workers' Compensation Insurance Rating Bureau of California (WCIRB) and contains information for a specific period of time and may not reflect long-term trends before or after the specific period addressed in the Research Brief. This Research Brief contains data from a variety of sources, both public and private. The WCIRB has made reasonable efforts to ensure the accuracy of this Research Brief but cannot guarantee the accuracy of all the data or data sources. You must make an independent assessment regarding the use of this Research Brief based upon your particular needs and circumstances.

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**Table 1. Projected Claim Frequency Change from WCIRB's Indemnity Claim Frequency Model
As of Policy Year 2017 Preliminary 1st Set & March 2020 UCLA & BLS Unemployment Rate for April 2020**

AY	Annual % Changes Intra- Class Ind Freq	Annual Log Differences						
		Intra-Class Indemnity Frequency per \$M Exposure at Policy Year 2018 Level			AY+1 Indemnity Benefit Level	Cumulative Injury Index	Economic Variables (1st Prin.Comp.)	CalOSHA Dummy Variable
		Total	Total	Cumulative	Non-cum.			
1979	0.5%	0.005	-0.053	0.007	0.000	-0.060	0.134	0.000
1980	-6.5%	-0.068	-0.132	-0.066	0.033	-0.066	-0.080	0.000
1981	-3.5%	-0.036	-0.028	-0.036	0.000	0.008	-0.079	0.000
1982	-1.6%	-0.016	0.153	-0.022	0.352	0.175	-0.294	0.000
1983	6.2%	0.060	0.214	0.054	0.081	0.160	0.029	0.000
1984	9.5%	0.091	0.235	0.084	0.000	0.151	0.222	0.000
1985	2.0%	0.020	0.138	0.014	0.000	0.124	0.081	0.000
1986	-2.4%	-0.024	0.039	-0.028	0.000	0.067	0.078	0.000
1987	1.5%	0.015	0.053	0.013	0.000	0.041	0.151	0.000
1988	0.7%	0.007	0.104	0.000	0.000	0.104	0.088	0.000
1989	2.5%	0.024	0.212	0.009	0.046	0.203	0.045	0.000
1990	9.0%	0.087	0.337	0.061	0.071	0.276	-0.121	0.000
1991	0.3%	0.003	0.166	-0.018	0.023	0.184	-0.293	0.000
1992	-11.1%	-0.118	-0.272	-0.098	0.013	-0.174	-0.186	0.068
1993	-14.9%	-0.162	-0.240	-0.153	-0.057	-0.088	-0.022	0.464
1994	-12.8%	-0.136	-0.462	-0.107	0.061	-0.355	0.106	0.173
1995	-4.6%	-0.048	-0.016	-0.050	0.053	0.034	0.092	0.295
1996	-6.8%	-0.070	-0.136	-0.065	0.096	-0.071	0.075	0.000
1997	-3.3%	-0.033	-0.023	-0.034	0.066	0.011	0.138	0.000
1998	-3.8%	-0.038	-0.040	-0.038	0.058	-0.002	0.079	0.000
1999	1.5%	0.014	0.100	0.008	0.040	0.092	0.128	0.000
2000	4.0%	0.039	0.071	0.037	-0.003	0.034	0.066	0.000
2001	-6.9%	-0.072	-0.018	-0.076	-0.007	0.059	-0.101	0.000
2002	-2.3%	-0.023	0.007	-0.026	0.060	0.033	-0.202	0.000
2003	-2.9%	-0.029	-0.005	-0.031	-0.065	0.026	-0.023	0.000
2004	-16.6%	-0.182	-0.209	-0.180	-0.398	-0.030	0.093	0.000
2005	-13.6%	-0.146	-0.298	-0.133	0.051	-0.165	0.141	0.000
2006	-5.7%	-0.059	-0.050	-0.059	0.016	0.009	0.095	0.000
2007	-1.6%	-0.017	0.021	-0.019	0.049	0.040	-0.084	0.000
2008	-2.7%	-0.027	0.038	-0.033	0.006	0.038	-0.308	0.000
2009	-0.2%	-0.002	0.168	-0.018	0.066	0.186	0.000	0.000
2010	8.9%	0.085	0.139	0.079	0.012	0.060	-0.092	0.000
2011	1.2%	0.012	0.032	0.010	0.003	0.022	0.043	0.000
2012	4.7%	0.046	0.127	0.036	0.025	0.091	0.123	0.000
2013	0.4%	0.004	0.126	-0.013	0.071	0.139	0.151	0.000
2014	0.2%	0.002	0.051	-0.006	0.003	0.056	0.178	0.000
2015	-1.2%	-0.012	0.025	-0.018	0.002	0.043	0.194	0.000
2016	-2.4%	-0.025	0.062	-0.039	0.004	0.101	0.124	0.000
2017	-2.3%	-0.023	-0.042	-0.019	0.004	-0.023	0.137	0.000
2018*	-1.4%	-0.014	-0.085	-0.000	0.003	-0.085	0.132	0.000
2019	-1.7%	-0.017	-0.017	-0.017	0.004	0.000	0.023	0.000
2020	-14.0%	-0.151	-0.151	-0.151	0.004	0.000	-1.274	0.000
2021	-3.7%	-0.038	-0.038	-0.038	0.004	0.000	-0.183	0.000
2022	-2.0%	-0.020	-0.020	-0.020	0.004	0.000	-0.008	0.000

Y = Hazardousness-Adjusted Noncumulative Indemnity Claim Frequency	
Constant	-0.020
Std Err of Y Est	0.039
R Squared	0.571
No. of Observations	40
Degrees of Freedom	35
X Coefficient(s)	0.178
Std Err of Coef.	0.072

Notes:

Economic variables are historical through 2019; Unemployment rate of 14.7% for the 2020 projection was from BLS Employment Situation Summary on April 2020; March 2020 UCLA Anderson Forecasts for 2021 on.

Regression is over AY 1979 through AY 2018. AY 2019 through AY 2022 are projections.

Indemnity Benefit Level variable is leading. The benefit level change for AY 2004 is related to the AY 2003 change in non-cumulative frequency.

The Indemnity Benefit Level change for Ogilvie & Almaraz / Guzman in 2009-2010 is not leading.

The Indemnity Benefit Level variable excludes indemnity benefit utilization, and changes in the death and permanent total benefits.

The Indemnity Benefit Level variable has been revised due to on-leveling reassessments. See Actuarial Committee item AC09-03-03.

For 1993 on, cumulative claims include both cumulative trauma and occupational disease claims. See March 19, 2014 Actuarial Committee Agenda Item III.

The constant term, -0.036, consists of measured offsets that recognize annual changes in real benefit levels relative to nominal benefit levels and long-term economic growth. Without these offsets, the indemnity benefit level and economic variables would project frequency to increase without bound.

*AY 2018 is preliminary and change is based on a comparison of 2018 accidents on 2017 policies to 2017 accidents on 2016 policies.

Table 2. Indemnity Claim Frequency History and Projections

AY	Intra-Class Indemnity Claim Frequency(a)	Inter-Class Indemnity Claim Frequency Index(b)	Overall Indemnity Claim Frequency	Annual Percent Changes		
				Intra-Class	Inter-Class	Overall
1979	0.510	0.921	0.614	---	---	---
1980	0.477	0.914	0.570	-6.54%	-0.75%	-7.24%
1981	0.460	0.900	0.541	-3.54%	-1.56%	-5.04%
1982	0.452	0.882	0.522	-1.59%	-2.00%	-3.56%
1983	0.480	0.873	0.549	6.20%	-0.98%	5.17%
1984	0.526	0.871	0.600	9.53%	-0.18%	9.32%
1985	0.537	0.867	0.609	2.05%	-0.51%	1.52%
1986	0.524	0.859	0.589	-2.39%	-0.92%	-3.28%
1987	0.532	0.854	0.595	1.53%	-0.56%	0.97%
1988	0.536	0.854	0.599	0.69%	-0.06%	0.64%
1989	0.549	0.853	0.613	2.47%	-0.08%	2.39%
1990	0.599	0.845	0.662	9.04%	-0.89%	8.07%
1991	0.600	0.832	0.654	0.28%	-1.58%	-1.30%
1992	0.534	0.820	0.573	-11.09%	-1.45%	-12.37%
1993	0.454	0.810	0.481	-14.91%	-1.25%	-15.98%
1994	0.396	0.809	0.420	-12.76%	-0.06%	-12.81%
1995	0.378	0.811	0.401	-4.64%	0.16%	-4.49%
1996	0.352	0.800	0.369	-6.78%	-1.25%	-7.94%
1997	0.341	0.791	0.353	-3.27%	-1.23%	-4.46%
1998	0.328	0.786	0.337	-3.76%	-0.60%	-4.34%
1999	0.333	0.774	0.337	1.45%	-1.48%	-0.05%
2000	0.346	0.752	0.340	4.02%	-2.91%	0.99%
2001	0.322	0.753	0.317	-6.91%	0.13%	-6.79%
2002	0.315	0.763	0.314	-2.31%	1.34%	-1.00%
2003	0.306	0.764	0.306	-2.86%	0.20%	-2.67%
2004	0.255	0.763	0.254	-16.65%	-0.21%	-16.82%
2005	0.220	0.760	0.219	-13.59%	-0.31%	-13.85%
2006	0.208	0.754	0.205	-5.69%	-0.81%	-6.46%
2007	0.204	0.749	0.200	-1.64%	-0.68%	-2.31%
2008	0.199	0.740	0.192	-2.71%	-1.18%	-3.86%
2009	0.198	0.727	0.189	-0.20%	-1.82%	-2.02%
2010	0.216	0.713	0.201	8.87%	-1.87%	6.83%
2011	0.219	0.703	0.201	1.22%	-1.42%	-0.22%
2012	0.229	0.694	0.208	4.71%	-1.20%	3.46%
2013	0.230	0.692	0.208	0.37%	-0.36%	0.01%
2014	0.230	0.693	0.209	0.16%	0.20%	0.36%
2015	0.227	0.689	0.205	-1.22%	-0.66%	-1.88%
2016	0.222	0.683	0.198	-2.45%	-0.78%	-3.21%
2017(c)	0.217	0.680	0.193	-2.26%	-0.51%	-2.76%
2017(d)	0.215	0.680	0.191	-100.00%	-100.00%	-100.00%
2018(e)	0.212	0.678	0.188	-1.38%	-0.26%	-1.63%
2019	0.208	0.679	0.185	-1.67%	0.15%	-1.52%
2020	0.179	0.678	0.159	-14.02%	-0.19%	-14.18%
2021	0.173	0.674	0.152	-3.74%	-0.53%	-4.26%
2022	0.169	0.673	0.149	-1.98%	-0.18%	-2.16%

Notes: (a) All frequencies are per \$M exposure at PY 2018 Level.

(b) Index is to AY 1961.

(c) 2017 accidents on 2017 and 2016 policies.

(d) 2017 accidents on 2016 policies only.

(e) AY 2018 percent changes are based on a comparison of 2018 accidents on 2017 policies to 2017 accidents on 2016 policies.

(f) Forecasts below thick solid line.

Source: WCIRB Indemnity Frequency Model